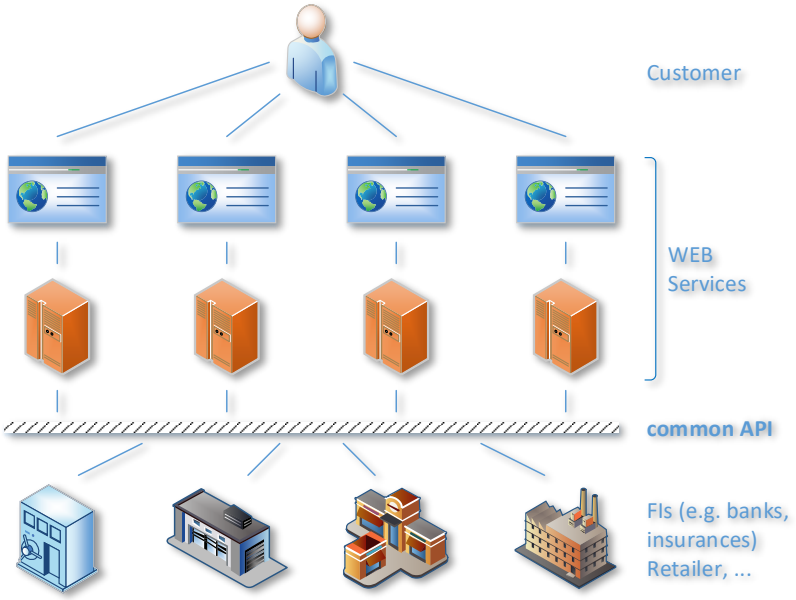
SFTI - working group 'Common API'

Multi-banking Services

Whitepaper



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About SFTI

Swiss Fintech Innovations (SFTI) is an independent association of Swiss financial institutions committed to drive collaboration and digital innovations in the financial services industry. For more information about *Swiss FinTech Innovations*, please refer to http://www.sfti.ch.

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Management Summary

The present white paper aims to address the non-technical perspective on a Swiss multi-banking environment. It is intended to serve as a source of information regarding customer needs, possible multi-banking scenarios and banking-related services. Thereby we limit ourselves to the cross-company view. Bank-specific aspects are indicated but not addressed in detail, as the strategic positioning of the respective bank is at the forefront of such issues.

The main objectives of this white paper are to provide guidance on the following aspects:

- Fostering financial innovation (development and use of innovative technologies)
- Retaining the customer interface (financial service providers and house bank can use new business models)
- Ensuring data security (controlling access and authorization processes according to the highest banking security standards)

The main objective is to support the Swiss financial centre in the structured development and implementation of open banking concepts (and not through regulation as with PSD2).

In the first chapter of this document, basic terms are explained, followed by survey results on customer demand, which clearly show the need for multi-banking solutions. In addition, this chapter also includes aspects which are of fundamental relevance in principle, but which must be addressed individually by each bank in the context of its respective strategy.

The second chapter covers basic aspects of multi-banking, such as an approach to segmentation of multi-banking users and basic scenarios of API-based multi-banking. Particular emphasis is placed on the multilateral approach, where banks themselves offer multi-banking services.

An overview of use cases forms the content of the third chapter. The aim of this presentation is not to be exhaustive, but to show the wide range of services that multi-banking must cover.

Finally, the fourth chapter takes up the topic of a PoC. These comments are intended to provide an outlook rather than a complete picture. They outline aspects such as objectives and scope, as well as a basic solution design.

Based on this white paper, a sandbox environment may be established to foster the development of multi-banking solutions. With this, multi-banking PoCs can also be designed and implemented, for example.

1. Introduction

This white paper addresses fundamental aspects regarding near real-time multi-banking services related to the banking business domains *Access to Account* (XS2A) and *Payments*. It is intended to serve as a source of information on this topic and also lay the foundations for a corresponding PoC.[1]

In addition to basic considerations for finding a suitable solution, the concepts described in the following chapters address the business view as well as technological aspects. Furthermore, the specific positions of the companies involved in implementing such a solution are also presented.

1.1 What is Multi-banking?

Multi-banking enables bank customers to manage multiple bank accounts through a single platform. It therefore uses the possibilities of open banking to efficiently aggregate data from different institutions.

The exact functions may differ slightly. These include, for example: Call up current account balances, retrieve bank statements, make bank transfers, manage standing orders, graphical analysis or ATM search.

Because it addresses a fundamental customer need (see e.g. section 1.3 Customer Demand Analysis), multi-banking is of high potential for all FIs involved. But so far, in the Swiss financial center multi-banking solutions for the retail segment are not yet available with sufficient functionalities.

Within Europe, UK has made the greatest progress in this area. In the EU, attempts to create at least a common regulatory basis for such services have been performed with the PSD2. However, due to a lack of technical specifications for implementation, these attempts have not yet been particularly successful.

Here, Switzerland can rely on the proven instrument of the banking center's own initiative. In this context, the SBA published a document on open banking in July 2020, which is intended to serve as an interpretative guide for the Swiss financial center.[2]

There, the topic of open banking is structured from the perspective of the Swiss banking industry and fundamental guidelines are defined for the relevant legal aspects. The document contains legally non-binding recommendations and assessments that can be used in the further implementation of open banking business models.

One key finding is that Multi-banking is quite straightforward to implement when generally applicable standards are addressed. This is exactly the path that SFTI is following with its Common API Initiative. The topic of multi-banking addressed in this document is an example of this approach.

[1] The authors of this white paper explicitly do not claim that this document is a substitute for the full-fledged planning.

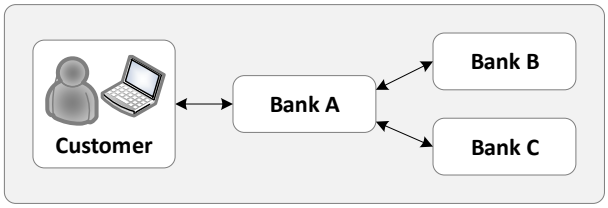
[2] https://www.swissbanking.org/library/richtlinien/auslegeordnung-open-banking/sbv_auslegeordnung_openbanking_de.pdf/@@download/file/SBV_Auslegeordnung_OpenBanking_de.pdf

1.2 Setting up Multi-banking

When it comes to the interaction of the parties involved in multi-banking, two basic scenarios can be distinguished: The Bank-centric and the TPP-centered one.[3]

1.2.1 Bank-Centric Scenario

In bank-centric scenarios, the orchestration of all multi-banking services takes place entirely on the banking side. There is a 1:1 connection between the customer and the bank that coordinates the service provision.



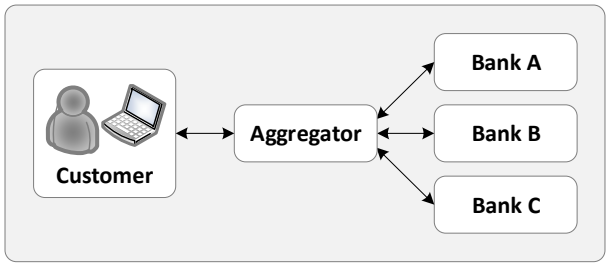
The main advantage of this option for end customers is that they can access multi-banking services through the bank of their choice. Despites, this scenario may also involve some disadvantages.

(i) Some banks may provide multi-banking solutions, but they lack in targeting all customer segments with their offering.

(ii) A multiplication of integration efforts occurs because multiple banks act as aggregators. In this case, repetitive work is done when each bank aggregates multiple bank accounts to provide a single point of access to a consolidated overview of the customer's financial situation via the bank's user interface.

1.2.2 TPP-centered Scenario

In these scenarios, parties outside the banks (e.g. TPPs) are at the center of service delivery. From the banks' point of view, consolidation takes place externally, or in simple terms on the customer side.



This model can be designed in two different ways: On the one hand, the aggregator may be a third-party provider (TPP) from which the customer sources certain services. This TPP then processes these services on behalf of the customer at the banks.[4]

[3] The explanations in this chapter shall serve as an introduction to the topic. The detailed portrayal of the variants outlined here is given in the next chapter.

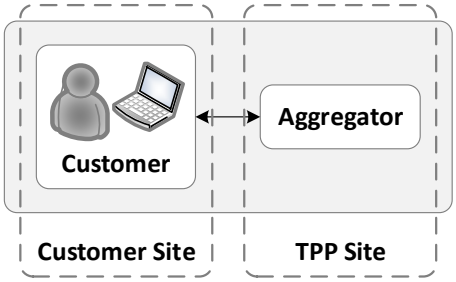
[4] The aggregator layer can also be structured in a more complex way, for example by a platform operator offering value-added services for or via TPPs (b.Link approach of SIX).

On the other hand, the function of the aggregator can also be taken over by a system that runs under the direct control of the customers (e.g. EBICS based solutions). This layout is restricted to larger companies, which thus retain full control over the corresponding processes.

This model may have some disadvantages as the customer interaction with the bank is mediated by a TPP and implies further security checks as the sensitive data of the client is being shared with a non-regulated/non-supervised Third Party. Nevertheless, PSD2 provides a regulated scenario where eIDAS[5] certificates allow to identify authorized TPPs to ensure the secure data exchange with a TPP acting as an intermediary.

