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REDUCING BARRIERS IN CROSS-BORDER E-COMMERCE THROUGH AN AUTOMATED VAT DECLARATION SYSTEM

Master's Thesis

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Author’s declaration

I hereby confirm that I am the sole author of this thesis and this thesis has not been presented for examination or submitted for defence anywhere else. All used materials, references to the literature and work of others have been cited.

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Abstract

While cross-border e-commerce aims at efficiency and speed, the area still faces problems that make crossing borders slow and administratively burdensome. The current thesis looks into the problems cited by companies, tax boards, customers and other relevant stakeholders in VAT declarations in cross-border e-commerce and aims to solve them through creating an automated VAT declaration system in cooperation with multinational e-commerce platforms and aimed at non-EU SMEs. The paper defines the problems in today's system through analysing EU documents and interviews conducted with relevant stakeholders, and looks into the new legal VAT reform that will enable companies to declare their VAT in only one chosen EU Member State. Through following the characteristics of good service design and utilizing methods such as AOM and BPMN, the thesis develops a framework and recommendations for the creation of an automated VAT One-Stop-Shop System.

The thesis is in English and contains 84 pages of text, 8 chapters, 13 figures, 9 tables.

Annotatsioon

Kuigi piiriüleses e-kaubanduses on viimastel aastatel kasutusele võetud erinevaid tehnoloogilisi arendusi, mis suurendavad kaupade liikumise kiirust ja tõhusust, seisavad mitmed osapooled tänaseni vastakuti erinevate probleemidega. Ettevõtete poolt enim välja toodud probleem on seejuures piiride ületamine ja sellega kaasnevad administratiivsed kohustused, eelkõige käibemaksu deklareerimise osas. Käesolev magistritöö analüüsib probleeme piiriüleses e-kaubanduses ja käibemaksu süsteemis läbi ettevõtete, klientide, maksuametite ja teiste oluliste osapoolte perspektiivi ning üritab neid lahendada läbi automatiseeritud käibemaksudeklaratsioonisüsteemi loomise.

Defineerides probleemid tänase piiriülese e-kaubanduse käibemaksusüsteemis läbi Euroopa Liidu dokumentide ja läbiviidud intervjuude analüüsimise, annab käesolev töö ülevaate uuest e-kaubanduse käibemaksu reformist, mis võimaldab e-kaubandusega tegelevatel ettevõtetel alates 2021. aastast deklareerida enda kogu Euroopa Liidu tehingute käibemaks vaid ühes valitud liikmesriigis (nii-öelda *VAT one-stop-shop'is*). Kuna uue käibemaksusüsteemiga kaasnevad ka suurenenud kohustused kolmandate riikide ettevõtetele ja rahvusvahelistele e-kaubandusplatvormidele, tekib aga 2021. aastast veelgi suurem vajadus automatiseeritud süsteemi järgi, mis oleks võimeline tagama maksukohustuste järgimise läbi protsesside lihtsustamise ja 'nähtamatu maksustamise' ning mis tagaks kiire ja tõhusa kauba liikumise.

Järgides hea teenuse ja süsteemi omadusi ja viimaseid arenguid avalike teenuste arendamises, kasutab autor agentorienteeritud modelleerimist ja äriprotsesside modelleerimist, et töötada välja raamistik ja soovitused uue automatiseeritud käibemaksudeklaratsioonisüsteemi (automatiseeritud *VAT one-stop-shop*) loomiseks, mis oleks lihtne, tõhus, kiire, paindlik, usaldusväärne ja turvaline ning muudaks piiride ületamise e-kaubanduses lihtsamaks. Magistritöös esitatud mudelid ja soovitused on heaks hüppelauaks töötamaks välja süsteem Eesti Maksu- ja Tolliameti ja rahvusvaheliste e-kaubandusplatvormide vahel toomaks kasu kõigile osapooltele piiriüleses e-kaubanduses ning ka Eesti riigile endale läbi suurenenud raha- ja kaubavoogude ning investeeringute.

Lõputöö on kirjutatud inglise keeles ja sisaldab teksti 84 leheküljel, 8 peatükki, 13 Figuret, 9 tabelit.

List of abbreviations and terms

AOM	agent-oriented modelling
BPMN	business process model and notation
EC	European Commission
EMTA	Eesti Maksu- ja Tolliamet (Estonian Tax and Customs Board)
EU	European Union
eWTP	Electronic World Trade Platform
MOSS	mini one-stop-shop
NPG	new public governance
NPM	new public management
OECD	The Organisation for Economic Co-operation and Development
OSS	one-stop-shop
SME	small and medium-sized enterprises
VAT	value added tax

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1. Introduction

Recent decades have witnessed a rapid growth in cross-border e-commerce and its popularity. Nevertheless, despite the numerous technological advancements applied in the area, there are still several problems that neither companies nor governments haven't managed to tackle. One of the biggest problems cited by companies, tax boards and other relevant stakeholders concerns value added tax applied to e-commerce consignments while crossing the borders (European Commission 2016). Companies are struggling with the high administrative costs of declaring VAT (European Commission 2017) and customers are struggling with the unexpected costs on delivery (European Commission/Deloitte 2015). Moreover, the current system fails to deliver the main goal of tax administration cited by scholars for decades – tax compliance (Reinganum and Wilde 1985, Feld and Frey 2007, Langham and Paulsen 2017). The system has instead resulted in low tax compliance, lack of control and high rates of fraud (European Commission 2015).

While the legal development on the European Union level are catching up with the developments in cross-border e-commerce and the problems cited by different stakeholders are being taken into account, the European Commission has announced a legal VAT reform that aims to react to those problems, increase tax compliance and make certain procedures easier for companies selling via cross-border e-commerce (European Commission 2017). The new regulation going into force in 2021 creates a VAT one-stop-shop (OSS) system for cross-border e-commerce, which means that companies selling cross-border can start declaring all of their VAT in one Member State, which will then distribute the taxes between the Member States where the products were actually sold to.

While the new legal VAT reform comes with simplifications, it also comes with complications that create a need for a system that would address the new emerging shortcomings trough good service design and taking advantage of the newest technologies. The following thesis aims to respond to this need through developing a framework for an automated VAT declaration system that could be implemented by the Estonian Tax and Customs Board in cooperation with multinational e-commerce platforms (e.g. Alibaba) and aimed at non-EU small and medium-sized companies (SMEs) selling through cross-border e-commerce to Europe.

The goal of this thesis is to deliver a framework for an automated VAT one-stop-shop through creating a set of models that describe the goals, requirements, roles and the whole process of the new system. Through analysing the best practices in the field and defining the key

characteristics of a good service in tax administration and e-commerce, the thesis aims to create a simple and efficient system aiming at the goal of invisible taxation (Langham and Paulsen 2017, OECD 2014, OECD 2016). In order to develop such a system, an understanding of the problems in the current system and in the new legal environment will be developed through analysing existing resources and interviews conducted with stakeholders through content analysis. With the final VAT declaration system being complex in its nature and involving different social and technical aspects, agent-oriented modelling together with business process model notation will be used to deliver a framework for an agile system able to react to changes in the sociotechnical environment (Sterling and Taveter 2009).

The following thesis consists of six important parts. After the initial introduction to the thesis, an overview of the theoretical and conceptual background of the thesis will be given. This will be followed by an analysis of the current state in literature. Subsequently, based on the current situation in both research and business, the problem and the research questions of the thesis will be presented. This will be followed by an overview of the methodological aspects of this thesis. The sixth chapter explains the current situation in cross-border e-commerce VAT declarations through analysing existing sources and interviews done with several stakeholders and concludes with a list of problems perceived in terms of the current system. The final analytic chapter looks into the legal VAT reform taken on by the European Union and analyses the opportunities and problems that are related to the new legal system. It then gives an overview of the proposal for a new automated VAT OSS system through defining the benefits and requirements of the system and developing a framework for developing the system. The thesis concludes with a summary and suggestions for future research.

2. Theoretical Framework

The following chapter will explain the theoretical and conceptual framework of the paper by looking into the field of public e-services, their characteristics and into how to design good e-services both in general and in the field of e-commerce and tax administration. By giving an overview of the field of public administration and e-service innovation, the chapter will explain the relevant concepts and explain what are the key characteristics and trends that need to be followed to develop a good service.

2.1. Public e-service definitions

Public electronic services are often discussed in academic literature, but nevertheless, there is still no unified definition of the term that all academics would agree on. There are several related terms used as synonyms, such as e-government service (Jansen, de Vries ja van Schaik 2010), e-service (Kaisara ja Pather 2011), e-public-service (Lenk 2002) etc., but since the authors uses the terms without defining them in a comprehensive way, there is no certainty that those terms all refer to the same meaning. In order to understand the whole concept, it is important to look into the three important terms that are included in the concept – service, public and electronic.

Service is a term that has many different definitions in academic literature. Despite the differences, there are still certain characteristics that most of the definitions share. Lehtinen (1984) has defined service as a "benefit providing object of transaction that is more or less an abstract activity or process of activities essentially produced, marketed and consumed in simultaneous interaction". The keywords that stand out are abstract, benefit and interaction, which are elements that seem to prevail also in other more recent definitions (Lovelock and Wirtz 2011, Gronroos 2007).

With services being abstract in their nature and involving interaction between two different sides, there are also other characteristics that explain service nature. Järvinen and Lehtinen (2015) point out that services have process nature and can be also characterized as being heterogeneous and perishable. Zhang (2017, 21) on the other hand points out that the crucial elements of a service are value-creation and satisfaction of externalized needs. Through the different definitions one can conclude that a service is an intangible and abstract activity that involves at least two parties, provides benefit/value and satisfies one's externalized needs.

While services can be provided and consumed in interaction between different stakeholders, the term public service indicates that the service is provided by the public sector to the general public in the public interest and aims to develop public value (European Commission 2013, 2). Zhang (2017, 29) claims that providing public services involves two different tasks – determining public needs and determining how to satisfy them. That means that the governments have a difficult task of figuring out ways on how to determine what exactly does the public need and what would be the best way to provide services.

Public administration and the views on how to develop and provide public services have been evolving over the years with the emergence of new paradigms. Therefore, traditional public administration that assumed citizens to be passive clients and that focused on the state and its needs was soon replaced with the views of New Public Management (NPM) and afterwards with New Public Governance (NPG). While the first refers to drawing practices from the private sector to make public services better, then NPG is based on collaboration, multi-stakeholder governance and involving the third sector in public service development (Maciuliene 2018, 25).

With the environment around the governments changing rapidly and new paradigms approaching, another concept has arisen – public e-service. Although using information technology in improving public services has its roots back in the 1950s, the aim of doing it back then was to support governments in handling big data sets (Carter, Schaupp and Moore 2016, 2892). Today, ICT is used for different purposes in public administration, e.g. to enable public value co-creation, improve service provision or increase administrative efficiency.

The term public e-service itself is understood in different ways among different groups. The Estonian Government Office (2017, 1) considers public e-service and public service to be the same in nature and identifies e-service as a service that is merely delivered through an electronic channel. This is also in align with the broad definition mentioned by some other scholars (Hassan and Shehab 2011, 530). Lindgren points out that public e-services aim to fulfil the main objectives of e-government: improving citizens' interactions with the government, making governmental agencies more effective and increasing transparency (Lindgren 2013, 43).

