



**Prospective Medical Data International Inc.**

Burlington, Massachusetts  
[www.pmd-int.com](http://www.pmd-int.com)

**Results**

- Built multi-lingual software platform for creating and conducting patient/clinician reported outcome studies in over 40 countries
- Helped ensure the security, privacy, and integrity of collected health data
- Developed applications with ColdFusion twice as fast as it could on other platforms
- Improved hardware utilization up to 40% with virtual ColdFusion servers

Prospective Medical Data International Inc.

## Patient data management

Medical software manufacturer uses Adobe ColdFusion to more securely collect electronic clinical outcome assessment (eCOA) data

Efficiently and effectively capturing people's medical experiences and histories can be challenging, given the complicated environments in which healthcare professionals work today. Once healthcare providers, researchers, or administrators capture personal information, they are bound by strict rules that govern clinical practices, patient privacy, technical challenges, and regulatory requirements.

Prospective Medical Data International Inc. (PMDI) builds software that queries, collects, and disseminates health-related eCOA information from people participating in late-phase (Phase IV) clinical research. eCOA includes electronic patient-reported outcomes (ePROs) which are used in both clinical research trials and to support patients undergoing regular care. For example, an ePRO system may be used to collect symptom information from chemotherapy patients who use handheld diaries to submit data. This allows clinic staff to monitor outpatients and to identify the occurrence of adverse reactions that may require intervention.

With PMDI's Question MagiXX Framework (QMF), clients have a tool with all the checks and balances necessary for handling patient data—such as enhanced security and privacy—and mechanisms to authenticate data. The QMF clinical outcome data capture platform is used for setting up more secure, real-time, workflow-based, and validated data collection systems. Users such as clinicians, nurses, patients, caregivers, and researchers can be granted role-based access to help ensure the timeliness and integrity of the data they enter.

Built using Adobe ColdFusion, QMF consists of a desktop application and a web application. The desktop application lets users design and configure electronic web-based data collection systems (EWDCS). The QMF web application uses the EWDCS to run studies via the Internet.

"The good thing is that someone with no knowledge of programming or web layout can create an EWDCS application using the QMF desktop application," says Maartje Smulders, CEO of PMDI. "The desktop application is basically an automated computer program that happens to generate Adobe ColdFusion code, which is picked up by the QMF web application. In other words, all our clients are ColdFusion programmers, often without realizing it."

