

CUSTOMER SUCCESS STORY

AVIATION · BUSINESS ORCHESTRATION & AUTOMATION

Schiphol Airport

Improving operational efficiency through automation and decision-support solutions

Schiphol is a leading airport in digitalization, using real-time data to optimize operations such as flight coordination, passenger flow, and baggage handling while enhancing the passenger experience. USoft's low-code platform plays a key role by enabling fast and flexible development of digital solutions that improve operational control.

>10 yrs
PARTNERSHIP

20+
BOAT MICROSERVICES

8M+
EVENTS / DAY

01

THE CHALLENGE

Automating operational processes with a scalable and reliable platform.

Process automation as a key enabler for an autonomous running & event-driven airport

To put the vision of an autonomous airport, where operational processes run event-driven, into practice, Schiphol needs a flexible, scalable and reliable technological foundation. This foundation is called Foundation Technology: platform engineering that enables the business to develop and deploy all the applications it needs. Foundation Technology consists of the physical infrastructure (mostly IaaS) and the platforms that run on top of it (PaaS).

Or, as Senior Manager Enabling Technology Garbis van Okburcht puts it: **"We ensure that the business can grab all the building blocks straight off the shelf so they can generate business value much faster. Only if you have the basics in order can you quickly develop applications that are also 'always on': available 24x7, robust and secure. In addition to speed, compliance in terms of security, architecture and regulation is of course absolutely essential."**

CONCEPT

What is Complex Event Processing (CEP)?

This is the use of technology for real-time analysis of data streams to detect patterns, trends and anomalies. It enables organizations to respond immediately to events taking place within operational processes by filtering, combining and processing relevant information from large volumes of data. The team working on the USoft solutions calls itself the Process Automation team.

CEP can be seen as part of the BOAT concept (Business Orchestration and Automation Technologies) developed by Gartner. BOAT enables organizations to automate end-to-end business processes. You can view BOAT as an ideal mix of applications, automation (including AI), integration, process management and insight.

> To create an autonomous & event-driven airport you need process automation. One of the technologies we use to realize this ambition is USoft.

RD

Roel Donker
Technology Lead Enabling Technology at Schiphol

Process automation and orchestration as the basis for an event-driven airport

An indispensable category of building blocks is the scalable integration platforms, says Roel Donker, Technology Lead Enabling Technology. "An autonomous & event-driven airport is an airport where standard processes can take place with no or minimal human intervention. Passengers can drop off their baggage at the self-service baggage drop-off, find their own way to the right gate, and so on. This allows airport staff to focus on providing service instead of supporting day-to-day processes."

