



## Commissioning Services Provider Uses Software-plus-Services for Global Markets

### Overview

**Country or Region:** United Kingdom

**Industry:** Healthcare

### Customer Profile

Based in London, England, Humana Europe provides commissioning services to the United Kingdom's National Health Service. It employs 80 people.

### Business Situation

Setting up operations in the United Kingdom, Humana Europe had a target market of local Primary Care Trusts (PCTs). It needed to decide which technologies to use and the best method of delivering them.

### Solution

Humana Europe chose the software-plus-services model to provide PCTs with commissioned services that are built with Microsoft® technologies using the Microsoft Visual Studio® 2008 development system. Humana partnered with Infusion Development to design the user interface.

### Benefits

- Gives customers more choice
- Reduces development time
- Improves administrative productivity
- Provides a holistic view of patients
- Opens new market possibilities

**“Microsoft technologies and the software-plus-services model help us to improve healthcare service delivery on both sides of the Atlantic.”**

*Dr. Ramu Kannan, IT Director, Humana Europe*

Based in London, England, Humana Europe is a subsidiary of Humana Inc., an American health benefits company. When Humana Europe was named an approved supplier to 152 regional Primary Care Trusts (PCTs) within the United Kingdom's National Health Service, it looked for the best technologies to develop applications for the PCTs, and an optimal method for delivering them. Humana Europe chose the Microsoft® Application Platform, including the Visual Studio® 2008 development system to cut development time and differentiate its products with superior business intelligence and data visualization capabilities. It chose a software-plus-services model that's scalable, cost-effective, and easy for the PCTs to consume. PCT staff members require only a browser, Microsoft Office programs, and Microsoft Silverlight™—a free download—to access and interact with the healthcare services online.

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## Situation

Humana Europe is a clinician-led organization with expertise in health service design, data and knowledge management, contracting, provider performance management, communications and engagement, and motivational programs that promote healthy behavior. Humana Europe is a wholly owned subsidiary of Humana Inc., a leading health benefits company in the United States.

Humana has 47 years of experience in healthcare management, and a history of embracing innovative change in the areas of patient-centric wellness programs and services that reduce the burden of preventable diseases. Humana's other key strength lies in its data and knowledge management expertise, integrating powerful business intelligence capabilities into software applications to help end users make better use of information.

In 2006, the National Health Service (NHS) in the United Kingdom initiated a restructuring initiative that reduced the number of Primary Care Trusts (PCTs) from 350 to 152. The NHS is a publicly funded healthcare system for U.K. residents. PCTs are statutory bodies that are responsible for delivering healthcare services to a local area based on an allotted budget from the NHS. The U.K.'s Department of Health ordered the restructuring to reduce costs and improve NHS service delivery, placing the PCTs at the center of government policies to execute healthcare reforms.

## Encouraging a Different Approach

Despite the increasing amount of money and resources the British government has allocated to the NHS (it is the world's largest health service, and the world's fourth largest employer), this service model was not sustainable. In 2006, the NHS took steps to encourage a new service delivery

model for the PCTs based on the commissioning of healthcare services and taking advantage of the expertise of private sector healthcare companies. It called this model the Framework for Procuring External Support for Commissioners (FESC). Commissioning is a process that enables the PCTs to procure third-party resources to plan and deliver high-quality services that meet the healthcare needs of their local communities. Examples of these services include data and knowledge management, clinical programs, intervention, consulting, communications, and patient engagement programs.

Traditionally, PCTs have provided services directly to their local population, but they have also commissioned hospital and mental health services from NHS trusts or from the private sector. This activity puts the PCT in a similar position as the “payor” in the United States. With a goal to improve quality and productivity, the FESC is designed to extend the commissioning function within the PCTs so they can easily access expert healthcare technology, consulting, and other services from private sector healthcare companies. These suppliers would have to apply to the FESC for authorization to do business with the PCTs.

