

True to its Slogan "Accelerate Your Life," the U.S. Naval Facilities Engineering Command (NAVFAC) is Accelerating and Optimizing its IT Capabilities

Opportunity: With 13,000 military personnel, civilians and contractors, and more than 300 independent systems providing facilities planning, engineering, acquisition and public works services for the U.S. Navy, there is enormous opportunity for NAVFAC to streamline and consolidate enterprise applications and systems. Using a proven enterprise application deployment methodology, industry-leading software and internet-based architecture, a strong team of Navy personnel and Total Resource Management (TRM) consultants are pulling it all together into Single Platform Maximo that will support NAVFAC worldwide. Critical to this success are TRM's business technology optimization strategies, Mercury Interactive tools and MRO Software's Maximo enterprise asset management platform – and a healthy amount of teamwork.

The Required Outcome:

- Replace more than 300 independent systems with Single Platform Maximo, an internet-architected enterprise asset management system
- Integrate the requirements of several thousand customized business rules
- Accommodate more than 10,000 users in 14 different time zones
- Establish extensive end-to-end performance baselines
- Comply with many distinct service level agreements
- Proactively monitor and manage the system, including rapid detection and problem resolution

Value Delivered:

- Decreased legacy IT systems and costs
- Decreased information silos and increased information availability
- Mitigated risk upfront and throughout the lifecycle of Single Platform Maximo
- Real-time proactive performance reporting, monitoring and alerting

Single Platform Maximo® and Business Technology Optimization Strategies are Driving Efficiencies throughout NAVFAC.



With the precision of an F-18 Hornet landing on the deck of a nuclear-powered aircraft carrier, Total Resource Management (TRM) has joined forces with the Navy to bring a single IT system to major segments of the U.S. military.

The U.S. Navy relies on NAVFAC, the naval facilities organization, to keep their public works and associated enterprise applications at the ready. NAVFAC supports over \$7.6 billion in business services. To elevate the performance for all involved, the Commander of NAVFAC mandated the development of a quality end-to-end enterprise system that aligns organizational goals and business processes to IT capabilities and initiatives.

In response, TRM was tapped to lead the effort to standardize and then consolidate the Navy's many instances of Maximo worldwide. The Single Platform Maximo (SPM) deployment stretches across eight Public Works Centers (PWCs) and more than 50 Public Works Departments. They reach from the mid-Atlantic region (Norfolk) where there are 1,100 users; into the Washington D.C. area with 450 users; on to Florida, with 750 users; and include plans to move to the Southwest, Northwest, Pearl Harbor, Europe and the Far East over time. The assignment ultimately involves 10,000 users in 14 time zones.

The SPM project is a huge and complex IT initiative – replacing over 300 independent systems with one. Although hosted in a single location and database instance at the NAVFAC Information Technology Center (NITC), the SPM end-to-end architecture is multi-tiered at every logical segment – server (application, database, integration, reporting), hosting (load balancers, firewalls, proxies, switches, routers), and wide area transport (Legacy and NMCI), coupled with a dispersed user population spread across the globe. Additionally, TRM and NAVFAC have worked diligently to ensure the SPM application was designed as a high availability system (5Nines) and can accommodate the unique business processes and requirements of each region.

The Navy SPM team researched a variety of industry best practices then tailored and optimized them to fit their needs and mission objectives. After extensive testing, the team was able to begin implementing the best practices using the selected tools in the fall of 2003. The team was aware that along with the upside benefits of improving and streamlining organizational business

processes and reducing IT costs through centralized system hosting, a system consolidation of this magnitude also came with considerable risks. Virtually all other attempts have had significant performance issues. Because SPM is a mission-critical application and downtime or poor performance would result in significant revenue loss and increased costs, risk mitigation strategies were structured from the onset.

