Steering the adoption of Standard Business Reporting for cross domain information exchange

Nitesh Bharosa
Delft University of Technology
Delft, The Netherlands
n.bharosa@tudelft.nl

Lars Mosterd
Delft University of Technology
Delft, The Netherlands
L.E.Mosterd@student.tudelft.nl

Frans Hietbrink
Tax and Customs administration
The Netherlands
f_hietbrink@belastingdienst.nl

Ralf van Oosterhout
Thauris
The Hague, The Netherlands
r.vanoosterhout@thauris.nl

ABSTRACT
Over the years, several governments around the world have introduced a version of Standard Business Reporting (SBR) for information exchange with public agencies. Their main goals are to ease the reporting burden for businesses and the regulatory burden for government agencies. This paper takes a look at the adoption numbers in the Netherlands over multiple years. The objective of this paper is to analyse the adoption rates and explain them by revealing the steering instruments employed by government agencies looking to positive-ly influence SBR adoption. Our dataset consists of the total number of reports submitted using SBR towards the Tax Office, Chamber of Commerce and Industry, and the Education Executive Agency. Quantitative data analysis reveals different adoption rates and patterns in the aforementioned reporting chains. We found that adoption was positively influenced using a deliberate and fine-tuned set of steering instruments, including public-private governance, open communication and knowledge exchange, mandation, software community engagement and technical configuration (use of interfaces that match the sector specific reporting capabilities). When considering these steering instruments, policy makers and practitioners need to balance progressive standard setting and steady implementation.

CCS CONCEPTS
• **Social and professional topics** → *Governmental regulations*;

KEYWORDS
Standard Business Reporting, digital infrastructures, adoption, Qualified Information Exchange, XBRL, B2G, G2G, inter-organisational information systems

1 INTRODUCTION
On 6 October 2017 all the European Union Member States and EFTA countries signed the 'eGovernement Declaration' in Tallin. This marks a new political commitment at EU level on significant priorities towards ensuring high quality, user-centric digital public services for citizens and seamless cross-border public services for businesses. One of the commitments listed in the Tallinn declaration is the call to the European Commission to further explore possibilities of Standard Business Reporting (SBR). Increasing regulations and oversight, in combination with shorter reporting timelines, demand digitization of the reporting supply chain. We define SBR as a deliberate and coherent set of standards allowing for the implementation of inter-organizational information systems that enable Qualified Information Exchange, or QIE [19]. QIE refers to information exchange in which several conditions are met based on the principles of effectiveness, implementability and compliance (i.e. legal certainty for those that interact). Examples of such conditions include information exchange based on verified identities, standardized processes for preparing, submitting, accepting and processing data, standardized (preferably structured) data definitions and technical protocols. Enabling QIE, SBR promises many benefits. Ranging from modest (e.g. reduced communication and administration costs, improved accuracy and speed) to transformative (e.g. enabling business process reengineering or supporting industry value chain integration initiatives, automated auditing and continuous control monitoring). Instead of just benefiting a single public agency that requests data from businesses using point-to-point digital exchanges, SBR strives to provide benefits to all kinds of public agencies using a highly standardized inter-organizational information system for digital reporting across societal domains (e.g. financial, fiscal, social, health, housing, education).

The concept of SBR has been around for a while now [3]. Its roots can be traced back to the National Taxonomy project that was launched in 2004 in the Netherlands. To date, several Dutch institutions — including the Tax Authority, the Chamber of Commerce and Industry (CCI), the ministry of Education and the National Statistics Agency — employ SBR as an important approach for system-to-system (s2s) information exchange with businesses. In addition, multiple pilots are being run with SBR. For instance, actors are

experimenting with the use of SBR in the public housing domain. In such cases, the governmental institution acts as the requesting party in the information chain. There is a small yet growing body of knowledge on what SBR is [1, 3, 11, 14]. In comparison, there is more research focused on separate building blocks of SBR, often focusing on the use of the eXtensible Business Reporting Language (XBRL) as a data standard (e.g. [4, 5, 17]). However, few studies discuss the adoption rates of SBR [2, 9]. We did not find work that combines the analysis of adoption rates with the steering instruments employed by public agencies to accelerate adoption, i.e. promote the use of SBR standards for information exchange.

We regard the adoption rates of SBR as the first indicator of its success [15]. Adoption can be seen as the cumulative or aggregate result of a series of individual calculations that weigh the incremental benefits of using SBR against the costs of change (from old to new), often in an environment characterized by uncertainty (as to the future evolution of the technology and its benefits) and by limited information (about both the benefits and costs and even about the very existence of the technology). In most — if not all cases — the use of SBR standards compete with pre-existing standards and systems for information exchange. These can range from the use of paper and post, emails with signed reports in pdf, to more structured data exchanged over secured online channels. The technical bases for such standards have large, although not total, public good content, so that their provision frequently depends upon a combination of industry and government investment. Realizing the full potential of SBR's emerging inter-organizational connectivity requires understanding what positively influences its adoption and diffusion.

The main problem addressed in this paper is the lack of knowledge on the adoption of SBR, as well as the steering instruments used to positively influence adoption. Policy makers and practitioners looking for evidence on the success of SBR, as well as instruments for steering the transformation from pre-existing systems to SBR, will not find much guidance in existing research.

Therefore, the objective of this paper is to contribute to the existing knowledge base on SBR by studying the adoption rates, patterns and underlying steering instruments. The main question in this research is formulated as: *how do the adoption rates and patterns for SBR vary across different information chains and which steering instruments were employed to positively influence adoption?* By studying the adoption of SBR where it was first conceived (in the Netherlands), this paper provides insights and guidelines based on empirical data. As one of the first steps in a broader research agenda for SBR, we start by focusing on the public agencies who open up SBR and its underlying infrastructure as valid electronic channel for information exchange.

