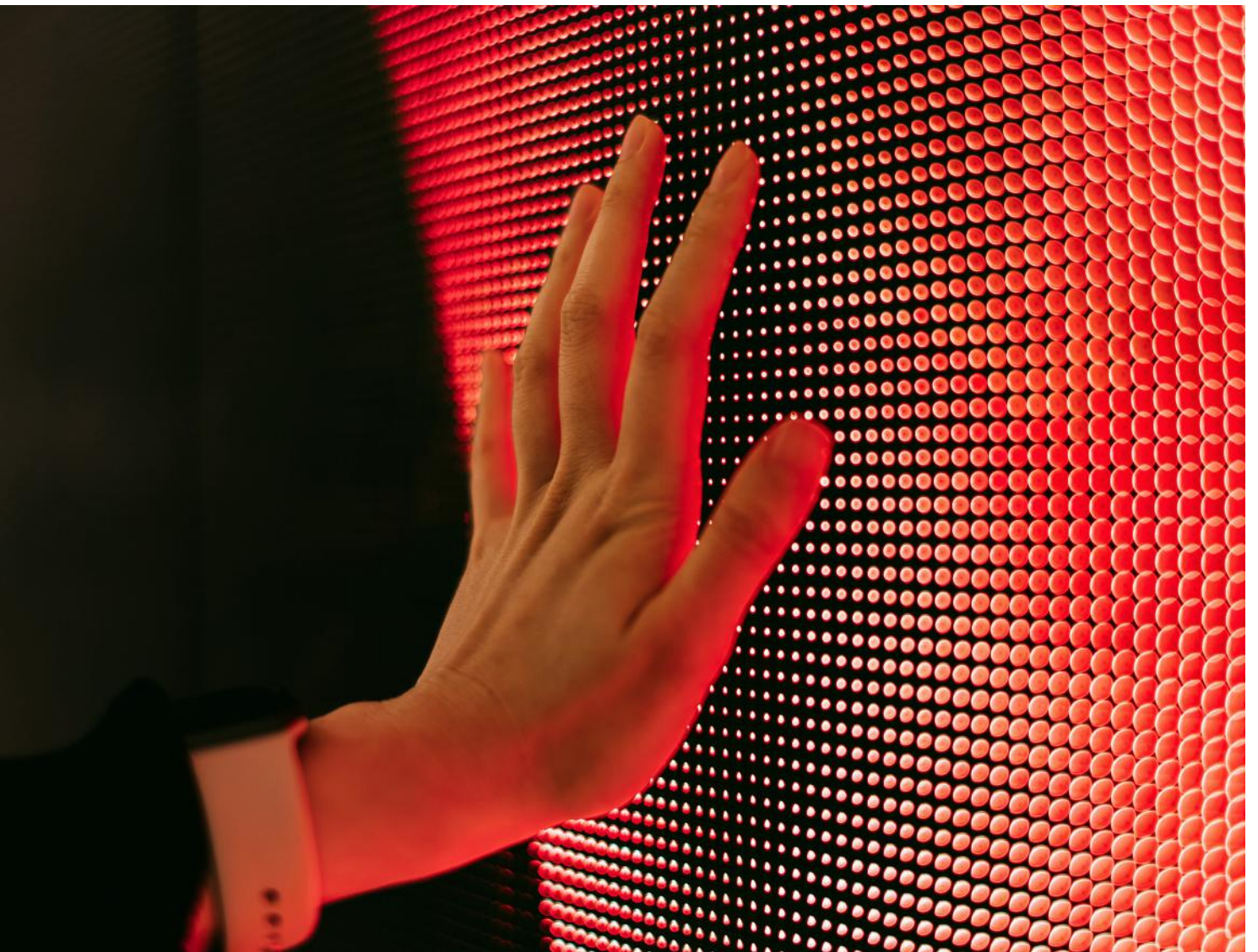


Future of Invoicing

A SIX White Paper

2023



Lucerne University of
Applied Sciences and Arts

**HOCHSCHULE
LUZERN**

Business
FH Zentralschweiz

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FOREWORD

SIX is one of the key players in the Swiss financial industry and strives to understand, identify, and shape developments that impact the payments ecosystem and key elements of the industry together with various communities. One particular element is invoicing, a topic that is very deeply rooted and established in Swiss payments and of great importance to buyers and sellers of goods and services as well as financial institutions. Invoicing is thus an essential element for a functioning economy in Switzerland. In light of advancing digitalization, invoicing is facing a transformation from a paper-based approach to a digital experience that is constantly evolving.

The aim of this white paper is to provide invoice issuers and invoice recipients, as well as the interested public in Switzerland with an overview and to outline future prospects for the different approaches to invoicing. It will examine the current state of the Swiss invoicing industry, focusing on a selection of the invoicing approaches available today. The white paper also offers strategic insights into possible future short- and long-term developments in invoicing for both invoice issuers and invoice recipients, based on current tendencies and trends.

The study is based on a series of reflections and discussions about the invoicing industry today – and in the future. It is therefore not intended to be a complete and conclusive overview of invoicing, but rather a guide and food for thought for both invoice issuers and invoice recipients, as well as software and invoice service providers, banks, fintechs, and other payment professionals.

This study was conducted as part of a collaboration between SIX and the Lucerne University of Applied Sciences and Arts, and is an update to the white paper published in 2020.

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Chapter 1

Introduction

In this study, we define an invoice and invoice payments as follows:

An invoice is a document issued by the seller of goods or services, stating the amount owed by the buyer of the goods or services. Often, this document also includes a payment deadline, but can also include further details about the goods or services to fulfil certain formal criteria, which are imposed by the law.¹

Invoicing transactions can be defined as transactions whereupon the buyer of goods or services pays his or her debt, usually with a delay, after the order or receipt of the goods or services.

Invoicing forms a central component of the Swiss payment industry, which is embedded in a distinctive landscape. A large part of the Swiss payment traffic flow is processed by the banks, using their respective SIC clearing system, and by internal clearing systems. Despite the continuous decrease, cash remains important. This decline has been exacerbated by the coronavirus pandemic. And although cash continues to lose turnover shares, it is still a popular means of payment in terms of frequency of use. In general, the pandemic led to sudden changes in the payment behavior of the Swiss population, although this has since stabilized again. In addition, debit² and credit cards³ form another component of the Swiss payment landscape via their own clearing system. In Switzerland, TWINT and other mobile payment solutions are on the rise or have already established themselves. The population has become increasingly familiar with and appreciative of innovations in the area of cashless means of payment (SNB, 2020a).

In Switzerland, 1.27 billion outgoing payments with an associated volume of CHF 8.09 trillion were reported in 2021

(SNB, 2021a).⁴ This volume corresponds to more than ten times Switzerland's gross domestic product (Federal Statistical Office, 2022a). Domestic transactions accounted for the majority of the number and volume in 2021 (97.3% and 77.0% respectively), while only a small proportion of the number and volume of transactions were cross-border transactions (2.7% and 23.0% respectively) (SNB, 2021a). The number and volume of payment transactions in Switzerland underline the aforementioned strong importance of the payment industry.

Invoicing enjoys a high level of awareness in Swiss society and is also anchored in the Swiss mentality. A survey of Swiss consumers conducted in 2021 found that people are familiar with handling invoices, both those paid over the counter and those paid via online money transfer channels. 49% of all remote transactions are made via a mobile phone, tablet, or smartwatch. This includes direct payments from a bank account, but also payments via a credit or debit card stored in an app, like Apple Pay (Graf, Heim, Stadelmann, & Trütsch, 2022). The usage of invoices⁵ paid via online transfers is thus high. While 22% of Swiss respondents in a European survey chose invoicing as their preferred payment method, the European average for this payment option is only 7% (Intrum, 2021). These survey results point to the prominence of invoices in Switzerland and a move away from over-the-counter business. In addition to high acceptance among customers, modern invoicing procedures offer further advantages such as efficient end-to-end processes with reliable, stable payment flows for the invoice issuer.

Invoices make up a significant part of consumers' total payments. The Swiss National Bank provides an overview of cashless payment transactions in Switzerland with its publicly accessible data (SNB, 2021b; SNB, 2021c).⁶ Note that these figures include both non-cash invoice transactions and other forms of non-cash payment transactions.

1 For the Swiss case, see the SME Portal for small and medium-sized enterprises (SME Portal for small and medium-sized enterprises, 2022).

2 Debit cards are linked to a bank account and allow the cardholder to debit payments and cash withdrawals directly from their bank account. In addition to debit cards issued by internationally accepted payment card organizations (e.g., Maestro, V-Pay, Debit Mastercard, Visa Debit), this also includes cards that are accepted or used at national level (e.g., PostFinance Card, M-Card). Definition based on (SNB, 2019).

3 Credit cards include both charge cards and credit cards with instalment or partial payment options. Charge cards, also known as delayed-debit cards, offer the cardholder interest-free credit until the due date specified in the invoice, but do not offer the option of paying in instalments or making partial payments. Definition based on (SNB, 2019).

4 See the Swiss National Bank data portal: [https://data.snb.ch/en/topics/finma/cube/zavezaluba?fromDate=2021-01&toDate=2021-12&dimSel=D0\(ZT,PGT,PGKL,DG,BT,BE\),D1\(K,D,EG\),D2\(IZ,AZ\),D3\(II,IA\),D4\(TT,BMF,BTF\)](https://data.snb.ch/en/topics/finma/cube/zavezaluba?fromDate=2021-01&toDate=2021-12&dimSel=D0(ZT,PGT,PGKL,DG,BT,BE),D1(K,D,EG),D2(IZ,AZ),D3(II,IA),D4(TT,BMF,BTF)).

