

Changing Face of Application Integration

Municipalities adopting various integration strategies to meet emerging requirements and gain operational efficiency

Ron Begg

Imagine the benefit to a finance department discovering that a portion of the information they require for tangible capital asset reporting is already collected and maintained by public works. Sharing this data will save time, effort and expense – but how do the two departments make their software applications talk to each other?

Like many organizations, municipalities use a variety of applications to meet the specific needs of each department within the organization. Problems occur when they need to transfer data between the disparate systems, if information must be manually re-entered or maintained separately in multiple locations. This problem grows with the size and complexity of the municipality.

Flowing the Information

Applications integration allows information to be entered in one place and flowed to other systems as required. With integration, applications can take advantage of data entered in other applications, and even use processes available in one system but not in an important legacy system. This reduces manual entry between applications; eliminates redundant data entry processes; and saves time. It also eliminates inconsistencies created when data is entered twice or maintained separately in different systems.



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Integration is even more powerful if the information flows to other systems in real time. By eliminating delays, information may be reported immediately for better, more accurate analysis. For example, when public works enters material usage in their system, the usage can appear immediately on re-order reports for purchasing and project costing reports for finance.

As municipalities begin to understand the value of application integration, some try to solve the problem by implementing one large Enterprise Resource Planning (ERP) system across their organization. While this offers powerful integration, some of the unique functionality required by each department can be lost. Also, the municipality may be purchasing more than they need. With larger ERP systems, much of the integration is inherent and mandatory – it will require a great deal of analysis and expense to configure, and might need to be implemented even if it is not warranted by the business requirement. In fact, a recent study initiated by the Municipal Information Systems Association of Ontario has shown that choosing these systems can result in purchasing and paying support for applications that are not necessary or never implemented.¹

Instead, with the variety of application integration methods now available, municipalities can let their business case determine where it makes sense to integrate, and choose the solution that best matches department requirements and project budgets. A better understanding of integration methods, challenges, and decision factors can help the municipality choose a more affordable solution that is also the best fit for each department.

¹ *Municipal Interface*, December 2007.

Methods for Integration

Vendors have, for a long time, used the term integration to refer to the data sharing that occurs within their own applications to the point where this type of integration is now commonplace and should be expected. Typically, information is centralized in one database and easily shared using a uniform interface. For example, a vendor's cash receipting application can easily take payments for amounts calculated in the same vendor's property tax, utility billing or building permits applications, and post the information to the general ledger.

Because most municipalities run software from a number of different vendors, the ability to share data between these applications (third-party integration) is extremely compelling and increasingly necessary.

The simplest way to achieve third-party integration is through file exports and uploads, such as exporting a file from one application and importing it into a second. For example, most utility billing applications can import data created in a handheld meter reading device.

More powerful third party integration is achieved by establishing direct connections between each system's database. With direct database integration, specific tables in one database link directly to tables in a second database. When a condition is met in one database, another function is triggered such as populating a table in a second database, sending an email or displaying an alert.

Database integration is established in one of two ways. The first is to create data triggers using the tools inherent to the database engine that is working behind the scenes to store the data, such as Oracle or Microsoft SQL. With database engines, data can be queried or retrieved based on a specific trigger, such as when information is added, deleted, or updated. This method takes advantage of software already in use, and is relatively easy to implement and customize. However, there is limited control over the results of each function. For example, the action might take place immediately, and it may require custom coding to restructure the information to fit the database of the second application.

If a business process requires additional control over how information is handled, a more advanced and flexible alternative is to use a data integration tool. These tools are middleware applications that reside on the server and mediate between separate databases. When triggered, they can perform not just one simple function, but an entire set of complex processes. These processes, referred to as workflows, offer more control over the data and the results. For example, they can transform data to fit both applications, perform complex calculations, monitor applications on an ongoing basis to keep data synchronized, or be timed to occur at specific times, such as during off peak hours.

While database integration tools are not yet widely used at municipalities, they offer rapid deployment of advanced integration functionality, and are becoming an increasingly viable solution. Some leading municipal software vendors

are even creating standard sets of workflows between their software applications, making the cost for this type of integration more attractive. Once installed, the tool can be extended to other integration activities, such as building custom workflows, linking additional applications, or extending the function of a legacy application. In this way, the database integration becomes more cost effective over the long term, and provides a flexible way to deploy new business processes, services, or applications with minimal operational change.

Case Study

Bonnechere Valley, Ontario has taken a lead in integrating their systems using a database integration tool. With the emerging Public Sector Accounting Board (PSAB) PS3150 requirement to report on tangible capital assets, they saw an opportunity to manage their business processes more efficiently by creating a single point of entry for public works information and transactions. They achieved this through sharing a set of information between their existing financial systems and the application they use to manage their public works information.

