

A hand holding a blue digital pen is shown in the upper right corner, pointing towards the center. The background is a dark blue, slightly blurred image of a document with checkboxes. One checkbox is checked with a blue mark, and another is empty. The overall lighting is dim, with a blue tint.

# Digital Pen and Paper

Point of View

**accenture**

Technology Labs

• Consulting • Technology • Outsourcing

Digital pen and paper provides a cost-effective way for traditional paper processes to enter the digital world.



Business still relies heavily on pen and paper. This may be for legal reasons or convenience, because some users are uneasy about making a full switch to the electronic world or because it is simply too costly to equip a large team of field workers with individual computing devices. Yet handling forms, receipts, and other paper documents often slows down essential processes and generates costly bottlenecks for many businesses. And at some point, this data needs to be incorporated into an enterprise's computing systems.

Digital pen and paper provides a cost-effective way for traditional paper processes to enter the digital world by fusing the traditional means of information-gathering with electronic communications. Until recently, consumers have been the primary target audience for digital pen and paper technology. Accenture Technology Labs, the technology research and development organization within Accenture, has developed in-depth experience of the technology and believes that it is now mature enough to make a radical difference in enterprises. In collaboration with client teams, the Labs are inventing assets that make this technology innovation relevant to a number of industries.

### Making its mark

Digital pen and paper technology combines the portability and social acceptance of traditional pen and paper with a computer's ability to store, share, and act upon the information collected.

Digital pens are used like ordinary pens – only they are embedded with electronics capable of storing time-stamped content. Users write on paper printed with a faint irregular pattern of dots similar to map coordinates, enabling the pen to know which form is being used, what is being written, where on the form and when. For increased security, each pen has a unique identifier allowing all information recorded by it to be traced back to the source. The data stored in the pen is transmitted through a syncing inkwell or a Bluetooth mobile phone to a central server for storage, further processing and analysis, or transmission to colleagues.

The Labs considers digital pen and paper to be especially relevant in situations requiring a significant amount of forms processing, and when information such as signatures and figures needs to be collected, or a paper-based item such as a receipt provided – either in or away from the office. In workflow situations that involve multiple hand-offs between departments, digital pen and paper technology can reduce cost sixfold.

Digital pen and paper technology can be easily introduced – at a manageable cost – to users who are unfamiliar with or wary of new technologies. For example, in industries that have tried and trusted paper-based processes, digital pen and paper enables a new level of efficiency without disrupting working procedures.

The universal benefits of introducing this technology include:

- speedier forms processing – written information is electronically transmitted to a central database where it can be accessed by authorized parties, without having to wait for it to be re-keyed into an enterprise's system. Quicker access to information can improve customer service;
- automatic backup – digital pen and paper creates a virtual double of records and forms that can be accessed enterprise-wide or by authorized external entities, while guarding a paper trace if required. This should help improve reporting and compliance where needed;
- transparent transition and acceptance of a new technology – the pens are so easy to use that little to no training is required. Users can perform their duties as they always have while benefiting from improved performance. Furthermore, digital pen and paper is less physically intrusive than PCs or laptops in situations such as financial discussions or census interviews;
- traceability – the paper can have unique identifiers which enable the pen to track and identify signatories. Information is traceable back to a specific pen and data is time-stamped for added accountability.

Equipping workers with a digital pen and paper for forms processing would cost a fraction of supplying them with computers or mobile devices – both initially and for replacements. With a relatively modest investment and minimal instruction, companies could achieve significant cost savings, streamline processes, and get a headstart on the competition.

