

# Dutch Railway tunes up for the Future with Eclipse



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Living in a small, densely populated country, the Dutch have long relied on rail for intra-city travel and daily commutes. Over the past several years their dependence on trains has become more acute as congestion and high gas prices force more drivers out of their cars.

possible. This means planning a train schedule that matches demand and ensures that all the logistic details, from having staff in the right place at the right time, to moving parts and equipment around, mesh together perfectly.

For over fifteen years Nederlandse Spoorwegen (NS) has used a custom-built application

The screenshot displays the 'Donna' application interface with several panels:

- BU Conflicten in infra:** A table listing conflicts with columns: Tijd, Lokatie, Element, Met, Conflicttype, Normw, Waarde, Acc.Pl, Acc.V.
- BU Patronen:** A table listing train patterns with columns: Trein, Vertrek, Spoor, Tijd, Aank., Spoor, Tijd, Matsoort, Geldigheid, T., Status, Infrag.
- BU Activiteiten:** A table listing activities with columns: Dngtr, Spoor, Arr, Van, Naar, Platntijd, Rezek, Kaal, Spl, Spln, Sijg, Maerz.
- Visualizations:** Two graphs showing network flow and activity patterns over time (0 to 60 minutes).

The new planning application, code named 'Donna', introduces intuitive visualizations, error checking, and 'patterns' to efficiently manage data.

So it is vital to the Dutch government that the national railway run as efficiently as

written in Pascal and run on a VAX to develop these detailed plans for their

components and other railway companies. As many as 350 planners would work together for upward of 18 months to build and then manually error check each individual component. Not only was developing a plan expensive and time consuming, making updates was just as difficult since adjusting one variable would impact hundreds or thousands of others. The Dutch government, represented by ProRail, requires that other, smaller, railway companies can plan their own components.

So although the existing solution was stable and familiar, NS set out to replace it in an effort to keep up with growing demand while keeping costs down. With such a long lifecycle for their planning software, they wanted to be sure the new version would meet their growing needs for the next fifteen years. They set ambitious goals to reduce the time required to deliver a plan to 12 months with less staffing. To meet this challenge Info Support, a

Netherlands-based IT consulting

firm with expertise in systems integration using modern languages and architectures, was invited to join the development effort. Info Support's expertise was an excellent match for development of the new application, code named Donna, since much of the work involved integrating legacy applications via J2EE-based server components. For the clients, Java was a natural choice. As William Maas, Project Manager explains, "we needed a user interface supporting multi monitor capabilities and the functionality for perspectives and fragments." They knew and

liked Eclipse RCP from earlier experience and recognized that it would meet their needs. "For us, choosing Eclipse for this project was easy. It was the most complete platform in critical areas."

On top of the Eclipse extension mechanism, they created a framework for super-types that define common functionality. Since many of their use cases require a similar look and layout, this use of extensions simplified development by eliminating a lot of repetitive coding.

Among the key benefits of the new application are *patterns* and error checking. As planners work, they can logically group items such as hourly train movements during rush hour on a length of track into patterns. Using the old software, adjusting each of these movements by 5 minutes may have



**Rich, responsive graphics and native printer access were important Eclipse features that help planners work effectively.**

represented hundreds of changes, each of which had to be made manually. Donna will allow them to make such changes with one edit to a pattern.

Similarly, planners used to error check each of thousands of interdependent elements of a plan manually. Donna will automatically check and alert planners to conflicts, greatly reducing labor intensive and expensive activity.

Since upward of 400 users will be working in the system, preventing update conflicts was critically important. Info Support

together with developers from the Dutch Railways designed a synchronization mechanism based on Java Messaging Services (JMS). Clients leverage Eclipse's ability to communicate over JMS to register with the J2EE server when they launch. As planners work, they save changes to the server, which performs error checking, commits their work and communicates their updates to all clients. Every planner is automatically assured of working with accurate information.

Info Support also took advantage of Eclipse's ability to access native OS resources. As Jeroen Leenarts, Senior Developer on the Donna project explains, "Planners need to print their work for a variety of reasons, and Eclipse gave us the access we needed. We also make heavy use of the Windows Clipboard to move data locally. Neither of these would have been as easy with another platform."

While having access to the Eclipse source code was very useful to Info Support, they

did find that a little knowledge can be dangerous, and have had to be careful to prevent changes to the Eclipse internals that would make future development difficult. Another wrinkle was that the rich Eclipse API tended to overwhelm new developers joining the project. Training, access to the Eclipse user community and reviewing the source code for open source Eclipse projects all helped them get developers up to speed.

NS will go live with Donna in stages, starting in the autumn of 2007. The project is on the road to being a big success and Info Support knows they can recommend Eclipse to future clients with confidence.

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