

# Future IT Trends and Their Impact upon the Industry

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The field of information technology (IT) is an ever changing and increasingly dynamic part of corporate enterprises. What was once considered merely overhead has become an integral part of business for all organizations and is even considered a strategic priority for most successful companies. As with all strategic advantages, for an organization to retain its advantage over competitors it must adapt to take advantage of the latest tools, resources and technologies available to them - IT is no different. Several new technologies and trends have emerged in recent years that promise to change the landscape of information technology for the foreseeable future. Concepts such as master data management (MDM) have the ability to speed decision making within an organization, particularly large, geographically diverse organizations. MDM will make global companies much more efficient and thus help move those organizations onto a truly world-wide stage. Similarly to MDM, server virtualization has gained a large following within the IT community as of late; it allows companies to take full advantage of their IT resources and reduces the need for excess or redundant hardware. Server virtualization is one of the first steps for enterprises to take on their path to operating within an environment of "cloud computing." Cloud computing is simply computing that is not tied down by hardware - software can run remotely on a workstation by accessing a server of the software company. Such computing will reduce the need for hardware

across organizations and by extension, reduce the overall amount of electricity consumed by the company for any given time period. Such reductions of electricity will become very important in the next five to ten years as Gartner research suggests that green computing – or environmentally friendly, low energy consumption computing – will not only be an important social responsibility of businesses but also a legal requirement. All of the aforementioned technological changes are rapidly approaching feasible and working status, if they have not already. It is important for organizations to stay one step ahead of competitors and remain ever mindful of the consequences – such as compliance and governance issues – as well as benefits – higher return on investment, faster order processing, etc – of new technologies; by doing this they will ensure their success and competitive advantages in the future.

MDM is hardly a new principle; the ability to consolidate all information from across the organization into a singular database searchable in real-time has been a goal of IT departments across the globe for years. However, MDM is just now becoming feasible to implement at a relatively low cost and effectively enough to add significant value to the business. Data management is a critical function of IT but many companies experience issues with managing their data. For instance, 93% of respondents to a 2006 SAP survey of American companies experienced data management problems on their most recent project (Halpern 4).

Obviously, since nearly all organizations polled experienced problems with their most recent project, it is no stretch to assume that virtually all companies will experience data management issues at some point throughout the year. By reducing the proportion of problems encountered as a result of poor data management, not only will the IT department waste less time on completing redundant tasks but it will also help to increase the ROI of IT projects, thus improving the business' bottom line.

Embracing the financial impact of large scale, multi-year projects such as implementing an MDM solution is critical to the success of not only the project but also of the IT department, as well. Too often has the IT department been marginalized in the past due in part to its lack of ability to see the "big picture" of the organization. MDM is attractive not only for alleviating the headaches of the IT department, but also because it is a project that has the very real potential to save the entire organization a great deal of money. Gartner stated in a white paper released January 28, 2008 that, "MDM is becoming a business imperative as organizations combat the effects of application heterogeneity and siloed thinking," noting that a properly approached MDM will increase profits and revenue, ease mergers, and significantly reduce costs (Radcliffe 2). Although such benefits are reason enough for any organization to consider an MDM solution, several compliance and governance-based benefits exist as well.

An SAP study on MDM conducted recently found that “implementing the right controls can reduce audit and other external costs by 25 - 50%” (Halpern 11). In a post Enron world a 50% savings of auditing costs is no small figure, indeed, so it is easy for one to see why businesses are attracted to the idea of an MDM solution. By centralizing all data throughout the organization into one database that is searchable in real-time, MDM grants auditors the ability to scour through regulatory and compliance-based paperwork and files with relative ease compared to what is currently the standard of seeking the files from whatever business owner happens to govern a particular area. Should accurate data be searchable in real-time then it would be possible for auditors to complete an audit in a fraction of the time that it would take without and it would open up the possibility of the audit to be completed mostly off-site, if not entirely. Properly implemented and maintained MDM systems may soon render traveling auditors obsolete and will allow an organization’s own internal auditors to complete several audits largely by themselves, such as a Gramm Leach Bliley Act (GLBA) audit for banks. As MDM solutions virtually guarantee to become staples of large organizations within the next few years, server virtualization technology has already been making a large impact in IT departments throughout the world.