Some scholars and interests groups argue that making public services electronic is not just a matter of putting them on the internet, but that public e-services should result in a conceptual change in processes and in an improved service (Hassan and Shehab 2011, 530). The European Commission has stated that effective eGovernment means reorganizing processes and should result in a change of behaviour (European Commission 2013). Making public services

electronic thus aims at optimizing processes and management of resources through adding a technological layer to the existing services and systems (Maciuliene 2018, 31).

Public e-services can be different in their nature and are divided into several different groups based on several characteristics. One of the ways of grouping e-services has been proposed by the Estonian Government Office (2017), which distinguishes between three different types of services –event-services, support services and proactive services. The definitions of each type of services is presented below.

- An event-service is a direct public service that several institutions provide together so that a person could fulfil all of their responsibilities and use every right that they have due to one event or situation. The aim of an event-service is to combine different services related to one event into one single service for the user.
- A support service is provided by an institution to their own or some other institution's officials or employees. A support service aims to support fulfilling institutional tasks.
- Proactive services are services initiated by an organization presuming the will of the people and using the state information system data collections. The services are provided automatically or based on the consent of the user (Estonian Government Office 2017).

Since the aim of this thesis is to develop an automated VAT declaration system for cross-border e-commerce with the system being targeted to small and medium-sized companies (SMEs), the most important term used in this paper is proactive service. This means that the service aims to fulfil the needs of SMEs by presuming the needs and providing the service automatically after asking their consent. Although the service itself will be automatic, it will still today require the confirmation from the company itself when the tax declaration form is filled and ready to be paid. Moving forward, it could be possible to make the service 100% automatic with only a text message being sent to companies informing them about the automatic payment being taken from their account.

2.2. Designing good public e-services

Innovation plays an essential part in any kind of area and adapting to new technologies has become even more important in today's globalized world where competition is as tough as ever. This means that both companies, but also governments need to take advantage of technology, innovate and offer their customers new services and values. It is not just about putting services

on the internet, but conceptually changing processes and services and improving them. It is about taking advantage of the newest approaches to service design and implementing them in existing services or developing new ones.

Making services better assumes though that there is an agreed set of characteristics or best practices that would explain what a good service is or how to develop one. Although different scholars have different views on the topic, one of the key elements that seems to prevail in almost all definitions of a good service is the term benefit or value (Lehtinen 1984, Lovelock and Wirtz 2011). This means that a successfully developed service satisfies the needs of certain groups in the society and provides them with some benefit. While the term benefit has in public administration often been described solely through efficiency and quality, Maciuliene (2018, 26) argues that the value of a service deals also with social and economic improvements created for the society.

Although in private sector, customers have been the central point of service development for decades, in public administration the paradigm has been changing only recently. We have moved from increasing public sector efficiency through traditional administration to New Public Management that started putting more focus on the citizens and aimed at improving performance and end results on public administration (Maciuliene 2018, 25).

With NPM focusing on improving results and cost-efficiency, another approach that seems to be more fit to the continuously changing environment today, has emerged – New Public Governance (NPG).The approach has a network perspective and it aims to cooperate with multiple stakeholders, e.g. the private sector, educational bodies, international institutions, third sector (Dedeurwaedere 2005). This indicates that more than ever, developing successful and beneficial services requires understanding the stakeholders and their needs and values.

Therefore, a good service design defines all the important stakeholders, exploits the creativity among all of them, and considers the broader scope, defines the goals, requirements and needs of all the parties influenced by the system (Holgersson and Karlsson 2014, Sterling and Taveter 2009). This means that it is important not to only think about the benefit that the service provides to the organization who is providing it or to the user, but to consider also other relevant agents who may be influenced by the service or who may provide useful insight.

Although gaining insight from citizens is important and can provide ground for great new service developments, good public administration also means responding to legal changes in the society and predicting users' interest. Good public service design takes into account the

whole surrounding environment, e.g. citizens' needs, legal changes, technological developments and uses the best service design methods to create services benefitting all the relevant stakeholders.

It is important to understand that in today's rapidly changing world, designing e-services requires taking into account two different things – it is service design, but it's also designing an IT artifact (Goldkuhl ja Perjons 2014, 29). It means paying attention to the soft social characteristics, but also realistically taking into account the technological barriers and opportunities. This is where the term sociotechnical systems comes in. A sociotechnical system is a system that contains both a social and a technical aspect and that is responsive, dependable and secure (Koplimaa 2016, 25). It is a large system that needs to adapt to an autonomously changing environment and take into account its unpredictability, complexity, time-sensitivity and uncertainty.

One of the key approaches that tries to model complex sociotechnical systems is agent-oriented modelling (AOM), which defines different attributes that help to describe the sociotechnical system in a more understandable and coherent way (Sterling and Taveter 2009). The approach takes into account multiple stakeholders, and helps to design better and more proactive services (Männik 2017, 31). By taking into account the needs of different stakeholders and creating a holistic and representative set of models, the approach helps to define complex systems in a clear and understandable way.

Based on the previous discussion and the views from different scholars, the following set of characteristics can be defined determining the success of an e-service:

- Creates benefit/value to both the user and the organization;
- Satisfies the needs and requirements of different stakeholders;
- Exploits the creativity of all the stakeholders and considers the broader scope;
- Takes into account the technological barriers and opportunities;
- Is responsive, dependable, adaptable and secure;
- The e-service is trustworthy, functional, accessible, integrated;
- Service uses up to date information
- Service is effective and convenient.

2.3. Good services in e-commerce and taxation

The previous chapter emphasized several times that the final definition of what a good service is and how to design it depends on the context. The following subchapter explains briefly the e-commerce and taxation field and explains the main concepts that the following research will be based upon. It explains how do the characteristics of a good service and the design process apply to the field of taxation and e-commerce and thus lay the foundation for the research paper.

E-commerce is a really wide term and could be defined as an Internet-based system that uses technological solutions to "perform one or more business functions – such as information provision, communication, buying, selling, distribution, customer service, delivery, and payment processing among producers, suppliers and their customers" (Molla and Licker 2001). This means that it entails everything starting from retail, transactions, logistics and IT. It is a complex environment, which has several stakeholders, with the main ones being the producer/supplier, the platform provider, consumer and the logistics or fulfilment provider.

Although e-commerce and the services offered in the field are mostly handled by the private sector, there is still one stakeholder that is often left out of the analysis focused on e-commerce – government. The author argues that government and different governmental stakeholders such as the tax administration board are important stakeholders that need to be taken into account while developing e-services for e-commerce since governments are often the main stakeholders setting the barriers and creating opportunities in cross-border e-commerce. The set of stakeholders in e-commerce is shown in Figure 1.

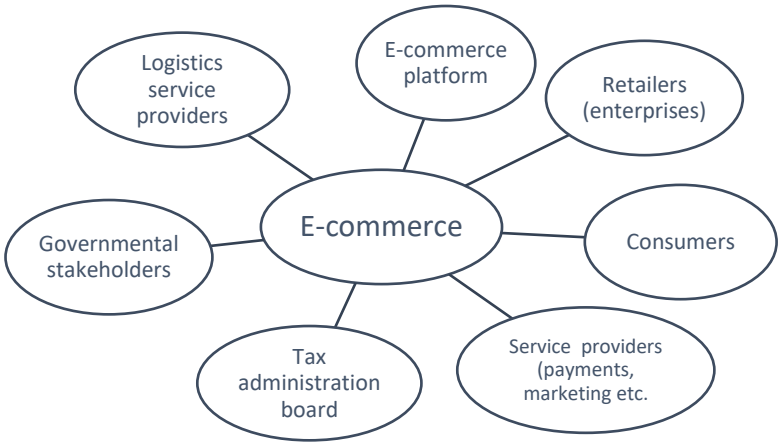


Figure 1: E-commerce stakeholders

One of the key barriers that governments pose to e-commerce concern legislation and the processes that take place while crossing borders – foremost taxation. While the discussions over

taxation and e-commerce used to focus on how and what should be taxed in e-commerce, today's discussions are more focused on how to ensure tax compliance while at the same time making it convenient for companies and consumers (Meharia 2012).

A good effort to explain what are the principles of good e-commerce service design has been done by Huang and Benyoucef (2013, 248). They have listed five design features that describe good e-commerce design: usability, information quality, website quality, service quality and playfulness. While they can be easily applied to designing e-commerce platforms/websites, they need to be slightly modified for designing specific services used in e-commerce fulfilment and aimed mostly at companies.

Bringing in the taxation dimension has a slight impact on those features and while some, like playfulness lose their importance, others may become more important than before. Langham and Paulsen (2017, 129) insist than similarly to other services, exceptional services in taxation place the customer at the centre and aims to achieve a balance between the needs of the customer and the organization.

With tax services being often services that the customers are not choosing to use, but are obliged to use, many governments and tax boards have chosen not to pay too much attention to service quality and design in tax services. Today the trend seems to be slowly changing. Australia's tax systems have recently been researched by scholars (Ecker, Lang and Lejeune 2012, Langham and Paulsen 2017) and a new term has been offered that could illustrate the future of taxation services – invisible taxation. While aiming at administrative efficiency, this approach tries to decrease the necessity for enforcement through excellent service design.

Moving towards invisible taxation and administrative efficiency symbols the rise of NPM and NPG and their reach to taxation. While other public management areas have already for some time tried to model themselves based on the structure and management processes of the private sector like NPM and take into account a complex networked system of stakeholders such as NPG (Langham and Paulsen 2017, 145), the tax boards are only now reaching the same mind-set.

The keywords that describe good service quality in taxation today are therefore relatively similar to other areas – agility, capacity, availability, security. With taxation being a complex area and complexity considered to be a main reason behind tax non-compliance, the keywords of simplicity, efficiency and flexibility are also of uttermost relevance. With service providers most of the time having no control over changing the legislative barriers in taxation, all they

can do is to compensate this complexity in the legal system with simplifications through good service design.

Based on the previous discussion a set of features can be defined that are necessary to develop good e-services in e-commerce and taxation:

- Places the customer at the centre of the experience, but takes into account all the stakeholders, their needs and requirements;
- Creates benefit/value for the customers and for other stakeholders;
- Takes into account all the barriers and opportunities;
- Service aims for administrative efficiency and compliance
- Service is agile, simple, efficient and flexible;
- Service is secure, available and convenient.
- Service is invisible.

3. Literature review

The following chapter will explain what has been done in the area of taxation and cross-border e-commerce so far. The chapter will give an overview of the current stage of research in both e-commerce and taxation and elaborate on the best approaches for developing tax administration services for cross-border e-commerce.

The current stage of research in the area of cross-border e-commerce and taxation is still fairly poor. E-commerce and taxation seem to be two distinct sets of research areas, which are going in different directions without often being linked together. While research on e-commerce has so far been focused mostly on the private sector and on service delivery and customer satisfaction, efforts in specifying design features of e-commerce have been done by Huang and Beyoucef (2013). Their research concluded with a set of common design features for e-commerce services:

- Information quality: information relevancy, information accuracy, information completeness, information update
- System quality: security, accessibility, precise operation and computation, participant control, transparency
- Service quality: responsiveness, following up services
- Usability: ease of use, navigation, error recovery, valid links, help functions, consistency
- Playfulness: enjoyment, attractive appearance

Although their research reached a conceptual conclusion by delivering a set of characteristics for designing services in e-commerce, the research focused mostly on designing e-commerce platforms and didn't pay much attention to e-commerce fulfilment and the governmental role in the field. Thus, even though the set of features can be helpful in getting some understanding of what is important in e-commerce services, it isn't fully applicable for e-commerce fulfilment services, especially in services that are provided by the governmental institutions for e-commerce retailers and platforms to improve service provision.

