

AdaCore CASE STUDY

IPESOFIT: Delivering reliable, long-lived energy and industrial systems with Ada and AdaCore



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Executive Summary

Applications that run energy grids, factories, and transportation infrastructure must be reliable, long-lived, and scalable to cope with demand. When creating its cornerstone D2000® industrial automation platform in the early 2000s, used to build real-time management and production systems, IPESOFTE knew it needed to find the right programming language and software development tools to support the platform's real-time application server. Thanks to its choice of AdaCore's comprehensive GNAT Pro toolset and the Ada programming language, the company has completed over 2,000 successful projects and has expanded into six countries.

Successfully delivering technology for real-time applications

IPESOFTE is a leading developer of real-time management and production systems. Based in the Slovak Republic, the company has over 100 employees and operates in six countries.

IPESOFTE creates software solutions for energy, transportation, and industrial manufacturing customers, including the Slovak electricity grid, fiberglass provider Johns Manville Slovakia, and the Kazakh state railway. Reliability, security, scalability, and long-term maintenance are key requirements for these industries, where a failure could cause cuts in power or heating to consumers or even cause production lines to cease operating altogether.

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- Miroslav Kunsch,
Chairman, IPESOFTE

demand and production requirements. D2000 is also used by partners to create their own systems.

At the core of D2000 is a real-time application server with robust platform-independent RAD (Rapid Application Development) tools. The server is scalable and distributed, and it supports redundancy.

Competing against much larger multinational players, IPESOFTE relies on the strength and capabilities of its D2000 platform to create integrated solutions for the whole enterprise – from process automation, comprehensive monitoring and management of production processes, to integration with other information systems within the enterprise. Systems scale from the smallest solutions (such as smart home applications running on a Raspberry Pi computer) to national electricity transmission systems with hundreds of thousands of I/O tags and complex algorithms for forecasting future

Customer:

IPESOFTE - a leading developer of real-time management and production systems for manufacturing and energy facilities

Challenge:

To identify a reliable, scalable software programming language and development environment to produce IPESOFTE's core D2000 industrial automation platform, which is used to build long-lived, real-time management and production systems

Solution:

The Ada programming language, AdaCore's GNAT Pro Ada development environment, and AdaCore technical support

Result:

Since 2002, IPESOFTE has completed D2000 implementations in over 2,000 successful projects, comprising more than 23 million lines of code, and has expanded into six countries

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Ensuring reliability and scalability over the long-term

IPESOFTE knew that choosing the right development language and tools for the D2000 development project was crucial to the success of the platform and the company's overall business growth.

The language needed to be reliable, secure, high performance, and easy and efficient to maintain over the long-term. They also wanted a long-term partner that would be able to help them create a stable and maintainable solution to serve as the foundation for the business's success. Ultimately, in 2002, IPESOFTE chose AdaCore's GNAT Pro and the Ada language to develop its D2000 platform. The team is currently using the Ada 2012 version of the language standard.

For IPESOFTE's customers, reliability and long-term maintainability are key. Systems must be able to operate continuously 24x7 for timeframes - of ten years or more, without unexpected outages. The Ada programming language meets these core needs by offering real-time features and strong type checking that helps detect errors and avoids vulnerabilities, along with language stability that has maintained backwards compatibility throughout the evolution of the language (Ada 2012, Ada 2005, Ada 95, and Ada 83). Maintenance is also helped by Ada's straightforward code readability, which makes it easier to structure code in ways that are easier for other developers to understand and therefore update.

GNAT Pro and AdaCore were chosen due to the combination of multi-platform availability and the expert support that AdaCore provides. The GNAT Programming Studio (now called GNAT Studio) visual user interface helped the team's productivity; one example is the ability to easily navigate the source code to find all references to declared entities.

"D2000 is the cornerstone of all IPESOFTE's current and future activities," said Miroslav Kunsch, Chairman, IPESOFTE. "We needed a long-term partner and a scalable software development environment. Selecting AdaCore has been key to our success; choosing Ada was the right decision at the right time."

Powering growth through time-efficient development

Thanks to the strength and flexibility of D2000, IPESOFTE has been able to expand enormously over the last twenty years. To date, IPESOFTE's programmers have completed D2000 implementations in over 2,000 separate innovative projects containing over 23 million lines of code. The scope of the solutions created using the platform has grown, evolving from initial

factory and machinery control systems to much more complex energy management systems, manufacturing execution systems (MES), energy trading solutions, and smart energy applications. This innovation has been powered by the strengths of the D2000 platform and its underlying Ada code.

All of these applications are mission-critical for the companies that use them. Exploiting the benefits of the Ada language, the applications can meet real-time requirements and deliver reliability, stability, and longevity. This provides

a competitive advantage to customers in the energy and industrial sectors.

Showing the strengths of Ada and GNAT Pro, D2000 is now a very robust system containing

several million lines of code, yet is maintained by a very small team of programmers. Platform development is extremely time-efficient, as Ada makes it easier to spot and prevent errors early in the development process. Moving forward the company is investigating expanding its use of AdaCore tools to further underpin innovation and efficiency.

"Using Ada and AdaCore helps D2000 work with data in real-time, reliably. When we compete against bigger rivals our success all comes down to the stability, reliability, and security of D2000 - and this can be attributed to a significant degree to Ada and the strengths of the AdaCore toolset," concludes Miroslav Rechterik, Marketing Specialist, IPESOFTE.



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