Beyond Big Data – The New Information Economy

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Organisations are faced with an ever-increasing flow of different data types, including formal, database transactional information as well as less structured documents, voice and video. Within this mix of data types lies the intellectual property of a given organisation – and ensuring that it is in a format that can be easily mined and monetised is an on-going battle. Big data will be part of this, but other issues have to be taken into account.
Many IT vendors and end-user organisations have been banging the drum about ‘big data’, as if this is the ultimate answer to everything. However, information is king – and how information is managed is more important than ‘big data’.

### Intellectual property may well become an item that has to be declared on the balance sheet

Discussions are taking place in the US and Europe around how an organisation should account for the value held in its intangible assets. Items such as patents and intellectual property are hard to value, but are increasingly seen as the core value of many businesses. However, much of this value is now held within documents and databases – and the organisation may not have enough visibility of these assets to be able to adequately quantify the worth held there.

### Increasingly, an organisation’s intellectual property is in its data

As an organisation moves more towards digital information internally and across the value chain of its partners, suppliers and customers, there is a growth in ‘hidden’ value within data. Implementing a cohesive information management system enables this value to be uncovered. By taking a broad view of incoming data streams, an organisation can put in place a system that is aimed at maximising the potential value held within these assets.

### The business will need to drive certain areas – such as agreed information taxonomies

An information taxonomy – even if kept simple (e.g. ‘Public’, ‘Commercial in confidence’ and ‘Secret’) – allows assets to be tagged accordingly. This then helps define the actions that users are allowed to take with the assets and allows technical processes to be applied using business policies set against these taxonomy classes. Further classes can be applied for more granular information control, such as information flows between internal departments, dealing with external entities, and information assets needed for e.g. governance, risk and compliance filings.

### An information management system needs multiple capabilities

Information management is not the same as document management. Document management systems deal with a small proportion of an organisation’s digital assets and are firmly focused on a single type of data. An information management system has to be able to deal with data streams in real time, has to be able to apply a suitable taxonomy to these, minimise the storage volume taken by these assets and be able to apply granular security across how the assets are searched and utilised.

### IM-systems have to be easy to use and must work within the end-users’ existing toolset

Stand-alone IM-systems with no integration into existing applications and platforms will not gain favour with users. They need to be embeddable into such areas as the user’s desktop operating system, email and other applications such that they can make continuous use of the capabilities throughout their work.

### Information availability is all important

A well-architected information management system must be able to provide constant access to informational data assets. This requires specific architecting of a solution to remove dependencies on any single item. The chosen system should also allow for business continuity should there be a failure of any part of the system, and for rapid and effective disaster recovery should such a failure fall outside of the organisation’s agreed risk profile.

### Conclusions

To uncover the true value hidden in the mass of data under the control of a given organisation requires a cohesive and coherent approach to information management. Quocirca believes that this needs a fully integrated system that acts on data streams, rather than taking actions on already stored data, and that there are multiple functions – such as data meta-tagging, deduplication, indexing, search and reporting – to ensure that the intellectual property assets can be optimally discovered and managed.
Background

How much is your organisation worth? Well, there are all the tangible assets – the buildings, the plant, stock, cash in bank and so on. There are less tangible assets, such a patents, moneys owed and so on. Then there are the intangible assets. I’m sure that the differences between these are clear to all. They’re not? OK, read on.

The International Accounting Standards Board (IASB) defines an intangible asset as one that is an “identifiable non-monetary asset without physical substance”. Any clearer?

Let’s step back a little. A storage system in a data centre is a physical asset – you may have paid $100,000 for it a year ago and, due to depreciation and lack of anyone wanting old kit, it is now worth $30,000. That is a tangible asset value that can be gained from just sticking a ‘for sale’ sign on it; but what about the value of the data that is on the device? What value does this have?

At a basic level, it is just a collection of electronic 1s and 0s – a binary hotchpotch of bits and bytes that have little meaning as they lie on the disks themselves. However, it would be a brave (or stupid) person who put forward the view that the data had no value, even when the storage device had reached the end of its useful life. Data lives on, and if it is dealt with correctly will have an on-going value to the organisation that owns it. If not disposed of safely, valuable data could fall into the hands of shady characters out there who recover data from old systems. Data is an intangible asset – yet could account for the majority of an organisation’s true value.

Data can have incredible value, yet few organisations are making the most of it. Instead, many try to make strategic decisions based on taking a teaspoonful of water out of the ocean – dealing with an analysis of data held in formal databases and document management systems without looking at the rest of the information that is at their disposal.