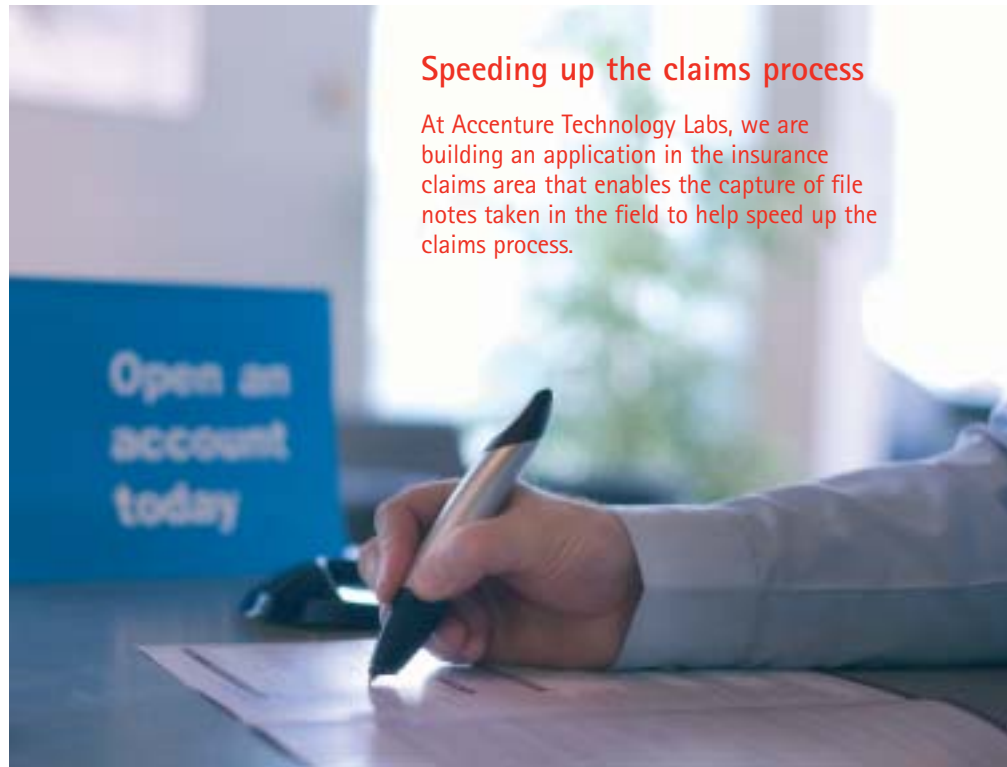
## In Accenture's opinion, the following industries in particular should consider the potential of digital pen and paper technology:

### Financial services – speeding up paper-based procedures.

The insurance industry could save money by reducing the costs linked to paper processing and increase revenue through not losing life assurance customers during a lengthy approval process. Similarly, banks could save money and improve customer services in areas such as loan applications or setting up new accounts, by reducing response time to days or even hours. For both industries, digital pen and paper would maintain the legal protection of having original signatures on forms, and retain the human touch (as opposed to mechanical) which is essential when discussing and recording sensitive information. This technology offers the opportunity to begin digitizing paper processes while financial institutions can further explore digital signatures.

### Healthcare – enhancing the safety, quality, and efficiency of patient care.

Digital pen and paper could be used to modernize the time-consuming, manual task of completing patient observation charts (see side-bar). Information recorded by the pen would be transmitted to a central server and integrated into an electronic patient record which could be accessed by authorized third parties such as other attending physicians, insurance companies, and pharmacies. Another use could be in combating fraud. The UK Health Service estimates that prescription falsification costs them over \$100m per year. With digital pen and paper, prescriptions would be digitally transmitted from the doctor to the hospital's server and then to the patient's designated pharmacy, thus thwarting a person's ability to manipulate or forge what the doctor ordered. Pharmacists would have an online copy to compare to a patient's written prescription.



### Speeding up the claims process

At Accenture Technology Labs, we are building an application in the insurance claims area that enables the capture of file notes taken in the field to help speed up the claims process.

### Improving healthcare operations

Through access to an early version of the technology, Accenture Technology Labs has developed the Digital Observations solution for the recording of patient information. Nursing staff would use digital pen and paper to record patient observations the way they normally do. Whatever is recorded on the charts would be digitally recorded by the pen, transmitted to the hospital's central server, and could be consulted whenever and wherever the attending physicians required, thereby creating a virtual double of the hard copy.

#### Benefits

Doctors would still make their rounds, but would be able to access patients' charts prior to visiting them and prioritize visits as needed or view a patient's progress over time electronically.

Staff efficiency and patient care could be improved through the solution's ability to alert staff when a patient's vital signs exceed safe thresholds or when their medication has not been given (especially relevant for those medicines where very accurate timing is vital).