5 Throughout this study, the terms "bill" and "invoice" are used interchangeably.

6 For further information, see the Swiss National Bank (SNB) data portal: [https://data.snb.ch/en/topics/finma/cube/zavezaluba?fromDate=2021-01&toDate=2021-12&dimSel=D0\(ZT,PGT,PGKL,DG,BT,BE\),D1\(K,D,EG\),D2\(IZ,AZ\),D3\(II,IA\),D4\(TT,BMF,BTF\)](https://data.snb.ch/en/topics/finma/cube/zavezaluba?fromDate=2021-01&toDate=2021-12&dimSel=D0(ZT,PGT,PGKL,DG,BT,BE),D1(K,D,EG),D2(IZ,AZ),D3(II,IA),D4(TT,BMF,BTF)) and [https://data.snb.ch/en/topics/finma/cube/zavezaluba?fromDate=2021-01&toDate=2021-04&dimSel=D0\(ZT\),D1\(K,D,EG\),D2\(IZ,AZ\),D3\(II,IA\),D4\(TT\)](https://data.snb.ch/en/topics/finma/cube/zavezaluba?fromDate=2021-01&toDate=2021-04&dimSel=D0(ZT),D1(K,D,EG),D2(IZ,AZ),D3(II,IA),D4(TT)).

Figure 1: Breakdown of cashless payment transactions in Switzerland, absolute figures in millions. The figure is based on an illustration from BAK Basel (2016) with updated data sourced from SNB (SNB, 2021b; SNB, 2021c)⁷

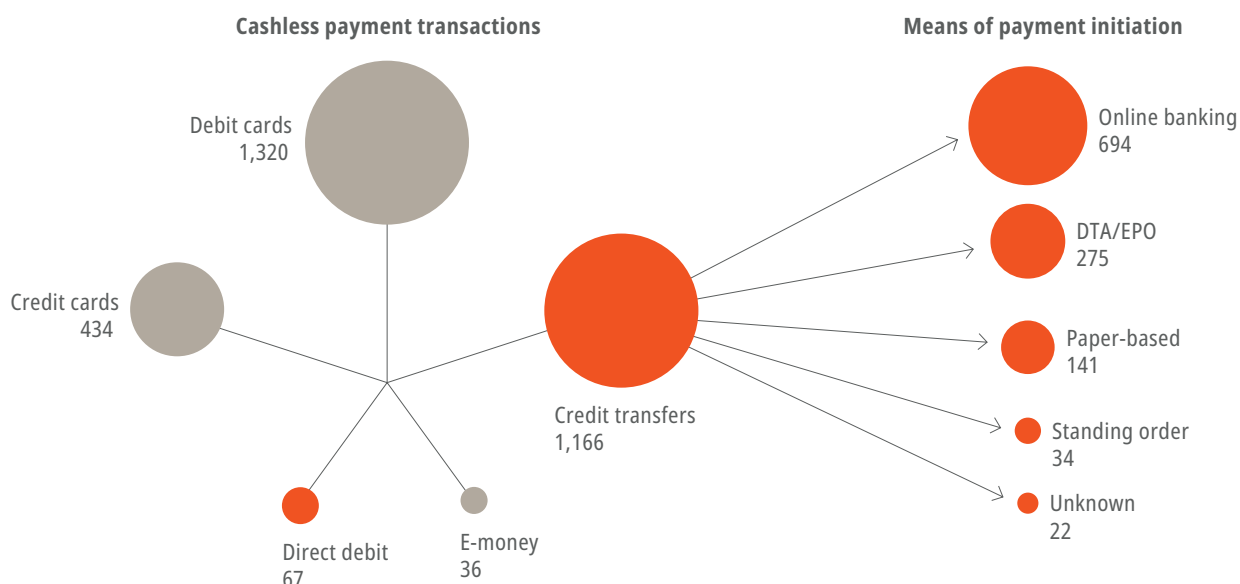
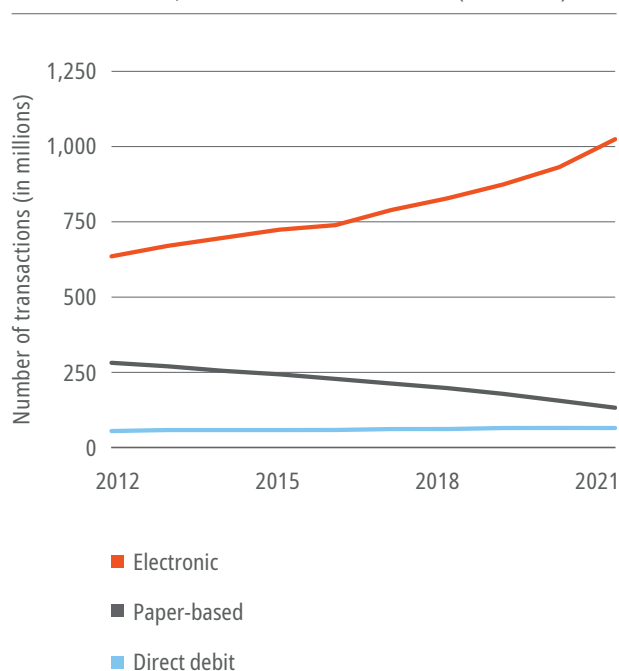


Figure 1 shows two pie charts of different sizes. The left-hand pie chart highlights the absolute (in millions) and relative number of cashless payment transactions in Switzerland. The right-hand pie chart shows a detailed breakdown of payment transfers by type of payment initiation, which account for 39% of cashless payment transactions.

A payment initiation in connection with the invoicing process takes place either after receipt of an invoice from an invoicing party or automatically via a direct debit procedure. Such an invoice can be submitted via different channels: either through a paper-based medium (e.g., by mail), in electronic form (e.g., by e-mail), or via a digital invoice service (e.g., eBill invoice). The payment order can also be triggered in different ways: either via a paper-based medium (e.g., payment of the invoice at the post office counter) or electronically (e.g., via m-banking or e-banking⁸). Another possibility is the automatic payment of the invoice by direct debit. That means that the form of payment request and payment initiation do not necessarily have to be the same. For example, one can receive an invoice in paper form by mail (e.g., QR-bill), but pay the invoice electronically via m-banking.

Figure 2: Number of transactions by type of payment initiation order in Switzerland, 2012–2021. Data source: SNB (2012–2021)⁹



⁷ Note that cash withdrawal transactions were not considered. Based on the SNB data, certain electronic payment initiations cannot be clearly assigned to one of the three methods of e-banking, DTA/EPO or standing order, thus the category “unknown” was added. Further explanation of abbreviations can be found in Table 1. The number of payment transfers included in the SNB data set only covers payments made in Swiss francs. Since the numbers are rounded, the sum of all the payment transfers in the right-hand pie chart does not correspond to the total payment transfers in the left-hand pie chart.

⁸ Including the Electronical Bill Presentment and Payment System (EBPP; e-invoices) and data carrier exchange (DTA)/electronic payment order (EPO) payments or standing orders submitted via e-banking. Definition based on (SNB, 2019).

⁹ The SNB data set only includes payments in Swiss francs. For further information, see the Swiss National Bank (SNB) data portal: [https://data.snb.ch/en/topics/finma/cube/zavezaluba?fromDate=2012-01&toDate=2021-12&dimSel=D0\(ZT,PGT,PGKL,DG,BT,BE\),D1\(K,D,EG\),D2\(IZ,AZ\),D3\(II,IA\),D4\(TT,BMF,BTF\)](https://data.snb.ch/en/topics/finma/cube/zavezaluba?fromDate=2012-01&toDate=2021-12&dimSel=D0(ZT,PGT,PGKL,DG,BT,BE),D1(K,D,EG),D2(IZ,AZ),D3(II,IA),D4(TT,BMF,BTF)).

Figure 2 shows the historical development of the number of transactions, broken down by direct debit, paper-based, and electronic payment triggers. On the one hand, the absolute number of paper-based payment initiation orders has steadily decreased in recent years (2012–2021: from 291 to 141 million, -52%), which is likely to be mainly attributed to a change in consumer behavior. The Covid-19 pandemic triggered in 2020 is also likely to have an impact. Electronic and direct debit payment orders, on the other hand, have increased (2012–2021: electronic: from 637 to 1,025 million, +61%; direct debit: from 55 to 67 million, +22%). By far the most payments (more than 83% in 2021) were initiated electronically. The reason for the strong increase in electronically triggered payments in recent years is mainly due to the growth in e-banking payments.

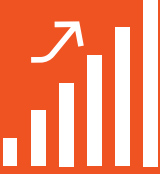
In the case of the invoicing industry, the use of electronic approaches is growing. For example, in 2021, the number of eBill transactions increased by over 25% when compared with the year 2020. In concrete terms, this means that over 50 million eBill transactions were reached in 2021, which is a new record. The average eBill invoice amount in 2021 was CHF 412.08 (see Figure 4). More than 4,000 companies already send their invoices via eBill and deliver them directly to their customers' online banking platforms. With around 2.5 million users, eBill now reaches a good half of all Swiss households (Schneider, 2022).

