International Journal of Innovation and Economic Development
ISSN 1849-7020 (Print)
ISSN 1849-7551 (Online)

URL: https:doi.org/10.18775/ijied.1849-7551-7020.2015.81.2001
DOI: 10.18775/ijied.1849-7551-7020.2015.81.2001

Volume 8
Issue 1
April, 2022
Pages 7-19

Digitalization of Business Processes in Federalist Environments: The Introduction of E-Invoicing in Germany

[1]Steffen Marzinkewitsch, [2]Arthur Dill

[1,2] FOM University of Applied Science, Essen, Germany

Abstract: In this article we will analyze the government-driven introduction of e-invoicing in Germany. The decision to digitalize the invoicing processes in Germany is based on an EU guideline that instructs all member states to switch to electronic invoicing (e-invoicing) within their administrations. The European Union thus aims to achieve a facilitation of trade across inner-European borders, as well as more transparency for the fiscal authorities. Germany, as a member state, has made e-invoicing mandatory for all national administrations, since 27 November 2020. At the same time the federal states of Germany have their own jurisdiction, which presents unique problems for the introduction of standardized solutions. For this study, several experts, representing the different stakeholders of invoicing processes were interviewed.
The results are showing that while the interest in e-invoicing solutions is high among all stakeholders of invoicing processes, the implementation in the German market comes with a unique set of challenges that are putting the success of e-invoicing in Germany at risk. The government-driven digitalization of processes is therefore heavily impacted by the fact whether a country has a federal structure or not.

Keywords: Digitalization, Government, E-Invoicing, Business Processes, Administration, European Union

1. Introduction

Directive 2014/55/EU of the European Parliament and the Council of the European Union on electronic invoicing (e-invoicing) in public procurement states, that there is no consistent format for electronic invoices for all member states. The use of significantly different, non-compatible national norms is considered an important barrier for new competitors that are looking to enter a national market. Therefore, these national norms are expected to be putting brakes on international trade opportunities within the European Union. Consequently, the guideline establishes the introduction of a unified European format and commissions the European standardization organizations to develop a semantic data model for the key elements of electronic invoices. The use of this data model should then be made mandatory for all public ordering parties (European Parliament and the Council, 2014).

The deadline for the implementation of all necessary legal and administrative regulations was set for the 28th of November 2018. The actual implementation of e-invoicing processes for public ordering parties and their contractors was determined to be finished within 18 months after the publication of the reference of the European standard on e-invoicing and the list of its syntaxes pursuant to Directive 2014/55/EU of the European Parliament and of the Council in the Official Journal of the European Union (European Parliament and the Council, 2014).

In a communication titled ‚Reaping the benefits of e-invoicing for Europe', the European Commission explains its motives for the introduction of electronic invoices to the European Parliament, the council, the European Economic and Social Committee and the Committee of the Regions. The communication places the introduction of e-invoicing into the context of the initiative ‚A Digital Agenda for Europe', that aims to digitalize the European society. In this document the savings that are expected due to the introduction of e-invoicing are estimated at around 240 billion euros. The main advantages which would drive these savings are named as shorter payment lead times, less potential for errors, reduced printing- and shipment costs as well fully integrated processes. To grant the success of the new format, especially small and medium sized companies should be targeted (European Commission, 2010).

In Germany the regulation on e-invoicing in the public procurement implements the directive on a national level. The format indicated in the regulation is called XRechnung. It is indicated that all billing entities will have to transmit their invoices to public procurement entities in electronic form as of the 27th of November 2020. On a national level the facilitation of the processing of incoming invoices, as well as ecological motives are indicated as major reasons to introduce e-invoicing processes. In addition, the reduction of unnecessary bureaucracy and economic growth are named as goals (Bundestag, 2017). The federal states of Germany are therefore left to implement the regulation into their own legislation.

1.1 Problem Statement

The introduction of a standardized solution across borders is a delicate path to tread, between a solution that covers the specific needs of all parties included yet is simple enough for small business to implement. Seeing the number of stakeholders that are involved in the implementation of a standardized invoicing solution in the European Union, it appears improbable that a high degree of standardization can be reached. Especially in countries that have federal legislation, national governments will find themselves between the European guidelines and the needs of their federal governments. The introduction of e-invoicing in Germany can therefore be considered a substantial challenge to both: lawmakers and implementing businesses.

