Information Technology Initiatives: Strategic Management of Tactical Assets

	**Managing Desktop Data and Applications with FMS Desktop Management**

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Introduction

Mid to large size organizations have hundreds to thousands of desktop computers in use on a daily basis. By design, each desktop has access to standard software that empowers staff to accomplish computing tasks without the intervention of the organization's IT department. This dynamic illustrates the central value tenet of desktop computing: empowering users to increase productivity and lower costs through decentralizing computing.

In most organizations, specific productivity applications like Microsoft Office are most prevalent. Typically, the three main applications in use cover word processing, spreadsheets, and databases. As users become more proficient in the operation of these applications, they begin to identify solutions to business tasks that they themselves can implement. The natural evolution of this process is that spreadsheets and databases are created and maintained by end-users to handle day to day tasks.

This dynamic allows both productivity and agility as users are empowered to solve business problems without the intervention of their organization's Information Technology infrastructure. The work product created by these knowledge workers, in the form of documents, spreadsheets, databases, queries, programming code and macros, are collectively referred to as "*desktop data assets*."

But with this power comes a price. As more users call on desktop spreadsheet and database applications to handle work issues, the proliferation of desktop data assets increases. Each new database and spreadsheet created in an organization represents potential risks in terms of security, reliability, and availability. As these risks are identified, the need for a managed solution becomes critical. It is prudent for organizational management to ask fundamental questions about risks and benefits of desktop data assets.

Management Solution Needs

As early as 1994, when the first personal computers from Apple and IBM started to integrate into organizations, issues with decentralization of data and logic began to appear. As more and more computing tasks were moved out of the data center, additional management issues began to arise. Questions about backup and disaster recovery, security, data duplication, and multi-user access. As the first networks based on Novell and 3COM technology were installed, some of the issues of backup and concurrency were addressed.

But as application productivity suites like Microsoft Office became standard, the ability for knowledge workers to create their own applications and databases became more prevalent. Data integrity and security were compromised as sensitive data and processes were moved from the data center to unmanaged personal computers, often shared by multiple users.

Today's office computer provides the ability to create sophisticated applications within documents, spreadsheets and databases. Wizards guide users through difficult concepts such as problem solving in spreadsheets or normalization techniques in databases. Import and export capabilities allow users to bring sensitive data into desktop spreadsheets or databases with a single click. And the ability to create macros or write programming code provides tremendous task automation abilities.

All of these attributes of modern desktop software afford users an unprecedented level of computing power and sophistication for end users. And with this power and ease of data transfer, the risk areas of security, data integrity, and reliability become of paramount concern.

Risk Scenarios in the Unmanaged Environment

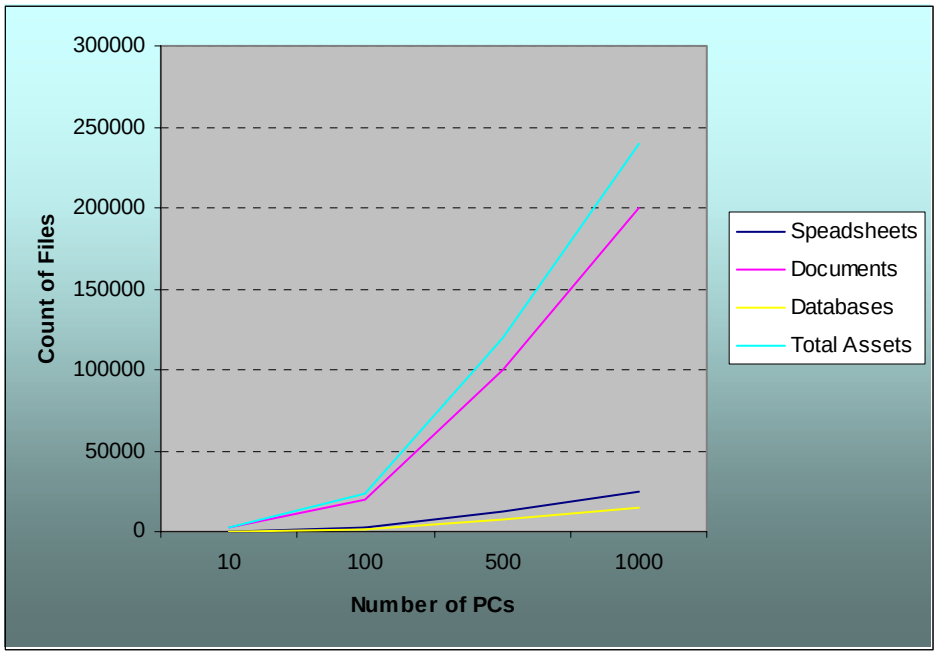
In order to understand the risks associated with desktop data assets, it is useful to examine typical desktop data asset scenarios and their attendant risks.