In the US and Europe, there have been discussions around bringing a valuation of an organisation’s electronic data to the balance sheet. However, if an organisation has little idea of what it has at the data level, it will struggle to apply a true value to what it has – and may struggle even harder to obtain that value from its data assets.

To manage the intellectual property of an organisation in order to maximise its worth, a full and inclusive information management strategy needs to be put in place. This is not based on document management, which has historically only targeted the top few percent of an organisation’s information assets – it has to be able to include everything; from transactional data stored in formal databases, through documents being created on employees’ disk drives, emails, and other documents coming from external entities, including internet searches and data feeds.

However, such inclusivity impacts not only the cost of applying a document-management style approach, but also in the costs of managing massive amounts of mixed data types being stored on high cost primary storage systems.

It is important to look at an information management strategy in the round and make sure that putting in place an information management system (IM-system) in one area does not raise new, more important and intractable issues in other areas.

This report looks at the issues involved and provides some basic guidance in how an organisation can look to optimise the value from its electronic data assets through the use of a fully integrated information management system.
The value of data

Data, in and of itself, has little value. A stream of 1s and 0s, even a column of numbers, is meaningless without context. The move from business reporting to business intelligence and now to business analytics is showing how data needs to be built on in order to extract the data hidden within it.

The best way to view this is as a pyramid value system.

At the bottom level is the data – there is lots of it, it is of mixed value to the business and, in its raw form, it is inherently valueless. By applying some process to the data, it can be turned into information – less volume but with more direct value to the business. The key is then to use the information to create knowledge for the business – things which help it become more competitive; things which help it make more revenues such as a launch of a new product or service; or maybe something that adds to the less tangible asset value of the organisation, such as the gaining of a patent.

With knowledge comes intellectual property – and this is where the intangible value of data becomes a tangible asset to the business.

The starting point for any approach has to be to get to grips with the data. Creating an information management system will provide the platform for optimising the value held within the data. Only then can the intellectual property value be monetised and other benefits accrue based on having greater visibility of information assets. An example is being able to apply business processes around the information and gaining an ability to quickly and effectively manage an organisation’s governance, risk and compliance (GRC) needs.

The data explosion

Throughout 2012, one of the IT industry buzz terms was ‘big data’. Unfortunately, many commentators confused this with ‘a lot of data’, and led people to believe that a bigger database on better hardware was the answer. However, big data has to cover a lot more as the world has changed and the sources and types of data an organisation now has to deal with are far broader and more numerous, compared to those even 10 years ago.

The best way to look at what has happened is to use a ‘5 Vs’ approach.

- **Volume** – The big one that everyone tends to focus on. Sure, high volumes of data cause issues, particularly where real time analytics are required. Also it is the overall volume of data – not the size of the databases – that matters, but volume is only one aspect of the problems organisations are having to deal with today.

- **Variety** – Data comes in lots of different types. A database will have rows and columns of data in it; an Office document will be less structured with large blocks of text in it; the data returned from a web search will have
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even less structure; while image, voice and video create their own problems due to the lack of easily searchable data in how they are formatted. Ensuring that an organisation can deal with the different types of data is crucial.

- **Velocity** – The speed at which data is coming in and the speed in which it needs to be dealt with is also an issue. Large volumes of data over short periods of time will require systems that are truly scalable, while business requirements for the analysis of data in ever shorter timescales means that old-style batch processing is rarely applicable now.

- **Veracity** – Just how good are the data inputs, and how does this impact the quality of the analytical outputs? In many situations, it is a case of ‘garbage in, garbage out’ – if the data streams are not managed adequately, then the cleanliness and veracity of the data will suffer, as will the capability for the business to rely on decisions being made around the analysis.

- **Value** – Is the data stream worth bothering with? Does it contain anything of real value to the business – or can it be disregarded or, even better, deleted from the organisation’s systems?

By ensuring that these 5 Vs are kept in mind, a suitable approach to optimising an organisation’s data towards information and intellectual property assets becomes more possible.

**Drinking from the fire hose**

The types of data that a given organisation has to deal with are diverse and, for many, the volume is growing beyond their capability to deal with it. Over the last few years, many organisations have moved from a situation where they deal predominantly with internally generated data to one where much of their data is being created and provided from a range of different external sources. These include suppliers, partners and customers, but also data comes from the public domain via web searches and commercial data sources, such as Dun and Bradstreet, Lexus-Nexus and other premium information services.

