Rethinking Data Analysis and Reporting:

The Case for the Correlation Data Warehouse

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Executive Summary

In order to understand the economic impact of the iLuminate correlation database, EAC interviewed seven illuminate customers and reviewed the details of another eight iLuminate implementations. The results of these efforts show a dramatically higher ROI and improved business benefit from deploying and using iLuminate relative to both a column-based data warehouse and a relational data warehouse.

While individual implementations vary tremendously, illuminate customers achieved dramatically greater improvements than both Sybase IQ and SQL Server customers in terms of overall data warehouse costs, as well as the costs and time involved with making changes to the database, and to producing reports and other analytics.

These factors in turn resulted in significantly reduced time-to-analytics and time-to-answer, as well as improved ability of the data warehouse to support the analysis needed to leverage new business opportunities. This latter factor is perhaps the most significant of all: the ability to use the data warehouse environment to support rapid business change, understand or open up new business opportunities, and provide long-term, strategic value to the data warehouse that has been lacking in all too many implementations. Importantly, without the cost reductions and agility that iLuminate provides, this new opportunity factor would be hard to realize.

Taken together, these different factors translate into significant value to customers that goes beyond the types of metrics the data warehouse market has typically focused on: load speed and query speed, to name just two. What iLuminate does is move the value discussion away from these more technical aspects of data warehouse design in order to focus on direct customer benefit. In this light, time-to-analytics and time-to-answer become much better yardsticks by which to measure data warehouse performance, and by this measure, the iLuminate correlation database provides significantly more value than traditional data warehouse technologies.

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Introduction:

The Functional Gap Between Business Users and Database Solutions: Achieving "Time-to-Analytics" and "Time-to-Answer"

The need for complex, comprehensive, and timely business analysis at an affordable cost has been the goal of most purveyors of database and data warehouse technologies since the dawn of those technologies. While various vendors and their technologies have succeeded in providing some means by which these goals can be achieved, the reality is that most solutions present customers with a stark set of choices. One set of solutions can readily support complexity and comprehensiveness, but not in a timely or cost-effective manner. Another set of solutions is low-cost and easy to implement, but unable to support complex, business-user analytical requirements in a timely fashion.

The result has been a history of compromise with respect to what businesses, and in particular business users, really need in terms of data analysis. All too often, business users must depend on over-taxed IT departments to help prepare their analyses – assuming their systems are even able to provide the analysis they are looking for. The design of many data warehouse environments is such that much of the analysis that would be most valuable to the company is too complex to be run efficiently on existing systems. The result is that these environments make it impossible to quickly create reports that can analyze new threats, or leverage new opportunities.

This leaves most businesses with a significant functional gap. Their ability to create an analytics framework in a timely fashion – often called the user's "time-to-analytics" – is severely hampered by these barriers. More importantly, the ability of business users to look for and find the answers they need – their "time-to-answer" – is equally cramped by the technical and functional limits of their existing analytics solutions.

Ironically, this functional gap between what business users need and what database vendors can provide hasn't stopped the incumbent market leaders from increasing complexity and cost, to the detriment of the business user with difficult problems to solve and a dearth of easy-to-use analytical tools to solve them with. The result is a market that is desperately out of synch with the needs of the users it is trying to serve.

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The traditional analytical database market, dominated by relational databases such as Oracle, IBM DB2, and Microsoft SQL Server, as well as newer technologies like Sybase IQ, a column-based database that is targeted specifically at the data warehouse market, has been challenged of late by the arrival of new database technologies that can meet many of the goals that have been so elusive to date. One new entry in this race to better serve the analytical needs of the business is illuminate Solutions, a four-year old database technology company based both in the U.S. and in Spain. The illuminate database, which the company calls the *iLuminate correlation database*, provides not just a new technological foundation for supporting business analysis, but also a new way in which the problems of "time-to-analytics" and "time-to-answer" can be readily solved.

illuminate has asked Enterprise Applications Consulting (EAC) to review its early wins in the market with the goal of defining how an iLuminate correlation database stacks up not just to the now-classic relational database, but also to one of the newer entries in the market, the column-based database. To that end EAC interviewed a cross-section of illuminate customers from the insurance, telecommunications, grocery, education, and credit card reporting industries. The results of those interviews show a product that offers significant functional advantages to business users over other data warehouses, at a cost and complexity level that is dramatically lower than that of the leading database and data warehouse solutions. This allows illuminate to deliver an impressive return-on-investment that has helped its customers improve their revenues and business opportunities, while eliminating much of the cost and complexity of traditional business data analysis solutions.

