RE-PLATFORMING SAP® ON VMWARE AND EMC STORAGE PRODUCES SUPERIOR RESULTS FOR CALLAWAY GOLF COMPANY
**INTRODUCTION**

Ely Callaway, founder of Callaway Golf, referred to his unique business model as “Demonstrably Superior and Pleasingly Different,” a model that has permeated every aspect of the business, including information technology (IT). Callaway Golf is no ordinary manufacturer of sporting goods equipment. Through an unwavering commitment to innovation, Callaway Golf Company (NYSE: ELY) creates products and services designed to make every golfer a better golfer. Callaway Golf Company manufactures and sells golf clubs and golf balls, and sells golf accessories under the Callaway Golf®, Odyssey®, Top-Flite®, Ben Hogan®, and uPro™ brands in more than 110 countries worldwide. With 2008 net sales of $1.117 billion, which was the second highest sales level in the Company’s history, and gross profit of $486.8 million, Callaway Golf has proven that innovation can also be profitable.

**BASELINE STATE: SAP ORGANIC GROWTH IS OUTPACING IT RESOURCES**

About two years ago, Callaway Golf embarked on a large number of initiatives to expand its SAP® Enterprise Resource Planning (ERP) application portfolio. Embracing SAP best practices, Callaway Golf’s IT department managed three distinct platform landscapes for each of their deployed SAP ERP applications. SAP: AP, FICO, MM, PP, SRM, APO, EP, and BW each required their own development, test, and production hardware and software landscapes. Each landscape was architected to be a multi-tiered platform including a database tier and application tier as well as auxiliary systems for application development and a systems administration console. The architecture was ideally suited for virtualization—across landscapes, applications, and tiers.

It was becoming increasingly clear that the IT staff would need to procure a large number of servers and re-examine their SAP Basis & SAP NetWeaver® technical center of excellence (TCOE) administrative staffing, as well as their functional center of excellence (FCOE) SAP ABAP, Java, C++, C* applications configuration, development, and report-writing staff to address the new workload. SAP Business Process Architects (BPAs) and internal level 1, 2, and 3 technical and functional support staffs would also be impacted by the proposed organic growth of the SAP ERP application.

From a standardization and consolidation point of view, Callaway Golf’s IT department did all it could to drive economics of scale out of existing operating architectures and systems. Callaway Golf standardized on SAP as its core ERP application and SAP Process Integration (PI) for other production applications interfaced with SAP as the system of record. Additionally, Callaway Golf standardized on EMC for all tier-1 storage supporting core applications, as well as a multitude of home-grown “roll-your-own” (RYO) applications. The data tier was standardized and centralized on Oracle’s RDBMS database server, and Microsoft® SQL Server® was employed for Microsoft Exchange Server and non-core applications.

To ensure high-availability, high-performance, and recoverability, Callaway Golf implemented a “split mirror backup” solution based on EMC® backup, archival, and retrieval solutions. The Company’s main SAP ERP database is over four terabytes (4 TB)—and the SAP landscape data is growing at a rate of 50-60 GBs per month. The EMC-based split mirror backup solution enables Callaway Golf to mount systems and perform backups to offset loads on primary SAP servers. Additionally, routine “system copies” for training and quality assurance systems and refresh times have been significantly cut by synchronizing production system data through EMC storage solutions.

Further economies of scale were not going to be achieved by standardization and consolidation. Chinh Van, senior manager, Global ERP Systems at Callaway Golf, was responsible for the global ERP infrastructure. His task was to facilitate the growth of SAP, without scaling the personnel and server infrastructure—the classic “do more with less” IT challenge. It was about this time that SAP announced certification and full support for VMware® in SAP production environments.
TARGET STATE: VIRTUALIZING SAP PRODUCTION WITH VMWARE TO REDUCE RECURRING CAPITAL AND OPERATING EXPENSES AND DRIVE IT STRATEGY AND PRODUCTIVITY