Another contribution to the field of e-commerce has been done by a group of researchers Aulkemeier, Schramm, Iacob, Hillegersberg (2016), who developed a reference model for service-oriented e-commerce architectures. By giving an overview of the state of the art in e-commerce research, the researchers also pointed out emerging challenges and proposed an architecture that could be implemented to overcome these challenges and develop

comprehensive e-commerce services. The researchers noted that currently used e-commerce architectures are too much focused on only one side of the service architecture (e.g. the processes) and thus fail to create holistic systems and services that would manage to take into account all social, application and technology components (Aulkemeier, et al. 2016, 27).

While the paper made a significant theoretical contribution by creating an extended e-commerce reference architecture and providing guidelines on how to understand and develop new e-commerce services, it didn't pay any attention to the role of public sector in the whole process. With public sector stakeholders playing a huge part in e-commerce (e.g. tax boards), the research didn't give any insight into how to perceive the government as a stakeholder in e-commerce and how to make e-commerce services better through the help of governmental agencies.

On the contrary to research on e-commerce, research on tax administration has been so far mostly focused on the public sector and on how to increase tax compliance and reduce the number of people and companies evading from taxes (Feld and Frey 2007, Reinganum and Wilde 1985). In recent years the paradigm has been slightly changing and more research on taxation has also turned to the topic of how to design better tax services based on the models derived from private sector (Langham and Paulsen 2017, OECD 2016, OECD 2014).

Langham and Paulsen (2017) made a significant contribution to the field of tax administration by exploring the commonalities between service delivery in the public and private sector and by elaborating on the topic whether invisible taxation could be achieved through good service design. They claimed that the reason behind tax evasion and the problems in tax administration lay behind the complexity of tax systems and that a good system is able to hide this complexity from an average citizen. With simplicity being one of the key determinants of the success of a good tax system, they also delivered a set of variables that can be used to measure the administrative effectiveness of a tax system (e.g. security, responsiveness, accessibility, credibility, etc.) (Langham and Paulsen 2017, 162).

While most research on e-commerce and taxation hasn't been really connected to each other, recent years have shown significant developments in the field of research on taxation of e-commerce. There has been a strong discussion over the fact how has the emergence of e-commerce changed taxation and how traditional policies have had to be adapted due to the new forms of retail (Downer 2016). Downer claimed that applying taxation policies that have been developed for brick and mortar transactions, are non-compliant with the new forms of

transactions that take place in cyberspace (Downer 2016, 12). By pointing out that electronic commerce is a completely different mode of business than regular commerce, she created a basis for discussion to create new standards and new policies for e-commerce transactions.

While most of the previously mentioned research has rather focused on the theoretical side of taxation and tried to justify either the difference between taxation of regular commerce and e-commerce, or tried to develop a set of variables that could characterize good services in tax administration, a big step forward in bringing practical suggestions on how to improve taxation especially for businesses, has been done by the OECD. While agreeing that the goal of tax administration is to increase tax compliance, OECD also acknowledged that this goal could be achieved through good service design and by adapting to changes in society (OECD 2014, 7). This means also taking advantage of the newest technological advancements.

While creating a set of guidelines for tax administrations on how to achieve good tax administration through service design, the OECD report on tax compliance also pointed out a big target group for taxation authorities – small and medium sized enterprises (SMEs). OECD pointed out the high importance of SMEs in the economy and also their fast adoption of new technologies. The report thus paid strong attention to how tax compliance could be made an integral part of the systems that those businesses already use to carry out daily transactions (OECD 2014, 11).

The OECD report (OECD 2014) introduced two approaches to build systems that support tax compliance – "secured chain approach" and "centralised data approach". While the first approach means that tax compliance requirements are built into the technology systems and processes used by the taxpayer and thus means that the taxpayer itself is freed from any reporting obligation, the second one reduces the compliance burden by collecting the business transaction information from the revenue bodies.

While the OECD report from 2014 gave a good overview of the new approaches that take advantage of the social and technological developments (OECD 2014), the OECD report from 2016 analysed how different specific technologies affect tax services (OECD 2016). By analysing technologies such as mobile applications, cloud technologies, blockchain, big data analytics, the report concluded with a list of perceived needs and expectations regarding tax service delivery:

- Reduced tax compliance cost
- Convenience

- Real time service delivery
- Customised and personalised services
- “Anytime, anyplace, any device” service delivery (OECD 2016, 48)

Nevertheless, although the OECD reports created a good basis for developing new systems for tax administration and gave guidelines on how to adapt to new technologies, most of the examples brought in the reports were based on how governments could improve tax services for local SMEs. Therefore, while the examples such as the Korean e-Tax Invoice System, Chile Electronic VAT Invoicing system and the Danish Tax Administration EasySME concept provided great information on how to actually take advantage of the emerging technologies and turn tax systems more convenient, personalised and innovative, no attention was paid to cross-border e-commerce and taxation of third country enterprises.

4. Problem

The following chapter provides an overview of the problem of the thesis. By giving a brief overview of the overall context and explaining the gaps in both research and business development, the chapter concludes with a set of research questions that aim to fill in the gap in today's literature and business.

Electronic commerce is today gaining more and more popularity and although the technological solutions used in the field are already highly innovative and advanced, the sector demands for more. There is a persisting need for higher efficiency and speed (European Parliament 2016), and for solutions that would solve problems while crossing-borders. With taxation often been cited as one of the biggest problems in cross-border e-commerce, an innovative system that would make crossing border a seamless experience would be highly welcomed by e-commerce platforms, companies and consumers (European Commission/Deloitte 2015).

The legal developments in the European Union are catching up and since 2021 it will be possible for non-EU companies to register their e-commerce transactions related VAT taxes in only one member state, which will then distribute the taxes quarterly to countries where the products were actually sold and delivered to (European Commission 2016). Although the new regulation is in a way a simplification and a move towards a digital single market (Deloitte 2016), it is accompanied by other regulations, which will enforce VAT taxes on all products independent of their price.

The new regulation not only makes it possible to develop a new service for cross-border e-commerce VAT payments, but it also creates a need for that service in countries such as China, where low price e-commerce products are extremely popular overseas. Since it will mean a higher administrative burden for small and medium sized companies (SMEs) who are selling low-price commodities, there is a need for a service that would make paying taxes convenient and easy.

The system is also necessary, because it could bring significant benefits to Estonia, such as larger flows of goods and financial gains, but also since it would be the first of its kind in the world. No such system exists yet to the author's knowledge in cross-border e-commerce and the due to legal changes only taking place in 2021, there hasn't even been a possibility to develop such a system. There is currently a plan of action being developed by the European Commission, which will set some more specific guidelines for the requirements of the system from the legal perspective, but the general guidelines are already publicly announced and

therefore it is a perfect time for member states such as Estonia to start developing a framework for a system that would be in compliance with the new regulation, but which would at the same time take advantage of technological and social advancements.

From a research perspective, the situation in cross-border e-commerce and taxation is considerably underdeveloped. Relevant research is available on the topic of tax administration for SMEs and useful guidelines on how to develop good tax administration services by taking advantage of new technologies exist. Nevertheless, most research focusing on how to improve taxation for SMEs focuses on creating services by the government to local companies. With cross-border e-commerce taxation being consumption based, meaning that the VAT and customs taxes will be collected in the place where the goods will be consumed in, there is a huge target group that hasn't been covered either in business or in research – non-EU SME-s selling their products through e-commerce to EU consumers.

In addition, the author sees that so far research on innovating services in cross-border e-commerce taxation is almost non-existent and that newer modelling techniques such as AOM haven't been applied to the area enough. With also the reports from OECD emphasizing the complexity of the ecosystem of taxation and e-commerce, the author sees that the AOM approach would already today enable to take into account the complex ecosystem of taxation and e-commerce, satisfy the needs of all relevant stakeholders, and develop a system that would be ready before the EU VAT regulation comes into force in 2021.

4.1. Research questions

Based on the previous discussion, the following research questions are established:

RQ: How to set up an automated VAT declaration system in the EU VAT one-stop-shop (OSS) framework between Estonia and e-commerce platforms?

The main research question will be answered through sub-questions that aim to define the challenges in the current system, explain the changes happening in Europe since 2021 due to a legal VAT reform and through that answer to the challenges by proposing a new automated system. The system's main features, requirements, goals and roles will be established and the overall logic of the system will be explained through business process modelling.

The sub-questions are the following:

1. What are the current challenges in the contemporary VAT declaration process?

2. How will the legal VAT reform change VAT declarations system in e-commerce since 2021?
3. What are the features, requirements, goals and roles of the new automated VAT OSS system?
4. What is the business process model of the desired system?

Based on the answers to the previous four research sub-questions, the thesis aims to develop a set of recommendations for the successful implementation of the automated VAT declaration system and explain the potential benefit to different stakeholders.

5. Methodology

The current chapter aims to give an overview of the methodological approach of this thesis and explains why and how will the chosen methods be used to answer the research questions presented in the last chapter.

The following research paper is a case study that will inductively study the current situation in the area of cross-border e-commerce VAT declarations between non-EU companies and the EU, and based on the best practices in the field and the interests of the stakeholders, will define the business process model, requirements and features of the desired solution.

In order to make the system applicable in reality, the author will focus on the example of Estonia and analyse systems used by the Estonian Tax and Customs board and base the creation of the new system on the cooperation between Estonia and e-commerce platforms that have non-EU sellers (e.g. Alibaba). Therefore, the author will describe based on this case, how does the situation today work and propose a framework for the desired solution through answering the research questions.

The paper aims to answer the research questions by qualitatively analysing existing resources on VAT declarations and cross-border e-commerce (e.g. European Commission regulations and directives, Member States' legislation, press releases, analysis) and interviews conducted with relevant stakeholders. Since the matter at hand is complicated and involves several social and technological aspects, the author believes that qualitative analysis of the existing resources and interviews is the best method to find answers to relevant questions and enables to connect the social part of the topic with the technical part.

As qualitative research design tends to work with a relatively small number of cases and puts more focus on details (Silverman and Mavasti 2008), information is gathered from existing databases, including EU legal databases and proposals. In addition, three interviews are conducted with the most important stakeholders in the process – the Estonian Tax and Customs Board, the Estonian postal company Omniva and an e-commerce fulfilment and logistics service provider Boomerang Distribution. With most of the information gathered from existing resources, the interviews aim to confirm whether the resources also reflect the views of the important stakeholders. The interviews are an essential component of the thesis and help to develop a realistic and achievable system that reflects the real situation and needs of the stakeholders.

With the tax board being the stakeholder that is responsible for the VAT systems for e-commerce and could therefore also potentially implement the system and benefit from it, the information gathered from the interview is of uttermost relevance. Since the Estonian postal company Omniva plays a huge role in e-commerce between Estonia and non-EU countries (especially China) and has the best overview of how exactly all the processes when crossing the borders work, their view on the current procedures and the future of tax declarations is extremely important and can provide the author a detailed insight into the system. With Boomerang Distribution having a holistic overview of e-commerce fulfilment and of returns, which is an important part of e-commerce transactions, they provide a relevant perspective on e-commerce fulfilment.

In order to get as much information from the respondents as possible and to hear their own views, the interviews are individual to have in-depth discussions with each of the representatives. Since all the information was shared by the interviewees willingly and no confidential information was revealed, the respondents' real names will be used throughout the paper.