1.2 Aim of the Study

Since the introduction of e-invoicing in Germany is a very recent occurrence, it is an interesting question to ask, how the implementation was done, how it was perceived and whether the goals of the introduction were reached. This study will provide an impression of the mood among German stakeholders after the introduction of e-invoicing and offer suggestions to improve the introduction process.

2. Literature Review

In this chapter the literature on the topic of e-invoicing will be reviewed. To provide the full picture of the perception of e-invoicing in Germany, not only scientific articles but also articles from companies and business associations will be included.

2.1 Scientific Literature

Pfaff and Spann (2001) describe the inefficiencies of paper-based invoicing processes. Already at this time, they observed that for most invoicing processes, the creation of the invoice as well as the payment entry were already computer based. The beginning and the end of these processes were therefore already digital, but the steps in the middle of the process were paper based. They define an ideal process as one where invoices are being created and delivered electronically. The receiving entity could then trigger the payment digitally. In terms of formatting, they already suggest an XML-based solution and recommend using a central intermediate entity. This entity would receive the invoices of all billing entities and deliver them to the recipients. Before delivering the invoices, the intermediate would convert them into a standardized electronic format. All billers as well as all recipients would have just one single point of contact, as opposed to the direct model, where they would have several contacts, each with different preferences as to how they want to receive their invoices.

The study of Cuylen (2016) is the sum of a series of articles over the years from 2010 to 2016, in which she explores different aspects of e-invoicing processes in the European Union. The methodology includes interviews with experts as well as literature reviews. In the beginning of her work, she attests a rise in importance to e-invoicing solutions. At the same time, she observes that the use of e-invoicing processes is rather uncommon in the European Union. As an explanation for this apparent contradiction, she declares the effort and cost related reasons as main problems to the introduction of e-invoicing solutions. Cuylen (2016) suggests that first a critical mass of users' needs to implement e-invoicing before a wide acceptance will take place. She suggests mandatory e-invoicing for business to government (B2G)-transactions, to achieve critical mass. Another important finding is the fact that most of the saving potential of e-invoicing processes will occur on the side of the recipient. Furthermore, she observes that most billers use external service providers, to digitize their invoices. She also states, that while bigger companies prefer structured data for electronic invoices, smaller companies tend to prefer image formats. Billing entities also prefer image formats since they want to avoid having to provide different formats of structured data for different customers. In conclusion, the paper suggests a standardized format, driven by government agencies, the format being a hybrid solution of structured data, embedded in an image file.

Mensching et al. (2019) researched how prepared the German Federal Ministry of the Interior, Building and Community was for the introduction of e-invoicing processes. They describe the vision of a unified end-to-end invoicing process for the entire ministry. The authors name several issues that have to be overcome to introduce an e-invoicing process. They named the delayed publication of the related legislation, specifically the lack of a definition of the invoicing format to be used. Furthermore, they criticize the lack of standardized invoicing processes in the German administration. Despite those challenges, the introduction of the new process was successful. At the same time the project is only considered as an intermediate step on the way to a complete digitalization of government processes. It leaves the authors asking, why the procurement process is not being digitalized at the same time as the invoicing process.

Piesold (2021) analyzes the laws on e-government on an EU-level, German national and federal level. His conclusion on the evolution of e-government in Germany is sobering. He considers the federal system to be a major hurdle when it comes to introducing digital solutions. An important tool to counter this effect is the introduction of portal solutions that are used across state borders. He also sees the risk that government-driven changes will mainly result in changes for the users on the billing side of business. In this case administrations might go on to process the invoices, that arrived digitally, in an analog manner. Thus, processes would be disrupted, and the positive effects of a fully digitized process could not be realized. On the topic of e-invoicing the author points to the positive effects, such as savings and improved quality.