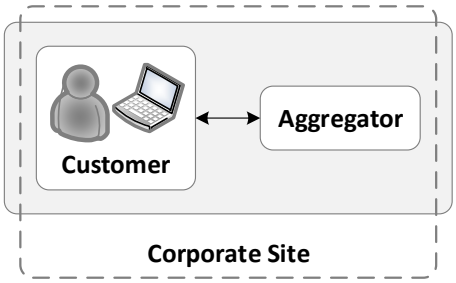
Despites, the interaction being intermediated by a TPP allows banks to rely on the agile technologies of FinTechs - acting as TPPs - and benefit from the innovative solutions they offer.

- **TPP-centric layout**
  This layout is suitable for private customers and SMEs with a low requirement profile for financial services. With the solutions available today, the required multibank services can easily be provided by third parties without the customer having to operate his own software.



  The role of the TPP can be played by specialist providers, but banks themselves can also provide this service. The latter is then identical to what is described in section 1.2.1.

- **Customer-centric layout**
  Historically, this is the common layout for corporate customers. In this case, typically complex ERP systems such as the ones from SAP act as aggregators. In addition to payment transaction functionalities, these systems cover many other elementary requirements of the company (accounting, production planning, inventory management system, etc.), and all these functionalities are highly interconnected.



  With the technologies available today, operational outsourcing is possible (e.g. SaaS, Cloud Services). However, this externalization only affects the operation of the technical infrastructure. External interactions (data exchange with suppliers, etc.) still take place

[5] The PSD2 Regulatory Technical Standard (RTS) dictates that a TPP should be able to use a qualified certificate issued by any eIDAS Qualified Trust Service Provider (QTSP) in order to identify and authenticate themselves to an Account Servicing Payment Service Provider (ASPSP) e.g. a bank.

via the company as a legal entity and not on its behalf by a "TPP" (i.e. the provider of the ERP system).

1.2.3 Conclusion

From a technical point of view, the bank-centric scenario has the disadvantage that each bank must handle multiple integration. Even if standardized APIs are used across banks, certain additional efforts are unavoidable. This does not apply to the Third Party-centered scenario, at least as long as a bank does not also act as a TPP in this context.

In terms of system availability, the Third Party-centered scenario is at a disadvantage, because if the intermediary's central platform fails, the entire system is down. In the bank-centric scenario, on the other hand, a total failure of all systems is not to be expected.

It is due to the nature of the requirements and their varying complexity that there is no solution that is equally suitable for all customer segments. Depending on the needs of the specific customer segment, the provision of multi-banking services must be considered in different ways. This will be discussed in more detail in the next chapter.

1.3 Customer Demand Analysis

Based on a variety of customer surveys, a clear customer interest in multi-banking solutions can be determined. This is illustrated in more detail in the following sections.[6]

1.3.1 E-banking

In 2019, only 34 percent of the Swiss population had only one banking relationship (Figure 1). On the other hand, ease of opening a bank account has become a major selling point in the Swiss retail banking sector, which is good news for prospective customers.

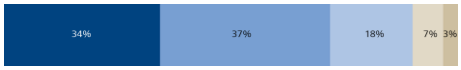


Figure 1: Number of banking relationships (1 to 5)

The dotted line in Figure 2[7] shows the proportion of bank customers who specify the respective bank as their main banking relationship (*HB-Quote*). The smaller the bank, the lower the proportion of customers with a main bank relationship, i.e. the proportion of customers for whom the respective bank represents the most important banking relationship.

[6] Except for the last two figures, which are provided by Raiffeisen Schweiz, any figure in this chapter is taken from BBS 2019 (*Basisstudie Bankenlandschaft Schweiz*).

[7] Source: BBS 2019 | Q06 Banking Relationship: At which bank(s) are you personally a customer as a private individual? This does not refer to banks where you only have a power of attorney. | Q40 Main banking relationship: Which of the banks you are a customer of is your main bank, i.e. the bank that is the most important for you for some reason??

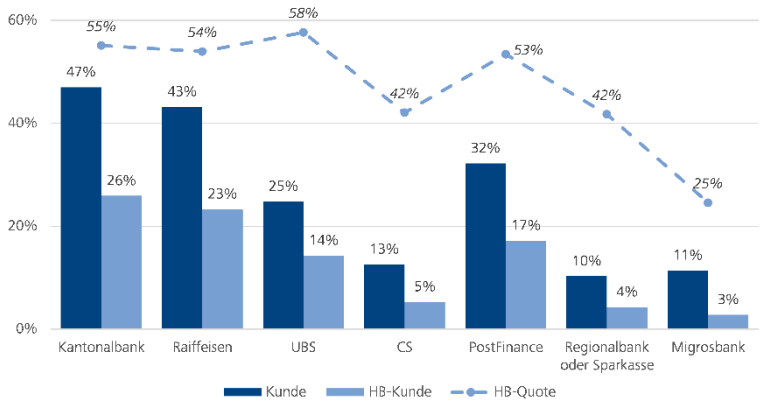


Figure 2: Main vs. secondary bank accounts

Figure 3[8] below shows three statistics: On the very left side, it can be seen that mobile devices, i.e. smartphones and tablets are not relevant as a means for online banking. The majority of e-banking users access e-banking via desktop PC, "mobile only" users are clearly the exception.

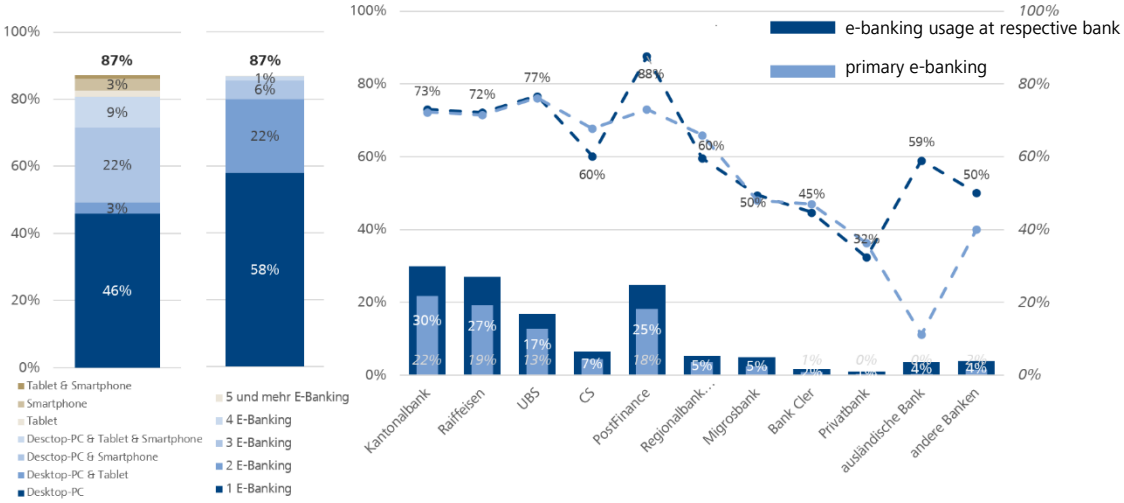


Figure 3: E-Banking Usage

The adjacent diagram shows that 87% of the population use at least one e-banking, that around 2/3 of the e-banking users have only one e-banking contract (58% of 87%) and that almost a quarter use e-banking clients from multiple banks.

The potential, i.e. the proportion of customers using e-banking at any one bank - is comparable at all banks (right side).

[8] Figure from BBS 2019 (*Basisstudie Bankenlandschaft Schweiz*).

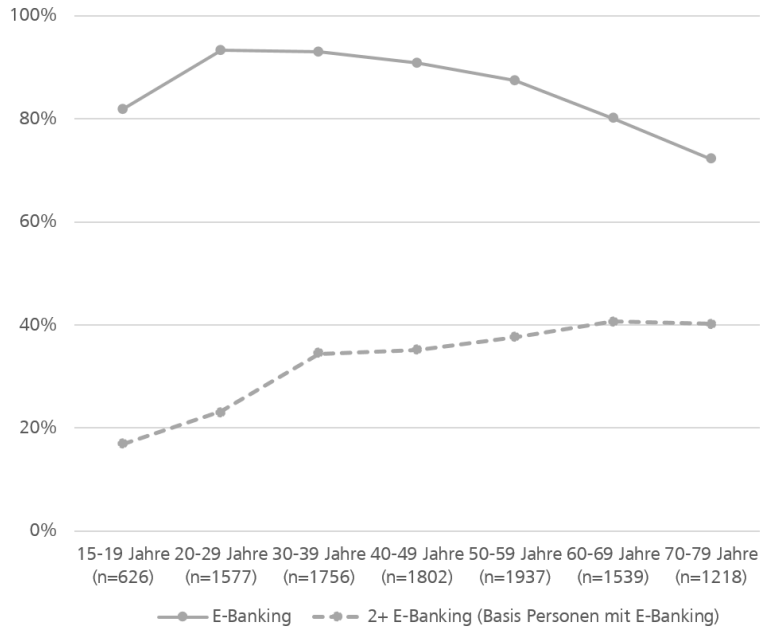


Figure 4: e-Banking Usage

Although e-banking usage decreases with age (see Figure 4[9]), the proportion of people with two or more e-banking relationships with different banks from 30-39 years of age is stable at around one third. Like the private account or debit card, e-banking is a basic service used by (almost) the entire population (apart from the generation effect).

