



## Windows Vista Customer Solution Case Study



### Overview

**Country or Region:** United States

**Industry:** Biotechnology

#### Customer Profile

The Scripps Research Institute in La Jolla, California, is one of the largest private, nonprofit biomedical research organizations in the United States and a world leader in the structure of biological molecules.

#### Business Situation

Scientists at Scripps Research wanted a better way to organize biological research information and share it with their colleagues.

#### Solution

An application built on the Microsoft® .NET Framework 3.0 with Windows® Presentation Foundation, and Windows Vista™ gives scientists a powerful tool to visualize and annotate research results.

#### Benefits

- Faster scientific collaboration
- Easier access to data
- Dynamic development process

## Collaboration, Visualization Tool Speeds Vital Cancer Research at Biomedical Center

“People are predicting that ... housing your data in SharePoint so that it can be collaborated on and looked at in different ways will become the pattern in scientific research for many years to come.”

Tim Huckaby, CEO, InterKnowledge

With mountains of data created daily, The Scripps Research Institute, a world-renowned cancer and biomedical research facility, needed to help scientists and doctors from a variety of disciplines link their work on potential cancer treatments with the latest research. Scripps Research turned to InterKnowledge, a Microsoft® Gold Certified Partner with experience in developing custom applications. Using the Microsoft .NET Framework 3.0, Windows Vista™, and Microsoft Office SharePoint® Server 2007, InterKnowledge created an application that allows researchers to examine 3-D models of cancer cell proteins, annotate the models with relevant data, and then share notes with colleagues. Researchers now spend less time searching for data and more time developing potential treatment solutions. To further streamline communication, Scripps Research plans to add Microsoft Exchange Server 2007.



Fast facts	
<b>Number of developers</b>	2
<b>Estimated weeks to complete</b>	6
<b>Developer tools</b>	Visual Studio 2005
<b>Programming languages</b>	Visual C#
<b>Programming model and technologies</b>	<ul style="list-style-type: none"> <li>■ Microsoft .NET Framework 3.0</li> <li>■ Windows Presentation Foundation</li> </ul>

## Situation

The Scripps Research Institute in La Jolla, California, is a world-renowned cancer and biomedical research facility where scientists and doctors from a variety of disciplines work together to link cancer treatments with the latest research on cancer-fighting drugs.

Like any other cooperative effort, the key to successful collaboration is communication among the people on the team. At Scripps Research, the team includes pathologists, oncologists, cell biologists, chemists, molecular biologists, and immunologists. Dr. Peter Kuhn, Professor of Cell Biology at Scripps Research, says, “In the past five to ten years, the concept of bringing together clinical researchers, life science researchers, and physical science researchers has become the big, new direction for science to get faster to outcomes.”

Kuhn continues, “It’s hard enough to make sure the person working next to you understands what you’re doing. It gets more difficult when the person you want to work with is across the hallway or off in another building, or in a different institution in a different town. In an ongoing collaboration, you want to exchange information and ask for opinions in real time.”

Collaboration at Scripps Research can be challenging because the topic of discussion may be a single cancer cell found among 50 million cells in a tube of blood. Sometimes researchers focus on only one of the millions of individual proteins in a single cancer cell. Kuhn says researchers at Scripps Research communicated with their colleagues in-person, at conferences or meetings, or by exchanging e-mail. Each of these methods had significant shortcomings for the rapid exchange of precise and complex scientific information.

With researchers in multiple disciplines urgently needing better tools to manage the mountains of data they create every day, Scripps Research turned to InterKnowledge, a Microsoft® Gold Certified Partner with extensive experience in custom application development on the Microsoft .NET Framework, an integral component of the Windows® operating system.