2.2 Other Related Publications

The Deutschsprachige SAP Anwendergruppe e.V. (German-speaking SAP Users Group, DSAG) published the results of a survey among their users in August 2021. The participants are companies from Germany, Austria, and Switzerland. Out of 145 companies, only 66% indicated that they had implemented an e-invoicing solution. 20% of all participants said that they were still in the planning phase and 52% had shipped between 0 and 100 invoices, using a structured data format. The most frequently mentioned issue is the difference in the solutions for electronic invoices from state to state. Those companies that use e-invoicing prefer e-mail, followed by uploads in public online portals as means of transmission (DSAG, 2021).

Backhaus (2021) focusses on the digitalization of administrations in Germany. She discovers that a better solution for the introduction of e-invoicing to the German market could have been found, if the billing entities would have been included into the discussion more often.

Wild (2020) describes a disorganization of regulations for electronic invoices and criticizes the differences between specific solutions in the federal states. Especially the differences in accepted invoice transmission channels, as well as the different thresholds of tenders below which invoices can be sent, using analog processes.

The European Parliament released a study on the Value-Added Tax (VAT) gap, showing the importance of mandatory EU wide e-invoicing for all businesses, to reduce the VAT gap, by enabling new control mechanisms (European Parliamentary Research Service, 2021).

3. Research Methodology

In this chapter the methodology of the study shall be described. Three qualitative approaches were chosen: to get a deeper understanding of the differences between the regulations on a federal level, a structured comparison of these regulations was done. A comparison with solutions in other EU countries was done, to understand the differences in the selected solutions. To gain insights into the perception of the introduction of e-invoicing to the German market, experts with different views on the invoicing processes were interviewed.

3.1 Analysis of German State Regulations on E-Invoicing

Germany is structured in 16 federal states, whose legislation follows the national legislation, but is subject to local changes. With regards to e-invoicing processes, most states issued a two-pronged regulation. The first part of the implementation in most federal states was the enactment of laws on the implementation of e-government structures in general. Based on these laws, regulations are then being put in place, regarding the specifics of e-invoicing processes. The federal state Rhineland-Palatinate constitutes an exception from this structure since no regulation has been released up to now. Based on the criticism highlighted in the literature review, these regulations were compared, focusing on the aspects: Deadlines, regulations regarding the format of the invoice, regulations on the transmission channels, regulations for billing entities.

3.2 E-Invoicing Solutions in other EU Countries

For a better understanding of the solution chosen in Germany, the e-invoicing solutions of two other EU members were analyzed. As a country that is historically governed centrally, France was chosen as an ideal comparison. Austria is a direct neighbor of Germany but has introduced mandatory e-invoicing in 2014. The long history of experience with e-invoicing processes made the country particularly interesting for comparison.

3.3 Interviews with Experts on E-Invoicing Processes

Based on the findings of the literature review and the analysis of relevant laws, interviews with experts from the field were conducted. For the interviews a questionnaire was designed, focusing on the following categories: Introduction of the interviewee, evaluation of the introduction of e-invoicing, evaluation of the chosen format, evaluation of e-invoicing in general, outlook on the future development of e-invoicing. The same questionnaire was used for all participants, granting the comparability of the answers. At the same time the discussion was intentionally led as an open conversation, to give the interviewees room to explain their personal experience and viewpoint. All interviewed experts received the questionnaire in advance, to give them the opportunity to prepare their answers. Due to the COVID-19 pandemic most interviews were conducted remotely and all of them were recorded and transcribed.

The interviewed experts were selected from different fields, involved in e-invoicing processes, to gain as much understanding as possible of the matter. Figure 1 below illustrates the aspects of the invoicing process, covered by selected interviewees.