Scenario	Risks
End-users create spreadsheets that imports data from a sensitive or confidential application. The end-user's computer is available to other workers.	Is the desktop data asset participating in a security configuration as defined by the organization? Most organizations have many end-user database and spreadsheet applications that contain organization-wide password and security information. These assets are not secure, even to the most casual snooper.
End-users write formulas, macros, and programming code to solve business problems.	How are operational decisions affected when they are based on macros, formulas, coding, or algorithms authored by end-users? Does each end-user know the definition of the standards and practices defined by an organization? Algorithms that differ even slightly between desktop systems and an organization's IT group can yield bad data that leads to incorrect assumptions and decisions.
In a typical organization, each desktop contains anywhere from 10 to 50 spreadsheets and databases. Many are updated on a daily basis, and are stored on the local hard disk.	Are all desktop data assets part of a reliable and comprehensive backup plan? What will be the organizational effect if a user loses data on a desktop computer because of hardware failure, virus, or accident?
A desktop database program is linked to a organization-wide database of task items. The reference to the server is hard-coded in the database.	Many desktop data assets contain pointers to data sources stored on centralized servers. When the IT group changes server locations or addresses, the desktop applications continue to point to old and out-dated data, leading to errors and defects in the organization's process.

Scenario	Risks
A new version of database or spreadsheet software is installed on a computer where the previous version was used to create files.	Desktop data assets are extremely dependent on installed software such as Microsoft Office. Installing a new version of Office often "breaks" existing desktop applications, especially databases. Because of this, most organizations either elect not to install new software they may already own for fear of destabilizing the work process. If upgrades are planned, the IT group is typically overburdened with desktop data asset upgrade and migration tasks.
At the end of its useful life, a computer is retired and sent to be recycled.	If one or more desktop computers are scheduled for retirement, does the organization have a clear inventory of what is on that system, or what should be deleted before the hardware leaves the organization's control?
An application fails because the desktop software is beyond its capacity limits. The application is sent to the IT department to be upsized.	Does the organization's IT group have the necessary knowledge of the scope of desktop applications for planning purposes? Many desktop data assets eventually need to be migrated to a managed environment for reasons of security and reliability. Without an up-to-date inventory of existing desktop data assets, can management plan for the future in terms of conversion workloads?
A group within an organization is re-tasked to new priorities. Staff and equipment changes are needed.	How can an organization support the agility needed to repurpose staff? Most organizations have ongoing needs to move staff between functions and locations. The problem becomes almost unmanageable when the organization is envisioning larger changes, such as mergers or acquisitions. Without a comprehensive inventory of desktop data assets, how can the organization make such changes without losing data, security, and expertise?

Now imagine that these scenarios and their attendant risks are part of every desktop within an organization. With an average of 25 spreadsheets, 200 documents, and 15 databases per computer, the numbers add up quickly.

The chart below shows that even with these conservative estimates, and organization with 500 deployed desktops is potentially facing risks from over 150,000 individual files. Numbers in this range show that a management solution is not only desirable, but in most cases required.



Identifying Specific Risks with Desktop Data Assets

In order to consider a correct and thorough management plan, it is important to first identify and quantify each of the risks that Desktop Data Assets represent. The problems can be divided into several areas:

Security

1. Data Access: Are the proper safeguards in place for access control and physical security? When users download sensitive data to a local computer for use in a document, database, or spreadsheet, is the data still secure?
2. Physical Access: Can a desktop computer containing sensitive data or programs be physically accessed by other users?
3. Network Share Access: Correct permission settings on a server are irrelevant when users can browse to another user's desktop, and automatically gain access to unauthorized assets.
4. Hardware Attrition: Are there safeguards to remove confidential data from computers before they are rotated out of a department or organization?
5. Audit Trails: Does the data incorporate audit trails to track creation and modification information?
6. Access Control: Does the spreadsheet or database contain secure information such as user accounts and passwords? Programs like Microsoft Excel and Microsoft Access store password information on the local hard disk in a non-secure way.