It is predicted that global data centre IP traffic will grow at 31% CAGR, hitting 6.6 Zettabytes ($10^{21}$ bytes) per annum by the end of 2016 (Source: Cisco). Although no one company will have to deal with this data volume in its entirety, every organisation has to identify what is important in this mass of data and create value from it for their own use. Dealing with such volumes does not fit in with normal data management approaches.

The problem is that, for too long, data has been stored first and then acted upon. Multiple copies of files abound; people act against local copies of files that are outdated and decisions are made against wrong revisions of information. The storage of multiple copies of the same (or almost the same) data assets leads to large data volumes – which are slow to search through and lead to probabilities (rather than possibilities) for errors in which file an individual will chose as the one true document. To help in minimising data volumes, data deduplication can be used – the act of getting rid of multiple copies of the same data, ensuring that a single, true version is made available as required to anyone who needs to access it. Early deduplication technology tended to be based on ‘target’ based deduplication – taking the amount of data stored on primary (source) storage systems and reducing it for storage on archive or backup (target) systems. While this does have some value, the main money is spent on primary storage, and the real need is to manage data volumes here. By using deduplication techniques that apply to all data (global deduplication), data volumes can be massively decreased, resulting in faster and more accurate data searches, more effective reporting and better decision-making. It also enables backups to be carried out in a more timely manner, and allows more of them to be carried out, so allowing faster recovery point and recovery time objectives (RPO/RTO) to be met. This is known as source-side deduplication, and can lead to a more controlled and compact data store of information where certain primary functions – such as indexing, meta-tagging and search – can be applied against the deduplicated content store rather than the actual dispersed source data storage systems. Some approaches to this use primary storage for both the full data and the deduplicated data store – this leads to an increase in the amount of primary storage required, and a hit in the read/write performance of the systems. It is far better to look to a well-engineered appliance-based approach that manages its own storage to an enterprise level.
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The same can be seen with the application of metadata against information. Many approaches are based on storing the information first and applying metadata afterwards. However, such a multi-touch approach has issues. For example, if systems are being used in real-time, the metadata may not have been applied to the information when the next access to that data is made. Again, with only part of the total knowledge available, the decision-making process is weakened.

The key now is to turn this on its head, deal with the data as a stream and create a content store that has all the necessary information within it for an information management strategy to be built around it. By doing this, a whole range of benefits can be accrued, from basic cost savings on the IT equipment needed to store information assets through to faster and better decision-making based on having access to a more complete pool of information.

Building the value from data to information

To turn the vast amounts of data into something more useful requires multiple different approaches – it is not just a question of data volumes. However, the first step should be in minimising these volumes to more manageable levels, followed by adding value through the use of taxonomies, the use of metadata tags, information and data indexing and search and reporting capabilities while ensuring high levels of security and information availability.

Quocirca recommends that the following capabilities be looked for in any information management system:

- **Data deduplication** – Source-side deduplication, where data volumes are reduced on the primary storage systems, can lead to massive savings in capital outlay, licensing and maintenance, along with the space needed for the systems and the energy needed to run them. On top of this, searching through 1TB of indexed deduplicated data can be far faster than the same search through the same basic data that is not deduplicated and could be taking up close to 10TB. However, the manner of deduplication and how it is carried out can have a deep impact on its effectiveness.

  At the most basic level, deduplication can work purely at a file level. Here, files which are exactly the same are identified and the ‘copies’ are deleted, with pointers being held within an index database so that when someone wants to find that file again, they will still be able to retrieve it from a single source.

  Greater savings can be made, however, by moving to block-based deduplication. Here, files or whole storage systems are compared against each other and a map built up of the patterns of zeros and ones. Where a large enough replication of a pattern is found, it becomes more storage-efficient to create a pointer and a pattern descriptor in a database, so that the original document can be rebuilt from constituent parts as and when required. Using such an approach can lead to 80% or greater savings on storage requirements – and concomitant improvements in search and reporting times.

  There is a need to ensure that technology is in place to ensure data availability however – if the data is deduplicated aggressively, only a single copy of the constituent parts is available, and any failure in the index and/or the storage system will have major implications on overall information availability. Look out for systems that maintain multiple indices and use an approach that allows for equipment failure or data corruption to be easily survived.

