

FIELDS OF DREAMS

MEDHOST accommodates growing healthcare providers with expanded field lengths



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Application end users typically don't think about back-end programming. They simply use the tools at hand that make them more productive to support their organizations. And why wouldn't they? Well-written programs are users' conduits to crucial data related to customers, sales or accounting functions, for example.

But front-line application developers are well aware of how seemingly invisible processes truly operate. After all, even if they didn't actually write the programs, they're often charged with supporting them. So when issues such as the length of character fields come into play, these developers must ensure they can quickly address them.

That was the situation MEDHOST, an application developer and hosting service provider for the medical industry, faced when a client requested that MEDHOST's application character fields be enlarged to support its growing business. After exploring options to accommodate this request, including manually extending the fields, MEDHOST decided instead to use several key tools from Fresche, including X-Analysis, X-Open and X-Resize, to quickly and cleanly streamline the process.

"Based on the magnitude and depth of the project, I can't imagine the amount of human hours that would have been required to match what X-Resize can do in just hours—without bringing in the potential for human error," remarks Cliff Dowell, former senior software engineer with MEDHOST. "It's really quite amazing."

Customer First

Headquartered in Franklin, Tennessee, MEDHOST offers a variety of IBM Power Systems* technology-based application offerings for the healthcare community, either locally hosted by MEDHOST or supported on customer systems. Applications within the suite of enterprise clinicals, financials, patient access and revenue cycle include MEDHOST Emergency Department Information System (EDIS), MEDHOST PatientFlow HD, MEDHOST Advanced Perioperative Information Management System (PIMS), and the software as a service (SaaS)- and cloud-based MEDHOST YourCareCommunity, and executive dashboard MEDHOST Business Intelligence.

"Around two-thirds of our offerings have a Java* interface and the other third a green-screen menuing system," Dowell notes. "For example, a hospital may be using all GUI-based apps or a mix, where doctors might use the Java front end but the pharmacy an RPG-based green screen. It's up to the customer which interface they prefer and, to some degree, it's driven by the application release they're running."

In an effort to ensure its customers (which include approximately 1,000 facilities)



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200

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get the most from their MEDHOST experience, the company has a 12-member physician advisory board that provides upfront input on software and ongoing support throughout the development process. This helps keep MEDHOST's offerings tightly aligned with overall healthcare-community wants, needs and requirements.

To further this goal, MEDHOST offers services designed to bolster both hosted and managed IT environments. Some organizations with their own IT departments can take advantage of MEDHOST Managed IT Services, which includes, among other offerings, remote-system management and disaster recovery services. Others can use MEDHOST Direct to avoid having to support their own IT environments by contracting with MEDHOST to support all or some of its IT assets.

"The hardware hosting is broken down by LPAR, so each customer will have a separate operating environment. They log in to our systems, but as far as they're concerned, everything appears local to them. This service is mainly used by smaller community hospitals or clinics. Most of our larger clients have their

own Power Systems environment and in-house IT staff. But when it comes to custom reporting, even they'll tap into our databases to gather the appropriate information," Dowell says.

Of Bytes and Men

Of course, not all MEDHOST customers are alike. Larger ones may require additional application and database support due to their size and business model, which is often directed by ongoing growth. In such cases, limited character fields must be expanded to identify distinct clinical facilities, geographic locations and occasionally even individual patients.

When MEDHOST began building its applications and database structures in 1984, this wasn't much of an issue and three-byte fields were more than enough for the company's client base. In fact, one client cleverly used the first two bytes to indicate how many hospitals and clinics were in specific regions, and the third byte was taken up by the particular regions.

As Dowell explains, "Initially, they wanted to use the first byte to indicate a region, but they eventually decided to use the 100th position instead. That way they would know, for example, that there were 99 hospitals in region 7, as in 997. As they grew, though, there were regions that had more than 99 facilities. To somewhat complicate the matter, there were also patient identifiers that included not just a patient number, but also what hospital they were in. So we obviously had to devise a way to expand the field beyond three bytes."

This meant changes to not just the database, but also the overlying applications. If a database field is extended from three bytes to four, that extension also must be reflected in the software. If not, the application is likely to fail.