This paper proceeds as follows. First, section two describes our research approach. Next, section three provides an overview of the steering instruments found in literature. Section four provides a brief background on the SBR concept and its evolution in the Netherlands. Section five elaborates on the studied information chains that use SBR. Section six presents the results of the quantitative data analysis. Section seven provides the explanation of adoption rates and steering instruments based on interviews. Section eight presents the main conclusion of this paper. Finally, section nine concludes with some avenues for further research.
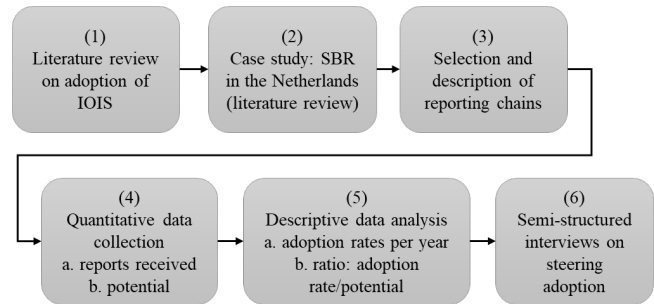

Figure 1: Research approach

2 RESEARCH APPROACH

In order to answer the research question (how does the adoption rates and patterns for SBR look like across different information chains and which steering instruments were employed?) we performed the research steps depicted in Figure 1.

2.1 Step 1 — Literature review

As pointed out in the introduction we conceptualize SBR as an interorganisational information system (IOIS) that is developed and used in a public-private setting. There is a large body of work on the adoption of IOIS. We surveyed the available literature for a shortlist of steering instruments that are commonly used in a public private setting. Our goal is to use the shortlist in the semi-structured interviews with senior representatives of public agencies that employ SBR for information exchange.

2.2 Step 2 — SBR Case study

In step 2 we zoom in on the evolution of SBR as a means for public-private information exchange. In particular we focus on the collective goals for SBR and the governance used to coordinate activities. Literature review sufficed for this step, since publications (e.g. [3]) already provide an in depth understanding of the SBR case. In addition, the Dutch SBR website provides some documents with relevant information.

2.3 Step 3 — Selection of information chains

In order to gain a deeper understanding of the adoption of SBR, we needed to focus on specific information chains (instances of public-private information exchange) in which SBR is used for some time now. We used the following criteria to select information chains:

- Various types of reports (e.g. tax filings, annual reports).
- Diverse sorts of reporting channels: system to system versus human to system (via portals).
- Mix of businesses and institutional reporting agencies, allowing us to study both business to government and government to government reporting.
- Mix of early adopters and early majority [15] organisations that have adopted SBR.
- Mix of public agencies that use SBR for a single information chain (single use) versus multiple information chains (multiple use).
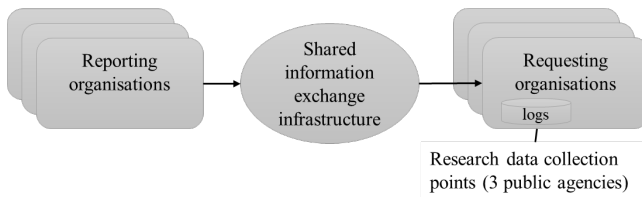
Figure 2: Data collection points

Based on the criteria listed above, we selected three requesting parties to study in depth: the Tax Office (business to government reporting), the Chamber of Commerce and Industry (business to government reporting) and the Education Executive Agency (government to government reporting). Section five presents more details on the information chains associated with these requesting parties.

2.4 Step 4 — Quantitative data collection

In step 4a, we have collected the metadata on the number of messages received by the abovementioned organisations via SBR. As depicted in Figure 2, the research data about the number of messages is collected from the log files at the requesting government agencies (which, in turn, are based on log files at the shared information exchange infrastructure). We obtained the number of successfully delivered reports. Reports that did not meet the SBR (form)specifications or could not be delivered, were rejected and not taken into consideration for analysis. Messages from the requesting party (such as decisions concerning the filed reports) and notifications concerning status information are out of scope for this research. This is out of scope because these messages are sequential to a business-to-government report, meaning that these messages do not exist without reports; hence they are no indicator for adoption. Furthermore, these notifications can be requested and delivered more than once for a single report.

In step 4b we established the potential number of reports that should be submitted in each chain using SBR. The SBR potential is defined as the total number of reports that a requesting agency expects for a specific year. This expectation can be based on multiple factors, including historic factors (e.g. how many reports did we receive last year) and socio-economic factors (e.g. rise in the number of freelancers). Table 2 in section five outlines the potential number of reports in a specific information chain.

2.5 Step 5 — Descriptive data analysis

In step 5 we conducted a descriptive analysis of the data collected. The results are discussed in section six. This descriptive analysis includes both the adoption rate and the (evolution of the) ratio between the numbers of reports submitted versus the potential number of reports — as defined above — over a specific timeframe (i.e. relative adoption). The relative adoption was calculated for each chain within a domain and for the chain as a whole, in every year since SBR has been introduced in a particular chain. Since our data concerning the tax authority only allows to calculate the potential in 2017, aggregated patterns for this domain could not be determined.