  Source-side deduplication also needs to be optimised through the way that it is implemented. Quocirca’s view is that pure software-based deduplication, or even deduplication built directly into primary storage systems, will have a negative impact on the performance of those storage systems due to the actions that are being taken on the stored data. Deduplication requires a lot of read and write actions – and the input/output (I/O) capability that the organisation thought it had invested in can be heavily hit through carrying out deduplication actions directly on these primary storage systems.
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It is far better to use an appliance-based approach. Here, data streams can be stored on a temporary basis and deduplicated, with the data then being stored within the content store along with an efficient index. The appliance can be hyper-tuned to deal with this role and should not introduce any significant latency into the data environment. This releases the primary storage systems to act as they should be doing; being the data platform for business activities such as on-line transaction processing (OLTP).

• **Meta-tagging** – Many documents already contain an amount of metadata added during the creation, editing, opening and saving process. However, the business may want to apply other metadata that will help with future searching and reporting.

For example, an organisation may have a simple document taxonomy of ‘Public’, ‘Commercial in confidence’ and ‘Secret’ for its documents. Through applying simple rules against policies, it is possible for different documents to be automatically recognised against these categories and metadata applied accordingly. Once the metadata is in place, it can then be used by other systems – for example, a document with a metadata tag of ‘Secret’ that has been attached to an email with the recipient’s address being that of a competitor can be automatically blocked from passing through the email gateway.

Other types of metadata can be applied – internally, an organisation may want to apply tags that refer to departments or groups and then use these to ensure that information stays within certain areas. There may be a need to apply tags that apply to certain customers or suppliers, using these combined with the taxonomy of ‘Public’, ‘Commercial in confidence’ and ‘Secret’ to ensure that documents do not go astray.

The metadata tags can also be used to improve searching and reporting – for example, searching for all documents that have a metadata tag of ‘Customer A’ is far more rapid if the tag has been indexed than if the organisation is trying to search across all its data assets and all its information stores for all documents with ‘Customer A’ mentioned in them.

Again, it is worth looking for systems that apply the metadata tags against the data streams, rather than applying them after the data or document has been stored, as this could lead to assets held on primary storage being out of synch with the rest of the systems.

• **Indexing** – Searching through un-indexed data stores is resource intensive and slow. Every item across the stores has to be searched through to see if the search term is there and, as data volumes grow, the search grows with it. Effective indexing creates a database of small size that provides a reference of all data items, alongside pointers to the original data and documents, still held where they should be on the primary storage systems.

Searching through an index is extremely rapid, as the index itself will be far smaller than the total data volume being searched through. With advanced systems, the search will automatically populate as the search progresses, providing findings through a front end dashboard and enabling the links to the original documents to be active so that when a user clicks on a search result, they are taken straight through to the original document.

• **Security** – It is important that the intellectual property held within an organisation’s data is secured. Misuse or theft of easily identifiable information – such as that containing personal details or credit card details – can often be dealt with through database security. However, in many cases where less tangible data value is involved (for example where the value can only be gained through identifying underlying patterns between disparate data stores), organisations have a built-in security system – as their data assets are so distributed and uncontrolled, it would be difficult for any external individual or group to be able to gain enough of a picture of the overall value of the information to cause any massive harm. Unfortunately, though, this also applies to the organisation owning the data.
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Therefore, once a system has been put in place to better manage information assets and make them more available to users, it is more important to make sure that this is done in a secure and manageable manner.

Any information management system must be able to deal with not just employee roles, but also those of customers, suppliers and partners. The information must be managed in such a way as to make sure that data leaks can be prevented as much as possible (see metadata tagging above). The search and document indices should be encrypted wherever possible. If aggressive deduplication is being used, the data stored on the primary storage systems will be essentially secure anyway, as it is a collection of pattern fragments rather than complete documents – the ‘keys’ to rebuilding the fragments will be held in the document store.

- **Data management and archive** – A core part of any information management strategy has to be the longer-term storage of information assets. A part of this may be to cover governance, risk and compliance (GRC) needs, but should also be part of an on-going information value optimisation approach.

It may be that information that is deemed to have little to no value now could have value in the future. For example, findings from research now may be predicated on providing value to the business against the invention of something else in the future. Should that ‘something else’ be invented, then it is important that the information be available rapidly so that the organisation can move fast to optimise its penetration of the market.