As the lead system engineer and trusted advisor, TRM incorporated business technology optimization (BTO) strategies to mitigate risks upfront and throughout the entire lifecycle of this large-scale enterprise deployment. SPM is now leading the “enterprise application charge” in NAVFAC, with the most users on the single most complex system in NAVFAC’s application portfolio. Moreover, interfaces are already in place linking SPM to other key NAVFAC systems. As Rear Admiral Michael Loose stated, “SPM is a critical enabler in support of the NAVFAC’s transformation and is absolutely integral to the success of our Facilities Engineering Commands and the integration of the Public Works Departments and Regional Engineers.”

A Two-Phase Life Cycle

TRM’s BTO strategy for NAVFAC started with a deep understanding of the Navy and NAVFAC’s organizational mission. TRM then aligned business objectives and processes with the applications and end-to-end technology (servers, software, hosting sites and network infrastructure) that would optimally support NAVFAC’s mission. Understanding how the organization operates and realizing what’s important to various levels of stakeholders helped TRM develop a BTO strategy that was not only tailored to fit the Navy’s needs, but is positioned for continual success.

This strategy is delivered in a comprehensive and tightly integrated fashion that leverages sophisticated software tools and methodologies in a framework made up of a two-phase lifecycle – application delivery and application management. Driven by TRM’s project management, systems engineering and technical support team, BTO tools and proven methodologies ensure that each phase is successfully executed.

Throughout the application delivery to the application management phases, SPM’s capabilities can be customized and optimized to suit any and all regionalized business processes and strategies. To guarantee continual system performance, TRM partners with Mercury™ and relies on

several of its software applications. “Mercury’s application delivery and monitoring, and other tools set a standard for excellence. They make the invisible – visible, and allow us to isolate potential bottlenecks before they even occur,” said Don Omura, TRM executive vice president of Pacific operations.

Application Delivery

The application delivery phase also involves software tools and best practices that ensure success and mitigate risk before deploying a system. There are two distinct components of application delivery – a quality center and a performance center – both powered by Mercury technology solutions. The various components of these centers include quality, functional and regression testing; application and network infrastructure testing; network fine-tuning and performance benchmarking.

Load testing is part of the effort to mitigate the risk of system unavailability (e.g. the application being down, no connectivity or slow response times) and guarantee throughput; it also ensures that the system is consistently up and running. Using Mercury’s LoadRunner™ tool, the TRM team is able to test the SPM system, under load, to uncover potential bottlenecks before going live with a new site or major software release. LoadRunner technology emulates hundreds or thousands of concurrent SPM users, stressing the application and network infrastructure using scenarios based on real-world conditions. Various monitoring and analysis features allow the SPM team to assess application and network performance for the entire architecture. The SPM team observed response times from representative business processes in a controlled and repeatable manner, allowing the team to systematically identify and work through issues that surfaced from pre-production testing.

“By using a tool like LoadRunner, we’re able to generate quantifiable measurements in a consistent manner for our analysis. This is an essential risk mitigation step in a pre-production setting to avoid costly false starts in production,” said Jim Miwa, TRM vice president of systems engineering.

Application Management

The second phase occurs once the system has been deployed or upgrades are complete. It is at this point that the IT control and pre-production performance baselining shifts to application management, ensuring that pre-production observations and conclusions are continuing to be met while in production. Several key criteria were



identified by NAVFAC Assistant CIO Ken Kelley as “defining the line between deployment and sustainment.” These included:

- Functionality
- Performance
- System stability

In this phase, the SPM team ascertains that service level targets that were defined, benchmarked and established for the aforementioned criteria are still being met.

Continuous compliance, end-user monitoring and service level management, visual metrics and ongoing management all occur in this phase. TRM works closely with the NAVFAC Command Information Office, Public Works Field Support Office, NITC and the NAVFAC regional offices to develop a business availability plan that defines:

- Key objectives
- Business impacts
- Key performance indicators
- Service level targets

This business availability plan is then translated into “views” that are tailored for the Navy, including applications and system monitoring. Validation thresholds and alerting processes are established at both the system level and from end-users. Then, escalation procedures and workflows are defined in the event of a problem. Finally, in an effort to minimize application downtime, software tools and procedures to help manage performance – along with application and network infrastructure capacity and change management tools – are deployed.

