

MANAGEMENT BRIEF

DB2 FOR PEOPLESOFT APPLICATIONS

Cost/Benefit Case for UNIX and Windows Deployments



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WHICH DATABASE?

The choice of a database is one of the most important technological issues facing any organization. The scalability, performance, functionality and availability delivered by any application solution are materially affected by the database it runs on.

The issue is, however, no longer just which database to employ for specific applications. IT agendas are increasingly dominated by demands for cross-functional system integration, organization-wide data transparency and cost-effectiveness. The extent to which these broader strategic objectives may be realized depends heavily on underlying database infrastructures.

This document deals with how these issues affect PeopleSoft applications. Specifically, it provides reality-based comparisons of costs and benefits for deploying PeopleSoft Financials, Human Resources, Enterprise Resource Planning (ERP) and Student Administration applications using Oracle and DB2 on RISC/UNIX and Windows servers.

Two sets of conclusions emerge clearly:

1. **Costs.** Five-year software costs (including licenses, updates and support) for RISC/UNIX servers are on average 1.72 times higher for Oracle than for DB2. If differences in personnel costs are included, overall Oracle costs are 2.25 times higher. For Windows servers, Oracle software costs average 89.9 percent of DB2, while overall costs are 1.77 times higher.

These figures include software costs calculated using Oracle processor-based pricing. If named-user pricing is employed, Oracle costs for RISC/UNIX servers are 2.99 and 3.52 times higher respectively than for DB2. For Windows servers, software costs are 73.7 percent of those for DB2, while overall costs are 1.61 times higher.

Personnel costs are significantly lower for DB2 for all platforms. Ratios of 2:1 or 3:5 in numbers of database administrators (DBAs) are commonly reported. Differences in personnel costs increase the DB2 cost lead in large installations, and erase what would otherwise be a marginal Oracle cost advantage in small configurations.

2. **Benefits.** Organizations that have deployed PeopleSoft applications on DB2 cite not only lower costs, but also quality of support (71 percent) and performance and functionality advantages (58 percent) as benefits of using this database.

Users reported superior performance relative to Oracle for transaction processing as well as Enterprise Performance Management (EPM) workloads; higher availability, particularly for business-critical 24/7 operations; more effective backup and recovery; and reduced database administration complexity.

With little growth occurring in Informix usage, Sybase and other players reduced to niche roles, and Microsoft SQL server restricted largely to the low end of the marketplace, Oracle and DB2 emerge as the main contenders for PeopleSoft applications. The status of Oracle as an exclusive organizational database standard becomes moot.

These conclusions are based on inputs from 87 organizations employing a wide range of PeopleSoft applications on Oracle or DB2 on RISC/UNIX and Windows servers, including Compaq, Hewlett-Packard, IBM and Sun platforms. Results are supported by detailed user profiles included in this document.

INTRODUCTION

Infrastructures

Databases impact the value of the applications they support. The extent to which a database can handle growth in data volumes and workloads largely determines the scalability of the overall solution. The efficiency with which processor and storage resources are utilized affects application-level performance.

The ability to maintain 24/7 availability requires high levels of stability in underlying database architectures, and effective clustering mechanisms. Data movement throughput affects query processing, replication, backup and recovery times.

Database choices gain in significance as users confront pressing demands for system and data interoperability at the enterprise level. Backlogs of integration tasks remain in most organizations. E-business “time to market” pressures have added to these.

The database role expands as organizations move toward new information-based strategies. Core issues not only in business intelligence, but also in e-business, customer relationship management (CRM) and ERP increasingly revolve around the extraction and exploitation of operational data. Conventional decision support cycles are yielding to new pressures for aggregation, interpretation and distribution of data in real time.

These shifts affect the PeopleSoft world. As the PeopleSoft environment expands beyond backbone financials, HR and ERP into CRM, supply chain integration, intranet-based tools and analytical solutions, the value equation changes. Sources of benefit extend beyond back-end processing to the integration of broader business processes, the delivery of new capabilities at the user and customer interface, and the exploitation of information.

The issue is no longer about selecting a database for an application. It is about selecting a database for an infrastructure.

Sources of Data

This document draws upon two main sources of data. First, a survey was conducted of more than 100 organizations that have deployed major PeopleSoft applications on RISC/UNIX and Windows servers using Oracle. Data was obtained from these organizations on applications, user populations, production and development server configurations, and database staffing levels.

A separate survey was then conducted of 24 organizations that had deployed, or were in the process of deploying major PeopleSoft applications on DB2 using RISC/UNIX or Windows platforms. Additional qualitative inputs were obtained from this group, primarily on why DB2 was selected over alternatives. Five organizations participated in both surveys.

From both groups, a total of 68 organizations were selected for comparative costing. These form a representative sample of the PeopleSoft user base in terms of industry, type of application, organization and workload size, and server platforms employed.

Surveys were conducted prior to the introduction of Oracle 9i in June 2001. Although the 9i pricing structure is used to calculate Oracle software costs, this document does not address new technical features announced by Oracle at that time.

COST PICTURE

RISC/UNIX Servers

Basis of Calculations

Database cost comparisons for RISC/UNIX servers are based on the experiences of 48 organizations. These included 34 companies and two government users employing a representative mix of PeopleSoft Financials, Human Resources Management Systems (HRMS) and ERP, along with 12 universities employing Financials, HRMS and Student Administration on Compaq (Alpha), Hewlett-Packard, IBM and Sun Microsystems servers.

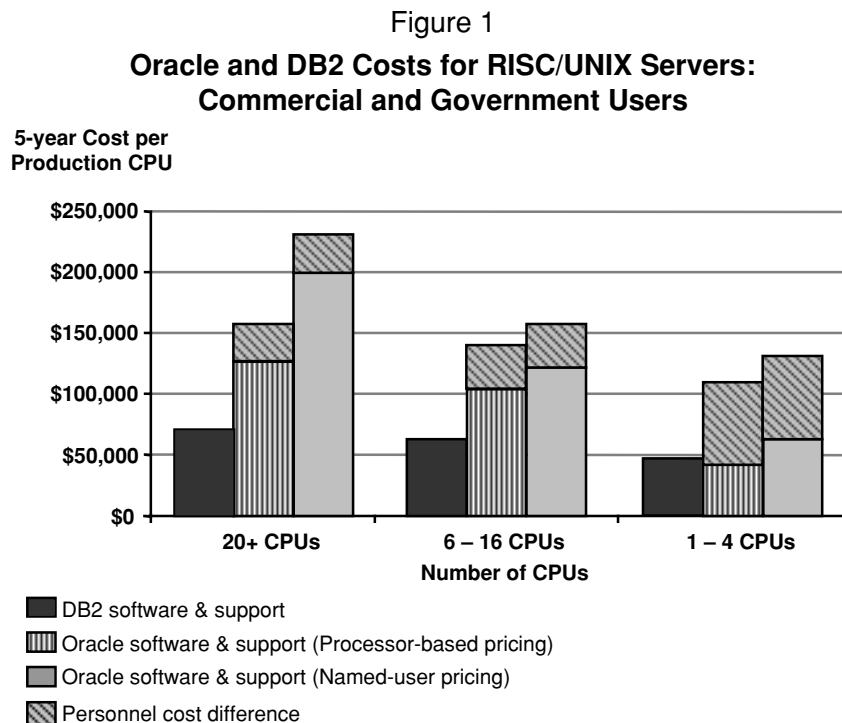
Costs presented here are based on application portfolios, configurations and user populations reported by these organizations. They include software costs (license fees, update subscriptions, and vendor support) for production as well as development servers, and loaded personnel costs over a five-year period.

