Delivering triple-A quality, Web-enabled applications that follow the business process, not the database transaction.

Excelligent offers customized System i ERP solutions with automatically transformed and componentized ILE RPG

The concept of assembling software from components was a novel idea for most software providers only a decade ago. Today, Java and C++ object oriented (OO) frameworks are the de facto programming standard for most new application design efforts. Therefore, it is not too unusual that Excelligent, an ERP provider to small and midsized businesses in the European geographies, has embraced the concept of using components to build software. What is unusual is that this 35-year-old, Belgium-based application vendor routinely assembles complete ERP applications from a huge inventory of ILE RPG-based components, many of which contain business and data logic that was written to exacting business rules during the last three decades.

To reiterate (as an OO developer would say), Excelligent uses ILE RPG components and Java program models and components to implement customized ERP solutions for its clients. And amazingly, Excelligent (Reymen Data Center was the company’s original name) has been automatically generating customized accounting applications from these ILE RPG components for eight years.

“Importantly, the typical timeline and effort required to build customized solutions in this manner has been cut by more than 70%, as compared to the company’s previous model that involved handcoding the special requirements for a new client,” says Erik Deboutte, general manager for Excelligent. He continues, “The streamlined delivery of applications has tremendously reduced the complexity and expense of our development and maintenance processes. And for our customers, the assembled software model means that applications are implemented faster, the functionality fits their needs better, and the cost of entry is lower.”

Always RPG, always an IBM Business Partner

An IBM Business Partner since 1984, Excelligent developed a comprehensive ERP offering, AAA Business Suite Software, that it began marketing in 1988. This offering was written in RPG and depended on the ubiquitous 5250 display (green screen) as the user interface.

AAA BUSINESS SUITE was a solid success, allowing the company to grow the number of its clients significantly. However, the IT world never stands still, nor do the businesses that rely on these systems, so Excelligent began looking at ways
to redesign its application architecture to be more resilient to changing business needs, while preserving the proven RPG code and utilizing the company’s existing RPG skills. “As soon as the IBM Integrated Language Environment (ILE) for RPG was announced, we thought it was the perfect tool,” says Deboutte.

Six developers spent three years moving the existing code into ILE RPG. This involved separating the business logic into reusable components, breaking out the screen logic, and moving as much of the data calculations as possible into the database engine itself (IBM DB2 UDB for i5/OS). The components were also grouped into domains as determined by their typical value to a particular business process (accounting, accounts receivable, order entry, purchasing, and so on).

**Custom-manufactured solutions upgrade the client relationship**

There is nothing unconventional about moving older RPG applications to ILE RPG, though this effort does take diligence and careful planning. However, Excelligent did something rather uncommon and very clever by building an application source generator, all of which is written in ILE RPG (Figure 1). This approach ensures that the new code was more consistent and maintainable and also allows for the very rapid manufacture of application code. The generator receives input from an application dictionary that contains client specifications (a customized application model). It also uses templates with architectural rules (for example, the common user access [CUA] rules for building a 5250 screen). Additionally, the generator folds into the application all required connectors to a rich set of Excelligent foundation components as well as connectors to general services.

A driving consideration during the transition to ILE RPG and the creation of the source generator was the commitment to make sure that the resulting applications could be implemented throughout the European subcontinent. Every function had to be language-independent and comply with legal requirements throughout the European Union (EU). The data description specifications (DDS) and message members had to be available in seven languages (Dutch, German, French, English, Spanish, Italian, and Polish). Therefore, Excelligent also built a translation generator that converts the application screens and message members to these languages. This tool is based on a set of language correspondence and synonym dictionaries. The initial population of these language dictionaries is performed by native speaking application users.

Deboutte explains that the company has amassed critical business consulting expertise during its long history; this is valuable to both its clients and its development efforts. Excelligent can now take advantage of its deep industry expertise by having its business analysts work directly with a client to review the rich inventory of functions that are already precoded (as ILE RPG components). These functions are role-based, which means that the user presentation of the application that is generated for a bookkeeper will vary from the presentation of the same accounting application to the vice president of finance. “This is a paradigm shift in the way we interact with our clients,” says Jan De Witte, marketing manager for Excelligent. “Until we developed the source generator, our value to our clients was more IT-driven. Now, however, we enjoy a business consultative interplay with them. Not only can AAA Business Suite applications adapt to the needs of the client, but because of our experience, the customer almost always moves closer to a best-practices set of processes when they see the tremendous additional value our applications bring to the environment.

“The typical timeline and effort required to build customized solutions with ILE RPG has been cut by more than 70%, as compared to our previous model that involved handcoding the special requirements for a new client.”

