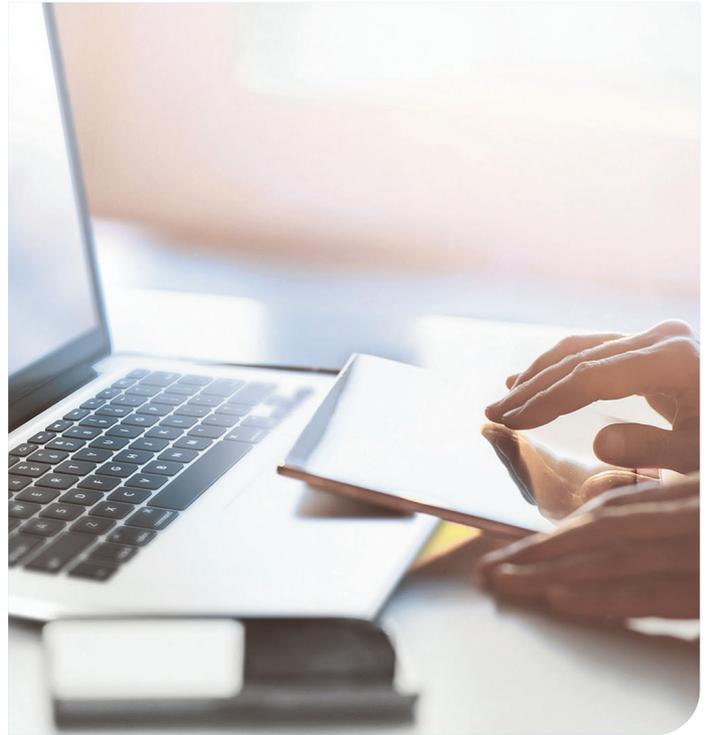




Delivering agility,  
security and simplicity  
in financial payments

**avalog**  
simplicity for a new era

# The story of the open banking implementation



With the adoption of the PSD2 regulation into national law of EU countries in January 2018, the race was on to undertake the technical implementation of the open banking standards ready for the 2019 deadline. For financial institutions, as well as technology and service providers, this presented a significant challenge; notwithstanding the lack of agreement and consistency as to the definition of the Regulatory Technical Standard (RTS) itself. Nevertheless, apart from a few exceptions, the financial community has successfully come through this transition and is reflecting on what happened. Indeed, as the dust starts to settle, many are now asking: what has changed?

Avaloq has worked together with its community of financial institutions and partners to successfully implement PSD2 over the period. Fourteen Avaloq clients were operating payments in the EU jurisdiction, and therefore needed a new, highly secure, PSD2 solution: a solution that required close collaboration with its long-time partner for security technology, Ergon, and its Airlock® solution.

The outcome was more than just a PSD2 compliant solution. For many, the greater benefit was the additional agility, security and simplicity that could be delivered to their clients.

## What was PSD2 about?

When the EU adopted PSD2, it sought to enhance consumer protection, promote innovation and improve the security of payments services.

It identified several key objectives:

- Deliver strong client authentication
- Transparency with card payments
- More rights with online payments
- Account connection through third parties
- Prohibition of card surcharges

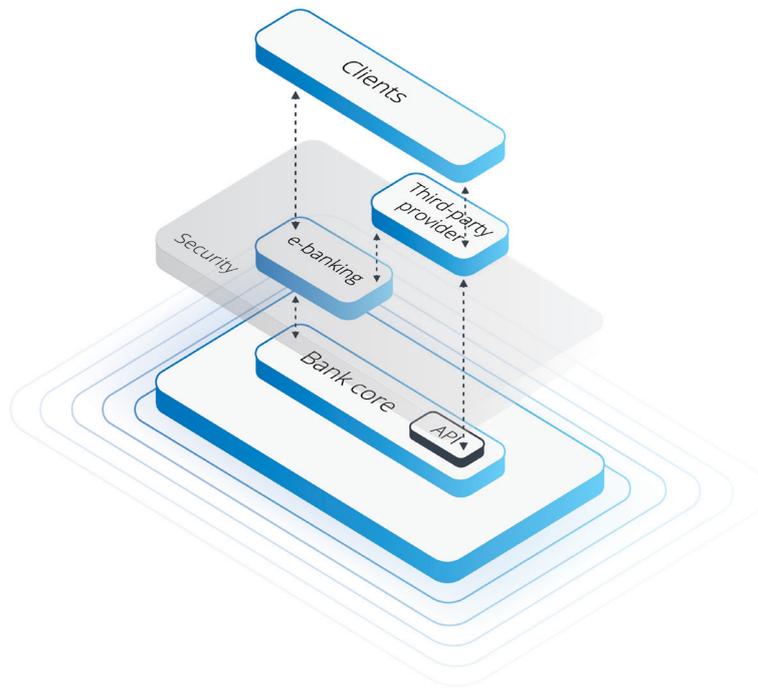
Ultimately, PSD2 is about providing a better service for the end client – at less cost. Nevertheless, the regulation and the technical implementation presented numerous challenges for incumbent banks and wealth managers.