However, a strategy of storing everything on primary storage, ‘just in case’, does not make sense. Through an approach of using document stores and search indices, pointers can be maintained to information assets, no matter where they are. Therefore, documents can be moved from primary storage to secondary storage or even through to tape and will still appear in a user’s search. If they are on secondary storage, they will still be directly accessible. If on tape or other off-line storage, an event can be raised to retrieve the assets automatically or manually, depending on the system. The user can be informed of expected response time and expectations managed accordingly.

- **Availability, business continuity and disaster recovery** – These three interlinked items should not be confused in anyone’s minds as to their levels of importance. Information availability is a crucial aspect of any system. If information is not available, then no work can be carried out that has any dependence on that information – no real decisions can be made, and the business will struggle to maintain any level of commercial activity. Therefore, any information management system must be able to maintain access to data to a level that meets the organisation’s own needs and risk profile. Even for an organisation that has a high capacity for carrying risk, it is important that small problems do not bring the organisation to its knees, and for those with a low capacity for carrying risk, higher levels of availability will need to be put in place. Much of this is then predicated on how well an organisation has put in place a business continuity plan.

Business continuity is the capacity to have some level of capability to continue working through a failure of a part of a system. For example, within IT, any component failure (a single disk drive, a power supply) should have no material impact on information availability or performance. A systems failure (a complete storage subsystem, a server, a network link) will require higher levels of systems redundancy to be built in. A facility failure (e.g. that of a data centre or a regional power cut due to e.g. weather conditions) will require even higher levels of redundancy, up to and including the mirroring of systems and data over large distances. Business continuity can enable an organisation to continue working through any of these eventualities, as long as they are willing to make the required investments. Performance may be impacted, but at least the business continues to operate.

Disaster recovery is the capability to get back to a known position on the failure of a part of system that has halted a capability in the organisation. Many organisations cannot afford the costs of putting in place a complete business continuity plan, and will have to accept that certain events will lead to the need for a disaster recovery plan. The aim here is to ensure that the recovery point and recovery time objectives (RPO/RTO) are met so that the organisation knows exactly where it is starting up from.
By having a suitable information management strategy in place, data should always be highly available as the indices used will be operated in a redundant manner and the primary storage systems will also be operated so that business continuity is enabled through elegant failover of failed systems to live systems. By balancing the organisation’s risk profile and available funds for investment, this then defines how much of a disaster recovery plan will be needed.

Through using an information availability approach combined with a data archive system based on secondary and off-line storage, information assets can be rapidly recovered and restored to new primary storage assets so that an organisation can regain operations within a very short period of time.

- **Governance, risk and compliance** – An increasingly important area, as national and centralised governmental bodies attempt to place greater controls over the operations of various industries and the perceived need to monitor information in the name of national security.

  Alongside this is the need for reporting to other stakeholders, from employees and shareholders through to partners and customers, as well as market bodies such as the FSA in the UK, the FDA or even being able to prove compliance to an ISO standard, such as ISO 27001 for information management.

  Again, the use of tagging and indexing can ensure that only the information that should be made visible in any GRC situation is made available – but also that all the information that is needed can be quickly and easily identified and included.

  GRC will be the subject of a further Quocirca paper where it can be examined in greater detail.

- **Enterprise search and reporting** – The final part of the jigsaw is in managing the end user experience. Even if the information is under complete management and control, any system will fail if the end user is unhappy with the system’s performance or in how they perceive it to operate.

  Therefore, any system put in place must be able to be used intuitively, must be highly responsive and must allow the user to easily identify what they are looking for, preferably within their existing work areas, such as email or within a Windows Explorer session.

  Any such system should be able to fully utilise the document and metadata indices to be able to rapidly and effectively return details about all identified information that the person has the rights to see against a particular search. The system should also have sufficient granularity so that an organisation can decide if some information should be presented in a less visible manner (for example, with certain content, such as personal identifiable information redacted) or with title of documents only, so that the user is aware that other pertinent information may be available that could influence their decision. The user can then either ask for a temporary lift in their privileges, or forward on the information found so far to someone who has more privileges so that they can continue the search.

  The way that the search works overall is dependent on much of the capabilities that have been outlined above in other areas. Metadata allows for information to be rapidly taxonomised and compared to corporate policies on information security. Indexing allows for searches to be rapid and against a more inclusive overall pool of information assets. Deduplication allows the search to return its findings more rapidly. Essentially, information management cannot be done as a collection of best-of-breed pieces of software from different vendors – it needs something that is highly integrated to work effectively.