The interviews were half-structured to provide more flexibility during the process. The author used a topic guide with some questions and key words to lead the discussions. The interviews were held in the offices of all the stakeholders with only the author and the interviewee(s) present. All the interviews were recorded on the permission of the interviewees with an audio recording device. All three interviews were held in Estonian to simplify gathering information from the respondents.

The three interviewees were the following:

1. Estonian Tax and Customs Board: Priit Vao (Leading Auditor); Duration: 51min
2. Omniva: Ardi Ratassepp (Head of International Business); Duration: 65min
3. Boomerang Distribution – Zoja Simakova (Finance Manager) and Evelin Lahuri (Key Account Manager); Duration: 43min

The main questions that the interviews aim to answer are:

1. How does the VAT system for cross-border e-commerce work today?
2. What are the problems in the current system?
3. What are the positive and negative perceived effects of the new VAT system since 2021?

4. How would a perfect VAT declaration system for cross-border e-commerce look like (features, requirements, process)?

The interviews and also the documents will be analysed by using content analysis, which enables to pay attention to details and phenomena that are rare or unique (Kalmus, Masso and Linno 2015). It enables the author to find specific characteristics, shortcomings and requirements that help to describe the current situation and also the desired system.

The interviews and documents will be analysed by identifying codes and categories to one or more passages or words, which all relate to one thematic idea (Gibbs 2007). The codes are formed based on the research questions and therefore aim to identify problems in the current system, the developments taking place in the future and the features and the requirements of the new desired system (e.g. requirement – simplicity). The analysis will take advantage of the theoretical foundation of the thesis and also take into account previous research on the topic since it may be beneficial to develop a final set of recommendations.

5.1. Combination of business process and agent-oriented modelling

Based on the analysis of the interviews with relevant stakeholders and the existing resources, the author will construct models that help to describe the current situation in cross-border e-commerce VAT declarations and also the desired automated system. With the tax declaration system being concerned mostly in the processes, the author finds business process model and notation (BPMN) to be a relevant tool to describe the current and the desired system and to give an overview of the logic of the whole system.

The author believes that the combination of qualitative analysis, BPMN and agent-oriented modelling (AOM) gives a holistic overview of the existing situation and enables to deliver a framework for the desired system. While BPMN enables to focus on the system from a process view, agent-oriented modelling (AOM) by Sterling and Taveter (2009) enables to take into account the complex ecosystem of cross-border e-commerce and taxation and come up with a set of models to describe the requirements, goals, roles and features of the system.

The author will focus on the motivational level of the system and develop several models that describe the desired system in a coherent way. The most foundational are the goals, roles and organization models, which will define the goals of the systems as well as the roles for achieving

the goals. It will also describe the aggregates such as organizations that determine social policies (Sterling and Taveter 2009, 28).

Based on the developed models and the analysis done based on the interviews and existing sources, a set of recommendations will be presented for the successful implementation of the automated VAT declaration system.

6. Analysis of the current VAT declaration system

The following chapter looks into today's system of VAT declarations in cross-border e-commerce and analyses the current situation based on existing resources and on interviews conducted with stakeholders. By defining the bottlenecks in today's system and explaining the process of today's VAT declarations system, the author concludes with a set of problems that pose the biggest challenges in today's cross-border e-commerce

Today's situation in cross-border e-commerce and related tax procedures is overly complicated. With commerce moving more and more towards e-channels and taking advantage of new innovative solutions, tax systems and also the legislation concerning the topic have fallen behind.

The two main taxes that are applied to e-commerce inside the EU today are customs and value added taxes (VAT). While the first concerns only products valued over 150€, the second is applied also to small consignments currently valued over 22€ (Council Directive 2009/132/EC). Although both taxes are applied to products coming from outside of the European Union to consumers in European Union, they have both different systems and different rules, and are therefore handled separately. The following thesis therefore focuses solely on VAT obligations and declarations and handles customs tariffs only when it's of uttermost relevance.

VAT obligations have been cited as one of the biggest barriers in cross-border e-commerce by companies (European Commission/Deloitte 2015). Not only do the companies need to register for VAT in all member states which they sell goods to, but they also need to take into account the different VAT rates in various member states and work in national systems that are mostly in local languages and follow different legislation and administrative procedures.

The different VAT rates in EU member states can be seen in Table 1. The table indicates that there are ten different standard VAT rates applied in different member states ranging from 17% in Luxembourg to 27% in Hungary. In addition, it shows that there are also reduced rates applied for certain products and services that the companies selling to or inside the EU need to take into account. The European Commission has estimated that the cost of engaging in cross-border B2C e-commerce amounts to almost 6 billion euros, or about 8000 euros for each member state in which a company is VAT registered (European Commission/Deloitte 2015, 34).

Member states	Code	Super-reduced rate (%)	Reduced rate (%)	Standard rate (%)
Belgium	BE	-	6/12	21
Bulgaria	BG	-	9	20
Czech Republic	CZ	-	10/15	21
Denmark	DK	-	-	25
Germany	DE	-	7	19
Estonia	EE	-	9	20
Ireland	IE	4,8	9/13,5	23
Greece	EL	-	6/13	24
Spain	ES	4	10	21
France	FR	2,1	5,5/10	20
Croatia	HR	-	5/13	25
Italy	IT	4	5/10	22
Cyprus	CY	-	5/9	19
Latvia	LV	-	12	21
Lithuania	LT	-	5/9	21
Luxembourg	LU	3	8	17
Hungary	HU	-	5/18	27
Malta	MT	-	5/7	18
Netherlands	NL	-	6	21
Austria	AT	-	10/13	20
Poland	PL	-	5/8	23
Portugal	PT	-	6/13	23
Romania	RO	-	5/9	19
Slovenia	SI	-	9,5	22
Slovakia	SK	-	10	20
Finland	FI	-	10/14	24
Sweden	SE	-	6/12	25
United Kingdom	UK	-	5	20

Table 1: List of VAT rates in EU (European Commission 2018)

In addition to the problem of dealing with different VAT rates among member states, complex legislation and administrative procedures, a study conducted by the European Commission among businesses engaged in cross-border e-commerce pointed out the following problems:

- Monitoring distance sales thresholds is complicated
- The distance sales thresholds are different across Member States
- Competition is distorted due to different VAT rates in various countries (European Commission/Deloitte 2015, 24)

Overall, the study conducted by the European Commission points out the high dissatisfaction among companies towards the current VAT declaration system in the European Union (European Commission/Deloitte 2015). With the administrative costs being as high as they are right now and with the companies having to comply with the standards of all the EU member states that they sell to, they often decide to outsource the obligations – 50% of all companies trading via cross-border e-commerce outsource their VAT responsibilities (European Commission/Deloitte 2015, 36). While for big companies this may not be a huge burden, the costs are disproportionally high for microbusinesses and small and medium-sized enterprises

(SMEs), who account for more than 99% of businesses in the EU (European Commission/Deloitte 2015, 44).

While the system overall is considered to be overly complex and administratively burdensome by companies, there are some simplifications in today's system that make doing business easier under certain conditions. Directive 2009/132/EC (2009) allows Member States to exempt VAT from small consignments valued between the set minimum value of 10 euros and maximum value of 22 euros. The regulation, embedded in all the relevant legal acts of EU member states, has facilitated the movement of low value goods and enabled companies to do trade in a simplified way.

In order to decrease the administrative burden and make the flow of goods smoother and faster, most European Union countries have implemented the 22 euro threshold in their legislation concerning VAT. The Value-Added Tax Act §17(9) by the Estonian Parliament (Value-Added Tax Act 2003) states that value-added tax shall not be imposed on imports of consignments with a value up to 22 euros, with the exceptions of alcohol, tobacco products, perfume and toilet water. At the same time, several countries have decided to modify the VAT exemption threshold according to their own best practice – e.g. in Bulgaria the threshold is approximately 15.34 euros (BGN 30) and in Romania the limit is 10 euros (European Commission 2015, 8).

A similar regulation also applies on imports of small consignments of goods of a non-commercial character from third countries. The European Council directive 2006/79/EC (2006) states that goods of non-commercial character sent from a third country by private persons to other private persons in a Member State will be exempt on importation from turnover tax and excise duty. The consignments need to be of occasional nature, sent by the sender to the receiver without payment and contain goods with the total value not exceeding 45 euros. Although this simplification only applies to goods of non-commercial character, the system is often taken advantage of also by companies who form their parcels as gifts.

Although the tax exemptions placed upon goods valued under a certain threshold reduce the administrative burden of companies and also national tax authorities, there are also certain problems associated with it. The VAT exemptions on small consignments are today one of the causes of the main concern regarding the VAT system from the governmental side - compliance. The final report on VAT conducted by the European Commission (2015, 59) collected information from tax authorities all over the European Union and pointed out that the level of non-compliance in VAT is significant, but that the amount of VAT revenues that are not

collected due to fraud or other reasons is very difficult to estimate due to the complexity of the system and the lack of capabilities to verify the data provided by suppliers.

The European Commission's report on VAT aspects of e-commerce pointed out that the main types of non-compliance identified by tax authorities are the undervaluation and mis-labelling on imports and ignoring distance sales thresholds (European Commission/Deloitte 2015, 67). Another study ordered by the European Commission assessing the impact of the VAT exemption on importation of small consignments stated that a number of industry organisations across the EU commented that the VAT exemption is being abused within the EU on a really high level and has resulted in competitive distortions, business closures and business relocations (European Commission 2015, 70).

Similar problems uncovered also in the interview conducted with the leading auditor of the Estonian Tax and Customs Board Priit Vao. When asking about the potential problems in cross-border e-commerce today in relation to the tax procedures, Priit pointed out the massive exploitation of the VAT-free threshold:

> *"What is happening right now is a massive exploitation of the VAT-free threshold – those are currently consignments valued under 22 euros and gifts valued under 45 euros. Unfortunately it is very complication to assess the real value of the goods" (Priit Vao, Estonian Tax and Customs Board)*

Priit also pointed out that due to the extremely high number of goods that are flowing through the postal distribution centres and that are handled by customs, a lot of the incorrectly valued packages end up going through without actually detecting the mistakes. The European Commission has estimated that about 65% of packages from third countries are non-compliant with EU VAT rules and that EU member states currently lose about 5 billion euros annually in VAT revenues (European Commission 2017).

Another big issue that came up in the interview with the Estonian Tax and Customs Board, concerned counterfeit products and products that are not meeting certain standards. As an example Priit mentioned that there are sometimes electronic products coming in from foreign countries that don't have CE marking and that can actually turn out to be dangerous for the user. In order to fight the exchange of counterfeit products, the postal operators and tax boards are tightly working together with intellectual property protection officials, who are responsible of assessing potential violations of intellectual property rights.

Despite the problems in the current VAT system for cross-border e-commerce mentioned in European Commission reports and also by the Estonian Tax and Customs Board, all the interviewed stakeholders pointed out that the current system in Estonia also has some positive sides and that the system is not very difficult to use:

> *"You can always say that the system could be better, but one of the good things is that people have started to declare their taxes themselves electronically and that paper-based declarations are decreasing. About 80% of people started declaring their import taxes online via internet and their smart phones. This shows that the system is easy enough and that people actually do find the time do fill out the declaration without being tempted to try whether not doing it will result in them getting caught." (Estonian Tax and Customs Board, Priit Vao)*

The electronic systems of the Estonian Tax and Customs Board were mentioned in a positive note also by Boomerang Distribution and Omniva, who both confirmed that the systems are relatively easy for customers and companies who are already familiar with the system. Omniva pointed out that the electronic systems work quite well and that the tax board is working towards making them even better. Boomerang Distribution added that while the system is relatively straightforward, it can be burdensome for companies, who are sending some products to Estonia for the first time:

> *"The system is relatively easy. In the beginning it may be difficult to figure out though what product it is, what group it belongs into, what kind of marking should it have, but it gets easier after that." (Boomerang Distribution, Evelin Lahuri)*

While the electronic systems were considered as a positive improvement and the system represents a move towards reaching the characteristics of good service design mentioned in the theory part of this thesis, such as simplicity and efficiency, there still seems to be a long way to go towards reaching the invisible taxation phenomena mentioned by Langham and Paulsen (2017). While the benefit or value mentioned by several scholars and organizations over time (Lovelock and Wirtz 2011, European Commission 2013) that is gained from using the service has increased for customers ordering things online, the author sees that there could still be further steps taken to make the service more beneficial for different stakeholders.