Data Integrity and Reliability

If knowledge workers are basing decisions or reports on faulty or out of data date, the conclusions are almost always wrong.

1. Backups: Is the data part of an enterprise backup plan? Is there a defined policy for disaster recovery? Are the safeguards to prevent data loss to getting rid of old computers or passing them around within the organization?
2. Sourcing: Where is the data coming from? Is the data source reliable and accurate?
3. Currency: Is the data current? Is there a defined policy for data expiration? This is of special importance in the present environment of mandated data sharing between and among organizations.
4. Defects: Does the program contain defects that yield to incorrect results? If the program is connected to other programs or processes, how do they react to defects? Note that the number of defects in desktop applications is typically much larger than in enterprise applications simply because most desktop application developers are not professional programmers.
5. Best Practices: Does the application use best practices to ensure data and process correctness?
6. Algorithms: Does the application use organization approved algorithms? The potential for data loss or loss of business due to inconsistent algorithms can be huge. What if two users have slightly different routines for calculating interest? What does the organization stand to lose?
7. Viruses: Is the program protected from viruses by up to date scanners? Viruses can piggyback on desktop applications to destroy or steal data.

Manageability

1. Documentation: A typical desktop data asset is created by one or two end-users. They build the system over time to accomplish the tasks at hand. But it is very rare that end-users create documentation that explains the operational and troubleshooting aspects of their work. What happens when the author of a desktop data asset moves within, or outside of an organization? Documentation is an important part of the solution.
2. Knowledge Transfer: How can reorganization happen without identifying the costs of transferring knowledge and physical desktop data assets to new staff and computers?
3. Inventory: How does an organization know how many desktop data assets exist? Where are they located? Do they represent mission critical processes, or require secure data. How often are the files updated?

4. Risk Assessment: What is the organization's overall exposure to risk because of desktop data assets? How does one implement a management strategy that prioritizes the risk exposure of each asset? In an organization with hundreds or even thousands of desktops, the ability to manage this problem is impossible without an automated solution.
5. Planning: How does an organization's IT staff know the number of desktop data assets that will need to be moved into a managed environment in the next 6 months or year? If now, how can capacity planning be accomplished?
6. File Format Lock-in: As new versions of Office or its component programs are installed, applications stop working. This is especially true of Access. If IT managers cannot determine what applications are in use, it can prevent them from moving to new versions of productivity software.
7. Ongoing Management: How does an organization build a plan that encompasses the ongoing nature of inventory and management process? Desktop data assets are much like weeds in the garden—you can pull them today, but by the next morning, new ones have appeared.

Solving the Problem with FMS Desktop Management

With all the risks associated with desktop data assets, one may wonder how organizations continue to operate at all. Indeed, the initial reaction to scope and breadth of the risk factors is to clamp down on the use of desktop data assets, or severely limit end-users abilities to create spreadsheets and databases. Of course, such an approach is not only impractical, it can severely reduce and organization's ability to fulfill its mission. Instead, the best approach to desktop data asset management is one that strikes the ideal balance between organizational control versus end-user productivity.

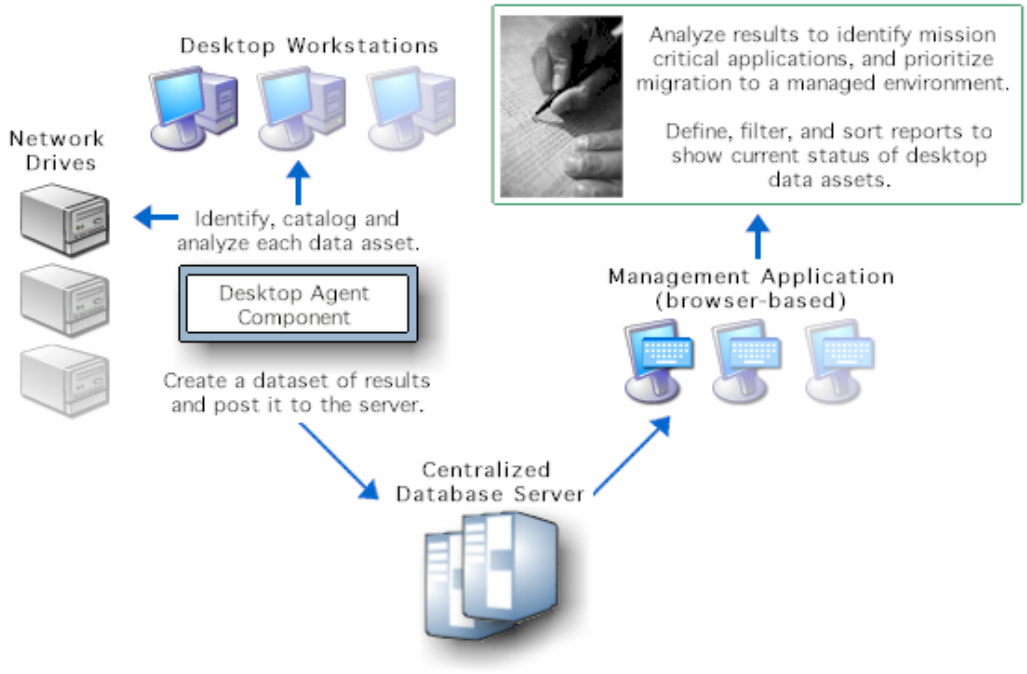
FMS provides a complete system that meets the needs and provides a results-oriented solution: FMS Desktop Management System (DMS).