## Taking Advantage of an Opportunity

To expand internationally, Humana applied to become one of the FESC's approved vendors. “Humana has a wealth of experience in structuring and organizing data to achieve optimal managed care programs. It seemed like our areas of expertise would add significant value to the NHS,” says Dr. Ramu Kannan, IT Director, Humana Europe. “In the U.K., everyone has an NHS number, and we were intrigued by the opportunity to pull together a lifetime of healthcare information around each patient in a way that's currently not

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Leyan Phillips, Marketing and Communications Director, Humana Europe

possible in the United States, where patients move from payor to payor."

In October 2007, Humana was chosen to be one of 14 FESC-approved vendors and one of three companies endorsed to provide support across a range of 162 different service areas.

In response, Humana created a subsidiary, Humana Europe, to establish operations in the U.K. Humana Europe did not receive explicit recommendations from FESC on what kind of applications to make available to the PCTs. The first challenge for the new organization was to choose the right technologies and the right service delivery model to win business with the PCTs.

### Solution

Humana Europe chose a software-plus-services model of delivery for its U.K. operations for a number of reasons. The software-plus-services model describes a combination of Internet services and local software interacting with each other. In this case, Humana would provide a series of modular clinical, administrative, and financial healthcare software services. On the client side, PCT staff would use their browsers to access the services and their Microsoft® Office programs to interact with the services. Local users would also download Microsoft Silverlight™, a free plug-in for their browser that only takes seconds to install, to enjoy the rich visuals and interactivity that Humana planned on building into its services. The benefit to Humana would be offering a flexible, scalable suite of products that would be easily customizable for each PCT to drive a competitive advantage in a new market.

Humana envisioned aggregating patient and healthcare data in a centrally hosted, multi-terabyte data warehouse, where it

would be available for use in a series of services that the PCT could choose, depending on its unique needs. "The data would be the foundation for a suite of integrated services, and we needed an extremely flexible, user-friendly, compelling delivery mechanism to make these services available for many different customers," explains Kannan. "We chose a Web-based delivery mechanism that requires no software to run on the clients' PCs except a browser, Microsoft Office programs, and Microsoft Silverlight."

The software-plus-services delivery model would provide Humana Europe's clients with the flexibility to purchase, use, and manage Humana Europe services in the manner that best suits their needs. They could also use familiar Microsoft Office programs to further interact with the applications, for example by exporting data into the Microsoft Office Excel® spreadsheet program for further analysis.

"We would act as a partner to the PCTs, providing customizable software services, consulting, and support, including onsite Humana Europe employees to help the PCTs get up to speed with our new applications," says Leyan Phillips, Marketing and Communications Director, Humana Europe. "The software-plus-services approach is scalable. Once we have the basic infrastructure built, it'll be easy to integrate new services into the array of applications that PCTs can choose from."

### Choosing Flexible Technologies

Humana took into account the software-plus-services delivery model when evaluating a technology platform for building applications for the PCTs. "We needed flexible, integrated technologies to develop Web-based, service-oriented applications that map to the needs of our customers now and in the future," says

Figure 1 - Working with Microsoft technologies, Humana Europe developed a Web-based clinical platform that brings together real-time tracking and analysis of healthcare data with evidence-based guidelines to improve patient care services in the United Kingdom.

Kannan. "So it was important that we endorsed the technology road map of our partner. For the past few years, we have seen how Microsoft technologies and development tools have become more integrated, more scalable, and more robust, and this gave us comfort that the innovation would continue going forward. Instead of trying to build a diverse set of technologies ourselves, we decided to go with the Microsoft Application Platform."

Kannan, who had worked with Microsoft in the United States, also recognized the value of partnering with Microsoft. "Our Microsoft contacts understand healthcare issues on a deep level and can recommend technologies, provide valuable advice on architectural design, and introduce us to other Microsoft partners to augment our development efforts, if required," he says.

