AberdeenGroup

Low-IT Database Cost-of-Ownership Study: 2001 Update

An Executive White Paper

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Aberdeen Group, Inc.
One Boston Place
Boston, Massachusetts 02108 USA
Telephone: 617 723 7890
Fax: 617 723 7897
www.aberdeen.com

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Executive Summary

The aim of this *Executive White Paper* is to update Aberdeen's March 1999 examination of the total cost of ownership (TCO) of Pervasive Software and Microsoft databases. In this document, we examine the Pervasive.SQL 2000/2000*i* and SQL Server 2000 versions of these databases.

The study focuses on a distinct and growing set of users — small to medium businesses (SMBs) and workgroups and departments within larger businesses — that Aberdeen calls, using Pervasive Software's terminology, "Low-IT" users. These users are often not well served by databases aimed at the large data stores and large corporate IT departments of major enterprises. Aberdeen research shows that these users focus especially on overall cost, ease-of-use, and minimizing deployment and administration resources.

The White Paper contains:

- A "visible-cost-of-ownership" (VCO) study estimating cost of ownership for both Pervasive.SQL 2000/2000*i* and SQL Server 2000, using the same cost-of-ownership criteria as in the previous study; and
- A set of criteria that both users and Aberdeen find most useful in assessing databases for the Low-IT market.

Aberdeen diverges from traditional approaches to TCO assessment because we find that traditional TCO estimates often do not fully capture users' real-world experiences. It is frequently impossible to calculate a value or values for intangible components in the cost equation, such as the risks associated with the timely delivery of next-generation technology or providing a smooth transition for mission-critical applications. The interdependencies of a solution with the rest of an enterprise's IT infrastructure cause wide variations in estimates among customers. And our studies have convinced us that "post-mortem" TCO estimates can differ widely from TCO forecasts.

Therefore, to make TCO more realistic for users, Aberdeen estimates VCO — an indication of how a customer is likely to perceive cost of ownership before the sales process starts, using the traditional models and pricing information as well as initial user experiences of this or an immediately previous version of the solution.

Aberdeen then places TCO within the context of all the key criteria for an informed buying decision: cost of ownership; generic technical criteria, including performance, robustness, and flexibility/openness; and Low-IT-specific criteria, such as ease-of-use and maintenance costs/resources.

Executive Summary

Aberdeen's overall findings include the following:

- *Pervasive Software's Pervasive.SQL's advantage over Microsoft's SQL Server 2000 continues to widen* in percentage terms.
- *This difference is especially due to Pervasive.SQL 2000/2000i's ability to offer a "near-lights-out" administration solution*, in which remote non-technical personnel often can handle any problems unresolved by the database's automated administration tools at a large cost savings.
- *Pervasive.SQL 2000/2000i also continues to differentiate itself with regard to other criteria* key to many Low-IT implementations, such as ease-of-use and maintenance resources.

Aberdeen also finds that:

- *Administrative and maintenance costs continue to increase in importance* as a buying decision factor, and proactive, "designed-in" database maintenance is key to many successful Low-IT implementations.
- *Low-IT users have unique database requirements*, such as "near-lights-out" administration and minimal training costs, which enterprise databases in many cases cannot meet adequately.
- *In 2001, for the first time since we started the survey, some results showed a slight increase in VCO*. Increases in VCOs reflected rapidly rising database administrator (DBA) salaries, new pricing initiatives, and new product functionality. These increases were partially mitigated by increased automation in database administration, along with the continuing effectiveness of application service providers (ASPs) in limiting license costs. Thus, while not as effective in decreasing costs as in previous years, supplier technology at least continues to offset rising salaries and other personnel costs.

These findings are likely to continue over the next year. While new versions may supersede today's databases in some customer sites toward the end of that period, initial indications are that these new versions will reinforce present trends by driving down administrative costs for both suppliers without changing their present relative ranking.

Project Scope

This *White Paper* outlines Aberdeen's qualitative research findings, which are based on interviews with departments/workgroups of large user organizations and SMBs that have deployed one or more of the databases, as well as on suppliers' published prices. The updated report includes a sampling of previous respondents as a means of verifying changes in costs over time. We examine 5-, 10-, 20-, 50-, and 100-user configurations for Low-IT database servers on Windows 2000 — as well as

Telephone: 617 723 7890
One Boston Place
Fax: 617 723 7897
Boston, Massachusetts 02108
www.aberdeen.com

an unlimited-access configuration. The costs cited in this study should be used only as an initial set of guidelines, because actual costs incurred by any user organization may differ based on each implementation's unique characteristics.