The increase in electronic invoices and electronic payment initiation orders have been driven, or are expected to be driven, by various developments. On the one hand, existing approaches such as eBill have been further developed and established in the Swiss population. On the other hand, m- and e-banking as payment initiation channels

have gained popularity, are becoming further established, and offer the possibility of processing payment slips. The number of m- and e-banking transactions therefore grew significantly faster in 2021 (+7.9%) than in previous years (2012–2020: average annual growth rate of 6.3%). In 2020, when the pandemic broke out, the largest year-on-year increase in m- and e-banking transactions was recorded (+10.1%).

The QR-bill replaced traditional payment slips (IS/ISR) on 30 September 2022. The integrated Swiss QR Code on the payment part contains all of the relevant information for both invoicing and payment. In order to process the payment, it needs to be scanned with a mobile device or a scanner. The QR-bill, like IS/ISR, can be paid via m- and e-banking or at the post office counter. The QR-bill can be sent either electronically (e.g., by e-mail as a PDF) or in a paper form by mail. The QR-bill offers a range of possibilities and can thus be classified as future-proof, as invoice recipients can decide for themselves how they want to use the QR-bill.

This study seeks to offer an overview and update on invoicing today, and how invoicing might look in the future, with a focus on business-to-consumer (B2C) transactions. The study is divided into two parts. The first part starts with Chapter 2 and gives an overview of today's invoicing, comparing the approaches direct debit, QR-bill, and eBill with historical as well as current figures. Chapter 3 updates the ranking of the three approaches with characteristics based on the PEST approach with the four underlying dimensions of politics/environment, economy, society, and technology. In the second part, Chapter 4 focuses on short-term developments in invoicing, while Chapter 5 concentrates on long-term developments. ●

over **50** million 

eBill transactions were reached in 2021

Chapter 2

Invoicing Today

This study examines invoicing transactions, which can be considered a subset of total payment transactions. A characteristic element of a invoicing transaction compared to other payment transactions is that there is usually a delay between ordering or receiving the goods or services and the actual payment. This delay provides the buyer with the benefits of a degree of convenience, affordability, and security. In addition, payment by invoicing generally follows the issuance of an invoice document by the seller of the goods or services. The process leading to the issuance of an invoice by the seller depends on the invoice issuer and can vary in length, complexity, and automation depending on the business model, resources, priorities, and infrastructure of the companies. The buyer of the goods or services enters the invoicing process after receiving the issued invoice and must then proceed with its payment. A special focus will be placed below on eBill and QR-bill, which have great future potential and have only recently been introduced.

Besides the eBill and QR-bill, direct debit is another established approach in Switzerland. After an initial, usually paper-based, onboarding process (creation of a direct debit mandate) by the invoice recipient, the invoice issuer can from then on automatically initiate a payment, whereby the corresponding financial institutions will debit the invoice recipient's account and credit the invoice issuer's account based on the stored direct debit mandate.

The eBill invoice is delivered completely electronically to the eBill platform, which can be accessed via the m- or e-banking account of the invoice recipient, and merely needs to be approved (released) by the latter. QR-bills can be sent via mail or as a PDF attached to the e-mail. They need to be scanned so that all the necessary invoice data is automatically transferred. Alternatively, the invoice recipient can receive an e-mail invoice. In this white paper, an e-mail invoice is considered an unstructured digital invoice that contains an IBAN. Its design does not comply with the guidelines for implementing QR-bills.

Figure 3 shows the absolute number of transactions between 2018 and mid-2022 of direct debits, QR-bill, eBill, and ISR processed via the SIC platform. No figures were available for e-mail invoices. QR-bill was introduced in

mid-2020, so this data history only starts from June 2020. It can be seen that the number of transactions with QR-bill is growing very strongly. The growth rate between 2020 and 2021 is 1,012.95%. For this year-to-year comparison of the QR-bill, the averages were calculated for the missing months from January through May 2020 because, as mentioned above, the QR-bill was not introduced until mid-2020. In the first six months of 2022, the numbers increased sharply again. The number of eBill transactions also shows a continuous growth rate. Between 2020 and 2021, it was 26.54%. In contrast, the number of direct debit transactions is growing at a below-average rate (growth rate 2020–2021: 3.54%).

Figure 3: Indicated growth rate of the number of invoicing transactions by approach in Switzerland in 2022 in percent. Data source: SIX (2021a)¹⁰

Absolute number of transactions since January 2018

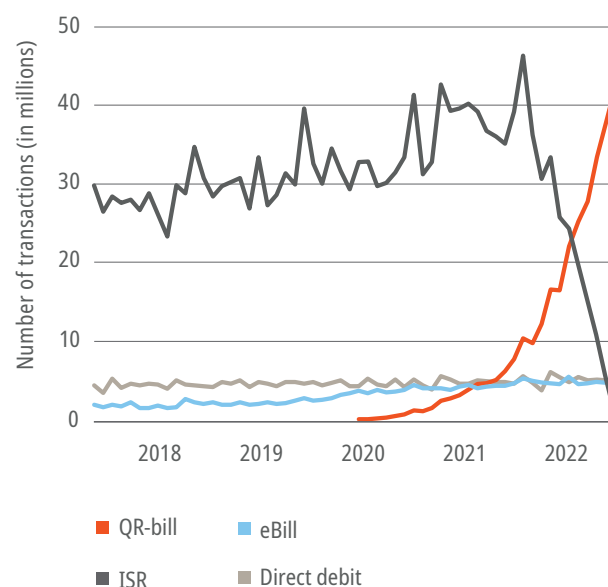


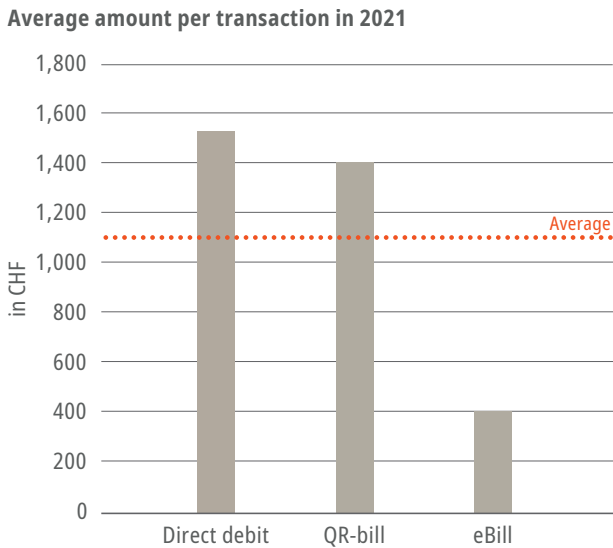
Figure 4 shows the average amount per transaction in 2021 of direct debit, QR-bill, and eBill.¹¹ Overall, the average volume per transaction in 2021 was CHF 1,113. The lowest average volume per transaction was eBill with CHF 412. The highest average volume, on the contrary, is accounted for by direct debit at CHF 1,529. Since payments with QR-bill

¹⁰ The sample of QR-bill payments does not include eBill transactions.

¹¹ The average transactions are calculated based on figures that include only the transactions cleared over the SIC platform. Since not all Swiss transactions are included, the average amounts per transaction should be understood as indications for the Swiss market.

account for the largest share of the total volume of settlement transactions, it is not surprising that their average settlement amount is closest to the average at CHF 1,399.

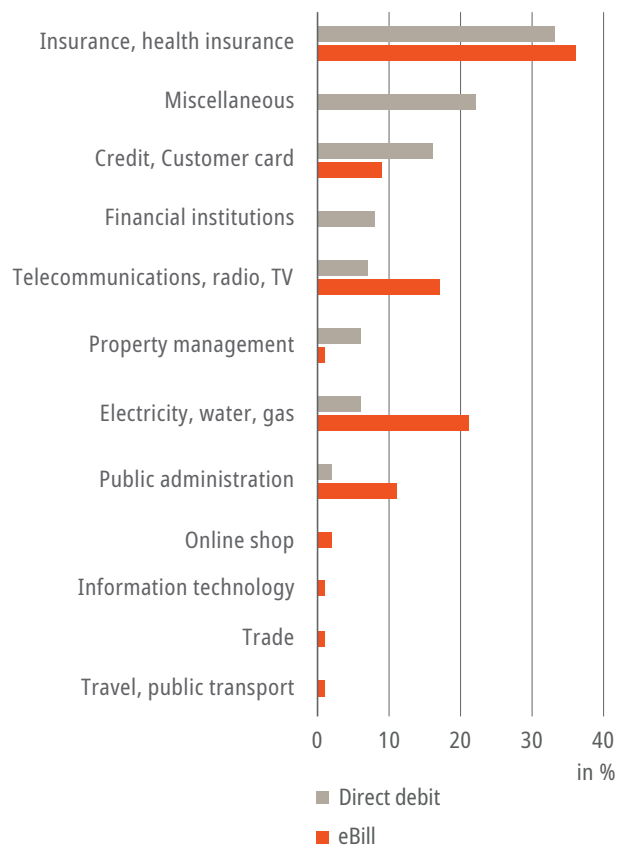
Figure 4: Indicated average amount per invoicing transaction by approach in Switzerland in 2021 in CHF. Data source: SIX (2021a)¹²



One explanation for the difference in average amount per transaction is that eBill is a more consumer-focused product and thus has many small transaction amounts. In addition, invoice issuers in different industries seem to use different invoicing concepts.