### Solving Development and Design Challenges with the Right Software

For Humana Europe, many challenges lay ahead. It had to aggregate large data sets

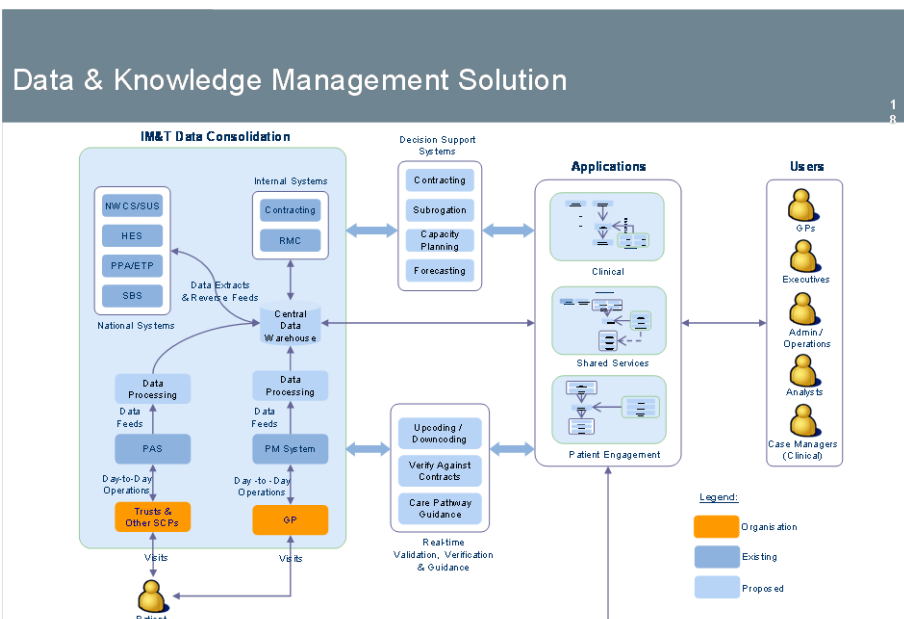
from different entities in the United Kingdom and host them securely as a single data warehouse, which is anticipated to grow to several terabytes. It had to use its expertise with metadata to integrate the data sets and to provide business solutions with powerful business intelligence (BI) capabilities built in. It had to efficiently move that data over the Internet and present it in a compelling, relevant user interface. If it was to meet its go-live goal of January 2008 for the first set of clinical, financial, and administrative applications and services, it needed an efficient development environment.

After a Strategy Briefing and Architecture Design Session in July 2007 at the Microsoft Technology Center (MTC) in Chicago, Illinois, Humana Europe came away convinced that partnering with Microsoft and choosing Microsoft technologies would solve these challenges.

"At the MTC, we talked about our vision for the applications for the U.K., and our Microsoft contacts worked out what technologies would fit. The Microsoft team helped to create an architecture design document and committed to supporting us from design to implementation and beyond," says Kannan. "They also put us in touch with Infusion Development, a Microsoft Gold Certified Partner, to help us achieve the rich information visualization we wanted for our Web applications. It was an auspicious beginning."

### Delivering a Scalable Database and Better Business Intelligence

Humana Europe was so impressed with the scalability and reliability demonstrated by Microsoft SQL Server® 2005 database software during the two days at the MTC that the company decided to build its applications to run on SQL Server database software. At an expected 10 terabytes of



data, this is the first and largest SQL Server–based project at Humana, which traditionally uses Oracle. “We have no worries about the enterprise-level performance and scalability behind SQL Server 2005,” says Kiran Raja, Enterprise Architect at Humana Europe. “At the same time, we have plans to migrate to Microsoft SQL Server 2008 when it became available. Security, scalability, reliability, and manageability are our highest priorities when it comes to our data stores, and we wanted to take advantage of enhancements in those areas with Microsoft SQL Server 2008 to better support our growing business with the PCTs.”

As Humana Europe embarks on its first software-plus-services project, SQL Server 2008 provides two important capabilities that will support this delivery model—centralized database management and integrated BI capabilities that work with the 2007 Microsoft Office system.

“Microsoft SQL Server 2008 will provide us with leading-edge data mining and business intelligence capabilities,” confirms Raja. “As an additional service that we provide, employees at the PCTs will be able to use familiar tools to perform additional analysis of the information that we deliver.