From the age of 30, (almost) the entire resident population of Switzerland has e-banking. The proportion of people with two or more e-banking relationships, out of all people with at least one e-banking relationship, is increasing steadily and strongly until the 30-39 age group.

1.3.2 Multi-banking

Multi-banking solutions provide a single point of access to a consolidated overview on all the accounts a customer holds across multiple banks and other financial institutions (e.g. 3rd pillar).

Although many customers are not yet familiar with multi-banking, this topic is gaining in importance. Current multi-banking users are the clear exception. The multi-banking solution is used, for example, for foreign bank accounts (e.g. Commerzbank, Consorsbank in Germany).

[9] Figure from BBS 2019 (*Basisstudie Bankenlandschaft Schweiz*).

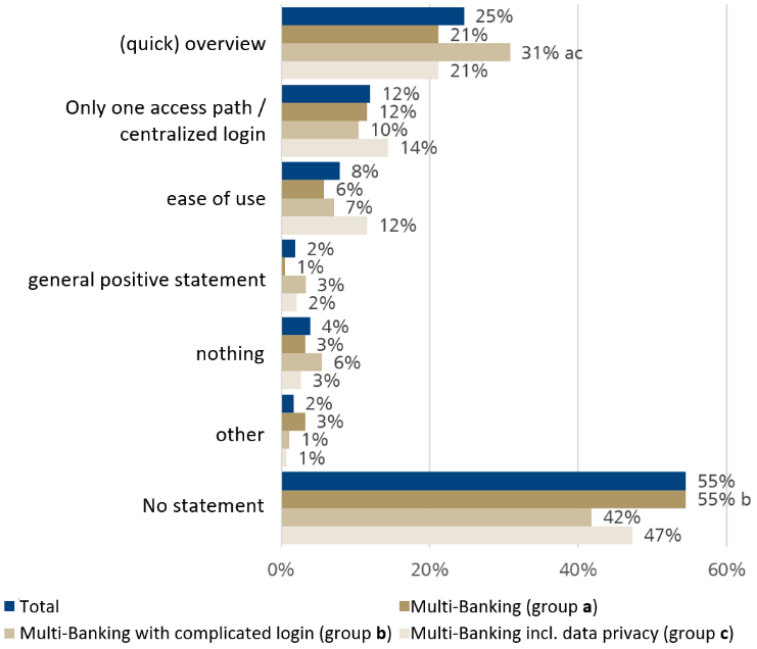


Figure 5: Likes on Multi-banking concepts

In *Figure 5*[10], the likes on some multi-banking related service ideas are shown. A multi-banking concept appeals most to customers with e-banking because they could obtain a quick and comprehensive overview of the current financial situation.

For the sake of easy usability, a simple registration is also desired (see *Figure 6*[11]).

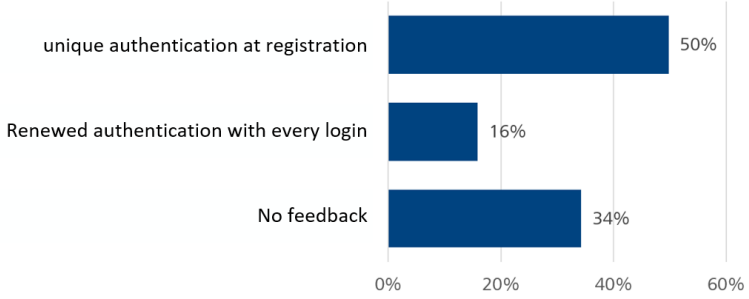


Figure 6: Registration process

[10] Figure provided by Raiffeisen Schweiz

[11] Figure provided by Raiffeisen Schweiz

1.3.3 IFZ Survey

During the course of working out this white paper, another insightful article on multi-banking was published by Prof. Andreas Dietrich (Lucerne University of applied Sciences and Arts) in his IFZ Retail Banking Blog.[12]

The blog article is based on a recent survey on multi-banking. Although the demographic characteristics of the survey sample do not correspond exactly to the population structure of Switzerland, the survey gives a first impression of how great the interest in multi-banking solutions for retail or private banking customers in Switzerland could be.

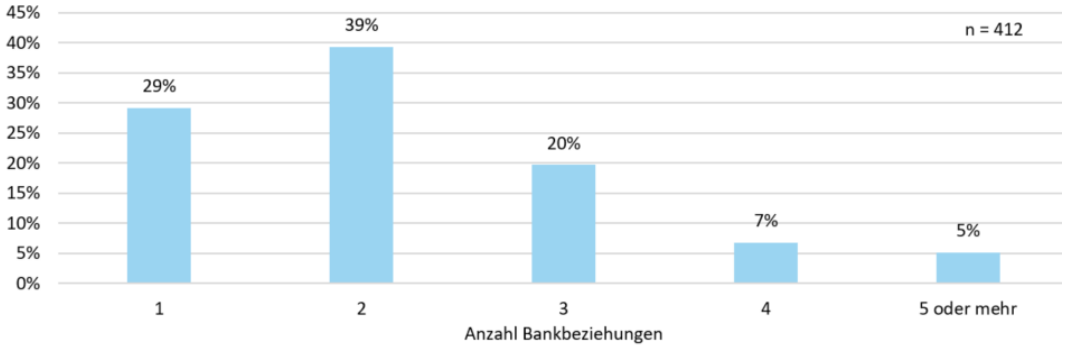


Figure 7: Number of bank accounts

One important finding is that around 70% of all Swiss private clients of banks have multiple bank accounts (see Figure 7). Most respondents have a positive attitude towards multi-banking in retail banking and would welcome such offers. But although well over 70% of respondents say they would use multi-banking if it were available (see Figure 8), only about 15% are willing to pay for this service.

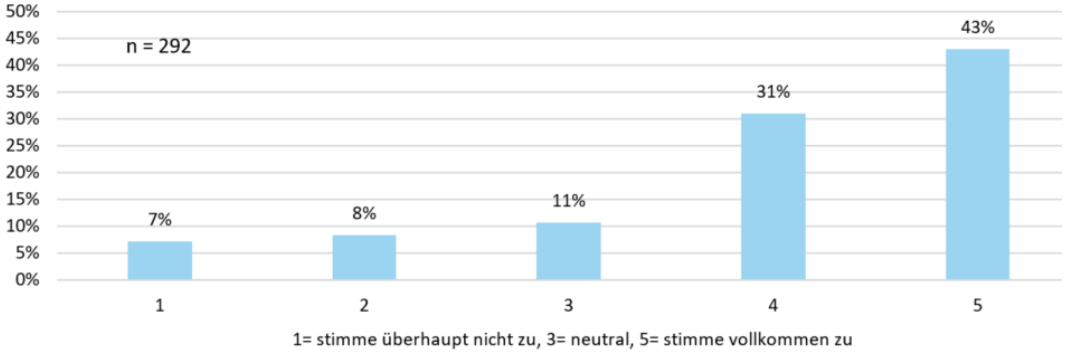


Figure 8: Attitude towards multi-banking

Another key finding, which Prof. Dietrich presents in his blog article, is that potential multi-banking users are rather skeptical about FinTechs and would rather have an offer from their own bank (see Figure 9).

[12] Source: https://blog.hslu.ch/retailbanking/2020/09/14/wuerden-retail-banking-kunden-multibanking-nutzen

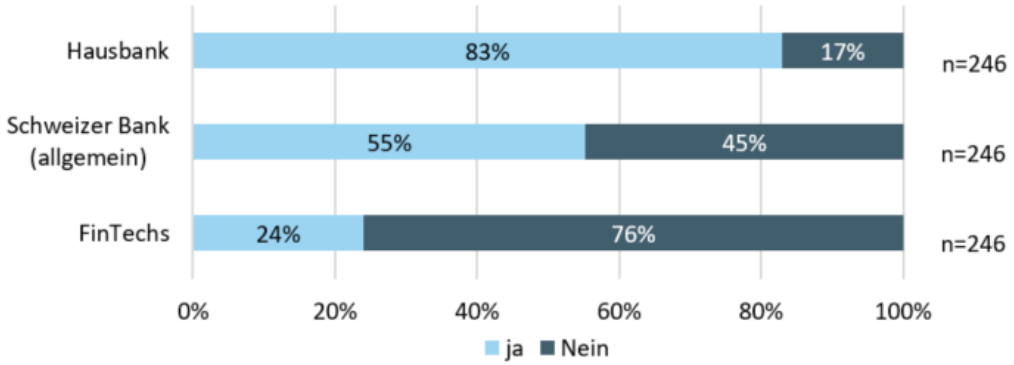


Figure 9: Preferences regarding providers

Shortly spoken: Multi-banking is becoming a commodity that private customers expect from their bank and they expect to receive it free of charge. It is then up to the banks to supplement the free basic functionalities of multi-banking with services that can be monetised.

1.4 Further Considerations

The following sections cover considerations that must be addressed from a strategic point of view at each financial institution which plans t participate in multi-banking ecosystems.

1.4.1 Target Group

The Swiss financial centre is slowly but surely moving in the same direction as Europe, where multi-banking via various channels, in particular via mobile devices, is becoming the standard. In this white paper, the classic distinction between potential, future providers such as new banks, TPP, "classic" banks, platform providers and end customers such as treasurers, CEOs, accountants, EAM, family office, retail, custody, is not covered in detail.