## Solution

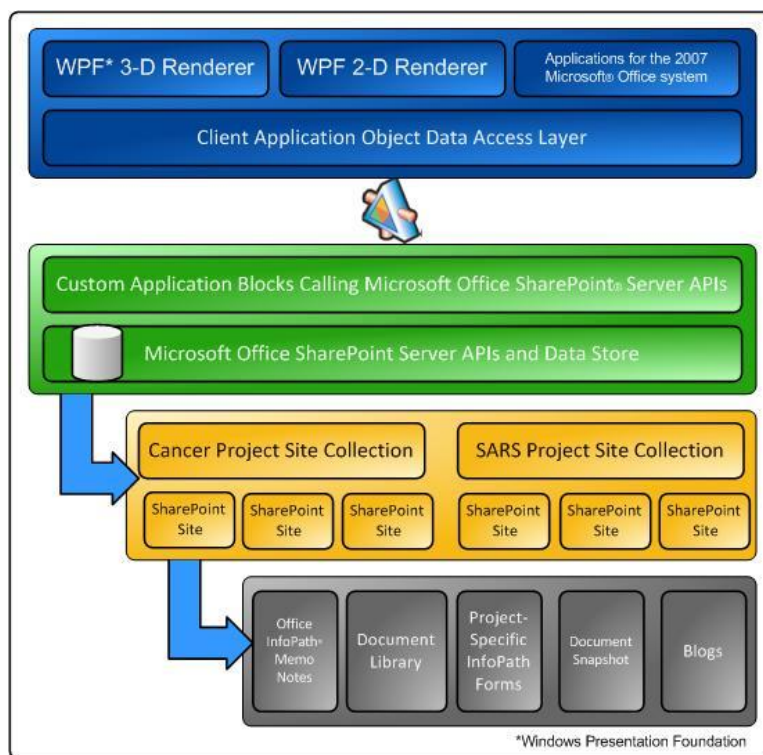
Scripps Research asked InterKnowledge for help creating a better way for scientists to work together. Tim Huckaby, CEO of InterKnowledge, remembers, “When I first started talking to Peter [Dr. Kuhn at Scripps Research], he sounded just like the CIO [Chief Information Officer] of any other business. He told me they had data everywhere, their applications were in islands, and their people were doing great research, but the information wasn’t getting to the people who needed it.”

Huckaby’s team came up with a solution for Dr. Kuhn’s lab called the Collaborative Molecular Environment (CME), which provides a tool that researchers can use for data capture, visualization, annotation, and archiving (Figure 1).

The CME takes stored information about cell and protein molecules, builds 2-D and 3-D models of these molecules, and makes the models available to Scripps Research staff and their collaborators around the world on a dedicated server using Microsoft Office SharePoint® Server 2007. InterKnowledge developed the customized application by using the Microsoft .NET Framework 3.0 with Windows Presentation Foundation, the Windows Vista™ operating system, and Office SharePoint Server 2007.

Scripps Research has significant tools to analyze samples and display them as 3-D images, Huckaby explains. “What they didn’t

Figure 1. The Collaborative Molecular Environment provides a tool that researchers can use for data capture, visualization, annotation, and archiving.



have was a way to annotate those images or a specific part of the image. They could only look at an image, maybe discuss with their colleagues in the same room, but to confer with anyone else, they had to go offline or take notes on a piece of paper.”

That was the problem CME is intended to solve. “We built a viewer on the .NET Framework 3.0 with Windows Presentation Foundation, and the viewer allows cancer researchers to look at these 2-D or 3-D images. Then, with just a right-click, they can attach their notes, create Word documents, attach other research or another picture, or point to a URL that is any specific point on the rendering,” Huckaby says.

In the near future, Scripps Research will link the CME to Microsoft Exchange Server 2007. “We need to build complex workflow

scenarios among the peers, researchers, pathologists, doctors, and patients around the world. The integration between Microsoft Office and Exchange Server 2007 is fantastic and it will be dramatically easier to create those workflow tools with Exchange Server 2007 in the solution,” Huckaby says.

The CME is sponsored by Microsoft Research and the Microsoft BioIT Alliance, an industry partnership that includes Microsoft, Scripps Research, InterKnowlogy, and several other life sciences research companies. “This use of Microsoft technology will help scientific researchers and institutions organize their information more effectively and help speed up the process of innovation by reducing duplicate research,” says Don Rule, who works with the BioIT Alliance for the External Research & Programs team of Microsoft Research.

“...[The] proof of concept prototype took only six weeks to build. Before [we had] the .NET Framework, it would have taken twenty developers two years to build this application.”

Tim Huckaby, CEO, InterKnowledge

### Benefits

The CME has already improved the collaboration among Scripps Research scientists by giving them an easy, convenient way to pinpoint the specific topics they want to discuss with colleagues. In addition, the CME allows scientists to organize their data in any way that makes sense to them.

InterKnowledge's Huckaby believes other research organizations will use the model his team developed. “Many people are predicting that this paradigm—using a Web application and housing your data in SharePoint so that it can be collaborated on and looked at in different ways—will become the pattern in scientific research for many years to come,” he says.

### Faster Scientific Collaboration

The CME has dramatically improved the ability of Scripps Research scientists to organize and collaborate around their data. “The application gives us a graphical, high-content way of communicating research results where the data is persistent,” Kuhn says. “I can keep adding data to the same molecule.”