“Centralized management becomes an important capability as we host the data warehouse remotely for all PCTs,” Raja continues. “We see lots of promise in SQL Server 2008 data warehouse performance, and we plan on working with the SQL Server team to learn about multi-tenant security and improved policy capabilities in SQL Server 2008. We are also going to explore how we can improve our current active-passive configuration for high availability or perhaps move towards an active-active configuration.”

### **Choosing an Efficient Development Platform**

Humana used the Microsoft Visual Studio® 2008 development system and Microsoft .NET Framework 3.5 to facilitate Web development with enhanced tools for creating compelling, Asynchronous JavaScript and XML (AJAX)-enabled Web applications. Humana Europe took advantage of AJAX to ensure efficient client-side execution and a responsive experience for practitioners and administrators at the PCTs.

“We are using the AJAX Control Toolkit for our Web development efforts, and we like the way all the controls have matured over time to support skins, themes, styles, and easy and efficient data binding,” says Raja. Humana Europe developers used other features in ASP.NET 3.5—the collection of classes in .NET Framework 3.5 for Web application development—to save time. “We especially like the versatility of controls like ListView and DataPager,” Raja says.

While development of new services for the PCTs is ongoing, the Humana Europe team is taking advantage of the testing and profiling infrastructure of Visual Studio 2008 to perform consistent unit testing, as well as functional, regression, and performance testing. Meanwhile, developers are finding that Visual Studio 2008 makes them more productive. “Visual Studio 2008 has helped us save time with features like JavaScript debugging and better support for LINQ,” adds Raja. “And we are more productive using JavaScript-compatible IntelliSense® technology because we don’t have to look up syntax.”

### **Creating Compelling User Interfaces**

In November 2007, Humana Europe met with the Microsoft team and Infusion Development for a two-day architecture and strategy session to walk through the

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different services within its Data & Knowledge Management Solution, and to pick the individual components that would benefit from being built as Microsoft Silverlight 2.0 controls. The Microsoft Silverlight browser plug-in is a cross-browser implementation of the .NET Framework for building and delivering rich interactive Web applications—and Humana Europe’s development platform of choice for creating a user interface with cutting-edge visuals and interactivity. To run a Silverlight-based application, PCT staffers require a small, free plug-in for their browser. The download and installation take seconds and require no interaction from the user except permission to install.

“We envisioned using Silverlight-based rich presentation components to solve various complex visualization needs, including intuitive search results, advanced patient history visualization, and timeline-based smooth drilldowns and easy-to-use survey scales,” says Raja.

After the session, the Infusion Development team developed the Silverlight controls remotely but kept in touch with Humana through almost-daily conference calls. “Infusion was incredibly quick at picking up the workflows behind the information presentation,” says Kannan. “It’s not easy to come in and immediately understand the scenarios we are talking about with healthcare workers in the U.K. Infusion’s expertise and experience working in this brand new development environment shows—we had delivery of the components in less than four weeks.”

Shawn Konopinsky, Practice Manager, User Experience, Infusion Development, credits the fast turnaround time to the Silverlight plug-in, which provided access to the .NET Framework programming model, and to Visual Studio 2008 features such as

debugging tools and powerful editors. And when Infusion Development delivered the components, it was easy for the Humana Europe team to integrate them into its applications because Silverlight integrates with existing JavaScript and ASP.NET AJAX code to complement the functionality it had already created.

“Silverlight is another example of a Microsoft technology that supports the software-plus-services delivery model,” says Peter Goth, Practice Manager, Health and Life Sciences, Infusion Development as well as a Microsoft Virtual Technical Specialist. “You can develop a rich user experience available in a small download to the browser that was traditionally only available for a client-based application. Now the Humana Europe team can quickly develop additional Silverlight components to add to their suite of services as needed.”

#### **Developing Services for the PCTs**

Between October 2007 and January 2008, Humana Europe developed the first iterations of the clinical, administrative, and financial applications that make up its Data & Knowledge Management Solution. To support those applications, Humana Europe’s data and knowledge management systems extract data from primary and secondary care, pharmacy, dental, and mental health sources.