One major change has been made to data reported by users. Server configurations have been updated to latest-generation models based on total MHz and vendor comparative performance data. Costs thus approximate those that would be experienced by organizations deploying new PeopleSoft applications on current server technology.

Commercial and Government Users

Among commercial and government users overall, software costs were 1.72 times higher for Oracle processor-based pricing than for DB2. Overall costs, including allowance for differences in personnel costs were 2.21 times higher.

There were, however, significant variations according to production server size which are summarized in figure 1.



Results may be summarized as follows:

- **Software costs.** For production configurations with six to 16 CPUs, Oracle software costs using processor-based pricing were 1.67 times higher than for DB2, while overall costs were 2.24 times higher. Where more than 20 production CPU were employed, the disparities increased slightly in favor of DB2. In this bracket, Oracle software and overall costs were 1.77 and 2.21 times higher respectively.

In configurations with six or more CPUs, higher Oracle software costs were primarily a function of the company's higher license fees – Oracle 9i Enterprise Edition (required for servers with more than four CPUs) lists for \$40,000 per processor, while the equivalent DB2 Enterprise Edition lists for \$20,000.

This 2:1 disparity was offset to some extent by proportionately higher DB2 update subscription fees (IBM charges 20 percent of the initial license fee per year, while Oracle charges 15 percent); and by IBM pricing for 24/7 support, which is based on numbers of processors multiplied by numbers of contacts.

There was less difference in license fees for smaller configurations. Oracle's 9i Standard Edition lists for \$15,000 per processor, compared to \$14,500 for the equivalent IBM offering. Among organizations employing four or less production CPUs, Oracle software costs were on average approximately 89 percent of those for DB2.

- **Personnel costs.** Oracle personnel costs were higher than those for DB2 in all brackets. This reflected higher levels of DBA productivity – meaning that fewer full time equivalent (FTE) persons were required – and lower salaries for DB2 DBAs relative to their Oracle counterparts.

Reflecting this effect, overall Oracle costs were significantly higher even in installations with four or less production CPUs. Differences in personnel costs represented \$67,100 per CPU in this bracket compared to \$35,571 in installations with six to 16 production CPUs, and \$31,494 in those with 20 or more.

For most small users differences in personnel costs primarily reflect lower average DB2 salaries. The effect is more significant in percentage terms because of smaller IT expenditures by these organizations.

Oracle named-user pricing resulted, in most cases, in significantly higher costs than if the company's processor-based model was employed. In installations with six to 16 production CPUs, software costs were 1.94 times higher than for DB2, while overall costs were 2.51 times higher. For installations with 20 or more production CPUs, the comparable figures were 2.79 and 3.23 times respectively.

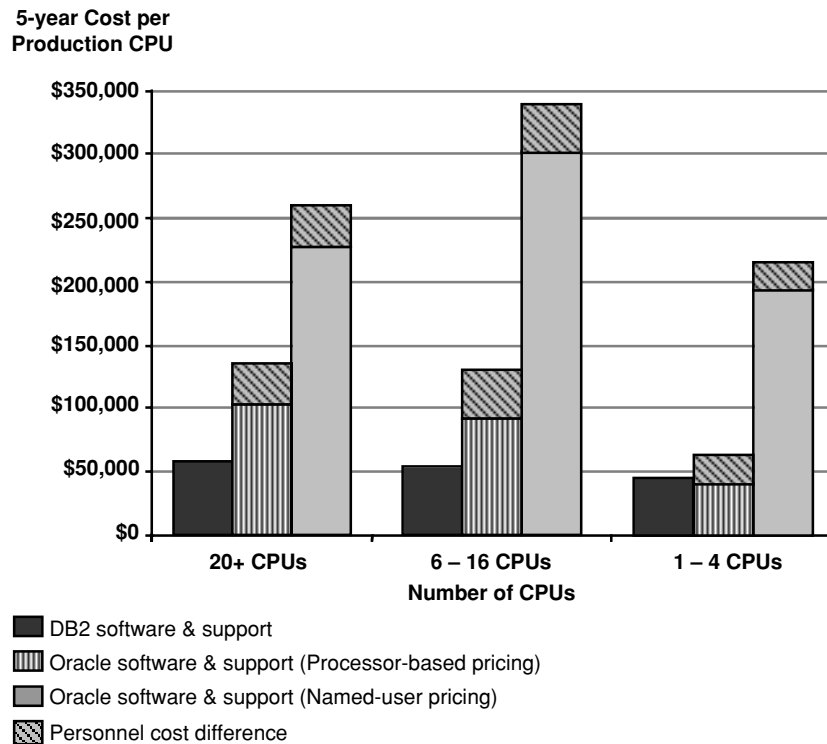
Disparities in software costs were smaller in installations with four or less production CPUs, reflecting lower Oracle pricing. The 9i Standard Edition list price is \$300 per named user for configurations in this bracket compared to \$800 for 9i Enterprise Edition. Software costs were, however, still higher than those for DB2 – by an average of 1.34 times – while overall costs were 2.74 times higher.

Universities

Relative Oracle and DB2 costs using Oracle processor-based pricing were generally similar among universities.

In installations with six to 16 production CPUs, Oracle software costs were 1.70 times higher than for DB2, in those with more than 20, 1.76 times. Overall costs were 2.42 and 2.32 times higher respectively. In smaller configurations, Oracle software costs were 88.8 percent of those for DB2, while overall costs were 1.41 times higher. Figure 2 summarizes these results.