Aberdeen's research shows that the VCO for implementing a basic 20-concurrent-user Pervasive 2000/2000*i* Server database in a Low-IT situation and maintaining it for five years is approximately $9,934 (not including hardware and operating system costs), while the VCO for implementing and maintaining a basic 20-concurrent-user Microsoft SQL Server application is approximately $75,316.

IT organizations need to be aware of the real costs associated with ownership and deployment of an application (including hidden costs like database maintenance) and weigh those figures against the life span of the application and its value to the enterprise. Thus, at any level in the organization, Aberdeen has found that the cost of ownership can be an important factor in both the evaluation process and the purchasing decision. Interviews with users (IT departments and DBAs) continue to confirm that — aside from any specific requirements such as row-level locking — scalability, low cost of ownership, and reliability are the features most often required in a database server.

What Was Included in Each System

Two database products are examined in this research update: Pervasive Software's Pervasive.SQL 2000 and 2000*i* (users have not yet had enough experience with 2000*i* to identify major differences in TCO between the two, although 2000*i* has new features that should reduce costs as users gain experience with it) and Microsoft SQL Server 2000, both databases running on an Intel/Windows NT 4.0-based server platform. These versions of the databases were chosen because they were the latest versions, and because meaningful data on user experience with these versions was available at the time of the research for this study.

In calculating the VCO of a Low-IT database, Aberdeen included the following:

- *Database license* — the database's published software license cost for the Intel/Windows NT-based server platform.
- *Development costs* — the cost of a single copy of a selected developer tool kit needed to maintain and modify the application, when the database license does not include this tool set, and if users indicate that this tool kit is typically needed.
- *Deployment costs* — Aberdeen averaged the fees charged by the independent software vendor (ISV) or an independent professional services firm to deploy the database and application with the likely cost for sophisticated customers to perform deployment.
- *DBA costs* — to determine the efforts spent by the internal staff in deploying and maintaining the system, Aberdeen calculated that each im-

Telephone: 617 723 7890
One Boston Place
Fax: 617 723 7897
Boston, Massachusetts 02108
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plementation required some amount of dedicated time. In the Pervasive case, this often involved non-technical support staff, each of which typically costs $36,000 to $40,000 per year, or approximately $160 per day. In the Microsoft case, this involved internal systems professionals, each of which costs $2,000 per week — or $290 to $400 per day — depending on the skill level of the individual. That total is based on the cost of hiring a database administrator/developer, calculated at an annual salary of $73,000 to $80,000 or approximately $315 per day — a sharp 10% to 14% increase from 1999.

- *Training costs* — this number reflects the cost of training developers in how to use, update, and maintain the database. The cost reflects time spent training developers/administrators in how to troubleshoot the application, become familiar with the features and benefits, and generate and interpret reports. Pervasive users typically reported little or no need for developer training. One to two weeks of training is generally sufficient for Microsoft developers, depending on the complexity of the database. Courses were selected from those available from the suppliers or from third-party training organizations.
- *Upgrades* — the supplier charges for an upgraded version of the database. Based on present trends, we estimate two upgrades over five years. Upgrades can be purchased separately or included with maintenance contracts.
- *Support/license maintenance costs* — this fee is charged by the supplier or ISV (typically based on a percentage of the software license cost) to provide telephone-based and field service support for its application. Because users' reported need for Pervasive.SQL support calls was dramatically reduced since the last report, we assume 5 incidents per year for Pervasive.SQL 2000/2000*i* rather than 10.

Costs Not Included

The focus of this research was to determine the *incremental* costs of deploying and maintaining a Low-IT database as part of an application. As a result, several expenses incurred by an organization have been omitted in our calculations, including:

- *Hardware and operating system acquisition and support costs* — Aberdeen estimates that users will spend approximately $10,000 for a typical high-end PC server (averaging dual-processor and quad configurations) with Windows NT or Unix license bundled. If users do not have these servers available, IS buyers should add these costs to the VCO. Most organizations currently support networked desktop PCs for their employees. Because desktop support is almost invariably already part of the

budget, it is not included in the cost of ownership, nor is the cost for the client hardware itself.