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The State of the Art:
The Limits of Relational and Column-based Databases

The data warehouse revolution of the late 1990s was, like many revolutions, less successful than any of its proponents or users had hoped. This lack of success was striking in its comprehensiveness: the growth of data warehouses simply did not correlate with improved access to business intelligence and analysis, nor did the analysis that emerged begin to justify the extraordinary costs associated with these projects.

Even at the height of the data warehouse phenomenon, questions were beginning to emerge about cost and complexity. An article published by Booz Allen in 1996 cited an average initial implementation cost of $3 million (which is more than $4 million in 2009 dollars), a cost that does not include on-going system maintenance and support, staffing, license maintenance costs, and, perhaps most importantly, the cost of changing the data warehouse to meet new business requirements.

The first glowing reports of the return on investment for data warehouse projects, published by IDC in 1997, deliberately excluded failed projects and projects that had exceeded their cost estimates.

Another factor not taken into account in calculating the cost of a data warehouse project was the tremendous amount of human resources – business managers, IT staff, and outside consultants – needed to bring the project to fruition. It's not surprising that the first glowing reports of return on investment for data warehouse projects, published by IDC in 1997, deliberately excluded failed projects and projects that had exceeded their cost estimates.

At the core of these problems with cost and complexity were two factors: the technical limits of the relational database model upon which data warehousing was based, and the complexities of the interplay between the IT department and the business users that the relational database model required.

Relational databases, while excelling at supporting transactional systems, were not ideally suited to support complex data warehouse systems, due to a number of factors. Among those factors are the limits of SQL as a business intelligence language suitable for business users, and the problem

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with supporting complex, high performance business intelligence in a relational environment. The latter problem has lead to the growth in cost and complexity in the data warehouse as vendors made up for the performance shortfalls of relational databases by throwing more and more hardware and software resources at the problem. This need for more resources and more complexity, in turn, has led to the excessive cost-overruns and high failure rate of many data warehouses.

Further limiting the success of the data warehouse was the rigidity of the typical data warehouse system with respect to creating new ad hoc reports and analyses in response to changing business requirements. This rigidity is perhaps the leading cause of customer dissatisfaction among data warehouse users, and calls into question the positive ROI reports that have emerged regarding traditional data warehouse deployments.

BARRIERS TO SUCCESS:

THE COMMON PITFALLS OF RELATIONAL-BASED DATA WAREHOUSES

- Large Scale Databases Create Excessive Complexity and Cost
- Database Complexity Creates High IT Resource Demand
- Technological Rigidity Makes Initial Design Complex and Time-consuming
- Technological Rigidity Makes Change Complex and Expensive
- Limits of Rigidity Combined with SQL as a Business User Language Mean More IT Involvement is Needed

EAC's interviews with line-of-business users across many industries reveal a typical pattern of disservice that is all too familiar in the market: changes in the analytical requirements of the line of business must be mediated by the IT department, which typically takes weeks to respond to individual requests for change. The fact that the analytical tools are too complex for many line–of-business users is only part of the problem. The methods for storing data and performing analytics in the typical data warehouse produce a rigid structure that is simply too complex for most line-of-business users to change, even if they knew what specific data they were trying to analyze.

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The result has been an analytical infrastructure in most companies that is rigid, overly complex, excessively costly, and unable to meet the rapidly changing needs of the enterprise.

The Column-Based Challenge

The problems bedeviling the relational data warehouse market led a number of vendors to venture into a new database technology, the column-based database. The advent of the column-based database came as a direct result of the problems with relational databases in the data warehouse market, and column-based databases are designed to circumvent a number of the challenges with relational technology.