Nevertheless, the separation of professionals/companies and private persons is crucial when it comes to the point where a deep understanding of the target groups is needed. When a bank starts its multi-banking project, with the help of Persona Profiles, it is possible to develop this understanding for the target groups. It is easier to put yourself in the hypothetical person's situation than to imagine the behavior of a whole group of people. With persona profiles it is therefore easier to understand the wishes, needs and problems of the target groups.

1.4.2 Economic Considerations / Business Case

Financial service providers planning to participate in multi-banking should, in addition to the benefits (qualitative & quantitative), also examine the strategic significance of multi-banking in terms of the topic area "customer interface" and its side effects with respect to their overall corporate strategy. A comparison and assessment of different options for action with financial and strategic effects on the "customer interface" can be of decisive benefit in the realization of multi-banking services.

1.4.3 Supported Countries/Regions

The changeover to new APIs to bank accounts may take a long time, as there are specific requirements and guidelines of the country, financial institutions, regulatory standards, etc.

However, how exactly the banks implement these changes in practice is largely up to them. Accordingly, banks handle the requirements in different ways. With a view to the future, in addition to financial freedom and security, it is equally important that financial institutions continue to provide the interfaces necessary for multi-banking applications in the usual good quality and without restrictions.

In this context, standardizing the requirements for security procedures and interfaces in such a way that they can also be fully used by offline applications is of essential importance. Here, all stakeholders involved should pull together, all sides should act in the interests of specific end customers in the countries and regions.

1.4.4 Compliance

Multi-banking will include information on customer behavior such as names of third-party bank account holders, balances and transaction data. When handling these data from third party banks, there are the dangers of misjudging the customer risk, insufficient monitoring of the business relationship, non-recognition of money laundering, financing of terrorism and/or economic sanctions, etc. (this is simply because the details of the third-party bank relationship are not necessarily sufficiently known to the bank offering the multi-banking).

In order to counteract this risk, financial institutions need standardized (and regulated) compliance requirements, which are already available e.g. through the Data Protection Laws. This includes how the bank uses the data for its own purposes, which may be addressed e.g. through terms of use.

1.4.5 Costs and revenues

Platforms such as b.Link, for example, incur costs but also revenues, depending on their role. This fact should be made transparent to the end customer.

1.4.6 Digital Onboarding

As already with regular e-banking, onboarding is a central element and one of the key factors for successful multi-banking . In the context of a use case, an optimised onboarding concept can help by clarifying the benefits and increasing trust.

When it comes to implementations, a follow up of this whitepaper with focus on technical aspects as well as on usability should show approaches to simplify onboarding for customers, e.g. by means of wizards or automatically filled in financial details.

1.4.7 Approval & safety requirements

Each channel brings with it its own security requirements. When connecting to API platforms such as b.Link, for example, one must meet not only approval requirements predefined by the channel provider, but also its security requirements (certification, periodic re-certification). This is of significant importance especially for TPPs.[13]

1.4.8 Pricing

Possible pricing models can be used to demonstrate successful and sustainable growth and monetization strategies around multi-banking services "around" which will inspire and retain interested parties/customers. In combination with considerations of economic efficiency, this requires a deep understanding of the target group, otherwise there is a risk of high IT investments with minimal economic value - and the danger of losing valuable customer trust.

It is up to the participants to agree on a pricing model which is based on a flat rate or of pay per use type.

1.4.9 Customer Requirements and Solution Design

In addition to customer expectations like the basic requirement for high security in data management, it is also elementary for the user that the third-party bank data is integrated into the existing tool landscape (e.g. e-Banking) in the best possible way.

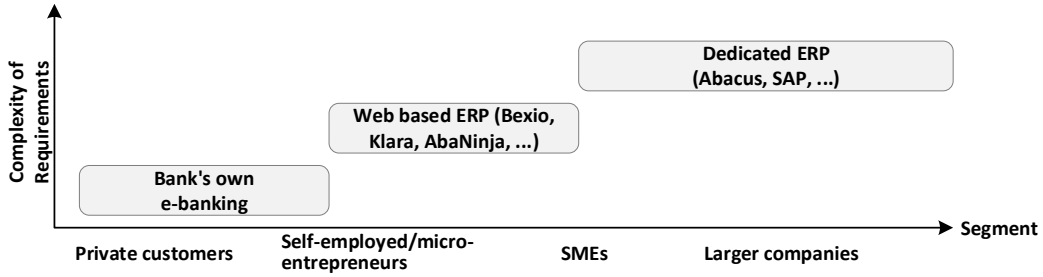
A separate, decoupled solution without consolidation with the bank's own data brings only limited customer benefit. Simple account transfers but also all other payment methods (EZ orange, bank payment abroad, SEPA, ...) should be integrated into the existing bank functionalities if possible. In this way, the bank can offer innovative products to the end customer, which are dependent on the integration with a transaction backend and/or an online system.

[13] In theory, such requirements could also be freely negotiated between the TPP and the platform provider. In fact, however, providers of such platforms have no interest in individual agreements and the additional efforts and costs involved.

2. Fundamental Aspects of Multi-banking

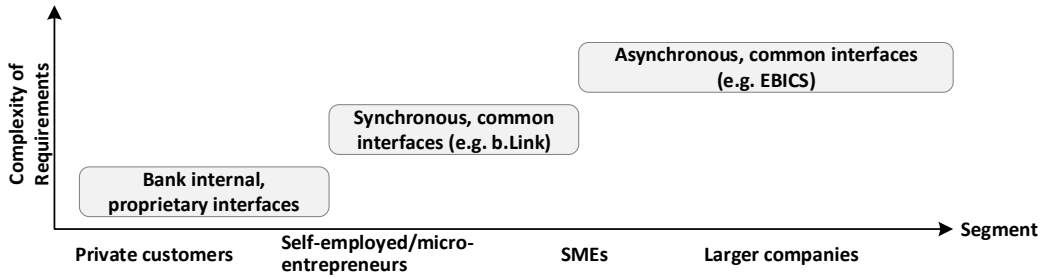
2.1 Segmentation of Multi-banking Users

The functional and thus also the legal and regulatory requirements for a multi-banking solution differ significantly depending on the customer segment. In terms of the portfolio of requirements for a multi-banking environment, the segments of private customers[14], self-employed persons and smallest companies[15], SMEs[16] and larger companies[17] can be distinguished:



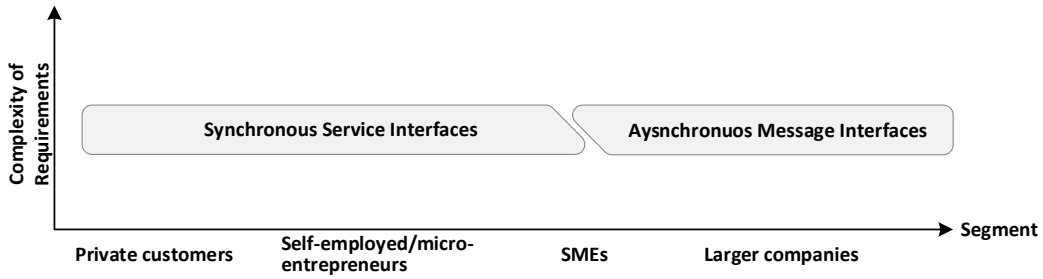
Only when using an own ERP system (i.e. for some of the SMEs and for larger companies), software is operated on the customer side. In all other cases, banks or third parties (TPPs) operate the solution.

The following picture shows the interfaces that are used here:



The characteristics of these interfaces are not freely chosen but are largely determined by the design of the respective business solutions.

The following technical implementations are required to be able to serve these interfaces on the bank side:



[14] The main requirement in this segment is the consolidated presentation of financial information on all banking relationships.

[15] A characteristic feature of this user segment is the processing of their bookkeeping by means of their bank's e-banking or web-based solutions such as Bexio, Klara, or AbaNinja.

[16] Depending on the size of the company and the complexity of the requirements, web-based solutions or dedicated ERP systems are used.

[17] This segment operates its own dedicated ERP systems (on premise or cloud-based) from providers such as SAP or Abacus.

One of the main differences is that - at least for now - synchronous service interfaces (aka APIs) are used to serve UI-based applications, whereas asynchronous message interfaces handle the conversation between backends.

For both interface types, established standards or implementations are available.

2.1.1 API based Approach

The service interface side is the foundation of what nowadays is best known as open banking. Since this field is addressed in detail in the present white paper, no further remarks will be made at this point.

2.1.2 Message based Approach

In the case of message interfaces, EBICS[18] is increasingly establishing itself in Switzerland and the surrounding countries as the standard for the transmission of payment transaction data in the bank's corporate customer segment. In Germany, this standard has already been mandatory for banks for years, in France and Austria, it is becoming more and more widespread, and in Switzerland, too, EBICS is already being used by numerous banks.[19]

In extension of the original implementations, in which only the message exchange for payment transactions was in the foreground, there are now also portal-based solutions available. These portals allow users to easily access their data via GUIs. The integration of overlay services with bank-owned products or those of partners (insurers, etc.) is also possible with these portals.

Since the scenario of connecting to dedicated ERP systems is not the topic here, it will not be covered further in this document.

