



AUTOMATED CONVERSION TECHNOLOGIES OF INFORMATION SYSTEMS

Migrating from ISAM to SQL with Go Up Technology's Solution

**10 reasons why converting your
applications and their database via Go
Up Technology's 100% true automated
solution, can make all the difference
between failure and success**



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Abstract

When migrating from ISAM to SQL, there is a lengthy checklist of procedures that must be properly carried out in the correct order to ensure a successful conversion. Failure to follow through on even one of those tasks could wreak havoc on the converted database, an outcome that could be catastrophic for mission-critical applications. This white paper explains why using the 100% true automated solution from Go Up Technology is the best way to avoid complications, and ensure a successful conversion.



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Assumptions & Options

This white paper is written with the assumption that the reader has already made the decision to switch from ISAM to SQL. If that is not the case, we highly recommend reading one of our other white papers – "[Switching From ISAM to SQL](#) - SQL databases are more complex and maintenance-intensive than ISAM databases (like Pervasive Btrieve). Here are the top 10 reasons to make the switch to SQL anyways."

As for options, Magic customers who want to convert their application database from ISAM to SQL usually have only two:

1. Perform the database conversion manually, using internal staff or a subcontractor
2. Perform the database conversion with automated or semi-automated tools, usually provided by a subcontractor

Unfortunately, option #2 is often not what it seems since what some subcontractors call an "automated tool" isn't *truly 100% automated*, and in fact includes a deceptive amount of manual work.



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10 Common Problems in Converting from ISAM to SQL

There are numerous potential problems if an ISAM to SQL conversion isn't performed using a 100% true automated tool. Here are 10 of the most worrying a Magic customer should be concerned about:

1. Manual Maladies

Performing a manual or semi-automated conversion to SQL from ISAM virtually guarantees that something will fall through the cracks. It is almost impossible to properly deal with all the issues that must be handled in such a conversion, unless it's done with a 100% true automated solution. Additionally, a manual or semi-automated conversion is much more vulnerable to errors, and usually results in non-standard solutions being implemented throughout the application. Worst of all, a manual or semi-automated conversion requires a much longer "code freeze" period for your application, which could have negative financial implications for your organization, and/or its customers.

2. Conversion Content

Switching your backend from ISAM to SQL is not just about handling the database conversion itself. You also need to handle the creation of objects in the new SQL database, convert the data, compare it to the old data, and also address changes in the Magic/uniPaaS environment. These issues become more complicated when the data includes a number of physical libraries, or if your data management uses "Logical Names". Attempting to perform this manually or semi-automatically only increases the likelihood something will be missed.

3. DIRECT SQL

One of the biggest advantages of SQL databases is the ability to use DIRECT SQL statements with them in your Magic/uniPaaS application. As the Magic documentation states, "The Direct SQL Command object lets you provide an SQL statement that is passed to the underlying SQL database to provide the task's data view, or to perform the processing required by the command". Another advantage SQL databases afford is the ability to use the WHERE clause in your Magic/uniPaaS programs and move the Ranges from a Magic expression to WHERE clause statements. A manual or semi-automated conversion may neglect to incorporate these performance enhancers.



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4. Performance

There are more than 50 elements which can affect application performance and should be handled during conversion (Storage of Magic fields, Tables cursor settings, Keys and index optimization, Hints to database, CndRange functions, and many more...). A manual or semi-automated conversion will probably not handle all of those issues, and also won't take full advantage of Magic via the DIRECT SQL command object. Without full implementation of all these issues, performance problems are virtually assured. Even worse, the more advanced your ISAM database version is, the more exacerbated your performance problems will be.

5. Data Integrity

Conversion of data is a very important component of an ISAM to SQL conversion, and there are many issues that can affect the quality of that data when it comes across. If the data transfer process occurred with errors, or worse, resulted in corrupted data, then the amount of time needed to make corrections can grow exponentially.

6. Implementing SQL Rules in your Application

Working with SQL databases requires adoption of a list of coding standards and guidelines which specify a framework for programs in your application. Manual conversion to SQL or use of unskilled providers lacking proper experience tends to result in a partial or even total failure to properly implement these important rules. Improper implementation of these rules risks exposing your database and application to a variety of errors and bugs in the future.

7. Transactions and Locks

One of the most important advantages of a SQL database is its ability to handle transactional data. Equally germane is preserving lock-related functionality, as defined in the original application. These 2 issues are intertwined. During conversion to the SQL database, problems can occur that require proper intervention and treatment to preserve the functionality on one side, while still allowing the use of transaction capabilities on the other side.



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8. Physical Manipulation of Real Files on the Disk

One option available to Magic programmers working with ISAM databases is the ability to perform physical actions on physical files. For example, many programmers can code operations and activities in their Magic program that act upon the physical Pervasive/Btrieve database files by using the DB or IO functions (i.e., DBDEL, IODEL, etc.). Some even use DOS commands operating on those files (exit to DOS command and call expression to copy or rename folders/files). Also allowed was working with "Logical Names" that determine the physical file location or expression in the Task DB table. When converting to a SQL database, all these issues undergo radical change and must be addressed one-by-one. A manual or semi-automated approach is unlikely to handle these properly.

9. Object Definition in Database

Converting your database from ISAM to SQL will require you to create the new database, and then transfer the data into it. Upon completion, the database and its structure will accompany the application, and your organization, from then on. For this reason, it's important to get the object definitions right, with object names that support the rules of SQL, and the right choices are not always based on default settings. This is a critical factor that a manual or semi-automated conversion can often foul up.

