# Business impact and return on investment from mainframe rehosting

*A META Group Case Study White Paper*

*Commissioned by Sun Microsystems*

METAGROUP

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# Introduction

**Data Center Trends in Europe**

Over the past 20 years, the importance of the centralized IT function (e.g., the data center) has moved from being essential (in the 1970s), to secondary (the client/server distributed computing paradigm of the mid-1980s), to significant again.

Increasingly, organizations are implementing driving new applications into the data center, such as Enterprise Resource Planning (ERP) and Business Intelligence (BI), in order to eliminate process redundancy, reduce costs, and benefit from the performance and security of centralized processing environments. At the same time, consolidation strategies (involving either physical data centers, or processor or storage infrastructure), have swung the pendulum from the a decentralized IT processing environment popular through the 1990s to a more centralized model that drives a maximum of application processing into the data center.

The result of these trends is that the amount of processing capacity, as measured in MIPS, is growing at steady – some would say rampant – rates. META Group commonly observes 20% year-on-year growth in data center capacity among European organizations. In some organizations, the growth is over 40% annually.

Along with this growth come new demands being placed on data center managers by the executive suite. In prior years, their challenge was to strike the appropriate balance between centralized (data center) and local (line-of-business) processing, in order to enable the flexibility that local units required to roll out specific new applications for competitive advantage. Today, they are being asked to satisfy new requirements from the business: for Web interfaces to a growing number of host applications, for continuous application availability, for granular capacity on demand, for secure commerce chain initiatives, and for other demands that are focused on delivering technology-enabled benefits to line-of-business constituencies.

As the importance of centralized IT functions regains favor, the topology of data center will once again evolve. During the next five years, data centers will need to become logically centralized through a hub-and-spoke virtual structure, and will require managers to pursue a portfolio management approach to aligning both internal and external service providers to the delivery of value into the business. We expect more and more data centers to incorporate a physically decoupled infrastructure.

In order to respond effectively to these requirements, data center managers must find new ways of balancing the drive for data center efficiency (improving productivity, reducing cost), along with data center effectiveness (delivering strategic business benefits). META Group believes that during the next years many organizations will selectively outsource certain applications to hosting providers and outsourcers, in order to achieve cost advantages while delivering ever-higher service levels.

META Group believes optimized delivery of new data center services will be influenced by two key criteria:

1. Financial justification of IT expenditure, principally covering:
   - Software costs (averaging 35% growth annually within the data center);
   - Data management costs (driven by exponential increases in data volumes);
   - Labor costs;
   - Operational costs.

2. Maintaining a synergistic linkage of IT with business strategy through time, based on:
   - Ease of integration of data center application, data, and processing elements into enterprise or line-of-business IT initiatives;
   - Speed to develop and deploy of new strategic business applications;
   - Growing operation of the data center as a service provider 'business within a business' with responsiveness and accountability to line of business stakeholders.

Delivering on both sides of this benefit equation – both business and financial – will be a key challenge for IT managers in the coming years.

**Addressing the Challenge of Business Linkage**

In order to achieve sustained linkage with business initiatives, IT managers must move away from the predominant "closed shop" data center model where operations are planned and executed with little involvement from stakeholders (end users, line-of-business managers providing funding, senior executives). Furthermore, only about one European IT organization in seven today develops and delivers data center delivery capabilities as 'products' that must obey to strict considerations of fitness for purpose, responsiveness to changing needs, and profitability.

During the next few years, IT managers must not only become more product-oriented; they must also become more e-marketing-oriented. In this way, stakeholders become part of the planning and deployment process (their requirements are listened to, they are involved in the decision-making process, and they understand the returns on their investment). In essence, data centers must "open up" and become customer-focused.

META Group recommends that IT groups establish a performance measurement discipline as a key element in their business alignment activity. We have found balanced scorecard (BSC) techniques to be useful in establishing workable and effective metrics and measurement programs. In dialogue with IT leaders, business stakeholders formally define their requirements of the IT data center function in relation to their business objectives. A set of appropriate metrics may then be defined, such that the success or failure of IT to deliver value to the business may be measured.