The Accenture Digital Observations solution can optimize the usage of staff time, enhance human performance, and reassure patients, without requiring special skills or training to implement it.

It illustrates a key aspect of the Reality Online technology vision where people are able to access and manage the physical world online through the creation of virtual doubles of physical objects or events. For more information on Reality Online, visit: [www.accenture.com/realityonline](http://www.accenture.com/realityonline)

In Accenture's opinion, the following industries in particular should consider the potential of digital pen and paper technology:

**Manufacturing – aiding in quality control and safety check-ups.**

Manufacturing a car requires more than 15,000 parts and accessories which must fit and work together perfectly even though they might be made by many different companies, in different countries.\* Cars on assembly lines could be issued with a checklist which workers could quickly complete with a digital pen for each vehicle they work on. This information could be fed into a central system where managers and other concerned parties could constantly monitor quality. The technology could also be used for collecting and transmitting safety-critical information from aircraft and machine maintenance where the added safety of the pen's time-stamp and unique identification features would prove invaluable.



**Government bureaus – improving the quality of public services.**

The UK's *Police Magazine* reported that of the 43.1 percent of time spent by officers in police stations, 40 percent is spent on paperwork\*\*. Digital pen and paper could help reduce the enormous amount of time involved filling in forms such as incident reports, so that police would have more time to proactively serve the public. The postal service could use this technology for tracking deliveries, and filling in customs forms. And census takers and pollsters could be equipped with a digital pen and paper to enable statistics to be tallied more rapidly and securely.



\*NIST website – National Institute of Standards and Technology  
\*\**Police Magazine*, February 2002 – 'Bureaucracy Busters'



## Composing the write strategy

Digital pen and paper is an emerging technology set to take off. As the cost of the pens decreases, Accenture Technology Labs believes that their use will become more widespread, and that new features and innovations will be introduced. In the meantime, innovative companies can gain competitive advantage by:

1. identifying areas where costs are high because of the current use of pen and paper, where processes could be accelerated to give competitive edge, or where new revenue streams could be generated through the introduction of the digital pen and paper;
2. conducting a value-targeting exercise to determine how digital pen and paper technology can be applied to address your company's key business issues and integrated into your overall infrastructure – including enterprise applications, mobile devices, and IT platform;
3. developing a business case for incorporating digital pen and paper technology;
4. rolling out a pilot to test its effectiveness and acceptance.

### Right technology at the right time

Depending on what a mobile workforce needs to achieve, one type of mobile technology or a mix of several might be appropriate. For example, if workers need to access or retrieve information, digital pen and paper technology is unlikely to replace PC, PDA, and other mobile devices. However, in the specific scenario of checking and managing hospital observation charts, the Labs demonstrates how digital pen and paper can be integrated seamlessly with tablet PCs to help doctors and patients alike.



*High performance. Delivered.*

### **About Accenture Technology Labs**

Accenture Technology Labs, the dedicated technology research and development (R&D) organization within Accenture, has been turning technology innovation into business results for almost 20 years. The Labs create a vision of how technology will shape the future and invent the next wave of cutting-edge business solutions. Working closely with Accenture's global network of specialists, Accenture Technology Labs helps clients innovate to achieve high business performance. The Labs are located in Chicago, Illinois; Palo Alto, California; and Sophia Antipolis, France. For more information, please visit our website at [www.accenture.com/accenturetechlabs](http://www.accenture.com/accenturetechlabs)

### **About Accenture**

Accenture is a global management consulting, technology services and outsourcing company. Committed to delivering innovation, Accenture collaborates with its clients to help them become high-performance businesses and governments. With deep industry and business process expertise, broad global resources and a proven track record, Accenture can mobilize the right people, skills and technologies to help clients improve their performance. With more than 100,000 people in 48 countries, the company generated net revenues of US\$11.8 billion for the fiscal year ended August 31, 2003. Its home page is [www.accenture.com](http://www.accenture.com)

© 2004 Accenture All rights reserved.

Accenture, its logo, and High Performance Delivered are trademarks of Accenture.