2.6 Step 6 — Semi-structured interviews

Finally — in step 6 — semi structured interviews with senior representatives of each of the requesting parties were used in order to discuss the main steering instruments they have employed over the years to promote and accelerate SBR adoption by reporting parties within their domain. Having the opportunity to do so, the interviews were also used to validate the results of the quantitative data analysis. We conducted three semi-structured interviews, one with each requesting party. We asked them to first verify the graphs that resulted from the data analysis. After confirming the numbers in the graphs, we proceeded with questions like: can you explain the adoption trends shown in the graphs? After the respondents gave a first reaction, we discussed the steering mechanisms based on a shortlist of steering instruments obtained from the literature review (result of step 1). The interview results are included in section seven.

3 LITERATURE REVIEW ON IOIS ADOPTION

We agree with Lyytinen & Damsgaard [10] who define IOIS as "information systems used jointly by at least two autonomous organizations to facilitate the creation, storage, transformation and transmission of information across organizational boundaries". It is safe to say that there is large body of work on the adoption of IOS. In particular about the adoption of Electronic Data Interchange (EDI), which refers to the computer-based exchange of standardized business-related information between buyer and supplier firms [6]. Researchers have found that several factors can determine whether or not a technology will be adopted. The list of determinants include factors such as awareness/knowledge availability, perceived cost, benefits, complexity and risks, organizational and technical readiness, organizational slack and size, global scope, regulatory environment, competition intensity, technology readiness, top management support and so on (e.g. [20, 22]). Altough these are all interesting to study in the context of SBR, we intent to study these kinds of determinants in a later stage (see the limitations section for more explanation).

This paper seeks to reveal the steering instruments public agencies used over the years in order to promote the adoption of SBR. From the perspective of the other parties in the information chain (i.e. businesses, intermediaries / service providers and software providers), the steering instruments are perceived as 'external drivers' for SBR adoption. Using Scopus, the following combination of keywords were used to review literature: interorganisational information systems, adoption, EDI, IOS, IOIS, strategies, measures, incentives and steering mechanisms. We examined the literature for steering instruments that were deemed effective. The literature review was performed from October 2017 to December 2017. Table 1 outlines the shortlist distilled from the literature review.

The shortlist is by no means a complete set of possible steering instruments. Our purpose with this list is to provide seed topics in the interviews with senior representatives of three public agencies that employ SBR. The results of the interviews are discussed in section 7.

Table 1: Shortlist of steering instruments found in literature

Steering instruments	Definition and source
Coercive pressure / exertion of power	Power exercised by a dominant organization. Power can be exercised in different ways. This strategy thereby primarily relies on the mechanism of the exertion of bargaining power in terms of sanctions (e.g. passing additional processing costs to an uncooperative business partner) by a more dominant organization onto its less dominant partners [8].
Financial incentives / subsidies	Financial incentives may include direct or indirect subsidies (i.e. investment tax credit) provided by the government for companies to invest in the adoption of a technology or standards [13].
Persuasion	Persuasion refers to "an active attempt to influence people's action or belief by an overt appeal to reason or emotion" [22, p. 7], or "communication intended to influence choice" [22, p. 19].
Policy on standardization (voluntary vs. mandatory)	Governments, especially where large economies of scale are present can choose to mandate some standard(s). Mandation means: to require use, through regulation. Getting from a 'de facto' to a 'de jure' status of standards affects both innovation and technology diffusion [18].
Knowledge exchange (dissemination of the ideas and knowledge underpinning the technology)	Documentation and publishing knowledge about the existence of a new technology, how to apply it, and what the outcomes are in terms usage (processes), potential benefits, risks and costs. Both formal knowledge transfer (for example via courses, conferences presentations and publications) and personalized or informal knowledge transfer (for example through informal discussions and social events) can be promoted [12].
Public-private governance (inclusion of the private sector in the governance).	The implementation and usage public-private IOIS strongly depends upon the coordination of industry and government efforts and investments. For optimal coordination, representatives of all actor groups (i.e. information providers, intermediaries, software providers) can be invited to join the various decision making bodies [7].

4 CASE STUDY: STANDARD BUSINESS REPORTING IN THE NETHERLANDS

For decades, the Dutch government is working on solutions that reduce the administrative burden on business [21]. Starting in 2003, a new ambitious reform project was started with one of the major

goals to reduce the administrative burden. An important aspect of this reform project was to give actual meaning to the widely held intention to make the public sector a better partner for the Dutch (business) society. In 2004 the Dutch government launched the Netherlands Taxonomy Project (NTP), using the relatively new standard XBRL to codify data definitions for tax, statutory and statistics reporting, and facilitate the exchange of reports. NTP realized that the type of information they requested contains similar or identical elements and that standardization required a discussion about the definition of the data they requested.

The other aspect is the technology, where the task was to agree to develop and use a generic and shared information exchange infrastructure. The result — labelled as Digipoort — is now one of the key components of SBR. In 2009, the SBR programme was initiated by four ministries (Interior Affairs, Economic Affairs, Finance and Justice), with public agencies (Tax Administration, Central Bureau of Statistics, Chamber of Commerce and Industry) in a direct role. The program included the instalment of public-private governance councils and working groups. In cooperation with representative bodies of businesses, intermediaries and several ministries, the XBRL standard could now be phased in as the standard for reporting to the government. Right from the start, private sector associations and companies were also involved in the decision-making bodies and the working groups. Different principles were formulated that SBR would have to address on a higher level. First, it should contribute to reducing the administrative burden by means of a close cooperation between government and businesses. Second, usage of SBR should lead to reliable, comparable (financial) data where the possibility to re-use information should stimulate economic growth. In 2014 the SBR Roadmap 2020 has been developed in which the next steps for SBR are formulated, giving direction to the participating parties how to proceed. The vision and goals of the SBR Roadmap are also the key drivers for organising the activities and they fit seamless in the SBR Governance, which is structured into three levels of consultation:

(1) SBR Board: the board is the decision-making body of the Dutch SBR Program. The SBR Board usually meets once every 4-6 months.