Periodic communication of the IT function's performance against the agreed metrics is critical to establishing and maintaining effective IT/business alignment. An important thing to remember is the need to modify and adapt the critical IT contribution metrics as business contexts naturally evolve. META Group research shows that while over 60% of Global 2000 organizations currently employ performance measurement techniques, including balanced scorecards, only 10% of those organizations periodically update their

scorecards to reflect changes to the business, leading to measurement programs that are incapable of maintaining the critical IT/business linkage.

**Addressing the Challenge of Financial Optimization**

While the question of business linkage poses certain cultural challenges for IT managers, the need to demonstrate an operation that is optimized from a financial standpoint demands a detailed examination of the opportunities for cost reduction. This discussion takes place within an evolving context of technological, economic, and market forces.

Economically, it is clear that today's environment is challenging both for IT end-users and for vendors. After years of rising IT expenditure, as measured by IT expenditure as a percentage of turnover, or in terms of gross year-on-year budget increase, in 2001 and 2002 many IT managers found for the first time the need to make do with a smaller overall budget than the year before. Many IT managers have been caught unprepared for this, leading to a flurry of IT cost-cutting programs and the development of IT portfolio management approaches to optimizing the business 'yield' from the IT investment.

At the same time, it is equally clear that virtually no strategic development program in enterprise today – from a merger or acquisition (or de-merger!), to supplier rationalization programs or new product initiatives – can succeed without a corresponding modification – be it small or major – of the firm's underlying information systems. IT managers therefore find themselves called upon to deliver *more* capability to the business, with *less* resource to do it with.

In terms of market forces, a majority data center managers today have an installed legacy environment comprised of IBM or plug-compatible mainframe machinery, plus associated system and application software (either packages or custom developed applications). On the hardware side, managers have little room for cost control maneuvering as only one manufacturer – IBM – is still selling compatible hardware, making the data center effectively a single-platform environment. In terms of software, system and application vendors have little motivation to reduce pricing, for they know that in many ways mainframe users are 'locked in' to their solution.

At the technical level, evolution is underway on several fronts. Based on advances in hardware partitioning (also known as virtualization) techniques, workload management (WLM), and availability remedies for high-end Unix suppliers (Sun, HP, and IBM) over the past twelve months, Unix vendors have turned the corner in their pursuit of mainframe-like systems and mission-critical delivery. Although historical Unix software and hardware virtualization maturation curves have been often just "technically interesting" for mainframe operations, Unix virtualization options are now capable of delivering more credible high-end delivery capability.

Major Unix vendors now have hardware as well software critical mass, and our extrapolation of each vendor's two to three major operating software and hardware upgrades (about every 18-20 months) indicates that all three should reach near parity with z/OS (as we currently know it) in the 2005-07 time frame. Although high-end systems will tend more toward 2005, middle-range systems will have to wait until 2007 for these upgrades.

In fact, by 2005, all will provide dynamic, logical partition virtualization (e.g., not tied to hardware board boundaries à la Sun) via new operating firmware software virtualization layers. In addition, all major Unix vendors will provide fine-grain workload management, leveraging emerging fair-share processor allocation schemes that will incorporate swap data set management shortly (2002/03). Further, important goal-driven workload management extensions with application group-like aggregation (much like z/OS) will emerge within 24 months (with reasonable maturity, even by z/OS standards, by 2007).

In fact, in the next five years (from a z/OS perspective), Unix vendors will move the Unix platform forward almost 15 "z/OS years" (1990 to 2005) because little discovery work is required for expanded availability, workload management, and partitioning frameworks. Because so much has already been invented and concepts proven, for high-end Unix suppliers, it is a case of planning the work and working the plan as they replicate proven technology concepts. META Group believes that end-users pursuing a well-defined and well-executed migration to maturing Unix platforms for high-end complex legacy systems can realize 20%-40% operational cost savings in the 2005-07 timeframe.

**Cost reduction options: when, why, how**

Existing mainframe users, thus have the option of embracing zSeries technologies or moving to Unix, Linux or Windows platforms. However, as legacy applications need to be modified to include new business processes and be integrated with new applications for web services and portals, users will face the challenge of legacy application integration.