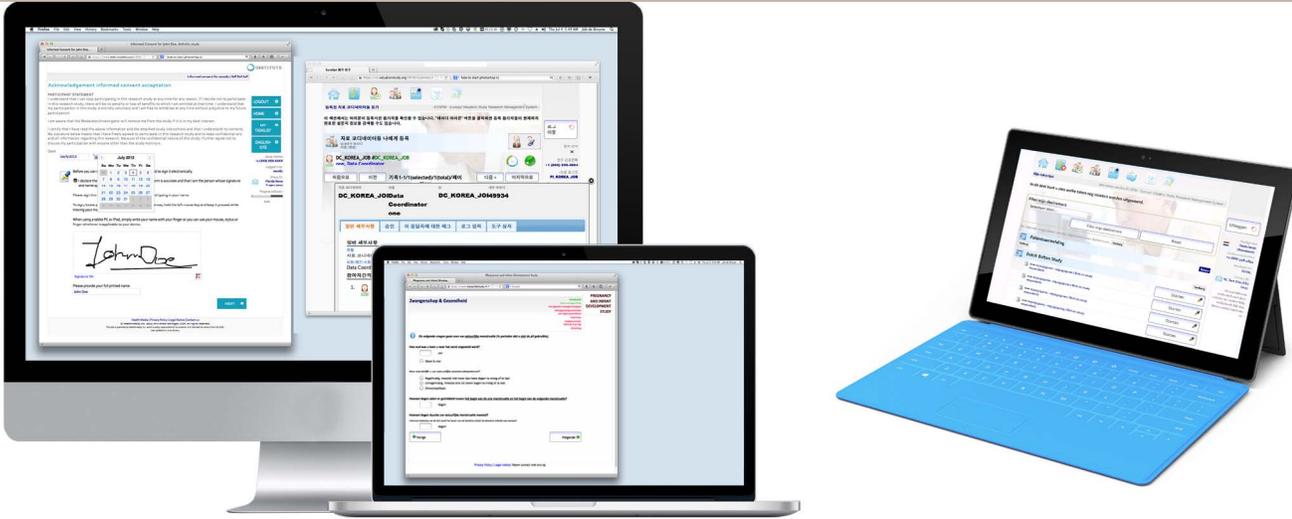
### QMF's ColdFusion origins

Job de Bruyne, founder and global operations director at PMDI, had no web development experience until he was introduced to Adobe ColdFusion in 2001. Luckily, Adobe ColdFusion was easy to learn and easy to master, and it became one of de Bruyne's favorite tools.

"When work began on QMF, several development platforms were evaluated," says de Bruyne. "Compared to other alternatives, we liked the speed at which we could develop with Adobe ColdFusion. Plus, the other products available were too convoluted and not as intuitive."

More than 10 years later after launching QMF, Adobe ColdFusion is still the foundation for developing PMDI's health data capture solutions. The primary reasons PMDI uses ColdFusion include the software's abundance of features and its stability. For example, Adobe ColdFusion is able to provide web services, professional-grade encryption, digital signatures, PDF generation, and Microsoft Office document creation. Furthermore, PMDI values the careful control of ColdFusion features that Adobe brings to each upgraded product release.

PMDI chose Adobe ColdFusion as the foundation to develop their QMF product because of the development platform's speed of development, stability, and abundance of features including web services, professional-grade encryption, digital signatures, PDF generation, and Microsoft Office document creation.



### Challenge

- Creating electronic web-based data collection systems that comply with legal and regulatory requirements
- Access to Java built assets by non-Java programmers
- Rapidly establishing ColdFusion servers for client projects

### Solution

Using Adobe ColdFusion and Adobe ColdFusion Builder as a foundation for designing, configuring, and deploying electronic, web-based data collection systems and for using those systems to collect patient data via the Internet

### Systems at a glance

Adobe ColdFusion  
Adobe ColdFusion Builder

"We have peace of mind that our proprietary QMF software will also work in subsequent versions of ColdFusion," says de Bruyne. "There are free web development tools out there, but they don't have the performance and reliability that we get in ColdFusion. ColdFusion significantly improves our productivity."

### Simplifying software development

Because ColdFusion is built on the Java™ Platform, Enterprise Edition (Java EE), PMDI uses the Java capabilities built into Adobe ColdFusion to better manage the privacy and integrity of its medical and health data. For instance, through the Java engine, Adobe ColdFusion enables the use of digital signatures.

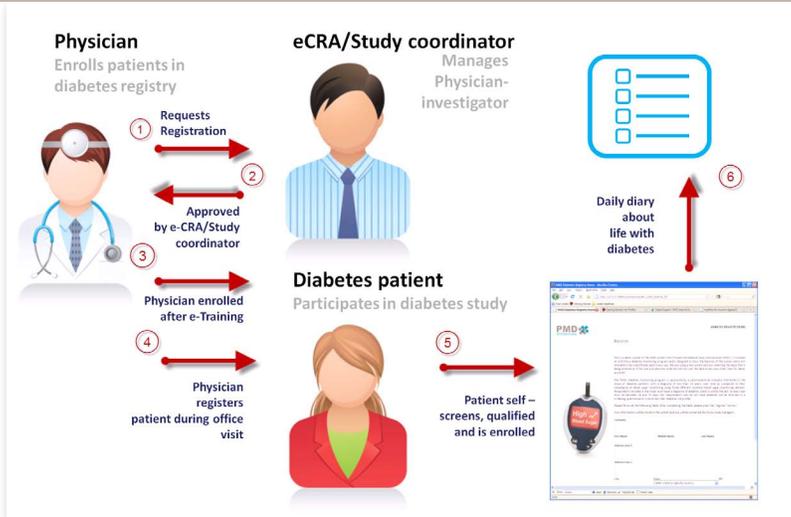
PMDI developed QMF to comply with legal and regulatory requirements for health information, such as the U.S. Health Insurance Portability and Accountability Act (HIPAA), the U.S. Food and Drug Administration's Part 11 regulations concerning electronic records, electronic signatures, audit logs, change logs, computer systems validation (CSV), and equivalent regulations worldwide. Through ColdFusion Builder™, the Adobe solution's integrated development environment (IDE), PMDI maintains the software validation and documentation required for regulatory compliance. Adobe ColdFusion Builder integrates easily with PMDI's open-source software quality management system (CVS/GitHub), which keeps track of what code is in production, who created it, and who changed it.