- *Networking infrastructure* — Most organizations already have local area networks in place if they are deploying a database. As a result, networking equipment and costs such as wiring a building are not included.
- "*Soft costs*" — This figure includes the penalties associated with a database not having a particular feature — thus reducing its effectiveness — and also includes the costs associated with redesigning business processes and applications to take advantage of the database. No costs associated with business process reengineering or the purchase of additional products will be included in this cost analysis. Soft costs vary considerably based on the type of application being deployed and the environment in which it is deployed — and therefore are not included in this study.
- *Productivity loss* — This cost is a calculation of lost productivity based on the time spent in training and in getting the developers and administrators up-to-speed with the software. Productivity loss should be determined on a case-by-case basis, depending on the skills of the DBA or developers involved, and therefore is not included in this study. However, IS buyers should note that Pervasive.SQL 2000/2000*i*, in particular, appears to involve little or no productivity loss, because training required is typically minimal.

Methodology

To gather the data for this study, Aberdeen used the suppliers' published prices (derived from Web sites or printed material) for their software and professional services rates. Discounts were included only where offered as standard; research shows that, in some cases, additional discounts are provided. Aberdeen recontacted several users to get a real-world validation of costs associated with implementing each of the databases. In addition, we conducted telephone interviews with each supplier's customers to determine, "post-mortem," their history of administrative and other database costs. Customers surveyed are solicited from the suppliers and from our own list of users.

It is important to note that the survey does not take into account the different features and functionality of the various applications built around the database engine, nor those of the database engine itself. A comparison of these elements is beyond the scope of this research project. Suppliers should be contacted directly for the exact capabilities of their products.

The Results

Following are the updated VCO figures for the two databases, based on supplier-provided information and Aberdeen research. All calculations are rounded to the

Telephone: 617 723 7890
One Boston Place
Fax: 617 723 7897
Boston, Massachusetts 02108
www.aberdeen.com

nearest dollar. Table 1 outlines the total cost of deployment and five-year lifetime costs for Pervasive Software's Pervasive.SQL 2000/2000*i* database and compares its VCO to the VCO of Microsoft SQL Server 2000. Table 2 lists the comparable 1999 costs for Pervasive.SQL 7 and Microsoft SQL Server 7.0.

The tables outline the costs associated with 10, 20, 50, and 100 users as well as for Internet access over the five-year span. They assume that one-time costs are accrued upfront, that upgrades are purchased two times over the course of the five-year period, and that maintenance costs accrue every year — increasing with the user count. Annual maintenance costs were assumed not to increase over time. All costs are listed as a total cost for the five-year period, whether they are actually one-time costs (e.g., database licenses, monitoring tools, and server hardware and systems software) or costs that accumulate over five years (e.g., internal maintenance costs).

Aberdeen summarizes these results as follows:

- In all configurations, under conservative assumptions, Pervasive Software's Pervasive.SQL 2000/2000*i* showed an average 7-to-1 *superiority* in VCO over Microsoft's SQL Server 2000, compared to an average 5-to-1 superiority in 1999. To put it another way, Pervasive.SQL 7's VCO was typically 15% of SQL Server's VCO.
- Pervasive.SQL 7's superiority was most marked in *maintenance costs* — an area that past Aberdeen research has shown is a major and increasing component of TCO in most implementations for all organization sizes. However, even when Aberdeen removed maintenance costs from VCO, Pervasive.SQL maintained at least a 3-to-1 superiority in VCO (up from 2-to-1 in 1999). Both Pervasive.SQL and SQL Server users reported a sharp drop in problems because of the new versions of the databases. However, because Microsoft's service fees remained high and Pervasive users were able to employ non-technical personnel for administration more frequently and across more databases (e.g., via ASPs), the gap between Pervasive and Microsoft in maintenance costs widened.
- Over the two years since Aberdeen's last assessment, Pervasive.SQL's VCO has *decreased by approximately 55% on average*; Microsoft SQL Server's VCO decreased by approximately 5% on average — *despite increasing administrator salaries*.

Given these results, Aberdeen concludes that:

- Pervasive.SQL has a clear and increasing superiority in VCO.
- This superiority is primarily (but not entirely) due to Pervasive.SQL's ability to achieve "near-lights-out" administration in many cases.