2.1.3 Annotation

For small corporates and privates, API initiatives help and play a key role in the data exchange. However, they are not to be seen as a replacement for EBICS, but rather an additional option in the range of bank interfaces that is suited for the smaller corporate customers that use cloud solutions for bilateral data exchange with financial institutions.

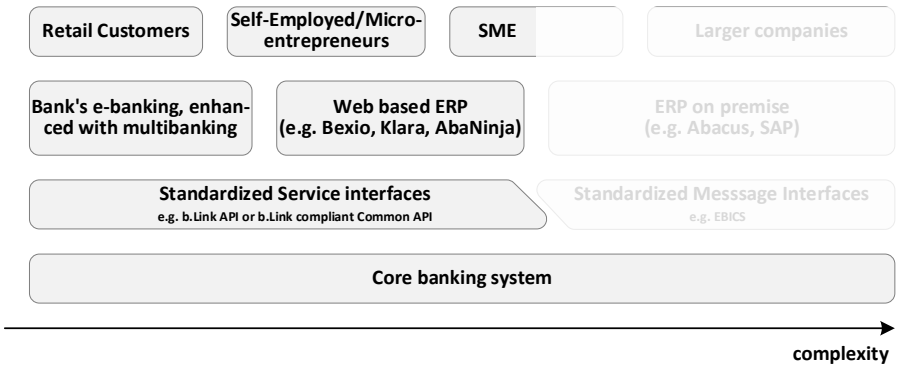
[18] **E**lectronic **B**anking **I**nternet **C**ommunication **S**tandard describes an ISO20022-compliant standard for the transmission of payment transaction data via the Internet for corporate customers. For this purpose, EBICS supports various authorization concepts (individual electronic signature, split electronic signature, distributed electronic signature), as well as the processing of cross-national transactions.

[19] UBS, Credit Suisse, Raiffeisen, Zürcher Kantonalbank, PostFinance, Basler Kantonalbank, St. Galler Kantonalbank, Luzerner Kantonalbank, Basellandschaftliche Kantonalbank, Thurgauer Kantonalbank, Aargauer Kantonalbank, SIX Interbank Clearing, Valiant

2.2 API based Multi-banking

2.2.1 Consolidated View

Based on the findings of the previous chapter, the following overview can be derived for API based multi-banking:



To serve three customer segments, two solution architectures may be in place, based on one infrastructure to access a single core banking system.

2.2.2 Implementation variants

As already pointed out in section 1.2, API based multi-banking services can basically be realized in two ways: Via intermediaries/TPPs or via a multilateral approach solely between banks. In the following sections, a more detailed view is given.

2.2.2.1 TPP centric Approach

In the intermediary approach, the multi-banking service is provided by third parties (FinTechs). In this case, these TPPs have to be validated in terms of trust, privacy and data security. Where the intensity of cooperation between the bank and the third party requires the bank to verify the latter, this can be done in several ways. Essentially there are three different approaches a financial institution can pursue: Carrying out bilateral audits of third-party providers, standardized third party provider audit by a "trusted party" or relying on existing certifications. Checks of TPPs may also be reduced or even omitted if the customer explicitly releases the bank from responsibility (in contrast to outsourcing, where responsibility clearly lies with the bank). A detailed assessment of the topic can be found in chapter 4 of the document "Open banking - An overview for the Swiss financial centre" recently published by SwissBanking.[20]

One of the approaches mentioned in the above section can be used when third parties (TPPs) intend to offer their services to customers of several banks. First and foremost, it does not matter whether the service in question provides a consolidated view of these different bank accounts, or whether there is a 1:1 relationship between customer and bank via the TPPs service. The decisive factor here is rather that the third party contacts the bank(s) on behalf of the customer. This makes an assessment of the TPP (due diligence, trust, ...) unavoidable - at least from the banks point of view.

Scaling effects can bring significant advantages here. This is achieved, for example, if the above-mentioned checks are carried out by a central entity (National Competent Authority). This authority then issues corresponding certificates and validates the certification at regular intervals.[21]

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[20] https://www.swissbanking.org/library/richtlinien/auslegeordnung-open-banking/sbvg_auslegeordnung_openbanking_en.pdf/@@download/file

[21] An example from neighbouring Europe: The PSD2 Regulatory Technical Standard (RTS) states that the National Competent Authority (NCA) is responsible for validating the TPP identity and ultimately issuing a TPP Authorisation Number,

An example of such a service is the attempt by SIX to set up such a portal through what they call their b.Link platform.

2.2.2.2 Multilateral Approach

Under the multilateral approach, the banks themselves offer multi-banking services. Here, trust and security is – or at least should be – not an issue, as banks trust one another anyway and regulatory supervision is already in place. So here there is no need for TPP certification. Moreover, in this approach the banks retain control over the customer interface and security.

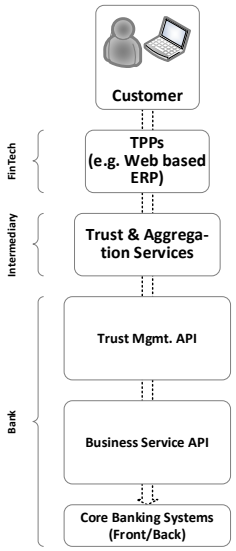
Such an approach is obvious if the cross-bank services provided essentially contain functionalities that the participating banks already provide for their respective customers.

The present white paper considers multi-banking for retail customers to be one such scenario.[22]

2.2.3 Scenario «Combined Service Landscape»

In the following section, the outline of an architectural API concept is given which supports TPP centric as well as multilateral approaches:

- In the TPP centric approach, an intermediary platform consisting of both business services and trust services can be highly valuable.

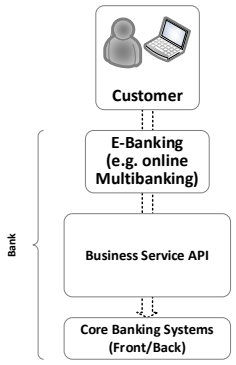


  This combination of trust and business aggregation services is the basic precondition to enable open banking with TPPs.

- When it comes to pure and direct interbank services instead, the enhanced trust services required for TPPs from the banks' perspective would add a layer of complexity which is of no added value.

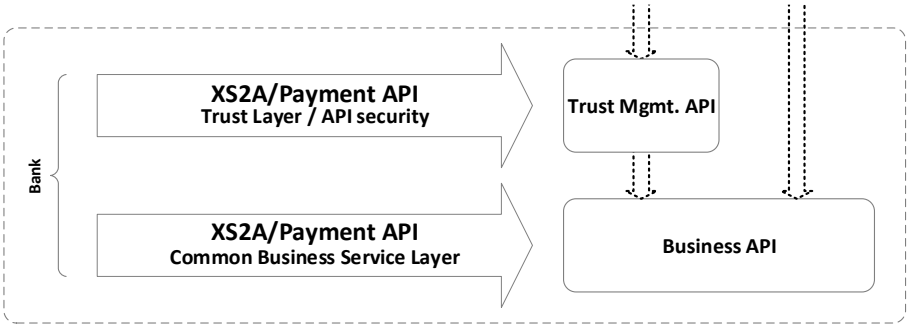
which will be maintained in a public registry. The TPP can prove its identity through a certificate issued by any eIDAS Qualified Trust Service Provider (QTSP) in order to identify and authenticate themselves to an ASPSP.

[22] EBICS as a standard for b2b payment processing between companies and banks will not be examined in detail here as it is not of use in the retail context.



For such pure interbank cases, a possible authorization processing via OAuth can be implemented.

- To participate in both scenarios, the API framework at the bank's side must be split into two layers.



By this, the trust layer is completely separated from the business layer. This makes it possible to deliver two classes of endpoints based on the same source code on the business service layer.

2.2.4 Indication

No matter which scenario we look at, one aspect has to be addressed explicitly: Trust amongst participating banks would fade off if clients are being poached by these banks. Then the whole model would not succeed.

2.3 The multilateral approach in detail

2.3.1 Key requirement

Whichever way the multi-banking services are to be implemented - there is in any case a central precondition: The availability of uniform and near real-time *XS2A* and *Payment APIs* is a prerequisite for all participating banks.

So to this end, all participating banks implement a standardized payment API, which each bank makes available to the participating partner banks (under mutually agreed conditions).

API standards such as those specified by the SFTI[23] (www.common-api.ch) can be used. Using these API standards, the necessary enhancements towards multi-banking services can be implemented with minimal effort.

SFTI's API specs are aligned with the corresponding ones of the b.Link platform. This ensures its future sustainability.

2.3.2 Different ways of implementation

Multi-banking services can be realized in three ways. These variants as well as their advantages and disadvantages are described in the following sections

2.3.2.1 Fully-fledged multi-banking app

Here, each bank develops its own full-fledged multi-banking app. This approach represents the bank acting as a manufacturer of its own APIs.

Advantages:

- Each bank can implement the complete multi-banking extensions in the look & feel familiar to users.
- Bank-specific value-added services can be implemented flexibly.
- The customer interface does not have to be left with any service.

Disadvantages:

- Banks lose control over the customer interface when they have to carry out transactions initiated by third-party banks.[24]
- The execution of payments at third-party banks on behalf of the customer may be refused due to e.g. liability issues.