“Somebody from the University of Graz [in Austria] recently sent me an e-mail with two files about a particular sugar sequence. I annotated that sequence and attached the e-mail and the two files,” says Kuhn. “Now, if I want to talk with a chemist at Scripps Research about this, I can show him the exact protein structure and the information from our colleague in Graz in the three-dimensional context that we're talking about, and he understands it in just a few minutes and can make suggestions about what we should do next.”

The addition of Exchange Server 2007 will make it easier for Scripps Research scientists to send and receive information in a variety of formats.

### Easier Access to Data

The CME is easy for Scripps Research scientists to use because Office SharePoint Server 2007 presents a familiar metaphor to users. “Why do people use e-mail?” asks Kuhn. “Because it's easy to use, and people use it every day. SharePoint is interesting because it's actually a database, but it looks like a file system, and you have very little learning curve. People can organize their information in any way they like. This is important because we need productivity tools that support the creative process of scientific research.”

“Researchers in the lab enjoy using the CME application because it is so simple. It's a very natural way of annotating protein molecules, visualized in 3-D, and connecting those annotations with standard data files. We link word processing documents, screen captures, [Microsoft] Excel® spreadsheets, sitting anywhere on our network, things we'd put naturally in a lab notebook, except now we can link them electronically using the CME,” Kuhn says.

Because Office SharePoint Server 2007 creates a central repository for data in almost any format, researchers are not limited in the ways they organize their data. Being able to link multiple kinds of data to an image of a single molecule, for example, makes it easier to organize experiments, collect and distribute results, and speed up the process of uncovering deeper knowledge from various experiments. “Because it's SharePoint, every entity, every blood sample or lab report, can become its own site,” says Huckaby. “All the information about that entity can be collected and retrieved—from one point.”

The volume of data created at Scripps Research is immense. “They have terabytes of data spread over numerous networks. There was no way they could find all that data, let alone link one piece of research to

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Dr. Peter Kuhn, Professor of Cell Biology, The Scripps Research Institute

another. Because everything's now housed in the [Office] SharePoint 2007 site, Peter and his team can search all their data. It's all together, all linked. That makes their job dramatically easier,” Huckaby says.

In addition, because the CME is built on Windows Vista, it's easy and safe to allow access to researchers around the world. “We run the application on a secure server, and we control the access we give to people under Active Directory® directory service,” says Kuhn.

#### **Dynamic Development Process**

The use of Windows Presentation Foundation allowed the InterKnowlogy team to build the CME in a fraction of the time it would have taken using earlier methods. “Amazingly, the proof of concept prototype took only six weeks to build. Before [we had] the .NET Framework, it would have taken twenty developers two years to build this application,” says Huckaby.

Development on the project started in March 2006 and Kuhn was evaluating an early version of the tool about two weeks later. “This was important because it allowed us to have a very dynamic development process,” Kuhn says. “Every two weeks, they would bring us a new version that was just an order of magnitude better than the previous one. It was just unbelievable.”

Huckaby explains that one member of his team, developer Kevin Kennedy, built the control mechanism for the 3-D image viewer in two weeks. “That's how powerful the Windows Presentation Foundation is. It's just amazing how much we can accomplish with .NET [technology] these days,” Huckaby says.

Kennedy says he had some, but not much, experience with 3-D before this project. “The fact that Windows Presentation Foundation could allow someone with my experience to do something that used to take an experienced game developer to do is just amazing.”

## For More Information

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For more information about The Scripps Research Institute products and services, call (858) 784-7100 or visit the Web site at: [www.scripps.edu](http://www.scripps.edu)

For information on supporting The Scripps Research Institute, see: [www.scripps.edu/philanthropy/](http://www.scripps.edu/philanthropy/)

For more information about InterKnowledge products and services, call (760) 930-0075 or visit the Web site at: [www.interknowledge.com](http://www.interknowledge.com)

## Windows Vista

Windows Vista can help your organization use information technology to gain a competitive advantage in today's new world of work. Your people will be able to find and use information more effectively. You will be able to support your mobile work force with better access to shared data and collaboration tools. And your IT staff will have better tools and technologies to enhance corporate IT security, data protection, and more efficient deployment and management.

For more information about Windows Vista, go to: [www.microsoft.com/windowsvista](http://www.microsoft.com/windowsvista)

### Software and Services

- Windows Vista
- Microsoft Visual Studio
  - Microsoft Visual C#
  - Microsoft Visual Studio 2005
- Microsoft Office system
  - Microsoft Office SharePoint Server

### Technologies

- Active Directory
- Microsoft .NET Framework 3.0
- Windows Presentation Foundation

### Partners

- Interknowledge