10. Guidance and Training

Developing applications that work with SQL databases requires programmers to acquire new knowledge, and this knowledge can't just be purchased. A SQL Database Administrator course can teach the relevant subject matter for SQL databases, but it doesn't include the specific rules pertaining to Magic and uniPaaS. It's important that this knowledge be available to an organization during its conversion, because it is ultimately going to have to take over maintaining the application immediately upon completion of the conversion.



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10 Reasons to use Go Up Technology's 100% True Automated Solution

The best way to perform an ISAM to SQL conversion is by using the true 100% automated solution from Go Up Technology. This is the only approach which will enforce a multitude of encapsulated best practices to ensure that EVERY step which SHOULD be done actually GETS done. Accomplishing this manually would be extremely difficult and far more time consuming for even a senior-level expert, who due to schedule constraints might be tempted or even pressured to cut corners. There are no corners cut when a true 100% automated solution is utilized, and deadlines are much more likely to be met since virtually no manual intervention is necessary.

A Magic customer considering an ISAM to SQL conversion and worried about the consequences of performing it manually can rest assured that the top 10 concerns listed earlier invert to become among the top 10 reasons to use Go Up Technology's 100% true automated solution.

1. Manual Maladies

The Go Up Technology solution is a 100% true automated solution, and the only tool available that can perform a 100% automatic conversion. There are pretenders in the market claiming to offer automatic conversion services, but who are actually hiding the fact that much of their efforts are done manually! They're easy to identify. Just insist that they do their conversion entirely on-site at your facilities under your watchful eyes. If theirs is a 100% true automated solution, then you'll be able to see it for yourself. If they insist upon doing ANY aspect of the conversion off-site (away from prying eyes) then you can be assured they're deceiving you, and may not be telling the truth about other things as well. A 100% true automated conversion ensures standardization, and minimizes the errors normally resulting from manual work. In addition no code freeze is needed, and the time table to perform the conversion is usually much shorter.



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2. Conversion Content

Go Up Technology's 100% true automated solution ensures that all the issues relevant to an ISAM to SQL conversion are properly handled during the conversion (for full conversion specifications, please download the [Go.SQL](#) product PDF). Our solution includes scripts for creating the new SQL database, an application to convert the data and check its integrity, creation of reports and logs, setting the Magic/uniPaaS environment to work with the new converted application and database, guidance and training, and of course, scripts and programs to handle and support tables managed by "Logical Names" or multiple libraries. This last item is a crucial factor for Pervasive/Btrieve users who take advantage of this feature, and it often gets botched when an ISAM to SQL conversion gets done manually or with only a semi-automated tool.

3. DIRECT SQL

Go Up Technology's 100% true automated solution ensures that your converted backend will be able to take advantage of the SQL database's ability to use DIRECT SQL statements in your Magic/uniPaaS application. It will also replace Ranges from a Magic expression with WHERE clause statements.

4. Performance

There are more than 50 elements that affect system performance in an SQL database. Go Up Technology's solution ensures that every single element receives the proper attention and optimization, starting with the object definition in the database, continuing through defining the optimal storage type in the Magic application, and ending with replacing ranges in the program with the WHERE clause and implementing DIRECT SQL statements. Go Up Technology is the only conversion provider providing a guarantee that the performance of your converted application will not decline, and will even improve over its predecessor!

5. Data Integrity

The 100% true automated solution from Go Up Technology not only includes a data conversion component with an integral data integrity check, but also includes in every conversion project a check of the data itself by Go Up Technology's team to ensure the process went smoothly and without problems. Our team's extensive experience in dealing with such data conversion problems, ensures that your project will proceed quickly and efficiently.



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6. Implementing SQL Rules in your Application

Experience counts, and Go Up Technology is the most experienced company providing database conversion solutions for Magic and uniPaaS applications. With over 15 years of experience and nearly 1,000 Magic and uniPaaS applications successfully converted (along with their databases), we have acquired extensive knowledge that we've incorporated into our 100% true automatic conversion tool. One example - the list of SQL rules we fully embed in your application during the conversion. In addition, we do a total knowledge transfer to our customer's developers about these SQL rules. This list includes handling tables with non-unique indexes, selecting all the main index segments in a view, handling transaction and locks, handling DELETE in expressions, handling DB and IO functions, Command operations, supporting "Logical Names" and many more.

7. Transactions and Locks

Every proposal sent out by Go Up Technology includes a commitment to maintain the system functionality. Beyond this guarantee, during the conversion we perform optimizations which include changes to reduce the problem of locks in the future. For example, checking if DB is opened in Write mode (Magic default until version 9.4) can be changed to Read-Only mode instead. We also support implementing transactions in the application during the conversion process.

8. Physical Manipulation of Real Files on the Disk

Our 100% true automated solution enables preservation of physical actions on physical files that many ISAM developers have grown accustomed to. The solution supports continued working with "Logical Names", replacing the IO and DB functions with SQL commands, handling the DOS command operation, and other activities.

9. Object Definition in Database

When Go Up Technology converts your ISAM database to SQL, we create your new database structure using a proven optimization process. Our optimization processes take into account various aspects about the original database and factor that into creation of the target database. We also define the database in such a way that minimizes the imminent data conversion needs (for example numeric5 is declared as an integer that allows up to 9 digits). In addition, we choose the data types that can provide the best performance for your Magic/uniPaaS application.



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10. Guidance and Training

Go Up Technology includes guidance and training with your conversion project. There is also an option to let the customer's developers be involved in the conversion process so they can learn more by watching firsthand and be fully ready to maintain the converted application.



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Conclusion

Being penny-wise and pound-foolish when it comes to converting mission critical databases can be a fatal business choice. If a decision has been made to invest in a SQL back-end, then cutting corners by converting from ISAM manually or with an un-skilled subcontractor makes little sense. The best way to ensure a high-quality conversion is to utilize the 100% true automated solution from Go Up Technology.