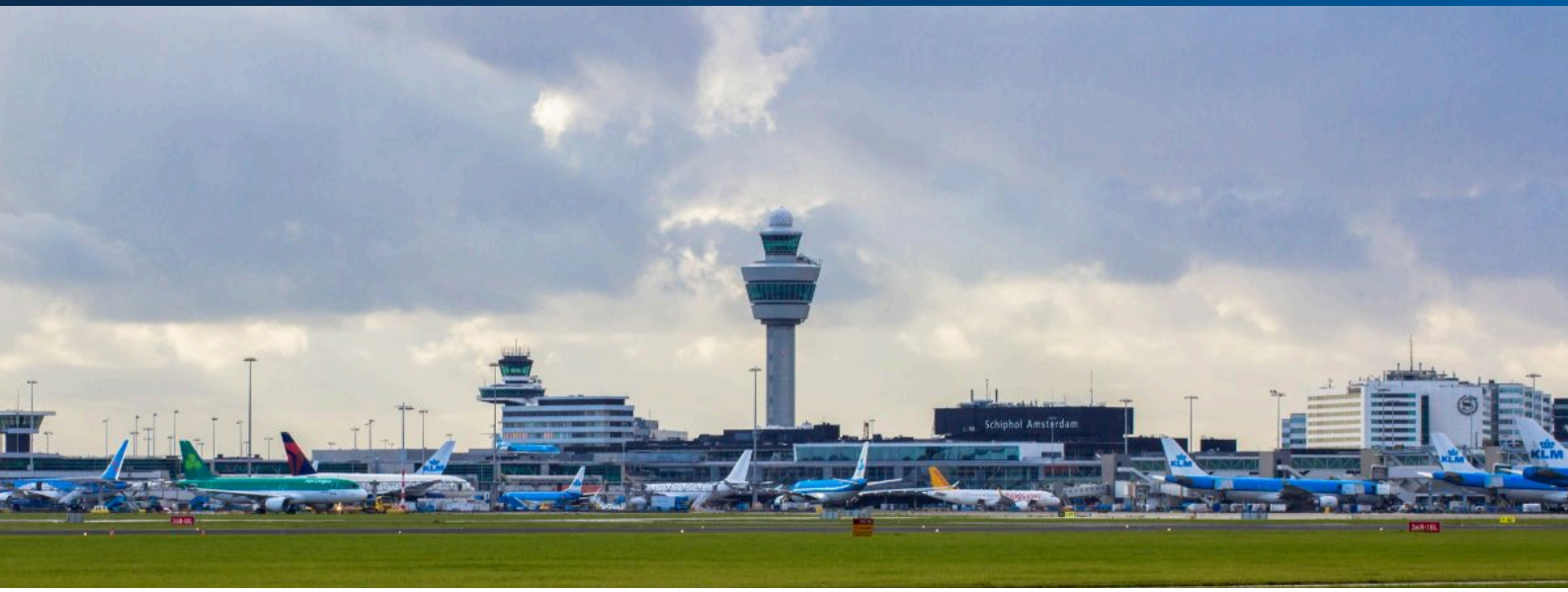
Automation and integration are essential to make the terabytes of data that an autonomous & event-driven airport generates every hour usable for all employees and stakeholders at the airport, and for systems that are increasingly able to function autonomously, says Donker. He gives an example: "An aircraft stand (VOP) is a complex system of equipment that all has to function to handle an aircraft. These days, they are equipped with all kinds of sensors and systems that generate data. To determine that a VOP is usable, complex business rules must be applied to all that data. From a technical perspective we do this with a Business Rules Engine (BRE) and Complex Event Processing (CEP). We deploy the USoft platform for both capabilities."

Data sharing does not only take place with Schiphol employees and other systems within the airport. It is also becoming increasingly important for sector partners such as airlines and air traffic controllers. There are so many processes at the airport that influence each other and the various partners working at Schiphol. This makes making information available a key factor in achieving Schiphol's ambitions around creating an autonomous airport.

02

THE SOLUTION

Automation and integration technology for an autonomous & event-driven airport



The crucial role of integration and automation technology

To make such a data-driven and chain-oriented approach possible, Schiphol works according to the principle of decoupling data and applications. Every application must be able to use every type of data. Data should therefore no longer be locked into applications, but must be able to flow freely. The basic assumption, of course, is that there must be a valid reason to use certain data products. Because of data security, there are limits to what is and is not possible. For Schiphol, Privacy and Security by Design are therefore important principles.

To put this vision into practice, you need integration technology that goes beyond, for example, a simple API, says Donker. "We work with a product and service catalog so that the Business Platform Teams can choose their own technology, as long as it fits within the architectural guidelines. One time that will be an Enterprise Service Bus (ESB) or an API, and another time it will be Complex Event Processing (CEP) for a piece of process automation. In this way we have a landscape consisting of a multitude of different scalable solutions with which you can build integrations; 'liberation of integration'. USoft is a crucial part of this landscape, because we use it to implement both process orchestration and the BRE capability."

Why USoft?

Schiphol uses the USoft low-code platform for two capabilities: as a Business Rule Engine (BRE) and for process orchestration. The ways the platform is used within Schiphol have grown over time, says Donker. "Initially, we used USoft only as a BRE. Generally speaking, business rules are hidden away in domain-oriented applications, which means you cannot clearly see across applications which processes a particular business rule affects. That is why we started centrally recording the business rules in USoft. The Schiphol landscape consists roughly of 80 percent COTS applications and 20 percent custom software. The BRE capability of USoft is useful where you need to work across application boundaries, when you have aggregated data and need to make decisions on top of that.

"In conversations with USoft it quickly became clear that their low-code platform also has Event Processing capabilities. This offered two advantages: USoft is a Dutch company. A company that is very approachable, with whom we already had a good relationship and where we knew very dedicated people were working. Moreover, USoft is strongly aligned with industry standards and anyone with SQL knowledge can quickly learn to work with USoft. This ensures that you can actually find developers in the market."

Schiphol has now been working with USoft for more than 10 years and the scope of use has deepened. USoft is now primarily used for process automation, decision support and orchestration, aimed at streamlining a broad range of operational processes at the airport.