"Because of this quality management integration, we have fewer software imperfections and are better equipped to deal with project-specific code differentiations," says Lorne Cheeseman, quality director at PMDI. "Adobe ColdFusion saves us the labor of having to manually migrate changes into multiple systems. It's a huge cost saver. Before, this was repetitive work. Now, it's a largely automated process."

Because ColdFusion has native access to each Java release, PMDI can use any component developed in Java and hook it up to ColdFusion. In other words, the world of Java is at PMDI's disposal, but the company does not need to hire a contingent of Java programmers to accomplish it. In fact, the straightforward use and relatively-flat learning curve afforded by ColdFusion means it's easy for the bulk of PMDI programmers to write and maintain application code without having to master Java.

Furthermore, ColdFusion Builder helps developers deploy ColdFusion applications faster by using timesaving features such as code searching and navigation, and numerous automated coding tasks. It also allows PMDI to outsource software development for standalone QMF components while protecting the company's intellectual property.

The combination of Adobe ColdFusion and ColdFusion Builder helps speed up product packaging and deployments for PMDI. Adobe ColdFusion Builder helps developers deploy ColdFusion applications faster by using timesaving features such as code searching and navigation, and numerous automated coding tasks.



*“When work began on QMF, several development platforms were evaluated. Compared to other alternatives, we liked the speed at which we could develop with Adobe ColdFusion. Plus, the other products available were too convoluted and not as intuitive.”*

Job de Bruyne, founder and operations director, PMDI

“Adobe ColdFusion Builder speeds up product packaging and deployments. Product launches that used to take a day can now be executed in less than two hours,” says de Bruyne. “Because of our ability to better manage complexity, we can also get our versions released faster. With the combination of Adobe ColdFusion and ColdFusion Builder, we now launch a new release each year. Before, this took us one-and-a-half years.”

Adobe ColdFusion eliminates PMDI’s reliance on web development solutions from third parties, too. Because the company can build what it needs with ColdFusion or as a ColdFusion component in Java, not having to accommodate multiple vendors, languages, and standards saves the company one FTE, which it can reallocate to other needs.

### Efficiency across the board

Another benefit of Adobe ColdFusion being built on the standards-based Java EE platform is how users can run multiple completely isolated instances of the QMF applications—effectively multiple ColdFusion servers—on the same physical machine. The Java virtual machine enables the ability to write ColdFusion applications that can run anywhere. It also helps optimize hardware utilization.

“Now we can put more QMF systems for more clients on one physical server, and at the end of the day that saves us more money per month,” says de Bruyne. “With Adobe ColdFusion, we can have up to 40% more projects on one server. With QMF being used in more than 40 countries globally this benefit can add up quickly.”

Virtualization capabilities greatly simplify the deployment of ColdFusion applications, on which its clients’ surveys run in the cloud. Before virtualization, provisioning new servers and applications took PMDI about one month, including hardware acquisition, setup, configuration, and ColdFusion installation. Now, a virtualized server can be set up in just 20 minutes. “Within two hours, I can have a virtual server running with ColdFusion installed,” adds de Bruyne.

Looking ahead, PMDI expects to continue using Adobe ColdFusion to create and manage EWDCSs, and expanding the capabilities of QMF as Adobe expands its native support to include web development technologies such as AngularJS, jQuery, and Bootstrap.

**For more information**  
[www.adobe.com/products/coldfusion-family.html](http://www.adobe.com/products/coldfusion-family.html)



Adobe Systems Incorporated  
345 Park Avenue  
San Jose, CA 95110-2704  
USA  
[www.adobe.com](http://www.adobe.com)

© 2013 Adobe Systems Incorporated. All rights reserved. Printed in the USA.

Adobe, the Adobe logo, ColdFusion, and ColdFusion Builder are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries. Java is a trademark or registered trademark of Oracle and/or its affiliates. All other trademarks are the property of their respective owners.

91084983 7/13