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Justifying the Cost of the Mainframe and Increasing the Business Value of the Data Center

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Executive Summary

Consider this scenario. A fleet manager of a large enterprise is under pressure from senior management to reduce costs. He decides to cut costs by replacing his large, semi-trailer rigs with less-expensive smaller trucks. Bad decision. The big rigs were designed specifically to handle extremely large loads and to reliably haul these loads over long distances. The smaller trucks are just not up to the task. They can't match the unique capabilities of the big rigs. What's more, the manager now has far more trucks to manage and maintain, and dispatching has become a nightmare because it requires synchronization of several smaller trucks to carry the load that one big rig would have carried. Deliveries are suffering and customers are complaining.

What does this have to do with IT? Some IT managers who are under pressure to cut costs are making a similar mistake. They are considering moving mature and stable applications and databases off mainframes and onto smaller machines. The results of those who have actually attempted the move are not encouraging. Many have abandoned the projects after long and costly efforts because they simply could not get them to work. Others have achieved the migration, but have suffered in performance or reliability.

If you are considering moving applications or databases off the mainframe, keep in mind the plight of the fleet manager. In addition to cost, it is important to consider the value of the business services supported by the applications or databases, and whether that value is increased or decreased by moving to other seemingly less-costly platforms. When weighing cost against value, you'll find that the mainframe is the optimum platform for certain applications and databases.

Business Service Management (BSM) is the most effective approach for managing IT from a business perspective. Solutions are available that combine to create a BSM approach that can help you strike the optimum balance between cost and value. BSM automates the management of technology and IT process workflow to drive down cost and lower business risk. BSM is based on a shared view, across all IT, of how IT resources directly support the business. A well-architected BSM approach supports best practices, such as the IT Infrastructure Library (ITIL®) and Control Objectives for Information and related Technology (COBIT).

BSM can help you justify the cost of keeping certain applications and databases on the mainframe by showing the mainframe's superior value in delivering the associated services. It also can help you increase the value of your mainframes, as well as that of your other data center resources, by aligning them more closely with the business.

This paper:

- > Discusses the balancing of cost versus value to determine the optimum matching of applications and databases to platforms
- > Describes the concept and the importance of "right-platforming" the data center
- > Discusses how a BSM approach can help in right-platforming and in managing the resulting right-platformed data center
- > Describes the business benefits

Cost Versus Value

In responding to pressure to reduce costs, you may have set out to “optimize” your data center. This typically involves looking at the applications and databases on each server and determining whether they can be deployed more cost-effectively by consolidating them on a lower-cost platform, or moving them to other types of platforms altogether.

In making re-platforming decisions, you certainly need to take into account the cost of operating the applications and databases on both the source and the potential target platforms. But cost is only part of the equation. You also have to balance cost against the value of the services that the resources deliver to the business, with the goal of delivering the highest value at the lowest cost.

Understanding Business Value

Over the years, technology advances have enabled IT to increase its value to the business significantly, especially by fostering business innovation. Consider the impact of the personal computer and the Internet on business.

A main thrust of IT strategy today is to continue this tradition of increasing the business value of IT. This worthy goal is strongly supported by ITIL. A central theme of ITIL V2 is to *align* IT with the business. ITIL V3 takes this business orientation even further to *integration* of IT with the business. A mantra of ITIL V3 is that what IT does should be done in the context of its contribution to business value.

In making data center reconfiguration decisions, therefore, you need to consider the value of the resources to the business as well as their costs. To determine the business value of a resource, it is essential to understand two factors. First, you need to know which business services, and hence which business processes, that resource supports. Second, you need to know the business criticality of those services as measured by the impact on the business of performance degradation or temporary loss of those services.

A server that supports online stock trading, for example, is of higher value to the business than a server that supports online access of employee benefits information. Performance degradation or temporary loss of the online stock trading service can have a catastrophic impact on the business, including heavy financial loss and substantial negative impact on company image. The impact of a similar degradation or loss on the employee benefits information system has less impact.