In order to understand what could be done to make the system better, more efficient and simple, it is important to also hereby mention how does the delivery and receiving of e-commerce parcels work today in the EU and in Estonia. It is important to firstly understand that value-

added tax is in its essence a tax paid by the consumer/the receiver of the goods. When people go to stores, the VAT is therefore always included already in the price of the products and paid automatically at check-out. In cross-border e-commerce, the situation can be solved in two different ways (see also Figure 2):

1. The VAT on import of goods is not included in the price paid by the customer to the seller. This means that all the taxes applied on the goods will need to be paid to the postal company or directly to the customs by the customer when receiving the parcel.
2. All taxes, including VAT, are included in the payment that the customer is paying for the seller. The seller becomes the Importer of Record, registers themselves for VAT in the country of importation and declare the taxes (European Commission Taxation and Customs Union N/A).

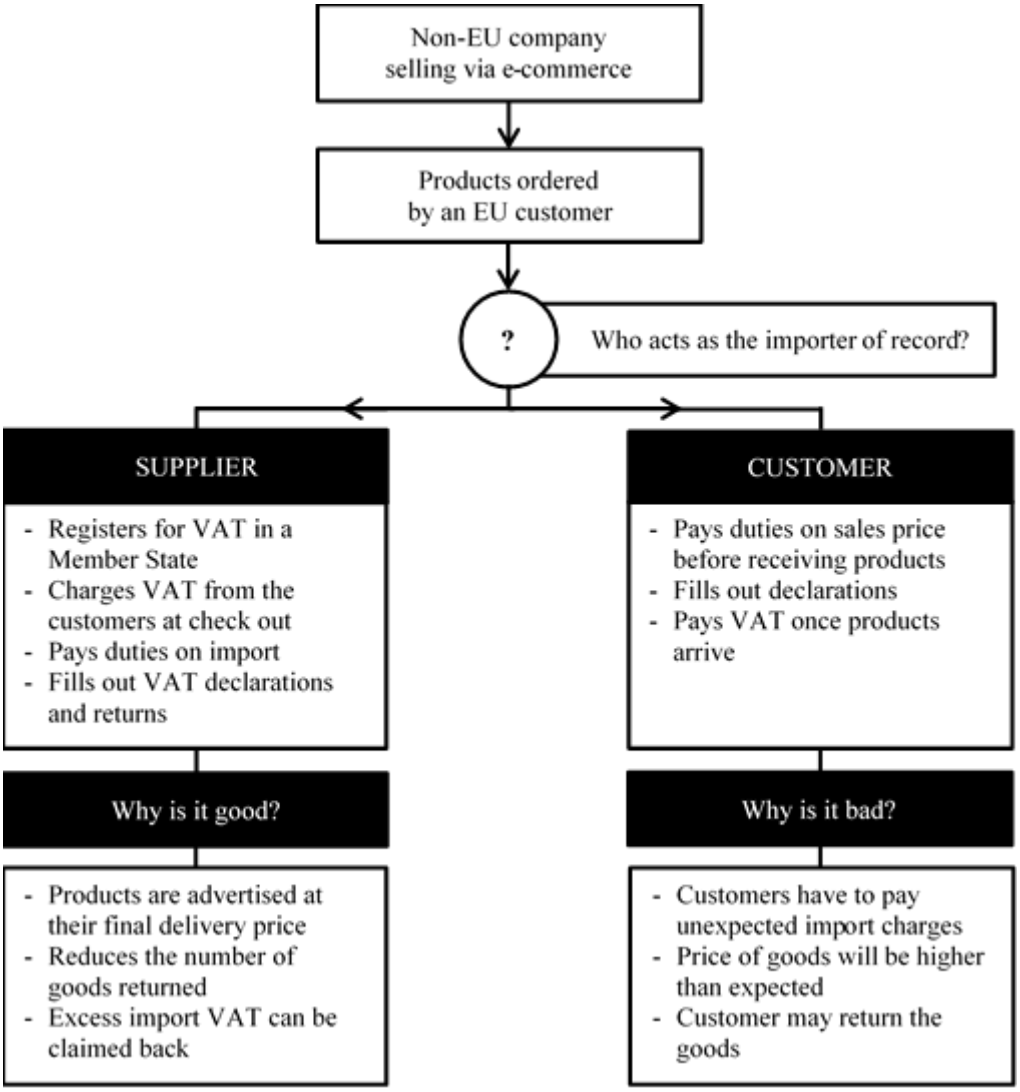


Figure 2: Importing from non-EU companies

While the second option is definitely more convenient for the buyer, the evidence collected by the European Commission showed that most sellers have opted to make the process easier for themselves and don't show any VAT information in their order confirmation (European Commission/Deloitte 2015, 62). They have mostly added disclaimers on their webpages saying that the VAT and customs duties are the responsibility of the customer. With most of the companies leaving all the import duties to be covered by the customer, only a few companies showed the applied VAT amount on order confirmation and charged it from the customer at check-out.

The interview with Omniva confirmed that today's process of ordering products online from third countries is indeed built up so that the customers will need to take care of the VAT and/or customs duties when receiving the products. They pointed out that the system is therefore a bit deceptive towards the customer, who buys a product with one price, but ends up paying also for unexpected VAT and customs. Therefore it is difficult for the customer to estimate what is the final price of the order. Therefore, on arrival, they may decide that the product is too expensive and decide to return it.

The returns topic was strongly pointed out in the interview with Boomerang Distribution. The company's representatives pointed out that one of the biggest problems for them in today's system is that there is no exact information on how should VAT and other import duties be handled and reclaimed in case of e-commerce returns. Since the products will often be moving between different countries due to examination of products or due to them being sent back to warehouses, they need to have some unified system on how to exactly handle the VAT refunds and how to verify information about them.

Overall, both Omniva and Boomerang pointed out that with returns and also with regular transactions, one of the persisting problems is the lack of information exchange and communication between stakeholders. Due to the lack of information exchange, lots of transaction data gets lost in the supply chain, which requires extra time for entering and verifying the information and results in slow processes and delivery. In addition, since the tax board usually starts processing the taxes often only once the products have physically arrived to Estonia, a lot of time is wasted on administrative processes when products could already be delivered to the final consumer.

6.1. The current process

As mentioned earlier, there are several different things that need to be taken into account when handling value-added tax in cross-border e-commerce. Therefore, there will be two processes shown for the current system for selling goods to European Union consumers through cross-border e-commerce and declaring VAT taxes on it. With customs declarations being out of the scope of this thesis, all products valued over 150€ will be left out of this analysis and the following two scenarios will be described:

1. Small consignments valued under 22€ being ordered via e-channels from non-EU companies to Estonia
2. Small consignments valued between 22€-150€ ordered via e-channels from non-EU companies to Estonia

The following processes will be described by using Business Process Model and Notation and explained through the model.

Figure 3 describes the cross-border e-commerce order process for small consignments valued under 22€. Since the goal of the process model is to give an overview of order processing from the VAT perspective, some of the tasks in the process are simplified (e.g. processing and delivering the order). With the focus being on processing the order and getting an overview of the obligations that either of the stakeholders have, the process model starts from the moment when the customer has chosen the desired products and starts the check-out procedure.

The process model has three important stakeholders – customer, seller and logistics partner. There is also a fourth important stakeholder in the cross-border e-commerce VAT process that is not depicted in the current process model, the tax and customs board. With their role in the order making process being minimal and the attention is more paid to the company and the customer and how the process looks from their perspective, they are not brought into the process model.

Figure 3 indicates that when it comes to orders valued under the threshold of 22€, the process is relatively simple and doesn't require any extra steps from neither the customer nor the seller. The order is confirmed by both stakeholders, payment is made and received and the delivery is handled by a logistics partner. The only small task that needs to be done in relation to VAT on importation, is that the seller needs to produce a simplified import declaration and tax board in cooperation with the postal company frees the products from import duties on border.

Thanks to the VAT exemption the customer can just go pick up their products or have them delivered and due to that the process is relatively easy and fast. One of the moments in the process where problems can occur is on the border when import declarations and products can be required to go through a check if there is any doubt whether the import declaration and actual product information aren't compliant.

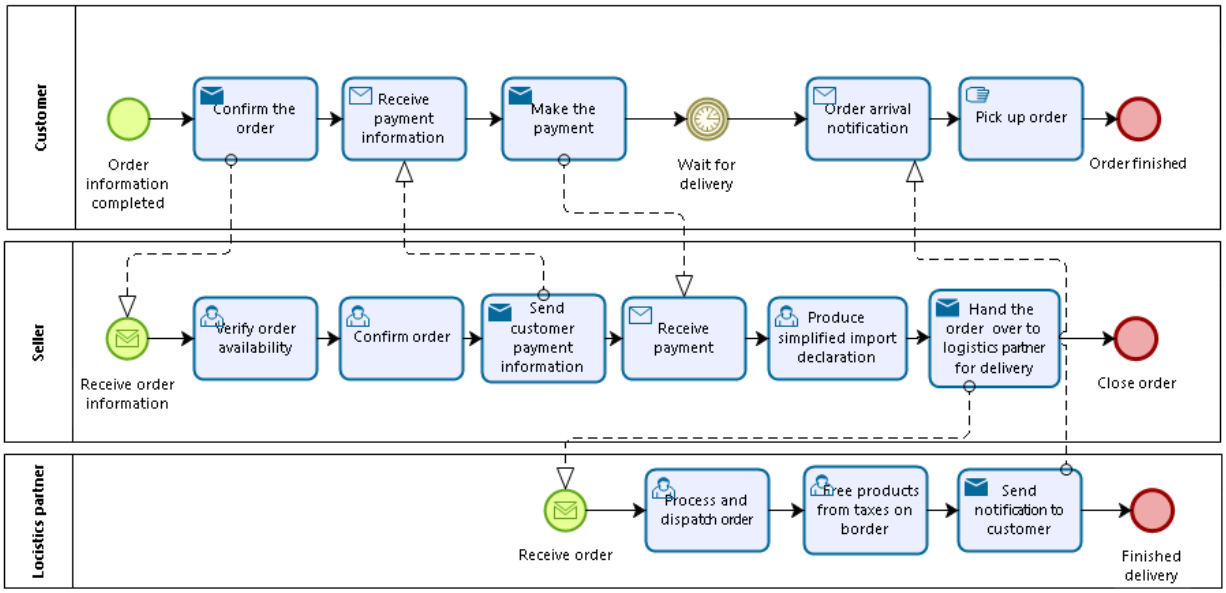


Figure 3: Current VAT declaration process in cross-border e-commerce – orders under 22€

The process looks slightly different for products valued between 22 and 150 euros, which are taxed according to the VAT amounts of each member state. The process model in Figure 4 depicts the process of ordering products from a non-EU company by an Estonian customer. Once again, some parts of the process are simplified with the emphasis being on understanding how does the processing of order is influence by the VAT obligations.