Data center managers therefore have the following options today for reducing cost and / or improving the financial and business performance of their data centers:

- **Retain** the legacy mainframe environment, along with its business-as-usual operational process, running cost, and business process linkage. This approach does not offer significant opportunities for cost reduction, but is often the only option for organizations with core business applications on the mainframe.
- **Replace** the legacy applications by a packaged software solution, when such a solution exists for the specific application required. This approach may lead to economies in terms of software maintenance costs, against which must be measured the cost of acquiring the new package and associated maintenance fees.
- **Rewrite** the legacy applications in order to consolidate applications on strategic hardware platforms (e.g. Unix, Linux, Windows). Re-writing complex applications can be time- and resource-intensive, however once complete it can afford economies in terms of reduced operating cost of the platform, relative to the mainframe.
- **Re-host** the applications on a new platform. Rehosting is a technique that enables existing mainframe applications to be rapidly ported to operate "as-is" on a Unix platform.

Sun Microsystems is a proponent of the mainframe rehosting solution, which aims at reusing clients' existing mainframe data and application code, while changing out an MVS or z/OS platform for a Sun hardware platform, theoretically delivering a lower cost

of operation, maintenance, and new application development for equivalent or near-equivalent application throughput.

Sun delivers the rehosting capability via CICS and Batch compatible program execution environments that it acquired with the 2001 acquisition of CriticalPath. These tools, which include Sun Mainframe Transaction Processing Software and Sun Mainframe Batch Manager software, operate on the Solaris operating environment. Together these tools permit data center managers to execute CICS- or Batch-based mainframe applications and data on a Solaris platform unchanged, or with only minor changes.

In late 2002, META Group was contracted by Sun Microsystems to assess Sun customers' experiences with mainframe rehosting programs. The goal of the research was to determine whether the firms' investment in new hardware, software, and associated integration and training costs is being rewarded with one-time ongoing gains in cash flow, productivity and progress toward strategic goals.

META Group conducted interviews with project leaders and operations personnel at two Sun customer sites in Italy to gather data for the analysis. Through these interviews and on-site visits, META Group identified a number of ways in which mainframe rehosting has positively impacted these customers' businesses during the three-year assessment window. These include:

- Reduced operating cost for the applications migrated;
- Ability to re-use existing code, business rules and operating procedures;
- Increased ability to integrate re-hosted applications with other business process or enterprise applications operating on Unix systems.

META Group also identified some risk factors inherent in mainframe rehosting. These include:

- Financial benefits can be maximized only if the rehosting effort allows a mainframe system to be retired, or if it allows the organization avoid committing the purchase of a new system or supplemental capacity;
- Benefits are also maximized only if the company undertaking the rehosting effort has a strategic commitment to the Unix / Solaris platform, allowing it to optimize the return on data center and operations personnel expenses.

The case studies in this paper detail the business and technical context for these Sun customers' rehosting projects, the alternatives they considered, their experiences throughout the migration process, the results they have realized, and their action plans for the future.

# Mainframe rehosting customer case: CEDCamera

**Background**

The Milan Chamber of Commerce provides business services, information, and assistance to more than 350,000 small and medium-size businesses in Milan and the surrounding area. Like many chambers of commerce in Europe, its goal is to aid the development of local commerce by serving as a clearinghouse of information linking businesses and prospective customers. Building on this central function, the Chamber also hosts meetings and conferences, organizes business courses and workshops, and provides a wide range of other services to members.

To enable the Chamber to provide members with high-quality services, the Chamber relies on the information-processing capabilities provided by CEDCamera, the Chamber's IT department. CEDCamera's goal, according to Attilio Sprela, CEDCamera's operations manager, is to provide the IT capabilities required by the Chamber efficiently and at the best possible cost.

**Critical Issues**

Leading up to the year 2000, CEDCamera had two pressing IT issues to resolve: avoiding the millennium bug, and preparing its systems for Euro compliance. In addition, the Chamber asked CEDCamera to look for ways of aggressively reducing costs in order to free up additional resources for use in member programs.

The organization's mainframe-based system, an IBM mainframe running OS/390, DL1, VSAM, and CICS, was delivering accounting, payroll, and specific database applications to the Chamber itself, as well as supporting custom-developed applications for member companies. Annual operating costs for the system were approaching one million Euros, leading CEDCamera to consider whether there were opportunities for cost reduction, and if so, how they might be realized.

