Taking Java to the embedded market

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The age of the 'disappearing computer' is upon us. Slowly but surely, traditional IT systems are moving from visible desktop computers to invisible embedded computers in intelligent devices, thanks in part to cutting-edge Java technology.This is where the IST project HIDOORS set out to make its mark. HIDOORS blazed a trail in its target market by demonstrating that the programming language Java was sufficiently robust and flexible to deal with the full requirements of embedded, real-time systems.

Java, which has become an important implementation technology for desktop and Internet applications, counts improved portability, type safety, and syntax as among its prime advantages. With appropriate tools and technology, HIDOORS' goal was to bring these advantages to real-time and embedded systems as well.

HIDOORS brought together six European partners to improve the state of real-time programming using Java technology in the form of the JamaicaVM. The project aimed not just to improve the implementation of Java itself but also the tools needed to apply Java technology to a wide array of embedded real-time applications.

A commercial success

The major advances made in Java technology through the HIDOORS consortium also provided the launch pad for the commercial success of one its participating companies, aicas.

Project coordinator Dr James J. Hunt, who is now CEO at aicas,

estimates that the company has grown by about 30 per cent a year since the beginning of the project.

“This project really enabled aicas to establish itself on the market,” he said. “We are the only commercial vendor that supports the Real-time Specification for Java (RTSJ) specification for Java which is a major plus. We also have incorporated real-time garbage collection technology that makes it easier to use Java in a real-time environment without compromising on the flexibility that is one of Java’s great strengths.”

Dr Fridtjof Siebert, Director of Development with aicas, agrees that the fledgling company would never have achieved so much in such a short space of time without the initial impetus of the HIDOORS project.

“For aicas, the participation in HIDOORS was essential to mature our product from a research prototype to a product that is the technology leader on the market. HIDOORS enabled this development and the addition of required new functionality such as the RTSJ support, better optimisation, thorough testing, complete libraries and powerful tools. Furthermore, the evaluation that was performed in HIDOORS forced the development to address the users’ needs and provided most valuable feedback for improvements,” he said.

A leading market position

With its innovative use of Java, aicas has rapidly established a leading position in a burgeoning market. Siebert feels that its early mover advantage means that aicas is now perfectly positioned to capitalise on the growing demand for real-time Java applications.

“Today, we see three main markets for our technology: Industrial automation, automotive and aerospace/military. We see a potential to achieve a turnover of tens of millions of euros in each of these markets in the coming years. The total benefits for the users of real-time Java

technology will be significantly larger and we expect a total yearly productivity gain in the order of hundreds of millions of euros compared to classical development technologies in this area," he said.

Hunt agrees that the timing has been critical for aicas's success, allowing the company to push forward into an area where few other companies initially dared to tread. "There was an obvious gap in the market. But the main problem at the time was that the technology for Java simply wasn't mature enough to develop the sort of applications that were needed. So it is gratifying that we were able to push the state-of-the-art ahead in terms of Java technology with this project," he said.

In terms of the benefits to enterprises of using Java technology for real-time applications, James Hunt cites two principal advantages.

"One clear benefit is the programming security that you have with an object oriented language like Java; there are classes of errors that you simply don't have if you use Java instead of a language such as C or C+. And the other advantage is the flexibility that the Java platform provides. For instance, we have industrial automation customers who can give their customers a much greater ability to customize the machines that they produce without having to harbour major concerns about it causing failures in the system. And this kind of flexibility is very important for many markets," he said.

Hunt is also adamant that the backing of the IST programme was critical in allowing a small company like aicas to develop its technology and flourish in the marketplace. As to the future, although HIDOORS has officially run its course, James Hunt doesn't anticipate any let-up in the pace of innovation.

"There are various bases of technology that we would like to push ahead with. Some of it has gone into a new EU project and we are also looking

at the possibility of working with other partners from the HIDOORS project in specific technology areas. I think you will see a lot more development from these collaborations in the future," he said.

Source: istresults.cordis.lu/