Figure 2
Oracle and DB2 Costs for RISC/UNIX Servers: Universities



Oracle costs were, however, significantly higher among university users if named-user pricing was employed. Software costs calculated using this model were 3.89 times higher than for DB2 in installations with 20 or more production CPUs, 5.63 times higher in those with six to 16, and 4.32 times higher even when servers with four or less CPUs were employed.

Variations by Application

Differences in Oracle and DB2 costs were generally similar within size brackets across organizations employing different types of PeopleSoft applications. Oracle software costs employing processor-based pricing were in all cases higher in installations with six or more production CPUs, and lower in installations with four or less. Overall Oracle costs were higher in all cases.

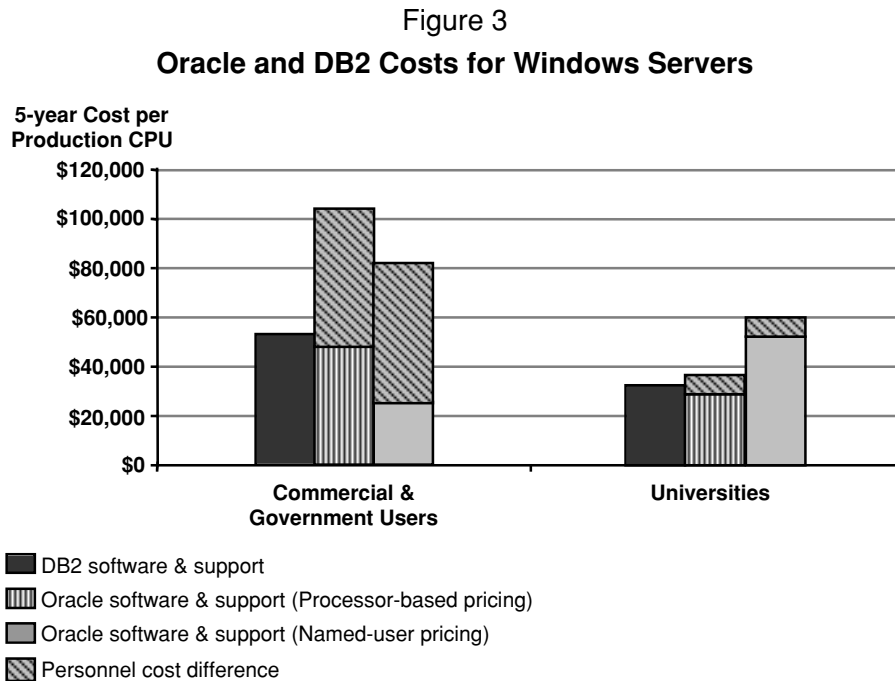
Although Oracle software costs calculated using processor-based pricing were generally lower than if named-user pricing was employed, there were some exceptions. These included four installations with four or less CPUs, as well as four in the six to 16 CPU range where named-user costs were approximately the same as for DB2. These involved PeopleSoft Financials applications with relatively small numbers of users.

Windows Servers

Costs for Windows server installations are based on inputs from 20 organizations, including 15 companies, one government user and four universities. These employed a range of Intel-based hardware from Compaq, Dell, Hewlett-Packard, IBM and other vendors.

Organizations were in most cases smaller than their RISC/UNIX counterparts. Company revenues averaged approximately \$2.5 billion, compared to \$12 billion for RISC/UNIX server users, while HRMS users averaged 8,700 employees compared to 49,000, and universities averaged 8,000 students compared to 27,000.

All of the organizations surveyed employed servers with four CPUs or less. If Oracle processor-based pricing was employed, the overall picture summarized in figure 3 was generally similar to the four CPUs or less bracket for RISC/UNIX servers.



Among commercial and government users, Oracle processor-based software costs averaged 90 percent of those of DB2, while overall costs were 1.98 times higher. The comparable figures for universities were 88.3 percent and 1.10 times respectively.

Because user populations were smaller than for RISC/UNIX installations, Oracle named-user software costs in commercial and government installations were lower than for processor-based pricing in 15 out of 16 installations, and averaged approximately 46.6 percent of those of DB2. Overall costs were also lower, averaging 1.54 times those of DB2.

Again, however, relatively large user populations for Student Administration rendered Oracle named-user pricing less attractive in university installations. Software and overall costs were 1.61 and 1.82 times higher than for DB2 respectively.

DB2 USER INPUTS

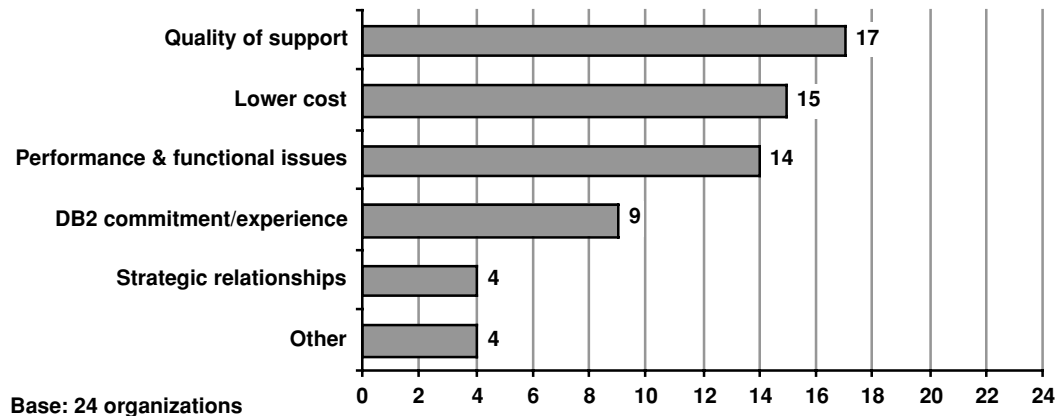
Overview

DB2 user inputs as to the value of this database for PeopleSoft applications are drawn from 24 organizations, including 19 companies, three government organizations and two universities. These employed a representative mix of Financials and HRMS (seven cases), Financials (six), HRMS (five), Student Administration (two) and EPM (four) applications.

All of the organizations surveyed had reviewed Oracle and DB2 options for their PeopleSoft applications before deciding in favor of the latter. All except three also had experience with Oracle databases elsewhere within their organizations.

Lower costs relative to Oracle were a major factor in preferences for DB2. Lower license fees, reduced DBA costs or both were cited by 15 organizations (63 percent) as contributing to their decisions to employ this database. The overall pattern of responses – summarized in figure 4 – was, however, much broader.

