Cincom®

Key Technology, Inc.

Goal: Find a development environment to create new features for the company's industry-leading product

Challenges:
- Overcome a crucial maintenance concern
- Preserve the product's touch-screen interface
- Make the product's software both portable and flexible

Solution: Cincom Smalltalk™ VisualWorks®

Results:
- A stronger image model compared with IBM's VisualAge
- Every deadline met within budget
- Improved time-to-market
- Two or three times more productive

Making food better for all of us!

Ever notice when you eat french fries, that none of them have any defects? Whether in a restaurant or from your local grocery store's freezer section, it's amazing how all are "almost perfect." How about a can of peas, corn, or green beans? Well, to get this way, they have to be electronically scanned and sorted, separating good product from bad. Today, virtually all of the world's french fries (95% to be exact) pass through the Automated Defect Removal System (ADR), created by Key Technology, Inc. (Key) of Walla Walla, Washington.

In fact, Key has changed the way food is inspected, sorted, handled and prepared for processing, from its first equipment designed solely to separate foreign material from raw peas, to its most recent release of Tegra, the first automated optical sorter of its kind. Tegra, whose user operating system is written primarily using VisualWorks, a Cincom Smalltalk application, is able to sort by color, shape, and size criteria, and eject defective product using jets of air with pinpoint accuracy at rates of up to a million objects a minute.

To enable Key to apply the Tegra sorter to many different products, the software had to be portable and very flexible, both from an "add new features" perspective and from a runtime scalability point of view. But these weren't the only reasons Key chose Cincom Smalltalk's VisualWorks as its application development environment.

Redesigning the System

When a senior software engineer arrived on the scene at Key Technology, Inc. in the mid '90's, his job was to maintain existing applications. However, the current system had reached what he termed "a critical patchability level—one more patch and the system would melt down." Also, there were many new features that needed to be added into the system, but adding any new feature was almost impossible. So, instead of patching and maintaining existing code, he felt that they really needed to start over again with a new development environment.

So Key looked around for other languages and applications. The engineer knew that Key wanted to go with Smalltalk and narrowed its choices down to IBM's VisualAge and Cincom Smalltalk's VisualWorks to address its development needs. After evaluating both systems, Key decided to go with VisualWorks.
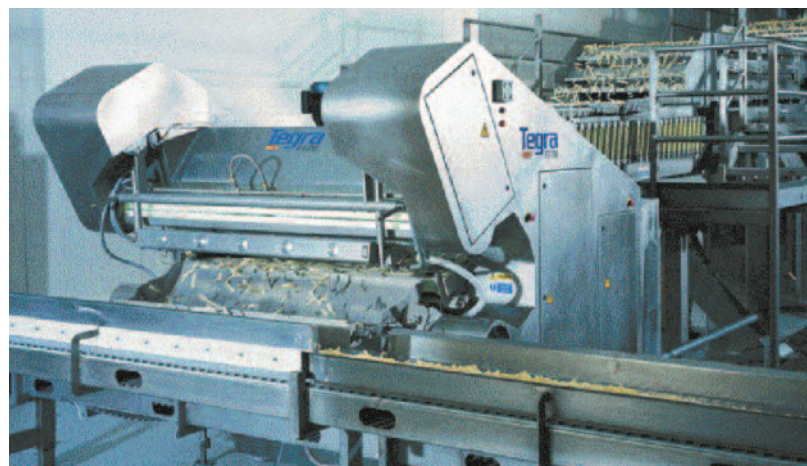
Why Cincom Smalltalk's VisualWorks?

One reason for deciding on VisualWorks was because of its emulated graphics framework, which was much more mature than VisualAge. Another reason is VisualWorks' cross-platform capabilities, which enable applications to be easily ported.

A Key sorter does all of its operations with a touch-screen, which means that the user interface does not use a "standard" desktop widget set; rather, it uses a set of widgets developed by Key specifically for touch-screen use. Key also heavily leveraged the UISpec framework to provide different screen interfaces to be used specifically for sorting different products (one type of interface for french-fry sorting, another for cereal sorting).

When Key's software engineers evaluated VisualAge, they discovered that the application relied on the operating system too much. Key's sorters are optical sorters, taking lots of pictures. This way, when a user tunes or operates the machine, the sorter has to process a number of image operations. Key found that the image model in VisualWorks (the graphical image model) was a lot stronger than VisualAge.

"We also knew that our machines go all over the world, with 15 or so languages that we ship the system under," says the engineer. "So another reason we selected VisualWorks was because of Cincom's excellent internationalization capabilities and support expertise." Since he had experience in dealing with Cincom, he was aware of their presence in nearly every country around the world.

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"If It Ain't Broke, Make It Better Anyway"

Since transitioning to Cincom Smalltalk's VisualWorks, Key has met every deadline on time and within budget. Much of this has been due to VisualWorks' ease of learning and ease of use. "It's more than being easy to use," the engineer says. "It's also how you're able to get improved time-to-market when you use Cincom Smalltalk. Cincom Smalltalk is such an excellent development language that you can develop fast, and it allows you to concentrate on solutions while you're coding.

"Developing algorithms that reduce complex concepts to simplistic touch-screen interfaces is largely a trial and error effort," he continues. "It's kind of like a soccer game, where the statistic 'shots on goal' is one of the most telling in who will most likely win the game. It's much the same for us. The more times we can repeat the 'try this approach' cycle, the more likely we are to get a solution that works for our customers. Cincom Smalltalk, with its integrated tools, allows us to make more 'shots on goal' than with other technologies we've used."

The engineer believes there is nothing worse than applying the "if it ain't broke, don't fix it" philosophy. "A lot of programmers feel that if you've got it working, don't touch it," he comments. "But Cincom Smalltalk allows you to strive for elegance in the code. You know it's not enough to just make it work. You've got to make it work the best the code lets you. Cincom Smalltalk is the most powerful language and syntax development environment around. And this allows you to be at least two or three times more productive. You can do global functions over the entire system with one click. It's just awesome what you can do."

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What's Next for Key?

Key is currently working on enhanced and next-generation machines that will have VisualWorks control systems running them, as well as innovations to its existing machines. Key is porting the Tegra operating system to the new equipment and making the necessary changes. "The operator interfaces will be different," says the engineer, "because at some point, they will need to control different peripherals with different lighting. But this shouldn't pose a problem because of the reuse capabilities of VisualWorks." Whatever the new machines or innovations turn out to be, you can be assured that it will be with the goal in mind of "making food better for all of us."

Cincom Smalltalk

The Cincom Smalltalk software development suite is an object-oriented environment providing instant, binary, portable, cross-platform application development. Cincom Smalltalk is the state-of-the-art environment for software developers who need to build applications quickly and efficiently. Cincom Smalltalk is the most productive programming tool that enables scalable, web-based intranet, and internet systems, as well as client/server development. Unlike Java, C++, or Visual Basic, Cincom Smalltalk offers significant productivity enhancements, allowing developers to bring their products to market significantly faster.

VisualWorks Environment

The VisualWorks suite is the premier Smalltalk toolset for building instantly portable server, web-based, and client/server applications. With connectivity to all major relational databases, object databases, and internet standard protocols, VisualWorks offers a complete solution for Windows (95/98/ME/NT/2000), PowerMac, Intel Linux, AIX, SGI Irix, Compaq Unix, HP-UX, and Solaris. With the most well-respected, high-performance, virtual-machine architecture, VisualWorks is the preferred choice for internet development.