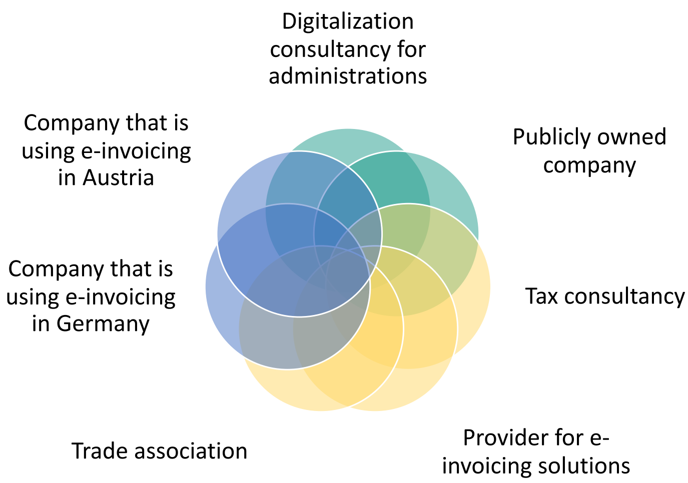

Figure 1: Branches using e-invoicing, covered by selected interviewees

To reflect the receiving side of e-invoices, an employee of a consultancy that focuses on the process digitalization in German administrations was interviewed. The consulting firm is a spin-off of the Goethe University Frankfurt, where the founder was doing research on e-invoicing. In addition, an accountant of a major German publicly owned company was interviewed, as well as an assistant from a state-owned university. The wider business perspective was represented by a tax consultant, the owner of a company that provides e-invoicing solutions, as well as a representative of the German association for electronic invoicing (Verband elektronische Rechnung, VeR), who also works for one of the most important accounting and controlling software providers. The billing entities were represented by an accountant of a German software company that is using e-invoicing for their outgoing invoices, as well as employees of an Austrian company.

4. Findings and Interpretation

In this chapter the analysis of state regulations on e-invoicing as well as the results of the interviews shall be discussed. For improved readability the state laws will not be indicated in the text but will be included in the list of sources.

4.1 Analysis of German State Regulations on E-Invoicing

Most German federal states' guidelines instruct their administrations to being able to receive electronic invoices by a certain deadline. However, these deadlines vary between the states. Below is a list of the deadlines of each state in table 1.

For companies that have federal authorities as customers from different states, this leads to uncertainty as to whether the customer will be able to process e-invoices. The data between the states ranges from November 2018 to May 2021. The differentiation between supreme state authorities and other state authorities is further complicating the situation.

The regulations regarding the billing entities are even more heterogenous. While some countries make it mandatory for billers to send their invoices to state authority by electronic means, other states do not have any regulations for billing entities at all (table 1).

The regulations for billing entities also include exceptions, that defer between states. For example, invoices that have a value of less than 1.000,00 € are exempted from the regulation in some states, such as Bavaria and Saarland. In other states the value of the tender to which an order is linked has an impact on whether an invoice must be transmitted in an electronic format.

Table 1: Implementation and regulation of e-invoicing in federal states

Federal state	Deadline implementation	Regulation of e-invoicing
Baden Wurttemberg	18.04.2020	E-invoicing as of 01.01.2022
Bavaria	18.04.2020	No regulation for billing entities
Berlin	16.04.2020	No regulation for billing entities
Brandenburg	01.04.2020	No regulation for billing entities
Bremen	27.11.2018	E-invoicing as of 27.11.2021
Hamburg	26.05.2021	No regulation for billing entities
Hesse	18.04.2020	E-invoicing as of 28.04.2023
Mecklenburg-Western Pomerania	22.06.2021	E-invoicing as of 01.04.2023
Lower Saxony	19.04.2020	No regulation for billing entities
North Rhine-Westphalia	19.04.2020	No regulation for billing entities
Rhineland-Palatinate	03.06.2020	No regulation for billing entities
Saarland	01.08.2020	E-invoicing as of 01.01.2022
Saxony	11.03.2020	No regulation for billing entities
Saxony-Anhalt	12.04.2020	No regulation for billing entities
Schleswig-Holstein	18.04.2020	No regulation for billing entities
Thuringia	27.11.2019	No regulation for billing entities

Looking at the transmission channels accepted by the federal governments, more differences can be found (table 2).

