From 20+ application packages to one new solution

fecher modernization project consolidates local government software to a single new platform

The Tempest Development Group's client list includes 50 cities, communities and districts in British Columbia, Alberta and Washington State. Headquartered in a Vancouver suburb, the company has become a leading provider of eGovernment solutions in Western Canada. All of these 20 plus municipal administration application packages were gradually developed since 1993 using the 4GL Gupta Team Developer environment. fecher's application modernization project enabled Tempest to migrate away from this outdated platform and simultaneously transfer its application solutions to a standardized, consistent architecture.

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Tempest's applications cover a wide spectrum of local government business operations, whether at the city, community or district level. They handle dog licenses as well as business licenses, property taxes, building permits, traffic tickets and fines. The Tempest Development Group's Senior Product Manager Mike Jensen explains the dilemma: "While we had an integrated system at the database level, every application was an independent executable. The applications often contained duplicated code as over time there had become many versions of code for performing very similar core product functionality. More importantly, the separate EXEs required users to run multiple applications and re-enter query or account number information if they wanted to follow the integrated data from one application to another. Also there were development inefficiencies. For example, if we wanted to modify the menu operation logic, we would have to make these changes in dozens of places simultaneously."

Team Developer was once a reliable development platform back in the early years of the company. A tight database integration allowed Tempest to quickly turn their business know-how into working software. Back then, clients were also happy that the applications were being installed locally. "Local governments, however, are now demanding more than just working software," explains Mike Jensen. "As a premium player in this market, long-term we can only maintain our premium status if our software keeps up with technological developments." The 15-person development team had become more and more constrained by the 4GL nature of the Gupta Tools. “The rapid development capabilities that Gupta provided were no longer our top priority. We now needed more control and the time delay in waiting for new technology features to become available in the development tools was becoming more of a concern," Mike Jensen adds.

Best to look before you leap

It was also getting hard to find and hire people that wanted to program with Gupta. Young graduates who were used to C# and Visual Studio considered Team Developer to be a software development dinosaur. It became very clear that Mike Jensen had to make a decision when clients also began questioning its use. "By the end of 2013, we were sure we had to convert our software to .NET. It was the only way to create the foundation we needed. We wanted to consolidate our solutions and give them a fresh look and feel, plus at the same time prepare for web-enabling them in the next step," explains the manager.

The Tempest project team – back row (left to right): Michael Jensen, Blake Collins, Chris Tsui, Jan Pradas. Front row: Junko Yamamoto, Dianna Winslow, Rhea Reyes, Jason Matthews.

“The challenge was that the Gupta 4GL tools had allowed us to develop a large product base with a small team, thus we felt that completely rewriting the software as a web app in .NET was not something that could happen in a timely manner. It would have meant freezing development for several years. Also, the associated risk level was very high," says Mike Jensen. Instead, they decided on Ice Tea Group's porting tools and fecher, the Premium Porting Partner they recommended. At this point, fecher had already successfully completed more than 150 similar tool-based porting projects. Tempest did not, however, have to rely only on ITG's recommendation: a thorough code analysis let their developers clearly see the possibilities offered by a porting project. To obtain the analysis, Tempest sent fecher the application code and received a detailed report highlighting the challenges involved and what the process would look like.

Extensive prototyping conducted at the end of 2013 provided an even greater level of clarity. Mike Jensen explains, "During this process, we quickly saw that the fecher team members really knew what they were doing. As the project plan they submitted was well thought out, it was an easy decision for us to make." Working with fecher also made the project riskless: The porting specialists submitted a fixed price offer with a guaranteed completion date and the assurance that all improvements made to the applications during the porting phase would also be included at the end of the project. The go-ahead to convert a total of 1.6 million SAL items to the new platform was given in April 2014.

Porting as a moving target

It wasn't only the large number of code lines that made this project unusual. During the 18-month project cycle, fecher had to master an even greater challenge - parallel refactoring implementation. Tempest had decided it would thoroughly clean its old Gupta code - some of which was more than 15 years old - before handing it over for porting. Meaning, every two weeks fecher received all of the Team Developer code that had been refactored to-date and, in return, delivered the current porting state as a C# project for Visual Studio.

"As development continued throughout the entire project, pieces of code we had already ported kept changing," explains Andrea Bradea, fecher Project Manager. "We were dealing with pieces of code in the various applications that were identical, except they were in different development stages." The fecher team therefore worked closely with Tempest's developers to identify redundant code and, in each case, the final version of the code was taken to a shared library. Moreover, the various applications often used different solution approaches for the same task. For these cases, Tempest selected the best-practices approach, which was then included in the new code base.

