Hitachi Develops the Basic Technology for Authentication of Digital Research Notebooks
Secure authentication and electronic archiving of experimental notes and ideas by writing on paper

Tokyo, Japan, 30th August 2006 --- Hitachi, Ltd. (NYSE:HIT / TSE:6501) today announced the development of basic technology for digital research notebooks enabling research notes recorded on paper to be securely archived.   The technology developed is an integration of digital pen(*1) technology which automatically creates an electronic record of handwritten notes and digital signature(*2) technology which authenticates the originality of an entry, enabling the authentication of ideas and experimental data.   This technology is expected to find wide application as basic technology in next-generation management systems for research notebooks in the current trend towards fortification of intellectual property strategies and authentication of research originality in both industrial and academic research.

The recent trend to fortify intellectual property strategies within public and private research organizations, as well as the emphasis on originality of papers presented at academic societies, is increasing the importance of being able to authenticate the originality of ideas and validity of data collected during the research phase.   Until now, it has been common practice for researchers write down ideas, record experimental data and other notes in a paper-based research notebook on a daily basis.   If a research notebook system existed which could securely archives handwritten notes, it would be an objective source of evidence to support the originality of the research, and in the future, when that research culminate in a patent application or research paper.

In response to this need, Hitachi has employed a "digital pen" which automatically creates an electronic record of handwritten notes and a "digital signature" which insures that the data is recorded without tampering, to develop basic technology for a secure digital research notebook system based on the conventional practice of handwritten paper-based research notes.

Features of the technology developed are:

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(1) Digital conversion of handwritten records and management of the information written with the digital pen

An electronic entry is made using a digital pen which automatically records information written in the specialized notebook, and stores it on a computer.   The notebook contains special paper with a unique dot pattern, which is used to automatically identify the area on the notebook being written on. Further, *more -* printed information such as experimental data and graphs which are not handwritten in the notebook, may also be electronically linked to the notebook by printing on special paper, also with a unique dot pattern, and affixing it to the specialized notebook.

(2) Application of digital signature technology for authentication of the recorded data

Digital signature technology was employed to authenticate the originality of the electronically formatted data.   Each time an entry is made in the notebook, an electronic signature is attached to the digital entry, providing a secure back-up of and historical record of changes.   This function also serves to prevent tampering of research notes.

(3) Research note verification procedure checked by entry time, date, and author information

Data entered with the digital pen includes not only handwriting information but also the pen ID, entry date and time.   Organizational information such as information on the researcher, supervisor, management, etc., may be added to the system, to ensure that the authorization procedure is being correctly processed. (*3)

(4) Research record search by entry date and author

Required data can be quickly retrieved from research notes saved on the computer, by keying in search parameters such as researcher name or research period, dispensing with the need to flip through pages of written notes.

The technology developed for digital research notes, not only allows researchers to continue taking notes in the familiar and conventional pen & paper style, but also enables the entries to be stored on a computer together with a guarantee of authenticity and originality of entry. As this technology can be applied to other tasks which involve the use of written records and is able to check that the records are being processed correctly, it is it is expected to find wide application in public agencies, financial institutions, and as a means for ensuring corporate compliance.

This technology will be presented at 5th Forum on Information Technology (FIT 2006) to be held from 5th – 7th September at Fukuoka University, Fukuoka, Japan.

Notes:

(*1) Digital pen technology was developed by Anoto AB of Sweden.   Products and solutions using this technology are being developed by partners such as Hitachi.

(*2) The digital signature technology used hysteresis signature technology, developed through joint research by Hitachi, Waseda University, and Yokohama National University.   When digitized handwriting data is recorded, any previous signatures which have been assigned to the data, are carried over, so that a link is created between signatures when the new data is recorded.   As a result, the security of data which will be saved over a long periods, is improved. For further information: http://www.hitachi.co.jp/Prod/comp/app/proofbox/ (in Japanese)

(*3) The authentication process is initiated by the researcher, followed by the supervisor, however, based on the ID number registered to the owner of the pen, entry log time and date of the signature, it is also possible to check that the process is being conducted correctly.

About Hitachi, Ltd.

Hitachi, Ltd., (NYSE: HIT / TSE: 6501), headquartered in Tokyo, Japan, is a leading global electronics company with approximately 356,000 employees worldwide. Fiscal 2005 (ended March 31, 2006) consolidated sales totaled 9,464 billion yen ($80.9 billion). The company offers a wide range of systems, products and services in market sectors including information systems, electronic devices, power and industrial systems, consumer products, materials and financial services. For more information on Hitachi, please visit the company's website at http://www.hitachi.com.

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