Figure 4 indicates that with the value of the order increasing, the process gets significantly more complicated and slower from the perspective of especially the seller and the customer. With no simplified processes currently being in place, most of the tasks need to be done manually by the stakeholders, which also means a significantly higher consumption of time.

The process model indicates that the process is different for both the seller and the customer depending on the seller's decision to either charge the VAT from the customer at check-out, and take care of the VAT duties themselves or to leave all these obligations to the customer. If the seller decides to make the ordering process easier to the customer, the process isn't much different for the customer than for the previous model – they make the order, pay for the product

together with all the added taxes and go pick up the product once it has arrived to the destination (or have it delivered home).

From the company's perspective, making ordering easier for the customer means extra obligations – they need to verify the customer's location, the correct VAT amount of the member state where the customer is in and the correct rules that they need to comply with. The company also needs to deliver an invoice to the customer and for tax compliance purposes with the following information:

1. The serial number and date of issue of the invoice;
2. The name and address of the taxable person and the person's registration number as a taxable person;
3. The name and address of the acquirer of goods or the recipient of services;
4. The registration number of the acquirer of goods or the recipient of services as a taxable person if the acquirer of goods or the recipient of services has tax liabilities upon the acquisition of goods or receipt of services;
5. The name or a description of the goods or services;
6. The quantity of the goods or extent of the services;
7. The date of dispatch of the goods or provision of the services or the date of receipt of full or partial payment for the goods or services if the date can be determined and differs from the date of issue of the invoice;
8. The price of the goods or services exclusive of value added tax and any discounts, if these are not included in the price;
9. The taxable amount broken down by different rates of value added tax together with the applicable rates of value added tax or the amount of supply exempt from tax;
10. The amount of value added tax payable, except in the cases provided by law. The amount of value added tax shall be indicated in euros (Riigikogu 2003).

After receiving the required payment from the customer, producing an import declaration and handing the order over to the logistics partner for delivery, the company also needs to fill out the VAT declaration, pay the VAT due on the order through a bank transfer (no other options available currently) and store the invoice and the transaction information for a legally required period. Despite the extra steps that the company needs to do for getting everything done in terms of the import VAT, the products get released from postal/customs warehouses very quickly after arrival, which makes the order more smooth and fast for the customer.

If the company decides to let the customer handle all the import duties including VAT on receiving the products, the process gets easier for the company who just finishes the order from their side after handing it over to the logistics provider. At the same time for the customer the process of receiving their order gets a lot slower and more demanding. Often the import duties come as a surprise to the customer. They receive a notification from the tax and customs board about the necessary VAT declaration for their ordered goods and they need to fill it out before their products are freed from the postal warehouse. They need to pay the VAT due on their order through a bank transfer and receive their product only then.

The process model illustrates how many steps both the company and the customer need to take when selling/ordering products via e-commerce from a non-EU country to an EU member state. The important thing to understand here, is that for products valued over 22 euros, the company also needs to register for VAT in the member states that they sell to, which requires often even more effort, especially in countries where electronic registration isn't supported. In that case, the administrative costs and time spent on administrative procedures raises even more.

In addition, the company is also responsible for storing all the invoices meeting the requirements and documents certifying the payment of VAT upon import of goods. They need to keep an eye on the deadlines of every single member state for when should the tax declarations be filled and VAT paid and need to pay for VAT through bank transfer, which means extra expenses due to differences in currencies and transaction fees.

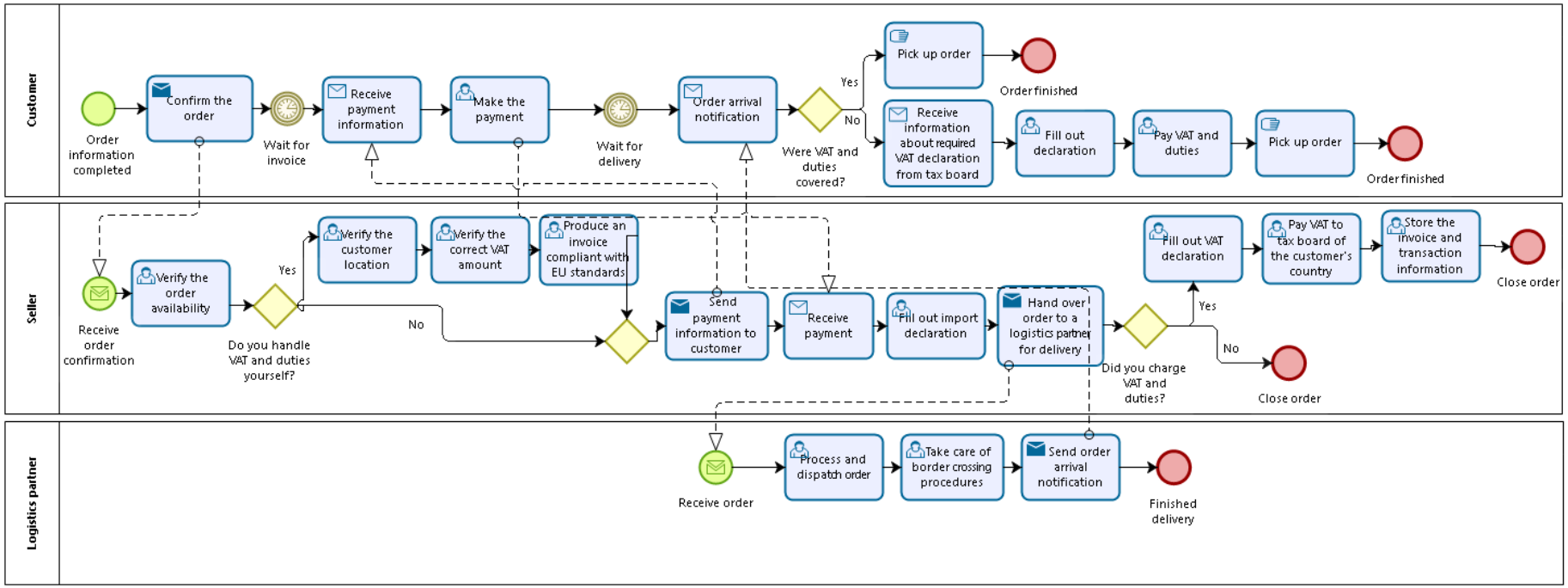


Figure 4: Current VAT declaration process in cross-border e-commerce – orders between 22 and 150€

6.2. Conclusion

As a conclusion, although improvements have been done over time to make systems for declaring VAT more convenient and electronic solutions have been implemented, the system still has several shortcomings. In order to understand the problems in a better way they will be viewed from the perspectives of different stakeholders – businesses, consumers and state (including tax boards).

From the side of companies selling to EU the main problems are the following:

- **Financially burdensome** - the administrative burden related to selling products cross-border to EU and declaring VAT is extremely high (estimated 8000€ for every Member State that they sell to).
- **Complex** - complying with the rules of different member states is difficult and companies don't have any set mechanism that would allow simplifying this process (VAT rates, systems, forms and languages are different).
- **Time-demanding** – since VAT declarations are done order-based, which means that every order requires a separate declaration in the required form of the Member State, this results in high time losses.
- **Inconvenient** – since the VAT electronic systems aren't currently automated enough and require a lot of manual steps, the systems are extremely inconvenient for the user and can result in mistakes.
- **Lack of integration** - The VAT declaration systems demand for payments through bank transfers, which means extra costs associated with the payment (different currencies, transaction fees).
- **Uncertainty** – due to the complexity of the import VAT declaration system, companies often let the customers handle the import duties on arrival. This has resulted in a rise in order returns and uncertainty associated with the unexpected costs.

From the side of the government the most persisting problems are the following:

- **Unfair / Distortion of competition** - although the VAT exemption for small consignments valued under 22€ has reduced the administrative burden for non-EU companies selling low-value products, it has resulted in distortion of competition between EU and non-EU companies

- **Non-compliant** - the tax exemption for low value goods has resulted in high non-compliance. Companies are taking advantage of the tax exemption and take different measures to evade from paying VAT (e.g. undervaluing products).
- **Low transparency and control** – the tax boards and customs officials currently have no effective measures to control VAT non-compliance. Random check are done, but the officials have no way to precisely assess the value of consignments.

From the side of the customer buying products from non-EU companies the problems are the following:

- **Slow** – due to the current process of every over 22€ product needing to go through VAT declaration, the delivery time of consignments is relatively high. In addition, since the declarations and VAT duties of the products is usually handled only when the products have arrived to the destination country, the processes get even slower.
- **Uncertainty in costs/deceptive** – due to companies often letting customers to take care of VAT on importation, the customers can encounter unexpected costs on delivery, which can increase the price of the package significantly.
- **Inconvenient** – although steps have been taken to make declaring VAT on importation faster and more efficient, the system still requires declaring VAT on every single order and entering information to the system that the authorities could have already in advance.

The problems in the current system point out keywords that are strongly opposing the characteristics of good services defined in the theory and literature part of this thesis. With the goal of taxation being invisibility and simplicity (Langham and Paulsen 2017), the current system fails to deliver those expectation. Through not meeting the expectations of how a good service design could be characterized, the current system moreover fails to deliver the main goal of tax administration – compliance (Feld and Frey 2007). Therefore, a lot can still be done to improve the system and meet the expectations of different stakeholders by increasing the benefit and value that they could get from using the system.

7. Analysis of the new VAT system since 2021

The following chapter will analyse the new VAT system for cross-border e-commerce that will be implemented in 2021. By first looking into the legal changes taking place on the European Union level, the author then looks into how the new VAT system for cross-border e-commerce could be implemented. Through comparing the theory and literature, available resources and conducted interviews, the author turns to BPMN and AOM to define the process, goals, roles, requirements and domain of the system.

7.1. Legal changes on EU level

The problems in the current VAT system in regards to cross-border e-commerce have been recognized by the European Commission that considers a common VAT system to be a core element of Europe's single market (European Commission 2016). They have acknowledged that the current VAT system that was implemented more than 20 years ago hasn't been able to keep up with the changes and challenges of today's digital economy and has resulted in several problems that need to be tackled with new reforms.

Although a broad public debate over the VAT system in the EU has been ongoing for more than ten years, the plan to reform the current VAT system begun with the release of the Green Paper on the future of VAT on December 6th 2011 (European Commission 2011). In May 2015 the Digital Market strategy of the European Union announced that a legislative proposal to modernise and simplify VAT for cross-border e-commerce and in particular SMEs will be presented (European Commission 2015). The strategy stated the following:

> *"The Commission will make legislative proposals in 2016 to reduce the administrative burden on businesses arising from different VAT regimes including (i) extending the current single electronic registration and payment mechanism to intra-EU and 3rd country online sales of tangible goods, (ii) introducing a common EU-wide simplification measure (VAT threshold) to help small start-up e-commerce businesses, (iii) allowing for home country controls including a single audit of cross-border businesses for VAT purposes and (iv) removing the VAT exemption for the importation of small consignments from suppliers in third countries."* (European Commission 2015)

The promise came just a few months after the first steps to modernise the VAT system in the EU were made. Namely, since January 1st 2015 a new special scheme for all

telecommunications, radio and television broadcasting and electronically supplied services was implemented. The change that was adopted by the European Commission with the Directive 2006/112/EC (2006), also established that digital services shall be taxed in the Member State where the customer is established, which was a change from the previous system where service providers were able to establish their EU headquarters in a country with low VAT rates and pay all their VAT in to the same Member State.

