

# White Paper

September 2002

## Document Management

Hummingbird DM™ 5.0 in  
Hummingbird Enterprise™

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## ► EXECUTIVE SUMMARY

The implementation of a document management system should not be considered in isolation. Whilst the benefits of such an implementation can be put forward, it has to be seen as only one piece of a total Enterprise Information Management System (EIMS).

Hummingbird Enterprise is such an EIMS, of which Hummingbird DM 5.0 is one part. This White Paper examines the key features and benefits of that particular product, but also places it in relation to the other elements of Hummingbird Enterprise.

When considering a large-scale implementation, such as an EIMS, a balance has to be struck between utilising existing assets and replacing those assets with a new solution. The industry trend in many areas is to create a modular solution that abstracts common services, thus removing the need to implement the dreaded 'framework', or start everything from scratch.

Hummingbird has taken this approach with Hummingbird Enterprise, and the solutions described in this White Paper, within the section on this suite of tools, can all be implemented as single entities. The strengths of some combinations of products are enhanced by the implementation of other elements, and this is always worthy of consideration.

This enhancement can be most clearly seen with two of the products within the Hummingbird Enterprise suite; namely, Hummingbird Portal, and Hummingbird DM. Both of these elements are functionally rich in their own

right, and also present additional possibilities in interaction between themselves and with the other available products.

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interchangeable terms, used depending upon the flavour of the moment. When considered logically, there are distinctions between the two areas, and any solution should take this into account.

At the highest level, document management can be considered as the ability to physically manage the data-containing documents. Content management, on the other hand, is about the logical use of the data and surrounding metadata (or contextual elements) contained within any given document or set of related documents.

Understanding this difference is important when considering the solutions available. Organisational requirements will differ, and this will influence the choice of solution provider. Given the above differentiators, most organisations will require content management, even if they talk about document management.

Although Hummingbird DM is branded as document management, the contained functionality goes far beyond the physical and spreads its influence to the logical. This is equally true of Hummingbird Enterprise, which has both physical and logical uses.

## ► HUMMINGBIRD DM 5.0

Hummingbird DM is a document management solution that handles the physical management of documents and the logical use of document content. It forms an essential management part of the Hummingbird Enterprise suite of tools and products, but can be considered as a stand-alone solution.

As an open document management system, Hummingbird DM can interface with third-party solutions, but there is extended value in considering it in relation to the other elements of Hummingbird Enterprise, which will be discussed later in this White Paper.

### **User Interface**

The product is available with three UI metaphors; all are provided as standard and a global implementation is not tied to any one of the three. The three UIs available are:

1. Browser or Web-based.
2. Microsoft Explorer-based.
3. Microsoft Outlook-based.

Users can select any or all of the UIs which all contain the same facilities and functionality. Of especial interest is the fact that the Web-based UI, known as webtop, does not contain limitations that would normally be associated with this type of interface.

There is full drag-and-drop support in the Web-based UI, where a frameset can represent and have the same properties as a Window pane. Thus, the left frameset can contain hierarchical folder trees and the main frameset can contain the individual documents contained within a folder. The documents can be dragged from the main frameset to a folder within the left frameset exactly as with Windows Explorer.

Within any browser-based UI, much is often made of the ease of use and the fact that users are comfortable with the Web-page paradigm. In reality, there is no actual Web-page paradigm beyond the use of hyperlinks. There is no standard that users could be considered 'comfortable' with. By applying a true 'user standard' (the Windows Explorer) to a browser interface, Hummingbird DM does create a far more intuitive solution.

Document management is not just about the UI, although this is an element that should be understated, it is about the ability to access the relevant content of the stored documents. A strong argument could be put forward that a document management solution is only as strong as the strength of the implemented search engine.

### **Search Capabilities**

Whilst this might be too sweeping a statement to be fully supportable, there is no doubt that the ability to search, and receive relevant result sets, is a key feature for any document management solution.

Hummingbird DM contains the Hummingbird SearchServer, which was originally the Fulcrum SearchServer acquired when Hummingbird acquired Fulcrum Technologies in 1999. Extensive R&D work has been put into the search engine in the intervening years, and the SearchServer is not only an integral part of Hummingbird DM and Hummingbird Portal, but is also OEM'd in many other products.

Within Hummingbird DM, the search engine has been implemented to allow different levels of search capability. Although all document management search engines can perform complex queries, not all also provide a facility for simpler searches. Hummingbird DM allows a variety of different searches to be undertaken.