The business value of a resource is underpinned by such factors as the inherent capacity, availability, and performance of that resource. For example, the mainframe’s ability to handle extremely large databases and huge transaction volumes — and do it with unmatched reliability, availability, and serviceability — is crucial in many business-critical applications. It is essential, therefore, to include these factors when assessing the business value of the mainframe and justifying its cost.

Different Values for Different Industries

Value assessment differs depending on the industry. For example, in a mutual fund company, data is the core of the business. As these companies describe it, “Data is our business.” The databases are enormous and include such vital information as customer account balances, securities costs, and net asset values. Up-to-the-minute accuracy and immediate availability of this data is crucial. Even a small system hiccup could be catastrophic. So a company in the mutual funds business places high value on the ability to handle huge data volumes with “always there” availability. That’s why mutual fund companies have typically maintained their databases on mainframes, justifying the cost of the mainframe by its high value to the business.

As another example, consider a large international bank. Here, the back-office customer account system has to journal literally millions of transactions that come in from a variety of sources, including teller terminals, ATMs, electronic transfer, and online banking Web sites. It’s essential to ensure that each and every transaction is accounted for and completed accurately. What’s more, it’s imperative to back up transaction information to protect it from loss. Inaccurately processed transactions, missed transactions, or transactions lost due to some form of failure could have serious consequences. Again, the mainframe may be the only platform that is up to the task.

The Pitfalls of Cost-Only Analysis

Making optimization decisions based solely on cost is short-sighted and could result in exposing the organization to considerable business risk. In an attempt to lower cost, some organizations have opted to move mature, stable applications or databases off the mainframe onto other platforms because of the apparently lower costs of these other platforms.

Some of these projects have failed outright because the other platforms could not match the unique and powerful

capabilities of the mainframe. For example, a major retailer attempted to move a large mainframe DB2® database to Wintel servers. After spending a substantial amount of time and money, the IT staff was able to move the application and have it work, but the staff discovered that the recovery time for the application was completely unacceptable. As a result, the project was abandoned. As this example illustrates, migration off the mainframe can result in exposure to considerable risk.

Even if the migration off the mainframe is successful, there could be other risks. The quality of service may suffer, such as performance slowdown below acceptable levels. What's more, these migrations are usually very costly because moving a very large, stable and mature application or database off the mainframe requires a non-trivial effort that may involve expensive consulting engagements. The significant amount of money spent may take a long time to recoup. Moreover, the time and money spent could have been used in other ways to deliver greater business value, such as by advancing the state of the application or developing a new application.

Consequently, when considering moving mature, stable applications or databases off the mainframe to other platforms, be sure to factor in the high costs of migration, exposure to non-obvious risk, and the potential for outright failure.

Right-Platforming Versus Lowest-Cost Platforming

It is essential to strive for right-platforming rather than looking only to lower costs. Right-platforming means selecting the optimum platform for each job, and that's not always the lowest cost platform. The right platform must have the required processing and storage capacity to support the business services. It must deliver those services at the required levels of reliability, availability, serviceability, and performance. In addition, the platform must have sufficient scalability to meet expected future requirements. In general, the more mission critical the application, the more important the unique characteristics of the mainframe become.

Of course there are many jobs best suited to platforms other than mainframes. You should consider each application or application component individually. In applying the cost/value criterion to a multi-tiered application, for example, the Web-based user interface may be best suited to a Wintel platform, the middle-tier application server may be best suited to a UNIX platform, and the database may be best suited to a mainframe.

The Unique Strengths of the Mainframe

The mainframe has several unique strengths that make it the right platform for certain jobs. These include:

- > **Unmatched capacity.** Its exceptional processing and storage capacity enable the mainframe to handle massive databases and huge transaction volumes.
- > **Highest level of Reliability, Availability, and Services (RAS).** Superior RAS features include the ability to install and update software on the mainframe without rebooting or otherwise interrupting operation.
- > **Unparalleled business continuity.** Mainframes have extremely high fault tolerance and highly advanced backup and recovery capabilities that permit these platforms to continue operation in the event of a failure or even a catastrophe in the data center — without missing a single transaction.
- > **Highly resilient software set.** The mainframe software operating environment is highly resilient to misbehaving applications.