(2) SBR Platform: private parties and the government are represented in the Platform. The Platform is the link between the Board and the Expert groups. The primary task of the SBR platform is to coordinate the SBR activities and to ensure that these take place in proper context. The SBR Platform meets every month.

(3) SBR Expert groups: experts from the private and public domain take place in different Expert Groups and advise on the aspects that affect the SBR Program, such as data harmonization, legal developments, regulator rollout and international developments.

This governance model ensures that all parties have a say and that the necessary investments are shared 'fairly', just as the social benefits. This creates buy-in and trust. More than 100 companies and organisations have signed a covenant to adopt SBR as the communication standard of choice and contribute to further development of SBR. Over the past 6 years, several government agencies like the Tax Administration, the CCI and the Central Bureau of

Statistics (Statistics Netherlands) have standardised and harmonized their data definitions, processes and systems to get ready for receiving and sending SBR messages. Increased adoption of SBR standards should enable organisations to capture numerous benefits. For example, due to data quality improvement, regulators can manage their data definitions better and can react quicker to incoming business information (thanks to automated back end processing). Network effects as a result from a standardized installed base (i.e. SBR ready system of software, processes, databases, interfaces) at reporting parties as well as requesting parties, in turn, will prompt software providers to develop shared utilities as modular services that allow for multiple applications, thus setting the standard higher and higher, both in aggregation and quality levels. Finally, when designing new reporting chains, parties can develop desired data specifications based on information that is already being recorded in other chains (i.e. data reuse). The Dutch implementation of SBR includes the use of a shared service centre that provides a set of connection, change management and operational services. The benefits that come from the use of a shared infrastructure (Digipoort) and a shared service centre (i.e. specialisation and economies of scale) are an option first and mainly for governments, and benefits are especially evident when public agencies pursue a coherent (uniform) e-government strategy.

Today, SBR accommodates the exchange and processing of tax filings and financial reports on a large scale in the Netherlands. More than 16 million reports are submitted yearly using SBR, and the number is growing (note: the total number is approximately 34 million when including the number of return messages/notifications and authorization requests). The growth expectations — both in terms of number of information chains that use SBR and the number of messages exchanged via SBR — are high. These expectations are captured in the SBR 2020 Roadmap [16].

5 DESCRIPTION OF THE STUDIED INFORMATION CHAINS

For the studied information chains, the usage of SBR is correlated with the potential of the chain to be able to express the adoption both as an absolute and a relative number. The SBR potential is defined as the total number of reports that a requesting agency expects for a specific year. This expectation can be based on multiple factors, including historic factors (e.g. how many reports did we receive last year) and socio-economic factors (e.g. rise in the number of freelancers). Table 2 outlines the potential number of reports in a specific information chain, together with the absolute figures.

An important remark is that this expectation can include reports received via SBR and via other channels. It is useful to make such a distinction since the presence of other channels is a variable influencing the adoption. Many reporting agencies follow a multi-channel strategy, allowing for the use of various paper based and digital channels for information exchange. Besides, the potential within a chain will also change when the number of companies with reporting obligation changes (e.g. through mergers, economic growth, changing regulations or bankruptcies).

It should be noted that this is a narrow definition of the SBR potential. On a higher abstraction level, one could also define SBR adoption related to the number of reporting chains. From that

Table 2: Potential of using SBR for information exchange

Requesting party and channel	Type of report that needs to be filed / submitted	Potential (# of reports expected by requesting party in 2017)	Received via SBR in 2017
Tax office: system to system only	VAT (Value Added Tax) Return Form	8.744.375	3.521.190 (40,3%)
	Sup-VAT (supplementary filing of VAT)	356.735	166.914 (46,8%)
	Allowances	3.836.556	1.015.946 (26,5%)
	Wages Tax	7.849.568	7.404.679 (94,3%)
	CIT (filing of Corporate Income Tax Return Form)	742.193	640.011 (86,2%)
	IT (filing of Income Tax Return Form)	13.126.965	3.743.672 (28,5%)
	PR-CIT (Provisional (assessment) Tax Return Form Corporate Income Tax)	135.585	114.200 (84,2%)
	PR-IT (Provisional (assessment) Tax Return Form Income Tax)	1.000.035	300.363 (30,0%)
	Extension request (requesting the extend of period filing)	1.323.347	895.217 (67,6%)
ICT (filing of Intra Communautary Transactions)	807.861	315.058 (39,0%)	
CCI system to system & portal	Annual report	864.702	672.029 (77,7%)
Education Executive Agency (portal only)	Annual report with audit report	1.762	1.747 (99,1%)

perspective, adoption can be seen as the number of reporting chains in which SBR is applied, relative to the total number of reporting chains the requesting party has, weighed by the number of messages expected in each chain. Though it might be interesting to go into this subject, this would require far different data and should account for many moderating variables.

5.1 Tax Reporting

In terms of Rogers' theory on diffusion of innovation[15], the Tax Office can be seen as both an innovator and early adopter for SBR. Table 2 provides an overview of tax information chains that employs SBR. The reports outlined in the table do not represent all the information flows to the Tax Office; there are also chains that don't make use of SBR or the shared information exchange infrastructure. For the reporting types that apply SBR, the potential is defined as the number of reports to be expected in the chains on a yearly basis. This expectation is based on calculations made by the Tax Authority. In other cases, it is based on hands-on experience and the number of reports in previous years. This is for example the case in the chain concerning the extension requests; this number cannot be estimated by only considering the total number of companies since there is no obligation or general need for extension requests. In addition, consolidation also plays a role here: fiscal units can file data for either Corporate Income Tax or Value Added Tax. Besides, not every organisation has cross-border transactions (filing of Intra Communautary Transactions) or the need to change a provisional assessment. Most businesses often file tax reports via one of the 17.000 intermediaries.