Conclusion:

From the customer's point of view, this option would have the advantage of a seamless transition between the several banking relationships and the services of the participating banks. From a banking perspective, however, any third-party bank in such an environment would run the risk of completely losing the customer interface.

In addition, when executing value-changing transactions on third-party bank accounts, the risk may lie with the bank that offers multi-banking. Due to the - at least in Switzerland - unsolved liability problem and the other disadvantages mentioned above, such a solution has little chance of being implemented.

2.3.2.2 Joint development

Here, all participating banks jointly develop a multi-banking app, which then receives the branding of the respective bank (similar to TWINT).

[23] Swiss Fintech Innovations (SFTI) is an association of Swiss banks and insurance companies for the promotion of innovations across their branches.

[24] No different than when this is done by a TPP

Advantages:

- With this variant, the implementation costs are minimized.
- All banks offer the same scope of service.

Disadvantages:

- A consolidated multi-banking approach will not be considered due to the fact most major Swiss banks offer multi-banking. Each of the bank would not benefit from the full potential of retaining its own competitive advantage against the other banks.
- There is little or no room for bank-specific extensions, services with unique features cannot be implemented.

Conclusion:

Realistically and due to its major disadvantages, this option has the least chance of being implemented.

2.3.2.3 Multi-banking via overlay services

In this case, each bank extends its banking app with multi-banking functionalities that are non-value changing ones, such as transaction overviews of all the customer's bank accounts. As a result, holistic views of the user's asset situation can be generated across all his bank accounts. This approach requires only read access to customer data at third-party banks.

The value-changing transactions (e.g. payments) at third-party banks are implemented differently: Here, the payment initiation is transferred automatically via API calls to the third-party bank and can be executed automatically when received by the third-party bank. (Similar to receiving a SWIFT MT101).

In Switzerland, however, the corporate / TPP relationship and confirmation model for payment release still have to be made directly via the third-party bank e-banking platform, at least with b.Link as the currently only available, API-based corporate solution.[25]

The b-Link platform for Corporate is based on a TPP approach. Whereas, if a client would log directly into a bank for multi-banking and execute payments, the API layer enables for the secure connectivity between the bank application and the bank API. APIs rely on the authentication and authorization processes by issuing security tokens for the secure data flow.

Advantages:

- The implementation costs at the individual bank are manageable.
- Value-changing processes run completely under the control of the bank where the respective transaction takes place

Cons:

- Due to the integration of different payment confirmation frontends, the user interface may not be uniform but allows to retain control on the customer interface. This will only change if the Swiss banks jointly agree on a common payment confirmation scheme as in the PSD2 area.

Conclusion:

Although this solution cannot currently be implemented completely seamlessly from a customer's point of view, it provides the best compromise for banks offering flexible multi-banking services without potential liability issues or the risk of losing the customer interface.

[25] This can be achieved by an overlay service which incorporates a service at the third-party bank to release the payment. This means that the executing third-party bank retains complete control over the transaction.

3. Multi-Banking Use Cases

The following sections outline use cases of multi-banking services. These illustrations are intended primarily as a guide. They are not necessarily complete in themselves, nor is the presentation as a whole conclusive.

This overview of use cases should rather serve as a basis when the prioritization of services is to be determined within the context of a PoC. At an appropriate time, the existing descriptions shall be transformed into a format suitable for further development (e.g. UML).

A clustered list of all use cases addressed in this chapter is shown in Table 1.

Cluster	**Use Case**	**Description**	**Features**
View consolidated data	3.1 Show account categories	A list of all account categories where the user is invested in is shown, together with the respective account balance.	- All investment accounts - Account balances
	3.2 Show details per account	Detailed information on the selected account is provided.	- Statistics like spending categories - Liquidity forecast - Search for buzz words
	3.3 Show details per account category	Depending on the selected account category, key details of the respective accounts are provided	- IBAN, interest rates, fees, benefits, performance of investments
	3.4 Comprehensive search function	Search function to search for depositors across all banks	
Initiate or change transactions, data, requests	3.5 Manage customer related master data	Administrative account related changes can be managed, e.g. perform changes to customer related master data, such as address modification, across multiple banks.	- Delete or ad signatories - Change signatory rights Open/close sub-accounts
	3.6 Perform reconciliation with accounting software	Direct connection to an SME's accounting software including all 3rd party bank accounts	- Send payment from accounting software - Send trx-details to accounting software
	3.7 Transfer payment order or standing order	An existing, but not yet executed payment order or standing order is transferred to another account for execution.	- Move standing payments - Execute payments
	3.8 Use multi-bank messaging	Customers may send secure messages to a third party bank. While doing business in a bank's E-Banking the client may be interested in certain rates or quotes from a third party bank but does not make the effort of calling the other bank or log into another E-Banking. Via multi-banking the third party gets the chance to make a quote and the customer does not have a barrier of	- Get a quote from 3rd party near-real-time - alternative for self-admin (initiate a change request)

Cluster	Use Case	Description	Features
		initiating another request separately.	
	3.9 Define & manage payment rules	Certain schemes for payment execution can be defined in a cross bank approach. The customer indicates certain "if-then" rules for payments trigger the execution of payments depending on predefined account balances. Account balances and savings can be optimized and payments are carried out more efficiently.	- Introduce transaction rules - Define triggers for transaction initiation - Automated account rebalancing / trigger payment template
Alerts & transaction rules	3.10 Multibank Alerts	The customer can set up alerts across banks in the multi-banking tool. When creating an alert, the customer selects which accounts/banks are to be considered. (eMail, SMS, Push etc.)	- Balance alert - Currency alert - High volume payments - Detect payments from certain customers
Other	3.11 Document storage (e-Dokuments)	The customer may get access to and download all e-documents of the connected banks. Furthermore, the customer can manually upload additional documents as required.	-

Table 1: Use Case Overview

The parts each use case description consists of are described in Table 1.

Section title	Name of the action to be performed
Brief description	sic!
Customer Segments	Any customer segment to be addressed
Actors involved	Any person who is *actively* involved
Possible services	Outline of services, ordered by category of service objects

Table 2 Structure of descriptions

Note: Although the Multi-Banking white paper focuses primarily on the retail segment, the present use case descriptions are agnostic with respect to customer segments.

3.1 Show account categories

3.1.1 Brief description

A list of all account categories where the user is invested in is shown, together with the respective account balance.

3.1.2 Customer Segments

☒ Standard Retail[26]

☒ Retail & Trading

☒ High-net-worth Individuals

☒ Self-Employed/Micro-Entrepreneurs

☒ Small and medium Enterprises

☒ Mid Range Companies

☒ Large Companies

3.1.3 Actors involved

☒ End customer

☐ End customer's counterpart

☐ Employee at bank providing multi-banking

☐ Employee at 3rd party bank

3.1.4 Possible services

Possible services by object category

- **Current account**
  A current account, also called a checking account, chequing account, transaction account or demand deposit account, is a deposit account held at a bank or other financial institution. It is available to the account owner "on demand" and is available for frequent and immediate access by the account owner or to others as the account owner may direct.

- **Savings Account**
  A savings account is a bank account at a retail bank whose features include the requirements that only a limited number of withdrawals can take place, it does not have cheque facilities and usually do not have a linked debit card facility, it has limited transfer facilities and cannot be overdrawn.

- **Money market account**
  A money market account (MMA) or money market deposit account (MMDA) is a deposit account that pays interest based on current interest rates in the money markets. The interest rates paid are generally higher than those of savings accounts and transaction accounts; however, some banks will require higher minimum balances in money market accounts to avoid monthly fees and to earn interest.

- **Securities Account**
  A securities account sometimes known as a brokerage account is an account that holds financial assets such as securities on behalf of an investor with a bank, broker or

[26] Account information, payments and other transactions, loans and mortgages, retirement planning

custodian. Investors and traders typically have a securities account with the broker or bank they use to buy and sell securities.
Possible added value services:

- *Consolidated performance of all securities accounts*
- *Current over-all asset allocation*

- **Tied Pension Provision Account**
  Tied pension provision (pillar 3A) is a form of pension provision based on the constitutional three-pillar principle of Switzerland. Contributions to pillar 3A are tax deductible. The capital saved in Pillar 3A is earmarked for financing old age and is therefore earmarked for a specific purpose. However, the legislator provides for exceptions in order to withdraw the money early for defined purposes.

- **Credit Card Accounts**
  A credit card is a payment card issued to users (cardholders) to enable the cardholder to pay a merchant for goods and services based on the cardholder's promise to the card issuer to pay them for the amounts plus the other agreed charges.

  Classification of services by object category is expected to fade as Open Finance27 potentially broadens the Open Banking concept to savings, mortgages, pensions, investments and insurance policies. It allows to handle the customers' financial situation as a whole.

  It is worth mentioning Open Finance, which potentially stands for the extension of Open Banking data-sharing principles to enable third party providers to access customers' data across a broader range of financial sectors and products, including savings and investments.

[27] This broad scope of Open Finance, including focus on individuals' total financial lives, makes it particularly relevant for the financial advice and wealth management industry.

Open Finance potentially stands for the extension of Open Banking data-sharing principles to enable third party providers to access customers' data across a broader range of financial sectors and products, including savings and investments.

3.2 Show details per account

3.2.1 Brief description

Detailed information on the selected account is provided.

