1 Introduction

When they asked you to "take a look at some document management systems and make a recommendation" it must have seemed so simple. Documents are pervasive in practically every organisation and in every industry - surely it has all been sorted and the answers are well-known?

So you did a web search, and now you are in a swarm of buzzwords such as:

- Knowledge Management (KM) systems
- Enterprise Content Management (ECM)
- Content Management Systems (CMS)
- Document Management Systems (DMS)
- Enterprise Content Management (ECM) systems
- Web Content Management (WCM)
- Collaborative Working / Groupware
- Enterprise 2.0
- Enterprise Resource Planning (ERP) systems
- Regulatory compliance and e-Discovery

The first thing we are going to do is to provide simple definitions of these, to help you know what it is you should look for.

The second, slightly harder, thing we are going to do is to help you decide what class of system is right for solving your problem. You won’t be too surprised to learn that ‘it depends’, but if you can recognise your type of problem, you may be able to narrow your search to a system that addresses those requirements.

2 Making Sense of Definitions

This part of the software industry has a baffling array of terms to describe what ought really to be common sense requirements.
Perhaps the best way to make sense of it is to start at the most abstract level, which is **Knowledge Management** (KM). This term generically describes the practices used by organisations to identify, create, represent, and distribute knowledge. Some of the 'enablers' that have been used to do this include document management systems as well as other IT systems. This term is just too high level to add much practical value.

If we turn to **Document Management Systems** (DMS) then Wikipedia says: “a document management system (DMS) is a computer system (or set of computer programs) used to track and store electronic documents and/or images of paper documents. The term has some overlap with the concepts of Content Management Systems and is often viewed as a component of Enterprise Content Management Systems and related to Digital Asset Management, Document imaging, Workflow systems and Records Management systems.”

AIIM\(^1\), the organisational body for **Enterprise Content Management** (ECM), defines ECM as "the technologies used to capture, manage, store, preserve, and deliver content and documents related to organizational processes. ECM tools and strategies allow the management of an organization's unstructured information, wherever that information exists." Other ECM vendors would add that this is done through "the centralized management of content, allowing for people and systems to access and manage content from within any business context using platform agnostic standards."

A **Content Management System** (CMS), Wikipedia says: “is a program used to create a framework for the content of a Web site.” Features of a CMS might include automated templates for common types of web pages and a WYSIWYG page editing tool. Wikipedia goes on: “a web content management (WCM) system is a CMS with additional features to ease the tasks required to publish web content to web sites.” The latter highlights the workflow or life cycle management of digital information. An example feature might be that only approved pages can be published to an external web site, or an audit of who has changed what, and when.

The easy part is to work out the hierarchy of relationships in the above definitions, and depict it graphically:

The less easy part is to use this to help narrow your research and the search for a system that will help address these requirements in your organisation.

As is often the way with these things, the way forward is not to look at definitions of IT systems but to look at the requirements and other characteristics that define your organisation.

A very good way to focus your requirements is to consider what type of content you want to manage.

### 3 What type of Content do you Manage?

A problem with documents is that there are many types. Sometimes, they can be relatively structured (as in forms or records) and sometimes they are completely unstructured. They can be either paper-based or electronic. And so on...

Not everything done under R&D is a document – we produce CAD files, PowerPoint presentations, Sales spreadsheets, images etc. Collectively, this is **content**.

Forrester Research sorts enterprise content into 3 categories\(^2\):

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What type of system you require depends on which category accounts for most of your content. If you are an insurance company receiving paper-based forms that need to be entered electronically, then it would be practical to look at document imaging and scanning features. If you are doing the same operations regularly on transactional content then it is likely you will benefit from what Gartner calls CEVAs (content-enabled vertical applications) that run on top of ECM environments.

If you are a design company that maintains several dozen websites for different clients, then your emphasis is persuasive content and web content management systems have been developed with you in mind.

