Shades of Green

A User Guide to Green Initiatives
in Software Technology

WHITE PAPER

Cincom In-depth Analysis and Review

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SIMPLIFICATION THROUGH INNOVATION®

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Everywhere you turn, you hear it. Commercials show it. Magazines write about it. Websites blog it. News anchors dissect it. Companies promise it. Consumers demand it: *"We're going green!"*

But, what is *it* … really?

In its purest form, the "going green" idea is simply being kind to the planet that allows us to live on it every day. *The Blue Planet. Mother Earth.* Whatever you want to call it, it's our duty to be responsible inhabitants and treat her kindly —insert your favorite "golden rule" cliché here. However, it seems that the good Mother does not come with a handbook or user manual. And even though it's a simple concept, we have largely been slow to adopt practices and agree on the methodologies to accomplish it.

Enter: a Bad Economy

It's amazing what money, or the lack thereof, can do to people's priorities. No longer is it a slow adoption. Now it's a race to see who will be the first to discover a breakthrough technology that will save money and improve the environment at the same time. In fact, it's become so widespread that it's on the verge of becoming "a social fad." So much so, that a new term has been created to dispel the facts from the fiction. TerraChoice (http://www.terrachoice.com) defines this term as "greenwashing."

Green-wash
(green'wash', -wôsh') - verb:

the act of misleading consumers regarding the environmental practices of a company or the environmental benefits of a product or service.

They have even published white papers on the subject to help consumers understand this issue.
Download TerraChoice's "6 Sins of Greenwashing" at http://www.terrachoice.com/Home/Six%20Sins%20of%20Greenwashing

But apart from these deceptive practices, there are legitimate green initiatives being done in a plethora of arenas. Take for example, the Philadelphia Eagles. In one of the world's most financially successful sports industries (the National Football League), the Eagles have gone away from the stigma that most major franchises have. They have made a commitment to "going green" by encouraging their fans to plant a tree. They propose that each fan at Lincoln Financial Field can reduce their carbon emission from a typical game day by contributing toward the Eagles Forest located in Neshaminy State Park in Bensalem, Pennsylvania. They have even taken it one step further by converting their team's practice facility to solar power. For more, visit http://www.philadelphiaeagles.com/gogreen.

Another, more glorified example is the Vatican. In an effort to become the first "carbon-neutral state," the Vatican has replaced "roof tiles on the Paul VI auditorium … [with] 2,700 solar panels."[1] According to the BBC, these panels have photovoltaic cells capable of converting sunlight into electricity and generating enough energy to power the 6,000-seat auditorium.

"The modules were made according to the specs of the original tiles planned by the building's architect, Pier Luigi Nervi. The panels are just the beginning of the church's efforts to incorporate sustainable practices … the Vatican is also growing a 37-acre forest they've called the Vatican Climate Forest in Hungary to offset all of its CO2 emissions."[2]

These are but a few examples of the many tangible initiatives by companies, organizations and institutions looking to make a difference in these trying times. However, one new industry is making a push to the front of the pack: software. Sam Bond writes in "Saving the World Through Software: Microsoft's Green Agenda," "Software and the internet can play a great part in efforts to help the environment—as they did in winning the U.S. Presidential election for Barack Obama. This was the message of Jan Meuhlfeit, Microsoft's European chairman, when he spoke at a conference bringing together global business leaders in London this week. Speaking at Green Strategy 08, Mr. Meuhlfeit said that the huge public support—and funding—raised by Obama's campaign via the internet should be a lesson to those involved in the environmental movement. … He spoke of the magic of software, highlighting how virtual meetings, conferences and other communication technologies could massively reduce the need for transport, thus reducing energy use and carbon emissions."[3]

[1] *http://news.bbc.co.uk/2/hi/europe/7642811.stm*

[2] *CleanTechies.com, Holy Solar Panels! The Pope is carbon neutral … are you?, Nov. 26, 2008*

[3] *http://greenercomputing.com/news/2008/12/01/microsofts-green-agenda*

Software? Making an Environmental Impact on Our World?

It sounds like another gimmick, right? More "greenwashing" and marketing spin to take advantage of consumers during this economic crisis.

"This is the first time that the Internet and technology have played a key role [in the U.S. elections] … Obama has said he collected 86% of the money for his campaign through the Internet. If we're serious about the environment, we should definitely use this way too … this is the first time in human history when the young generation uses current technology much better than [the previous] generation. And I do believe that this generation is much more environmentally aware, so this will have a positive effect on society."