5.2 Annual reporting to the Chamber of Commerce and Industry

Except for freelancers, all legal entities in the Netherlands must submit their annual statements to the Chamber of Commerce and Industry (CCI). For an increasing number of organisations, it has become mandatory to submit the annual reports digitally via SBR. CGI mandates the use of SBR based on three categories. Companies in category 'micro and small' must use SBR starting 2017, reporting for the financial year 2016. The required data set (number of data elements in XBRL) is smaller than for medium and large businesses. Businesses in the category 'medium size' must use SBR starting 2018, reporting for the financial year 2017. While there is no explicit mandation date for businesses in the category 'large' CGI expect that large businesses must use SBR starting 2020. Most businesses often submit their annual reports via one of the 17.000 intermediaries.

When defining the potential, the sum of all obliged legal entities has to be corrected for holding companies that comprise multiple legal entities, as these entities can (but not necessarily) deposit as one entity. Since there are no statistics on the ratio of entities to consolidated annual account, we cannot accurately define the total potential of annual accounts to be filed yearly. Furthermore, not all entities who are obliged to deposit their annual account do so. We therefore use a proxy as potential: the yearly total of annual accounts received by the CCI, via all available channels. Taking this proxy as potential, it is possible to describe relative adoption,

the adoption of SBR in relation to other channels and the total of received reports.

5.3 Educational reporting

One of the examples of use of SBR is the accountability of the educational institutions in the Netherlands to the Education Executive Agency and the Education Inspectorate. Every year, approx. 28 billion euro from the State budget is spent on education. Schools finance their educational programs with it. So far, the accountability of this large amount of money came with paper reports. That was a huge manual process for the Education Executive Agency, because schools differed in the way they built up their annual report. The Education Executive Agency must therefore spend much time looking into and comparing the paper reports, and sometimes the very things they would like to have, were not in the reports. Schools and the Education Executive Agency shared the opinion that the whole process could be done in a smarter way. It started with agreeing on what actually should be in an annual report. Hence the move to SBR was easy, as a taxonomy had already been developed. The Education Executive Agency together with the school elaborated on this taxonomy to prepare it for the educational sector. The result was that an originally cumbersome process was standardized using SBR, digitized and enhanced. A smooth digital accountability process emerged that meets the requirements that the government has agreed upon with private parties. The potential for the educational reporting domain can be determined based on the number of supervisory boards. Multiple primary and secondary schools can fall under the supervision of a board, which reports to the ministry of education on their behalf. All other educational instances usually have their own, separate license and are therefore obliged to independently report to the Education Executive Agency. Only the boards that receive a monetary contribution from the ministry are obliged to report.

6 DATA ANALYSIS RESULTS

The results of the quantitative data analyses are presented per public agency. Section 7 provides an explanation of the adoption rates and steering instruments based on interviews.

6.1 Tax reporting — description of data analysis

The tax domain consists of multiple reporting chains that employ SBR. Figure 3 shows the number of business reports submitted to the Tax Office using SBR.

The most notable difference between these chains is the size; in the smallest chain less than 50 reports are submitted each year, in the biggest chain over 6 million. To ease the task of visually comparing the patterns, the three largest chains are omitted in Figure 4. From this, a few different adoption patterns can be distilled. Section 7 deals with the identification and explanation of these patterns.

6.2 Chamber of Commerce and Industry — description of data analysis

For the adoption regarding the CCI, three observations can be made. First, there is a steadily growing number of annual accounts received via SBR, both absolute and relative to the total number
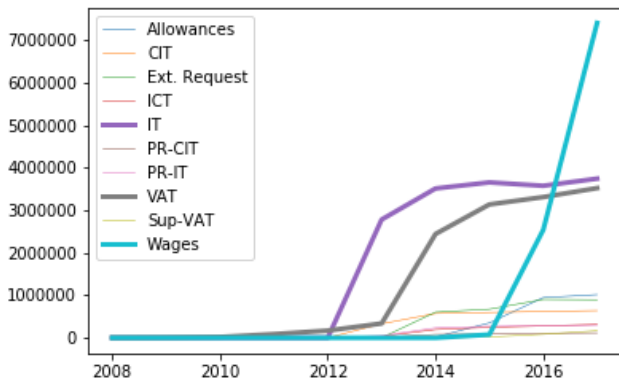
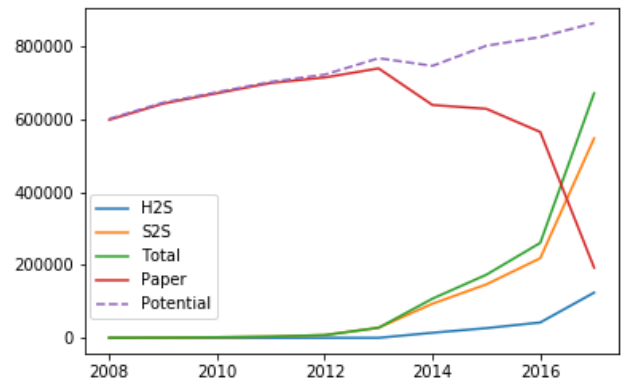**Figure 3: Total number of business reports submitted to the tax office using SBR**

