

Click away the snow

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Intelsys is optimized for coordinating in winter service at the Cologne Bonn Airport. A summary of the most important resources and documents (top), instructions on the need for action (left), and the central map provide a visualization of the relevant information for winter service. Modular applications (right) display detailed information on the data and allow the input of changed or new data by users. Credit: Fraunhofer FKIE

The control center at the Cologne Bonn Airport coordinates a number of actors during winter services. The new software upgrades the airport's central control of winter service activities. Now, one click is enough in order to respond to weather changes.

The airport sprayer looks like an airplane. Instead of wings, yellow metal

arms protrude to the left and right from the snow plough. With these, it distributes de-icing fluid on the runways of the Cologne Bonn Airport for up to a width of 45 meters. Alexandra Cahn is the Winter Services Coordinator at the second largest airport in North Rhine-Westphalia, making sure that in spite of ice and snow, 190 take-offs and landings can operate seamlessly every day. "One click is all it takes for me to know whether there is still enough de-icing fluid in the tank," explains Cahn, pointing with her finger to the small tank-icon on the right side of the screen. In the middle, the entire airport area shows up in front of her from a bird's eye-perspective. She sees runways, terminals and taxiways – the lanes for the airplanes – in principle every- thing that exists on the 130 hectare-sized area. Cahn can change the perspective that she uses to look at the airport grounds from up above. When she zooms into the screen, the information becomes denser.

The application retrieves the data from the depths of the airport IT system – from servers and databases. Since the beginning of November, the airport has been running "Intelsys," the graphical situational awareness system from the Fraunhofer Institute for Communi- cation, Information Processing and Ergonomics FKIE in Wachtberg. The software gathers all the relevant data for winter service in a central database, and processes the incoming flow of data arriving each day. Among other things, these data are recorded by data meas- urement vehicles that check how slick the runways are, and by temperature probes that indicate how cold it is outside on the runways.

Winter service can be planned predictively

The system knows current weather information, knows what the condition of the snow ploughs is, and has insight into the de-icing work on the airfields. "Winter service can be planned predictively. We have programmed the software in such a way that it automatically warns employees of problems, for example, if the parking positions needed for

arriving airplanes have not yet been cleared of ice and snow," Dr. Michael Wunder of FKIE explains. He sits with his team just 50 kilometers south of the airport. The software program detects critical situations automatically – for example, temperatures on the runways are steadily dropping – and offers recommendations for problem resolution.

"Winter service has to react quickly to short-term changes in weather. The smallest delays in the flight schedule cost the airlines a lot of money. With the new [situational awareness](#) system, we can access all the necessary data within a few seconds, and introduce preventive measures. We prevent delays and deploy our resources optimally," says Cahn, and clicks on one of the runways on her screen. With a few entries, she advises her colleagues about a interruption to operations on the runway so that the snow ploughs can provide their services. At the same time, a message is automatically dispatched to all participating offices.

If the software passes the practice phase during winter service, then additional functions will follow. The foundations for this have been laid at FKIE. "The software is capable of gradually taking over other tasks. Among other things, a rules engine has been implemented that lets us flexibly adjust 'Intelsys' to the [airport's](#) business processes," says Dr. Christopher Schlick, deputy director of the institute. Cenk Özöztürk, head of the traffic and operations division at the Cologne/Bonn Airport, is pleased with the excellent collaboration between his employees and Fraunhofer FKIE. "With close coordination, the pilot system could be developed within a year. We want to continue this successful concept. Our goal is to control all operating processes from one system."

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