



WHITE PAPER

TECHNOLOGY AS A TOOL

“Where is records and document management heading?”

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Introduction

In 1981 (26 years ago), while Director of Customer Support and Services for Sperry Univac, I wrote my first paper about the coming revolution in personal computers, networking and office automation. This paper included my first (very wrong) prediction about the paperless office. I think I said that most of the commercial world would be paperless in ten years or so.

In subsequent years I wrote and presented many times on the "paperless office" and related topics such as records management and document management but soon gave up predicting when we would be all paperless because all available statistics showed a rapidly escalating use of paper in business, not a decline.

I once said, "Until governments outlaw printers, copiers and fax machines the paperless office is a pipe-dream."

<http://www.knowledgeonecorp.com/news/WhitePapers.htm>

Interestingly, most of the technological improvements I predicted came true but none had the effect on paper usage I envisioned.

In 2007 we are using technology that wasn't even imagined in 1981 but business and government are using more paper than ever before and the majority of organizations all around the world are still reliant upon paper records.

All of which begs the question, "Does technology really have an effect on the way organizations manage records and documents?" Or, "Why has technology failed to make other than a minimal impact on the way we manage records and documents?"

Technology has obviously had a major impact on the way we manage factories and produce goods and it has had a major impact on the way we manage information (the Internet and Google for example) and wage war (smart bombs) so why hasn't it has a significant affect on the way we manage documents and records? Why are most records systems still paper-based? Why are organizations like Iron Mountain still making a fortune from storing paper records?

Certainly, we have thousands of customers around the world that use our software and our software (like that of our competitors) has full EDM and imaging capabilities but, most of our customers still maintain paper records even though they could easily implement a paperless office. It is a constant source of puzzlement and frustration.

And finally, "Will coming technological changes and improvements finally and fundamentally change the way we manage records and documents?"

What technological changes and improvements can we expect?

The Obvious – More of the same

1. Faster and Cheaper Computers

Improvements in servers will provide performance benefits but further improvements in workstations won't make much difference as very few 'workers' today use anything like 100% of their current workstation's capabilities.

2. Bigger, Cheaper and Faster Disk Drives/Storage Solutions

Will make long term storage a more efficient proposition and improvements in access times will reduce transaction times.

3. Faster, Smarter Scanners

Will be coupled with smarter software (e.g., K1Corp's High Speed Scanning Module) and will make 'capturing' paper easier, faster and more of an automatic process.

4. Faster (Greater bandwidth) Networks

Will reduce transaction times but not as much as expected because "work always expands to fill the available capacity."

5. Improved WiFi Services

Better Standards (e.g., ODF) - ISO 26300

Will allow us to utilize new and improved devices and will also allow for more 'convenient' processing, i.e., from the 'floor' and on the move instead of having to return to your desk. It will liberate managers from their desk bound status as improvements make broadband services ubiquitous and give us the ability to 'connect' to our EDRMS system from virtually anywhere.

<http://www.abiresearch.com/home.jsp>

6. Standards, Standards, Standards

The real problem with standards is that we always use the plural form. Who remembers Xopen and its lofty ideals? Ho hum, we have yet another standard for long term electronic document storage and exchange and more lofty ideals from involved (read "hoping to make a buck") parties. So, what is the next one going to be? Will Microsoft succeed in getting a competing standard recognized? At least we should be grateful that we now have a single ISO standard (a single world standard?) that we can all agree on and use; if only we do.

<http://en.wikipedia.org/wiki/OpenDocument>

<http://xml.openoffice.org/>

<http://www.computerworld.com/softwaretopics/software/apps/story/0,10801,111130,00.htm>

7. RFID (Radio Frequency Identification) Technology

This technology has been promising to reinvent the records management business for many years but the twin evils of high cost and conflicting standards (read proprietary solutions) have slowed the conversion process to a snails pace.

However, with cost-effective pricing and non-proprietary standards this technology does have the ability to significantly improve all records management tracking and inventory processes. This is one of my picks as a technology likely to significantly improve EDRMS processing.