Figure 5: Total number of annual reports submitted to the Chamber of Commerce
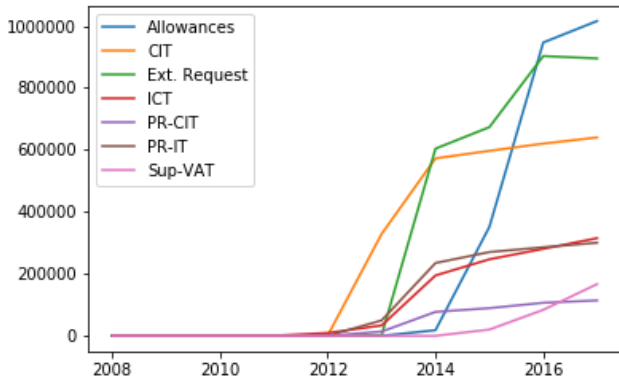

Figure 4: Total number of business reports submitted to the tax office using SBR (zoomed-in version of Figure 3)
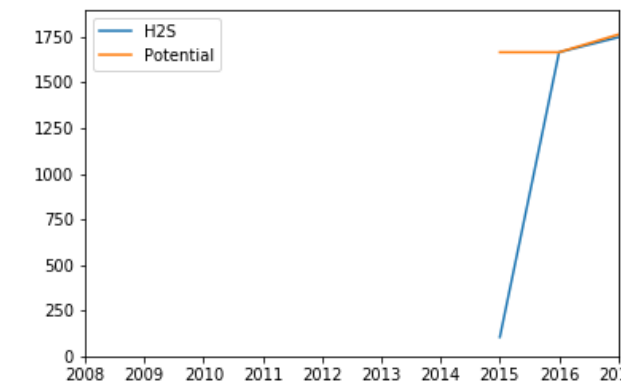

Figure 6: Total number of annual reports submitted to the Executive Education Agency

of received annual accounts. This can be seen in Figure 5. From 27K on a total of 723K in 2012 (3.5%) to 672K on a total of 864K in 2017 (77.7%). Second, the absolute growth accelerates in 2016 and 2017. At the same time, a decrease in paper reports occurs. Third, in comparison with the adoption patterns in the tax domain, the adoption rate is slower.

6.3 Educational Reporting — description of data analysis

The most notable aspect of the adoption pattern for educational reporting (Figure 6) is the speed of adoption; from 0 to full adoption (ratio 1) in just two years. This is a lot faster in comparison with previously discussed domains, where there is still no full adoption in any of the chains. Possible causes for these differences will be discussed in section 7. Another notable difference is related to the size of the reporting chain, the potential in this domain is substantially smaller in comparison to the other domains (around 1700 reporting parties in 2017). There is no possibility for system-to-system exchange in this domain, all reports are filed using a portal. It should be noted that the potential in 2014 and 2015 is based on an estimation.

7 EXPLANATION OF ADOPTION RATES AND STEERING INSTRUMENTS BASED ON INTERVIEWS

7.1 Taxes — explanation of general policy

The interview with a senior representative of the Tax Office reveals that this organisation proactively promotes the use of digital exchange channels (electronic filing) in general, and SBR in particular. The Tax Office is the biggest investor in SBR and plays an important role it the governance of SBR. They promote an open, public-private governance structure where private sector associations and businesses are involved in the decision-making bodies and the working groups and were knowledge is shared as much as possible and made publicly available. In this way, joint action is possible, and market-interest can be appraised properly. Furthermore, they indicated that it is important that all parties must support the rationale of the (mandatory) program and at least have a reasonable belief that it's possible. In this sense, 'mandatory' programs are used as a decisive push if 'everything else is agreed upon'. These obligations must fit within a total framework of a customer-oriented treatment. The Tax Office wants to create an environment in which there is a

collective sense of responsibility and were profits are distributed equally. Where possible, 'sales' should be left to the market. In this respect, it is also necessary to get software providers on board as soon as possible, since they implement the SBR standards for businesses and intermediaries.

An important remark is that steering for standardization without constant monitoring and modification is bound to fail. It is important to pick up on the signals of the other actors confronted with decisions regarding SBR. The tax office also acknowledges that pioneering can take several years and that it is important to keep it simple; it is already big enough. Given this general policy on steering adoption, individual adoption patterns will be explained below by the requesting party.

7.2 Tax reporting — explanation of the adoption patterns found

The IT- and CIT- tax are the first chains that were subject to mandation. This explains why these chains are the first to experience a swift increase in filed reports in 2012/2013. Although these reports are relatively complex, the number of software service providers was limited, causing that technical support could be tailored to their needs. In the regular interaction between businesses and the Tax Office, an IT/CIT report is regularly preceded by a provisional IT/CIT report. So when the IT/CIT became mandated via SBR (in 2013 regarding fiscal year 2012), PR-IT/PR-CIT was the next logical step to introduce in 2013 and mandated (regarding fiscal year 2014), which led to an increase in these reports in 2013/2014. Just like PR-IT and PR-CIT, extension requests are additional interactions to IT/CIT tax return filings. This made EXT request the next logical step to introduce (in 2013 regarding fiscal year 2012) and mandate (2014 regarding fiscal year 2013).

It took a while for the voluntary introduction of VAT to reach a substantial number of reports, following a run-up with innovative parties starting as early as 2008. The Tax office chose to mandate VAT a year later than IT/CIT. This might seem odd, since the report is technically relative simple in its syntax and interface. Yet, the Tax Office chose to start with the small group of IT/CIT software developers. After some lessons learned with the introduction of IT/CIT, the Tax Office introduced additional group support and documentation for the larger number of VAT software service providers, which supported the adoption. Supplementation VAT (Sup-VAT) is an additional interaction to the VAT report. It became operational in 2015, which explains why its growth appears later in time.