Metadata can be searched using Query By Example (QBE). There is a simple to use UI that allows documents to be filtered against metadata and/or content. Lookup tables are attached to relevant metadata fields, making selection of items such as author or document type, a completely guided process.

An 'easy search' screen is also available, with a single entry box for required text. The user has to make no other entries, and the returned result set is ordered in the following manner:

- Documents containing the exact phrase in the title.
- Documents containing the exact phrase in the document.
- Documents containing one or more words in the title.
- Documents containing the words in the same sentence or in proximity to each other.
- Documents containing one or more words in the document.

Users can also instantiate more complex searches of content by entering key words or phrases separated by semi-colons, defining whether it is an exact phrase search, a search on all of the words, or a search on any of the words. The range for word proximity can also be set, as can word or phrase exclusion.

Finally, custom searches can be built against content and/or metadata. Even though this might be considered as a piece of functionality for power-users, the inclusion of lookup tables and drop-down menus brings it into the range of the less experienced.

## Relationships

One related aspect of searching is also worthy of comment, and that is the ability within Hummingbird DM to create document-to-document relationships and/or document-to-folder relationships. Users can set relationships between other documents or folders at any point in time; for example, on discovery of a new document that the user feels has relationship relevance. This will have a knock-on effect for searching, when not only will the relevant documents be displayed in the result set (based on the specific search criteria), but the user will also be presented with a list of related documents or folders that might also hold relevant information.

Two items stand out here; one positive and one negative. Showing possible related documents moves Hummingbird DM from the purely physical to the logical. It provides possible additional informational resources that may be of use to the person making the search. By including these related objects as distinct elements, this allows the user to choose whether or not they are relevant to the reason for the search.

No matter how good a search engine is, it can never understand the 'reason' for a search. The inclusion of related objects moves the solution closer to being able to answer the unanswerable. As a technology implementation it is both clever and well designed. As a logical construct it is immensely impressive and useful.

The negative aspect comes with enforcing the rules for relationships. The user working with the document has to have knowledge of related objects, or has to perform an additional search to discover possible relationships. Overdoing relationships will also form a far too complex structure for future search result-sets, and make the whole methodology counter-productive. Therefore, there has to be a strong administration element in this whole relationship-defining area.

## Property Inheritance

One aspect of Hummingbird DM that helps ease this negative aspect is the implementation of folders as objects. As a folder exists as a distinct object, a document that is saved to a particular folder can inherit the properties of that folder. In terms of relationships, this makes the document-to-folder relationship a powerful tool and less demanding than the document-to-document relationship.

A more obvious benefit of property inheritance from folder to document is that the user placing the document in the repository is saved the time of entering all the property details. Document property elements are pre-filled and the user just needs to make any minor adjustments as necessary to better define the individual document.

**Security** The security of documents is administered by the standard implementation of users and user groups, with enforceable read/write and publish privileges able to be set against individuals or groups. These privileges can be administered in one of two opposite manners. Users can be specifically given rights to an object or can be denied rights to an object. This ability to enforce security from opposing default viewpoints can considerably ease the management burden.

**Personalisation** Although many of the features within Hummingbird DM affect the front-end presentation layer, they are more than mere window-dressing. The implementation of front-end usability is backed by enhanced structures within the underlying technology.

The personalisation possibilities made available demonstrate this fact admirably. Personalisation within any product can be implemented simply at the presentation layer, or can impact on the business logic or process layer. The former gives a nice look-and-feel, while the latter makes personalisation more effective by enhancing the work process and removing restrictions caused by too rigid a work-rule structure.

Hummingbird DM's personalisation starts with the webtop where the usual forms of personalisation can take place. These include elements such as how dates should be displayed, the number of documents to show per result-set page, etc. The first major factor that is of interest concerns the ability to set up how documents should be opened.

Three options for document viewing are available:

1. Opening the associated application (such as Microsoft Word for .doc files, or Acrobat Reader for .pdf files). The native application has to reside on the client machine for this to be available.
2. Using the DM viewer, which can display numerous file types.
3. Have the document rendered in HTML.

Naturally, only the first option allows documents to be edited (the others are for read only) and only if the application has that inherent capability and the user privileges allow it.