Figure 4
Reasons for Deploying PeopleSoft Applications on DB2



Only one organization cited lower costs as the exclusive reason for preferring DB2. Another characterized lower costs as the “predominant” reason. In most cases, other factors were equally if not more important. These included the following.

Quality of Support

Cited by 17 out of 24 organizations (71 percent), the quality of IBM support was the most common reason for deciding to deploy PeopleSoft applications on DB2. Responses were consistent across users of all types of application, including organizations with widely varying sizes and levels of sophistication.

At one end of the spectrum, several small organizations reported that IBM assistance had made it easier to implement PeopleSoft applications than would have been the case with Oracle.

One respondent commented, for example, that Oracle partners tended to assume that users already had experience with this database, or could acquire it easily by attending classes, reading manuals, and so on. In small organizations with only one or two DBAs, however, the adoption of new database technologies was a more daunting proposition, and the more in-depth “hand-holding” offered by IBM was appreciated.

At the other extreme, large corporate and government users reported that, in comparison with Oracle, IBM was generally stronger in areas that related to “business-critical” operations. The role of IBM support in maintaining efficient availability for large-scale financials and HRMS systems was seen as particularly important.

A key benefit, according to one respondent, was that the organization’s IBM support team was familiar with and capable of dealing with problems affecting not only the database platform but also servers, systems software and PeopleSoft applications employed in the installation. In contrast, Oracle support focused on the company’s own products.

Performance and Functionality

Cited by 14 of the organizations surveyed (58 percent), performance and functional issues ran a close third among reasons for preferring the DB2 platform.

Respondents cited benefits in such areas as scalability, availability, more effective backup and recovery, and reduced complexity of database administration. Two main themes emerged:

1. **Automation.** One of the major advantages of DB2, as described by one respondent, was that it was less “labor-intensive” than Oracle. Others made similar comments. Eight organizations reported that administration was simpler than in the Oracle environment, or that DBA staffing was less, or both.

High levels of automation also meant that job scheduling and performance optimization became more flexible and reliable processes. Because risks of system error were reduced, availability for business-critical operations could be more easily ensured. One respondent noted that, while similar functionality could be achieved with Oracle, this was a more “arduous” process.

2. **Database design.** Users also commented on functional superiorities in underlying DB2 design. Several organizations noted, for example, that DB2 performed better than Oracle for high-volume data movement workloads such as replication, backup and recovery.

According to one respondent, while DB2 and Oracle were generally similar in their ability to handle batch workloads such as reporting, DB2 demonstrated a clear lead in online, user-intensive applications with large numbers of table access. This lead became particularly significant in financial, HRMS and ERP applications with high volumes of inserts and deletes.

One organization reported that it had experienced significant bottlenecks when employing Oracle in a high-volume PeopleSoft general ledger application. Another cited “monumental transaction volume” that internal tests had shown could not be handled effectively by Oracle.

A third organization cited the superiority of DB2 for an extremely large catalog application with numerous tables (including one table with more than 65,000 line items) generating “massive I/O.” A fourth reported that DB2 performed better than Oracle for an HRMS workload characterized by frequent changes in personnel, benefits and payroll records caused by high staff turnover and heavy use of seasonal labor. Others reported similar experiences.

PeopleSoft EPM

DB2 performance benefits were cited by all four organizations employing PeopleSoft EPM systems.

In all of these cases, PeopleSoft EPM had been adopted for strategic, enterprise-level performance measurement applications. These included high-end business, customer profile and profitability analysis, along with activity-based management (ABM) and balanced scorecard reporting.

Databases were relatively large – over 300 GB, over 600 GB and over one terabyte (two cases) – and growing. One user projected an eventual database size of over 10 terabytes. Server configurations were also larger than the norm for PeopleSoft installations. They included 24-way IBM p680 and Sun E6500s, and 16- and 24-way IBM SP systems.

Respondents noted that workloads were characterized by high query volumes, including many large, complex calculations. They were closer in profile to decision support data warehouses than to the transaction processing workloads that constituted the historical PeopleSoft environment. The impact on underlying databases, and requirements for database performance were thus significantly different.

In two of these organizations, it had been determined that parallel databases were required to handle extremely large query workloads, and it was decided to employ the parallel version of DB2, DB2 Extended Enterprise Edition (EEE). Respondents noted that Oracle did not provide a realistic parallel capability, and was thus not an alternative.

Other Factors

Other factors which contributed to decisions to deploy PeopleSoft applications on DB2 included commitments to DB2 as the organization’s database standard (two cases) and previous experience with and availability of existing skills for DB2 (seven); strategic relationships with IBM (three) and with an IBM business partner focusing on the DB2 platform (one); and recommendation by PeopleSoft that DB2 should be employed (one).

Three respondents cited concerns about evolution of relationships with Oracle. One commented that, while Oracle had abandoned its Universal Power Unit (UPU) pricing, the precedent had been disturbing – there remained the possibility that the company would revert to a more aggressive pricing scheme in the future. Others worried about degradation of Oracle support in the future.

PROFILES

PeopleSoft applications referred to in these profiles are abbreviated as shown in figure 5.

Figure 5
PeopleSoft Applications

FINANCIALS	HRMS	PRODUCTION MANAGEMENT
GL General ledger	HR Human resources	BR Bills & routings
AR Accounts receivable	BA Benefits administration	CM Cost management
AP Accounts payable	PA Pension administration	EN Engineering
AM Asset management	TL Time & labor	OM Order management
IM Inventory management	PY Payroll	PC Product configurator
PC Purchasing	SUPPLY CHAIN	
BI Billing	DP Demand planning	PM Production management
PJ Projects	EP Enterprise planning	PR Product planning
BD Budgets	OP Order promising	
	PP Production planning	

RISC/UNIX FINANCIALS & HRMS USERS	A	B	C	D
INDUSTRY	Manufacturing	Manufacturing	Manufacturing	Finance
REVENUES	\$30 billion	\$15 billion	\$8 billion	\$6.5 billion
EMPLOYEES	20,000	60,000	35,000	50,000
APPLICATIONS				
Financials	GL, AR, AP, AM, PC, PJ	GL, AP, AM, PJ, BD	GL, AP, AM, PC, PJ, BD	GL, AR, AP, AM, IM, PC, PJ, BD
HRMS	HR, BA, PY	HR, BA, PY	HR, PY	HR, BA, PA, TL, PY
NUMBER USERS	2,000	3,000	2,000	2,500
PRODUCTION SYSTEM	2xIBM p680 18x600 MHz each	2xIBM p680 24x600 MHz each	2xHP Superdome 16x550 MHz each	2xSun E6800 16x750 MHz each
DEVELOPMENT SYSTEM	IBM p680* 18x600 MHz	IBM p680* 24x600 MHz	HP Superdome* 16x550 MHz	Sun E6800* 16x750 MHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$4,536	\$6,048	\$4,032	\$4,032
Named users	\$6,720	\$10,080	\$6,720	\$8,400
DB2 COST (5 YEAR) (\$K)				
	\$2,565	\$3,420	\$2,280	\$2,280
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$2,402	\$3,903	\$2,402	\$3,002
DB2	1,386	1,940	1,386	1,663
Difference	\$1,016	\$1,963	\$1,016	\$1,339