Working closely with EMC, Chinh Van began the discovery and education process with his team. EMC educated Callaway Golf on the advantages of virtualization, and shared the EMC and SAP partnership by discussing their internal application and co-development of virtualization solutions. Both SAP and EMC are strategic partners for Callaway Golf, and with SAP and EMC working closely together, along with VMware, much of the project risk had been mitigated. Although experienced in running VMware on development and quality assurance SAP landscapes, Callaway Golf had yet to make the move to a virtualized production landscape for SAP. EMC provided the technical education and specific use cases, as well as transparent visibility to the EMC and SAP future roadmap, which aligned nicely with the Callaway Golf IT strategy.

The Callaway Golf data center is located on the second floor, so weight and structural issues were also a big concern. Although conserving data center space and energy were drivers in the virtualization project, the ability to reduce weight was key in assuring that Callaway Golf could continue to innovate its SAP and IT landscape without building or relocating to a new physical property or building—an endeavor that would have been extremely disruptive and costly.

Once Callaway Golf made the decision to move forward, the discovery process took six months.

After the buy decision was made, it took an additional two months to procure and deploy VMware. The remainder of the project was spent on the SAP deployment which was lock-step typical for SAP project lifecycles (the SAP SRM deployment took about six months). VMware added no additional time to the actual SAP deployment; however it has saved significant time on subsequent SAP projects. VMware has eliminated a lot of the time and complexity related to sourcing, procuring, and provisioning new hardware for subsequent SAP projects.

Ultimately, the VMware project was delivered on time and on budget, and made optimal use of data center resources by reducing overall weight, energy, and space requirements.

“Before virtualization, if I had a new requirement that required a new SAP test instance, it would take several weeks to buy a new server and install the operating system and SAP application before development and testing could begin,” says Chinh Van. “But now with VMware, we just provision it within 30 minutes and we’re off and running.”

The transformation at Callaway Golf included the implementation and virtualization of an enterprise storage model based on an EMC Symmetrix® DMX™ solution. Symmetrix DMX systems are built on Symmetrix Direct Matrix Architecture®—the proven storage array technology that delivers the highest possible I/O throughput. The uniquely flexible DMX architecture easily scales up and down, and configurations can be customized to meet the precise needs of complex SAP environments. The EMC DMX solution provided economies of scale and flexibility of growth through its unique dynamic provisioning and high-performance communication abilities based on EMC Fibre Channel connections and a Cisco Systems switch infrastructure.

“Users are now becoming accustomed to increased data online; they are now requesting more data,” explains Chinh Van. “We can now manage and migrate storage by user, application, and policies—so sales orders, for example, may be migrated every two years based on our company policy. These capabilities significantly improve Callaway Golf’s ability to align our services with the business.”
“VMware was the only solution that made sense to Callaway Golf, since our IT governance process required SAP certification prior to virtualizing our production landscape, and only VMware is certified for SAP,” adds Chinh Van. “Additionally, as the market leader, VMware is actively co-developing solutions with SAP and EMC that map directly to our IT platform and landscape strategy.”

VMware enables Callaway Golf to deploy fewer servers and still support multiple environments (development, test, and production). Callaway Golf was looking at 12 to 15 physical IBM P-Series servers, running IBM AIX for its SAP landscape. This virtualized solution reduced the number of physical servers to four and provides 12 to 15 virtual servers—with plenty of room to expand.

Fewer hardware servers mean less labor requirements. VMware provides easy provisioning of virtual servers and seamlessly provides tremendous flexibility along with high availability; snapshots creation; and system image copies. Today, Callaway Golf can copy its SAP landscape within 90 minutes. This increased capability helps the Company’s TCOE and FCOE professionals focus on higher orders of work and reduce the backlog of IT requirements in a more expedient fashion. In the end, VMware offers tremendous operating expense economies of scale.