The allowances chain became operational in late 2014 and grew quickly in 2015 and 2016. Wage taxes were introduced to SBR in 2015 and mandated almost directly, which caused a rapid growth in the number of reports. The Tax Office was able to handle this strategy because wage taxes were exchanged in XML via BAPI, referring to IOIS used prior to SBR. As the XML specifications for wage taxes were not changed, the switch to SBR was therefore only a change in channel, referring to the system-to-system interface for intermediaries and software developers.

A time gap can be observed in 2014 in between the growth curves of Sup-VAT and allowances. This can be explained by the fact that the Tax Office introduced return messages to SBR in 2013/2014, which also required the introduction of a system for authorized

representatives, i.e. enabling authorised intermediaries to retrieve return messages on behalf of their clients. These return messages are delivered to reporting parties in XBRL-format, which was a big change for businesses as they were used to receiving these messages in EDI-format. After the introduction of return messages, the Tax Office introduced messages for pre-filled IT. These were the final large scale information chains for the Tax Office to introduce to SBR. Implementations in later years focus on tax types with smaller numbers of parties and reports such as inheritance-, gift- and dividend tax.

An important addition to the pattern description is the explanation for the (seeming) S-curve that can be found in most chains. The flattening part of the S-curve following the steep growth, is not caused by 'lagging' reporting parties. It is the accumulation of reports from former fiscal years, as mandation is always based on a fiscal year. So, when a certain tax is being mandated, it is mandated for the most recent fiscal year onwards. In the following years, reporting will concern the most recent fiscal year and prior fiscal years up until the mandated fiscal year. The most recent fiscal year is the largest in terms of reports, and less reports are being filed the further the fiscal year has passed. Hence, when this accumulates over time, the number of reports via SBR gradually rises, stemming from the same reporting parties that file changed reports over multiple years besides the most recent year. This mechanism explains why most adoption patterns have an S-curve shape (VAT, ICT, PR-IT and PR-CIT) or display the first part of the S-curve and are expected to show the same pattern in time (Sub-VAT, allowances and Wages tax).

Next to these 'apparent' S-curve growth patterns, a logarithmically shaped growth pattern is found for the CIT and IT chains. The number of reports submitted in these chains grow very fast in the beginning (linear) and after some time, the growth decays. This differs from the S-curve patterns in the sense that mandation coincides with the first possibility to submit via SBR. Therefore, no parties start submitting via SBR as anticipation to the upcoming mandation, which is the case for the apparent S-curve growth patterns described above. For the Extension request chain, the data does not reveal a clear pattern. After a period of linear growth (caused by mandation), the number of reports submitted changes irregularly on a yearly basis. This can be expected since an extension request is not a mandatory type of report.

7.3 Chamber of Commerce and Industry

Next to the Tax Office, CCI is the largest adopter of SBR in terms of message volume. Similar to the Tax Office, CCI strategy on information exchange is electronic filing, as much as possible. Adoption in the years prior to mandation is based on convenience and customization by reporting parties who preferred SBR over paper. The steep increase of filed reports through SBR in 2017 coincides with the mandation of SBR as the channel for filing annual accounts for micro- and small enterprises (which is the largest portion of filed accounts) in 2017, regarding the fiscal year 2016. In December 2017, 97% of the annual accounts where received via SBR. With the mandation for medium enterprises in 2018, perhaps followed by large enterprises, the adoption is expected to reach almost the full potential in the coming year. After this point, it is likely that

changes in the number of reports submitted via SBR are caused by the increasing amount of companies, not related to the implementation of SBR (since it will be the only possible way of depositing by then).

Compared to the Tax Office, CCI mandated the use of SBR only in a later stage (starting in 2017 over the 2016 reporting year), explaining the slower adoption in comparison with other domains. Figure 5 shows that mandation is an effective steering instrument. Other important steering instruments are promotional activities, proactive marketing and the provision of information. CCI put significant effort in promoting SBR and informing reporting parties, which led to a slow yet constant increase in voluntary adoption (22% in 2015). However, the mandation for micro- and small sized enterprises is the largest attribute for the substantial adoption of SBR (77% in 2017). On the CCI side, data quality has improved, although just slightly. From a CCI perspective, more needs to be done with it comes to communicating benefits. The benefits of using SBR should be underlined as much as possible in all communication. Benefits include easier, quicker filing for businesses, cut cost / save time, rapid publication = rapid business insights. Overall, CCI is satisfied with the use of SBR.

7.4   Educational reporting

Similar to the previous two agencies, the Education Executive Agency also follows the digital first strategy, striving to maximize digital information exchange. Compared to the others, the Education Executive Agency is the only public agency that has reached 100% adoption of the H2S portal for SBR. However, it's important to note here that the portal is the exclusive reporting option, in contrast to the case of the Tax Office and CCI.

Thanks to SBR, data quality has improved considerably. This applies to the data itself and in particular to the internal consistency that has been optimized with the help of business rules. During the introduction of SBR in the educational domain, The Education Executive Agency invested considerable effort in promotion and alignment with reporting parties and software developers. The possible options for introduction of SBR and XBRL were considered in working groups with the Education Executive Agency. Carefully selected sector representatives, face to face communication, clearly defined procedures and direct feedback when parties encountered problems provided a useful working relation. These working groups brought to light that the Education Executive Agency preferred a S2S solution, yet software providers were not able and willing to support this option. A compromise was then found to introduce SBR via a H2S portal. The intensive preparation, dialogue and the willingness to take the preference of partners serious, created both support and preparedness for the introduction. So, when SBR was mandated in 2016, all reporting parties were capable of using SBR and did so. Contributing to this success might be the fact that the introduction of SBR in this domain is some eight years after the introduction of SBR in the other domains. This meant that the Education Executive Agency entered SBR when the governance was fully developed and could take the lessons learned by others to heart. Future measures are aimed at expanding the scope of SBR in the domain and on communicating the benefits of SBR for reporting parties.

