

Case Study: ABB

A giant in mission-critical systems for utility and industrial customers embraces desktop Static Code Analysis to help ensure their software security and reliability



WEBSITE: WWW.ABB.COM
EMPLOYEE SIZE: ABOUT 150,000
EST. DATE: 1988
INDUSTRY: POWER AND AUTOMATION TECHNOLOGIES

ABB's software development community is spread around the world across five divisions. A global review of tools that support their software development processes found multiple products in use for static code analysis, with varying results as far as reliability and effectiveness. The company's Software Development Improvement Program ultimately standardized on Klocwork Insight thanks to its ease of integration, accurate detection of defects, competitive price point and extensive support and training materials.

» ABB: A Global Powerhouse

ABB (www.abb.com) is a leader in power and automation technologies that enable utility and industry customers to improve their performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries and employs about 150,000 people.

Its current incarnation was formed in 1988, but ABB's predecessor companies were founded more than 120 years ago. The company's longevity has been fueled by a strong focus on research and development regardless of market conditions, maintaining seven corporate research centers around the world.

Many technologies that provide the foundation for modern society were developed or commercialized by ABB, including high-voltage DC power transmission. Today, the company is the world's largest supplier of industrial motors and drives, the largest provider of generators to the wind industry, and the largest supplier of power grids worldwide. Its power and automation technology are used in network management, industrial robots, power substations and transformers, marine propulsion and crane systems.

» Five Divisions, Common Challenges

ABB's operations are organized into five global divisions, each comprised of specific business units focused on particular industries and product categories: power products, power systems, discrete automation and motion, low voltage products and process automation.

All of these divisions share a common element to one degree or another: their products require software. And they all face the same challenges and demands from their customers: security and reliability. Whether it's a transformer, robot, motor, generator or other system, a field failure can translate into lost productivity or revenue – a best case scenario – or worse, could have adverse affects for a great number of people. Faulty code could also be exploited by a third party, either for financial gain or to support an act of terrorism.

» Islands of Activity

Under certain, albeit rare, conditions, errors in their software could cause significant problems for any of their customers. ABB is sensitive to these facts. In 2008, they undertook a global review of all their software tools, training and practices, and found there was room to improve.

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John Hudepohl, ABB’s Software Development Improvement Program Co-Lead

This review led to the formation of the Software Development Improvement Program (SDIP) a year later, which serves all five divisions and reports directly to ABB’s chief technology officer. “Our internal customers are basically the entire ABB software community,” says John Hudepohl, who co-leads SDIP. “Our function is to develop and deploy best practices, tools and training for all of the business units that make products that contain software.”

Part of the challenge faced by ABB is that its growth has been due in part to acquisitions. “You end up with a lot of different practices and a lot of different tools at various levels of maturity,” says Hudepohl. SDIP’s objective was to move everyone to higher, common level of practice and standardize on best-in-class tools.

Efforts to establish a standard toolset across the ABB software community included selecting a single static code analysis (SCA)

tool of choice. In 2009, Klocwork Insight was already part of the mix of products in use, from other commercial SCA tools to the built-in utility that comes with Microsoft TFS, as well as other shareware downloaded by individuals themselves.

» One Tool to Rule Them All

The review concluded that some of these products just weren’t able to meet ABB’s evolving requirements. Features were lacking, there wasn’t any formalized support for them, there was no subject matter expert on static code analysis within the company’s software community, or other issues. “There was no integration with our other tools such as Microsoft TFS,” says Hudepohl.

SDIP made a shortlist of leading static code analysis tools, including Klocwork Insight, and ran these through a side-by-side comparison with input from the internal software developer community. Key considerations were how well each tool integrated into ABB’s software development environment, ease of installation and maintenance, and the rate of false positives, says Hudepohl. “When you step into the realm of running static code analysis on code that’s never been subjected to static code analysis before, you run the risk of overwhelming the development team.”

Too many false-positive alerts about potential errors in the code invariably lead developers to throw up their hands and walk away, says Hudepohl. “Developers are not going to spend the time to triage a thousand warnings if they discover as many as 70 per cent are not worth their while.”

Beyond the technical requirements of ABB’s software development community, there were broader ramifications that had to be considered as part of the SCA selection process, including corporate and legal requirements such as liability and compliance.

Price is always a factor when selecting software tools, Hudepohl says. ABB’s software community is spread across business units within its five divisions, and all expenditures need to make sense from a cost-benefit point of view for each business unit.

Equally important given this dispersed user community, consistently high levels of global product support and training were also critical considerations.

» Klocwork Pays for Itself

Klocwork's ability to integrate easily with ABB's development environment, its extensive and accurate analysis features, and its competitive price point made it the best choice as the company's default static code analysis tool. ABB now has a static code analysis and Klocwork subject matter expert for its community of developers, and it has integrated Klocwork training materials, including videos, within its own learning management system. It also has a power-user community set up so developers can help each other learn and improve the security and reliability of their code.

Hudepohl cites Klocwork Insight's on-the-fly analysis capabilities as particularly compelling as well as the ability for developers to set up specific alerts.

"The ability to find and fix issues as the code is being written, before it leaves developers' desktops, is very powerful. I'm really pleased with the amount of real defects that are being found, and the ratio of warnings to defects is good," says Hudepohl.

» About Klocwork

In the world of AppSec, developers and the firms that employ them demand tools that provide a competitive edge. Klocwork meets these demands with compelling desktop tools that enable developers to produce secure, reliable software more easily and quickly. Klocwork's unique SCA tool provides accurate, reliable analysis as developers write their code, identifying potential security vulnerabilities and reliability issues before they are submitted to the software build. Additional desktop tools simplify code review, refactoring and architectural analysis. More than 1,100 customers, including the biggest brands in the automotive, consumer electronics, gaming, medical technologies, military and aerospace, mobile device and telecom sectors rely on these tools everyday to make their software more secure and reliable. Creating applications they are proud of. Find out more at www.klocwork.com

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ABB's Five Divisions

- » ABB's **Power Products division** serves electric and other infrastructure utilities, with offerings that include circuit breakers, switchgear, capacitors, instrument transformers, power distribution and traction transformers. It recently developed the highest-voltage direct current (DC) transformer ever.
- » Its **Power Systems Division** pioneered HVDC technology nearly 60 years ago and serves power generation, transmission and distribution utilities with turnkey solutions for traditional and renewable energy-based power generation plants, transmission grids and distribution networks.
- » ABB's **Discrete Automation and Motion division** serves manufacturers and original equipment manufacturers (OEMs) in a variety of industries as well as end users in a variety of process industries with motors, generators, drives, robotics, wind converters, voltage regulators and fast DC chargers.
- » Its **Low Voltage Products division** encompasses low-voltage circuit breakers, switches, control products, wiring accessories, enclosures and cable systems for distributors, installers, panel builders, OEMs, system integrators, contractors, architects and end users.
- » ABB's **Process Automation division** serves industries such as oil and gas, petrochemicals, mining, metals production, marine, pulp and paper, and cement with products, systems and services designed to optimize the productivity of industrial processes such as turnkey engineering, control systems, measurement products, life cycle services and outsourced maintenance.