Telephone: 617 723 7890
One Boston Place
Fax: 617 723 7897
Boston, Massachusetts 02108
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- This superiority is likely to continue and possibly (as it has over the last two years) to increase.
- Much of the difference in VCO between the two products (and especially maintenance costs) appears due to Microsoft SQL Server's focus on large-enterprise needs. Thus, its pricing and service policies target organizations with greater administrative resources and a larger training budget. As a result, its functionality, pricing, and service aim less at the Low-IT user than do Pervasive.SQL's.

Table 1: Five-Year Comparative VCO

Number of Clients	5	10	20	50	100	Unlimited Access
DBMS One Server Plus Client License						
Pervasive.SQL 2000/2000*i*	$1,195	$1,195	$2,095	$4,595	$7,995	$11,995
Microsoft SQL Server 2000	$1,489	$2,249	$11,099	$19,999	$19,999	$19,999
DBMS Development Tools (Min. license fee, 1 developer)						
Pervasive.SQL 2000/2000*i*	$149	$149	$149	$149	$149	$149
Microsoft SQL Server 2000	$1,619	$1,619	$1,619	$1,619	$1,619	$1,619
Deployment						
Pervasive.SQL 2000/2000*i*	$400	$450	$500	$550	$600	$800
Microsoft SQL Server 2000	$3,200	$8,000	$11,000	$14,000	$17,000	$20,000
DBA Cost						
Pervasive.SQL 2000/2000*i*	$1,500	$1,500	$1,500	$2,000	$2,500	$2,500
Microsoft SQL Server 2000	$25,000	$30,000	$35,000	$40,000	$45,000	$50,000
Training						
Pervasive.SQL 2000/2000*i*	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Microsoft SQL Server 2000	$5,330	$5,330	$5,330	$5,330	$5,330	$5,330
Two Upgrades over Five Years						
Server License Plus Client Lic. Upgrade						
Pervasive.SQL 2000/2000*i*	$1,190	$1,190	$2,190	$4,590	$7,990	$11,990
Microsoft SQL Server 2000	$1,498	$5,998	$11,098	$15,998	$15,998	$15,998
Developer/DBA Support Cost						
Pervasive.SQL 2000/2000*i* (5 Incidents/year)	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000
Microsoft SQL Server 2000 (20 Incidents/year)	$15,675	$15,675	$15,675	$15,675	$15,675	$15,675
Pervasive.SQL 2000/2000*i*	**$7,434**	**$7,484**	**$9,434**	**$14,884**	**$22,234**	**$30,434**
Microsoft SQL Server 2000	**$53,811**	**$68,871**	**$90,821**	**$112,621**	**$120,621**	**$128,621**

Source: Aberdeen Group, September 2001

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One Boston Place
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Boston, Massachusetts 02108
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Table 2: Microsoft SQL Server 7.0 and Pervasive.SQL 7 Five-Year VCO (1999)

Number of Clients	5	10	25	50	100	Internet Access
DBMS One Server Plus Client License						
Pervasive.SQL 7	$995	$995	$2,493	$3,995	$6,995	$2,490
Microsoft SQL Server 7	$1,399	$1,999	$3,999	$7,107	$13,323	$2,999
DBMS Development Tools (Min. license fee, 1 developer)						
Pervasive.SQL 7	$295	$295	$295	$295	$295	$295
Microsoft SQL Server 7	$549	$549	$549	$549	$549	$549
Installation						
Pervasive.SQL 7	$800	$900	$1,000	$1,100	$1,200	$800
Microsoft SQL Server 7	$3,200	$3,600	$4,000	$4,400	$4,800	$3,200
DBA Cost (Year 1)						
Pervasive.SQL 7	$400	$450	$500	$550	$600	$400
Microsoft SQL Server 7	$10,000	$11,000	$12,000	$13,000	$14,000	$10,000
DBA Cost (Years 2 to 5)						
Pervasive.SQL 7	$1,600	$1,800	$2,000	$2,200	$2,400	$1,600
Microsoft SQL Server 7	$40,000	$44,000	$48,000	$52,000	$56,000	$40,000
Training						
Developers						
Pervasive.SQL 7	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500
Microsoft SQL Server 7	$1,275	$1,275	$1,275	$1,275	$1,275	$1,275
DBAs and Server Administrators						
Pervasive.SQL 7	$3,625	$3,625	$3,625	$3,625	$3,625	$3,625
Microsoft SQL Server 7	$3,400	$3,400	$3,400	$3,400	$3,400	$3,400
Documentation						
Pervasive.SQL 7	$250	$250	$250	$250	$250	$250
Microsoft SQL Server 7	$100	$100	$100	$100	$100	$100
Two Upgrades over Five Years						
Server License Plus Client License Upgrade						
Pervasive.SQL 7	$990	$990	$2,485	$3,990	$6,990	$2,490
Microsoft SQL Server 7	$2,136	$2,874	$4,514	$7,630	$13,862	$4,396
Developer/DBA Support Cost						
Pervasive.SQL 7 (10 Incidents/year)	$5,100	$5,100	$5,100	$5,100	$5,100	$5,100
Microsoft SQL Server 7 (20 Incidents/year)	$10,170	$10,170	$10,170	$10,170	$10,170	$10,170
Pervasive.SQL 7	**$15,556**	**$15,905**	**$15,848**	**$19,205**	**$25,555**	**$15,150**
Microsoft SQL Server 7	**$72,229**	**$78,977**	**$88,007**	**$99,631**	**$117,479**	**$76,089**