Figure 5 shows a wide range of industries using direct debit and eBill, with the extent of use varying by industry and invoicing method. For both direct debit and eBill, insurance and health insurance companies are the most common invoice issuers, at 33% and 36% respectively. 21% of eBill invoice issuers in the sample, but only 6% of direct debit issuers, are in the electricity, water, and gas industry in December 2021. A further 17% of eBill invoice issuers are telecommunications, radio, and television companies, representing 7% of direct debit issuers in the sample. Credit and customer card companies as invoice issuers are more prevalent among direct debit issuers at 16%, while companies from this industry account for only 9% of eBill invoice issuers in the sample. Companies operating as financial institutions or in the property management industry are more strongly represented among issuers of direct debits, at 8% and 6% respectively, than among issuers of eBill, at none and 1% respectively. In general, it can be said that the industries have not changed significantly compared to 2019.

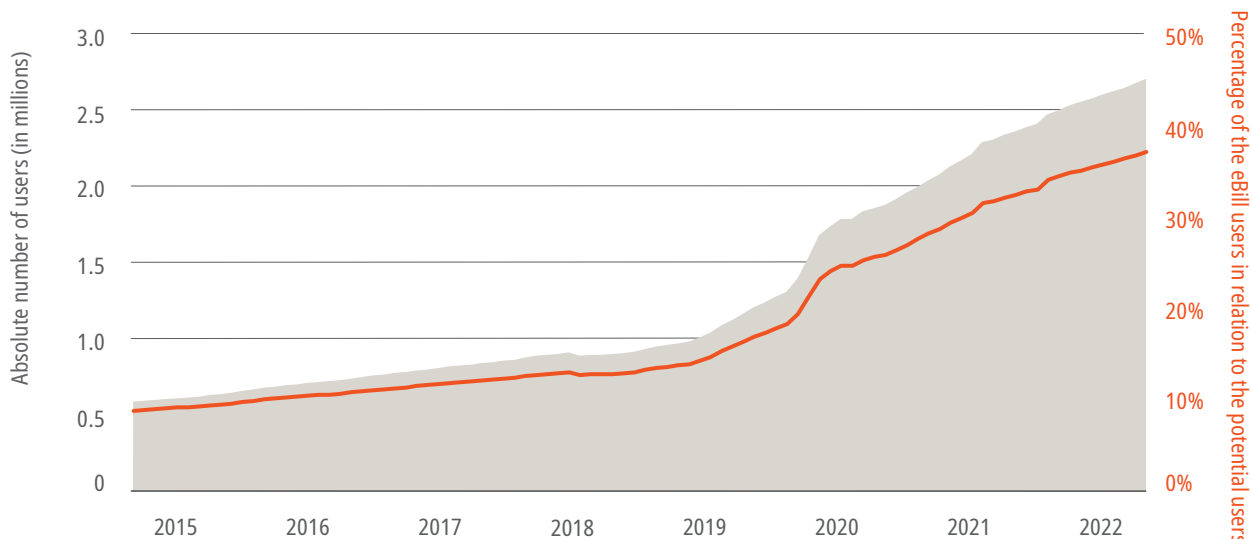
Figure 5: Direct debit and eBill invoice issuers by industry as of March 2022. Data source: SIX (2021a)



The bars in Figure 6 show the historical development of the number of eBill users from January 2015 to July 2022. The figure clearly indicates that their number has increased in recent years. The line shows the number of eBill users as a percentage of the permanent resident population that are 16 years old or older in Switzerland, which serves as a proxy for the potential number of eBill users. The development of the line and the bars is roughly the same, as the permanent resident population in Switzerland has changed relatively little compared to the number of eBill users. From the beginning of 2015, a growth in the number of eBill users can be observed. By December 2021, their number had increased from around 0.6 million to around 2.4 million (+300%) and has thus quadrupled in around six years. The share of users among potential eBill users rose from 8% to 33% during this period. Figure 6 shows an increase in the growth rate in January 2019. The reason for this higher growth rate could be related to the further development of the eBill platform (i.e., the switch from “E-bill” to eBill in December 2018) as well as the impact of the new innovative functionalities and corresponding marketing campaigns.

¹² The sample of QR-bill payments does not include eBill transactions.

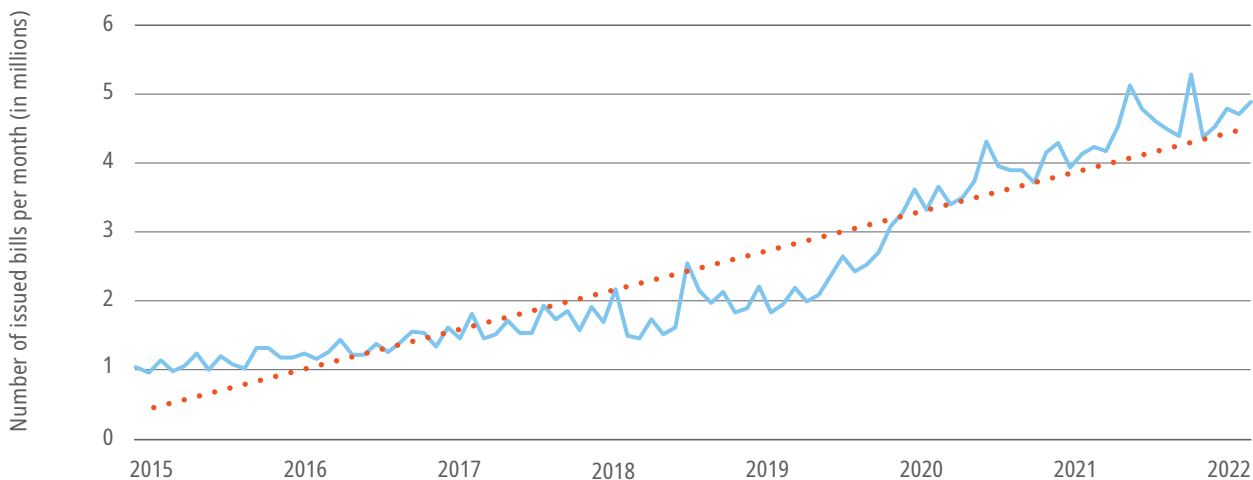
Figure 6: Historical development of eBill users. Data source: SIX (2021a) and FSO (Federal Statistical Office, 2022b)¹³



A similar trend to the number of eBill users can also be observed in the number of eBill transactions. Figure 7 shows the number of eBill transactions per month from January 2015 to July 2022, rising from around 1 million in January 2015 to almost 5 million in July 2022 (+439%). The total transaction volume in 2021 is estimated at around CHF 20.8 billion. This corresponds to an increase of 165% compared to 2019 (transaction volume 2019: CHF 12.6 billion). As can be seen in Figure 4, the average eBill transaction amount

of CHF 412 is the lowest among the settlement approaches considered. The number of eBill transactions per user remained constant between 2015 and 2021 at 1.8 per month. The dashed line in Figure 7 is an approximation of the historical trend from a linear regression analysis. As the number of eBill users is expected to continue to increase in the future, this is also expected to have an impact on the future development of the number of eBill transactions. ●

Figure 7: Historical development of number of eBill transactions from January 2015 to July 2022. Data source: SIX (SIX, 2021a)



¹³ Potential number of eBill users cover Swiss permanent resident population that are 16 years old or older.

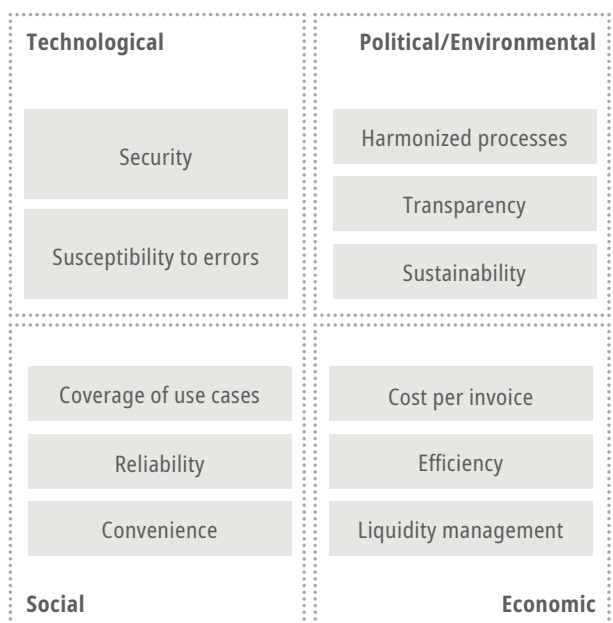
Chapter 3

Evaluation of Invoicing Approaches

After four invoicing approaches currently relevant in Switzerland were identified, these four approaches were evaluated in the previous study by means of a utility analysis (SIX, 2020a). The analysis is based on the characteristics of the direct debit, eBill, QR-bill, and e-mail invoice approaches. The aim was to capture the relative benefits of each approach from the perspective of both the invoice issuer and the recipient, using qualitative ranking measures and focusing on the B2C business case. Capturing the relative benefits of each approach allowed the approaches to be ranked from first (1) to last (4). It should be noted that the differences in benefits between the ranks may be small as this analysis uses a ranking rather than a rating system. This qualitative assessment depends on the individual use cases of the invoice recipient and the invoice issuer. Therefore, the assessment may be different for different invoice recipients and issuers.