> USoft is a very versatile product that can be used for various business-rules-driven solutions.

RC

Roderick Cazander
Product Owner CEP at Schiphol

Check existing process against business rules

Schiphol chose to use USoft for both capabilities. The Process Automation team within the Enabling Technology department demonstrated the added value of USoft with a proof of concept around passenger flows. Van Okburcht: "A practical use case like this is necessary to make it concrete, because if you explain to IT teams what USoft can do and how we as Schiphol want to use the software, it remains too abstract. You need a real-life example, for instance around monitoring passenger flows, to show that with USoft we can automate all the movements in a process."

A recent example is the security lanes, where baggage is scanned by operators. According to Roderick Cazander, Product Owner Process Automation: "We discovered an optimal ratio. As soon as staffing is optimal a green light automatically comes on. What used to be manual work we were able to automate and put live in just a few weeks. That immediately delivered more than 10 percent efficiency gain. As we digitize more and more processes at the airport, you are dealing with hundreds of thousands and soon millions of variables. Without such a USoft solution, you can never maintain control over this."

To get the full value from the platform, Roderick Cazander was brought in to roll out the service more broadly within Schiphol. He explains: "USoft is a very versatile product that can be used for various business-rules-driven solutions. As long as you have the right data and the business rules for the process are known, you can fairly easily enrich, validate and supplement data. On the one hand, we use USoft to steer an existing process using data and rules, for example by investigating where in the process a suitcase got lost. Or by ensuring that specific baggage requirements from an airline are safeguarded when a passenger drops off their own baggage at a self-service point. On the other hand, we use the real-time capabilities of USoft to support operational processes."

12% higher throughput on the security lanes
Automated and put live in just a few weeks.

03

THE RESULT

User-friendly building blocks to develop complex applications

The value of USoft for Schiphol

Schiphol has now developed more than 20 microservices based on the BRE and CEP capabilities in USoft. All of them are focused on process automation, making operational processes run more efficiently, reducing errors and enabling faster responses to potential disruptions in operations.

Expertise and agility are therefore of great importance. Schiphol wants to enable its teams to quickly realize process automation solutions, Donker explains. "To realize this vision, we are strongly committed to developing best practices and to the possibilities for reusability." That is also Cazander's experience: "On average, a developer needs two months to become familiar with the platform, after which they can develop their first applications fairly autonomously."

20+
APPLICATIONS (MICROSERVICES)

8M+
BUSINESS EVENTS PER DAY

100+
INTERFACES

Results

- Significant process efficiency improvements, **starting at 10–25%**
- **Go-to platform for process automation**
- Strong TCO performance with **20+ apps in a 5 FTE DevOps team**
- **Improved passenger satisfaction & stakeholder collaboration**
- Increased contribution to **the airport's on-time performance**

Key metrics

- **20+ applications** (microservices)
- Over **8 million** business events per day
- More than **100** interfaces
- Reusable building blocks
- Time-to-market of **8–12 weeks** (fastest in 4)

> You need people who understand what an efficient and effective process looks like and who are prepared to take a step back first. In USoft, we have found a partner who contributes to our business and processes.

GO

Garbis van Okburcht
Senior Manager Enabling Technology at Schiphol Airport

USoft from development role to advisory role

This growth in maturity of the Schiphol organization also goes hand in hand with a shift in USoft's role. Whereas USoft initially developed the solutions for Schiphol, they are now mainly developed by Schiphol employees, supplemented by a few USoft consultants. "Our vision is to have all IT embedded in our core processes internally, and therefore to have our own developers. But I must say that the added value of the relationship we have with USoft also lies in the co-creation. As outsiders, they have a different perspective. They look at the matter from the outside-in, while we look from the inside-out. You get synergy when you bring those two perspectives together. For that reason, we are closely involved with USoft's R&D team. We actively contribute ideas about the features to be developed that end up on the roadmap," says Donker.

Van Okburcht agrees. "The people at USoft are genuinely enthusiastic about our operations. There is a shared drive to improve them. They not only think along about the technology to be used, but also about the processes. Are they effective and efficient? Because in the end, of course, everything starts and ends with a good process. If you digitize a bad process, it is suboptimal. You need people who understand what an efficient and effective process looks like and who are willing to take a step back first."