Cliff Dowell, former senior software engineer, MEDHOST

UP CLOSE

Customer: MEDHOST Inc.

Headquarters: Franklin, Tennessee

Business: Full-service enterprise and best-of-breed application developer and hosting company for the healthcare industry

Challenge: Increase database field lengths to accommodate a growing customer

Solution: Using several tools from Fresche Solutions to ensure that changes in field length were also reflected in MEDHOST's applications without disrupting customer operations

Hardware: A variety of IBM Power Systems servers

Software: Fresche Solutions' X-Analyze, X-Open and X-Resize



Making changes to the database and the corresponding function of the software is no easy chore, especially when handled manually. The potential exists for human error as each database-connection change must be correctly assigned to the affected application fields.

So, rather than spend many labor hours on a manual conversion, the company turned

to Databorough, which has since been acquired by Fresche, and its X-Analysis, X-Open and X-Resize tools. MEDHOST also reached out to contractor Simon Savage to help with the initial setup, as well as to fine-tune some of the complexities in the iterative processes involved in resizing.

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Sleeping Well at Night

With everything now in place, MEDHOST began the job of resizing the appropriate fields. The first step in this process is running X-Analysis, which, according to Dowell, “rebuilds the file base.” It finds out what fields are in the file, what the fields look like and whether, for example, they’re numeric or alpha, and how big they are. It then indicates which programs use the fields.

“In a perfect world, everything would be correctly identified, as in ‘Hey, this is a hospital number.’ However, because not every programmer names everything the same thing even though they are, you do have to in some cases take a cursory look at things to make sure they’re correctly identified. But when you’re talking about hundreds of lines of code, the relative few you have to examine really isn’t a big deal,” Dowell adds.

The company also uses X-Open during this process. This tool scours code not native to IBM i, including Java in Apache Subversion (SVN) repositories, to look for any changes that have to be made there, in addition to the RPG applications found by X-Analysis. Dowell and his team then notify the Java team as to what field alterations should be made and where.

Next, X-Resize is brought into the mix. Based on the X-Analysis output, which Dowell describes as a “sunburst,” with field-size changes emanating outward from the analyzed impact changes may have on applications, X-Resize will update the RPG application code to reflect where application changes should be made.

“Essentially, X-Resize will run through the code and indicate that a field is a three

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—Cliff Dowell, former senior software engineer, MEDHOST

but should be a four. It then comments the old code and puts in the new code line, at which point the application is ready to be recompiled,” Dowell says. “Simon Savage, who was so good with the source-manipulation process, ended up building a recompile process for my box so I didn’t have to manually change source code.” This work was expanded upon by teammate James Orr and eventually included an import/export for the company’s change management system.

X-Resize also marks comments in the code to indicate what has changed during this automated process. This is simple due diligence, and MEDHOST is now able to review where changes were made and exclude them if they’re not necessary. Dowell describes it as a “trust but verify” process where developers can ensure the one-button solution functions as it should. In the healthcare industry, this is critical. “We want to be able to sleep well at night, as patient safety is paramount to our mission,” Dowell adds.

A Dramatic Difference

Although this work was conducted largely based on the request of one big customer, the results have since been rolled out to others in next-

generation releases of the impacted applications. While this helps alleviate back-end headaches caused by having to support multiple versions of an application, it more significantly allows all MEDHOST customers to have the same functionality.

Without tools such as X-Analysis, X-Open and X-Resize, this job would likely have been a logistical nightmare—and perhaps inaccurate. Preliminary analyses of projected changes radiating from field alterations indicated only 200 or so files would have to be changed. However, X-Analysis and X-Resize spotted around 1,600.

“The tools’ count and their depth and vision were so much more complete than any human hand could easily find. Obviously, the number of hours it would’ve taken to catch those would’ve been dramatic—and a drain on our resources,” Dowell remarks.

Although this effort was comprehensive from the developers’ point of view, it greatly benefited end users, who are focused on matters other than what happens at developer consoles. And that’s the point: supporting users without impacting their front-line work. **P**

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