The benefit analysis was based on a PEST approach with the following four underlying dimensions that examined different aspects of the invoicing approaches: political/environmental, economic, social, and technological. Each dimension in turn comprised two or three indicators. This meant that all four settlement approaches were assessed for a total of 11 indicators. An overview of the different dimensions and indicators of the supply analysis is shown in Figure 8.

Figure 8: Overview of dimensions and indicators of utility analysis



The results of the analysis from the perspective of the invoice recipient and the invoice issuer are shown in the form of a spider diagram in Figure 9 and Figure 10 respectively. It is noticeable in the results that the ranking of the individual indicators can differ from the perspective of the invoice recipient and the invoice issuer.

Overall, the eBill approach takes the top spot in both perspectives and never ranks below second place in the individual indicators. The high ranking of the eBill approach in several indicators and in both perspectives is due to the completeness of the platform. One reason for this could be that it is a relatively new system. The results speak for the future potential of the approach. As the approach is attractive in terms of benefits for both parties involved in the invoicing process, it can be expected to continue to grow and possibly be expanded in certain areas. Many of the conclusions drawn from the analysis of the eBill approach, as well as the other three approaches, are in line with previous research (e.g., Parexa, 2018; Gashnjani & Klinkert, 2019).

In the case of the direct debit approach, it is found that the invoice payer derives high benefits from the efficiency and reliability of the approach, especially for the recurring payments use case. As the direct debit procedure enables the automatic payment of invoices by authorization of the invoice issuer, there is no effort for the invoice recipient after registration. In terms of benefits, the invoice issuer benefits from the transparency and improved liquidity management that the direct debit procedure offers through the predictability of the payment date, low reminder rates, and the possibility of progress monitoring. In addition, this approach is associated with low costs per invoice for the issuer.

QR-bill invoicing is high on the agenda in terms of harmonized processes. The approach represents the final step in the process of harmonization with the ISO 20022 (2020) standard in Switzerland and is in line with new standards. QR-bill offers flexibility through the broad coverage of use cases. Financial flexibility is characterized by the high value placed on liquidity management, whereby the invoice recipient is free to choose when and how to pay the invoices. The main advantages for the invoice issuer are the convenience and the broad coverage of use cases through the QR-bill. QR-bill covers analog invoice recipients, while eBill for example, addresses digital customers only. The disadvantages of the QR-bill compared to the eBill result from the type of solution, whereby the eBill is a system solution and the QR-bill is an invoice standard. The QR-bill represents

a further development and clear improvement of the old document solutions and will be important in the future.

The e-mail invoice represents the most unstructured of the approaches examined and its usefulness in many cases depends on its form. Invoice recipients can benefit from the

low cost of this approach, as well as the financial flexibility it offers, as they can choose when and how to pay the invoice. From the issuer's perspective, e-mail invoicing is an important indicator of benefit due to the multiple points of contact with the customer, the low switching costs, and the simplicity of the approach.

Figure 9: Overview of the ranking from the perspective of the invoice recipient

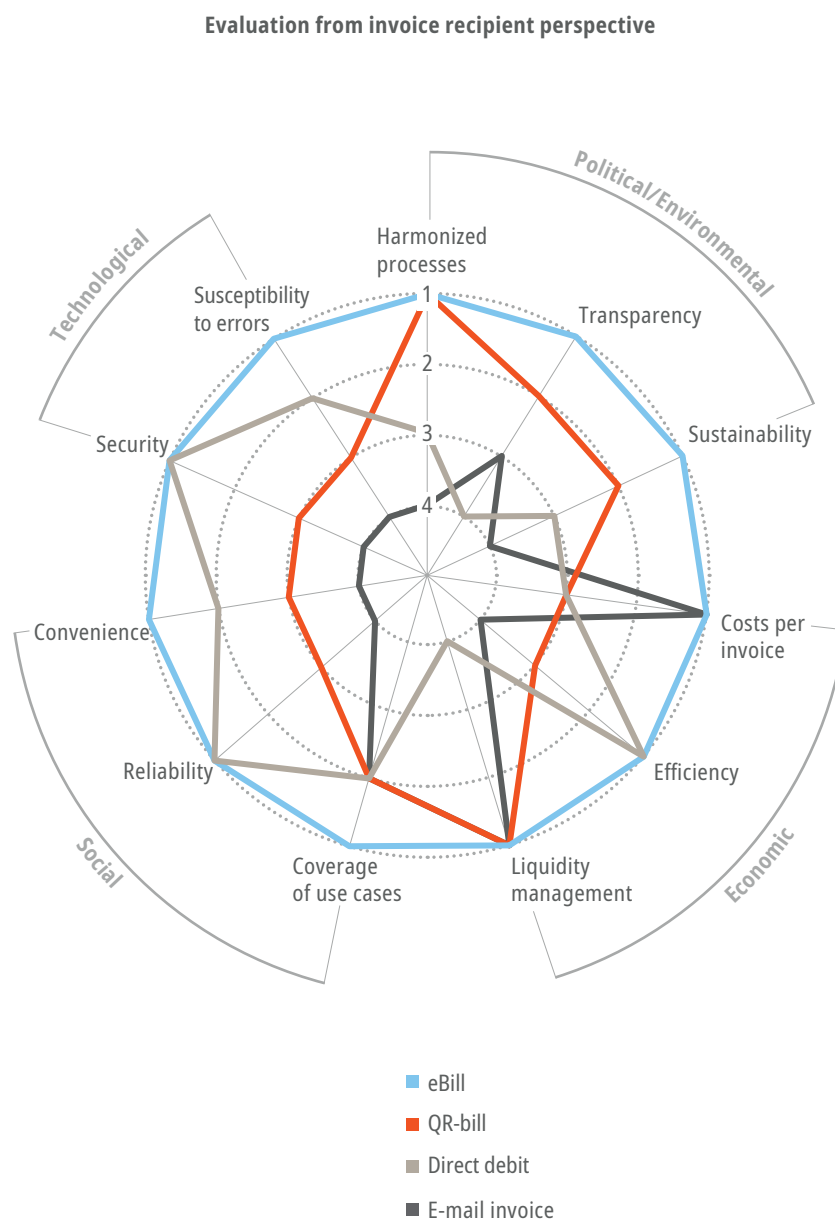
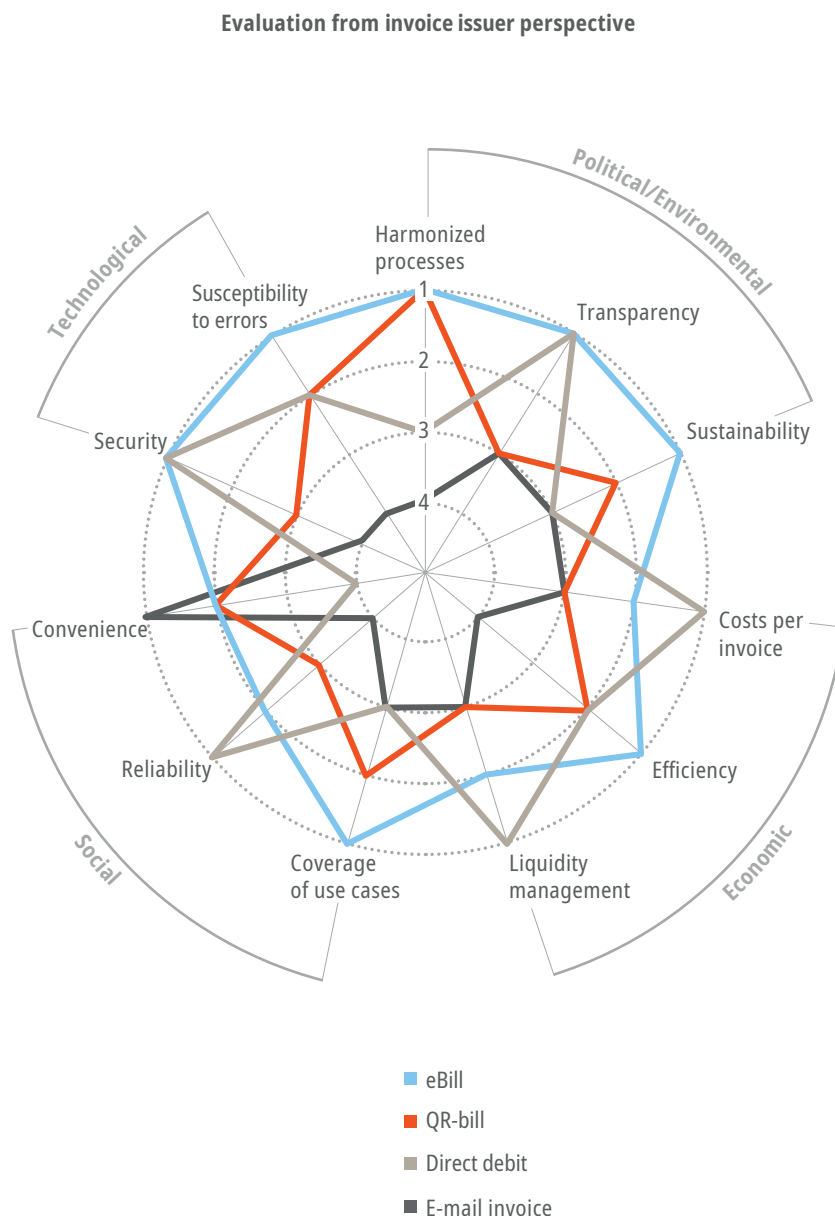


Figure 10: Overview of the ranking from the perspective of the invoice issuer



In this study, one indicator for two of the four dimensions mentioned above is examined and updated in more depth and detail. This concerns the policy and environment and the social dimension. The policy and environment dimension includes policy aspects and environmental considerations in a broader sense. The focus in this dimension is on the sustainability indicator. Sustainability refers to the future potential of a payment approach, e.g., in terms of resource use or infrastructures associated with a payment approach or its future acceptability. The social dimension includes the convenience indicator for the invoicing approach. This multi-layered indicator includes aspects such

as ease of use, the degree of customer loyalty, the existence of invoice storage facilities and the possibility of re-access, the level of switching costs, and the existence of network effects.