Source: Aberdeen Group, February 1999

One Boston Place
Boston, Massachusetts 02108
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Beyond TCO: Other Key Buying Criteria for Low-IT Users

For the last eight years, Aberdeen has advised enterprise-database buyers to use scalability, open flexibility, robustness, and programmer productivity as overall buying criteria. By contrast, Aberdeen recommends that Low-IT database buyers consider the following overall criteria aside from TCO:

- *Performance* in common Low-IT tasks, such as back-office, workgroup, and intranet transaction processing. Although scalability is still an issue in some cases, most users handle this by linking to enterprise databases.
- *Administrative ease-of-use*, which not only drastically reduces Low-IT TCO, but also allows a wider range of end-users to access key SMB and departmental data, because they need no administrative skills.
- *Minimal downtime*, meaning that the operations of the embedded database should be invisible to the user; excessive downtime is the most visible and bottom-line-affecting flaw in an embedded database.
- *Flexibility*, which for Low-IT implementations typically means both the ability to connect to enterprise and supplier databases and the ability to easily upgrade to a new version of the embedded database.

Performance

For most Low-IT users, data processing involves small to midsize online transaction processing (OLTP)-type updates or "mixed" query and update processing. As a relational database, Pervasive.SQL excels in OLTP. Pervasive.SQL's ability to support navigational data access also allows it to perform well in medium-scale querying and, therefore, in mixed situations. Pervasive.SQL 2000/2000*i*'s microkernel tuning delivers major improvements in performance over previous versions, as interviewees attest.

Administrative Ease-of-Use

It is clear from user reports that Pervasive.SQL is outstanding in this area. Pervasive.SQL effectively handles all the administrative details that tend to trip up other Low-IT databases, such as the need to periodically reorganize the database to avoid degrading performance, automated online backup and recovery, and expanding the database as it nears its capacity. Features such as Distributed Tuning Interface for deployment, Pervasive System Analyzer for component management, the Pervasive replication service offering for synchronizing far-flung databases, and Pervasive Control Center for multiserver administration clearly aim at automating common administrative tasks. Moreover, easy-to-understand user interfaces mean that Pervasive and its ISVs receive relatively few support questions. User surveys clearly indicate that Pervasive.SQL 2000/2000*i* has drastically cut down on system problems and therefore on these support questions.

Telephone: 617 723 7890
One Boston Place
Fax: 617 723 7897
Boston, Massachusetts 02108
www.aberdeen.com

Minimal Downtime
Again, user reports indicate that Pervasive.SQL rarely has downtime. Pervasive.SQL's attention to data integrity and online backup and recovery means that some users report no downtime due to Pervasive.SQL alone.

Flexibility
Pervasive.SQL supports Server engines for Windows NT, Linux, and Novell NetWare, and provides connectivity to other LAN servers via its workgroup engine. Pervasive.SQL 2000/2000*i* continues to add extensive Internet features, such as a Java JDBC 2.0 driver and OLE DB 2.5 support. Again, user reports continue to confirm that Pervasive.SQL upgrades involve simply upgrading the surrounding database, with no user database expertise required.

Additional Aberdeen Key Research Findings
Buyers of Low-IT databases should note the following additional conclusions from Aberdeen's ongoing research into the Low-IT database market:

- Because administrative costs are a major component of overall VCO and Low-IT databases vary widely in administrative costs, performing a realistic analysis of likely DBA costs before purchasing any software or hardware can make a huge difference in lifecycle costs.
- Low-IT database VCO continues to decrease, often due to greater supplier and user effectiveness in automating key administrative functions. However, it remains true that tuning a database for optimal functioning is often well worth the added cost.
- Buyers should also note that low database administrative costs allow IT professionals to focus on higher return-on-investment projects and businesses with little or no IT to implement and support key applications.