Advanced Mainframe Features

The mainframe has a number of advanced features that support its unique strengths. These include highly evolved virtualization and clustering.

Logical Partitioning (LPAR)

Virtualization technology originated and is more highly evolved in the mainframe than in other platforms. LPAR permits a single physical mainframe to host multiple mainframe images, with each image appearing as a separate operating environment. LPAR permits you to deliver a wider, more fault-tolerant variety of services without increasing the number of mainframes in the data center.

Clustering

Clustering technology also originated and is more highly evolved in the mainframe than in other platforms. Parallel Sysplex permits the integration of multiple, co-located physical mainframes into a cluster, with the cluster appearing as a single system image that is managed from a single point. Clustering permits failover to prevent service loss in the event of a system failure, and it permits dynamic load balancing to maintain fast performance, even under extremely heavy workloads.

Geographically Dispersed Parallel Sysplex (GDPS)

GDPS extends the capabilities of Parallel Sysplex with the ability to integrate geographically dispersed physical mainframes into a cluster. Because the mainframes in the cluster are geographically dispersed, GDPS permits business continuity without missing a beat, even if a disaster such as a fire or flood takes out an entire data center.

The Evolving Role of the Mainframe

The mainframe role has evolved from the stand-alone computer, isolated in the data processing center, to an integral and core component of the organization's distributed IT infrastructure. In many organizations today, the mainframe is employed as a uniquely robust and powerful server in multi-tiered business applications.

The mainframe role is continuing to evolve. For example, mainframe software developers are enabling mainframe software components as Web services in a service-oriented architecture environment. Web service enablement permits you to tap the power and stability of legacy systems, such as CICS and IMS, in new service oriented architecture (SOA) applications.

What About Mainframe Management Skills?

There has been a perception in the industry during the last decade that the pool of people with mainframe-related technical skills is drying up. Two factors have combined to dispel this fear.

First, the "death of the mainframe" myth has evaporated and a mainframe career is no longer considered a dead end. As a result, more people are now opting for careers in the mainframe arena. The mainframe industry is nurturing this revitalized interest with new training offerings in a variety of mainframe-related subjects.

Second, mainframe management tools have advanced significantly. These tools now automate many tasks, making the mainframe easier to manage and administer. In addition, self-diagnosis capabilities that simplify problem resolution have been developed. These advanced tools reduce the need for highly specialized skills. They also boost the productivity of the mainframe operations staff, so you can take on more mainframe applications and databases in the data center without hiring additional people.

The Role of BSM

There are two aspects to creating a more cost-effective data center. First, you have to optimize the data center itself by evaluating platform assignment using a cost/value analysis and making any necessary migrations of applications and databases to other, more cost-effective platforms. Then, you have to optimize management of the data center to derive maximum business value from the optimized resources.

Today, you can adopt a Business Service Management approach that provides solutions that can help you with both aspects. Look for BSM solutions that encompass

the mainframe as well as other platforms in an integrated fashion. Only in this way can you gain insight across all your data center platforms to enable you to optimize the use of each one and to use them in combination, such as in multi-tiered and service-oriented application architectures.

Optimizing Data Center Resources

Data center optimization involves the following steps:

- > **Establish a baseline.** Determine exactly what resources you have in the data center, their current workload profiles, and their total costs of ownership.
- > **Assess the business value of the resources.** Determine the business services supported by each resource and assess the value of the resource in delivering the services.
- > **Reconfigure resources to lower costs while maximizing business value.** Consolidate workloads and deploy them to the most cost-effective platforms. (This may involve moving applications and data to different platforms if that move increases the value of the associated services.)

An approach based on well-architected BSM solutions can help you right-platform through three major capabilities:

- > Comprehensive resource monitoring
- > Mapping of the relationships among the IT resources and the business services and processes that the resources support
- > Sophisticated analysis and modeling

Monitoring

BSM solutions provide extensive monitoring that encompasses physical and virtual machines running on all platform types, including mainframes. In-depth performance monitoring and reporting enable you to assess the current workload situation and establish a baseline for your current data center configuration. This requires BSM solutions that can monitor overall physical server performance and capacity as well as the performance of the virtual machines running on physical server hosts.