*Clustered failover

RISC/UNIX FINANCIALS & HRMS USERS	E	F	G	H
INDUSTRY	Retail	Media	Finance	Manufacturing
REVENUES	\$5 billion	\$4 billion	\$4 billion	\$2.5 billion
EMPLOYEES	45,000	12,000	7,000	12,000
APPLICATIONS				
Financials	GL, AR, AM	GL, AP, PC	GL, AR, AP, AM, IM, PC, BL, BD	GL, AR, AP, AM, PC, BD
HRMS	HR, BA, PY	HR, BA, PY	HR, BA, PY	HR, BA, PA, TL, PY
NUMBER USERS	850	500	500	400
PRODUCTION SYSTEM	2xHP Superdome 12x550 MHz each	Sun E6800 12x750 MHz	Sun E6800 12x750 MHz	IBM p620 8x600 MHz
DEVELOPMENT SYSTEM	HP Superdome* 8x550 MHz	Sun E3800 2x750 MHz	Sun E6800 4x750 MHz	IBM p640 2x600 MHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$2,688	\$1,071	\$1,134	\$735
Named users	\$2,856	\$853	\$865	\$685
DB2 COST (5 YEAR) (\$K)				
	\$1,520	\$633	\$696	\$443
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$2,402	\$1,801	\$1,501	\$1,201
DB2	1,386	1,108	831	831
Difference	\$1,016	\$693	\$670	\$370

RISC/UNIX FINANCIALS & HRMS USERS	I	J	K	L
INDUSTRY	Healthcare	Distribution	Finance	Telecom
REVENUES	\$2 billion	\$1.2 billion	\$1 billion	\$700 million
EMPLOYEES	16,000	5,000	3,000	4,500
APPLICATIONS				
Financials	GL, AR, AP, AM, PC, BD	GL, AR, AP, AM, BI, BD	GL, AP, AM, PC, PJ, BD	GL, AR, AP, AM, BI, BD
HRMS	HR, BA, PY	HR, BA, PY	HR, BA	HR, BA, PY
NUMBER USERS	500	350	250	300
PRODUCTION SYSTEM	2xHP N4000 8x440 MHz each	HP N4000 8x550 MHz	IBM p680 4x600 MHz	Sun E4800 6x750 MHz
DEVELOPMENT SYSTEM	HP N4000 4x360 MHz	HP N4000 4x440 MHz	IBM p640 375 MHz	Sun 420R 2x450 MHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$1,470	\$735	\$158	\$567
Named users	\$1,680	\$601	\$426	\$517
DB2 COST (5 YEAR) (\$K)				
	\$886	\$443	\$178	\$348
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$1,201	\$1,201	\$901	\$901
DB2	831	831	554	554
Difference	\$370	\$370	\$347	\$347

*Clustered failover

RISC/UNIX HRMS USERS	A	B	C	D
INDUSTRY	Government	Retail	Manufacturing	Telecom
EMPLOYEES	250,000	150,000	125,000	85,000
APPLICATIONS	HR, BA, PY	HR, BA, PY	HR, BA, PY	HR, BA, PY
NUMBER USERS	2,300	2,000	3,000	1,350
PRODUCTION SYSTEM	2xIBM p680 24x600 MHz each	2xCompaq GS320 16x731 MHz each	2xHP Superdome 16x550 MHz each	Sun E6800 16x750 MHz
DEVELOPMENT SYSTEM	IBM p680* 24x600 MHz	Compaq GS320* 16x731 MHz each	HP Superdome* 16x550 MHz	Sun E3800 4x750 MHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$6,048	\$4,032	\$4,032	\$1,470
Named users	\$7,728	\$6,720	\$10,080	\$2,293
DB2 COST (5 YEAR) (\$K)				
	\$3,420	\$2,280	\$2,280	\$886
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$3,002	\$2,402	\$2,402	\$1,801
DB2	1,940	1,663	1,663	1,386
Difference	\$1,062	\$739	\$739	\$415

RISC/UNIX HRMS USERS	E	F	G	H
INDUSTRY	Finance	Finance	Manufacturing	Government
EMPLOYEES	70,000	60,000	45,000	40,000
APPLICATIONS	HR, BA, PY	HR, BA, PY	HR, BA, PY	HR, BA, PY
NUMBER USERS	1,000	700	750	1,100
PRODUCTION SYSTEM	HP Superdome 16x550 MHz	HP V2600 12x550 MHz	IBM p680 12x600 MHz	Sun E6800 12x750 MHz
DEVELOPMENT SYSTEM	HP Superdome* 16x550 MHz	HP N4000 4x360 MHz	IBM p620 2x600 MHz	Sun 280R 2x750 MHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$2,688	\$1,134	\$1,071	\$1,071
Named users	\$3,360	\$1,201	\$1,273	\$1,861
DB2 COST (5 YEAR) (\$K)				
	\$1,520	\$696	\$633	\$633
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$1,801	\$1,201	\$1,201	\$1,501
DB2	1,386	1,108	1,108	1,108
Difference	\$415	\$93	\$93	\$393

*Clustered failover

RISC/UNIX HRMS USERS	I	J	K	L
INDUSTRY	Retail	Insurance	Energy	Telecom
EMPLOYEES	35,000	25,000	18,000	10,000
APPLICATIONS	HR, BA, PY	HR, BA, PY	HR, BA, PY	HR, BA, PA, TL, PY
NUMBER USERS	600	450	250	120
PRODUCTION SYSTEM	HP V2600 8x550 MHz	IBM p680 6x600 MHz	Sun E4800 4x750 MHz	Sun E3800 2x750 MHz
DEVELOPMENT SYSTEM	HP N4000 2x360 MHz	IBM p640 2x375 MHz	Sun 420R 450 MHz	Sun 420R 450 MHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$735	\$567	\$158	\$95
Named users	\$1,021	\$769	\$164	\$82
DB2 COST (5 YEAR) (\$K)				
	\$443	\$348	\$178	\$105
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$1,201	\$1,201	\$1,201	\$1,201
DB2	1,108	1,108	1,108	1,108
Difference	\$93	\$93	\$93	\$93