Aberdeen recommends that buyers of workgroup and enterprise Low-IT databases consider VCO, real-world TCO experiences, and Aberdeen's overall buying criteria in selecting a supplier. Buyers should also consider the supplier's focus on Low-IT database users' needs and support for the ASP model. In all of these areas, Pervasive Software's Pervasive.SQL databases have strong advantages that are worth a closer look.

Projected Effects of Recent Announcements and Future Database Releases
Neither Microsoft nor Pervasive have announced plans to upgrade databases during the remainder of 2001. Therefore, VCOs for these products should change relatively little over the next year.

Telephone: 617 723 7890
One Boston Place
Fax: 617 723 7897
Boston, Massachusetts 02108
www.aberdeen.com

Appendix

Changes in Methodology

Over the past three years, Aberdeen has performed extensive research on estimating cost of ownership. Our key findings relating to databases follow:

- Estimates of cost of ownership done before implementation can miss the mark by a wide margin. Users report that actual costs can vary widely from even the most fine-grained estimates based on license fees and user-supplied estimates of "typical development and maintenance costs." The two likeliest reasons: cutting a deal with the supplier that reduces acquisition costs, and mis-estimating administrative or maintenance costs.
- Cost of ownership can vary widely from the average, depending on the type of environment. Typical reasons for this variation among databases are Low-IT versus custom use, and workgroup versus enterprise environments.
- Increasingly, other factors such as quantifiable and intangible benefits, risks, and "negative benefits" (e.g., avoidance of loss of customers) should be taken into account in the buying decision. For example, in some Internet situations the user's main cost is not running the database but advertising on portals. Moreover, the user's top buying criterion may not be cost but speed-to-upgrade, so that the user's Web site or portal can stay ahead of competitors seeking to steal customers.
- Costs without context are not as useful to users. In other words, if an IS buyer cannot compare the average situation on which the cost-of-ownership estimate is based to the user's own situation, a TCO study is less useful than a case study.

Aberdeen therefore continues to update its cost-of-ownership methodology to provide more benefit to users and to avoid tarring suppliers unfairly with a "bad in all situations" brush. Over the last three years, we have made the following changes:

- In most cases, license fees are now based on published prices available via the Web or in supplier publications. We find that suppliers are moving away from street prices and negotiated discounts and toward a common pricing scheme available over the Web. Administrative cost estimates are based on both qualitative user "ex post" research and our estimates of how new releases will vary from historical precedent. Users should take special care to note the differences between their administrative situations and those in case studies.

Telephone: 617 723 7890
One Boston Place *Fax: 617 723 7897*
Boston, Massachusetts 02108 *www.aberdeen.com*

- In most cases, our estimates now focus on a particular type of environment (Low-IT/workgroup, for example, or custom/enterprise). Estimates for this type of environment should not be taken to apply to other, quite different environments.
- We now try to note additional factors (potential benefits and/or criteria) that we believe the user should consider in the buying decision.

Aberdeen calls its cost-of-ownership estimate "visible-cost-of-ownership" (VCO). VCO aims to give IS buyers a way of estimating the cost of ownership that the user might reasonably expect before the sales process starts. The IS buyer can then modify this estimate according to the deals that suppliers offer as well as the user's own experience of using and administering these environments.

One minor change in methodology in 2001 should be noted: documentation costs are removed, because IS typically uses free online documentation instead.

Additional Caveats and Considerations

This *White Paper* focuses on Low-IT databases. Based on past research, it is evident that this area of focus is both narrow enough to ensure that variations in costs are not too wide, and general enough to provide useful information for a broad range of IS buyers. Note also that the Low-IT-database area includes some, but not all, of the "embedded database" area investigated in previous Aberdeen VCO research. Readers should not try to apply conclusions from one study to the other.

Readers should also note the following assumption: Server hardware and operating system costs are identical across suppliers and at all levels of clients. Initial indications are that roughly comparable servers may be used for Pervasive and Microsoft databases.

Aberdeen Group, Inc.
One Boston Place
Boston, Massachusetts
02108
USA

Telephone: 617 723 7890
Fax: 617 723 7897
www.aberdeen.com