Personalisation options extend to creating a user profile that, as with folder inheritance, will again save time when placing a document in the repository. The choice can also be made as to which Hummingbird components should be installed. Examples of optional components include:

- Shell extensions and e-mail integration.
- Application integration.
- FulView, which is an ActiveX control for document viewing.
- Smart check-in/checkout.
- Extensions for collaboration integration.

E-mail integration is also worthy of further comment. E-mails are stored within the DM repository as .msg files and not .rtf; this allows e-mail links and hierarchical trees to be automatically maintained. There is also the ability to capture outgoing e-mails, and whilst this can be mandated, organisations have to be aware of any legal ramifications of this.

**Workspaces** Hummingbird has introduced the idea of 'Workspaces', where individual users can work with related documents. Workspaces are customisable virtual document stores that allow users to group sets of documents together logically. This saves time in terms of not having to regularly search for documents or navigate through complex structures to access a document.

Users can set up multiple Workspaces; giving them relevant names. Workspaces can contain documents, folders, and saved searches from the DM system alongside external URL links. Workspaces are personal and private, but folders within a Workspace can be declared as public. More importantly, the idea of a private Workspace has no impact on the implemented security layer. Thus, a folder within a Workspace and the documents within that folder retain their original access rights, even if the folder has been declared public.

As with any personalisation aspect of any application, not just document management, the over-riding requirement is to ensure that corporate policy, standards, and requirements take precedence over any individuality. Hummingbird DM enforces this requirement, and personalisation can be limited by any or all of the above factors.

**Workflow** Inherent within a good document management system is workflow, and Hummingbird DM has an optional workflow module. The workflow editor uses a GUI to perform the following actions:

- Select documents for the workflow.
- Create new workflow paths or utilise a current path template.
- Describe and implement the stages required, along with defining serial or parallel processing for the stage. Parallel staging is handled by defining the join conditions of the stage.
- Assign participant(s) for the stage.
- Assign tasks to the stage participant(s).
- Define sub-routes and sub-tasks for the stage.
- Add detail on who is allowed to view the path during execution. A monitor tool is included that allows an authorised or defined user to view the progress of any implemented workflow path. The monitor is not available to any person who is involved in the specific path as a participant.

Once the path has been fully defined and started, the associated tasks become visible to the participants. Full e-mail notification can also be implemented both in terms of sending e-mails to a tasked person when a task is required and also to the task originator when the task has been progressed.

Although the workflow is limited in relation to dedicated workflow applications (for instance, there is no modelling capability), and is completely document-centric, it is easy to use and performs at the level expected for a module that is associated with a document management system.

**Deployment** At the technical level, the following are the supported platforms and recommended system requirements for the various elements of Hummingbird DM 5:

#### **DM Server and DM Web Server**

- Dual Pentium III 600 processor.
- 1GB of memory.
- Microsoft Windows 2000 Server/Advanced Server.
- Microsoft Windows NT4.

#### **DM Web Server Platforms**

- Microsoft IIS 4.0 and above.
- Sun iPlanet 4.0 and above.

#### **Databases**

- Oracle 8i and Oracle 9i.
- Sybase ASE 12 and 12.5
- Microsoft SQL Server 2000 and SQL Server 7.

### Document Servers

- Microsoft Windows NT4.
- Microsoft Windows 2000 Server/Advanced Server.
- Novell NetWare 5 and 6.
- Generic UNIX. This utilises Hummingbird's NFS Maestro for Connectivity.

### DM Webtop and DM Extensions Workstations

- Pentium III 600 processor.
- Microsoft Windows XP.
- Microsoft Windows 2000.
- Microsoft Windows 98 SE.
- Support for Java and JavaScript is required.
- 128MB RAM.
- Microsoft IE 5.5 and 6.
- Netscape 6.2.
- Microsoft Windows NT4.

## ► HUMMINGBIRD ENTERPRISE

Hummingbird DM is one part of a total EIMS solution. Consistency between the various elements of Hummingbird Enterprise is provided at three levels:

1. Consistency of the codebase to remove the necessity for integration between the modules, and to provide cross-application functionality.
2. Consistency of UI to reduce the costs of training and to facilitate ease of use.
3. Consistency of implemented process to turn the various distinct elements into a knowledge-based solution.