The fundamental difference is in the storage schema: a column-based database stores data in columns, not rows, and this allows for an extraordinary amount of compression and faster data access. This storage schema is also better suited to business intelligence analysis than a traditional row-based relational database.

While column-based databases represent a significant improvement over relational databases, there are still limits to how much these new technologies can address the requirements of dynamic businesses.

In some cases, column-based databases still require indexes to be built and maintained, with the attendant costs in terms of on-going maintenance. This adds additional maintenance and support requirements, should the analytical model need changing or if more data are to be added.

Other column-based databases support only a subset of SQL, and are therefore difficult to use with existing SQL-based reporting tools. This adds a training and maintenance burden to the deployment of a column-based database: lack of support for common reporting tools means that line of business users have to be retrained on proprietary tools, or work-arounds have to be deployed to overcome the limited support of SQL.

The bottom line is that column-based databases have managed to eke out improvements in the performance and cost of the relational database. Rather than providing the last word on improving the performance and cost of the data warehouse, however, the column-based databases have helped set the stage for a more efficient and cost-effective solution: the iLuminate correlation database.

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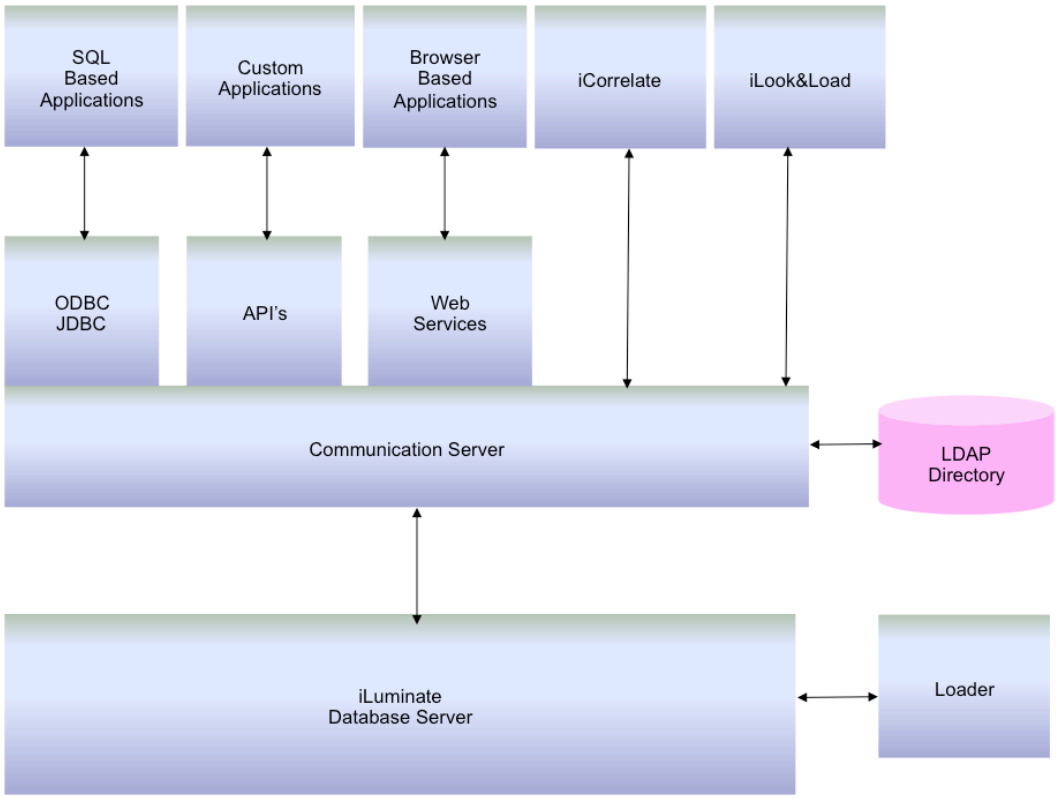
The ILuminate Correlation Database: Changing the Cost and Complexity Threshold of Analytic Platforms