FMS Desktop Management Overview

FMS Desktop Management is designed to provide an organization with a top-down view of desktop data assets, and their risk factors. Our award-winning Desktop Agent technology provides a zero-footprint inventory solution, and our DMS Management Server collects each desktop's inventory data set, and analyzes and reports on the current state of desktop data assets across the entire organization.

The Desktop Agent scans each desktop computer for documents, spreadsheets, databases, or other types of files that can contain, reference, or link to data or processes. This analysis is run on a regular basis without user intervention, and the results are automatically transferred to the Management Server for analysis.

Management Server automatically gathers the inventory results from all desktop computers, and performs analysis of the results. The results of this analysis are delivered in the form of reports that can be sorted, prioritized and acted upon. The Management Server also provides a graphical view of all data connections between desktops and servers, thereby making it very easy for IT managers to see where the risks are located.



Desktop Agent

Desktop Agent is a small program that resides installed on each desktop computer in your organization. Advanced deployment technology allows the desktop agent to be automatically installed or updated on each desktop when the user logs in. The program locates all Access and Excel files, and logs their names and locations. Additionally, the agent analyzes each file for key attributes, and loads all information gathered to a central location. Desktop Agent runs without user interaction on a scheduled basis, and is installed in a way that cannot be disabled or uninstalled except by authorized personnel.

Desktop Agent can also be installed on network servers to monitor shared drives for desktop data assets. Although the desktop agent automatically finds all links to network data sources, not all links from other applications may be readily apparent. By using the desktop agent to look at network drives, as well as desktop computers, a more complete picture of data usage and importance can be attained.

Desktop Agent is responsible for collecting the following information for each file located:

Temporal Information: Files are analyzed for temporal information, such as date created, and date last modified. This information is vital in determining if a file should even be considered for further analysis by the organization. In other words, if a file has not been opened in two years, it can generally be moved to the bottom of the priority list.

Data Locations: The location of data in a desktop data asset is a very good indicator of its potential mission critical nature or security risk. If a database or spreadsheet is pointing to data located on a local disk, it can be assumed that review of other analysis indicators is need to determine the mission critical nature of the asset. However, of the asset is pointing to a location on a networked, or shared drive, there is a good indication that application is either used in a multi-user environment, or the desktop user considered the asset important enough to be included on a network drive for backup and archive purposes. Furthermore, analysis determines if the asset contains links to, or logic associated with, network data sources such as ODBC, SQL Server, or Oracle. Such an indication would identify the asset as a good candidate for inclusion in a managed environment. The desktop agent component could analyze each file for data sources and include this information.

Pattern Matching: The contents of each file can be scanned for patterns or specific text. These patterns allow management to identify files that may contain sensitive information. For example, this feature can identify all files that contain the phrase "*confidential*" or "*classified*."

Data and Logic: The actual contents of the desktop data asset are also very telling. For example, in the case of Microsoft Access databases, the size of tables, number of records, and update frequency can help identify mission critical data. The existence of forms, user input controls, macros, and VBA programming code can all be quantified. In the case of Excel spreadsheets, the number rows and columns, the number and complexity of formulas, and other attributes can help indicate the nature of the asset. All of these items are cataloged.

See ***"Appendix A: Detailed Analysis Points of Desktop Data Assets"*** for a specific list of items Desktop Agent collects.