Table 2: Transmission channels in federal states

Federal state	Transmission channels
Baden Wurttemberg	Federal portal: "EGovG BW"
Bavaria	No regulation on the transmission channels
Berlin	National online portal solution: "OZG-RE"
Brandenburg	National online portal solution: "OZG-RE"
Bremen	Pan-European online portal solution: "PEPPOL", webportals (unspecified), upload, e-mail, or DE-mail
Hamburg	Pan-European online portal solution: "PEPPOL", webportals (unspecified), upload, e-mail or DE-mail
Hesse	E-Mail or others
Mecklenburg-Western Pomerania	Pan-European and National online portal solution: "OZG-RE" and "PEPPOL"
Lower Saxony:	E-Mail, web-upload or Pan-European online portal solution: "PEPPOL"
North Rhine-Westphalia	Federal portal: "erechnung.nrw"
Rhineland-Palatinate	Federal portal: "Zentraler E-Rechnungseingang Rheinland-Pfalz"
Saarland	Federal portal: "Zentraler E-Rechnungseingang Saarland"
Saxony	National online portal solution: "OZG-RE", e-mail, DE-mail, web-services
Saxony-Anhalt	DE-mail or others
Schleswig-Holstein	DE-mail or others
Thuringia	National online portal solution: "OZG-RE"

Again, companies with federal authorities from different states as customers face the challenge to address each customer differently.

When it comes to the format, indicated in the federal regulations, all states list XRechnung as the main format. XRechnung is an XML format, based on the EU standard EN-16931, defined by the European committee for standardization (DIN EN 16931, 2020). All states also allow other formats, as long as they are compliant with EN-16931, but some exclude hybrid formats. This is particularly interesting, as the e-invoicing format that was expected by many companies to become the official format for Germany, was ZUGFeRD, a hybrid format, consisting of a PDF-A with embedded XML data.

In summary it can be observed that the regulations within Germany are rather heterogenous and will ultimately lead to more complex invoicing processes and uncertainty, especially for companies that do not have big accounting and IT departments.

4.2 E-Invoicing Solutions in other EU Countries

Article 153 of the French Loi de Finances 2020 stipulates that all invoices that are subject to VAT, have to be issued digitally and the invoicing information has to be transmitted to the fiscal authorities (Parlement français, 2019). For invoices addressed to authorities or publicly owned companies this applies since January 2020, invoices between privately owned companies are impacted as of 2024. First bigger companies will have to implement e-invoicing processes, smaller companies will follow step by step. The chosen solution is a central portal named Chorus Pro, to which all invoices will be send. This can be done using invoices in different formats, such as structured data, hybrid formats, such as the French FACTUR-X, or online entry via a web-interface. All transmitted invoices are automatically being archived and the invoicing data is automatically being extracted and transmitted to the fiscal authorities. The receiving entity can then download their invoices from the platform (Parlement français, 2019). There are also external service providers that are offering automatized solutions for the transmission of invoices to Corus Pro and an online forum, where issues with the platform can be discussed.

Austria introduced the mandatory transmission of invoices by electronic means as early as 2014. All digital formats, including PDF, text files and structured data are considered as an electronic invoice. The transmission channels are not specified. Invoices to authorities or public entities can be transmitted via online entry, uploaded into a web portal or automatic transmission. The EU norm for XML invoices was implemented with the ebInterface format. Public companies must ensure that they are able to process all invoices that use the EU-norm. Therefore, the users are mostly free in their choice of format, while public companies are facing the challenge of being able to process different formats (Österreichischer Bundesrat, 2013).

4.3 Interviews with Experts on E-Invoicing Processes

The first section of the questionnaire was designed to present the interviewees and their specific angle on e-invoicing processes. The results of this section have been presented in chapter 3.3.

The next part of the interview focused on the evaluation of the introduction of e-invoicing by the experts. The answers given by the experts differed strongly, depending on their involvement with invoicing processes. Most interviewees stated that they were impacted by the introduction of e-invoicing, except for the interviewee representing a German University, who stated that the interview was her first contact with the topic of e-invoicing, even though the University is situated in a state where e-invoicing was already mandatory at the time of the interview. She also did a follow-up with her superiors after the interview and found that they were not aware of the issue. The Austrian experts answered that they were working with an e-invoicing process, but were not using structured data formats, which is in line with the Austrian law.