With the European Commission recognizing the difficulties to file VAT in all the Member States where digital services are provided to, the special scheme also known as the Mini One-Stop Shop[1] was supposed to enable companies to simplify administrative procedures. Priit Vao from the Estonian Tax and Customs Board explained the MOSS system as a simplified system that is voluntary for businesses:

> *"Basically businesses have two options. The first option to register themselves in every single Member State where they sell their services to as VAT liable and start making VAT declaration in all of those countries separately. This is extremely time and resource demanding. The other option is to register themselves as users of the one-stop-shop special scheme and declare all of the transactions done in EU to one tax authority, which will then distribute the money to all the Member States where the services were actually sold to." (Estonian Tax and Customs Board, Priit Vao)*

One of the questions in the new system where taxes are paid to the customer's Member State is how does the business determine where exactly is the customer located. Due to that the businesses have an obligation to store two pieces of proof that confirm where the customer is located (e.g. IP address, permanent address, telephone area code). In addition, according to the Council Implementing Regulation No 282/2011 (2011) the taxable company needs to store the following information:

1. The Member State of consumption to which the service is supplied;
2. The type of service supplied;
3. The date of the supply of service;
4. The taxable amount indicating the currency used;

[1] A mini 'One-Stop Shop' is a system where businesses are able to make a single declaration and payment in their own Member State or as a non-EU company in a freely chosen Member State. Suppliers use a web portal in their Member State of establishment or in the chosen Member State to account for the VAT due on sales in other Member States. In this way, a vendor is only required to register and account for VAT in one single Member State, which will then distribute the taxes between the Member States where the services/goods were actually sold to (European Commission 2015).

5. Any subsequent increase or reduction of the taxable amount;
6. The VAT rate applied;
7. The amount of VAT payable indicating the currency used;
8. The date and amount of payments received;
9. Any payments on account received before the supply of service;
10. Where an invoice is issued, the information contained on the invoice;
11. The name of the customer, where known to the taxable person;
12. The information used to determine the place where the customer is established or has his permanent address or usually resides.

Although the amount of information that is required to store by companies is quite large, the system is still a huge simplification for companies since the declarations are done on a quarterly basis instead of the old system where they were done on an order-basis, and the companies need to only do one declaration for all Member States.

Nevertheless, the system still isn't automated enough, meaning that companies still need to manually update all the required fields and know the tax rates of every member state themselves. There is also an option of collecting the information on a constant basis into an Excel file that would be compliant with the certain MOSS system where the business is declaring their VAT. This still means though that the expectations of convenient, simple, efficient and invisible tax service delivery mentioned in chapters 2 and 3, are still unfulfilled with the new MOSS system.

As a problem in the current MOSS system, the Estonian Tax and Customs Board pointed out the problem that with the system being simple, but information has to be entered manually, the mistakes are easy to occur:

> *"The system is easy, maybe even too easy, because mistakes are easy to occur. Since you need to mark basically two main things in the declaration – the customer's location and the transaction amount, mistakes happen. There have also been cases where companies declare their Spanish transactions to Estonia, because the abbreviations of Estonia (ET) and Spain (ES) are extremely similar." (Estonian Tax and Customs Board, Priit Vao)*

The interesting thing is that those mistakes mentioned by the Tax and Customs Board could be easily avoided by slight adjustments to the system and through simplifying transferring information from company's databases to the MOSS system of a Member State. This could also result in meeting the expectation of compliance, transparency and simplicity.

Despite the small shortcomings in the system, the European Commission has considered the special scheme for digital services to be a success. According to the European Commission the MOSS system had by 2016 already led to the collection of 3 billion euros of revenues (European Commission/Deloitte 2015, 1). Given the success of the system and the nature of cross-border e-commerce, the Commission is planning to wider the implementation of this scheme to reduce the administrative burden for also cross-border e-commerce VAT.

The e-commerce package that included one directive and two regulations was adopted at the meeting of the Economic and Financial Affairs Council on December 5th 2017 in Brussels (European Commission 2017). The proposals that aims to facilitate cross-border trade, tackle VAT fraud and ensure fair competition for both EU and non-EU businesses, intends to reduce the administrative burden in handling VAT declarations through a widespread reform. The proposal that will be implemented by 2021 includes the following changes (European Commission 2016):

1. The VAT one-stop shop special scheme will be extended to physical goods sold online. This means that EU companies can start taking care of all of their VAT obligations through the digital OSS portal hosted by their own tax administration and in their own language. Non-EU companies can choose one member state where to declare all of their EU transactions and related VAT.

   This means that it will be the company's responsibility to declare all of their VAT in an OSS portal, but the tax board will then distribute the taxes to the countries where the products actually went to.
2. VAT taxation for cross-border e-commerce products will be consumption based instead of import based, meaning that the taxes will be collected in the place of the consumer instead of the first country where the product enter the EU.
3. VAT declarations will be done once per month for all the transactions summed up instead of the old system where declarations were made for every transaction separately.
4. A new yearly VAT threshold of 10 000 euros will be introduced to support start-ups and micro businesses. This means that if the EU-company sells cross border for less than 10 000 euros, they are treated as domestic sales. Companies selling cross-border under the threshold of 100 000 euros can benefit from simplified tax reporting rules.
5. The current VAT exemption for imports of small consignments valued under 22 euros will be removed. This means that products coming from outside of the EU will be taxes starting from the first euro cent.

6. VAT on cross-border sales will be introduced also to B2B transactions. Currently VAT isn't charged on cross-border sales between businesses, but it will be changed since 2021.
7. Large online marketplaces will be made responsible for ensuring that VAT is collected on the sales that are made through their platforms by non-EU companies (European Commission 2016).

The new process of declaring taxes is depicted on Figure 5. The model indicates the idea of the VAT one-stop shop through the example of a non-EU company selling goods through e-commerce to three EU countries – Germany, Finland and Latvia. It shows that the seller only needs to pay their VAT to one member state where they have registered for the special scheme. It is then the responsibility of the tax board to distribute the taxes to the member states where the products were actually sold to.

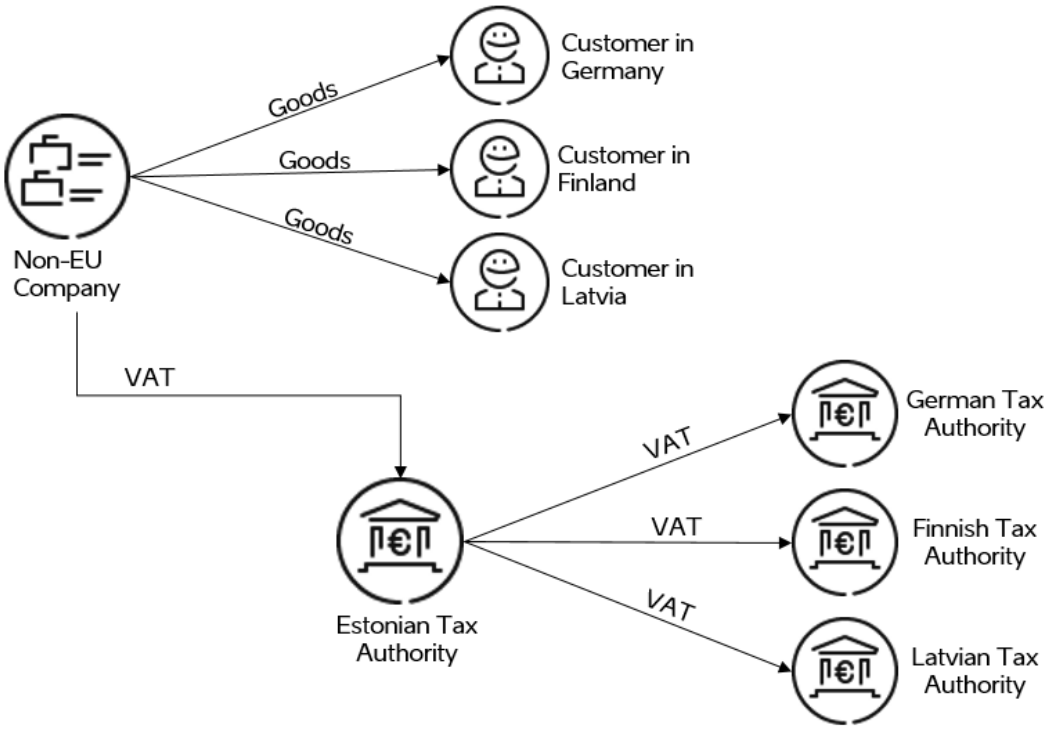


Figure 5: VAT one-stop-shop for e-commerce

With the regulation adopted both in the European Commission and the European Parliament, the main goals of the VAT system reform are set. The European Commission estimates that the new system will significantly reduce expenses on VAT compliance and save businesses across the EU about 2.3 billion euros per year. It will also lead to a more fair distribution of VAT

across member states, reduce fraud and enable Member States to collect an estimated 5 billion euros of currently lost VAT (European Commission 2016).

Nevertheless, with the legal cornerstones of the new VAT system set, there are still uncertainties that need to be resolved before 2021. A proposal for a Directive accompanied by relevant implementing measures that lay down technical provisions that are needed for an operational VAT one-stop shop will be presented in 2018 (European Commission 2017).

According to the Estonian Tax and Customs Board, they are currently planning to wait until the proposal from the European Commission is finished and then start planning the final system from their side. Other interviewees see that discussions on how to improve and implement the system in the best possible way should be done now. Even though the some main principles and requirements of the system will be laid out in the proposal, most of them are known already today, which means that planning an efficient system could be done already right now.

Although there are still some uncertainties on how the system will actually be implemented, the new VAT reform is still a huge step forward in terms of achieving a better VAT system for cross-border e-commerce. The system aims to decrease tax compliance cost, convenience and time spent on doing tax declarations, which OECD mentioned as one of the main goals of modern tax administration (OECD 2016). Nevertheless, current discussions point out that the system will still be relatively similar to the current MOSS system for digital services and thus will encounter the same problems: lack of automation, convenience and simplicity. A step forward in meeting the expectations of good service delivery and invisible tax administration could be done by utilizing technological capacities.

An overview of the legal changes laid out in the new regulations and the results of those changes are pointed out in Table 2.

Legal change	**Result**
Removal of the under 22€ VAT exemption	Higher administrative burden for non-EU companies
	Need for simplifications for low-value goods
	Fair competition between EU and non-EU companies
	Smaller rates of fraud / higher tax compliance
VAT taxation will become consumption-based instead of being import-based	More information about the customer is needed on order
	Taxes will be distributed more fairly
	Countries who used to gather VAT payments from high imports will lose this income

VAT for all member states can be collected in one VAT OSS system	Smaller administrative burden for companies
	Higher convenience for companies
VAT will be redistributed to Member States by the owner of the VAT OSS	Smaller administrative burden for companies
	More obligations for Tax and Customs Board
VAT declarations will be done once per month instead of once per every order	More convenient process for companies
	Less time spent on declarations
Large online marketplaces will be made responsible for collecting VAT on sales	Higher tax compliance
	Higher responsibility for e-commerce platforms
	VAT needs to be collected at the moment of sales
	Customers will pay for product with VAT included

Table 2: Legal changes and results in cross-border e-commerce VAT declarations since 2021

7.2. Proposal for an automated VAT OSS system

With the legal system catching up with the developments in cross-border e-commerce, and legal requirements of the new EU VAT system being set, the author believes it's time to start looking at how to take advantage of the changes and how to implement the VAT OSS system. Therefore, this thesis aims to develop a system that would meet the expectations of good service design and tax administration through taking advantage of the legal changes being implemented in 2021. With technology developing rapidly and new methods for designing new innovative systems emerging, there are a lot of opportunities to make the new legal VAT one-stop shop system that comes with both simplifications and complications more innovative and efficient and to reach the goal of invisible taxation (Langham and Paulsen 2017).

