

*Challenge yourself as a systems architect*

# PIETER'S CHALLENGE: creating a safe workplace

Pieter van der Spek, system architect



The Port of Antwerp is Belgium's largest sea port and the second largest port in Europe, surpassed only by Rotterdam. The port's 86 terminals are responsible for 223,655,312 tonnes of maritime goods transport. This means 10,450,900 TEU per year and an average of 45 crane movements every hour. The port relies mainly on manual processes, but ICT Group has taken on the challenge of automating some of this work.

The developments in the domain of IT make this work extremely challenging. "This might include anything from a mobile app to desktop applications, configuring servers, different types of communication protocols, PLCs, web sockets, and so forth. You're also dealing with a huge range of peripheral equipment that needs to communicate with each other. What really appeals to me is combining this huge range of technical aspects with the human factor."

### Safety

Pieter van der Spek, who is in charge of the software design: "All the vehicles are manned by drivers, including all the cranes, and the office is staffed by people who handle freight customs clearance. That level of activity makes it a pretty dangerous place to work. By automating parts of these processes, we intend to eliminate the need for human workers in these critical areas. But the shift toward automation is also driven by factors such as efficiency and cost cuts." ICT Group's vast experience with container terminals notwithstanding, Pieter explains that "each terminal is different. The layout of an automated terminal, for example, is completely different from that of a regular, manually operated one. People are not vehicles and not only do they work differently, they also have different requirements when it comes to the work environment. In the Port of Antwerp, there's the added factor that users are ruled by the tides, to the point where your ship will lay idle for a couple of hours if you happen to be late. All that also affects the requirements for human resources and the software applications we develop."

### Complexity

From a layperson's perspective, the process of vessels loading and unloading containers onto and from the terminal seems pretty simple. But as Pieter is well aware by now, there's a lot more to it than that: "The fact that you're dependent on people, the weather, and all sorts of external systems

makes it highly complex." The developments in the domain of IT make this work extremely challenging. "This might include anything from a mobile app to desktop applications, configuring servers, different types of communication protocols, PLCs, web sockets, and so forth. You're also dealing with a huge range of peripheral equipment that needs to communicate with each other. What really appeals to me is combining this huge range of technical aspects with the human factor."

### 'Tangible' software

As a software designer, Pieter needs to cover all the eventualities in developing the applications, ranging from the risk of collision, automated lane keeping, a variety of tasks, etcetera. What he finds challenging is to not only look at the ideal circumstances, but also at times when things could go wrong. "That's where our added value comes in. Of course, you do get it wrong sometimes and then need to find another solution. But if it does work, it always gives me a thrill. In the type of work we're involved in, the software becomes almost tangible, as it's installed in devices that actually do something. That's amazing and I never get tired of it."

### Testing

Container terminals don't have a test environment where everything can be tested extensively. After all, you can't take an AGV into the room in which you're performing your tests. This means that new software needs to be implemented in stages. "The work must continue no matter what, as the financial stakes involved are simply too high. Even though we implement the software incrementally, this doesn't rule out error. The difference between many and a few can be so large that it could blast out your entire system. That's when you really have to think on your feet: Should we go back? Or find a solution? A simulation is not the same as the real-life situation. It is up to us to minimize the risks at all times. Fortunately you're not alone, you can take on the challenge together with your colleagues!"

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