3.1

Political/Environmental: Sustainability

Sustainability is considered in more detail in the context of the political and environmental dimension. It is to be understood in a broader sense as the future viability of the invoicing approach, considering its consumption of resources and infrastructure as well as its future acceptance.

Over 1 billion invoices are sent in Switzerland every year, and the majority of these are still sent by mail. As can be seen in Table 1, the processing of invoices currently generates 63,222 t CO₂-eq (61.7 g CO₂ eq per invoice) annually. This corresponds to the CO₂ footprint of over 4,215 Swiss citizens (SIX, 2022).

Table 1: Estimation of the emissions of all invoices (SIX, 2022)

Invoicing	Emissions per invoice (g CO ₂ -eq)	Volume 2021 (million)	Emission (t CO ₂ -eq)
Paper invoice (e-banking)	54.4	622	33,839
Paper invoice (counter)	175.9	136	23,917
E-mail invoice (e-banking)	17.4	206	3,589
E-mail invoice (counter)	138.9	10	1,389
eBill	9.8	50	488
Total emissions Invoicing 2021		1,024	63,222

An important aspect of the sustainability indicator is the existence of paper-based or electronic documents. The latter can be considered the more sustainable option, as they reduce the consumption of natural resources such as wood and, with the trend towards increasing digitalization and automation, a more sustainable acceptance can be expected in the future. On behalf of SIX (2022), carbon-connect AG compared paper invoicing, e-mail invoicing, and eBill and examined the emissions impact of the individual processes. Their analysis showed that the purely digital solution with eBill is the most sustainable alternative compared to e-mail and paper invoicing. This is because eBill offers the greatest CO₂ savings potential. With emissions of 9.8 g CO₂-eq, eBill reduces CO₂ pollution by at least 44% (17.4 g CO₂-eq) compared to e-mail invoices and achieves a savings rate of around 82% (54.4 g CO₂-eq) compared to paper invoices, which in the best case are paid via e-banking (SIX, 2022). Monexa (2014) also concluded that compared to paper-based documents, electronic documents offer the advantages of increased cost savings for the invoice

issuer, increased convenience for the invoice recipient, better organization, and management for both parties, and greater environmental friendliness. According to analysis by carbon-connect AG, it is expected that 80% of all invoices in Switzerland will be sent with eBill by 2028 and thus an emission reduction of up to 66% can be achieved. This corresponds to approximately 0.5% of Switzerland's total forest area or the annual CO₂ storage of 2.9 million trees (SIX, 2022).¹⁴

Direct debit requires the completion of paper documents by the invoice recipient as well as a high manual effort during the registration process. Afterwards, however, the paper-based steps are eliminated as the transaction is fully digitalized and automated for both the invoice issuer and invoice recipient, even though statements can be sent by mail. In the eBill process, all steps of the registration and payment process are carried out electronically and without paper documents. In addition, there is a relatively high degree of automation, which enables the invoice recipients to pay their invoices at the click of a mouse or to set up a permanent release for automatic payments. The QR-bill can be issued either as a paper-based or electronic document.

The degree of digitalization in the course of the customer journey also depends on how the invoice recipient uses the invoice document. It can either be scanned, which imports the information it contains directly into an m- or e-banking account, printed out, or manually transferred to a payment slip. According to Moeller & Quack (2006), the behavior of the invoice recipient has a decisive influence on the environmental profile of an approach. In order to generate sustainable benefits, responsibility must be taken at both the consumer and the company level (Moeller & Quack, 2006). As with the QR-bill, e-mail invoicing entails different levels of sustainability depending on how the invoice recipient uses it. Although the invoice is issued electronically, there is still the possibility of manually transferring the information to a blank payment slip, resulting in paper documents that eventually have to be disposed of. The degree of automation is relatively high from the invoice issuer's point of view, but low from the invoice recipient's point of view, as the information must either be transferred to a payment slip or entered manually in m- or e-banking. Another sustainability factor that should not be underestimated is the dunning process. It is estimated that a reminder is triggered for 10% of paper and e-mail invoices, while the share of reminders in the total eBill volume is less than 1%. With paper and e-mail invoices, a reminder has to be sent for every tenth invoice on average, whereas with eBill fewer than one in a thousand invoices requires a reminder.

¹⁴ Assumptions and estimations had to be made for the calculation of energy emissions. The study by carbon-connect AG may therefore contain inaccuracies.

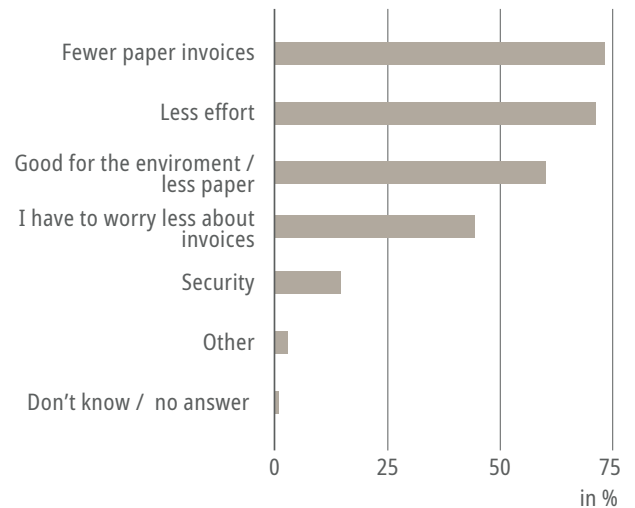
3.2

Social: Convenience

An important indicator within the social dimension is convenience, which includes various aspects such as the user-friendliness of an invoicing method, network effects, customer connectivity options, and switching costs. Factors such as invoice retention and re-availability are also important points to consider. The usability of an invoicing method depends to some extent on the preferences and habits of an invoice issuer or recipient. However, the usability of a method may also depend on its design. An invoice approach that is designed to allow quick and easy access to the invoice information, as is the case with eBill or QR-bill, can be considered more user-friendly. E-mail invoicing, on the contrary, contains only a limited amount of information that must be manually converted into a payment. An eBill, QR-bill, or e-mail invoice must be followed by a login to an m- or e-banking account to execute the payment electronically. Direct debit is easy to use (after the rather complex onboarding process with the invoice issuer) as the invoice recipient does not have to do anything to execute the payment. Network effects refer to the fact that the benefits of a procedure increase as the number of users increases (BAK Basel, 2016). Users of the eBill approach in particular can benefit from this effect, because the higher the number of participating invoice issuers, the higher the benefit of an eBill account for invoice payment. This is also due to the possibility of automatically registering new invoice issuers on the eBill platform.

In March 2022, a population survey on eBill was conducted by the research institute GFS Bern (2022). It became apparent that an absolute majority of the Swiss population is now familiar with eBill and its correct designation. Comparatively rarely, but about equally frequently, eBill was confused with the QR-bill or e-mail invoicing (6% and 5% respectively). According to this population survey, seven out of ten people use eBill to pay their invoices. Nevertheless, eBill invoices still bring up the rear in digital payment. In e- and m-banking, most invoices are currently paid using manual IBAN entry, followed by standing orders and scanning the QR-bill or payment slip. The non-use of eBill is mainly due to alternative payment options, a lack of knowledge, and the unclear added value of eBill. As can be seen in Figure 11, respondents see the main benefits of eBill as being less effort and fewer paper invoices, making it better for the environment (GFS Bern, 2022).

An invoicing approach can also be a process for closer connection with a customer, also known as customer touchpoints. The touchpoint can be created either between the bank and the customer or the invoice issuer and the customer and form part of the customer experience. Direct debit offers a low level of customer touchpoint for both the financial institution and the invoice issuer, as the invoice recipient is not obliged to participate in the invoicing process –

Figure 11: Main advantages of eBill (n = 701) (GFS Bern, 2022)

apart from registering. 55% of respondents would welcome the direct debit function being newly processed via eBill, 26% are against it, and 19% have no answer (GFS Bern, 2022). Both the QR-bill and e-mail invoicing offer several points of customer connection, such as when issuing the invoice or when initiating payment. By contrast, eBill offers a high level of customer touchpoint. The eBill approach provides a single point of contact for all three parties involved in the invoicing process in the same place, with access to the platform via m-banking or e-banking, where the issued invoices are viewed.