Most R&D organisations fall into the middle (Business content) category, with some requirements emanating from content in the other categories. In the average month in most high-tech companies the time of knowledge workers is spent on business content in unstructured formats. Every time that a new idea gets put down in a document and sent to a co-worker via email it is another example of the fact that an estimated 80% of all information generated by business today consists of documents, spreadsheets, e-mails, presentations, drawings and other unstructured data. Each R&D employee works in a team environment, where team membership could include other departments such as Product Planning/Marketing, Technical Authoring, Operations, Quality, Sales, Legal and Product Manufacturing. The essential ingredient in helping these teams collaborate is through the effective management of unstructured information.

Most key business decisions are made using unstructured information. Yet, in a survey of 565 senior executives across different countries and industries, the Economist Intelligence Unit found that 57% disagreed with the statement "I have ready access to all of the information I need to perform my role". When asked “what are the barriers to information sharing at their company”, the #1 reason was that the “necessary information resides in silos”.

Because unstructured information forms such as critical role, it can have a big effect on day-to-day economics. The Butler Group found that 25% of each working day (one full day per working week) is wasted on non-productive document tasks – time taken by staff finding information that they need for their jobs.

In some industries, it’s enough to worry about keeping an internal track of documents. But in the high-tech sector you also have to worry about sharing with other companies. In a different survey by the Economist Intelligence Unit, 68% of 405 senior European executives say that increased R&D collaboration with third parties is central to improving their firms’ innovation. This is also true for any company that depends on licensing IPR - there has to be a balance between protecting the IPR and sharing it with partners and licensed customers.

So, however difficult it may be to solve the problem of implementing a document management strategy for your company, there is no doubt as to its importance.

When it comes to an actual solution, many R&D organisations try to solve this using existing tools such as network drives, shared folders and/or software configuration management tools. They turn to what is familiar because they lack the time to invest in research and strategy. Or, a company may

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3 www.eiu.com/knowledgeworkers
4 http://www.eiu.com/site_info.asp?info_name=eiu_Qualcomm_Value_of_Knowledge&rf=0
invest in a commercial tool without understanding fully what they are getting into in terms of functionality, support, Total Cost of Ownership (TCO), licensing agreements etc.

There is a version of the Pareto principle that applies to document management in the typical R&D organisation - 80% of the benefits come from 20% of the functionality. By solving a few key needs, most of the advantages can be had.

4 ECM Vendors

One of the main sources of information about the ECM market is Gartner’s "Market Share: Enterprise Content Management Software" report. According to Gartner, ECM was a $2.9 billion market in 2007, based on worldwide software revenues.

Gartner has a concept of the "ECM Magic Quadrant" which is a 2x2 matrix based on their estimate of a vendor’s "ability to execute" and "completeness of vision". A rival study is the Forrester Research "wave" approach. The most recently published version of each is shown below:

These reports give a good overview of who the market leaders are in ECM. Both show that over half of the total market, as measured by total software revenue, is held by just four vendors, namely:

- EMC: Documentum Content Server and eRoom
- IBM: FileNet, Content Manager, and Lotus Notes
- OpenText: Livelink and Hummingbird (eDOCS)
- Oracle (Stellent)

One problem with these reports is that they have a self-perpetuating aspect – the more features that are packed into the all-encompassing, single vendor software suite; the more it looks like a suite and scores better on the Gartner and Forrester ratings. This correlates with the problem of defining ECM in the first place. A ‘little bit of everything’ is better than being ‘best in class’ on one or two elements.

The other factor that will not be immediately apparent is the problem of measuring value-for-money: these products have license-based costing, complicated pricebooks and are simply very expensive. Indeed, Forrester itself published a recent survey of users of ECM suites and found that “software licensing and pricing continues to be marred by complexity, soaring maintenance costs, and a lack of flexibility and alignment with business goals”.

5 http://www.forrester.com/go?docid=38876
6 http://www.forrester.com/Research/Document/Excerpt/0,7211,44266,00.html
Another criticism of these market reports is that they more or less exclude Open Source solutions. So, here is a report from Optaros on open source CMS products:

However, it would probably be more accurate to describe this as a chart of commercial open source document management systems rather than content, as the latter would include e.g. Drupal, Plone, Joomla and many others.

Based on the information in this section you should be able to make a short list of the market leading vendors.

## 5 What IT infrastructure do you use?

Or, perhaps better put as “if we are a Microsoft shop should I use SharePoint?” This section deals with one software vendor – Microsoft – because of the high probability that the enterprise desktops run Windows and Office software.