<http://www.rfid-101.com/>

8. Improved Mark up Languages (XML +)

The evolution from SGML and HTML will continue. XML already underpins most modern EDRMS solutions (e.g., K1Corp's Knowledgeone) and already provides the world's best self-documenting way to store and exchange electronic records. I see XML (or its successors) as being an essential foundation for all future EDRMS solutions.

<http://blogs.msdn.com/mikechampion/archive/2005/01/03/345862.aspx>

The Less Obvious

9. Virtualization

This is definitely more for the "techies" (or as they are sometimes affectionately known, "propeller heads"), as it delivers the ability to do more with existing server resources. Whether or not it will contribute in a significant way to improved EDRMS systems is debateable.

http://news.com.com/Dell+plans+virtualization-oriented+server/2100-1010_3-6169830.html

10. Faster, Improved Internet (Web 3.0)

This will be a major contributor to a new business processing model and will be the catalyst for many new and improved application processing paradigms. It has the potential to fundamentally change the way we run business software solutions like EDRMS software.

<http://blogs.zdnet.com/SAAS/>

11. Better Programming Tools and Techniques (.NET, SOA, PHP, AHA, Ajax, etc)

Most of these make it easier and faster for IT people to roll out and support EDRMS solutions. They also allow developers to implement new processing, capture and classification paradigms for EDRMS solutions. Paradoxically, while they make it easier for customers to roll-out and use EDRMS solutions they make it harder (read more complex) for the developer to design and write innovative EDRMS solutions.

<http://www.knowledgeonecorp.com/news/pdfs/Solving%20the%20Integration%20Problem.pdf>

12. Ubiquitous/Pervasive Computing

This is already widespread (even toasters now have computer chips) and has been around for a long time (see the following 1996 paper) and will become more so in the future. With major improvements in miniaturisation and falling costs comes the ability to add computers to any device or object including documents (newer passports already include computers), file folders, archive boxes and shelving.

<http://sandbox.xerox.com/ubicomp/>

13. Wearable Computing

Wearable computing means that the end-user 'wears' the computer rather than having to react with computers installed in the office. This is a step up from carrying around the portable barcode reader in a holster on your belt. Look forward to the records management shirt.

<http://alumni.media.mit.edu/~rhodes/Papers/wearhive.html>
<http://cnnstudentnews.cnn.com/2001/fyi/news/04/11/wearable.computers/>

14. Embedded Computers

The general definition of embedded computers (see Wikipedia link below) defines them as single purpose computers 'embedded' in devices such as phones and PDAs. The future will

see embedded computers in desks, doorways, walls and ceilings (big brother is watching) to fully automate many manual tasks and to track and locate any object.

http://en.wikipedia.org/wiki/Embedded_system

15. Implanted Computers

People have been implanting computers since at least 2000 and the practice will invariably become more and more common despite its Orwellian connotations. Within 20 years Cyborgs will be as common as mobile/cell phones today.

How long before Paris Hilton creates a new fashion trend with an implanted cell phone? My bet is that it will become common amongst the 'trendy' set within 5 years.

As far as EDRMS solutions go I don't really see records and knowledge managers rushing out to get 'chipped', at least not within the next 10 years. After that, who knows; it may be mandated by governments (starting with children so they can be tracked and traced just like pets) or it may just become de rigeur.

<http://archives.cnn.com/2000/TECH/computing/12/07/robot.man/>

<http://www.cs.indiana.edu/cgi-pub/midwic/papers/uploads/olivera.pdf>

16. Improved Human-Machine Interface

Basically, the easier it is for a human being to work with a computer the more the human being can get done. However, advances in operating systems and office products do not necessarily mean an improved interface.

For those of you with a few years in IT please contrast the ease of use of 'old' character based word processing packages with Word 2007. Word 2007 has to be at least 10 times more difficult to use and 100 times more complex than word processing packages of yore.

For whatever reason, user interfaces (UIs) have become more 'sexy' (i.e., graphical user interfaces versus character user interfaces as in DOS) but also significantly more complex and infinitely more difficult to navigate.

