HOW SOFTWARE + PEOPLE APPROACH IS HELPING A CITY MODERNIZE ITS TAX SYSTEM FASTER AND AT A LOWER COST

Abstract

The agency is the tax collector for one of the most populous Cities in the United States. The agency administers the City's tax law, issues tax registration certificates and permits to over 600,000 entities, and collects over US$ 2.5 billion in taxes and fees.

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When legacy became a stumbling block

The agency's in-house tax and permit processing system is a distributed (n-tier) tax collection software, built in the 80's on PowerBuilder technology, running on a Sybase (now SAP) EA Server (Version 5.5) environment using Oracle Database (Version 12c) as a backend. The system supports approximately 350 employees located at 3 work locations.

Continued use of the system built using these legacy technologies created a number of challenges for the agency including:

- **Maintenance and upgrades** – Lack of system documentation made it difficult to maintain the system or implement upgrades. Imminent discontinuation of support for PowerBuilder technology was making it extremely difficult for the agency to find people to support the system.

- **Agility** – The system was inflexible and couldn't support new business requirements; e.g., enabling web-access so that tax payers could fill the form online. This impacted agency's ability to keep pace with customer's demands.

- **Interoperability** – The system integrated with agencies like the Police and Fire Department through a custom built Java utility hosted on the EA server. The existing server didn't support updates to the utility, increasing the likelihood of being unable to exchange information with partner agencies.

- **Usability** – Some of the processes, like authorization and authentication, were not streamlined and took longer to execute. This impacted the efficiency and productivity of the staff.

To address these challenges, the agency decided to modernize its system into an agile system that could be maintained easily and upgraded quickly to be in line with evolving business and citizen expectations.

Accelerating modernization with people + software approach

The agency partnered with Infosys Public Services (Infosys) to replace its legacy system with a modern, agile, web-based system that would address the issues of scalability, interoperability, usability and maintenance.

Infosys proposed its legacy modernization solution, ModernizeIT, to support the agency's requirement and accelerate the initiative.

A modernization journey is typically executed in 5 steps – application assessment, migration, post-migration, server integration, and testing. ModernizeIT uses a software (smart tools) + people (modernization experts, best-practices) approach to automate significant portion of the modernization journey. The result is future-proof, web-based application that is built faster by as much as 50% at substantially lower cost and risk.

The 5 steps of a modernization journey

01 Application Assessment
02 Application Migration
03 Post-Migration
04 Server Integration
Application Testing
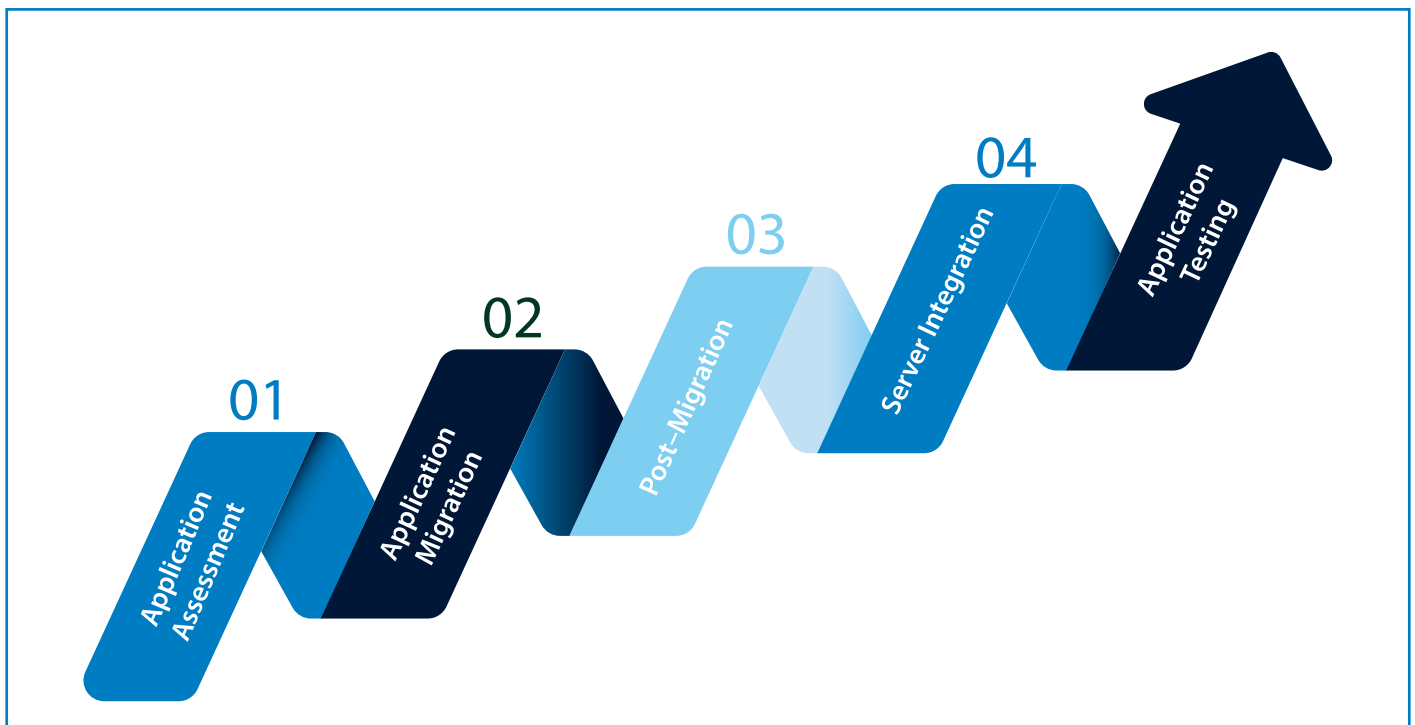
Migrating to a web-based application
Infosys ModernizeIT Smart Algorithm Converter is being used to automate migration of PowerBuilder code and business logic to target J2EE technology. The Converter is driven by Grammar based conversion which ensures 100% code coverage with specific emphasis on the quality and maintainability of the converted code. The new system is being built using the industry-standard Spring framework and will be deployed on the JBOSS server. This will make it easier for the agency to manage its new application and upgrade it quickly to meet changing requirements.