The iLuminate correlation database is a technology developed by illuminate (illustrated in Figure 1), that has taken the improvements of column-based design one step further, by eliminating not just the notion of a traditional index, but also the notion of a fixed database structure. Instead of being organized in rows or columns, iLuminate is organized into a value index and a row index. These two indexes allow for the rapid and thorough correlation of all data in the database, without requiring an explicit record structure. This allows for complete flexibility in analysis as well as database design. Adding new data to the database involves a single change to the data dictionary, whereupon the new data is automatically indexed, correlated, related and made available for analysis.

FIGURE 1:
The iLuminate correlation database can use standard SQL, custom applications, and illuminate's own iCorrelate and iLook&Load tools to create reports and analyses. Its communication server can also access an LDAP directory in order to manage user access and permission.



Source: illuminate

This departure from traditional database design has the effect of significantly improving analytical throughput and database efficiency, while making it extremely easy to change both the database design and the analytical model needed for a specific query or line of business.

These changes make the data warehouse much more accessible to line-of-business users, eliminating the need for complex database administration and direct IT involvement in report and query building. The simplicity in design means that building an iLuminate correlation database is significantly less costly and less time-consuming than a traditional data warehouse. In addition, changes to the data model can be made and new queries and reports created by line of business staff, instead of by the IT staff. These factors, in turn, dramatically reduce the total cost of ownership and improve the ROI for a data warehouse.

EAC believes that iLuminate significantly alters the cost and usability equation in the data warehouse market. These changes are reflected by what illuminate calls improved "time-to-analytics" and improved "time-to-answer." These improvements, as we shall see in the next section, translate into significant improvements in ROI, not just over relational databases, but as compared with column-based databases as well.

Time-to-Analytics

The concept behind improving time-to-analytics is well-known to any business intelligence or data warehouse user. Faced with a new business problem or opportunity, most data warehouse solutions require a complex design and modeling process, followed by a data loading process. This built-in complexity makes time-to-analytics a time-consuming barrier to solving business problems or leveraging new opportunities.

In iLuminate, the time-to-analytics has been significantly compressed by the lack of a requirement for a database design or schema. Loading time is also reduced, as the load process essentially has the effect of generating the database schema and creating the indexing at the same time. Once fully loaded, on-going maintenance is greatly reduced by the elimination of the need for complex tuning or schema changes. Adding new data to the data model, as noted above, is accomplished by simply loading the data, which automatically updates the dictionary.

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The above factors make iLuminate exceptionally nimble with respect to the concept of time-to-analytics. Whereas data warehouse projects are often measured in months or years, the design of iLuminate enables time-to-analytics to be measured in days and weeks – a capability that has been lacking in the data warehouse market since its inception.

Time-to-Answer

The ability of iLuminate to provide remarkable time-to-analytics is matched by its ability to provide support for rapid query development and fast query performance. The fact that all data correlations and relationships are built into the database design itself, using a data-generated schema, makes it simple for line of business users to develop queries that, in a traditional data warehouse environment, would require significant intervention by the IT staff. In addition, the fact that all data are accessed at index speed means query performance is consistent and exceptionally fast.

The iLuminate correlation database supports rapid time-to-answer in several important ways. The first is that it provides several methods for performing complex analysis, based on the user's requirements. Importantly, iLuminate offers an incremental query process that allows the user to use the results of one query to formulate a subsequent query, creating a dynamic, ad hoc query "chain" that is more useful than the typical "drill-down" analysis. This is impossible in SQL.

The structure of iLuminate also makes it easy to build queries that leverage the system's built-in correlations and relationships. This allows the user to see relationships between different objects in the database that other database technologies can reveal only through a complex programming process. This is particularly useful for allowing business users to perform "drill down" and other multi-dimensional analysis.

The iLuminate correlation database also supports more standard query methods, including full support for SQL 92. This means that corporate standards like Business Objects and Cognos reporting tools are supported as well. Finally, users who prefer tools like Excel and SAS are able to export their data from iLuminate for use in these environments.