Hummingbird considers that the informational needs of organisations can be broken down into seven areas of required functionality and process, for each of which it can provide a solution. The defined areas and the implemented solutions are detailed below:

<b>Access</b>	Hummingbird Portal
<b>Connect</b>	Hummingbird Connectivity
<b>Manage</b>	Hummingbird DM
<b>Protect</b>	Hummingbird RM
<b>Find</b>	Hummingbird KM
<b>Analyse</b>	Hummingbird BI
<b>Share</b>	Hummingbird Collaboration
<b>Publish</b>	Hummingbird ETL

Butler Group's view would be slightly different, in that attempting to pigeonhole solutions against any conceptual or semi-conceptual model is ultimately counter-productive. The modules that go to make up Hummingbird Enterprise do not fit neatly into the prescribed slots. Hummingbird Enterprise has to be considered in terms of functionality and not marketing.

The over-riding point is that the individual solutions can be utilised in a number of ways, due to their high degree of functionality. Some of these features and functionality are shown in the following sections.

### Hummingbird Portal

Hummingbird Portal is the core platform for utilising all aspects of an enterprise information infrastructure. In this instance, this means access to data, content, and applications. It also means forming a collaborative environment where all of the above can be shared in a structured manner.

The collaborative environment is document-centric, and is extensible beyond the internal enterprise boundaries. Creating document-centric collaboration not only fits well with Hummingbird DM, but also with the effective use of informational assets, which typically reside within a document structure.

Hummingbird Portal introduces e-Clip plug-ins that provide integration between the portal and enterprise systems such as SAP R/3, Siebel, Lotus Notes, etc. There is also a developer kit available that allows the creation of specific e-Clips using any standard scripting language for integration, access and delivery of content, and a range of other possibilities. The developer kit also has strong support for Microsoft Web Parts, being able to automatically translate Web Parts to e-Clips.

An integrated messaging system is incorporated into the portal that handles collaborative requirements across different devices (such as mobile) and different user needs in a role-based model.

### Hummingbird Connectivity

Hummingbird Connectivity is made up of three technologies that give connectivity to legacy systems. These three technologies are:

1. **Exceed** – give users the ability to access UNIX applications from within Microsoft Windows-based desktops. Exceed comes in a range of flavours that give interoperability at a number of levels and in a number of environments (such as low-bandwidth connectivity).
2. **NFS Maestro** – allows access to file and print services in a mixed environment. As with Exceed, NFS Maestro has a range of individual solutions that address specific infrastructure requirements.
3. **HostExplorer** – provides access to host systems from Windows desktops. These hosts include IBM Mainframes, IBM iSeries, UNIX, and Linux systems. It works by emulating TN3270E, TN5250E, and Telnet data streams.

### Hummingbird RM

The provision of a record management solution as a separate entity to a document management solution is, in this instance, slightly problematic. Hummingbird RM is in effect an extension to Hummingbird DM, ensuring that organisations can implement the differing requirements of record management in an easy manner.

As record management is concerned with document lifecycle, and the legal/governmental requirements of the same, it is worth noting that Hummingbird RM does not stop at the electronic, but also takes in record management of paper-based information.

As the new Data Protection Act (DPA) in force within the EU (as with many similar Acts enforced worldwide) focuses on paper as well as electronic record keeping, it is vital that any such solution also manages both aspects.

Hummingbird RM/DM can be considered as single environment for record/document management with the functionality features completely switchable or combinable dependent upon the requirements of the moment.

### Hummingbird KM

Knowledge management solutions come in all shapes and sizes, with definitions of exactly what knowledge management is varying from vendor to vendor. Therefore, it is worth noting the definition that Hummingbird promotes for its Hummingbird KM product; which is *'automatically bringing context to enterprise content.'*

Arguably, knowledge management extends beyond that, but equally supportable would be the view that knowledge cannot be managed. Whatever degree of manageability is available for knowledge, the addition of context to content is most certainly a core element, and as such, Hummingbird's definition would fall within most people's perception of knowledge management.

Hummingbird KM provides search and retrieval capabilities across multiple data sources, both structured and unstructured. It is in the presentation of the returned unified results that make Hummingbird KM a knowledge management solution.

Within the returned documents, search results are highlighted with navigation to specific information. Relevance ranking is applied using complex algorithms, and a special feature is the return of a 'more like these' result set.

Hummingbird KM has an Enterprise Table Of Contents (ETOC) facility that takes the search results and presents them in the form of a book contents page.

Categorisation of content is carried out using neural net that orders content into logical categories. Users are also presented with a single page summary of any recovered document for ease of viewing relevance to the underlying reason for the search.