Server virtualization is already entrenched in cutting-edge datacenters and is rapidly moving into the mainstream. The Burton Group stated in November of 2007 that server virtualization had been “the single most successful technological development for the datacenter... in the past 18 months” (Santos 2). Virtualization is a technology so innovative that it causes all organizations to reevaluate the manner in which they manage their data centers. Server virtualization essentially grants the ability for one server to act as several by allocating cycles to different tasks regardless of their origination. In this way it is possible for one server to handle mail requests at the same time it is dealing with backups, thus reducing the need for extra, dedicated hardware. Not only is the need for hardware reduced but a smaller staff is capable of manning the data center, only creating more savings for the organization. One other benefit to virtualization is the ability to have customizable workstations for every employee within an organization. By doing so it is possible to create custom-tailored environments for different types of employees in different departments and those employees would each be able to customize their workstation however they would like. The added customization grants each employee the ability to work as effectively as possible using their own account which can be transferred to any computer in the organization by simply logging into the terminal (Santos

5). A downside to server virtualization does exist; however, virtualization, as with many new technologies, makes the IT environment much more complicated.

The most glaring difficulty facing server virtualization is that consolidation has led to increased backup and recovery complexity (Santos 4). Interestingly enough, its backup and recovery abilities are also one of the features that make virtualization so attractive because it allows disaster recovery plans to be more efficient at backing up and restoring critical business functions. While other minor weaknesses do exist, such as help desk problems encountered with added customization, the one with the most potential to impact the business is not even a technical difficulty, it is a contractual impediment.

Virtualization generates the need for adding another large vendor for enterprise licensing can complicate the contract, licensing and vendor landscape (Santos 4). These vendors will provide a service that becomes such an integral component of the enterprise's business that the business itself will lose some of its power within the client-vendor relationship. It is a simple case of Porter's Five Forces. The supplier, or vendor in this case, has higher bargaining power than the buyer, the organization utilizing virtualization, and is thus able to command a higher premium for its products and services. Consequently, this situation is known as a scenario where the bargaining power of suppliers is high and the bargaining power of buyers is low. Despite the contractual drawbacks,

many IT departments have either already begun dabbling in virtualization or have plans to do so in the next calendar year. IT is an increasingly service-based offering and many large enterprises are comfortable with adding numerous large vendor solutions instead of going through the trouble of trying to build them in-house. Server virtualization itself does not lead to any drastic changes in the structure of governance, but it does segue into one new technology that will undoubtedly change many aspects of compliance – cloud computing.

Gartner declared “cloud computing” the primary buzzword of 2008 (Plummer 3). Cloud computing simply means the ability to develop and utilize technology entirely over the internet with minimal on-site hardware. Essentially, all one would need to partake in cloud computing is access to a website with some sort of web-based graphic user interface (GUI) and a workstation with some sort of internet connectivity. As one can imagine, the money saving potential of switching from a physical system to a cloud-based system is enormous. Enterprise level hardware such as datacenters and servers could potentially become obsolete for many organizations as they move toward computing entirely in the “cloud” of the internet. For these companies there will be no need for a large capital investment upfront or constant hardware maintenance and upgrading, which, depending upon the size of the organization’s IT needs, could lead to annual savings measuring in the millions

of dollars (Applications 6). In addition to savings via hardware expenses, the company will save much more money by reducing the need for consultants to visit them on-site and aid in large-scale hardware restructuring. All savings lead to a lower total cost of ownership for the enterprise. Cutting-edge, Type A companies will be the first to adopt the cloud method of computing and begin purchasing their software as a service (SaaS). It is important to note that Type A companies are not determined by size or industry, but rather by IT philosophy (Applications 7).

SaaS solutions are simply software solutions purchased as a service instead of as a license. The client pays for using the software on a subscription-based or transaction-based level, thus only paying for the software as often as it is needed and reducing the need for installations in-house because it is all run off of the internet. Though SaaS has been theorized as a successful business model in the past, it has finally become feasible with high speed, reliable internet connections and workstation computers capable of running high-intensity software remotely. SaaS solutions have enjoyed enormous success in 2008; Saugatuck technology forecasts that by the end of the year over 55% of small-to-mid-sized business will utilize a SaaS solution and that by 2011 worldwide spending on SaaS solutions will reach \$13 billion (Applications 5). Through the rapidly increased use of SaaS solutions, Gartner believes that standardization in

SaaS and open-source software will eventually lead to standardization in infrastructure and that by 2011 Type A companies will purchase 40% of their IT infrastructure as a service in addition to their SaaS adaptations (Smulders 16). Such standardization in the IT world is almost unprecedented and will lead to many fewer compatibility issues with not only SaaS but also licensed software, thus reducing the need for customization of out-of-the-box solutions. Cloud computing, including SaaS, not only has the potential to transform businesses at the departmental level, it also has the ability to change the governance landscape.

Cloud computing, SaaS in particular, will transform the way audits are completed in the future. Since all of the company's data is stored off-site in a "cloud" it will be easy for the software providers to offer an auditor environment. In this environment auditors will have the ability to access the organization's data via the internet and complete audits without leaving their home office. As mentioned before, the days of the traveling auditor seem to be numbered.