One product used for the regional SPM rollout from Mercury’s toolbox is the Business Availability Center (BAC). BAC applications are used to monitor end-to-end system performance, help diagnose issues and assist in managing service level targets for the SPM community. Using emulation technology similar to LoadRunner, the

BAC provides continuous, round-the-clock monitoring of the actual production instance. Unlike load testing, the point of application monitoring is not to generate load on the system. Rather, the BAC collects SPM metrics and data while users are placing real load on the system through business process monitors strategically placed at NITC and various other sites.

“The BAC enables us to bring all the stakeholders to a common portal of real-time performance and availability metrics. This ensures that we are immediately on top of a situation if performance levels dip below acceptable thresholds,” Miwa said.

Service Level Management (SLM) compliance is monitored and reported at all levels of the organization and includes both executive level and detailed analytical reporting. Visual metrics are provided through at-a-glance, color-coded dashboard screens that are useful for many levels of the organization. Various reports (standard and customized) can be viewed from the support staff level all the way to the executive level of the organization.

Future Improvements

Providing users with system support to help them accomplish their daily work and ongoing effective change management will continue to be critical factors in determining the success of SPM.

The SPM team continues to add increased functionality and integration to help the Navy provide the best facilities support possible. New integration efforts include:

- Work Induction System (WIS) – automate routing and provide electronic notification of incoming work requests
- Facilities Condition Assessment Program
- Regional Shore Infrastructure Management System (RSIMS)

Organizational Transformation

NAVFAC's dramatic organizational transformation continues to affect a vast number of people. Detailed planning, communication and training are critical to an effective and smooth transition. According to Lisa Abad, Navy SPM Program Manager, "Organizational and cultural challenges are just as significant as the technical hurdles."

That's why training and communication are so important to the successful implementation of SPM. Before each site goes live, the SPM team identifies training requirements, target dates and site support requirements. User training starts a few weeks prior to the "go live" date. Subject matter expert teams are involved in the early stages of each region's transition to SPM and these teams participate in every training session. This process helps ensure that each user group has the specific knowledge needed to carry out their job using SPM.

In addition to training, the TRM SPM team publishes a monthly SPM newsletter that is distributed throughout the NAVFAC organization. This publication features rollout news, details lessons learned and upcoming events.

Finally, with a mandate for integration acceleration brought about by NAVFAC's organizational transformation initiatives, the TRM SPM team is geared up to help make full integration a more natural business process within NAVFAC. The TRM SPM team continues to support and sustain the business technology efforts at NITC and is solely focused on SPM and its successful deployment and integration within the new NAVFAC organizational structure.

Find Out More

For more information about Total Resource Management solutions or this story, please call 877-548-5100.

About Total Resource Management

Total Resource Management, Inc. (TRM) delivers consulting and information technology solutions that help organizations improve the management and performance of their enterprise assets (facilities, infrastructure, logistics, production and IT). Over the past decade, the company has supported over 200 clients with enterprise asset management expertise, professional services and productivity enhancement products that result in significant improvements to their business operations. Its headquarters are located in Alexandria, Virginia and supporting offices are located across the U.S. Total Resource Management's Advanced Technology Centers are located in Virginia, California, Washington, Pennsylvania and Hawaii. More information is found at www.trmnet.com

About NAVFAC

The Naval Facilities Engineering Command (NAVFAC) is composed of the Navy's facilities engineering professionals committed to Navy and Marine Corps combat readiness. They are a global organization that is Fleet focused, innovative, a surge enabler, ever faster and committed to continuous cost reduction. NAVFAC delivers best value facilities engineering and acquisition for the Navy and Marine Corps, Unified Commanders, and Department of Defense agencies through six business lines:

- Capital Improvements
- Environmental
- Real Estate
- Public Works
- Base Development
- Contingency Engineering