When you use the term SharePoint be clear whether that means ‘free' Windows Sharepoint Services (WSS), or MS Office Sharepoint Server 2007 (MOSS 2007) which needs a CAL (Client Access Licence) for each named user. With WSS 3.0 you get support for basic workflow and can manage lists and libraries. With MOSS 2007 Standard you get content management and search, good for say a personal website. You need MOSS 2007 Enterprise edition for document centre support.

So, MOSS 2007 can create a "document library" which is a type of SharePoint list that contains documents and metadata. You choose whether or not to enable versioning on the document library and once the library is created, you can upload documents and share them with other users. MOSS 2007 is well-integrated with Outlook and can be used to manage calendars, meetings and agendas. MOSS 2007 can be a good way to implement a collaborative environment for a department or small company, especially if the IT infrastructure is predominantly based on Microsoft server software.

Microsoft also promotes MOSS 2007 for Web Content Management. There are critics of this who point out its lack of security and inability to scale for the large Enterprise because the content (as opposed to just metadata) is stored in the database. You need to set up a SharePoint server farm, with one database server/cluster and multiple SharePoint/Web servers. ECM vendors such as Open Text are currently "providing business process and/or vertical-market specific ECM applications that work on top of SharePoint; and providing enterprise-scale records management and archiving capabilities that can support a company’s SharePoint sites”.

The cost of a MOSS 2007 Enterprise license for an external site combined with the cost of a CAL for each named user, as well as the cost of server hardware, means that this can work out to be an expensive solution. If you procure an ECM suite as well, this can work out to be a very expensive

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solution. It’s your decision, but the advice is to do a full total cost of ownership (TCO) analysis and do not assume it will be free or low-cost.

It’s important that software (even open source) works well in a Microsoft environment and supports file system level access. For example, CogniDox has support for Web-based Distributed Authoring and Versioning (WebDAV) which is a set of HTTP extensions that allows users to create, change and move documents on a remote web server. This proves that file sharing and configuration isn’t the start and end of content / document management. There are many essential features in addition.

6 Putting it into context: Enterprise 2.0

In these days of a well-publicised 'credit squeeze' there are considerable pressures on IT budgets and several commentators have written on the decline of proprietary enterprise software 'mega deals' in which a single vendor is awarded a high-value contract to integrate as many functions as possible.

As recently as just ten years ago there wasn’t much choice. Organisations could not buy an enterprise suite and had to buy (and integrate) component solutions. However, not very long after integrated ECM suites became available the truth dawned that these are very generic solutions that seem to add complexity to their products to improve comparisons with their competitors rather than drill down into the needs of any one vertical market.

This is why the rise and fall of proprietary enterprise software has been so swift. There is a growing trend towards pre-customised, industry-specific software. However, this in itself does not address the costs associated with integrating any software. Companies have learnt that it is not wise to ask for non-standard features or add-ons – the cost balloons and maintenance is more difficult.

These days, proprietary enterprise software vendors will give discounts on license fees but then raise maintenance prices; most commercial open source software vendors rely on support and training fees as their source of revenue. This can have a blurring effect where the cost of the initial licence gets lost, and what should really be considered is the total cost of ownership.

You know your business sector, so who best to decide the requirements for your enterprise software than yourself. If you choose free open source software to match those requirements you save on the licensing fees, but you also have to factor in the cost of integration and customisation, support and training. If you co-opt in extra employees to do this, what do you do when the project is complete? If you out-source it, you pay a premium for contract labour and consultancy.

In the UK, there seems to be slower adoption of open source software despite the up-front cost advantage. This may be because UK companies are reluctant to download software online, and prefer to establish a relationship with the software vendor upon purchase, in case they need help or support with the software during and after implementation. And, although it is improving, it is still an issue to
find people with good technical skills in open source platforms. Therefore, if there is a glitch in the open source software project it may be catastrophic trying to recover.

The right answer seems to be a hybrid model. For the company’s IT strategy, do choose your open source platform (e.g. Perl, PHP or Java) and an open source database (e.g. MySQL or PostgreSQL). But, rather than building applications from scratch on these platforms or thinking that downloading free open source will address your industry-specific requirements and ongoing maintenance needs; consider buying-in commercial software based on open source.