8   CONCLUSION

In this research, adoption rates and patterns for Standard Business Reporting (SBR) in the Netherlands were studied together with the steering instruments that were used to accelerate adoption. The adoption of SBR is an ongoing process from 2004 onwards. While the evolution from idea to implementations was a rather slow process, the adoption of the concept has increased substantially over the past few years. The results of the quantitative data analysis show that over the past years, the number of reports exchanged via SBR has increased substantially in each of the domains considered in this study — both relative to potential and absolute. The public agencies that employ SBR all follow the digital first strategy, striving to maximize digital information exchange. Compared to the CCI, the chains in the tax and educational domain display a faster growth towards the full potential for electronic filing. Since SBR cannot produce any positive outcome unless it is widely adopted and used, more benefits of this approach are expected in concurrency with the increased adoption.

However, SBR adoption does not happen by itself and competes with pre-existing systems and business models. The use of SBR affects not only the back office of the public agencies that employ it, it also affects businesses, intermediaries and software providers, on a business and technical level. Intermediaries providing governmental reporting services have to adapt their software to the SBR process as well as adapting the way they advise companies. Steering is required when you want SBR adoption. Drawing on the shortlist of steering instruments found in theories of innovation diffusion, information technology adoption, and persuasion, the interviews with senior public agency representatives reveal that proactive steering was needed to realize the high levels of adoption. Steering instruments included policy on standardisation (from voluntary to mandatory), governance (inclusion, consultation, joint planning), communication, knowledge exchange and technical configuration (matching channel with domain characteristics). Moreover, it is essential to get software providers on board as soon as possible because they are the ones that implement the SBR standards for businesses and intermediaries. An important side note is that steering for standardization without constant monitoring and modification is bound to fail. It is important to pick up on the signals of the other actors confronted with decisions regarding SBR. Finally, mandation has proven to be the most effective steering instrument. A high increase in the adoption rate correlates with mandation in the year under review or the years directly preceding the mandation. Nonetheless, public agencies consider mandation as a final stage steering instrument only to be used after effective governance. Thus, we can consistently say that mandation — preluded by effective governance — is a strong predictor for SBR adoption.

While there is a growing body of knowledge on what SBR is, few studies discuss its adoption and evolution over a longer time span. This paper contributes to the existing SBR knowledge base by revealing how the adoption of SBR in the Netherlands has progressed over the years. Another contribution lies in the explanation of how three public agencies have steered the adoption of SBR. Even though we have a limited scope (SBR in the Netherlands), the data supports the notion that deliberate steering by policy makers is effective in accelerating adoption. Policy makers and practitioners

looking to implement some form of SBR, can draw on the steering instruments presented in this paper. Finally, this paper contributes to the recurring debate on whether or not public-private programs like SBR can be deemed as 'successful'. While there are several indicators for success, from the adoption data and interviews can be concluded that participating public agencies are satisfied with the results and want to proceed with SBR. Nonetheless, as discussed in section 9, more research is needed to claim success.

9 LIMITATIONS AND FURTHER RESEARCH

This research has at least four limitations, all of which signalling opportunities for further research. First, this paper looks at a single case study on SBR — the case in the Netherlands. Other countries such as Australia and New Zeeland have explicit and mature SBR programmes. While not using the SBR label, a larger number of countries have some form of standardization in public-private or cross domain information exchange looking to achieve the same goals as SBR. Future research can attempt to tap in on the adoption numbers in other countries, allowing for the generalization of steering mechanism on a cross country level.

A second opportunity for further research is related to the scoping of information chains. Our scope was to analyse the adoption of SBR in the information flows to three public agencies. Future research can also consider information flows to other adopters of SBR (for instance, to the national office of statistics) and perhaps include the adoption of SBR in the private sector (for instance, to banks). Especially in cases in which there is private sector use of SBR can reveal a broader spectrum of steering instruments.

Third, we only included SBR adopters in this study. We did not survey or interview the non-adopters. The non-adaptors can be defined as public agencies that know about SBR and understand that it might be useful (i.e. how it could work) for their information chain(s), but have decided not to adopt SBR or are still in the decision-making process. Collecting data from the non-adopters may reveal a broader spectrum of blocking issues or factors that render a negative business case for the adoption of SBR.

Finally, and perhaps most important, this study only focuses on adoption from the perspective of the public agencies (the information requesters). Consistent with our narrow definition of adopters (public agencies who open up SBR and the underlying infrastructure as valid electronic channel for information exchange) only public agencies were interviewed. We did not survey or interview other parties in the information chains such as businesses, intermediaries and software vendors that voluntarily use SBR or were obliged to work with structured data formats and submit data via digital channels (systems to system or via portals). Further research should also take the side of the information providers, intermediaries and service provider (software vendor) into account: when did they decide to support information exchange via SBR and why? Here lies the opportunity to research the determinants of adoption, such as awareness/knowledge availability, perceived cost, benefits, complexity and risks, organizational and technical readiness, organizational slack and size, external pressures, top management support and so on. Moreover, including this group in the study may reveal other possibilities or use cases for SBR in general or a specific standard in particular.

Acknowledging these limitations as deliberate choices within a broader research agenda for SBR, the authors will continue to pursue the stated research opportunities and welcome collaboration.

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