Management Server

Management Server provides an advanced management view of all current desktop data assets. Results of inventories prepared by the Desktop Agent are collated and analyzed, and presented in a series of reports and information.

A browser-based user interface provides the ability to view pre-defined reports with sort, filter and group capabilities, or issue ad-hoc queries to address specific questions.

Based on a scalable SQL based engine, the Management Server can scale to accommodate even the largest organizations, and includes complete security access control.

Specific Analysis to Identify Mission Critical Data

The FMS Desktop Management solution adds additional value beyond the mere identification and cataloging of data assets in a centralized manner. Because FMS is a pioneer in commercial software to analyze data assets, we are able to incorporate sophisticated algorithms to prioritize each desktop file by risk factors. This allows an organization to quickly drill down on immediate problems, and address lower level risks at a later date. When an organization is facing a management task whose scope is tens of thousands of files, this triage ability is one of the most valuable aspects of FMS Desktop Management.

Customizable Framework

Through our many engagements with large organizations, we have found that no single solution can encompass the needs of every organization. With that in mind, we have developed FMS Desktop Management on a framework that is both customizable and scalable. This architecture allows us to modify functionality specific to your needs.

The Desktop Agent is designed to look for updates from a central network source each time it runs. As additional functionality is required in the management system, new custom versions of the agent can automatically be deployed to each desktop computer.

Additionally, since Management Server is based on extensible browser-based platform, we can customize analysis and reports for an organization's specific needs.

Upsizing Applications to a Managed Environment

Once you have identified critical desktop data assets, you can use the information provided by FMS Database Management to prioritize your risk areas. Your next task is to plan the move of specific assets into a managed environment. This process is typically known as upsizing.

Upsizing happens in a variety of ways depending on the scalability and reliability requirements of your application. When considering an upsizing project, you should focus on two key aspects:

Data Hosting Platform: Does the existing desktop application store its data in an unmanaged local environment? If so, you should determine if the data is important enough to move to a managed environment, such as Microsoft SQL Server.

Application Hosting Platform: Does the existing Access or Excel application need to be moved into a managed environment? If so, you should plan to rewrite the application using a professional development platform such as Visual Studio .NET.

Some upsizing projects require only a transfer of data from the desktop to a managed server. Others may require upsizing of the data and the application. There are a variety of guidelines and resources available to help you make this decision. For more information, visit www.fmsinc.com/upsize????

Conclusion

As your organization grows, more and more desktop data assets come into play. While these assets illustrate the value of desktop computing, they also carry risks. FMS can provide your organization with several key benefits:

About FMS

FMS, Inc. is a premier global provider of packaged Microsoft developer tools and custom application solutions. Since 1986, FMS has been counted on to provide 'best of breed' solutions for a myriad of clients including federal and local government agencies, enterprise firms, and non-profit organizations. In fact, 90 of the Fortune 100, and over 50,000 others in more than 100 countries use our software tools and solutions to help them attain their goals.

Widely regarded as the industry's foremost expert on MS Access products, we have a unique understanding of the challenges corporations face in implementing strategies to manage their desktop IT systems. Our reach extends throughout the network's client/server architecture - from LANs to WANs and the web. Over the years, our industry peers and respected publications have bestowed some 40 awards on our efforts.

Drawing on our core strengths and thorough understanding of all of Microsoft's offerings, as well as other vendor's database products, our Professional Solutions Group has designed, written, and implemented hundreds of custom software applications. Included in this body of work is extensive experience designing and deploying database migration projects such as those discussed in this paper.

FMS executives and developers work closely with their counterparts at Microsoft to exchange information about new product releases, discuss market trends, and establish industry standards. We are proud to list 3 Microsoft MVPs – the highest honor given to individual developers, 7 MCPs, several contributing editors, book authors, and others who moderate various forums and newsgroups on our team.

FMS is large enough to offer a variety of expertise and stability as a technology partner, yet agile enough to respond rapidly to specific situations. In addition to our own facilities and staff, we have established a wide range of external resources, both human and physical, which can be brought to bear on any situation. From small opportunities to complex n-tier web enabled e-commerce sites, FMS has helped organizations everywhere with reliable systems written or optimized exclusively for them.