3.2.2 Customer Segments

☒ Standard Retail[28]

☒ Retail & Trading

☒ High-net-worth Individuals

☒ Self-Employed/Micro-Entrepreneurs

☒ Small and medium Enterprises

☒ Mid Range Companies

☒ Large Companies

3.2.3 Actors involved

☒ End customer

☐ End customer's counterpart

☐ Employee at bank providing multi-banking

☐ Employee at 3rd party bank

3.2.4 Possible services

Possible services by object category

- **Current account**
  All transactions are listed, together with the respective details.
  Possible added value services:
  - Statistics on different spending categories
  - Search for buzz words in transaction history (the customer may ask "at which bank and account I debited a certain payment?"

- **Savings Account**
  All transactions are listed, together with the respective details.
  Possible added value services:
  - Forecast based on confirmed earnings
  - Preparation of payment plans, based on expected final payout

- **Money market account**
  All transactions are listed, together with the respective details.
  Possible added value services:
  - Historical development of the assets
  - Comparison to investments in outer asset classes (e.g. pillar 3A)

- **Securities Account**
  All securities are listed, together with the respective details.
  Possible added value services:
  - Let the asset managers decide …
  - Consolidated performance of all securities accounts
  - Current over-all asset allocation

[28] Account information, payments and other transactions, loans and mortgages, retirement planning

- Buy and sell securities to be settled in 3rd party bank accounts

- **Tied Pension Provision Account**
  The complete payment/withdrawal history is listed, together with the respective details.
  Possible added value services:
  - Preparation of payment plan suggestions, based on expected final payout

- **Credit Card Account**
  The complete purchase history is listed, together with the respective details.
  Possible added value services:
  - Concierge services: What to buy where at the best price
  - Look-up buzz-words in credit card transaction history including 3rd party card accounts

3.3 Show details per account category

3.3.1 Brief description

Depending on the selected account category, key details of the respective accounts are provided.

3.3.2 Customer Segments

☒ Standard Retail[29]

☒ Retail & Trading

☒ High-net-worth Individuals

☒ Self-Employed/Micro-Entrepreneurs

☒ Small and medium Enterprises

☒ Mid Range Companies

☒ Large Companies

3.3.3 Actors involved

☒ End customer

☐ End customer's counterpart

☐ Employee at bank providing multi-banking

☐ Employee at 3rd party bank

3.3.4 Possible services

Possible services by object category

- **Current accounts**
  All accounts are listed, together with the actual account balance and further account information, e.g. bank name, IBAN and interest on debit / credit rates.
  Possible added value services:
  - Comparison of account management costs and benefits
  - Generate a consolidated liquidity forecast over all bank accounts, i.e. include all standing orders + credit lines + manual values. As a result the client is able to foresee cash needs or excess cash of the next couple of weeks or months. (More relevant for SME and professional project or wealth planning

- **Savings Accounts**
  All accounts are listed, together with the actual account balance and further account information, e.g. bank name, IBAN and credit interest rate.
  Possible added value services:
  - Comparison of account management costs and benefits

- **Money market accounts**
  All accounts are listed, together with the actual account balance and further account information, e.g. bank name, IBAN, credit interest rate and withdrawal conditions.
  Possible added value services:
  - Comparison on performances of the different accounts

[29] Account information, payments and other transactions, loans and mortgages, retirement planning

- **Securities Accounts**
  All securities accounts are listed, together with an overview of the actual investments and further account information, e.g. bank name, IBAN and the liquid assets.
  Possible added value services:
    - Comparison of account management fees and other costs

- **Tied Pension Provision Account**
  All tied pension provision accounts are listed, together with the actual account balance and further account information, e.g. bank name, IBAN and credit interest rate.
  Possible added value services:
    - Comparison on performances of the different accounts

- **Credit Card Accounts**
  All credit card accounts are listed, together with the actual account balance and further account information, e.g. issuer name and interest on debit / credit rates.
  Possible added value services:
    - Comparison of account management fees and other costs
    - Customer gets a consolidated view of all credit cards. Customer may allocate limits between 3rd party credit card accounts (also card provider like Migros are in scope!)

3.4 Comprehensive search function

3.4.1 Brief description

In the multi-banking tool, the customer can use a comprehensive search function to search for depositors across all banks (especially for corporate customers)

3.4.2 Customer Segments

☒ Standard Retail[30]

☒ Retail & Trading

☒ High-net-worth Individuals

☒ Self-Employed/Micro-Entrepreneurs

☒ Small and medium Enterprises

☒ Mid Range Companies

☒ Large Companies

3.4.3 Actors involved

☒ End customer

☐ End customer's counterpart

☐ Employee at bank providing multi-banking

☐ Employee at 3rd party bank

3.4.4 Possible services

Possible services are:

- Search for depositors (names etc.)
- Search for amounts (from - to)
- Etc.

[30] Account information, payments and other transactions, loans and mortgages, retirement planning

3.5 Manage customer related master data

3.5.1 Brief description

Administrative account related changes can be managed, e.g. perform changes to customer related master data, such as address modification, across multiple banks

3.5.2 Customer Segments

☒ Standard Retail[31]

☒ Retail & Trading

☒ High-net-worth Individuals

☒ Self-Employed/Micro-Entrepreneurs

☒ Small and medium Enterprises

☒ Mid Range Companies

☒ Large Companies

3.5.3 Actors involved

☒ End customer

☐ End customer's counterpart

☐ Employee at bank providing multi-banking

☐ Employee at 3rd party bank

3.5.4 Possible services

Possible services are:

- Delete or ad signatories of a specific account
- Change signatory rights of third-party accounts
- Open new or close new subaccounts

[31] Account information, payments and other transactions, loans and mortgages, retirement planning

3.6 Perform reconciliation with accounting software

3.6.1 Brief description

Direct connection to an SME's accounting software including all 3rd party bank accounts.

3.6.2 Customer Segments

- ☐ Standard Retail[32]
- ☐ Retail & Trading
- ☐ High-net-worth Individuals
- ☒ Self-Employed/Micro-Entrepreneurs
- ☒ Small and medium Enterprises
- ☒ Mid Range Companies
- ☒ Large Companies

3.6.3 Actors involved

- ☒ End customer
- ☐ End customer's counterpart
- ☐ Employee at bank providing multi-banking
- ☐ Employee at 3rd party bank

3.6.4 Possible services

Possible services are:

- SME customer may send transaction details and account statements from all bank accounts to his accounting software in order to create accounting records automatically.
- Vice versa the accounting software may initiate a reconciliation of transaction with outstanding items.

[32] Account information, payments and other transactions, loans and mortgages, retirement planning

3.7 Transfer payment order or standing order

3.7.1 Brief description

An existing, but not yet executed payment order or standing order is transferred to another account for execution.

3.7.2 Customer Segments

☒ Standard Retail[33]

☒ Retail & Trading

☒ High-net-worth Individuals

☒ Self-Employed/Micro-Entrepreneurs

☒ Small and medium Enterprises

☒ Mid Range Companies

☒ Large Companies

3.7.3 Actors involved

☒ End customer

☐ End customer's counterpart

☐ Employee at bank providing multi-banking

☐ Employee at 3rd party bank

3.7.4 Possible services

Possible services are:

- Moving transaction templates holding payment information (IBAN, payee, amount of last transaction) for infrequent transactions from one account to another.
- Shifting a standing order from one account to another.
- Execute single and bulk payments without authorization in 3rd party bank
- Overdraft protection

[33] Account information, payments and other transactions, loans and mortgages, retirement planning

3.8 Use multi-bank messaging

3.8.1 Brief description

Customers may send secure messages to a third party bank. While doing business in a bank's E-Banking the client may be interested in certain rates or quotes from a third party bank but does not make the effort of calling the other bank or log into another E-Banking. Via multi-banking the third party gets the chance to make a quote and the customer does not have a barrier of initiating another request separately.

3.8.2 Customer Segments

☒ Standard Retail[34]

☒ Retail & Trading

☒ High-net-worth Individuals

☒ Self-Employed/Micro-Entrepreneurs

☒ Small and medium Enterprises

☒ Mid Range Companies

☒ Large Companies

3.8.3 Actors involved

☒ End customer

☐ End customer's counterpart

☐ Employee at bank providing multi-banking

☐ Employee at 3rd party bank

3.8.4 Possible services

Possible services are:

- Ask a third-party bank for a quote or rate and get the best and transparent execution.
- May also function as an alternative for the multi bank self-administration, i.e. send an order via message instead of fully fledged self admin

[34] Account information, payments and other transactions, loans and mortgages, retirement planning

3.9 Define & manage payment rules

3.9.1 Brief description

Certain schemes for payment execution can be defined in a cross bank approach. The customer indicates certain "if-then" rules for payments trigger the execution of payments depending on predefined account balances. Account balances and savings can be optimized and payments are carried out more efficiently.

3.9.2 Customer Segments

☒ Standard Retail[35]

☒ Retail & Trading

☒ High-net-worth Individuals

☒ Self-Employed/Micro-Entrepreneurs

☒ Small and medium Enterprises

☒ Mid Range Companies

☒ Large Companies

3.9.3 Actors involved

☒ End customer

☐ End customer's counterpart

☐ Employee at bank providing multi-banking

☐ Employee at 3rd party bank

3.9.4 Possible services

Possible services are:

- Multi-Bank account balancing
  Customer gets a payment proposal to be confirmed in order to transfer money to a savings account at BANK A if the balance on BANK B exceeds CHF XY or

- Minimum balance thresholds
  If account at BANK C drops below CHF XY then initiate a transfer from BANK D or rather trigger a payment template

[35] Account information, payments and other transactions, loans and mortgages, retirement planning

3.10 Multibank Alerts

3.10.1 Brief description

The customer can set up alerts across banks in the multi-banking tool. When creating an alert, the customer selects which accounts/banks are to be considered. (eMail, SMS, Push etc.)