CEDCamera considered several options, including outsourcing the IT operation entirely. Through Sun Microsystems CEDCamera learned of the option to re-host its core business applications off of OS/390 and onto the Sun Solaris environment.

The scope of the rehosting program would be significant, as there were over 1300 objects to migrate: 1031 online programs, and 307 batch programs. The project would also involve migrating 78 VSAM files, 787 screens, 150 batch programs, 150 JCL scripts, and 907 transactions.

CEDCamera commissioned a feasibility study from I-TER Srl., a certified Sun mainframe rehosting systems integrator in Milan. The study a showed that potentially significant cost savings were attainable, as well as measurable increases in operating efficiency compared with continuing operations on the mainframe, the Chamber and CEDCamera decided to pursue the Sun mainframe rehosting solution.

The key elements in making the mainframe rehosting solution viable were the Sun Mainframe Transaction Processing software and the Sun Mainframe Batch Manager software, which allow transaction-based applications written for CICS and Batch processes to execute natively on the Solaris operating environment with only minimal changes. They permitted CEDCamera to retain core business applications, rules, and operating procedures, incurring only minor one-time migration costs for the migration, while at the same time essentially swapping the mainframe environment for a Sun Fire server, so realizing significant ongoing savings in operating costs.

"We made the right decision," said Sprela. "We found our operating expenses were reduced by 70 percent on an annual basis, which translates to savings of 665.000 Euros every year.

"At the same time, the new environment also offers us improvement in run-time performance of about 20% compared with the previous environment. Plus, we have high availability, flexibility, and a growth path for the future.

"With these savings, we can invest more in developing new services for our members."


**Bottom Line**

CEDCamera's primary objective in pursuing the mainframe rehosting was to realize significant cost savings while minimizing its exposure to risk from changes in IT-related business or operational processes. The mainframe rehosting project delivered against these objectives. The mainframe-to-server migration process followed the pre-project plan and budget with no major divergences or "surprises." The result therefore corresponds in large measure with the objectives originally set out by CEDCamera.

For the future, CEDCamera expects to derive other advantages from having pursued the rehosting option. Among these is the operational advantage of the wider availability of Unix operations personnel is another valued benefit of the IT migration program for CEDCamera, allowing it to pull on a growing pool of labor to meet its changing needs.

At a business level, CEDCamera expects to leverage the increased flexibility of the Unix-based system to allow it to evolve more rapidly to meet the changing needs of the Milan Chamber of Commerce, which continues to grow and add new members and services.

# Mainframe Rehosting Cost and Business Impact Map

META Group analysis, CEDCamera rehosting case, June 2003

| Strategic Drivers | Improvement Levels | | |
|---|---|---|---|
| | Overall | Cost Savings | Business Advantage |
| Hardware | + | ++ | + |
| Software | ++ | +++ | +++ |
| Application Development | + | + | + |
| Disaster Recovery & Data Security | - | + | - |
| Operations | + | + | + |
| Personnel | + | + | - |
| Facilities | +++ | +++ | +++ |

| Operational Drivers | Cost & Business Overall Improvements |
|---|---|
| Asset/contract management (people + processes) | + |
| Middleware Support | + |
| Applications Support | + |
| Server Utilization | +++ |
| Service Availability | - |
| Quality of Service Delivery | + |
| People Efficiency | - |
| Hardware Maintenance | +++ |
| Hardware Leases | +++ |
| Hardware Amortization | + |
| Hardware Upgrade | + |
| Storage hardware | - |
| Network hardware | - |
| Software License | + |
| Software Maintenance | +++ |
| Software Upgrade | +++ |
| Cost of testing | + |
| Cost of Business Continuity / Disaster Recovery Contract | - |
| Consulting Costs | - |
| Services Costs | - |
| Staff Costs | + |
| Admin/ Operators costs | + |
| Technical Engineering Costs | - |
| Facilities Power | +++ |
| Facilities Floor Space | +++ |
| Labor hours for SINGLE server environment RESET | + |
| Labor hours for SINGLE server environment REBUILD | + |
| Labor hours for ENTIRE server environment REBUILD | + |
| Labor to provision customer servers | - |
| Labor hours on backups, security and maintenance | - |
| Planned and unplanned hours downtime per month | - |

### Color Coding Scale

| From value | To value | Color |
|---|---|---|
| 0% | 10% | - |
| 11% | 35% | + |
| 36% | 50% | ++ |
| 51% | 100% | +++ |

# Mainframe rehosting customer case: Europ Assistance

**Background**

Active in 208 countries and territories around the world, Europ Assistance delivers insurance and assistance services to household and business customers through a global network of over 16,000 service partners, including providers of medical, roadside assistance, and even home-based assistance services.