From a pure business perspective, it challenges some of the fees charged for payments services. Conversely, by fostering the open banking concept (i.e. third-party access), it encourages innovation in services and provides new opportunities for payment clients – and therefore new revenue potential for banks.

The technical implementation was fraught with complexity. Technical standards had to be agreed upon. While they were all based on the open banking standards using REST APIs, the two main protocols defined by Paris based STET and the Berlin Group differed substantially in their security aspects and corresponding process flows.

Innovation was, in essence, driven by the requirement to open up payment services to third parties. This meant that multiple, often competing, companies had to collaborate. It also implied additional security measures for clients, to cover the requirement for consent and authorization to be given to the third-party provider to access the client's bank account.

Moreover, once developed, these new functions needed to be tested, supported and maintained, with the inevitable need to manage different software versions and environments potentially into perpetuity. Third-party providers (TPP) had to be given API access to bank's test facilities. All of this had to be built, hosted and managed.



**Figure 1:** The basic PSD2 concept of third-party provider (TPP) connectivity via APIs

**Third-party providers**



Payment Initiation Service Providers (PISP)





Account Information Service Providers (AISP)





Payment Instrument Issuer Service Providers (PIISP)






“There is a great need to develop common standards in the market. Once these standards are in place on commercial grounds, at fintechs and banks, the full potential of PSD2 and beyond can be harvested. However, in order to make this work, all actors of the value chain need to see and embrace the benefits of open banking. Ultimately PSD2 was about providing the client with a better, simpler service – and that is the driver for everything else – and that is what it delivered.”

**Alexander Streule**  
**Senior Product Manager, Payment Services**  
**Avaloq**

### What are the outcomes?

The solution is an enabler for innovation with third-party providers and fintechs with its implementation of open banking standards and REST APIs. It is perhaps too early to say whether innovation expectations have been achieved yet.

Avaloq's principle of building the PSD2 solution in not only an open way, but as a fully integrated module, in line with its end-to-end Enterprise-wide Object Model (EWOM), has brought significant benefit.

Making use of a common object model future proofs the design by avoiding unnecessary duplication of data attributes and means that banks can leverage investments made across their whole operation - without interfacing or rekeying errors. In addition, the nature of the design guarantees that there is a common solution for all banks. They simply have to switch on, or off, the specific feature they need. Overall, the solution delivered agility, security and simplicity for banks and their clients alike:

- **Agility**  
Very fast deployment of new services and functions. A deployment that would have taken days, can be implemented in a matter of hours thanks to the microservice based architecture, open APIs and Ergon's Airlock Secure Access Hub.
- **Security**  
The Airlock Secure Access Hub, together with Avaloq's comprehensive security framework, gives clients confidence to operate in a digital world where cyber security is paramount.
- **Simplicity**  
For the end client payments become easier and faster. The closer integration of third-party apps via open APIs and the use of Airlock's Customer Identity and Access Management (IAM) means that there can be a seamless experience.

### The benefits of PSD2 are not yet clear to all

Clearly, the EU directive was targeted at retail payment providers, yet it impacted a whole range of financial institutions for which EU retail payments have less of a focus for their clients. For many private banking and wealth management operations, the benefits of this new payments interface are not immediately obvious. While, clearly, there is a need to become regulatory compliant and make things easier for their clients, few end-clients have so far requested the use of third parties to execute or overview payments on their behalf – rather trusting their existing banking relationship directly.