Seen through the lens of *time-to-analytics* and *time-to-answer*, iLuminate provides a significant improvement over both relational and column-based databases in terms of their relative return on investment. As we shall see in the next section, this improvement not only translates into a

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significantly better ROI for iLuminate, it also enables new analyses that illuminate customers are using to leverage new business opportunities.

Improving Time-to-Analytics and Time-to-Answer: The ROI of the iLuminate Correlation Database Technology

In order to understand the economic impact of the iLuminate correlation database, EAC interviewed seven illuminate customers and reviewed the details of another eight iLuminate implementations. The results of this effort show a dramatically higher ROI and improved business benefit from iLuminate relative to both a column-based data warehouse, and a relational data warehouse.

In order to compare these three different approaches, EAC collected a number of published ROI and TCO reports concerning Sybase's column-based database, Sybase IQ, as well as Microsoft's SQL Server, generally considered the low-cost option for enterprise relational databases. While the methodologies and sample sizes in the studies were different, the baseline data was sufficiently rich to allow for a valid comparison between the three data warehouse approaches. The result is that, while individual implementations vary tremendously, illuminate customers achieved dramatically measurable improvements over both Sybase IQ and SQL Server customers in terms of overall data warehouse cost, and the cost and time to make changes to the database and analytics.

These factors in turn reduced time-to-analytics and time-to-answer significantly, as well as improving the ability of the data warehouse to support the analysis needed to leverage new business opportunities. This latter factor is perhaps the most significant of all: being able to use the data warehouse environment to support rapid business change and understand or open up new business opportunities provides a long-term, strategic value to the data warehouse that has been lacking in all too many implementations. Importantly, without the cost reductions and agility that iLuminate provides, this new opportunity factor would be hard to realize.

illuminate's Overall Data Warehouse Cost

The total cost of building a data warehouse includes a number of hard factors, such as software and hardware costs, labor costs related to implementation, and labor costs related to on-going

maintenance, as well as "softer" factors related to the planning and execution of what is typically a massively expensive and complex undertaking.

While these latter costs are not captured in most ROI studies, it's important to keep them in mind during the analysis of the relative cost and ROI of illuminate and its column-based and relational database competitors. The cost of moving a company in the direction of a traditional data warehouse includes a decision-making process that is complicated by the relative rigidity of the column-based and relational database models. As changing database schema and analytics can be costly and complex in these two models, most companies invest an enormous amount of up-front planning time in order to define the scope of the project with the goal of limiting the need for ad hoc changes down the road.

The cost burden of adhering to rigid [relational database] design principles … has led data warehouse guru Bill Inmon down the circuitously logical path of advocating against the use of ROI analysis because of the difficulty in knowing how useful a traditional data warehouse will be until it has been implemented.

This not only contributes greatly to the "scope creep" that is responsible for cost-overruns and outright failures; it is also emblematic of the cost burden of adhering to rigid design principles at the outset of the project. This disconnect between the planning and the implementation of the traditional data warehouse has led data warehouse guru Bill Inmon down the circuitously logical path of advocating against the use of ROI analysis because of the difficulty in knowing how useful a traditional data warehouse will be until it has been implemented.

This tortured logic need not apply in the use of the iLuminate correlation database. The lower overall cost and improved flexibility of iLuminate make ROI much easier to justify both in terms of initial hard and soft implementation costs, as well as the on-going costs of revising the data and analytical methods in order to react to changing analytical requirements.

EAC's research showed a number of key factors that contributed to lower overall cost in an iLuminate correlation database. One company working with iLuminate compared its costs against costs for an existing data warehouse, and found an order of magnitude difference between the two. This company, a major U.S. insurance firm, calculated an average 'legacy' data warehouse

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implementation as totaling $4 million in year-one costs, which include hardware, software, and labor charges.