Conversion costs are relevant for the newly established approaches eBill and QR-bill. However, from a B2C perspective, the conversion costs of QR-bill are only relevant for the invoice issuer. This is because the invoice issuer has to comply with certain formal requirements, while the process for the invoice recipient is remarkably similar to that of a payment slip, as the QR code can be scanned with a mobile device, which most people already own. It is important to note that the conversion costs refer to today's costs. There are also conversion costs for direct debit, as the cost of registration is high. Another crucial factor is invoice storage. If invoice recipients want to store the invoices, they must do so via their personal filing system for direct debit, QR-bill and e-mail invoice procedures, which represents an additional expense for them. However, the eBill platform offers the advantage that invoices are stored on the platform for at least 180 days after payment processing. This period will be increased from 180 days to 730 days in the first quarter of 2023, which will offer users more flexibility in the storage of invoices (see Section 4.2). This is also reflected in the GFS Bern survey (2022): around three out of four eBill users believe that no functions are missing. The attestation of a missing function mainly refers to the filing options and the possibility of overviews and evaluations (GFS Bern, 2022). ●

Chapter 4

Short-Term Developments in Invoicing

This chapter presents short-term developments, i.e., innovations that are launched within one to two years. The innovations mainly concern the eBill platform and further strengthen its position as the central invoicing platform in Switzerland. Section 4.1 introduces eBill Donations, a new type of use case within eBill. Section 4.2 explains the Archive Feature Concept, which was briefly mentioned in Section 3.2. Finally, Section 4.3 rounds off the fourth chapter with eBill for Business, a function geared towards businesses.



81%

of Swiss households donate an average of CHF 350 per year

4.1

eBill Donations

eBill Donations is a new function that was launched in October 2022. It uses the technology and infrastructure of eBill and thus offers security and convenience for all parties involved instead of paper, detours, and unnecessary environmental pollution. As a result, the non-profit organizations (NPOs) can reach donors directly via online banking. NPOs are offered a fully digital solution for executing donation campaigns, starting from the submission of the donation request, its approval by the donor and ending with payment initiation.

The process is as follows: NPOs send their donation requests with attached PDF via eBill directly via e-banking to their donors. Donors can study the received donation request in the eBill portal and initiate payment to the corresponding NPO with a single click. NPOs also have the option of suggesting specific amounts or different donation purposes and projects to their targeted donors. In doing so, the organization always has an overview of the success of the campaign, as eBill reports how many requests have been successfully delivered and how many have resulted in a donation.

By using eBill Donations savings can be achieved on the donor acquisition side and on the printing and mailing side of the donation campaign execution. In addition, the ecological footprint of the respective organization can be optimized. According to the Donation Report by Swissfundraising and the Zewo Foundation (2021), one in five Swiss citizens already donates digitally, and one in three of those is under 35 years. The proportion of digital donors is constantly increasing, and the potential is huge. A total of 81% of Swiss households donate an average of CHF 350 and thus more than CHF 2 billion per year.

4.2

Archive Feature Concept

With eBill, users receive the data relevant for the payment, such as the name of the invoice issuer, amount, and due date, as well as a PDF with the invoice. Currently, the PDF is available for download in the portal after approval for at least 180 days after the due date. This retention period will be increased from 180 days to 730 days in the first quarter of 2023. The aim is to offer users more flexibility in the storage of invoices. After expiry of the presentation deadlines, the invoices are transferred to the agreed archiving system for long-term archiving.

4.3

eBill for Business

With eBill for Business, companies benefit from the digitalization of Swiss payment transactions. This is because business customers can receive and pay their invoices digitally. A distinction is made between two options as to how the eBill invoice is to be received: either directly in online banking or without media disruption in the customer's own business software.

If the business customer opts to receive eBill invoices via online banking, there are two advantages: efficiency and transparency. It is efficient because all authorized employees can connect their company with other invoice issuers via the eBill platform to receive eBill invoices directly via online banking in the future. And it is transparent because all authorized employees can view and check invoices for their company and then approve or reject them for payment. The payment process is as follows: A company sends eBill invoices. The company that owes the invoice amount receives the eBill invoice via online banking. The authorized employees can view, approve, or reject the corresponding eBill invoice. In the case of a permanent release, eBill in

voices are automatically triggered. The bank then triggers the payment and the eBill invoice is stored.

Customers also benefit from several additional advantages with the media disruption-free variant via their own business software. Business customers with their own business software will be enabled to manage invoices received via eBill in a standardized manner in this software. The payment process is as follows: The company sends an eBill invoice. The invoice is transmitted by the bank as a PDF A/3 with an integrated XML file. The bank transmits eBill invoices via proven channels that customers are already using today (e.g. file transfer tools, like EBICS). After receipt of the eBill invoice in the business software, booking and payment run according to the standard processes. No adjustments to the existing processes are necessary. Moreover this process has a convenient archiving function. In addition to the electronic invoice data, the customer also receives the corresponding PDF. This way, the invoice document can be easily archived via the existing processes. ●

Chapter 5

Long-Term Developments in Invoicing

The following sections attempt to identify technologies, concepts, and trends with the potential to improve invoicing in the long-term future. In the last study on the future of billing (SIX, 2020a), the following three future trends were elaborated: invoicing experience, intelligent invoicing platforms, and Internet of Things (IoT).

The **invoicing experience** is evolving due to various factors. In the last study, it was expected that increasing digitalization will shape future invoicing approaches. In addition, user demands for more transparency, control, and automation in the invoicing process will lead to invoicing approaches changing to meet these demands. These efforts may lead to customizable settings, personalized offers, and support. Intelligent invoicing platforms refer to solutions that can support the user in different ways in the invoicing process based on the available data.

Intelligent invoicing platforms are trusted centers for invoice recipients and issuers to access their invoicing information and manage their invoicing experience and processes. Combining the data collected through the platforms with data analytics tools enables them to support users with a range of different value-added services, from notifications to financial management systems.

Internet of Things (IoT) devices benefit from invoicing platforms for sharing, collecting data, and a directly integrated payment process that – depending on the level of integration – does not require any interaction from the user (payer). The successful integration of invoicing approaches into IoT devices offers benefits for all stakeholders along the entire value chain. Using various invoicing situations as examples, the last study showed how developments could affect the invoicing process in the future. To describe how

the predicted trends could affect the future of invoicing on a micro level, some future use cases of invoice issuers and recipients were illustrated.

The success of the eBill platform supports the scenarios of a central intelligent invoicing platform with additional integrated functions and services. The enhancements in Chapter 4 further strengthen this position. In contrast to Chapter 4 the following section outlines possible long-term developments in invoicing based on the eBill platform. The concepts and trends are divided into the following three scenarios:

- Scaling
- Further intelligence
- Open Billing

Scaling deals with the question of how a platform can be made bigger and profit from network effects. The topics of direct debit integration, European expansion, business-to-business, and the migration of existing volumes (QR-bill) are addressed. **Further intelligence** deals with topics such as the credit function in cooperation with banks, document management, or forwarding to additional insurances, for example, as well as instant payments. The new term **Open Billing** draws upon the topics of Open Banking, Open Finance, and Decentralized Finance (DeFi). This is a continuation of the considerations in the IoT area in the last study. In general, it can be said that the platform idea from the last study has been further accentuated and confirmed.

5.1

Scaling

In Switzerland, eBill has established itself and matured into an important player in the payment system of invoice issuers across Switzerland. This raises the question of how the eBill platform can grow in the long-term and economies of scale can be achieved. One possibility is to integrate direct debit into the eBill platform. In this way, invoice issuers can settle invoices directly on the eBill platform of the invoice recipients who have an overview of all their invoices on one platform. It can thus be assumed that there will be a shift of all payment options to the eBill platform. This means that existing volumes, for example those of QR-bill and especially today's direct debit transaction volumes, can be migrated to one single platform (eBill).

Another possibility for scaling the eBill platform is **expansion to Europe**. However, the platform would have to expand its functionality in order to be suitable for use in the international payment business, including legal requirements and European-wide standards and formats. One way of driving this expansion approach is **Request to Pay (R2P)**. R2P is a payment request messaging standard that precedes the payment. An R2P message contains all of the information about the transaction, is initiated by the invoice issuer and triggers a payment transfer, provided that the customer confirms it with a single mouse click or any other

verification method defined by the bank of the payer. As such, it is more of a messaging service than a new payment instrument. R2P bridges the gap between invoicing and payment: With the new European standard, completely media-interruption-free, digital payment processes can become a reality. In Europe, SEPA Request to Pay, the first set of rules, was officially launched in July 2021. This set of rules has the potential to permanently change the European payment traffic market. This is because R2P is not just another procedure or format, as many payment processes can be made leaner, more efficient, and more user-friendly. The entire payment process will be quicker, simpler, and less error-prone (European Payments Council, 2022). Combining with SEPA Instant Payment, it gives rise to several new application scenarios (see Chapter 5.2). Integrating R2P into the eBill platform would present some hurdles, such as cross-border networking with other countries and legal factors. At the moment, R2P is being strongly pushed by regulatory terms in some countries. If R2P could be integrated into the eBill platform, this would be associated with positive economies of scale (PPI AG, 2022).

5.2

Further Intelligence

In relation to the topics of intelligent invoicing platforms and the Internet of Things, which were examined in greater detail in the last study, this year's study also deals with new, long-term intelligent functionalities that fall under the umbrella term of further intelligence. This includes, for example, a **credit function** for banks. This necessary platform is available with eBill. This is a similar function to the already well-known "buy now, pay later" (BNPL) option. Here, the invoice recipient can select "buy now, pay later" in addition to the familiar payment options in eBill. The invoice can be paid on credit. The advantage of this new type of credit is speed. Credit can be purchased with just a few clicks from anywhere and at any time. The customers have complete control thanks to a transparent overview of their finances and can consolidate their credits. The credits are funded by banks or other providers. For banks and businesses, this creates further opportunities to generate competitive advantages, offer customers a new payment experience, and improve customer loyalty.