In 2001, the Europ Assistance network handled over 33 million customer calls, resulting in some 6.5 million actual service calls – about one every 5 seconds. Customers interact with Europ Assistance through a network of toll-free help numbers, which connect them with Europ Assistance agents located in 34 call-centers worldwide, 24 hours per day.

In Italy, Europ Assistance supports not only local direct customers, but also a business-to-business relationship whereby Europ Assistance operates assistance centers for Fiat as a solution center for owners of Fiat automobiles. The call- and data-center platforms in Italy support front-office, back-office, proprietary insurance applications, and sales support applications.

**Critical Issues**

In the course of reviewing its IT budget in 2000, Europ Assistance Italy realized it had a significant challenge to resolve. Europ Assistance business management was increasing its demands for new projects that could increase the firm's efficiency, profitability, and competitiveness in the marketplace. At the same time, there was no opportunity to secure additional budget for funding these initiatives.

Europ Assistance's legacy environment, composed of proprietary software applications operating in an OS/390 mainframe environment, was not particularly fit for this requirement to "do more with less." Ongoing hardware operating costs and hardware and software maintenance fees were high. And Europ Assistance had little chance of negotiating a reduction in these costs; on the contrary, the likelihood was for these costs to nearly double over the coming five years, based on the fact that its growing business volume would require it plan for regular upgrades to the legacy hardware and software environments.

The challenge for Europ Assistance, then, came in four parts:

1. to achieve a significant reduction in the cost of providing the required levels of service to the current set of applications, so freeing up budget to allocate to new strategic projects for the business;
2. to guarantee Europ Assistance's ability to deliver the processing volumes required for the firm's expected future business growth;
3. to retain control of Europ Assistance's IT platform, which was seen as a strategic asset for the firm in Italy and worldwide; and
4. to retain the firm's investment in proprietary application programs.

## Decision Factors

In order to meet these goals, Europ Assistance considered two options: upgrading the existing environment; or rehosting some applications off of the mainframe environment and onto a high-end Unix platform.

Upgrading had the advantage of leveraging the in-place skill sets and operating processes built from the ground up over many years. However, it had the disadvantage of being relatively expensive, not only in one-time upgrade costs, but also in continuing the high ongoing maintenance cost. At a business level, the mainframe also had a limited ability to respond to requirements to rapidly develop new strategic applications.

The rehosting option, by contrast, presented a relatively smaller one-time investment, while retaining or improving the current service levels. Europ Assistance also saw how rehosting would eventually reduce its ongoing operating costs in the medium term. The rehosting option would also allow Europ Assistance to develop its capabilities in the domain of open systems, which it saw as attractive at both an economic and at a business level.

On the other hand, rehosting would have a significant impact on the in-house data processing operating environment that Europ Assistance had developed over many years. Its in-house staff's skills in operating the legacy platform would no longer be an advantage, and management processes would need to be revised.

In the end, the decision was made adopt a mainframe rehosting solution proposed by Sun Microsystems. Key factors in Europ Assistance's decision included the financial cost/benefit analysis, which was compelling, and the opportunities of re-orienting the data center around an open-systems approach.

## Costs and benefits

The environment to be migrated in Milan was comprised of Europ Assistance's test and production mainframes with OS/390, DB2 and VSAM databases, the CICS transaction monitor, and application programs written in Assembler, Cobol, and Telon (a Cobol application generator). Altogether, over 4000 on-line programs, 2800 Batch programs, and over 3800 JCL scripts would need to be migrated. For the initial feasibility study and subsequent migration and integration work, Europ Assistance worked with a team of experts from Sun Microsystems Italy and I-TER, a certified Sun mainframe rehosting partner in Milan.