THE OVERALL ROI OF iLLUMINATE

US-BASED INSURANCE COMPANY:

- Average Data Warehouse Implementation Costs, Year 1: $4 million
- iLuminate: $315,000
- Direct Savings from illuminate: $1.5 million
- ROI: 400%

SPANISH INSURANCE COMPANY:

- Net cost of iLuminate: $180,000
- Savings due to iLuminate: $900,000
- ROI: 500%

By contrast, this company estimated that its year-one iLuminate costs were a total of $315,000, of which $300,000 covered the software and labor costs, and $15,000 was for the off-the-shelf hardware needed to run the system. Further savings came from running the iLuminate correlation database on low-cost server hardware. While maintaining a high-end relational data warehouse can cost upwards of $4 million per year according to IDC, maintenance costs for iLuminate are negligible, as reported by this company.

This insurance company estimated that it is able to save $1.25 million by moving only a portion of its data warehouse functions to illuminate. The result is an ROI of almost 400 percent for this implementation. This number, while high, doesn't represent the top end of the ROI possible from illuminate. Another illuminate customer, a major insurance company based in Spain, told EAC that the company was able to save $900,000 in database costs by moving a key analytical system to the iLuminate correlation database. As the net cost of this move, including hardware, software, and personnel costs, was $180,000, the ROI on this replacement project was 500 percent.

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Comparing Implementation and Maintenance Costs

While it is hard to make exact comparisons between technologies and how they are implemented at different companies, there are some striking differences between the cost structures of Sybase IQ and SQL Server – as well as their reported ROI – that are worth noting with respect to the experiences of the illuminate implementations cited above.

One major study of the Sybase IQ product by analyst firm Giga Group showed an average total implementation cost for a Sybase IQ database running on Sun hardware at almost $2 million, including hardware, software, maintenance, and personnel costs. These costs are lower than the oft-cited industry average of $3 million, or the $4 million in costs cited by the illuminate example above for a data warehouse based on a relational database system, but are still significantly higher than the cost of a comparable illuminate system.

With the baseline cost of a Sybase IQ system so high relative to the cost of an iLuminate correlation database, it's not surprising that the ROI cited by Giga is substantially lower than the ROI described by the illuminate customers interviewed by EAC. The average system described by Giga yielded a 78 percent ROI over a 13-month period. While this number is respectable compared to the limited successes and failures that have tarnished the data warehouse market over the years, it pales in comparison to the ROI figures reported by illuminate's customers, which are more than five times greater than the Sybase IQ ROI.

Looking at SQL Server costs reveals a similar picture, albeit with a slightly better ROI relative to Sybase IQ, though still significantly lower than the ROI experienced by illuminate's customers. As SQL Server's base license cost is lower than most relational databases, this lower cost and higher relative ROI is not unexpected relative to Sybase IQ.

A study by Forrester Group of the cost of upgrading SQL Server shows how cost and ROI both fall short of what illuminate's customers have experienced. In the Forrester report, the total three-year cost of an upgraded SQL Server environment was $1.17 million, with an ROI of 161 percent. It's important to note that in this total cost figure, software costs for the customer Forrester interviewed were covered under the company's annual maintenance agreement, and the upgraded environment therefore did not include an initial license fee that would add several hundred thousand dollars to the total cost of an initial implementation.

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If we use this three-year cost for SQL Server and compare it to iLuminate, the advantage clearly belongs to iLuminate due to its lower base-cost and overall maintenance cost. Most iLuminate customers interviewed by EAC reported insignificant annual maintenance burdens for their iLuminate correlation databases. For example, one large European insurance company budgets approximately 12 full-time equivalent days per year for iLuminate maintenance, which would translate to approximately $4000 per year, based on the average cost for a fully-burdened database administrator in the U.S. These lower overall maintenance costs were noted by another European customer of illuminate, which was able to repurpose one-fifth of its database administration staff once its iLuminate correlation database was up and running. As iLuminate had taken over approximately one-fifth of the company's analytics requirements, effectively downsizing the company's enterprise data warehouse by an equivalent amount, the staff reduction was proportional to the reduced dependency on the older data warehouse technology.