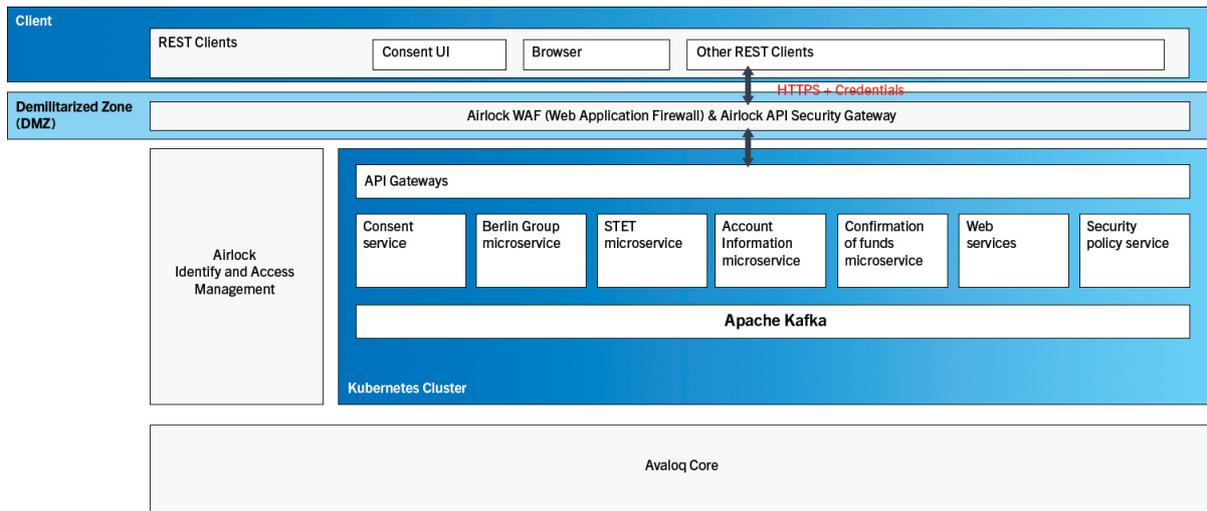
However, as Thomas Boeni, Senior Project Manager at LGT Private Bank, highlights “...this does not mean that the future open banking architecture will not play an important role. The PSD2 initiative of the EU / EEA has the undeniable advantage of setting a standard that is used both in the individual countries, as well as by the participating banks and TPPs. For us, the open banking will become relevant if other assets of value are included in such an overview or order entry; e.g. securities positions, money market transactions, etc.”

### A community approach and an open, secure architecture fit for today's digital world

Over the period, Avaloq has worked together with its community of banks and partners to successfully implement PSD2. As with all regulations that effect its community of banks and wealth managers, Avaloq takes a proactive approach using its Banking Environment Change Monitoring (BECM) unit. The BECM team actively investigates new regulations, and opens discussion with clients. In this particular case, the nature of the regulation was so complex that it was decided to run a series of user groups over the preceding two years, with key architects from Avaloq and the banking community to discuss the topic and determine the best way forward.

The outcome of this process was a solution based on Avaloq's open banking architecture. The new PSD2 services were implemented as a set of containerized services, in a Kubernetes cluster, using the OpenShift platform from RedHat. Wrapped around this is the Airlock Secure Access Hub to provide an additional security layer and the Strong Client Authentication function (see diagram 2).

Building PSD2 solutions as a set of services brings the advantage of rapid modular software deployment, deep integration, and a simpler upgrade path for Avaloq clients. Moreover, this method of deep integration means that clients benefit from the full power of Avaloq's Enterprise-wide Object Model (EWOM), which eradicates the need for complex interfacing and the risk of data attribute mismatch. However, at the same time, this architecture implied a significant system upgrade for many banks and wealth managers, and therefore the initial architecture implementation process required more planning, resources and in some cases took more time than a simple bolt-on solution would have done.