As the feasibility study progressed, a number of things became evident to the migration project team. First, the use of the Sun Mainframe Transaction Processing software would handle the majority of the on-line program environment with minimal requirements to change the program code. This part of the migration plan posed no special problems.

On the other hand, the programs written in Assembler would need to be re-written in order to function in the new Solaris operating environment. Further, Europ Assistance chose to convert its DB2 database to Oracle. All in all, the supplemental conversions involved 5 programmers over 48 weeks, with the result that the time required to recover the project investment, originally estimated at 24 months, moved out to 30 months.

**Bottom Line**

The timeline on Europ Assistance's mainframe rehosting project encompassed two years. Requirements analysis began in November 2000; the decision to go ahead was made in February 2002; and cut-over of the new system and retirement of the legacy mainframe in November 2002. Europ Assistance now estimates the net financial benefit to the firm after investment costs are recovered will amount to some 400.000 Euros per year. This is due not only to the reduced operating and maintenance cost of the Sun server environment vs. the legacy mainframe, but also to a reduced need to hire external project-based IT contractors. The firm's objective to achieve significant cost reductions in its data center is therefore in view.

The other principal objective for Europ Assistance was to transform its data center to an open-systems environment and so enable a number of business- and IT-oriented advantages. After six months of experience, Europ Assistance perceives the following types of changes:

- Shorter decision times for major IT changes;
- Increased involvement of business process managers in decisions regarding IT processes, which reduces turnaround time for new projects by about half;
- A more fluid environment for establishing consensus concerning decisions that are not strictly quantifiable;
- Faster ramp-up time on new applications, reducing the time required for roll-out of new applications to about one week vs. as much as 6 to 8 weeks.

# Mainframe Rehosting Cost and Business Impact Map

META Group analysis, Europ Assistance rehosting case, June 2003

## Strategic Drivers — Improvement Levels

| Strategic Drivers | Overall | | | Cost Savings | | | Business Advantage | | |
|---|---|---|---|---|---|---|---|---|---|
| Hardware | | ++ | | | | +++ | | | +++ |
| Software | | ++ | | | | +++ | | | +++ |
| Application Development | | | +++ | | | +++ | | | +++ |
| Disaster Recovery & Data Security | + | | | | | +++ | - | | |
| Operations | + | | | | + | | | | +++ |
| Personnel | - | | | | + | | - | | |
| Facilities | | | +++ | | | +++ | | | +++ |

## Operational Drivers

| Operational Drivers | Cost & Business Overall Improvements | | |
|---|---|---|---|
| Asset/contract management (people + processes) | | + | |
| Middleware Support | | + | |
| Applications Support | | | +++ |
| Server Utilization | | + | |
| Service Availability | - | | |
| Quality of Service Delivery | | + | |
| People Efficiency | - | | |
| Hardware Maintenance | | | +++ |
| Hardware Leases | | | +++ |
| Hardware Amortization | | | +++ |
| Hardware Upgrade | | | +++ |
| Storage hardware | | + | |
| Network hardware | - | | |
| Software License | | + | |
| Software Maintenance | | | +++ |
| Software Upgrade | | | +++ |
| Cost of testing | | | +++ |
| Cost of Business Continuity / Disaster Recovery Contract | - | | |
| Consulting Costs | - | | |
| Services Costs | | + | |
| Staff Costs | - | | |
| Admin/ Operators costs | - | | |
| Technical Engineering Costs | | + | |
| Facilities Power | | | +++ |
| Facilities Floor Space | | | +++ |
| Labor hours for SINGLE server environment RESET | | | +++ |
| Labor hours for SINGLE server environment REBUILD | | | +++ |
| Labor hours for ENTIRE server environment REBUILD | | | +++ |
| Labor to provision customer servers | | + | |
| Labor hours on backups, security and maintenance | | + | |
| Planned and unplanned hours downtime per month | - | | |

## Color Coding Scale

| From value | To value | Color |
|---|---|---|
| 0% | 10% | - |
| 11% | 35% | + |
| 36% | 50% | ++ |
| 51% | 100% | +++ |

## Mainframe Rehosting Business Impact Summary

The two mainframe rehosting customer cases analyzed by META Group show that in certain cases, organizations can realize significant cost savings from rehosting mainframe applications onto new hardware platforms using tools and techniques such as those proposed by Sun. The cost savings stem mainly from the reduced operating costs of the server hardware environment as compared with legacy mainframe platforms.