Previously, each department entered information separately. It was difficult and time consuming to gather all of the information required for an accurate analysis of project and asset costs, such as labour and material costs, asset maintenance and equipment usage. While Bonnechere Valley had collected their asset information in anticipation of the PS3150 requirement, without integration between their public works and finance systems it would be difficult to keep the information current.

Because their vendors already had a strong partnership in place and a database integration tool in use, they were able to establish an initial set of workflows between the systems, centralizing the information collection around work orders, and giving public works a single point of entry for work order activity and transactions. Entering the information is part of staff's normal business process and is required for their project tracking purposes. With the database integration tool handling the security and data restructuring required behind the scenes, the information is also available to other functional groups in the format they require for project cost reporting, payroll calculations and other activities. Figure 1 illustrates how the information flows between works orders and other systems.

As a result of the project, Bonnechere Valley staff have a single point of entry for data and can access better quality information more easily. Department managers now have access to accurate and timely information they can use for proactive planning and resources usage.

Because of the work done in Bonnechere Valley, standard integration points now exist between two leading software vendors and are being adopted by other municipalities like Niagara Falls, Ontario and the District of Summerland, British Columbia.

Making the Right Choice

As in Bonnechere Valley's case, determining the right integration method depends largely on the business requirement. Not all integration paths are realistic, and it should be employed only when manual entry is difficult, the task is high volume, and the business requirement must be met for a long time after the integration is complete. Some business requirements mandate only file transfers, which is usually the most affordable option, while others can only be accomplished through one of the more powerful data integration approaches.

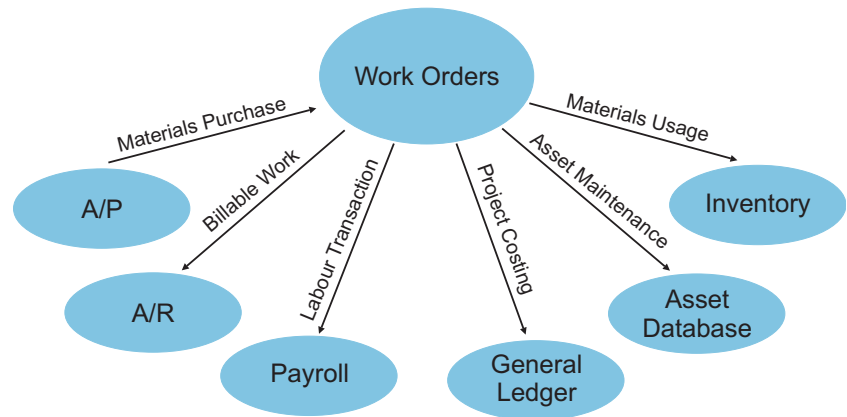
Once a municipality determines that integration is the right solution, they must consider how best to accomplish it, starting with areas that will eliminate the most duplicate entry, such as time sheet entry, supplier records, and inventory usage and adjustments. In considering what to integrate, municipalities should resist the urge to build an all encompassing integration utility – this is extremely difficult and expensive to configure.

A municipality should also consider what standard integration options exist prior to choosing a custom method. While a custom solution can be the best fit, scoping the project is more complex, and the municipality bears the full cost of development. The costs and complexity increases with the extent of the integration. The municipality will also bear the responsibility of maintaining and managing the system over time. Updates to one software application may break the integration to the second, and these updates are outside of the municipality's control and difficult to test.

With well-established vendors forming standard integration points between their applications, the cost for integration is reduced. Because the integration is deployed across more operating environments, the results are more rigorously tested. In addition, vendors shoulder the cost of development and the responsibility of maintaining the integration over time. Vendors who own their core intellectual property can also manage the impact of updates on the integration points, because they control the underlying data structure.

When evaluating integration, it's also important to consider the strength and stability of the relationship between the vendors. The more complex or technically challenging the integration, the more critical this is.

Figure 1



Each vendor must have a degree of access to the other vendor's applications, including file layouts, data architecture, security, and other intellectual property. A long-term, stable relationship between the vendors is critical to maintaining the integration through subsequent updates. Companies with formal partnerships, or that belong to the same consortium of companies, are in the best position to offer this stability.

Factors to Consider

When planning the integration project, it's important to consider how the information will be handled through the business cycle, how data security will be maintained, and what application will take the lead. In some instances, municipalities may also need to consider hardware upgrades to handle the additional load to their IT infrastructure. In Bonnechere Valley's case, they felt the IT investment was well worth it because of the volume of information they can now make use of, and the potential to increase this in future.

Despite the challenges faced with third party integration, municipalities that are striving for operational excellence and greater efficiency should scope all software purchases with integration in mind. Integration is well worth the investment because it not only enables a more holistic approach to information management within an organization, but offers a single point of data entry that reduces error and facilitates better quality information. With a better understanding of the integration options available, municipalities can choose the tools and methods that are the best fit to their requirements and budgets. *MW*

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