**Figure 2:** Avaloq’s open API based architecture was extended with PSD2 specific microservice and integrated with Airlock®

Airlock Secure Access Hub was integrated with Avaloq’s security framework to provide iron-clad security. Strong Client Authentication (SCA), including consent enforcement, was implemented through the Airlock Secure Access Hub, consisting of a Web Application Firewall (Airlock WAF), a Customer IAM system (Airlock IAM), and the Airlock API Gateway which provides some PSD2-specific security validations such as request signature verification and TPP certificate-based access control. Ergon’s solution delivered:

- a. Clear separation of competencies
- b. Application-independent support for multiple SCA methods
- c. Top-level security for browser-based access and APIs alike



**An open architecture that delivers real benefits**

- Containerization brings direct efficiency improvements through higher utilization and reduces operational overheads through standardization. Kubernetes allow banks to scale up without expanding their operations teams. As its creators point out, it is designed on the same principles that allow Google to run an astonishing two billion containers every week.
- Faster, richer browser-based and mobile UIs simplify lightweight UI integration of content from multiple systems and vendors and improve the end-user experience.
- Default semantics and limited customizability of new solutions, as well as standardized semantics for SaaS clients for both old and new applications further reduce the total cost of ownership.
- Upfront security allows for shorter time to market because business applications and APIs profit from specialised components focusing on relevant aspects.

# Conclusions



The success of such industry wide projects requires an immense amount of interaction, collaboration and understanding between people of a wide range of organisations. Avaloq's community approach is a key ingredient to achieving success in open banking and having Ergon as a strong partner to work with closely throughout made the critical difference for Avaloq and its clients.

Many of the innovative benefits of the whole open banking regulatory movement will be accrued over the coming decade. But already, Avaloq clients can benefit from the latest in architectural innovations, with an open API, microservice based platform that delivers agility, security and simplicity. An architecture that is built around an Enterprise-wide Object Model (EWOM) that provides end-to-end consistency; and with Ergon's Airlock suite, has the additional layer of iron-clad security required in today's exciting world of open banking.



"Avaloq and Ergon succeeded in delivering a state-of-the-art solution for PSD2 which sets the groundwork for future APIs and solutions based on a microservices architecture."

**Alexander Streule**  
**Senior Product Manager, Payment Services**  
**Avaloq**

"Avaloq cares about a key component of digital banking: Security. It is part of Avaloq's DNA and it's part of Avaloq's forward looking architecture. Clients benefit from an integrated solution that keeps on innovating. We at Ergon are proud to be part of the innovation process and deliver solutions that deliver business value."

**Roman Hugelshofer**  
**Managing Director Application Security & Member of the Executive Board**  
**Ergon Informatik AG**



# About Avaloq: simplicity for a new era



Avaloq is driving the digital transformation and automation of the financial services industry.

Based on our fully integrated banking software, we create powerful digital experiences provided through a standardized Business Process as a Service (BPaaS) or Software as a Service (SaaS) model to banks and wealth managers. Our solutions give financial institutions the freedom to focus on channel and product innovation, client service, client trust and growth, while Avaloq ensures a seamless operation behind the scenes.

Over 150 banks and wealth managers – with more than CHF 4,500bn in assets managed worldwide – trust Avaloq, our products and our experience. Our clients are the leading banks and wealth managers of today and tomorrow.

Avaloq is the only independent provider for the financial services industry to both develop and operate its own software, which makes us a world leader in efficient banking solutions. To further spur innovation, we closely work with clients, other fintechs, leading universities and hundreds of third-party developers in a uniquely collaborative ecosystem we call avaloq.one.

Headquartered in Switzerland, Avaloq has more than 2,000 employees; three R&D centres in Zurich, Edinburgh and Manila; and three service centres in Switzerland, Singapore and Germany. We also have a presence in the world's most demanding financial and innovation centres, including Berlin, Hong Kong, London, Luxembourg, Madrid, Paris, Singapore and Sydney.

More information is available at [www.avaloq.com](http://www.avaloq.com)

#### Contacts:

[alexander.streule@avaloq.com](mailto:alexander.streule@avaloq.com)  
[mark.shields@avaloq.com](mailto:mark.shields@avaloq.com)

[martin.zahner@ergon.ch](mailto:martin.zahner@ergon.ch)  
[gernot.bekk-huber@ergon.ch](mailto:gernot.bekk-huber@ergon.ch)

[www.avalog.com](http://www.avalog.com)