Once the data is harvested, it is amassed in the Humana Europe SQL Server-powered data warehouse. Humana Europe created a unique set of tools and algorithms that reveal pertinent information that can be turned into usable knowledge. On the clinical side, a combination of predictive modelling, data visualization, and other techniques identify immediate and longer-term risk factors for ill health; assess concordance with evidence-based best treatments; and evaluate whether current

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treatment is consistent with available evidence. The same rigor is applied to management systems, ensuring compliance, quality, and efficiency. (See Figure 1.)

The core suite of applications and services within the Data & Knowledge Management Solution is called the Clinical Platform. These services include:

- Care Coordination - Nurses can use this service to schedule calls with patients and provide motivational support to help effect behavior change and improve long-term condition management.
- Demand Management - Nurses can use these guidelines to manage a patient's hospital stay.
- Health and Wellness programs - Health coaches can monitor patients' progress in health and wellness programs.
- Patient at a Glance - Clinicians can use this interactive user interface to see timelines illustrating a patient's interactions with the healthcare system.

“On the operational side, we have the Settlement Application, which PCT administrators can use to validate hospital activities submitted for reimbursement,” explains Kathy Weaver, Business Technology Lead at Humana Europe.

“Humana Europe is offering a combination of technology, services, staff, and support that each PCT can choose from, based on their particular needs.”

## Benefits

Today, Humana Europe is poised to benefit from its initial expansion into an international market place. “Microsoft technologies and the software-plus-services model help us to improve healthcare service delivery on both sides of the Atlantic,” says Kannan.

The PCTs will benefit when they use these services to improve data and knowledge management, and to provide integrated healthcare services for holistic, patient-centric care. Patients will benefit from early identification of preventable conditions, opportunities for positive behavior change, and improved community support. “Our first foray into the U.K. market is going to be a win-win situation for everyone,” says Phillips.

## Gives PCTs Customers More Choice

For Humana Europe, the software-plus-services delivery model maps perfectly to the commissioning process that is now being encouraged in the United Kingdom. With each PCT now free to choose services from a variety of pre-approved vendors, Humana Europe is making it possible for PCTs to purchase, use, and manage IT resources in a manner that best suits the healthcare needs of their local populations.

“The emphasis is on choice for the customer,” says Kannan. “We recognize that each PCT is different, and our combination of technology, people, and processes can be easily customized to meet their needs. The software-plus-services model, our experience in the United States, our knowledge of the U.K. market, and the latest Microsoft technologies allow us to offer best-of-breed services with a competitive advantage.”

## Reduces Development Time

Humana Europe has also benefited by using Microsoft tools and technologies to reduce development time so that it is one of the first FESC vendors to enter the market. “We wanted to provide a state-of-the-art Web-based platform that the PCTs could use to strengthen health service delivery at the local level in the U.K.,” says Kannan. “Microsoft had the technology and