Hummingbird KM also contains search agents that can be configured and launched by users to hunt for specific content and to notify the user of any content change. This notification is carried out by e-mail.

Regardless of any semantic arguments as to the true nature of knowledge management, Hummingbird KM is a powerful, effective, and incredibly useful set of tools; backed by strong technology.

## Hummingbird BI

Hummingbird BI contains four key components:

1. **BI Query** – uses a GUI to provide rapid access to underlying data sources. Native connectivity is provided to the major DBMSs and ODBC connectivity is also provided for those not supported natively. BI Query produces customisable reports including the expected graphical representations of returned data.
2. **BI Web** – provides a Web-based solution for reporting, *ad hoc* querying, viewing and navigation through a data model, access to OLAP data sources, and generation of .pdf files.
3. **BI Analyze** – gives native connection to OLAP data stores and OLAP connectivity to other sources that recognise OLE DB, along with full OLAP viewing and manipulation.
4. **BI Server** – is used as a deployment mechanism for large-scale BI requirements.

Although Hummingbird BI has a rich toolset, it would not be seen as replacing enterprise-class BI implementations. The most powerful usage of Hummingbird BI would be seen in conjunction with the other products in the Hummingbird Enterprise range, or at the mid-to-large-scale organisation.

## Hummingbird Collaboration

With Hummingbird Portal it was noted that the solution was document-centric. Hummingbird Collaboration enables three distinct views to be taken of the collaborative environment:

1. Document-centric.
2. Process-centric.
3. Project-centric.

The concept of the Workspace defined in the section on Hummingbird DM is carried through to Hummingbird Collaboration, where Workspaces can be defined for user-groups. As a Web-based solution, the users defined within the Workspace can be both internal and external. The solution provides the necessary security model and implementation to ensure that only relevant content is available.

Hummingbird has introduced a 'permissions matrix' that eases the administration of access, which can be defined by an administrator at varying levels of granularity from project, right down to individual documents. The security model also allows for security delegation against individual projects.

## Hummingbird ETL

Used as a data integration solution, Hummingbird ETL provides connectivity between data sources and target systems without the need for programming or data staging.

The ETL Repository is object-oriented and can reside on any major RDBMS, while the ETL Designer is a GUI that gives full graphical control over data transformation and exchange processes. Hummingbird ETL uses DataLinks to provide native connectivity to most relational and multi-dimensional database systems, as well as flat files.

Hummingbird ETL uses the hub-and-spoke model for data exchange controlled by the ETL Engine, which handles multi-threading. Time- and/or event-based data exchanges and transformations are handled by the ETL Scheduler, which automates many of the required processes.

## ► CONCLUSION

Although the range of products within Hummingbird Enterprise is extensive, they can be viewed as single-point solutions. The products will fit into infrastructures other than those based around Hummingbird's products. However, there would be reason to view the extended capabilities of having an integrated solution based on a single product set as being a worthwhile alternative, even if this meant replacing some of the current infrastructure.

This decision would be organisational specific, but there are two major factors that need to be considered. Hummingbird Enterprise (in its entirety) provides a pre-integrated solution with strong technology hooks into the other parts of the infrastructure (such as data warehouses, ERP systems, etc.).

The implementation of a standard UI across multiple products is also a strong selling-point, as it dramatically reduces the cost of training and facilitates a more standard working environment, which can demonstrably increase productivity.

## ► VENDOR PROFILE

Hummingbird Ltd. is a publicly quoted company (NASDAQ: HUMC, TSE: HUM), which was formed in 1984 as a consulting organisation. A quick move was made into the connectivity market, and Hummingbird Ltd now has a 72% share of that market.

A natural extension to connectivity was the move into the content space, and Hummingbird Ltd. is now among the market leaders in content and document management.

Again, it is natural progression, rather than any change of emphasis, that is pushing Hummingbird Ltd into the expanded arena of total Enterprise Information Management Systems.

The base company financials is shown in the table below:

	2001	2000	1999
<b>Revenues US\$000</b>	211,340	238,024	170,385
<b>% Change</b>	-11.2	+39.7	-
<b>Profit/Loss US\$000</b>	4,044	(2,734)	4,302

Hummingbird Ltd. is headquartered in Toronto, Canada and employs 1,300 (as reported at the 2001 year-end) people in over 40 offices worldwide.

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