

Planning and Deploying a Customer Information System in Today's Economic Environment

CIS Product Team
Innoprise Software, Inc.

By its very nature, effective local government management is both complex and demanding. In today's environment of budget crises, rising costs, sweeping change, strained relationships between state and local government, and citizen expectations that are higher than ever, the pressure to find new and better ways to do more with less has never been stronger.

One of the many ways that local government is responding to these challenges is through more effective use of information technology (IT) to update traditional financial management and improve corporate performance management, streamline provisioning and procurement, and better connect citizens to the services provided by city and county agencies.

These factors -- along with considerations like limited personnel resources and the loss of key experience to the retirement of baby boomers -- are accelerating the need to transform legacy IT environments of yesteryear into modern IT architectures capable of coping with today's business realities.

The challenge is obvious. How can government agencies struggling to function within today's economic framework find the financial resources needed to upgrade an aging IT architecture that is rapidly approaching obsolescence?

A Tale of Two Cities

McPherson, Kansas, and Casselberry, Florida, are two of many cities and counties that found themselves being forced to limp along with technology purchased many years ago that was no longer meeting their evolving business needs. Both were faced with making a fundamental choice challenging many government agencies today - whether to continue upgrading and patching legacy customer information software or to replace old technology with new solutions whose costs can be justified in today's tight economic environment.

McPherson, Kansas, is not your typical Midwest community. One of the 100 best small towns in America, it boasts the lowest electrical rates in Kansas and among the lowest in the nation. The city provides electric, water, sewer and refuse collection service to 9,000 customers. When it started thinking about how to better serve its customers by expanding its service offerings, it quickly hit a stumbling block because its 16-year-old customer information system (CIS) was capable of handling billing for a maximum of only four services. "We found ourselves unable to add additional services without extensive - and expensive -- custom programming," said Larry Swenson, controller for the utilities department at the city. "We knew we wanted to add storm water services, and we also needed the flexibility to add cable, Internet, telecommunications and other new services," Swenson added.

Pressures brought on by deregulation have posed additional demands to unbundle billing for the various services provided by the city. “Our existing customer information software simply couldn’t accommodate these requirements,” commented Swenson, “nor did it enable us to move toward more energy-conscious approaches to energy management like time of use metering or power factor metering.”

“Plus,” said Debbie Boyd, IT Manager at McPherson, “forecasting, analyzing trends and consumption patterns, and managing costs and budgets have never been more critical. Our management needs reliable and accurate information to make the most informed decisions possible. We couldn’t get this from our legacy CIS.”

Casselberry faced similar obstacles. Located in the southernmost portion of Seminole County in central Florida, the city supports a population of 23,000 and provides water service to 19,000 customers. Some 60 employees were heavily reliant on the city’s customer information system, which had been in place since the early 1980s. “For the last few years, they’ve complained frequently and loudly that routine tasks were taking too much time,” said Joe Sinay, IT manager for the city. “Users accustomed to working with modern technologies want standard functionality that our old technology simply could not offer, like Microsoft™ Office integration, ad hoc report generation and the ability to easily extract information to support rate hearings. In addition, credit and collection management processes were extremely time-consuming and disjointed in the legacy environment.”

Overcoming the Legacy

McPherson and Casselberry have both experienced challenges with customer information management in the past several years, and both have found themselves unable to respond to the evolving demands of local government using legacy technology that had outgrown their useful ROI.

“The pure overhead costs of managing user desktops had gotten out of hand,” said Casselberry’s Sinay. “Our legacy CIS system processes were all server-based. As we grew and more CIS users were added, our performance degraded to a point that was unacceptable. Spending \$40,000 to buy a new server to accommodate additional users without gaining any additional functionality was not a cost I could continue to justify,” he added.

When a simple enhancement like adding the ability to pay bills online require updates to millions of lines of convoluted legacy code, it’s easy to understand why government agencies are spending a large percentage of their IT budgets just to keep these systems functioning.

Knowing that they could no longer meet their business objectives with their legacy software, McPherson and Casselberry independently decided to take advantage of a unique opportunity posed by enterprise solutions developer Innoprise Software, Inc. In 2002, Innoprise began seeking representatives from numerous departments in a dozen cities and counties willing to donate their time to participate in a two-year software development undertaking. The goal of the project was to develop a new software package from a clean slate and based on new technology revolving around an Internet-native, Web services architecture. In return for providing the time and input of their

personnel to define and test the functionality of the new software, the cities would receive a deep discount on the new software that resulted from the venture.

“We found that we could participate in the proposed new initiative and get a totally new system, built from the ground up using new methods and technology platforms, for considerably less than we were spending just to maintain the old system,” explained Sinay.

Defining the New Software

As part of the team of 52 government employees from 13 cities and counties who signed onto the development program, McPherson and Casselberry set about defining a new solution for customer management that allowed them to achieve their goals in the most productive and cost-effective manner. Their primary goals were to:

- Preserve their existing technology investments where possible
- Address high priority functionality needs while limiting capital IT expenditures
- Develop a solution requiring minimal in-house dedicated personnel resources for ongoing system management
- Reduce maintenance costs

“We saw the need for growth to meet the changing needs of our city,” commented Boyd, “and as we sought ways to replace our legacy technology, we wanted to do so in such a way that we could get the information into and out of the system exactly like we wanted it.”

Delivering Customer-facing Services On-line

One of the things neither city anticipated when planning their old legacy systems many years ago was the necessity in today’s world to conduct business over the Internet. Another was the need for much stronger interconnectivity between various functions and departments in order to expedite project life cycles from end to end. One of the key criteria, therefore, as they set about defining the new system was technology built with the Internet and wireless business transactions in mind.