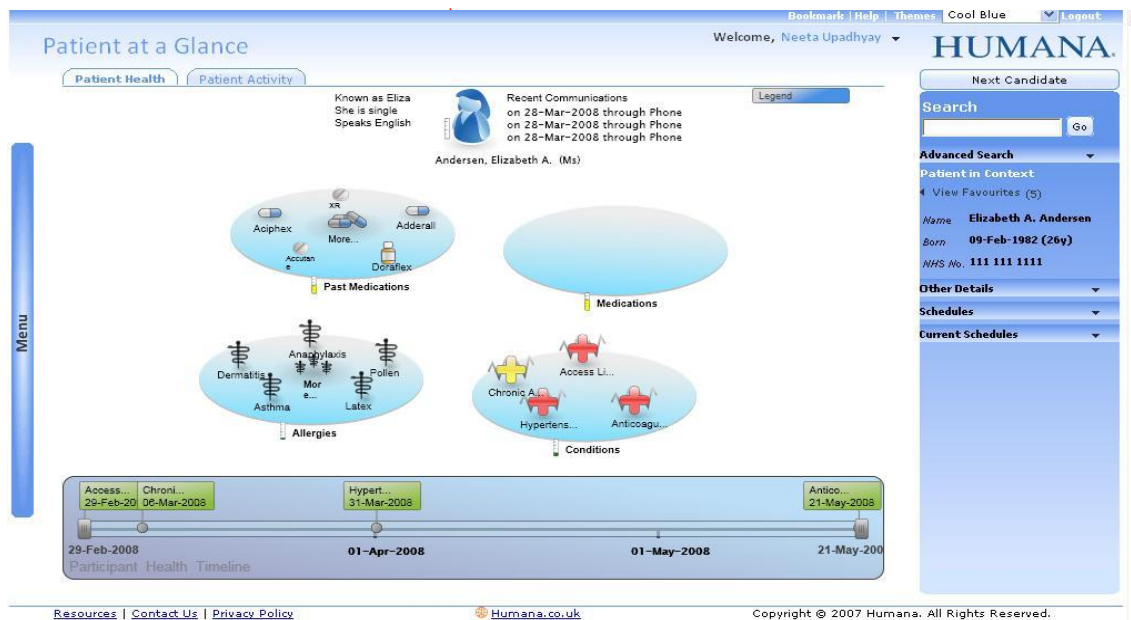


Figure 2 - Health practitioners can interact with the "Patient at a Glance" screen using powerful data visualization capabilities provided by Microsoft Silverlight to monitor patient progress and perform demand planning.

the expertise to turn our vision into reality within six weeks."

### Improves Administrative Productivity

The PCTs will benefit from applications that augment their core competencies yet require no software to be installed at their facilities. For example, Humana Europe's modular set of applications automate mundane tasks such as processing large volumes of transactional data using workflow and rules engines. For example, using the Settlement Application, PCT administrators will be able to monitor hospital activities to make sure the hospitals are billing the PCT by the right amount.

"We took Humana's experience with insurance companies and large claims processing platforms in the United States and tailored it to fit the U.K. market," explains Raja. "The Settlement & Invoice Validation platform (SIV) automatically validates the hospital's reported activities and enables commissioners to see more

clearly how they are spending their money and to improve demand management."

### Provides a Holistic View of Patient Services

On the clinical side, PCT staff will benefit from unprecedented access to information and have it presented in a compelling, interactive visual interface. For example, the Patient at a Glance screen presents a 360-degree view that puts the patient in the center, surrounded by the services being offered. A nurse can click any of the services and see details. It's a perfect visual metaphor for patient-centric care.

"It's very important for healthcare workers to have engaging user interfaces. They are busy and need to see information quickly, without having to read a bunch of text or click through drop-down menus," says Kannan. "Silverlight gave us the ability to present those clusters of services around the patient visually, and we added a timeline at the bottom. When a nurse adjusts the timeline to cover a certain

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period of the patient's life, only the information that's relevant to that timeframe will be in focus, allowing the nurse to zero in on what's important."

And, because Humana Europe designed its services to integrate with each other, PCTs can pick and choose which services to combine for additional benefits. For example, if an administrator wants to query a particular hospital activity based on a clinical or coding issue, he or she could bring up the patient history through the Patient at a Glance feature and look at the data to confirm or deny whether the activity should be reimbursed.

#### **Opens New Market Possibilities**

Finally, with a successful launch of the Data & Knowledge Management Solution in the United Kingdom, Humana Europe can enter new markets around the world, and even bring back some elements of the solution to the United States. "We are in the process of incorporating some of the technologies we have used for the U.K. into applications in the United States," explains Kannan. "For example, screens like Patient at a Glance can be very helpful in a customer care portal, and eventually, some of the ideas around database design will be useful for creating and storing universal health records when the United States moves in that direction."

"Ultimately, our services are all about improving patient care," concludes Kannan. "We are dedicated to working in partnership with the PCTs to ensure that the healthcare system is responsive to patients' needs and delivers value for money. With Microsoft technologies and a new service delivery model, we are well on our way to achieving that goal."

## For More Information

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For more information about Infusion Development products and services, call (888) INFUSE-8 or visit the Web site at: [www.infusion.com](http://www.infusion.com)

For more information about Humana Europe products and services, call (44) 020 3004 3200 or visit the Web site at: [www.humana.co.uk](http://www.humana.co.uk)

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### Partner

- Infusion Development