Another point could be **data management**, in that a forwarding function to supplementary insurances will be built into the eBill platform in the future. In doing so, relevant documents can be forwarded to insurance companies with the customer's assurance. In this way, tedious administrative work between all parties involved can be avoided and a lot of time can be saved. The insurance companies receive all necessary information from the eBill platform, and they do not have to approach the customers directly but can send a request to eBill to find out which documents are currently required. This allows seamless integration of insurance services for purchased and invoiced products.

The last point worth mentioning in further intelligence concerns the embedding of instant payments in the eBill platform. From August 2024, banks in Switzerland will be able to offer their customers instant payments around the clock. The path of a transaction from the payer's to the payee's account takes just a few seconds. This means that in the future, banks will be able to execute customer payments end-to-end in less than ten seconds. The SIC system itself processes the payments in no more than 0.2 seconds. Examples of applications can be found in retail directly at the point of sale, or in the area of digital transfers between private individuals, so-called peer-to-peer payments (P2P). There is no need to handle cash in this way and yet the amount is transferred to the right place in just a few seconds. With SEPA Instant Payment, this topic is now also finding its way into European payment transactions. Transfers can be executed around the clock, 365 days a year. This in turn enables economies of scale throughout Europe (see Chapter 5.1).

5.3
Open Billing

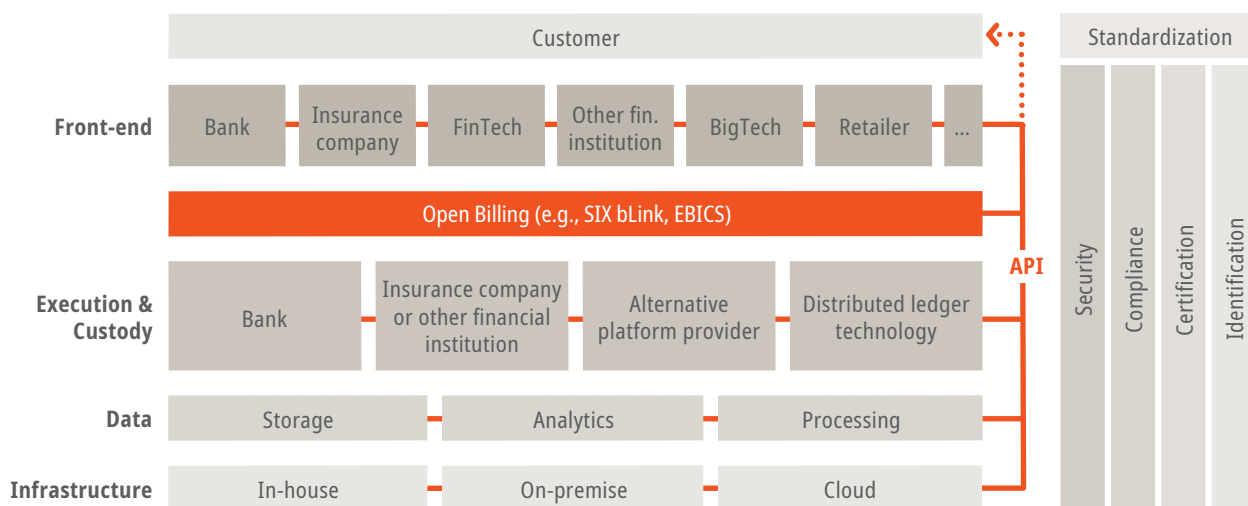
For the last point relating to long-term developments, a new concept is being created with Open Billing (see Figure 11). This nested concept is derived from the existing trends of Open Banking, Open Finance, and Decentralized Finance (DeFi) and allows the conceptual seamless integration of invoicing into open financial ecosystems.

In general, Open Banking describes the exchange of data and services between banks and third-party providers via available and published interfaces, e.g., OpenAPIs, whereby exchange can take place in both directions. Open Finance describes the extension of the principles of Open Banking to functions of other financial service providers such as insurers. It related to "open" financial ecosystems. DeFi

describes the merging of the traditional financial industry with distributed ledger technology (DLT) to create systems based on protocols that do not require intermediaries (e.g., banks or exchanges). The decentralized products and services are based on smart contracts, where predefined rules are enforced automatically and independently, and all corresponding data is stored in a decentralized, distributed ledger (e.g., blockchain) (Ankenbrand, Bieri, Frigg, Kronenberger, & Reichmuth, 2022).

Open Banking, Open Finance, and DeFi aim to give customers back control over data usage and allow them to access and selectively share their data with authorized third parties to develop bespoke innovative products and services. Open Billing takes the same approach as the three trends mentioned above, but focuses specifically on invoicing. According to this definition, bLink or EBICS can be considered examples of Open Billing ecosystems. With bLink, SIX provides financial institutions and software or service providers with a scalable platform for standardized interfaces (API), which enables participants connected to the platform to link up efficiently and securely. They exchange various types of financial data with each other in order to offer their customers innovative solutions in different areas and segments (SIX, 2022a). "Electronic Banking Internet Communication Standard" (EBICS) is a standardized, freely available Internet-based communication protocol for the secure transmission of files. In addition to its use for data transmission between corporate customers and financial institutions, EBICS is increasingly being used in the interbank sector by financial service providers and service bureaus. In addition to the widespread use in payment transactions (payment orders, account statements, etc.), EBICS is also increasingly being used for securities and for the transmission of documents (PDF) and master data. ●

Figure 12: Architecture of financial ecosystems – Open Billing



Chapter 6

Conclusion

This study examines invoicing methods in Switzerland and aims to provide guidance for invoice issuers and recipients. This chapter summarizes the main findings and conclusions from the analysis of three different invoicing approaches as well as the discussion on possible future short- and long-term developments in the industry.

An overview of the Swiss invoicing industry is given in Chapter 1 and illustrates the high relevance of invoicing in Switzerland. The analysis illustrates the importance of invoicing in the Swiss payment traffic and economy, both in terms of transaction volume and through its anchoring in the Swiss payments culture. Looking at the number of invoicing transactions over time between 2012 and 2021 also shows a trend towards increasing digitalization of the invoicing industry in Switzerland, with more and more payments being triggered electronically. Paper-based payments have consistently declined since 2012. This in turn supports the drive for more digital offerings in the invoicing industry.

Chapter 2 explains the three invoicing methods currently offered in Switzerland: direct debit, eBill and QR-bill. The absolute figures, the average amount, a categorization within the industries and the historical development of the number of eBill users and eBill transactions are presented. It shows that the absolute number of transactions has increased for all three invoicing types. The average volume per transaction in 2021 was CHF 1,113 and the number of eBill users and eBill transactions have increased in recent years.

Chapter 3 of this study focuses on sustainability based on political/environmental indicators and convenience based on social indicators. Electronic documents can be seen as the more sustainable option as they reduce the consumption of natural resources such as wood and with the trend towards increasing digitalization and automation, more sustainable adoption can be expected in the future. Furthermore, an invoice that is designed to allow quick and easy access to the invoice information (eBill or QR-bill) can be considered more user-friendly. Moreover, the results of the analysis show that platform-based approaches that are able to offer seamlessly integrated processes and customer experiences are far ahead in many of the indicators analyzed in the last study. This speaks for the potential and further development of eBill, which is such a platform system. But invoicing standards, such as the QR-bill, are also expected in the future due to the spread, the coverage of different use cases and the high flexibility.

Further statements on the short-term future of invoicing are described in the form of a collection of theses in Chapter 4. These revolve around eBill Donations, where NPOs reach donors directly in online banking, the Archive Feature Concept, where the retention period is increased from 180 days to 730 days, thus offering users more flexibility in the retention of invoices, and eBill for Business, where companies benefit from the digitalization of Swiss payment transactions. The increasing digitalization of invoicing approaches and solutions is a prerequisite for innovation and development in the future.

Finally, Chapter 5 rounds off the study by looking at long-term developments. Smart invoicing platforms allow for the storage of invoice documents and data. This enables users of the invoicing platform to easily access important documents. In addition, users can access value-added services that a smart invoicing platform can link and integrate into the invoicing process. This increases efficiency and convenience for both invoice recipients and issuers, while ensuring security and control over the user's data. For further automation, users can delegate routine tasks to a digital assistant. IoT devices can also be seamlessly integrated and use the platform for their invoicing needs.

Besides, the topics of scaling, further intelligence and Open Billing are addressed. Scaling is about how to scale a platform and benefit from network effects. The topics of direct debit integration, European expansion, business-to-business and migration of existing volumes (QR-bill) are covered. Other information covers topics such as the credit function in cooperation with banks, document management or the forwarding function to additional insurances as well as instant payments. The new concept of Open Billing adapts the topics Open Banking, Open Finance, and DeFi. In conclusion, it can be stated that Open Billing via eBill is now a reality.

Invoicing is an important part of the Swiss payment traffic and payment culture. Various invoicing approaches are offered in Switzerland today – and with eBill and QR-bill, future-oriented solutions are already in place. Trends and future developments can be expected to continue to shape and digitalize invoicing and the associated document management in Switzerland, especially in the direction of invoicing platforms that offer value-added services and expanded options and use innovative technologies in the interest of users. In the future, this will contribute to an improved invoice experience for invoice issuers and recipients that goes beyond the payment process. ●

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Note to the Reader

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