RISC/UNIX FINANCIALS USERS	A	B	C	D
INDUSTRY	Utility	Finance	Finance	Energy
REVENUES	\$50 billion	\$30 billion	\$18.5 billion	\$7.5 billion
APPLICATIONS	GL, AR, AP, PC, BI, BD	AR, AP, PC, PJ, BI, BD, Treasury	GL, AP, PC, BI	GL, AR, AP, AM, IM, PC, PJ, BI, BD
NUMBER USERS	1,200	1,000	300	700
PRODUCTION SYSTEM	IBM p680 24x600 MHz	IBM p680 20x600 MHz	Sun E4800 4x750 MHz	HP N4000 12x550 MHz
DEVELOPMENT SYSTEM	IBM p680* 12x600 MHz	IBM p680* 16x600 MHz	Sun 420R 750 MHz	HP N4000* 12x550 MHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$3,024	\$3,024	\$158	\$2,016
Named users	\$4,032	\$3,360	\$195	\$2,352
DB2 COST (5 YEAR) (\$K)				
	\$1,710	\$1,710	\$178	\$1,140
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$1,801	\$1,801	\$1,201	\$1,801
DB2	1,108	1,108	831	1,108
Difference	\$693	\$693	\$370	\$693

*Clustered failover

RISC/UNIX FINANCIALS USERS	E	F	G	H
INDUSTRY	Distribution	Media	Real estate	Utility
REVENUES	\$5 billion	\$2.5 billion	\$1.5 billion	\$1 billion
APPLICATIONS	GL, AR, AP, AM	GL, AR, AP	GL, AP, AM, PJ	GL, AR, AP, AM, IM, PC, PJ, BD
NUMBER USERS	200	120	200	300
PRODUCTION SYSTEM	IBM p680 6x600 MHz	Compaq GS80 2x731 MHz	IBM p620 2x600 MHz	HP N4000 2x550 MHz
DEVELOPMENT SYSTEM	IBM p640 2x375 MHz	Compaq ES40 667 MHz	IBM p640 375 MHz	HP N4000 360 MHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$567	\$95	\$95	\$95
Named users	\$349	\$82	\$132	\$195
DB2 COST (5 YEAR) (\$K)				
	\$348	\$105	\$105	\$105
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$600	\$600	\$901	\$600
DB2	554	554	554	554
Difference	\$46	\$46	\$347	\$46

RISC/UNIX ERP USERS	A	B	C	D
INDUSTRY	Services	Manufacturing	Manufacturing	Manufacturing
REVENUES	\$6.5 billion	\$2 billion	\$1.5 billion	\$1 billion
EMPLOYEES	18,000	10,000	3,000	3,000
APPLICATIONS				
Financials	GL, AR, AP, AM, IM, PC, PJ	GL, AR, AP, PC, PJ, BD	GL, AR, AP, AM, IM, PJ, BI, BD	GL, AR, AP, AM, IM, PC, BI
HRMS	HR, BA, TL, PY	HR, BA, PY	HR, BA, TL, PY	HR, BA, PY
Production mgmt.	All modules	-	OM, PM	All modules
Supply chain	All modules	EP, PP	EP, PP	All modules
NUMBER USERS	1,500	700	500	500
PRODUCTION SYSTEM	2x HP V2600 16x550 MHz each	IBM p680 12x600 MHz	Sun E6800 8x750 MHz	Compaq GS 160 8x731 MHz
DEVELOPMENT SYSTEM	HP V2600* 16x550 MHz	IBM p620 4x668 MHz	Sun E3800 4x750 MHz	Compaq GS 2x731 MHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$4,032	\$1,134	\$798	\$798
Named users	\$5,040	\$1,302	\$966	\$966
DB2 COST (5 YEAR) (\$K)				
	\$2,280	\$696	\$506	\$506
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$3,002	\$2,402	\$1,801	\$1,801
DB2	1,940	1,663	1,386	1,386
Difference	\$1,062	\$739	\$415	\$415

*Clustered failover

RISC/UNIX UNIVERSITY USERS	A	B	C	D
NUMBER STUDENTS	65,000	50,000	40,000	35,000
APPLICATIONS	Student Admin Financials HRMS	Student Admin Financials HRMS	Student Admin Financials HRMS	Student Admin Financials HRMS
NUMBER USERS	5,000	4,500	4,000	3,500
PRODUCTION SYSTEM	2xIBM p680 24x600 MHz each	2xHP Superdome 16x550 MHz each	IBM p680 24x600 MHz	IBM p680 16x600 MHz
DEVELOPMENT SYSTEM	IBM p680 12x600 MHz	HP V2600 8x550 MHz	IBM p620 6x600 MHz	IBM p620 4x600 MHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$5,040	\$3,360	\$2,520	\$1,470
Named users	\$8,602	\$7,694	\$6,821	\$5,905
DB2 COST (5 YEAR) (\$K)				
	\$2,850	\$1,900	\$1,425	\$886
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$3,002	\$2,402	\$2,402	\$2,402
DB2	1,663	1,386	1,386	1,386
Difference	\$1,339	\$1,016	\$1,016	\$1,016

RISC/UNIX UNIVERSITY USERS	E	F	G	H
NUMBER STUDENTS	25,000	20,000	20,000	18,000
APPLICATIONS	Student Admin Financials HRMS	Student Admin Financials HRMS	Student Admin Financials HRMS	Student Admin Financials HRMS
NUMBER USERS	3,000	2,500	2,200	2,000
PRODUCTION SYSTEM	Sun E6800 20x750 MHz	Sun E6800 12x750 MHz	2xHP N4000 8x550 MHz each	Sun E6800 12x750 MHz
DEVELOPMENT SYSTEM	Sun E3800 4x750 MHz	Sun 280R 2x750 MHz	HP N4000 4x440 MHz	Sun 280R 2x750 MHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$1,806	\$1,071	\$1,470	\$1,071
Named users	\$5,065	\$4,213	\$3,721	\$3,373
DB2 COST (5 YEAR) (\$K)				
	\$1,076	\$633	\$786	\$633
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$1,801	\$1,801	\$1,801	\$1,501
DB2	1,108	1,108	1,108	1,108
Difference	\$693	\$693	\$693	\$393