Perhaps most of all, FMS offers you tremendous value for your technology dollar. We augment and enhance your in-house capabilities, freeing your internal resources to focus on your business needs. We work in the background to help you build the infrastructure you need for success. In each engagement, we completely evaluate your needs and desires, the options available to you, and craft an answer that is 'right sized.' We assign the most qualified team to your project, based on each team member's skills and expertise. We are frugal with your budget, and find practical solutions in the most cost effective manner.

As a corporation, FMS is a Microsoft Certified Partner, a member of the Component Vendor Consortium, and the Visual Studio Integration Program.

Design and Implementation of an Automated Management System

Our FMS Desktop Management System is specifically designed to provide you with a robust and reliable set of tools to manage the risk of desktop data assets. This turnkey system provides tangible benefits out of the box, and can also be customized to suit your organization's unique needs.

Upsizing and Application Design Services

The FMS Professional Solutions group FMS has performed many successful projects for clients that face the problems of desktop management and application development. From upsizing Access and Excel solutions, to client/server enterprise application development, to ecommerce web applications, we can work with you to maximize your return on investment with desktop applications while simultaneously managing risk.

For More Information

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Appendix A – Detailed Analysis Points of Desktop Data Assets

The following table provides an overview of the types of analysis to perform on desktop data assets to help determine the management need quotient, and why it is useful in determining the mission critical nature of a file.

Analysis Attribute	What it Tells You
For All Files	
File Creation Date	If the file was created within the last 30 days, there is a good chance the data and/or business rules it contains are relevant and current. Conversely, if the file was created 2 years ago, and the file has not been modified in 2 years, there is a good chance that the file is neither in use, nor mission critical.
File Last Access Date	Important to know if the file has been opened in the last *x* days. In the case of Excel spreadsheets, a file may be opened but not modified if the user opens the file as a template, makes changes, and saves the file as a new name.
File Last Modified Date	If the file has not been changed in the last 30-60 days, it is lower in the list priorities.
File Location	Useful for inventory locations
File Created By User	Name of the user who created the file
File Size	The larger the file, the more the likelihood that it represents important data.
For Databases	
Number of Tables and Queries	The more tables a database contains, the greater the likelihood that it represents a more comprehensive view of a data set or business process. If a database contains 100 tables, there is a good chance that the database application is important.
Number of Forms/Reports	The more forms and reports, the better the chance that the application represents something of value.
Number of Macros/Modules	Programming code or macros generally exist in databases that are used for important business processes
Location of Data/Data Format	If the data is located in a local database, it represents a risk in terms of backups, and data segmentation. If the data is located in a linked network drive, there is a good chance that the database application is using shared data. If the data is located on a SQL database, the desktop database application may already be migrated to a managed environment, and not need further attention.
Multi-user status	Is the database currently being accessed by more than one user? If so, and the data is not stored in SQL Server, it represents a risk.
For Spreadsheets	
Number of Worksheets	Like file size, multiple worksheets are a good indicator of the complexity or importance of the file.
Complexity of Formulas	Complex formulas indicate that a fair amount of time has gone into the creation of the file.
Links to ODBC data	Links to external data sources indicate sharing of corporate data

Analysis Attribute	What it Tells You
sources	
Number of cells with any content	Helps identify spreadsheets with little or no content
Number of cells with formulas (different from text and numbers)	Helps identify the potential amount of business logic in the application.
Number of graphs (or other embedded objects)	Identify links to other data resources. The number of links is often directly proportional to the importance of the file within an organization.

Appendix B: Cost Breakdowns of Manual Analysis

This table details the specific costs associated with the manual analysis of desktop data assets. These are baseline figures based on our previous work in the area of desktop data asset analysis and are useful for "what-if" analysis.

Task	Time
Search Hard Drive(s) for all desktop data assets	20 minutes (total time for all files)
Catalog file location and temporal details (date last modified, etc.)	5
Manually analyze database/spreadsheet data to identify mission critical candidate status for data	30
Manually analyze database/spreadsheet for business logic in the form of queries, formulas, macros, and VBA programming code	60
Load local catalog data into centralized repository	10
Total Time per Workstation per file	2 hours
Total Time per Workstation assuming a 10/20 mix of Access and Excel Files	60 hours
Total Time in Hours, assuming the organization has 1000 desktops…	60,000 hours
Total Time in Weeks	1,500 weeks
Total Analyst Years	28 years
Conservative Estimate of Analyst Comp Rate (fully loaded $80k/annum analyst rate based on a salary of approximately ($50k)	$40/hour
Total Cost in Analyst Time	$2.4 million