ALLEGRO CL® @Work!

A Franz Inc. Customer Success Story

Northwest Airlines:
Airport Gate Scheduling System

Northwest Airlines uses Allegro CL for its scheduling applications, developed internally for the company's three major hub airports: Detroit, Minneapolis and Memphis. The system schedules gates for incoming and outgoing Northwest Airlines flights at these three (very busy) airports.

The Detroit site, for example, has approximately 360 departures per day. A total of 60 gates are available at that airport, so the requirement for careful scheduling is clearly there. This is especially true given the amount of last-minute changes experienced in a typical day at an airport. For example, weather in the Detroit area (as well as in the Minneapolis and Memphis areas) can be unpredictable and regularly causes last-minute schedule changes. Late flights conflicting with other scheduled flights, changes to personnel or other resource allocations also cause unforseen gate changes. A schedule is typically published ahead of time for all gate allocations, but this is usually changed several times throughout the day as circumstances evolve.

"That's where the expert system comes in," says Jean Prevost, Project Manager for the scheduling system built with Allegro CL. "It considers all the factors, then suggests the best gate. It has to consider the type of aircraft - many people don't realize that not every aircraft will fit into every gate! It's also got to take into account whether a gate is open or closed at that particular time, what maintenance and other resources are available at each gate, what personnel are available, etc."

The system makes recommendations for changes, allowing the gate planner to see all the available options. The selected change is graphically adjusted on the screen as well as

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>
> *Jean Prevost, Project Manager*

transmitted to other systems. For example, the information is passed to the Northwest Airlines reservations system so that the correct gate is printed on the customer's boarding pass. An additional module in the system tracks passenger and baggage connections to ensure proper coordination of planes, gates, people and baggage.

To handle this complex scheduling task, Prevost and her team turned to the Allegro CL dynamic-object oriented language for application development. "Allegro's language has the dynamic qualities built in," explains Prevost, "You can update objects while the system is running, mixing in behavior such as new time information or weather information, without having to take the system offline. This was crucial for the job we needed to do."

Similarly important was the rapid prototyping and incremental or 'user-evolved' development made possible by the Allegro environment. "We needed to get something up and running quickly. We needed to show it to people and solicit their feedback," Prevost explains, "With Allegro, we were able to incorporate user suggestions relatively easily, without having to recompile the entire program every time. This was a key point."

Other scheduling tasks are now being added to the system. "We're working on a new module," says Prevost, "which will handle the management of de-icing aircraft. Both Minneapolis and Detroit get a lot of snow and ice, so it's very critical to know where everything is at all times and who's next in line."

Mission-critical applications that must respond to rapidly-changing circumstances, such as the Northwest Airlines scheduling system, rely on the power and flexibility of dynamic object-oriented programming. Allegro CL, the leading Dynamic Objects programming environment from Franz Inc., provides the dynamic language and programming tools that software developers need to build applications that can successfully manage complexity.

For more information about Northwest Airlines, please visit http://www.nwa.com

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