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MS Access – Rules of Thumb For When You Should Move to SQL Server

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PCA Business Notes Series

Many business applications start life in MS Access. To power Users, MS Access is fairly easy to learn, and provides many capabilities to structure business data, define simple forms, query data and design reports.

MS Access goes beyond the row and column limitations of Excel, with functions for viewing, sorting and filtering and re-using data structured data. And with enough custom VBA code, you can even get your Access application to look and function like a professional database application!

The problem with MS Access is lack of scalability: among other shortcomings, there is only so much data you can store in MS Access, and only so many people that can use the program at the same time, before you run into real limitations of the MS Access platform. These are technical limitations that cannot be overcome with workarounds or special programming techniques.

Common indications that you are exceeding MS Access capabilities include poor performance, corrupt data, and/or the application frequently crashing. This Business Brief provides simple "rules of thumb" to know when it is time to consider moving to the MS Access datastore to SQL Server to overcome many of these deficiencies.

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MS Access Datastore Limitations

Microsoft advertises that MS Access is capable of storing up to 2 GBs of data. In a perfect world — with a very simple and perfectly-designed data structure, and a single End User — this may be true. In the real world however, the data structures necessary to support your business data are usually anything but simple, and the query and other methods used to retrieve and manage the data are rarely well-designed — and then you have 10-20 people pounding on the system at the same time over the course of a busy work day.

So, with real world business conditions in mind, you will start to experience MS Access performance and reliability issues in the 100 to 300 MB range. And the more data, the more forms, and the more End Users you add to the system will result in rapid diminishing returns on application performance and reliability.

Multi-User Limitations

Another major limitation of using MS Access is the inability to support multiple, concurrent End Users. Depending upon the application, fewer than ten concurrent End Users can push MS Access beyond its limitations.

Popular work-arounds to multi-user limitations include: putting the MS Access application on a shared network drive, and for Internet access, exposing this shared drive to the Internet with a remote access program like Citrix or GoToMeeting. What neither these work-arounds will address however is underlying design limitations of the MS Access platform: the ability to lock out fields when more than one User is attempting to update the same information, and the resulting train-wreck that occurs. Common consequences of using MS Access in a multi-user environment include corrupt data, lost data, crashing, or all of the above.

MS Access Upsize Wizard: GIGO

The benefits you can realize from replacing the native MS Access datastore with SQL Server are a direct function of the quality of the SQL Server design. The "Upsize Wizard" for example simply creates a SQL Server database structure that reflects the identical data structures in MS Access. And if the source MS Access data structures are poorly designed, guess what? You will get poorly designed SQL data structures. The lesson here: Garbage in, garbage out.

Many users realize that the MS Access Upsize Wizard not only fails to improve application reliability and performance, now you are working in a database that is totally unfamiliar, and much more complex than MS Access! Do not expect to gain much if anything by using the Upsize Wizard: in most cases, it is one step forward, two steps back.

Oftentimes, designing a SQL Server database from scratch is a far more efficient and cost-effective approach. The quality and completeness of your MS Access application design determines whether using the Upsizing Wizard makes sense, or whether the Upsizing Wizard will create more work for you to do in the long-run.

SQL Server "Rules of Thumb"

Here are some rules-of-thumb to indicate it is time to replace the native MS Access datastore with SQL Server:

Business Critical System

MS Access is great tool to *define* a new data management solution, but it's too fragile and unreliable to *run* a business on. ☝ If you are "betting your business" on data availability and integrity: migrate to SQL Server.

Growing Number of Concurrent End Users

MS Access is simply not designed to support more than a handful of End Users at the same time. In a multi-user environment, MS Access will quickly turn from an asset to a liability, where costs and issues associated with performance, versions, data integrity, etc. will steadily increase. ☝ More than 5 Users consistently using the system: migrate to SQL Server.

Internet Access

MS Access was designed well before the Internet was invented — for small work-groups working in a LAN environment. Workarounds to "Internet enable" an MS Access application (Citrix or VPN with Remote Desktop are common) will cost you additional time and money to build and maintain, and only serve to accelerate the problems that occur with multiple users. Remote Internet access is OK as a stop-gap measure, not a sustainable approach. ☝ Need to support remote User access via the Internet: migrate to SQL Server.

Poor Data Integrity

MS Access provide limited means to enforce data integrity — rules that insure that data records are complete, unique (no duplicates) and follow a consistent pre-defined format. Absent proper data

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integrity, calculations or references to data within the application will not function properly, and reports that are used to make business decisions become unreliable. ☝ If the data constraint methods available in MS Access are unable to enforce the level of data integrity you need, it is time to move to SQL Server.

Slow Application Performance

The root-cause of poor application performance is due most often to deficiencies in the underlying database schema design. This is true for MS Access and SQL Server. Poor MS Access performance might be a signal that your application is poorly designed, or you have exceeded the datastore limitations of MS Access, and/or you are attempting to support too many concurrent End Users. ☝ If you are frequently compacting and repairing a corrupt MS Access system, it is time to refactor your application design, delete old data, and/or reduce the number of End Users, or migrate to a SQL Server database.

Growing Amount of Data

If you are pushing the data store limitations of MS Access, it is probably time you seriously consider moving to a scalable database to support your business data management needs. While Microsoft advertises that MS Access can handle up to a 2 GB datastore, in reality you will notice appreciable degradation in performance and stability over 1 GB. Independent of the size of the datastore, a large number of records and/or users can also exceed MS Access limitations. ☝ If you have > 500 MBs of data in MS Access: migrate to a SQL Server database.

Security Deficient or Absent

MS Access provides very limited means to establish, manage and validate security and true End User authentication at the application level. MS Access can only be truly secured by the operating system itself e.g. security attributes set by the network administrator at the network hard drive and directory levels. ☝ If security is a must have, or you require different data management privileges associated with different business roles i.e. role-based security, SQL Server provides much more robust security capabilities, and supports true role-to-privilege-based security management controls.

Reporting Inflexible / Inadequate

If you have a simple application with a limited number of tables, sub-tables and less-than-complex relationships among the various data fields, MS Access may be adequate to support your reporting needs. MS Access makes it easy to design new reports, and perform ad hoc queries.

☝ If your reporting needs require more complex data modeling and formatting, or more robust nested queries, or your reports need to be high performance and 'bullet-proofed' for data integrity, then SQL Server Reporting Services offers the best, most cost-effective approach.

Application Unreliable

Does your MS Access application run like a work horse 24x7? Or, does it crash frequently or become corrupted, causing employee downtime and/or lost or corrupt data? The reliability of an MS Access application is constrained primarily by the quality of application design (poor application design and development decisions), and furthermore by the built-in datastore and user limitations of the MS Access application itself. ☝ If you are frequently compacting, restoring or repairing a corrupt MS Access system, it is time to refactor your application design, or migrate to the SQL Server database.

Lack of Industry / Regulatory Compliance

Specific attention to data security and application design and development processes (and associated documentation) are just a few of the items frequently required to comply with a number of different industry and regulatory standards including SarBox, SAS 70, HIPAA, 21 CFR Part 11, ISO and others. For example, any application that contains patient data in MS Access is de facto non-HIPAA compliant, due to deficient MS Access data security capabilities. ☝ If your application must meet many minimum industry and regulatory standards, migrate to SQL Server.

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