Good cooperation partner

Schiphol therefore hopes to benefit from its close cooperation with USoft for many years to come. Cazander: "There is a lot of knowledge at USoft. The USoft Community platform helps to make this knowledge more widely accessible. It enables developers to help each other and to further improve the products."

Finally, Donker points to the influence Schiphol has on USoft's roadmap. "As I said, we like the fact that USoft is a Dutch company. You have direct access to the management team and to product experts, you can have a say in the direction of development." One of the components of USoft in which Schiphol has been involved is the transformation to the cloud and, with it, the containerization of the platform. This improves the scalability and manageability of the solutions and reduces the costs of infrastructure. "Containerization is a direction that we as Schiphol have very consciously chosen, and USoft also decided to develop in that direction. We were able to contribute our ideas and USoft made use of them. That really is a win-win."

IN DETAIL — THE MICROSERVICES

Schiphol develops applications and microservices based on USoft

Airport realizes autonomous & event-driven airport vision with USoft as Business Rule Engine and solution for Complex Event Processing

You can safely call Schiphol a digital airport. More and more processes run fully autonomously, without human intervention. A number of processes have been digitized using the USoft platform. As product owner of the CEP team, Roderick Cazander has helped expand the microservice landscape within Schiphol. He gives a tour of the microservices and apps that use this technology.

"Running the digital airport and leading the transformation towards the autonomous future" is how Schiphol's current IT strategy is characterized. Integrating data across the chain is an important part of this. Schiphol uses the USoft low-code development platform for two capabilities: as a Business Rule Engine (BRE) and for Complex Event Processing (CEP). Based on these two capabilities, more than twenty microservices have now been built that support various organizational units and business processes, from baggage and passenger processes to cargo.

CONCEPT

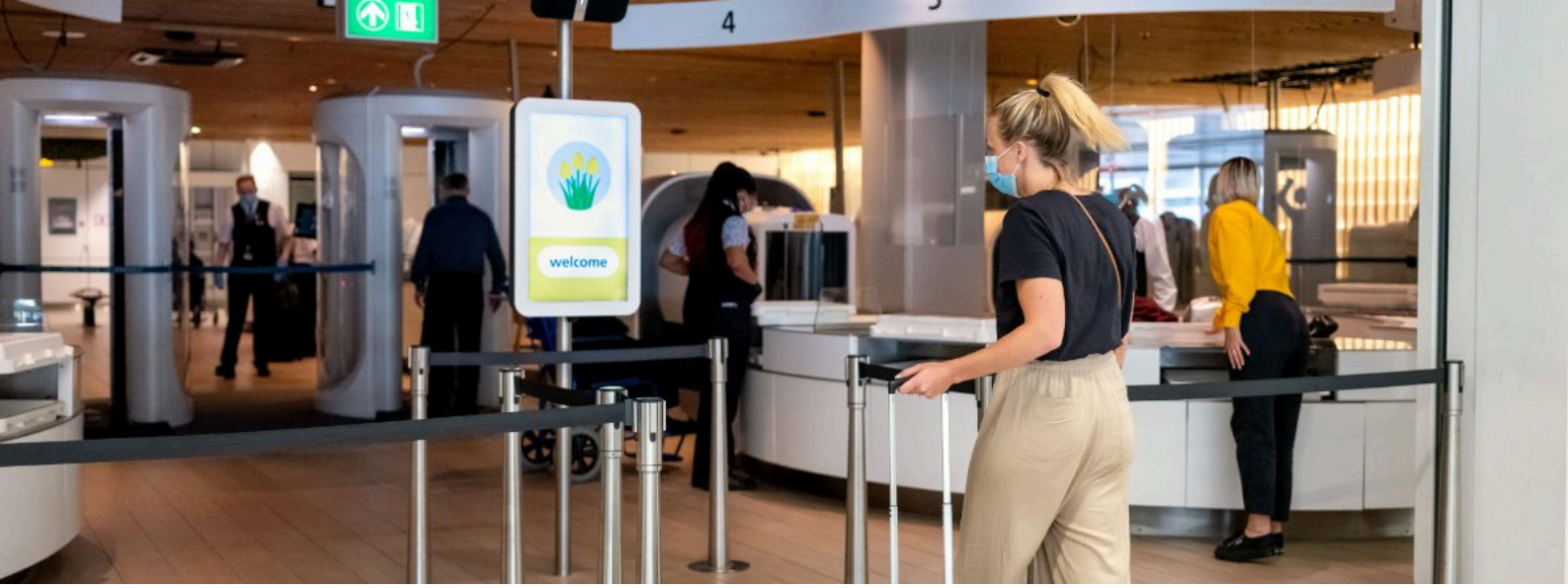
BRE & CEP

Taking business rules out of applications and centralizing them decouples logic from the system, so rules are easier to maintain and reuse. Schiphol uses the BRE mainly for validation; CEP mainly to support real-time processes.