The communication of the introduction of e-invoicing was rated as insufficient or non-existent by all interviewees, except the expert representing the consultancy for administrations. He described that a cluster-analysis of contacts had been made and that the national government had reached out to suppliers, to brief them on the new processes. The accountant from a German software company explained, that their main customer had indicated the mandatory use of e-invoices for their suppliers in their order documents. They were thus instructed on time, to implement a solution. The tax advisor complained that the communication was mainly done via the publication of laws, which mainly describe what would not be accepted, without giving clear instructions or solutions. The representative of the German e-invoicing association also criticized the differences in the laws on a state and communal level. The controller in a publicly owned company was only aware of the company-internal communication which was to her satisfaction.

Regarding interest groups of e-invoicing processes, the experts listed fiscal authorities, billing and receiving entities, tax advisors, auditors, service providers offering invoicing or document management solutions as well as associations. Especially companies that implement and run web portal solutions for e-invoices were named as a rising group of interest. Companies involved in the physical shipment of invoices were named as the main suffering group of interest. When looking on the introduction of e-invoicing, administrations and publicly owned companies were named as the main interest group, since the receiving side has major potential for savings, when switching to automated invoicing processes. For billing entities, the potential for automatization was considered as far less important. This perspective was opposed by the tax consultant, who stated that most administrations would still print the electronically received invoices and process them manually. This observation was also supported by the expert from the association for e-invoicing.

On the question whether the implementation of e-invoicing would have happened even without government intervention, the answers can be sorted in two groups: on the one hand, the representative of the association for e-invoicing, the consultant for administration processes and the accountant of a publicly owned company did not think, e-invoicing would have been introduced without pressure from the authorities. They supported their viewpoint by the fact, that e-invoicing had not been introduced prior to government intervention and even has not fully been implemented despite the new regulations. On the other hand, the employee of the University and the accountant of the software company agreed that the implementation of e-invoicing processes would have taken place without regulations but would have happened slower. The tax advisor suggested the implementation would have even been quicker if it was not for the confusing government interference. The Austrian interviewees stated that their company had implemented e-invoicing processes before they were mandatory.

Asked about possible challenges that might result from the use of different e-invoicing formats, the experts mentioned the challenge of monitoring several input channels as well as the problems that come from processing different types of incoming invoices. The ability to serve different processes is also named as main difficulty on the billing side. Since in Germany customers can choose the format in which they want to receive invoices, this issue will impact billing entities more heavily. It was stated that this will be especially challenging for small and medium enterprises. The experts also explained that these complications are leading to growing frustration among small companies, that now are at risk of having to transmit their invoices via different channels for each customer. In addition to differences in the transmission channels the experts criticized, that there is enough room for customization within the XRechnung-format, to further complicate a standardized solution on the billing side of the process.

All experts agreed that Germany was rather late regarding the introduction of e-invoicing. However, most experts would have been willing to wait longer if clearer guidelines would have been provided.

When discussing security aspects of the e-invoicing solutions chosen in Germany, the experts agreed that the format was not significantly less secure than other formats. Yet they were apprehensive about the different ways of transmission. Notably the delivery of invoices via e-mail was seen as a security risk. On the plus side the possibility of automated plausibility checks and antivirus software were indicated as a security advantage of invoices using structured data formats.

All experts that processed inbound invoices noticed an increase in efficiency due to the implementation of e-invoicing processes. The billing entities observe an increase in complexity and an aversion to the new technology. It is stated that the advantages and challenges of e-invoicing processes are distributed unevenly between billing and receiving entities: the billing side change its system, train their staff, and needs to serve the different requirements of customers. In advantage would be the decrease of the processing time on the customer side, resulting in faster payments. There would also be the possibility to automate neighboring processes, such as accounting processes. On the receiving side an increase in transparency, reduced processing times and automated plausibility checks were mentioned as positive effects. The representative of the e-invoicing association reported about customers that were able to book 30-50% of their incoming invoices without any manual verification. Especially the use of digitized workflows was mentioned positively. While paper-based invoices cannot be traced in the approval process, their digital counterparts can be tracked at any time. Another beneficial effect of e-invoices is the potential for automated reporting and data analysis. On both sides of the invoicing process, digital processes are an important enabler for remote work and collaboration. Not only is this relevant in pandemic times, but the Austrian experts explained that digitizing their invoicing processes significantly improved their collaboration with their international subsidiaries.