LOWERING MAINTENANCE AND DEVELOPMENT COSTS USING THE ILUMINATE CORRELATION DATABASE

SPANISH INSURANCE COMPANY:

- Total Database Admin Costs: $4000/year

DASHBOARD CREATION COSTS:

- Previous System: 7000 euros/dashboard
- iLuminate: 700 euros/dashboard

This extremely low cost of annual maintenance makes a direct comparison between SQL Server and iLuminate possible: excluding the cost of a net new license, SQL Server's three year ROI of 161 percent is less than one-third the 400 percent ROI delivered by iLuminate. Again, while both this study and EAC's interviews do not represent a statistically valid sample of either company's customer experiences, this comparison supports illuminate's contention that iLuminate will fare extremely well in any direct comparison with either Sybase IQ or SQL Server.

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Time-to-Analytics and Time-to-Answer: iLuminate vs. Sybase IQ and SQL Server

The impressive ROI and relatively low cost of iLuminate set the stage for a similarly impressive time-to-analytics and time-to-answer for iLuminate. The rapidity with which customers can deploy iLuminate and find the answers they need offers a level of value that has been largely ignored and unavailable in the traditional data warehouse market.

There are four main factors to consider regarding the relative time-to-analytics and time-to-answer capabilities of the correlation database. The first is that the technology that allows for the ease of initial implementation discussed above also allows the iLuminate correlation database to support rapidly changing analytical requirements without any of the complexity that comes with changing traditional data warehouse systems. The second factor is that illuminate provides a tool, called iCorrelate, that supports an iterative query process which can be used to rapidly query iLuminate and look for correlations, relationships and other significant information. The third factor is that illuminate has a standard SQL 92 parser, which can be used to run standard queries from tools such as Business Objects against iLuminate. The final factor has to do with iLuminate's indexing capabilities. The ability of iLuminate to automatically generate an index and then execute queries against this index/database significantly reduces query time and increases accuracy, and makes the index corruption common in relational databases essentially impossible.

This support for rapid analytical flexibility was a major factor in the overall ROI of illuminate in every interview EAC conducted. One customer reports that illuminate allowed the creation of new dashboards at an average cost of 700 euros (which includes the cost of a full-time equivalent employee), whereas for their previous data warehouse system the average cost was 7000 euros. illuminate's US-based insurance firm customer reported spending, on average, three to six months building complex reports in their old data warehouse system, at a cost of $120,000 per report. The same reports can be built using iLuminate in "minutes", according to this customer, at a cost characterized as "negligible."

Similar savings can be found by looking at the cost of making changes in the database to support new analyses, a key issue in computing time-to-analytics. This is where the ease-of-implementation of iLuminate pays off continually during the full life-cycle of the data warehouse.

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The same technology that allows rapid, low-cost implementation allows rapid, low-cost change in the data warehouse in order to support changing analytical requirements.

A typical example of this support for rapid time-to-analytics comes from the US-based insurance company cited earlier. This company reported that every major change in their analytics requirements necessitated a modification in the database model that averaged $17,000 per change. This identical process, this user told EAC, can be undertaken with no measurable cost using iLuminate. Similarly, adding new data sources also requires negligible cost and time.

All of these factors lead up to an exceptional time-to-answer for iLuminate, even before considering the much faster query processing speed that illuminate customers reported. This rapid query speed was also a significant factor for illuminate's customers. For example, for one European insurance company, typical query processing speed was reduced from an average of 25 minutes to less than a minute, while another customer reported overall query speed reductions of 50 percent.

Taken together, these different factors translate into significant value to customers that goes beyond the types of metrics the data warehouse market has typically focused on: load speed and query speed, to name just two. iLuminate shifts the value discussion from these technical aspects of data warehouse design to a focus on direct customer business benefits. In this light, time-to-analytics and time-to-answer become much better yardsticks by which to measure data warehouse performance, and by this measure iLuminate provides significantly more value than traditional data warehouse technologies.