In the two customer cases observed, the existence of automated porting and conversion tools enabled the organizations to re-use existing code and job flow control and scheduling processes after migration. Without these tools the advantages of rehosting would be much more difficult to achieve. In both customer cases, the migration tools used were easily employed and played a major factor in reducing the migration timetable.

Organizations considering rehosting should consider to what extent they wish to make a "one-to-one" conversion of the legacy environment into a high-end Unix server environment. The cost savings from rehosting will be higher for these "one-to-one" conversion projects than for projects that combine rehosting with the deployment of a new architecture. And if the target architecture is different in all aspects from the existing one, there may be small or even negative cost advantages in moving to the new platform.

To summarize, the bottom-line advantages we observed for these customer cases are:

- The high reuse of Cobol code – ranging in the area of 90 % of in-service code – as well as JCL and batch procedures, allowing the migration to occur without necessitating workflow changes;
- Reduced operating cost of the Sun / Solaris operating environments, compared with the legacy platforms allowing short cost recovery window and significant ongoing operating cost reduction;
- To differing degrees, business benefits in terms of increased agility, flexibility, and/or responsiveness of the IT function to meet organizations' evolving needs.

# Appendix: META Group model for ROI and Business Value assessment

META Group clients in Europe today often ask for advice concerning the return on investment (ROI) that they can achieve from technology investments. In the course of our ongoing data center technology migration and cost reduction engagements, META Group has developed an assessment methodology includes that includes measurement of all hardware, software, maintenance, and labor costs, including both start-up and annualized ongoing costs over the expected lifetime of a platform environment.

Fixed and variable direct costs – reduced hardware requirements, reduced operation costs, software cost reductions, etc. – are the 'known quantities' in these calculations. It is more difficult to assess the intangible benefits: increased business flexibility, rationalization of skill bases on a smaller number of strategic platforms or software environments; availability of labor for development or application maintenance; tool usability, and so forth.

However, even though intangible elements are difficult to measure, they must nonetheless be integrated into an organization's assessment of a technology program ROI. In META Group's assessment method, qualitative, intangible value drivers play the role of "mitigating factors," reflecting the business value attributed to the numerical metrics through subjective and individual evaluations revealed through a series of question-and-answer sessions with IT staff and business sponsors.

Like more traditional ROI evaluation models, the foundation framework of the META Group methodology sits on quantitative drivers that must be framed along taxonomy groups to reflect a specific organization's categorizations. The numerical values must gauge the percent impact of each driver against two major sources of business benefits:

- Cost reduction
- Business advantage

After providing an initial mapping of the quantitative drivers against cost reduction and business advantage, the META Group model "filters" the numerical outcomes through a second set of drivers, this time of more qualitative (i.e., soft, intangible) nature, for which the user must provide subjective and personal opinion rankings (i.e., strongly agree, partially agree, disagree, strongly disagree).

The quantitative values in our model derive from industry best practices as observed by META Group and from experience in having conducted dozens of prior assessments. Although it may appear that this approach is not "objective" in the strictest sense, our experience shows that the real value achieved from such assessments does not lie in their ability to generate exact theoretical ROI values and numbers, but rather in the capacity they have to catalyze the discussion around topics and subjects usually left aside by traditional ROI models, and so generate focus on critical results of good IT/business linkage. Enterprise readiness for the rollout of new strategic applications; users' flexibility to follow business processes designed around the solutions; improved process quality delivery, are but a few examples of such items commonly "left aside" in ROI analyses.

We observe that models that focus on pure reduced spending, rather than on accrued benefits, do not provide a means for working together with the user. Our continuous interaction with end users confirms that the real and demonstrated benefits derive when the models are capable of providing interaction and discussion points during the collection of the model input values, making the outputs reflect the real user's needs and concerns.

As a result, META Group believes that by 2003/ 05, organizations will be forced to adopt a "quantitative + qualitative" methodology for assessing their hardware and application portfolios, in order to enable meaningful dialogue and results-based reporting to business sponsors relative to the financial and strategic contribution of IT.