Not only will **ModernizeIT** ensure complete coverage of the code and the business rules, but it will also ensure that the functionality of the system remains the same. For example, the penalty and interest calculations will produce the same results in the new system as they did in the old one.

Infosys ModernizeIT Smart UI Converter is being used to automate the migration of the old UI to the new UI. The Converter will ensure that the new screens carry forward the layout and flow, but at the same time leverage the latest scripting features like Bootstrap framework to improve responsiveness. Keeping the same layout and flow will minimize the effort and investment in training business users. The new screens will also incorporate additional features like quick search and hot links to improve user experience and productivity. The Converter makes use of a hybrid UX framework (HUX) which balances the speed and multi window feature of the old data window and flexibility and maintainability of the web screens, in the new UI.

The agency is also working with Infosys to simplify system administration. With the existing application, users had direct access to the database which posed serious security issues. Infosys is implementing its Authorization framework to define role-based security and minimize data security risks. **ModernizeIT** is also making the new system secure against any web exploits through its Web Application Security project (iWASP) framework which is a combination of **TADM** (Trusted Application Development Framework) and **OWASP** (Open Web Application Security Protocol).
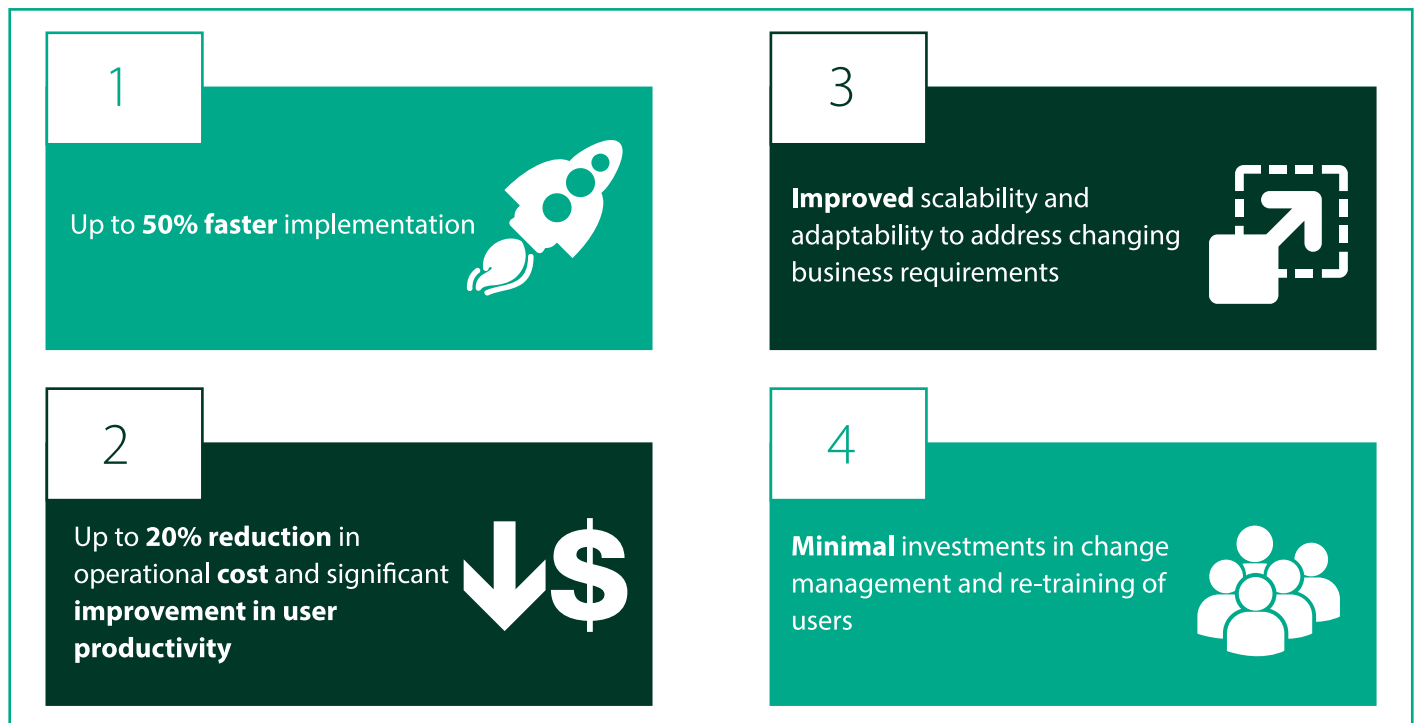
And to ensure that the new application performs as expected, Infosys and the agency will extensively test the system using automated regression testing tools like JMETER and Selenium. This will not only ensure 100% coverage but also accelerate the testing process.

All these capabilities will enable the agency to build a modern system faster at less risk, improve productivity of its users and ensure quick adoption.

Actualizing the benefits

With the software + people approach, the agency will be able to realize the benefits outlined in the graphic below.

Actualizing the benefits

1 Up to **50% faster** implementation

2 Up to **20% reduction** in operational **cost** and significant **improvement in user productivity**

3 **Improved** scalability and adaptability to address changing business requirements

4 **Minimal** investments in change management and re-training of users

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