– Erik Deboute, General Manager, Excelligent, N.V.
Excelligent wrote conversion utilities in order to provide its existing client base with an easy transition to the new functions delivered by the componentized application code.

**Web-facing provides graphical interface and Web enablement**

Deboutte is quick to assert that moving to the automated generation of custom applications was a resounding success, which continues to provide the company with powerful, flexible, and affordable solutions for all its clients. However, as the new millennium began to unfold, the strongest, and very immediate concern for Excelligent was the need to modernize its AAA Business Suite software once again, in order to provide graphical user interfaces and secure, Web-based access to the applications. “While the move to the ILE and the source generator was driven by the desire for better strategic positioning and cost containment, the impetus for graphical screens and Web enablement was more harsh: pure market survival. There was no return-on-investment decision in regard to browser interfaces; this was a must-do decision. However, there was an ROI consideration related to how the company would go about delivering graphical, Web-based access to AAA Business Suite,” Deboutte candidly states. Three options were investigated.

- Screenscraping would have required processing each of the application’s 2000+ screens (that is, 2000+ screens times six languages) individually. This alternative was not attractive to the developers who had long enjoyed the efficiency of automatically generating large volumes of code according to predefined formulas.
- A Java client was seriously discussed. In 2003, the developers even implemented a Java client prototype from a subset of the AAA BUSINESS SUITE code. Although the resulting HTML and browser-based graphical interface worked well, this alternative also required too much manual work, considering the volume of interfaces to modify. In fact, estimates indicated that the implementation of a Java client throughout the Excelligent software would consume 10 times the development effort that was originally required to develop the application itself. However, Marleen Martens, development manager for Excelligent explains that this prototyping effort did allow the programmers to gain valuable experience with n-tier technology. This knowledge would prove beneficial with the use of the IBM WebSphere® Application Server, which became part of the company’s ultimate Web enablement architecture.

- The IBM WebFacing Tool for iSeries surfaced as the most attractive alternative because all the source code continues to be the property of Excellent and it allows for easy and fast modification. Excelligent chose this avenue in 2004 and immediately set about customizing the templates included with this tool to suit the needs of the AAA BUSINESS SUITE application suite. It was also necessary to adjust the format of the DDS code a little in order to feed better input to the IBM WebFacing Tool. These DDS changes included information necessary for the JavaServer Pages™ (JSPs™) and information required for the IBM WebFacing Tool.

At first glance, the IBM WebFacing Tool was going to require that, each time the source generator produced a new, customized AAA BUSINESS SUITE application, every screen must be reprocessed to reflect its unique browser elements. But as you might have already discerned, Excellent’s developers are loathe to do anything manually when an automated rewrite is possible; and these resourceful guys found a way to batch-generate the Web-faced screens (Figure 2). The source generator was even adapted to include
all the necessary instructions for the IBM WebFacing Tool to produce the screen generations. The entire Web-facing effort took the six Excelligent developers less than nine months to accomplish. Amazingly, Excelligent can now produce a customer or role-specific application that contains as many as 2000+ browser screens automatically from DDS in a single hour.

Martens confides that there are some limitations with using DDS as the screen input source. For this reason, the company is moving toward XML technology, which is better for HTML presentations. There are a few additional technical tidbits regarding the application architecture since embracing the IBM WebFacing Tool; it does not require the system to have the iSeries interactive feature, which saves customers money. Instead, the Web-faced applications are served to each user through a WebSphere Application Server that interfaces with the business logic in an n-tier manner. “This can all be implemented on a single System i machine,” says Martens.

The ILE RPG source generator (that Excelligent wrote), coupled with the IBM WebFacing Tool, allows the AAA Business Suite to integrate seamlessly with e-mail systems, whether they are delivered from a Linux®, Microsoft® Outlook®, or IBM Lotus® Domino® mail server. This integration allows generation of e-mail messages from the application to proactively inform users that their attention is required in AAA Business Suite. It also supports the capability to send information originating from AAA Business Suite transactions to users through e-mail messages and attachments.

The source generator even takes advantage of some Eclipse tools. (Eclipse is an open source community whose projects are focused on providing an extensible development platform and application frameworks for building software.) However, the integration of new IBM and Web technologies will not stop here. Excelligent invests in excess of 10% of annual revenues in enhancing and refining AAA Business Suite. De Witte explains, “This continuous investment in new technology and software solutions is the best way to guarantee high quality and up-to-date applications for today’s rapidly changing business environment.”

For more information

Contact your IBM sales representative, or Excelligent, N.V. (www.excelligent.be), or visit IBM at: ibm.com/server

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