Looking at what defines a optimal invoicing process, the experts highlighted the quality of the results, avoidance of media-breaks, scalability, speed, transparency, and user friendliness. All participants agreed that the benefits of e-invoicing outweigh the downsides. It was however noted that the advantages are mostly found on the side of the receiving entity.

The question whether the stated goals of the introduction of e-invoicing in the EU have been achieved, all experts agreed that the facilitation of controls by the fiscal authorities had been successful. The invoicing solution provider added that an automatic transmission of e-invoices to the fiscal authorities could be a next step. On the achievement of the facilitation of international trade no consensus was reached. While the tax advisor as well as the representative of the association stated that the trade across borders could only profit, if e-invoicing was also mandatory for the B2B sector, other experts thought the goal had already been achieved.

The publication of a practice-oriented guideline was suggested as a possible next step to help users of e-invoicing tools to achieve legal certainty. A big part of why German companies are reluctant to embrace electronic invoices, is according to the experts, the uncertainty, whether their chosen solutions are legally valid. The digitalization of neighboring processes was suggested by the consultant for digitalization in administrations. All experts agreed that rolling out e-invoicing for B2B transactions would also reduce the aversion towards the topic. The provider of e-invoicing solutions explained that e-invoicing for point-of-sales systems would help facilitating the work of tax authorities. He also suggests that laws should not just focus on businesses, making e-invoicing mandatory but to also make it mandatory for providers of invoicing solutions, to make their products compatible with e-invoicing. The assistant at the University suggests to first put the existing rules fully into practice, before coming up with more solutions. The accountant of an IT company suggests a nationwide unified standard and standardized transmission channels. The discussion also included concepts of rewards and punishments to promote the introduction of e-invoicing. One approach was to penalize companies and administrations that do not comply with the legislation on e-invoicing. Another approach that was brought up was to reduce taxes on investments in process digitalization, to make them more attractive. Several experts expressed optimism, that the new German government would emphasize the digitalization of administrations, thereby improving the situation with e-invoicing in Germany.

5. Conclusion and Recommendation

The benefits and challenges of the introduction of e-invoicing are not evenly distributed between the billing and the receiving entities of the process. The receiver of the invoice benefits far more from the introduction. The risks that come with the digitalization of invoicing processes is shared by the receiver and the sender. However, the risk is much higher for the sender since his cash influx relies on a functional invoicing process. In addition, the customer gets to choose the invoicing format and the transmission channels. He therefore does not need to monitor several channels, while the sender potentially must serve several customers with different preferences. Furthermore, the potential for automatization and savings is higher in the processing of invoices received. Since the receiving side mostly consists of administrations it becomes obvious, that the risk has been moved to the private business sector.

Regardless of the challenges and criticism with the solution in Germany, all experts agreed that e-invoicing is an important technology that has the potential to reduce costs, improve the transparency and efficiency of the financial supply chain. One way to make the best of the situation could be, to evaluate the performance of the solutions found in the different federal states and implement the best parts of each solution on a national level.

For future improvement the interviews, the literature research, and the review of the relevant laws, as well as the comparison with the solutions in other countries all point in one direction: more standardization and the introduction of e-invoicing to the B2B sector are vital to achieving the goals set by the EU. Especially an alignment of the rules on a national, federal, and communal level would help to make e-invoicing more accessible. In terms of communication, authorities should try an approach more suitable for businesses. The resulting bettering accessibility would lead to more companies using e-invoicing, thus giving tax authorities more data. After getting the majorities of businesses to digitize their invoicing processes, neighboring processes could be approached.

At the time when the research on this article had been finished, the German association for electronic invoicing joined the European E-Invoicing Service Provider Association (EESPA) as an independent institution, aiming to give Germany more involvement in further legislation efforts, regarding e-invoicing (European E-Invoicing Service Provider Association, 2022). The EU resolution from the 10th of March 2022 supports the introduction of EU-wide invoicing by 2023 and supports tax-payer friendly solutions and takes special note of the challenges of different tax related legislations for Small and Mid-sized Enterprises (SMEs) (European Parliament, 2022).

In this conclusion, there is the willingness and technology in Germany for the implementation of e-invoicing solutions. Now a clear set of guidelines is needed, to make it a reality.

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