Mapping

A comprehensive BSM solution portfolio includes a business impact solution that indicates the relationships between IT resources and the business services and processes that the resources support, so you know which resources support which business services. You can then work with business managers to determine the business criticality of the delivered services. Knowing which business services a resource supports and the business criticality of those services, you can then assess the value of the resource, and that information is essential to right-platforming.

Analysis and Modeling

The challenge is to determine the right mix of applications and databases to run on each physical resource to maximize resource utilization while meeting or exceeding agreed-upon service levels. Sophisticated statistical analysis and modeling solutions are available that enable you to analyze workloads and develop an understanding of the complex relationships among usage level, resource utilization, and response times. Modeling complements performance analysis, enabling you to test-drive various consolidation/virtualization configurations risk free, before you migrate them into production.

Transitioning to Business-Centric Management

Perhaps the most important factor in deriving value from your optimized data center is transitioning from a technically oriented, platform-based, and siloed management approach to a horizontal, business-oriented approach. BSM solutions provide a number of important features that can facilitate this transition.

With respect to mainframe management, a comprehensive BSM solution portfolio provides two important capabilities that permit you to leverage the unique capabilities of the mainframe to deliver maximum business value:

- > It supports individual management and instrumentation of the mainframe with such features as:
 - Comprehensive monitoring and alert management that encompasses OS partitions, CICS, DB2, and IMS
 - Event management
 - DB2 and IMS management and optimization
 - Batch environment management and control
 - Business-oriented capacity planning
- > It weaves the mainframe into the fabric of the IT infrastructure and seamlessly integrates management of the mainframe into the overall management fabric of the distributed data center environment.

Look for BSM solutions that provide a unified, holistic view of the IT infrastructure that includes all platform types and that can be shared by all stakeholders. This view should depict the relationships between IT resources and the business services and processes that the resources support.

The solutions should provide a process-oriented approach that is based on best-practice IT processes, such as those outlined in the ITIL guidelines. They should automate, wherever possible, processes that the IT staff has previously had to perform manually. Automation provides guidance to the staff in making the transition to a process-oriented approach, and it increases staff productivity. It's also important that the BSM solutions provide process integration and data sharing across all application tiers (including those running

on mainframes), and across all IT functions (including incident, problem, change, release, configuration, and asset management).

Finally, an effective BSM approach includes a comprehensive, integrated identity management solution that not only simplifies user account management across all platforms, but also permits the other solutions in the BSM environment to share identity data and leverage that data to increase business value.

With the right BSM approach, you can manage the data center as a unified whole, across all platform types — Windows, UNIX, Linux, and mainframes. This maximizes the efficiency of IT staff and permits you to realize maximum value from all your data center resources, including mainframes.

Reaping the Benefits

By leveraging BSM solutions to right-platform and manage your data center, you can avoid the costly mistakes of the fleet manager and not only justify the cost but also maximize the value of your mainframes to the business. In the process, you'll also drive up the value of the other resources in your data center. The business benefits are compelling and include improved service quality, increased staff productivity, faster problem resolution, reduced service desk workload, and improved compliance position.

Improved Service Quality

BSM solutions implement and enforce best-practice processes through automation, embedding business process knowledge into the management system rather than isolating it in people's heads. For example, the change management solution embeds best practice change processes that reduce the risk of outages due to failed changes.

A comprehensive BSM solution foundation also can improve service quality by enabling proactive incident and problem management. Typically, most problems are reported by users, meaning that service degradation has already occurred. The monitoring component could automatically generate an incident ticket to the service desk component when an issue is detected, such as when an SLA is in danger of being missed. This timely action permits the service desk personnel to address the issue proactively, before it results in service degradation.

Faster Problem Resolution

A well-architected BSM solution foundation can automatically discover and display the physical and logical relationships among the components of the IT infrastructure. As a result,

the IT staff no longer has to diagnose problems in isolation. What's more, the BSM solutions consolidate problem data from multiple tiers and attach this information to the incident tickets they automatically generate. With the insight gained from this rich problem information, the IT staff can resolve problems more quickly.