RISC/UNIX UNIVERSITY USERS	I	J	K	L
NUMBER STUDENTS	17,000	15,000	10,000	10,000
APPLICATIONS	Student Admin Financials HRMS	Student Admin Financials HRMS	Student Admin Financials HRMS	Student Admin Financials HRMS
NUMBER USERS	2,000	2,000	1,500	1,200
PRODUCTION SYSTEM	Sun E6800 12x750 MHz	IBM p680 12x600 MHz	HP N4000 8x550 MHz	Compaq ES40 4x833 MHz
DEVELOPMENT SYSTEM	Sun 280R 2x750 MHz	IBM p640 4x375 MHz	HP N4000 2x360 MHz	Compaq ES40 677 MHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$1,071	\$1,134	\$735	\$158
Named users	\$3,373	\$3,385	\$2,533	\$769
DB2 COST (5 YEAR) (\$K)				
	\$633	\$696	\$443	\$178
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$1,501	\$1,201	\$1,201	\$1,201
DB2	1,108	1,108	1,108	1,108
Difference	\$393	\$93	\$93	\$93

WINDOWS FINANCIALS & HRMS USERS	A	B	C	D
INDUSTRY	Manufacturing	Services	Manufacturing	Healthcare
REVENUES	\$2.5 billion	\$1 billion	\$600 million	\$200 million
EMPLOYEES	2,000	4,000	5,000	1,200
APPLICATIONS				
Financials	GL, AR, AP, AM, IM, PC, BI, PJ, BD, Treasury	GL, AR, AP, AM, PC, PJ, BD	AR, BI	GL, AP, PC, IM
HRMS	HR, BA, PY	HR, BA, PY	HR, BA, PY	HR, BA, TL, PY
Other	OM			
NUMBER USERS	150	60	30	85
PRODUCTION SYSTEM	2x(4x1 GHz)	2x(4x1 GHz)	4x1 GHz	2x1 GHz
DEVELOPMENT SYSTEM	4x1 GHz	4x1 GHz	1 GHz	1 GHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$378	\$378	\$158	\$95
Named users	\$120	\$63	\$31	\$60
DB2 COST (5 YEAR) (\$K)				
	\$418	\$418	\$178	\$105
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$1,201	\$901	\$600	\$600
DB2	831	554	554	554
Difference	\$370	\$347	\$46	\$46

WINDOWS HRMS USERS	A	B	C	D
INDUSTRY	Media	Manufacturing	Retail	Manufacturing
EMPLOYEES	20,000	18,000	15,000	13,000
APPLICATIONS	HR, BA, PY	HR, BA, PY	HR, BA, PY	HR, BA, PY
NUMBER USERS	250	200	200	120
PRODUCTION SYSTEM	2x(4x1 GHz)	2x(2x1 GHz)	2x(2x1 GHz)	2x1 GHz
DEVELOPMENT SYSTEM	4x1 GHz	2x1 GHz	2x1 GHz	1 GHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$378	\$189	\$189	\$95
Named users	\$183	\$139	\$139	\$82
DB2 COST (5 YEAR) (\$K)				
	\$418	\$209	\$209	\$105
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$1,201	\$1,201	\$1,201	\$1,201
DB2	831	831	831	831
Difference	\$370	\$370	\$370	\$370

WINDOWS HRMS USERS	E	F	G	H
INDUSTRY	Healthcare	Government	Manufacturing	Utility
EMPLOYEES	12,000	8,000	4,000	2,500
APPLICATIONS	HR, BA, PY	HR, BA, PY	HR, BA, PA, TL, PY	HR, BA, TL, PY
NUMBER USERS	100	150	30	80
PRODUCTION SYSTEM	2x1 GHz	1 GHz	1 GHz	1 GHz
DEVELOPMENT SYSTEM	1 GHz	1 GHz	1 GHz	1 GHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$95	\$63	\$63	\$63
Named users	\$69	\$101	\$25	\$56
DB2 COST (5 YEAR) (\$K)				
	\$105	\$69	\$69	\$69
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$901	\$600	\$600	\$600
DB2	554	554	554	554
Difference	\$347	\$46	\$46	\$46

WINDOWS FINANCIALS USERS	A	B	C	D
INDUSTRY	Transportation	Distribution	Finance	Finance
REVENUES	\$1.5 billion	\$1 billion	\$1 billion	\$800 million
APPLICATIONS	GL, AR, AP	GL, AP, AM	GL, AP, PC, BI, BD	GL, AR, AP, PC, BI, BD
NUMBER USERS	65	80	100	60
PRODUCTION SYSTEM	2x1 GHz	2x1 GHz	2x1 GHz	1 GHz
DEVELOPMENT SYSTEM	1 GHz	1 GHz	1 GHz	1 GHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$95	\$95	\$95	\$63
Named users	\$47	\$56	\$69	\$44
DB2 COST (5 YEAR) (\$K)				
	\$105	\$105	\$105	\$69
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$600	\$600	\$600	\$600
DB2	554	554	554	554
Difference	\$46	\$46	\$46	\$46

WINDOWS UNIVERSITY USERS	A	B	C	D
NUMBER STUDENTS	12,500	9,000	6,000	4,000
APPLICATIONS	Financials	Financials	Student Admin	Student Admin Financials HRMS
NUMBER USERS	600	450	500	600
PRODUCTION SYSTEM	2x(4x1 GHz)	2x(4x1 GHz)	2x1 GHz	2x(4x1 GHz)
DEVELOPMENT SYSTEM	1 GHz	1 GHz	1 GHz	1 GHz
ORACLE COST (5 YEAR) (\$K)				
Processor-based	\$284	\$284	\$95	\$95
Named users	\$384	\$290	\$321	\$384
DB2 COST (5 YEAR) (\$K)				
	\$324	\$324	\$105	\$105
PERSONNEL COST (5 YEAR) (\$K)				
Oracle	\$600	\$600	\$600	\$600
DB2	554	554	554	554
Difference	\$46	\$46	\$46	\$46

METHODOLOGY

Profile Comparisons

Survey Demographics

Profile comparisons are based on a representative sample of 68 organizations which had deployed PeopleSoft applications or which (in three cases) planned to do so. The organizations planning deployments had developed workload and configuration projections, enabling data to be used with reasonable confidence.

Industry and size distribution of these groups are summarized in figures 6 and 7. Reflecting overall demographics of PeopleSoft deployment, Windows users were generally smaller than those employing RISC/UNIX servers.