Audits should be able to be done quicker without the auditors physically visiting the client's facilities and that time factor combined with eliminating the need for travel will greatly reduce auditing costs for the client organization. In addition to reduced auditing costs and becoming easier to remain compliant, the risk management landscape will change entirely. The organization will store very little of its own information onsite or even in its own datacenters, so the risk is

lower. They will not be trapped by their current system nor will they be responsible for their own data security. The risk is instead transferred to the service provider. While this may initially seem appealing, some organizations are very weary of allowing a third party to entirely control their data (Kusnetzky 5). While some corporations are ready and willing to trust their data to another company it is not unreasonable to assume that until such a time when SaaS and cloud computing are more battle-hardened and tested with time will most organizations be willing to take the plunge into a true cloud environment. One thing is for certain, when cloud environments are truly embraced there will be the need for either amendments to the SAS 70 report or a different type of report altogether since it will be very difficult to discern who exactly has access to data and where the data is stored at any given time (Kusnetzky 5).

The final drastic and foreseeable change to the IT governance landscape is that of green computing. Green computing is an all-encompassing term that pertains to creating more awareness about the energy used by computers and datacenters. Since the increasing power of computers requires an ever increasing amount of energy to power them the IT field is reaching a point where power consumption costs are higher than they have ever been as well as the carbon dioxide produced using said power. Increasing costs will not be the only influential factor driving IT departments and entire organizations to “green”

their operations, though; social pressures will also play a major factor when considering new hardware offerings (Rakesh 1). Budgeting decisions will be more conscious of environmental issues and become a collaborative experience between IT management and end users to satisfy social responsibilities (Smulders 15). “Greening” their operations could mean something as trivial as an organization choosing to subscribe to a SaaS solution instead of storing it in-house or it could mean something as drastic as erecting an entirely new datacenter with the sole purpose of reducing their carbon footprint – the total amount of carbon dioxide emitted as a direct result of the enterprise’s energy use. In any event, green computing is a trend that seems positioned to become a staple consideration of the IT department in the years to come.

With increasing pressure placed upon organizations to be socially responsible, Gartner believes that legislation will soon be passed requiring companies to track their carbon footprint (Smulders 3). In fact, they believe that “by 2010 75% of organizations will use full life cycle energy and [carbon dioxide] footprint as mandatory PC hardware buying criteria” (Smulders 6). In doing so, companies will finally get away from the skyrocketing costs of powering datacenters while being forced to examine lower energy consumption – and lower cost – alternatives. The world is still waiting for legislation to be passed requiring a company to obtain its “green” documentation but Gartner is of the

opinion that an auditing process will be established by 2011 that requires suppliers to present their “green” credentials to remain suppliers to large global organizations (Smulders 19). Therein lays the crux of an awaiting issue: how will companies gain green credentials?

Not since the Sarbanes-Oxley Act of 2002 has the IT profession been faced with such a daunting task to obtain compliance. Tracking carbon footprints has never been done on a large scale before and auditing standards will need to be established, which should be well-defined by the year 2012 (Smulders 20). Much like was the case with the Sarbanes-Oxley Act of 2002, the carbon footprint accounting legislation will require auditors and consultants to help various organizations achieve compliance and will likely need to offer their services over the course of several years before the company would be able to fulfill their compliance requirements on their own. Again, like the Sarbanes-Oxley Act, corporate enterprises will be given the time to either retro-fit their old datacenters and workstations to be compliant or to build new ones before the act will officially carry any financial penalties of lasting consequence (Rakesh 1). Companies are already looking ahead and green computing is already one of the most significant factors taken into consideration by organizations when they are building their next generation datacenters across the world (Rakesh 2).

IT is looking ahead to a dynamic horizon. Many new innovations stemming from several different concentrations of IT are poised to become new standards of all IT departments. MDM systems are already present in many large corporations around the world and when implemented correctly will ease the strain on not only the IT department of an organization but also its auditors. Any competent CIO has already begun exploring the many uses of server virtualization if they have not already put it into practice. Cloud computing will change the way software is distributed, used, and capitalized beyond the shadow of a doubt. And finally, green computing concerns will one day soon lead to legislation that creates an entirely new auditing standard – that of carbon accounting. With each technology come great benefits as well as enormous hurdles. The key to successfully implementing any one of these changes is for the entire organization, not simply the IT department, to understand and accept why a change will occur and exactly what benefits – as well as the drawbacks – such a system will yield. Despite the drastically changing technology and even the emergence of new compliance standards to be met, it is pertinent to recognize that IT is a dynamic field that has always been, and always will be, constantly changing. To retain an advantage over competitors and avoid getting trapped in a state of IT indifference, organizations must be proactively seeking to adapt to future IT trends, not simply reacting to changes that have already occurred – that

is the difference between an industry leader and a laggard soon to find itself out of business.

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