Enabling New Opportunities

A final measure of value – one that is admittedly difficult to compare – is the degree to which the data warehouse enables new opportunities for the company. New opportunity ROI can be a complex number to calculate, as there are innumerable factors that go into the process of capitalizing on a new opportunity, of which data analysis is only one.

Nonetheless, the capability of the iLuminate correlation database to support new opportunities was noted by every illuminate customer, and in most cases the new opportunities that were enabled added significantly to the ROI of iLuminate.

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The most dramatic impact came from using iLuminate to improve customer retention, a process that was undertaken by three different illuminate customers. The ability of iLuminate to support this kind of analysis is significant: customer retention depends on a careful understanding of buying patterns and customer requirements, and for companies with large customer bases and complex product mixes, this kind of analysis can be very taxing for traditional data warehouses. This is particularly true when a company is trying to uncover new, unknown patterns of behavior or opportunities: the rigidity of most data warehouses makes rapid, iterative data analysis slow and costly, and lacks the agility required to understand complex customer buying patterns.

NEW OPPORTUNITY ENABLEMENT

EUROPEAN INSURANCE COMPANY:

- Improved customer retention by 3%.
- Improved revenues by 30 million euros.

EUROPEAN CREDIT REPORTING COMPANY:

- Improved pricing strategy created 5 million euros increase in revenue.

EUROPEAN SUPERMARKET CHAIN:

- Lowered customer attrition by 35%, increasing revenues by 10 percent.

Deficiencies in the previous generation of data warehouse makes the results obtained by these three customers particularly important. The first customer, a European insurance company, was able to use iLuminate to improve customer retention by three percent, which in turn resulted in a 30 million euro increase in revenues to the company. A second company, which supplies credit-reporting services, was able to use iLuminate to restructure its pricing strategy, which resulted in a year-one revenue increase of 5 million euros. A third illuminate customer, a European supermarket chain, was able to lower is customer attrition rate from 50 percent to 15 percent using analysis derived from iLuminate, resulting in a net increase of 10 percent in the company's annual revenues.

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It is important to note with all three examples that these savings were obtained as part of the initial illuminate project in each company, and are considered by each customer as only the first of many potential new opportunity analyses that will result as the use of the iLuminate correlation database increases and is extended to other business units across the enterprise. While it is impossible to guarantee results of this magnitude from every iLuminate implementation, these examples show the possibility for dramatic new opportunity analysis that iLuminate can provide.

Conclusion

Revolutions in database technology come in waves, and the iLuminate correlation database is at the forefront of a revolution that will dramatically reduce the cost and complexity of data analytics. The ability to address the key issues of time-to-analytics and time-to-answer is only part of the story. Behind those capabilities is a means to provide the agility and insight that is needed to make companies more competitive in any economic climate, but particularly in one as trying and uncertain as that which the global economy faces today.

The ROI demonstrated by illuminate's customers illustrates an important set of options for companies that need to improve the speed at which they can understand and act on the challenges that seem to arrive daily in our dynamic, global economy. By enabling faster time-to-analytics and time-to-answer, illuminate significantly reduces the time needed for companies to react to change, understand their options, seize new opportunities to gain market share, improve customer satisfaction, lower costs, and increase revenue.

The success that illuminate customers have shown to date contrasts dramatically with the high rates of dissatisfaction and failure that continue to haunt the traditional data warehouse market. One of the more startling studies was performed by the Cutter Consortium in 2003, which surveyed over 140 data warehouse customers with respect to overall satisfaction with their data warehouse projects. The results of this survey stand in stark contrast with the experience of illuminate's customers: The Cutter survey reported that 41 percent of respondents had experienced a data warehouse project failure, and only 15 percent claimed that their data warehouse project had been a "major success."

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EAC believes that it is time to redress this predominance of failure and dissatisfaction, and unleash the full promise of the data warehouse market. illuminate's correlation database technology provides the means to do so in a demonstrably cost-effective and efficient way. The revolution has begun, and the results are clear. Companies looking to build new data warehouses or looking for improved ROI and functionality in the analytical environments should consider iLuminate. The numbers, while drawn from a relatively small sample, speak for themselves.

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