Hopefully, we will start the move back to simpler and more effective UIs as we have done with the new UI in Knowledgeone.

<http://www.iec.org/online/tutorials/hmi/>

17. Better Solution Paradigms

We desperately need to move away from the inefficient and productivity-sapping, client-centric, user-dependent and manual paradigm to a fully automatic, rules-driven and server-centric paradigm for records and document management systems. We need to do everything automatically using very clever software instead of relying on end-users. Make the software do the work, not the long suffering end-user.

We are designing all of our new products in this manner and now have an email management product (GEM) and a document management product (RecCapture) using this new paradigm. That is, where they operate as 'expert-systems' in the 'background' and where there is nothing to install on the workstation and nothing for the end-user to do.

- **GEM**
<http://www.knowledgeonecorp.com/products/gem.htm>
- **RecCapture**
<http://www.knowledgeonecorp.com/products/capture.htm>

Will technology alone ensure improved records and document management solutions?

- No, no and no again.
- We need a senior level and ongoing commitment to improved records and document management (EDRMS) practices.
- We need budget.
- We need adequate training for all levels of staff involved in EDRMS projects.
- We need milestones and objectives and internal reviews.
- We need metrics and regular external audits so we can review the plan against reality.
- We need to change the concept of an EDRMS application from that of a cost centre to a profit-centre.
- We need a better solution paradigm, server-centric (labour-lite) and not reliant upon end-users (labour-intensive).

Which technology will improve future EDRMS implementations?

- **Faster networks and improved WiFi services**
Allowing us to roll-out faster, better, smarter and more convenient solutions.
- **RFID technology**
Finally completely automating all paper, file and box tracking.
- **Embedded computers**
Single-purpose, single task computers handling many EDRMS tasks fully automatically.
- **Improved Human-Machine interface**
e.g., RecFind to Knowledgeone, 320 different screens to 10 different screens.
- **Better programming tools and techniques**
Facilitating an improved human-machine interface and better solution paradigms.
- **Better solution paradigms**
Reducing the workload and involvement of the end-user, moving away from the productivity draining, client-centric, end-user paradigm.

Conclusions

- 1. Will coming technological changes and improvements finally and fundamentally change the way we manage records and documents?**
I say yes but I have been wrong before.
- 2. Will we finally be able to achieve a 'Paperless Office'?**
I say yes but I have been wrong before.
- 3. What technology do you think will make the most difference to records management practices?**
RFID, fully automating all tracking functions.
- 4. What technology do you think will make the most difference to document management practices?**
The adoption of a client-centric, rules-driven and fully automatic processing paradigm, providing an 'expert system' that does not rely on end-users.

Acronyms

Note that all of the following are used in building web based applications.

SGML

Standard generalized Markup Language. The ancestor of both HTML and XML. SGML was itself developed from an earlier 1960s markup language called GML developed by IBM.

HTML

Hypertext Markup Language.

XML

Extensible Markup Language.

HTTP

Hypertext Transfer Protocol.

Ajax

Asynchronous JavaScript and HTML.

REST

Representational State Transfer protocol.

ASP

Active Server Pages, Microsoft's server-side script engine for dynamically-generated web pages.

JavaScript

JavaScript was developed from a programming language called LiveScript which was developed by Netscape. It is used for 'client-side' scripting (i.e., it runs in the browser). JavaScript scripts are added to HTML pages to add functionality to an otherwise 'static' web page.

JSON

JavaScript Object Notation. A data exchange protocol.

PHP

PHP is an open-source scripting language similar to JavaScript except that it is a server-side language. It runs on the web server to process code before it is sent to the browser.

AHAH

Asynchronous HTML and HTTP.

Web Services

The W3C defines a Web Services as a software system designed to support interoperable machine to machine interaction over a network. Web services are frequently just Web Application Program Interfaces (APIs) that can be accessed over a network, such as the Internet, and executed on a remote system hosting the requested services.

SOA

Services Oriented Architecture.

SOAP

Simple Object Access Protocol.

Rico

An Ajax framework.

Xoad

XMLHTTP Object-Oriented Application Development. A server-side framework with Ajax support.