This way, you address the traditional (but still vital) issues of the performance, scalability, security and reliability of your IT systems. You also get cost savings when you implement, because you need fewer and more generic hardware to support your open source software project.

You then have a choice in commercial open source - do you pay up-front for user licences and expect good value-for-money in ongoing maintenance? Or, do you download the free community version and higher pay-as-you-go fees in support and training?

The CogniDox option is to pay up-front and then benefit from the community aspect of future support and maintenance. But it is your choice.

7 Easy to Buy, Easy to Install, Easy to Use

These factors were probably evident to you when you were considering ECM vendors, but they are worth highlighting:

**Easy to Buy**: This refers to the obscure way that the ECM vendors price their products. Software vendor pricelists often run to literally pages of product choices. It’s not designed to be easy for you, the buyer. It is designed to leave cost as ambiguous as possible, to allow for the maximum ‘wiggle room’.

**Easy to Install**: This refers to a factor that isn’t always clear particularly with the open source products. Some are simply more difficult to install and get working than others. A problem with open source in general is managing the version control and it can be very frustrating working out by trial and error what version of software works with what. It’s vitally important that the installation process is as automated as possible. It’s also important that it doesn’t take effort to set up the initial user accounts. Preferably, the setting of user permissions and authentication should be automatic, via active directories, LDAP, etc.

**Easy to Use**: There should be a comprehensive User Guide, written by Technical Authors. There should be a separate Administrator’s Guide. The User Guide should be available as HTML such that it can be accessed as on-line help.

If the software allows for any degree of user personalisation it is an attractive feature, leading to better user acceptance. If, however, configuring the modules regularly breaks the system then any advantage is quickly lost.

But the really key thing about the user interface is that it should be simple and uncluttered.

The front page for CogniDox tries to find the happy compromise between ease of navigation and use of white space (i.e. as many useful links as possible without cluttering the screen):
Of course, in the source code model if you don’t like it, you own and can change the Perl code!

## 8  How much will it Cost?

As you may have anticipated by now, ECM vendors do not as a rule publish their price lists on their web sites.

The commercial open source vendors are also shy about telling you how much they charge for the paid services such as support or the Enterprise version.

There are useful web sites such as CMS Watch where you can find some information. We used them to create the following example for a **mid price** proprietary ECM system for 50 users:

<table>
<thead>
<tr>
<th>Cost of ECM</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>License</td>
<td>£ 20,000</td>
<td>£ 50,000</td>
</tr>
<tr>
<td>Install, Integrate &amp; Customise</td>
<td>£ 40,000</td>
<td>£ 75,000</td>
</tr>
<tr>
<td>Hardware &amp; Networking</td>
<td>£ 10,000</td>
<td>£ 10,000</td>
</tr>
<tr>
<td>Annual Support</td>
<td>£ 12,000</td>
<td>£ 48,000</td>
</tr>
<tr>
<td><strong>Total Budget</strong></td>
<td>£ 82,000</td>
<td>£ 183,000</td>
</tr>
</tbody>
</table>


What is a mid-range ECM system? For example, ECM’s ApplicationXtender is priced on the number of concurrent users: a 20-user system, says ECM, would cost around $20,000 - about quarter the price of the equivalent Documentum 5 purchase from the same vendor. That makes each user cost around £500 (compared to £2000 for Documentum). It follows that a 50 user system is £25,000 just for the license.

We looked at a number of similar solutions and opted for £20,000 as a typical low-end price for a 50 user company. The costs for a typical installation and annual support came from CMS Watch. We allowed a fairly generous hardware (servers mostly) budget of £10,000, but kept it level across all product tiers.
We’re happy to tell you how much CogniDox costs by comparison for 50 users:

<table>
<thead>
<tr>
<th>Cost of ECM</th>
<th>CogniDox</th>
</tr>
</thead>
<tbody>
<tr>
<td>License</td>
<td>£ 10,000</td>
</tr>
<tr>
<td>Install, Integrate &amp; Customise</td>
<td>£ 2,500</td>
</tr>
<tr>
<td>Hardware &amp; Networking</td>
<td>£ 10,000</td>
</tr>
<tr>
<td>Annual Support</td>
<td>£ 1,875</td>
</tr>
<tr>
<td><strong>Total Budget</strong></td>
<td><strong>£ 24,375</strong></td>
</tr>
</tbody>
</table>

Again, we kept the same hardware budget as in the example above. If you want to see our full pricing, please go to [www.cognidox.com](http://www.cognidox.com) for details.