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From information to intellectual property

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Having dealt with the basic data and enabling it to be taxonomised, tagged and indexed, it is now better placed to be analysed to help effective decision-making. By presenting the information to people in the right way, this helps them to make informed decisions based on knowledge – a view based on being able to consider the complete picture with all available information pulled together in a meaningful manner.

From an informed decision comes the real value to the business – turning information into intellectual property. For example, being able to bring the right information together to support a patent application leads to a more tangible asset that has discrete value to the business. It may be that when seeing all the available information, it actually becomes apparent that a patent would not be obtainable. Although this may sound like a bad outcome, knowing this before preparing and submitting a patent application will save a lot of time and money, and enable resources to be focused on other, hopefully more profitable, areas at an earlier time.

By putting in place a suitable information management system, an organisation will be able to make better-informed decisions. It will be able to move faster in the markets, maybe gaining patents more rapidly, being able to respond to customer requests more effectively and building up loyalty or being able to identify linkages and correlations between disparate information sources that means new opportunities can be identified.

On top of this, the organisation will be able to rapidly and effectively ensure that it meets the multiple needs under GRC with reports being able to be sent to anyone from a single individual to a centralised governmental body with little effort – so lowering costs and removing timescales as being an issue which may bring in financial fines against the organisation.

The intellectual property assets of an organisation are often hidden within the overwhelming amounts of data held across multiple different data stores. Only by pulling these together in a cohesive manner and applying techniques for managing the data assets in an easy and effective manner can the real value of the data be uncovered.

Conclusions

The explosion in data volumes brings with it a need to manage the data in a more meaningful and effective manner. Whereas many big data vendors are looking at how to deal with large volumes of relatively structured data held within formal databases, the real value to an organisation is in effectively dealing with and managing the information held within less structured data, such as office documents and internet feeds.

To provide the means of discovering and presenting the right information to end users so that a more informed discussion can be made requires a cohesive approach to dealing with data now and in the future. Any chosen system must work on minimising the actual volume of data stored; it must enable extra information to be applied to the information assets in real time through meta-tagging; it must enable the fast and accurate searching and reporting on information assets against natural language searches; and it must do so in a highly available and secure manner.
About CommVault

A singular vision – a belief in a better way to address current and future data management needs – guides CommVault in the development of Singular Information Management® solutions for high-performance data protection, universal availability and simplified management of data on complex storage networks. CommVault’s exclusive single-platform architecture gives companies unprecedented control over data growth, costs and risk. CommVault’s Simpana® software suite of products was designed to work together seamlessly from the ground up, sharing a single code and common function set, to deliver superlative Data Protection, Archive, Replication, Search and Resource Management capabilities. More companies every day join those who have discovered the unparalleled efficiency, performance, reliability, and control only CommVault can offer. Information about CommVault is available at www.commvault.com. CommVault’s corporate headquarters is located in Oceanport, New Jersey in the United States.
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About Quocirca

Quocirca is a primary research and analysis company specialising in the business impact of information technology and communications (ITC). With world-wide, native language reach, Quocirca provides in-depth insights into the views of buyers and influencers in large, mid-sized and small organisations. Its analyst team is made up of real-world practitioners with first-hand experience of ITC delivery who continuously research and track the industry and its real usage in the markets.

Through researching perceptions, Quocirca uncovers the real hurdles to technology adoption – the personal and political aspects of an organisation’s environment and the pressures of the need for demonstrable business value in any implementation. This capability to uncover and report back on the end-user perceptions in the market enables Quocirca to provide advice on the realities of technology adoption, not the promises.

Quocirca research is always pragmatic, business orientated and conducted in the context of the bigger picture. ITC has the ability to transform businesses and the processes that drive them, but often fails to do so. Quocirca’s mission is to help organisations improve their success rate in process enablement through better levels of understanding and the adoption of the correct technologies at the correct time.

Quocirca has a pro-active primary research programme, regularly surveying users, purchasers and resellers of ITC products and services on emerging, evolving and maturing technologies. Over time, Quocirca has built a picture of long term investment trends, providing invaluable information for the whole of the ITC community.

Quocirca works with global and local providers of ITC products and services to help them deliver on the promise that ITC holds for business. Quocirca’s clients include Oracle, IBM, CA, O2, T-Mobile, HP, Xerox, Ricoh and Symantec, along with other large and medium sized vendors, service providers and more specialist firms.

Details of Quocirca’s work and the services it offers can be found at http://www.quocirca.com

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