



Software Performance Systems, Inc.

CASE STUDY

# PALM: Mission Critical Enterprise Case Management System

## Situation

The United States Patent and Trademark Office (USPTO) needed to modernize and replace the aging Patent Application Location and Monitoring (PALM) system, developed in the early 1980s and running on a Unisys A16 mainframe, to track, monitor, and report on patent applications. The system was difficult and expensive to maintain and support, and did not allow the USPTO to rapidly respond to changing business needs and a growing user base and volume of patent applications.

## SPS – Problem Solved.

SPS migrated the system to an open client/server architecture that provides web-based and graphical user interfaces. SPS designed the technical architecture to emphasize flexibility in responding to functional and technological changes, scalability as volume of applications increased, and ease of integration with other USPTO systems. The system currently supports over 5,000 users processing in excess of 400,000 patent applications per year. The PALM EXPO system alone handles over 1.5 million transactions per day, including services supporting system interfaces, and supports a large database (approximately 280 GB) with over 300 production reports.

## Methodology

SPS used CASE tools approved in the USPTO Technical Reference Model (TRM) for analysis,

design modeling, and code generation, which together required more than four years and multiple, concurrent development projects. SPS used the USPTO Life Cycle Management (LCM) methodology and component-based development (CBD), which enabled teams to work concurrently and achieve reuse goals. SPS developed and/or customized COTS for eight reusable software components, now integrated across other USPTO production systems. The SPS role in each PALM Migration subsystem is described below:

**Infrastructure System** – SPS provided lead development, data migration, and follow-on maintenance and enhancements for an open client/server system managing USPTO Organization, Worker, and Location data, as well as Relocation planning. SPS later wrapped and published the Worker and Storage Location components for use in other USPTO application development projects. Developed components were used on PALM as well as other USPTO applications, improving USPTO’s return on technology investment.

**File Ordering System (FOS)** – SPS developed an ASP-based web application through which USPTO employees and the general public request copies of patent and trademark application case files stored in USPTO File Repository warehouses.

**Pre-Examination System** – The “Pre-Exam” system supports the business processes involved with initial examination of patent applications. SPS provided approximately 50 component services from 7 different components to the Pre-Exam development team. SPS managed the shared objects model for all data objects and components services for Pre-Exam and three other concurrent develop-



## CASE FACTS

### Sector

Federal Government

### Organization

U.S. Patent and Trademark Office

### Customer Profile

The mission of the USPTO is to ensure that the intellectual property system contributes to a strong global economy, encourages investment in innovation, and fosters entrepreneurial spirit.

### Business Challenge

The USPTO needed to modernize the large, mainframe-based PALM system in order to overcome limitations that impacted the system’s ability to meet evolving business needs.

### Solution

Model-based development and component-based design facilitated success in this incremental, large-scale system development and integration effort.

ment efforts.

**EXamination / POst-EXamination (EXPO) System** – SPS migrated the largest and most complex PALM subsystem that supports patent application processing through Examination and Post-Examination phases. The EXPO system was integrated with 11 other USPTO systems in the initial release. SPS completed full system deployment in November 2001 and continues to provide EXPO maintenance and enhancement support.

## Lessons Learned

- Partnership with the customer throughout implementation is key to success. The development team was co-located with CIO staff and user representatives.
- Customer commitment to the technologies involved outstanding technical management and oversight from the CIO organization, and continuous involvement of knowledgeable user representatives were key to project success.
- The reporting architecture and development effort required more time than was available during initial development. A subset of critical reports was identified for “day 1” availability. Subsequent report development and tuning was required to achieve required functionality and desired performance.
- CBD enabled reuse, concurrent development, and cost savings.

***The EXPO project “is a success and will probably rank as one of the best large-scale deployments ever done at the USPTO.”***

*—Kaj Vetter, Director, USPTO  
Trademark & E-Gov Business  
Systems Division*

*(formerly the USPTO System Development Manager for EXPO)*

## Results

Our project leadership, expertise in CBD and service oriented architectures, and experience in using Advantage Gen™ model-based development tools provided a solid and readily expandable technical solution.

SPS developed an “Activity Engine” component, core to the EXPO subsystem design, applying a set of validations, rules, and database updates associated with patent application processing. User feedback on the business value of EXPO in production specifically addresses the Activity Engine: “The Activity Engine created consistent data entry, resulting in highly accurate reports. The data-driven rules engine gave USPTO increased flexibility in creating reports and allowed it to quickly modify transaction characteristics.”



## ABOUT SPS

Software Performance Systems, Inc. (SPS), a small business based in Northern Virginia, is a privately held full-service information technology services provider. Established in 1995, SPS specializes in the design and integration of sophisticated web-based enterprise solutions for both the US Government and worldwide commercial clients. SPS has been honored with many national awards, to name a few: #10 ranking in the Computerworld Top 100 Best Places to Work in IT, Deloitte’s Virginia Technology Fast 50 and North America Technology Fast 500, Excellence.gov Grand Prize Winner, E-Gov Pioneer Award, and SBA — Exporter of the Year. **SPS...proven over time.**