– Jan Meuhlfeit,
Microsoft's European Chairman

No Greenwashing Here

Not all software lines are burning the midnight oil to think of ways to become eco-friendly. *Some have always been there.* Programming languages are designed to be powerful, delivering complex business applications on time and under budget. For example, the faster an application can get to market, the less time and money is wasted in development and the quicker profit can be made. In addition, the easier the language is to program, the fewer programmers are needed. This, in turn, results in fewer people commuting to work and a much smaller carbon footprint for a company. Some languages also allow for reuse and cross-compatibility, vastly decreasing the time and effort in improving technology and significantly minimizing purchases at a later date. Mom (Earth) would be proud!

Object-oriented languages are most successful at this. Take for example Cincom's Smalltalk. The Smalltalk Suite by Cincom offers *extreme efficiency* in programming by giving you all the tools you need to build lean, highly efficient, fully portable applications.

Portability

Portability is considered to be one of the most desirable characteristics of any software product. When several platforms are planned for or required with the same application, portability is the biggest issue for cost reduction. In fact, James D. Mooney, of the Department of Statistics and Computer Science at West Virginia University writes,

"In an age of ubiquitous computing and fast-moving technology, there are few software products that cannot benefit from implementation in multiple environments over their total lifetime. Mass-market products must leverage their cost through implementation on as many different platforms as possible. Software of any type or scale may benefit from the ability to migrate to newer and better systems as they become available."[4]

Smalltalk allows you to minimize risk, protect your development investment and get the platform flexibility you require. Its complete binary portability allows you to move seamlessly between platforms such as Windows, OS X, Linux x86, major Unix platforms and ARM-based mobile devices.

Portability, stability and time-to-market were big issues for JPMorgan, a Cincom Smalltalk customer. JPMorgan leverages its success with timely new products that it can rapidly scale for significant market share. It is committed to information technology for this competitive advantage. For example, JPMorgan developed the Kapital financial risk management and pricing system to trade large volumes of financial instruments simply and easily.

[4] *James D. Mooney. "Bringing Portability to the Software Process." West Virginia University. Dept. of Statistics and Computer Science.*

Using Cincom Smalltalk to develop Kapital, JPMorgan met the challenge of finding a development environment that deals with the complexity of its derivative products, delivers unparalleled productivity to stay ahead of the competition, and offers the scalability to support extremely high trading volumes.

JPMorgan estimates that it would have required three times the resources in another language, such as Java, to build Kapital. When asked about Smalltalk's value, Dr. Colin Lewis, Vice President at JPMorgan, said, "Our base system now runs on three different operating systems: Solaris, Windows NT and Linux. The Smalltalk portion of our system requires very little modification across differing operating systems. The power of this portability came to bear when we changed our primary infrastructure from SMP enterprise servers to cheap blade technology. The transition has taken only six months to do. … This would have been impossible to do in such a short time span in another language."

Lewis added that Smalltalk's high productivity factor gives JPMorgan such a quick reaction time to market changes that the company is able to beat most of its competitors.

To read more about how we helped JPMorgan succeed, visit http://www.cincom.com/common/success-stories/profiles/jpmorgan.html

Broad Application Flexibility

Cincom's Smalltalk Suite is flexible enough to build client, client/server, web browser, web server and distributed applications. Smalltalk offers full support for all the relevant communication and interoperability standards, making it easy to build either fully open or fully proprietary services.

An example of this can be found with Adventa Control Technologies, Inc., a software development and integration services company for the semiconductor industry. Reduced time-to-market is a key factor in the competitive semiconductor equipment manufacturing industry. Rapid proof of concept is essential to market deployment, both from the perspective of Adventa software developers and that of their customers. Because ControlWORKS is an integrated development framework that includes 80 to 90 percent of the functionality required to control most semiconductor equipment, customers can add to and customize semiconductor tools to create their own unique products.

The need for excellent configuration control cannot be overstated. "Because Adventa is a partner for success with our ControlWORKS customers, we often work with them remotely and end up sharing code across the miles in support of multiple product development threads," Becky Cooper, Deputy Director of Control Systems said. "VisualWorks supports this mode of development beautifully."

"The ControlWORKS framework supports applicable industry standards, and the framework provides almost all of the control functionality required in a state-of-the-art process tool. Additionally, the VisualWorks® package provides one of the best software development environments."

To find out how you can be more flexible with Smalltalk, visit http://www.cincom.com/common/successstories/profiles/adventcontroltechnologiesdetail.html

Full Source Code

An integrated development environment (IDE) is a software application that provides extensive libraries to programmers for development. They are typically designed to increase programming productivity by providing integrated components with similar interfaces. Combined with reducing the time to learn a language, the IDE is a useful programming tool in making software programmers more efficient.

Cincom provides the source code to Smalltalk's IDE allowing our clients to extend the IDE to custom fit their needs. Our customers can choose solutions from Smalltalk's community libraries or customize it for themselves.

When Bob Cherniak began his business in 1978, he wanted to provide powerful business systems that directly addressed his clients' needs. His team used Business BASIC and later, C with the relational DBMS, Informix.

