Software

Software plays a role in all ABB products at some time in their life: Some products can only be designed using software, like complex subsea Xmas trees; in other products software is the heart and brains, as in

switchbay control units; and in other cases the product *is* software, like the energy trading solutions described in this edition of *ABB Review*.

Software is used in a huge range of ABB products. For example, the researchers in Switzerland pictured above are working on leading-edge software components. At the other end of the scale, software is essential for the design, production, testing and operation of high-voltage equipment, like that seen here in this ABB US lab.

The ultimate catch-all description, then, might be to say that software is the medium used to turn ABB Brain Power into value for customers.

Software – The most important technology for our future

Given ABB's position as a world leader in the area of Automation and Control – which, incidentally, we call Industrial IT – there can be no doubt that software is *the* single most important member of our portfolio of emerging technologies.

Already today we have some 5000 software specialists developing embedded software solutions for our products. Another 15,000 engineers are designing and implementing customer-specific software applications. And there are more than 200 highly qualified scientists and researchers in our Corporate Research Centers worldwide working on software architecture, methodologies and tools for effective and high-quality software development, control algorithms, engineering system integration and collaborative technologies.

Our products are becoming 'knowledge components' because conventional products, such as drives, switchgear and robots, are getting 'smarter' and hence more software-based. We see the emergence of more and more software-based solutions not only in industrial processes and factory automation, where we have broad, in-depth 'domain' knowledge of our customers' processes, but increasingly in electrical power transmission and distribution and in the oil & gas and petrochemical industry.

We are integrating 'real-time' as well as 'transactional' software solutions into our products. The former is critical for embedded software used in process automation, robotics and substation automation. The latter applies to software used in energy trading, enterprise management systems, etc.

Developing high-quality, 'bug-free' software to operate in real time and control an entire production process – like a paper mill – is a challenging task. But it is even more challenging to integrate this plant control into a total value chain that includes the supplier logistics, customer order entry, and so on. This is precisely what ABB's Industrial IT architecture was developed to do. It aims at solutions for real-time order fulfillment based on the integration of operational, administrative and managerial aspects of an enterprise. The realization of this concept requires skilled and experienced personnel as well as access to advanced and innovative technologies such as data mining, agent technology, collaborative and next-generation Internet technologies, and our proprietary Aspect Object technology. Equally important success factors are ABB's industry-specific 'domain knowl-edge', the implementation of a 'powerful architecture' and ABB's approach to software design and implementation.

We have recently developed and implemented a methodology for high-quality software development that is closely related to the widely used Capability Maturity Model (CMM) originated by Carnegie Mellon University, ABB's strategic partner in this area. This, and our Gate Model for product development, allows effective integration of COTS (commercial off-the-shelf) software and represents the key to reliable software products.

In this issue of *ABB Review* we present some examples from the rich variety of ongoing software activities at ABB. They include software solutions that benefit our customers in areas such as factory automation, utility management, logistics, and service and maintenance. This should show the reader that software really is "the most important" technology for our future, as the title of this piece states. And, if any further proof is required, we need look no further than the major investments we are making, the double-digit growth in the number of ABB software patents and the build-up of highly skilled teams in our business areas and research centers around the world, including the creation of the ABB Industrial IT Center in India.

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