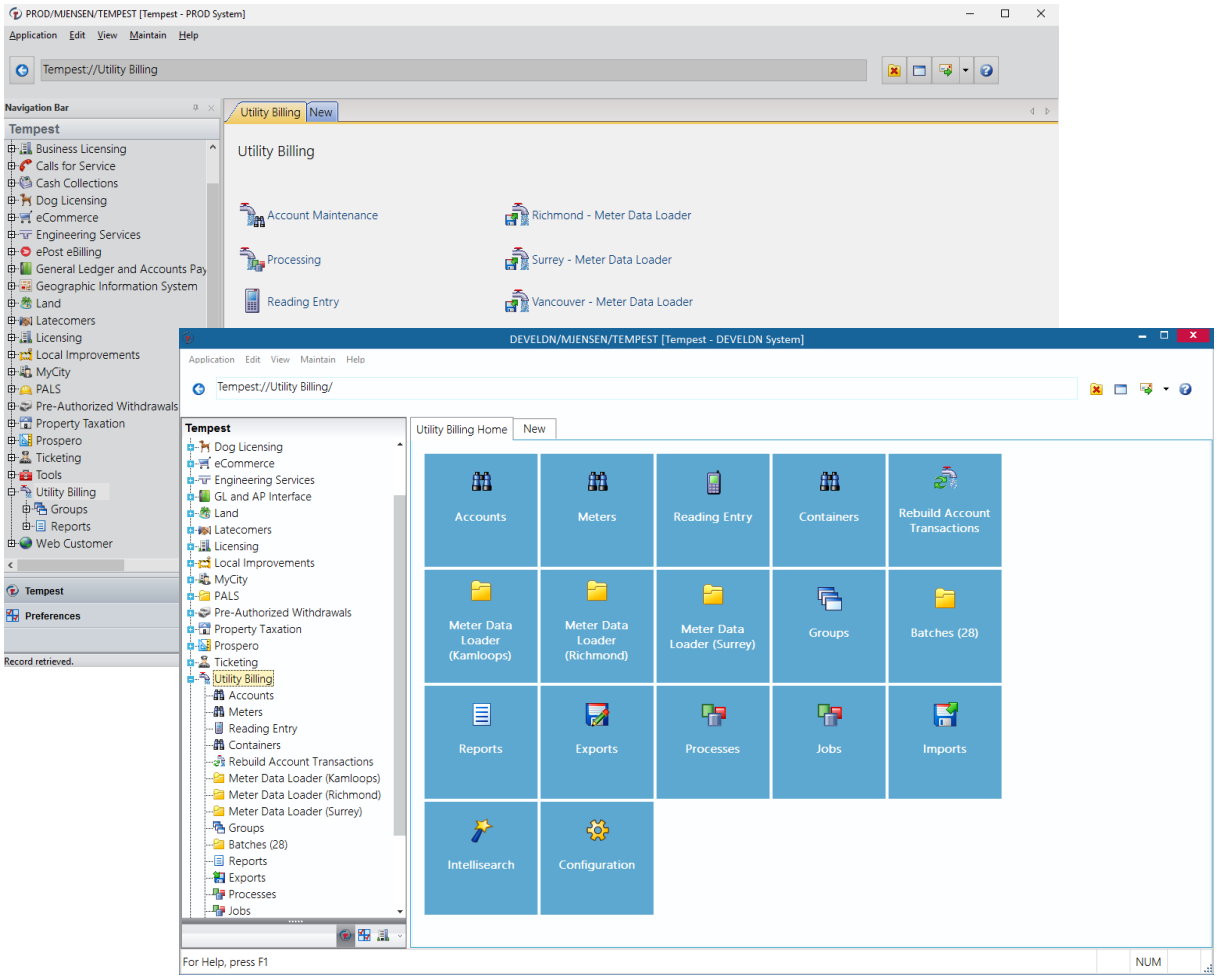
By project completion in September 2015, fecher had successfully ported all of Tempest's code to .NET and split it up into 780 C# projects within a single master solution. "Instead of 50 individual stand-alone applications, we now have only one application with a very modular architecture," rejoices Mike Jensen. The addition of functional changes and new application workflows throughout the project made it impossible for fecher to conduct the usual final function test. Instead, Tempest carried out an internal acceptance test for several months before beta testing the new software with the first five clients in March 2016.

The result? Happy clients!

Not only did the testers provide valuable feedback concerning the new functions, they also found a few errors that had not been identified during the internal testing phase. "Most of all, clients confirmed to us that the application is now much easier to navigate and use," says Mike Jensen, summarizing the feedback. "The user interface under .NET is much less cluttered. In particular, the users that work with several of our applications are pleased that we have standardized the operation and workflows. This has also reduced the amount of training needed."

At the same time Tempest was conducting its well-received field test, the company documented the new software version from which it then created upgrade management materials. The July 2016 roll out, which started with Tempest's beta clients, could thus proceed as scheduled. By the end of 2017, all of the remaining fifty clients will gradually be transitioned to the new software.

“When this new version is rolled out, Tempest application users will be able to seamlessly travel from one application to another quickly and easily following the trail of the already integrated data. Our developers will also be free to take advantage of many of the features available in C#.NET to extend our product’s features and our Mangers and Team Leads are beginning to experience the productivity gains from reduced developer onboarding times and the wealth of support available over the web for the .NET platform.”



Utility Billing - Old and new menu level

The future will be web-based

Mike Jensen is very pleased with the porting project. "Our application's value is now safely in C# code and we can build on that," he says, summarizing the achievement. In the future, he sees the application as a web-solution, although this will have to meet increased security requirements for the public sector. For example, cloud technology could only be used if the hosting was Canada-based. "For our clients, even more important than the cloud is the availability of a web front-end. As a browser application, our software will be available from any location and there will be no more local desktop management required by our client's IT staff."

He plans on developing this strategy over the coming months and sees the application modernizers from Germany as a strong viable solution that would provide a web-enabled software in a timely fashion: "Throughout the project, the fecher porting team proved to us many times that fecher can ably master our special challenges."

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