“We found that the technology backbone of our old system wasn’t able to natively adapt to an Internet environment or provide the user interfaces and functionality we required,” Sinay explained. “We had been operating in a nongraphic-oriented, green screen environment for years with our old system,” he said. “While it was possible to develop an Internet interface that presented a facade of newness, there’s a big difference between putting up a Web page and being Internet-native. The interface was little more than a modern face disguising an antiquated architecture. The underlying applications still had their roots in monolithic approaches and architectures that were very self-limiting.”

He credited the team’s decision to leverage a modern Web services architecture with the single consistent view his city’s employees now have of all relevant information. “In our case,” he explained, “this enabled a wide variety of applications across the full spectrum of community development interaction to access the same data set. Instead of having to open and sort through numerous computer screens to find various pieces of information about a particular piece of property,” he explained, “we can

now quickly find anything we want through one intuitive user interface. This is a dramatic change for the better. All information is captured once and immediately available to any person or application that needs it, and it's available from anywhere, over the Internet."

McPherson and Casselberry both have plans to extend their Internet functionality into the realm of bill presentation and payment. Casselberry is also entertaining the idea of leveraging Internet-based self-service kiosks to enhance services provided to their citizens.

When Components Replace the Monolith

Another important criterion in defining the new technology was to replace the monolithic software of earlier years with a flexible, component-oriented approach. "We are in a position today," said Sinay, "where we need to be able to change constantly." It is for reasons like this that the team specified a Java™ 2 Platform, Enterprise Edition (J2EE™) platform "With Java and HTML, the team was able to develop modular, object-oriented applications that could be reassembled and reused to create still new applications time and time again," he explained, noting that this ability to continually adapt and add new applications is critical to the city's ability to meet ongoing changes in regulatory requirements and associated reporting mandates.

This simplifies the ability to add new services, products and rate structures as business needs and regulatory demands change. It also provides built-in functionality for advanced features such as customer self-service, online bill presentation and payment, and complex rating and billing, plus much more robust customer analytics, trend analysis and forecasting capabilities. "We settled on a CIS solution that runs on a J2EE platform since Java has a proven track record in the industry and will allow us to use our existing AS/400 server as a database server," said Boyd.

Technology Freedom

On the hardware front, both Casselberry and McPherson wanted the freedom to pick and choose among the full spectrum of platforms, operating systems and database management systems, along with the flexibility to use open source licenses.

"Cost savings were very important to us," explained Sinay. "We installed the first modules of the system on a \$2,000 Linux server and used our existing AS/400 as a database server. That's it! We didn't need to buy any third party run-times or licenses in order to take full advantage of the system."

"By leveraging existing equipment, and not having to purchase additional third party portal or reporting software we expect to save at least a half a million dollars in operations and maintenance costs," he continued.

Lessons Learned

Casselberry and McPherson agree that the two-year development project was time-consuming and resource-intensive, but well worth the effort. As a result of their experiences, they have several important insights to offer to others embarking down the path to plan and deploy new customer management technologies.

- Get representatives from all the departments that will be using the new software involved as part of the project team from the very beginning.
- Make core software decisions based on common workflows and functional needs. With today's technology, it's much easier and less expensive than ever before to tailor software and applications for the unique needs of individual entities.
- Think out of the box and don't get bogged down trying to rigidly plan out software processes that define development. Instead, leverage technologies that enable rapid adaptation to change and are people-oriented, rather than process-driven in their approach and which reduce the cost of experimentation and iterative development.
- Selecting a solution that uses industry standard programming languages and a pure Internet platform for all system components is critical to ensure ease of integration with 3rd party applications. This will minimize the hidden costs of systems integration.
- Leverage enthusiasm where you find it. "We got our more progressive people involved first," Sinay said. "They got excited about the new technology first and the benefits it offered them and what followed was a domino effect - others began to see what they were doing and the desire to move to the new technology became contagious."
- There are things you'll forget; don't worry about it. "As you become more familiar with the capabilities of modern technology," Sinay advised, "you'll think of new things you'd like that hadn't previously occurred to you. The beauty of the modern software architecture is that programmers can continually modify the software and release updated versions as frequently as needed. In our case, this was sometimes as often as weekly."

Every City is Different

Two cities, McPherson and Casselberry -- both with similar customer information challenges and requirements - wound up with exactly what they asked for. After two years of collaborating with several teams consisting of several dozen peers and colleagues, one of the most important lessons they both learned was that every city does things differently and that this is an advantage for everyone. "We all came in focused on meeting our unique needs," said Sinay, "but we wound up taking the best ideas from each other and incorporated them into the software." By recognizing that each city has unique needs, the team discovered a basic reality. You can't build one off-the-shelf system that can satisfy 100% of every organization's requirements 100% of the time, no matter how much money and effort you put into it. But, if you build a system around common organizational workflows and which leverages modern technology architectures, each organization can easily meet even its most far-reaching goals.

About the Author

Bobby Abraham provides technology vision and leadership to identify software platforms that will enable local governments and utilities to streamline operations, improve productivity and reduce their cost of service. Mr. Abraham provides strategic and tactical planning, development, evaluation, and coordination of the information and technology systems that Innoprise develops for the local government market. Mr. Abraham manages the Innoprise programming staff and

works closely with every Software Development Manager to ensure that software requirements requested by cities, counties and utilities are reflected in future software enhancements.