Later he sought a graphical user interface language to develop high-quality applications faster and cheaper. A project with a telecommunications company introduced him to the advantages of object-oriented software development and the potential for "huge productivity gains." Northern Telecom, later Nortel, provided an opportunity in the form of a custom system it wanted written in Smalltalk. The libraries and development tools that Cherniak put together for Nortel were later built upon for other purposes—in particular, its traditional bread and butter, the Enterprise System.

Today, Cherniak Software uses Cincom's VisualWorks to give its clients uncommon flexibility, so that rather than reprogram applications, they configure changes at the user level—an especially important feature of their fully integrated enterprise systems.

To see more of what Cherniak Software is working on, visit http://www.cincom.com/common/success-stories/profiles/Cherniak.html

Easy Language

Smalltalk is simple—five reserved words and two operators. New developers can learn the syntax in minutes then start in on the important part—the class libraries and the importance of inter-object messaging. This significantly reduces the time it takes to create tests, allowing developers more time to explore and less time with needless trivia.

While some developers haggle over the appropriate syntax, Smalltalk developers are immediately working with objects and interfaces. Instead of deploying squads of language lawyers, they end up working requirements. This makes Smalltalk ideal for removing the artificial barriers that many other systems toss into the mix.

To back up these claims, Gartner, an independent research company, makes the following analogy:

"Here's a simple equation. In terms of mental fortitude:

1 Smalltalk developer = 2.5 C++ developers

1 C++ Developer = 1.5 Java developers

In other words: 'Smalltalk is a meal with a fine Bordeaux and a petite filet mignon. Java is a meal with a cold beer and t-bone.' So, yeah. I said it. Smalltalk is making a comeback."*

*** To read about Smalltalk from Mark Driver, visit http://blogs.gartner.com/mark_driver/2008/10/09/remember-smalltalk/**

Reuse

Reuse is a common practice when attempting to save time and resources for a company. Object-oriented programming languages such as Cincom's Smalltalk became one of the most common means to code reuse. Some of the goals set out by product researchers and engineers of these object-oriented languages include making reuse faster, simpler and more systematic. This gives increased productivity for developers while achieving the goal of reducing the size of the development team.

Cincom's Smalltalk supports reuse extensively. Some examples of Smalltalk's reuse include code, inheritance, component, framework, pattern and domain component. Additionally, Smalltalk has instant cross-platform portability, giving more ways to reuse and save on resources.

Penn State University wanted to make its huge storehouse of information readily available to students, faculty and staff. However, combining its legacy mainframe system with client-server functions quickly crashed key business applications during heavy usage.

Using Cincom's Smalltalk, PSU developers rapidly rolled out a three-tiered system using the mainframe, web servers and traditional desktops with thin clients. By reusing components, functions could be written once and placed on servers accessible by all applications, thus saving time and money in both labor and equipment. It also meant that the system could be expanded as needed, legacy mainframes could be linked for data access and passwords could be protected and authenticated.

Peter deVries, Penn State's Director of Advanced Technology, said, "Cincom Smalltalk's object-oriented architecture enabled rapid development and provided us with the opportunity to continually expand the system through component reuse."*

*** To read more about this amazing story, visit http://www.cincom.com/common/success-stories/profiles/pennuniversitydetail.html**

Cross-platform Compatibility

When software can operate on more than one computer system, it's considered to be cross-platform compatible. Running on different operating systems, however, does not necessarily guarantee that software written for that system will work on all supported platforms. Additionally, being written in a popular programming language does not guarantee that it will run on each system that specific language supports.

The good news is, Cincom's Smalltalk Suite is highly cross-compatible, and it seamlessly integrates with any platform. For example, to produce Tegra, the first automated optical food sorter, Key Technology wanted to write its applications in Smalltalk. But to apply the Tegra sorter to many different products, the software had to be cross-compatible and very flexible.

Key chose Cincom's VisualWorks for its emulated graphics framework, cross-platform capabilities and—because Key's machines ship worldwide in 15 or more languages—"Cincom's excellent internationalization capabilities and support expertise," said Travis Griggs, senior software engineer. Further, VisualWorks has helped Key meet every deadline and stay within budget, owing to its ease of learning and use.

"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."*

*** To see for yourself how compatible it really is, visit http://www.cincom.com/common/success-stories/profiles/keytechnology.html**

So there you have it. Software CAN make a difference. Software CAN impact the world.

By delivering powerful and complex business applications on time and under budget, companies are able to get to market faster, turning a quicker profit. Because of its ease of use, fewer people are commuting to work, reducing the carbon footprints of their companies. Additionally, reuse and cross-compatibility decrease the time and effort in improving technology and significantly minimize purchases in the future.

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