“We see our TCOE using more of their spare cycles to rearchitect and redesign the remainder of our landscape to further exploit VMware capabilities and enable greater SAP capabilities,” says Chinh Van. “Additionally they will spend less time putting out fires, and direct more fire-power at increasing availability, performance, and SAP landscape capabilities. I also think we will now be able to look for better and more creative solutions to drive the business.”

Through smarter virtualized processes and EMC data storage and management solutions, Callaway Golf has observed 20 to 30 percent improvements in productivity, including the ability to significantly reduce backup windows. The company has also been able to leverage technologies more creatively and have more time to think, strategize, plan, and act.

“SAP on EMC hardware gives us increased performance and higher availability,” says Chinh Van. “With VMware technology we are now able to deploy more SAP functionality and applications faster. We are also able to automate more business processes, add more users, and increase business efficiency—our SAP SRM (Supplier Relationship Management) deployment has eliminated paper procurement and replaced it with electronic procurement. Most of our SAP projects now work on a fixed budget and are self-funding; therefore, VMware helps us more cost-effectively and predictably deploy new SAP applications.”
The company is also able to perform faster system refreshes.

“We frequently leverage external subject matter experts to deploy new SAP functionality, and by using VMware we can reduce these costs by enabling these professionals to deploy, configure, and copy SAP landscapes faster,” says Chinh Van. “We can snapshot and roll back changes much quicker with VMware—almost immediately. For spinning off test systems, VMware enables us to quickly create copies of test and production systems to validate and accelerate functional development, testing, and deployments. Overall we’ve seen at least a 10 percent improvement in our FCOE activities.”

In addition, VMware enables the Company to take more risks, knowing it can quickly roll back changes or mistakes based on versions and time stamps. In terms of performance and availability, Callaway Golf can quickly use VMware to increase CPU horsepower to improve performance dynamically by moving processes from one physical server to another physical server on the fly.

“We can deploy new servers without any production downtime,” says Chinh Van. “Faster rollbacks, better load-balancing, and on-the-fly provisioning of servers mitigate the majority of risks we envision in our SAP implementation.”

The combination of VMware and EMC storage with deduplication via the EMC Data Domain® appliance is also having a significant and positive impact on the Company’s SAP landscape today. Plans are being made to leverage this same SAP-centric virtualization approach for Microsoft Exchange and Microsoft SQL Server with the goal of reducing the backup size for VMware instances; mitigating the risk of new projects going live; eliminating tape altogether and freeing administrators from tape management and the physical handling of tape; and delivering an overall faster time to value.

**IMPACTING THE BOTTOM LINE**

An independent economic analysis of the Callaway Golf storage and landscape virtualization project was conducted by ASG, leveraging the Gartner advisory firm’s TCO model. The independent analysis quantified and qualified an ROI of 289 percent, meaning that for every dollar invested in VMware and EMC solutions, Callaway Golf would save or earn $2.89, over a three-year period. This included a 13-month payback-breakeven, showing the project would be self-funding in a little over a year, and deliver over $1.8M in capital and operating expense savings.
FUTURE STRATEGY: A BALANCED APPROACH TO MANAGING EXPENSES AND MAKING LONG-TERM INVESTMENTS

Perhaps nothing sums up Callaway Golf’s long-term strategic view of innovation more than the remarks made by George Fellows, president and CEO of Callaway Golf, “As we have said before, the economy and golf industry will recover and there have been some positive signs of late. We therefore are taking a balanced approach between managing our expenses and liquidity for the current environment and taking action and making investments that are in the best long-term interests of our shareholders. We are the leader in the golf industry and we intend to remain so in the current environment, and when the global economy fully recovers. It would be short-sighted to over emphasize the short-term to the detriment of our long-term growth and shareholder value.”

Given the ongoing pursuit of operational excellence through the adoption and deployment of advanced technologies like virtualization and data storage and management solutions, Callaway Golf’s business strategy and operations are clearly on-track to remain “Demonstrably Superior and Pleasingly Different” via long-term investments in information technology from strategic suppliers such as EMC, SAP, and VMware.