Reduced Service Desk Workload

The IT staff can leverage user identity information maintained in the environment to determine, in advance, who will be impacted by a planned action. With this information, the staff can proactively notify affected users, thereby eliminating calls to the service desk. For example, in the past, when the operations team performed a scheduled DB2 maintenance operation that required taking the DB2 data base off line, it could stir up a flood of calls to the service desk, even though it was a scheduled operation. By knowing which users will be affected by the DB2 operation, the team can notify them in advance of the planned operation and eliminate most of these calls. In addition, the team can notify the users when the database is back on line.

Enhanced Compliance Position

By implementing and automating best-practice processes, you put in place the controls necessary to achieve regulatory compliance. What's more, the ability to integrate user identity data into your environment enables you to ensure the privacy of sensitive information as mandated by government regulations, such as Sarbanes-Oxley, HIPAA, and Basel II. In addition, a comprehensive BSM approach provides extensive auditing and reporting capabilities to demonstrate compliance to auditors.

A Real-World Example

Bell Aliant is one of North America's largest regional communications providers. Their 10,000 employees serve over 5.3 million customers in six Canadian provinces with innovative information, communication and technology services including voice, data, Internet, video, and value-added business solutions. Through its xwave offices, Bell Aliant also provides IT professional services in Canada and the US.

The mainframe is key to Bell Aliant's business in that it is the core platform for many of the company's business-critical applications, including customer order processing, rating, and billing. The Bell Aliant IT staff has performed extensive analysis on these applications to ensure that they are being run on the right platform. That analysis has validated the wisdom of keeping its core applications on the mainframe.

The Bell Aliant IT staff is committed to delivering significant business value to the company by supporting market differentiation through outstanding service management. The staff is well aware that effective service management provides the foundation for high quality customer service that is essential for lasting customer relationships and strong business growth.

To ensure effective service management, Bell Aliant has been following a BSM approach based on the ITIL guidelines and focusing on service support and delivery. Two key factors have contributed to the success of the implementation. First, is the ability of the BSM solutions in the environment to seamlessly integrate the mainframe into the overall management framework. This gives a holistic view of the IT infrastructure, facilitating problem identification and resolution. The second, and most important factor, is the ability of the BSM solutions to map the relationships between the infrastructure components, including mainframes, and the supported business services and processes. This permits support teams to monitor, manage, and report service performance and availability from a business perspective, categorizing and prioritizing actions based on their business impact.

Supported by the BSM solutions, the IT staff can operate much more efficiently and effectively in minimizing the impact of problematic events on services, and that means higher quality service and greater customer satisfaction.

Conclusion

Whether you are managing a fleet of vehicles or a data center, it's important to keep in mind that each vehicle or data center platform has unique strengths that make it the optimum choice for certain jobs. Simply transferring jobs en masse to lower cost platforms isn't the best formula for success. You need to balance cost with business value.

That's where Business Service Management comes in. With BSM, you can right-platform your data center. When you do, you'll find that the mainframe is irreplaceable when it comes to certain applications and databases, and you can readily justify its cost.

That's not all. With an effective BSM approach in place, you can transition to a business-oriented approach to managing your data center. By doing so, you'll increase the business value of your mainframes, as well as that of the other platforms in your data center. Moreover, you can demonstrate that value to your senior management in response to the pressure to reduce costs.



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About BMC Software

BMC Software delivers the solutions IT needs to increase business value through better management of technology and IT processes. Our industry-leading Business Service Management solutions help you reduce cost, lower risk of business disruption, and benefit from an IT infrastructure built to support business growth and flexibility. Only BMC provides best-practice IT processes, automated technology management, and award-winning BMC Atrium technologies that offer a shared view into how IT services support business priorities. Known for enterprise solutions that span mainframe, distributed systems, and end-user devices, BMC also delivers solutions that address the unique challenges of the mid-sized business. Founded in 1980, BMC has offices worldwide and fiscal 2007 revenues of \$1.58 billion. Activate your business with the power of IT. www.bmc.com.

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