FUN FACT

Naming the microservices

The team has developed more than 20 solutions and counting. Wanting recognizable, easy-to-remember names, Schiphol colleagues use the names of famous pop artists — **ELO, ABBA, ACDC, PINK and PRINCE** are examples of these microservices.



01 OPSVOP

Operational availability of aircraft stands

An application that shows the operational availability of aircraft stands (VOPs), also known as ramps, taking into account the infrastructure, the technical status of the equipment and the mitigating measures that can be taken in the event of a failure. An aircraft stand is subject to all kinds of rules, such as: two large aircraft cannot park next to each other because the wings would touch. If there is a large aircraft at one stand, the stands on either side therefore have reduced capacity. The stands are equipped with lots of technology, such as the passenger bridge. A failure of one of these technical devices obviously also affects the availability of a stand. OPSVOP calculates in real time where an incoming aircraft can best be handled.

02 Efficiency Light Orchestration

An application that provides real-time insight into the staffing levels of security lanes. At the security filters at the airport, efficiency and passenger throughput play a crucial role. The Efficiency Light Orchestration application monitors in real time how many operators are active within a cluster of security lanes. Based on the ratio between the number of operators and the lanes, a light signal immediately indicates whether staffing is optimal (green) or whether adjustment is needed (red). In the security lanes, CT scans are made of passengers' hand luggage. The images are assessed by operators at PVS stations located within the same cluster. Thanks to multiplexing, these operators can process the images centrally, which helps distribute the workload more evenly and optimize throughput. Efficiency Light Orchestration gives supervisors direct insight into the operational efficiency of a cluster. This allows them to respond quickly to bottlenecks and optimize staff deployment to minimize waiting times.

03 PAXCDM Passenger Collaborative Decision Making

An application that generates walking routes and route schedules for all passenger groups on arriving, departing and transfer flights. This contributes to efficient and streamlined passenger flows at the airport. Travellers can easily find the right way and reach their destination without unnecessary delays. Walking routes describe the route of passengers across all process steps and locations at the airport. The route schedules consist of a route and a time schedule for each relevant process step, for example security, border control and boarding (process locations). This way, passengers know exactly where and when they need to report to the various control and service points.

Especially given the large number of passengers transferring to other flights, this solution helps monitor all these connections in real time. By responding early, the risk of disruptions is reduced.

04 PCS Port Community System

A digital platform that facilitates the exchange of information between all parties involved in the air cargo sector. It functions as a central information system in which stakeholders in the air-freight chain — such as airlines, freight forwarders, ground handlers, customs and logistics service providers — can exchange data. The system is managed by the organization Cargonaut and is intended to make the logistics processes at the airport more efficient, faster and more transparent.

EXAMPLE FUNCTIONS

- **Central data exchange** — freight forwarders, handlers, airlines, customs and other parties share information in one system.
- **Track-and-trace** — real-time insight into the status of freight shipments.
- **Faster customs handling** — supports electronic declarations and speeds up clearance of goods.
- **Efficient cargo flows** — less paperwork, shorter lead times, better coordination.

ABOUT USOFT

The **rules-first platform** for business-critical operations.

Automate your operations with **full trust and control**. **Adapt** when your business demands it.

Rules govern every process and every decision. USoft helps you capture these business rules before software is created. Our engine ensures your rules are always enforced: no exceptions and fully traceable. Change your rules and your software stays in sync, everywhere. Whether people or AI build your software or act on your data, everything plays by the rules. All running in your ecosystem of choice.

We help organizations put their rules first: captured in natural language and enforced in every transaction, across people, systems and AI. Ready to change at the pace of your business.

We envision a world where organizations know exactly what their systems do and why, so people and AI can build the future with trust and confidence.

Clear rules you can trust. Results you can audit. Change you can control.

For more information, please visit **usoft.com** and **community.usoft.com**

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