## 9 Watch out for Hidden Costs

One of the reasons why the ECM vendor price books are complex is to make it hard to do “apples to apples” comparisons. Some of the licensing terms and conditions could significantly increase your costs and/or limit your flexibility in rolling out the solution across your company.

One aspect you should be wary of is the ‘named user’ license. A named-user license is typically based on the login name of a single user. Only the designated named-user may use or otherwise run the software and it must only be executing on one computer at a time. These licenses are activated and managed through a license manager, so it’s another process to be factored into IT operations.

A variant is the concurrent license, where you have say 30 licenses for a 50-person company because you calculate that is how many people are likely to use the software at the same time. This works until you mis-calculate, and there will be times when users complain they can’t get into the system to use essential tools. Concurrent licenses are usually not priced in a way that would encourage you to over-order in the first place, so this is a common outcome and puts pressure on the IT help desk.

Another tricky area can be server (or CPU) based licensing. A typical example from one vendor is a Server Corporate Edition for 2 CPUs, priced at $60,000 plus mandatory annual support at $11,000 (and you still need to buy concurrent user packs as well). Other examples are sold on a very rigid client/server model, and seem to view the typical company as clusters of users around a centralised server. Each server requires a separate license.

If you opt for a system configuration that has redundant servers for high availability, for example, you have to swallow the cost of paying for the backup machine licenses. If you want a cluster of servers, in which employees in the UK can logon to a system in India if the system in California is unavailable, then server-based licensing can simply cost more than the benefits justify.

Next, you need to watch out for the problem of the extra modules. This is where you opt for a system because it does ‘X’ only to find that the standard version doesn’t include that feature and you need to buy in another module, with another license to administer.

The last problem is most fuzzy, but potentially most expensive. You have this problem when you feel that you are adapting your business to the software package rather than the package adapting to you, or when you have to employ specialised IT staff from a rarefied part of the industry just to support the package. This is the problem of business re-engineering, where you have to spend on adapting your business because you opted for a tool. Not a problem if you wanted to change anyway, but a big problem when you end up playing an enterprise version of the "Twister" game.

It really should be much simpler. How about you pay for the software tool based on how big your company is on the day you bought the tool? If you double in size because you acquired your rival...
then you can pay the few £K difference for the higher category. Then, you decide what server configuration you'd like to run and you don't worry about how many users are logged on to the software tool at any one time.

How about if, instead of regarding system installation and customisation as a way to double or treble the revenue gained from the sale, that software tool vendors start from the assumption that every company is subtly different even from similar companies in their sector, and they charge you a fair fee for tailoring it to your requirements?

Yes, that's the way CogniDox is licensed.
Cognidox Ltd is a privately held company based in the UK. It was founded in 2008 but with document management software now over ten years in active development.

CogniDox started as a document management system called "doxbox" created by Virata in 1998 to assist it in managing silicon and software design for its communications semiconductors business. As Virata successfully added dozens of OEM companies to its list of licensees, a need arose for a way of sharing design documentation with those customers using a secure "licensee server". Virata wanted to make sure that companies only saw documentation for the designs they had licensed, and it wanted to know which users from those companies had downloaded what documentation, and when.

Doxbox was extremely useful to Virata in helping team collaboration as it acquired companies and added new R&D sites. Doxbox continued in use as the company merged to became GlobespanVirata and again later when it was acquired by Conexant Systems. It scaled effortlessly to 1000+ users at many worldwide locations. Finally, rights to the software were granted to us in 2005 to ensure that it could be commercialised as a product.

Cognidox Ltd was set up to make CogniDox the first choice document and content management system for High Tech companies.

The company CEO is Paul Walsh - [http://www.linkedin.com/in/paulwalsh1](http://www.linkedin.com/in/paulwalsh1)

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