Figure 6
Comparison Profile Sample: Industry Distribution

INDUSTRY	RISC/UNIX-BASED	WINDOWS-BASED	INDUSTRY	RISC/UNIX-BASED	WINDOWS-BASED
Manufacturing	9	5	Energy	2	–
Finance	6	2	Insurance	2	–
Retail	3	1	Services	1	1
Telecommunications	3	–	Real estate	1	–
Distribution	2	1	Transportation	–	1
Healthcare	1	2	Government	2	1
Media	2	1	Universities	12	4
Utilities	2	1			

Figure 7
Comparison Profile Sample: Size Distribution

REVENUES	RISC/UNIX-BASED	WINDOWS-BASED	NUMBER EMPLOYEES (HRMS Users)	RISC/UNIX-BASED	WINDOWS-BASED
Over \$10 billion	12	1	Over 50,000	8	–
\$1 – 10 billion	21	9	10,000 – 50,000	12	5
Under \$1 billion	1	5	Under 10,000	4	7

Universities employing RISC/UNIX servers ranged from 10,000 to more than 65,000 students, while their Windows counterparts reported from 4,000 to 12,500 students.

Organizations were based predominantly in United States or Canada. (66 cases), and in Europe and Asia (one each).

Server Configurations

Server configurations employed in comparison profiles are for database servers only, and do not include application servers, reporting servers and other types commonly found in PeopleSoft environments.

Configurations are based on those reported by users. These included IBM RS/6000, SP or pSeries servers; Hewlett-Packard Superdome, V Series, N Series or K Series servers; Sun Microsystems E4000, E5000, E6500, E10000 and equivalent models; and Compaq AlphaServers.

Configurations have been updated to vendor models and technologies current as of June 2001. New configurations were derived by applying vendor relative performance data where this was available, or by translating total processor MHz for installed servers into new models (e.g. an 8x360 MHz server was translated into a 6x550 MHz server). In both cases, the next largest new model configuration was employed. Configurations were verified using sizing guides and tools supplied by these vendors.

Although most organizations employed relatively small, dedicated platforms as development and test servers (the norm was a quarter to an eighth of the size of production systems), some users reported that larger machines were used both for test and development, and as failovers for production systems. Where appropriate, comparison profiles reflect such configurations.

Although there were some indications that DB2 hardware configurations were smaller than their Oracle counterparts, limitations in sample size and variations in workload characteristics make generalization difficult. This effect is thus not allowed for in Oracle and DB2 cost comparisons.

Software Costs

Costs are calculated as follows:

- **Oracle costs** are based on published prices of \$40,000 per processor and \$800 per named user for 9i Enterprise Edition, and \$15,000 per processor and \$300 per named user for 9i Standard Edition for perpetual licenses; plus update subscriptions and support based on 15 percent and seven percent per year of license costs respectively for five years.

Named-user costs for production servers are based on numbers of users reported by organizations surveyed, except in one case where the number was lower than the Oracle minimum named-user level for the server platform employed. Unless these were employed as failovers to production servers, costs for development servers are based on Oracle minimum named users.

- **DB2 costs** for licenses are based on published prices of \$20,000 per processor for DB2 Enterprise Edition and \$14,500 per processor for perpetual licenses, plus 20 percent per year for update subscriptions.

Costs for 24/7 support are based on \$500 per processor per year, multiplied by the number of designated customer contacts, and costs for techline support are based on a flat rate of \$500 per processor per year. Both are totaled for a five-year period.

It is assumed that 24/7 support is provided for all production servers on all platforms, and for development servers forming part of clustered configurations; and that there are three designated contacts per organization (one per shift). Techline support is calculated for other development servers.

Personnel Costs

Personnel cost calculations are based on the numbers of FTE DBAs for Oracle and DB2 shown in figures 8 and 9.

Figure 8

Numbers of DBAs: RISC/UNIX Server Installations

Organization	A	B	C	D	E	F	G	H	I	J	K	L
FINANCIALS & HRMS USERS												
Oracle	4	6.5	4	5	4	3	2.5	2	2	2	1.5	1.5
DB2	2.5	3.5	2.5	3	2.5	2	1.5	1.5	1.5	1.5	1	1
HRMS USERS												
Oracle	5	4	4	3	3	2	2	2.5	2	2	2	2
DB2	3.5	3	3	2.5	2.5	2	2	2	2	2	2	2
FINANCIALS USERS												
Oracle	3	3	2	3	1	1	1.5	1	-	-	-	-
DB2	2	2	1.5	2	1	1	1	1	-	-	-	-
ERP USERS												
Oracle	5	4	3	3	-	-	-	-	-	-	-	-
DB2	3.5	3	2.5	2.5	-	-	-	-	-	-	-	-
UNIVERSITY USERS												
Oracle	5	4	4	4	3	3	3	2.5	2.5	2	2	2
DB2	3	2.5	2.5	2.5	2	2	2	2	2	2	2	2

Figure 9

Numbers of DBAs: Windows Server Installations

Organization	A	B	C	D	E	F	G	H
FINANCIALS & HRMS USERS								
Oracle	2	1.5	1	1	-	-	-	-
DB2	1.5	1	1	1	-	-	-	-
HRMS USERS								
Oracle	2	2	2	2	1.5	1	1	1
DB2	1.5	1.5	1.5	1.5	1	1	1	1
FINANCIALS USERS								
Oracle	1	1	1	1	-	-	-	-
DB2	1	1	1	1	-	-	-	-
UNIVERSITY USERS								
Oracle	1	1	1	1	-	-	-	-
DB2	1	1	1	1	-	-	-	-

Cost calculations are based on annual average salaries of \$89,211 for Oracle DBAs and \$82,353 for DB2 DBAs. Salaries are multiplied by 1.346 times to include benefits, bonuses, travel and related costs, and are calculated for a five-year period.

Oracle DBA salaries are 28.5 percent higher than the comparable average of \$69,398 for all DBAs in the United States as of June 2001. This corresponds to the general industry norm that Oracle DBAs are approximately 30 percent more expensive than their counterparts for other platforms, due to the higher levels of complexity involved in Oracle administration.

DB2 DBA salaries used for calculations are 8.3 percent less than for Oracle DBAs, corresponding to the industry norm that these are approximately 10 percent lower than for the latter.

DB2 Users

Survey Demographics

Organizations which were surveyed for DB2 user inputs included companies engaged in manufacturing (five), finance (four), services (three), retail (two) and transportation (two), along with communications, healthcare and insurance (one each). The population also included three state and provincial government organizations, and two universities. All were located in the United States or Canada.

Companies reported revenues for their most recent fiscal year of over \$10 billion (three), \$1 to \$10 billion (12), and under \$1 billion (four). HRMS users included five organizations with 10,000 to 50,000 employees, and seven with under 10,000 employees.

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