3.10.2 Customer Segments

☒ Standard Retail

☒ Retail & Trading

☒ High-net-worth Individuals

☒ Self-Employed/Micro-Entrepreneurs

☒ Small and medium Enterprises

☒ Mid Range Companies

☒ Large Companies

3.10.3 Actors involved

☒ End customer

☐ End customer's counterpart

☐ Employee at bank providing multi-banking

☐ Employee at 3rd party bank

3.10.4 Possible services

Possible services are:

- Balance alert. Customer is notified when a balance limit is exceeded or undercut.
- Currency Alert. The customer is notified when a limit within a currency is exceeded or undercut.
- High payments: Customer is notified if a high payment (amount to be determined by the customer) has been debited to one of his accounts.
- Payments from a specific customer: Customer is notified when a customer to be defined deposits.

3.11 Document storage (eDokuments)

3.11.1 Via multi-banking tool, the customer is automatically uploaded all e-documents of the connected banks. Furthermore, the customer can manually upload additional documents as required.

3.11.2 Customer Segments

☒ Standard Retail[36]

☒ Retail & Trading

☒ High-net-worth Individuals

☒ Self-Employed/Micro-Entrepreneurs

☒ Small and medium Enterprises

☒ Mid Range Companies

☒ Large Companies

3.11.3 Actors involved

☒ End customer

☐ End customer's counterpart

☐ Employee at bank providing multi-banking

☐ Employee at 3rd party bank

3.11.4 Possible services

Possible services are:

- Tax relevant documents: Are all stored in a separate folder.
- Bank statements: Are stored in a folder, selected by bank.
- Customer lifts e.g. insurance policies or other relevant documents.

[36] Account information, payments and other transactions, loans and mortgages, retirement planning

4. Multi-banking PoC

4.1 Objectives and scope

The aim of a multi-banking PoC is to show how a simple but orderly and secure access to XS2A and payment services can be realized.

In addition to the technical perspective, this PoC will also address the aspects of security, data protection and governance.

This work is primarily intended to support banks in implementing multi-banking applications for their customers.

For this PoC, the API specifications of the SFTI form the basis for the implementation. These specs are fully compliant with Swiss Market Standards (and those for SEPA in regards to PSD2). Therefore, any service developed for this PoC may also be routed via direct bank-to-bank connectivity or multiple 3rd party platforms (TPPs, b.link etc.).

4.2 Basic solution design

The multi-banking API is designed from the ground up as a near real-time service interface, which is for the most part read-only and does not release any transactions at all.

This enables any multi-banking application to collect all the data needed in near real-time to meet the customer's information requirements and to offer a wide range of information aggregations based on this data.

When a user aims to initiate a transaction at a third-party bank, the multi-banking app issues an API call in real-time at their bank to submit this payment. In an initial version, the release of the payment at the third bank may be integrated into multi-banking using appropriate technical means.[37]

At a later date, banks may agree on a multi-banking API which also supports near real-time services that perform write operations, so that the multi-banking application can act as a full payment application.[38] It consists of an application issuing an API request for payment initiation on behalf of the user while contributing to the achievement of a seamless interaction from the client's perspective. PSD2 introduces Strong Customer Authentication as a regulatory requirement and OAuth 2.0 as industry standard protocol.[39]

4.3 Advantages of this solution design

The proposed design has several elementary advantages:

- Customers receive a solution that provides a complete and accurate overview of their current financial status in a uniform layout.
- At the same time, customers can carry out their transactions in the familiar user interface of their bank.
- Customers can thus be sure that their transactions are not carried out through channels that pose potential security risks. They always remain with the bank providing the multi-banking app, and the connection to any third-party bank is managed by this bank.
- The participating banks thus offer their customers an important additional functionality without losing access to the customer interface.

[37] This can be realised, for example, by integrating an AuthN/AuthZ-based dialog of the third party bank via i-frame, which is used to release the payment.

[38] Currently, UBS already has payment transfers in their multi-banking platform.

[39] Evidences come from the FIDO2 Project, which is a joint effort between the FIDO Alliance and the World Wide Web Consortium whose goal is to create strong authentication for the web. At its core, FIDO2 consists of the W3C Web Authentication standard and the FIDO Client to Authenticator Protocol.

- Customers benefit from the ever-evolving banking environment where banks operate and which is backed by PSD2, SCA and OAuth 2.0, thus allowing to achieve the secure data exchange.

4.4 PoC Coverage

4.4.1 XS2A

The following list shows all account related use cases that may be covered in a PoC:

1. Customer Experience Improvements
2. Customer Account Aggregation
   - All accounts and balances from different banks accessed through one account login
   - Near real-time updates on all accounts
3. Customer views and manages overall financial accounts
4. Bolster Account and Identity fraud protection

4.4.2 Payments

The following list shows all payment related use cases that may be covered in a PoC:

1. Customer initiates payment at bank (similar to e-banking)
2. Customer initiates payment at merchant and authorizes it at bank
3. Customer pays to another end customer (Peer-to-peer)
4. Customer initiates batch of payments at bank (bulk payments)
5. Customer manages standing orders (Daueraufträge)
6. Customer approves direct debit at bank
7. Customer views/inspects/modifies/deletes pending payment orders
8. Customer payment fraud protection

4.5 Communication guidelines

The following describes the approach to communication and the publication of media releases.

4.5.1 Events

These comprise hackathons such as at F10, individual innovation events at SFTI member companies

4.5.2 Online channels

SFTI has well established relations to Swiss Bankers (SBVg) and Economiesuisse, as well as to branch specific online media such as Moneycab, Fintechnews and others.

In addition, each bank involved in the multi-banking PoC shall contribute by proliferating information on any of their usual channels.

5. Appendix

5.1 Requirement collection

The following sections are dedicated to the fundamentals regarding the collection of requirements. A distinction is thereby made between three categories:

- **Digital Customer Experience**
  DCX is the sum of digital interactions between a customer and a company and the resulting impression.

- **Business Requirements**
  This section deals with the requirements of the participating banks with regard to the business relationship with their customers.

- **IT Architecture**
  Here the basic requirements for the various IT stacks required for multi-banking are outlined.

5.1.1 Digital Customer Experience

The main focus with regard to DCX is on the below mentioned aspects:

- Consistent orientation to user requirements is the top priority. This means in particular that each of these requirements is explicitly verified. To ensure this, appropriate customer surveys are to be launched. Unaudited assumptions must not be considered (no crystal ball predictions).
- The functional ramp-up is accompanied by regular customer surveys. Any deviations from the behavior expected from the customer's point of view are carefully examined and revised immediately if necessary.
- Flexibility of the Multi-banking infrastructure allows for new features to be added in; the module can be expanded at any time to include additional functions that offer (private and business) customers an even greater level of convenience and transparency. Multi-banking solutions enable for a holistic approach and higher degree of client retention.
- A change in the cultural organization of the bank would occur once multi-banking is implemented. It consists of making employees aware of its full potential and relying on a common understanding of any growth opportunities it enables across the different divisions.

5.1.2 Business Requirements

As far as the business requirements are concerned, the focus is on the following points:

- The chosen solutions must be designed in such a way that the banks do not have to take unacceptable risks of losing customers.
- The implementation path is based on modularized requirement packages. Thereby the packages are based on functionally grouped business services. In a first release only read-only services are addressed.
- The packaging of the subsequent releases is based both on the user requirements and the constraints that exist on the part of the banks.
- The primary objective of this balancing exercise is to achieve the most significant added value for end customers without losing sight of any possible concerns of the banks involved.

5.1.3 IT Architecture

Basic requirements for the technical specification or implementation are as follows:

- The software architectural style behind API specification is REST[40].
- The API specifications are described based on the OpenAPI[41] specification.
- The API security is based on standard technologies such as SAML[42] and Oauth[43].
- The multi-banking API shall be based on the most commonly used API specification. Only by using uniform standards across banks can implementations be realized quickly and operated with the least possible expense.
- The API must be designed so that each participating bank may provide and deliver a minimum number of specific links pointing directly to their respective domain for integration in the multi-banking UI. An agreement to integrate these links into the multi-banking UI (how many, what size, by what means) must be reached in advance.
- The definition of the user paradigm for the design of the user interface lies with the respective bank.

[40] . **Re**presentational **S**tate **T**ransfer is a software architecture for distributed systems like the World Wide Web.

[41] Originally known as the Swagger Specification, is a specification for machine-readable interface files for describing, producing, consuming, and visualizing RESTful web services.

[42] **S**ecurity **A**ssertion **M**arkup **L**anguage is an open standard for exchanging authentication and authorization data between parties, in particular, between an identity provider and a service provider.

[43] OAuth is an open standard for access delegation, commonly used as a way for Internet users to grant websites or applications access to their information on other websites but without giving them the passwords.