An important aspect to understand in terms of the VAT legal reform is that although the new system will make declaring VAT simpler for EU companies, who can start declaring their taxes in their home countries and be less influenced by the low-price products coming from non-EU countries, there are certain aspects that will make the system more complicated for non-EU companies, especially for SMEs. With the VAT exemption on products valued under 22€ being abolished and control mechanisms being strengthened, non-EU SMEs will have no other option than to comply to the new rule of declaring VAT starting from first eurocent.

The SMEs from non-EU countries will therefore need to start declaring their VAT either in all the Member States where their customers are located or need to register themselves as VAT one-stop shop special scheme users. Even in the special scheme, this will mean extra obligations for the companies and a rise in the prices of low-valued goods from outside of the EU.

Assuming that the companies do not want to lose their customers in all the EU, which forms a huge part of the market, they will need to find a way to comply with the rules.

The new VAT regulation also makes e-commerce platforms responsible for VAT collected on the sales done through their platforms by non-EU companies to EU customers. With the European Union being a huge market for also e-commerce platforms such as Alibaba, Amazon and eBay, they will also need a way how to assure the compliance of the companies selling through their platforms.

Therefore, there will be a persisting need among non-EU SMEs and also among multinational e-commerce platforms for a system that would make the new legal VAT reform easier to comply to. With a big step forward taken by the European Commission through proposing a one-stop shop system for VAT, the Estonian Tax and Customs Board could take step further by proposing a cooperation between themselves and multinational e-commerce platforms to reduce the cost of tax compliance for non-EU SMEs and to assure tax compliance of the companies to the e-commerce platforms.

Through the creation of an automated VAT OSS system by the Estonian Tax and Customs Board in cooperation with e-commerce platforms (e.g. Alibaba), Estonia could take a step forward in reaching the goal of invisible taxation in VAT that scholars like Langham and Paulsen (2017) have pointed out as the future of tax services. In its essence, the automated VAT OSS system would mean that transaction information from non-EU SMEs could flow through e-commerce platforms automatically in real time to the Estonian Tax Board, who would prefill VAT declarations that could be confirmed and paid by non-EU SMEs through an Estonian VAT OSS system integrated into the e-commerce platform.

While the goal of building an invisible and automated VAT OSS system demands for an excellent service design, it is important to take into account all the stakeholders in the system, take a look at the requirements, possibilities and necessary features of the new system. The key element is also to understand that when talking about the VAT system for cross-border e-commerce, we are talking about a sociotechnical system complex in its nature. This means that both social and technical aspects need to be taken into account.

The interviews done with stakeholders provided an important insight into what are the requirements and expectations among different interest groups for an improved and automated VAT declaration system. The outcomes that present a stepping stone for developing a framework for the desired system are presented in Table 2.

Key characteristics	Mentioned by	Explanation
Tax compliance	Tax and Customs Board	With VAT compliance being a big problem in today's system and the main goal of tax administration being ensuring tax compliance, the new system should aim to increase tax compliance among companies.
Simple	Tax and Customs Board, Omniva, Boomerang Distribution	With simplicity being the key enabler of tax compliance and also an important factor for other stakeholders, the system needs to be as simple as possible.
Convenient	Tax and Customs Board, Omniva	Convenience was considered to be an important factor for user experience.
Fast	Tax and Customs Board, Omniva, Boomerang Distribution	With speed being the most important factor in today's e-commerce, the processes need to be as fast as possible to enable quick VAT declaring and confirming, and also fast deliveries.
Reliability of data	Tax and Customs Board, Omniva, Boomerang Distribution	The data that is provided by the companies needs to be reliable, but so does the information flowing from one stakeholder to another.
Information exchange in real time	Tax and Customs Board, Omniva	In order to achieve speed in e-commerce and to assure tax compliance, information needs to move between stakeholders in real time. Information needs to move faster than the products and enable the products to move without any stops on the way.
Trustworthy	Tax and Customs Board, Omniva	With the information having to be reliable, also the partners in providing the service need to be trustworthy. If the information provider makes mistakes in providing correct information, the goal of fast deliveries cannot be achieved due to deliveries being stopped on borders for checks.
Efficient	Omniva	The goal of e-commerce is also efficiency and requiring as little steps from stakeholders as possible, same should apply to the system.
Able to handle also returns	Omniva, Boomerang Distribution	E-commerce isn't only about orders being delivered to the customer, but also about orders being returned to the seller. Therefore, the system should be able to take into account also orders being returned and calculate also VAT returns accordingly.
Innovative	Tax and Customs Board, Omniva	The system should utilize innovative technologies that enable reaching the different characteristics of an improved service.

Table 3: Interview outcomes: required characteristics for the automated VAT OSS system

The characteristics pointed out in Table 3 are strongly in accordance with the characteristics of good services in tax administration and e-commerce mentioned in Chapters 2 and 3, and should be followed while developing the framework and recommendations for the improved and automated VAT OSS system. When following the interests of the stakeholders and combining them with methods such as AOM and BPMN, a holistic overview of the system could be achieved.

One of the main questions before developing a service or a system though concerns its benefits. With the benefit of a service being a crucial element of the whole service concept, the author sees that an automated VAT declaration system could bring benefits to different stakeholders. Foremost, **Non-EU SMEs** who are selling goods to EU Member States can benefit from the reduced time and resources spent on doing VAT declarations. Since the information about their transactions would flow automatically into the systems of the Estonian Tax and Customs Board, their tax declarations would be prefilled and the companies would only need to confirm the declarations at the end of every month and make the payment with their own preferred payment method. This will result in **higher efficiency, lower cost of compliance** and **higher speed**.

In addition, the prefilled declarations and sharing data between different stakeholders, such as the tax board, company, e-commerce platform, logistics providers and border officials, the delivery of products will become faster. Since the border controls will have information about orders already in advance, the products can be released on borders faster than ever, which will also result in **higher customer satisfaction** and cross-border e-commerce being **faster than ever**.

With the new regulation going into force in 2021, **e-commerce platforms** that will be made responsible for VAT collected from transactions made through their platforms, will need to find ways how to assure tax compliance. Through cooperating with the Estonian Tax and Customs Board on assuring VAT compliance, the platforms could be certain that all information on transactions has been automatically forwarded to the tax board and all necessary declarations are done. They will see higher **transparency**, **efficiency** and **VAT compliance**.

The Estonian Government can get indirect benefits from the system, such as the **increasing financial flows** through our system and **increasing investments**. The author sees that an automated VAT declaration system could result in increasing **public attention** towards Estonia and result in **cooperation** with multinational e-commerce platforms that could bring big investments here (for example Alibaba is looking for an European hub for their eWTP, which could bring in millions of euros in investments and create jobs). Although according to new legislation VAT declarations don't come to the first place of importation, the author still sees that offering an efficient tax declaration system for non-EU companies and e-commerce platforms could result also in the **increase in the amount of goods moving through Estonia**.

The overview of the benefits of the system to different stakeholders is presented in Table 4. The table gives an overview of the main benefits of the automated VAT one-stop-shop for non-EU

SMEs (sellers), e-commerce platforms, logistics/postal companies, governments and tax boards in general and the Estonian government.

Stakeholder	Benefit	Explanation
Non-EU SME	Efficiency	No need to fill out VAT and import declarations; information will be forwarded automatically to the Tax and Customs Board for prefilled declarations;
	Convenience	Declarations can be confirmed once per month and paid with preferred payment method;
	Lower expenses	Reduced money and time spent on administrative obligations;
	Higher speed	Prefilled declarations and exchange of information in real time will result in faster deliveries;
	Higher customer satisfaction	Since VAT will be charged from customer on order and the price won't change on delivery, there is a smaller probability for returned orders. Thanks to fast deliveries, customer satisfaction is easier to achieve;
E-commerce platform	Higher VAT compliance	With platforms being responsible for VAT collection on transactions done through their systems, they will receive a partner helping them to comply with the new rules;
	Efficient procedures	Although the platform needs to build up systems that would enable sharing transaction data with tax board, they win from prefilled tax declarations for their companies;
	Speed	Thanks to efficient information exchange between stakeholders, deliveries through the platform get faster.
	Business gains	With non-EU companies getting more responsibilities since 2021 and selling will be more expensive and burdensome, the new system should assure that companies will still continue to sell to EU through the platform;
Logistics/ postal companies	Fast and simple border crossing	Thanks to prefilled import and VAT declarations for products under 150€, products can be released on border in a matter of minutes;
	Fast delivery	Thanks to receiving information early and information also being sent to border officials, delivery time will get faster.
	Higher business gains	Offering an efficient tax declaration system can result in higher flows of goods through Estonia, more deliveries and more business;
Governments/ Tax Boards	Higher tax compliance	Thanks to the convenient system and real-time automated data exchange, tax compliance is expected to increase.
	Reduced fraud	Due to the information being verified by the e-commerce platform and also shared with the tax and customs board in real time with no opportunities for changing the data, tax fraud is expected to decrease
	Higher revenues	Thanks to the automated system and reduced possibilities for fraud, tax revenues are expected to rise.
Estonian government	Higher financial flows	Due to VAT payments there will be larger financial flows going through the country;
	Larger flows of goods	Thanks to the efficient VAT declaration system, higher volumes of goods could be expected to move through the country;
	Incoming investments	Cooperation with big multinational e-commerce platforms could result in investments in other areas, also in new jobs created;
	Higher public attention	Innovative developments bring public attention and are good means of marketing

Table 4: Benefits of the proposed automated VAT OSS

With the system aiming to benefit different stakeholders directly or indirectly, an important part about the implementation concerns also its technological viability and necessity among businesses. While the interviews done with three different stakeholders confirmed that the interest among stakeholders is there, then another thing that was confirmed was that not only is the system technologically viable, but that similar systems are already in use between the Estonian Tax and Customs Board and different stakeholders.

For example, the Estonian Tax Board has systems in place with Taxify and Uber, which enables collecting transaction information from drivers and putting together prefilled income declarations for the drivers. Based on the interview conducted with the Estonian Tax and Customs Board, the system works well and new cooperation projects are being discussed and tested today with other web-based companies.

Based on the experience of the Estonian Tax and Customs Board in creating innovative tax administration systems for private companies and also multinational companies, the author sees great potential in building an automated VAT OSS system. Estonia has the experience in IT and e-governance and the capabilities to develop systems that for some countries seem to be a question of a long-term future and should therefore use its knowledge to build systems that could benefit both the country and different stakeholders.

7.3. Models describing the automated system

In order to understand the desired automated VAT OSS system better and to create a set of models for the development of such a system, agent-oriented modelling and business process modelling notation will be used. This allows the author to create a holistic and representative set of models that describe the systems goals, roles, organization and the process. With the emphasis in the innovation being on changes in the process of VAT declaration, the author has decided that BPMN can give a significant contribution to understand the new desired system and how it changes the process of declaring VAT and ordering/selling products cross-border.

7.3.1. Goal Models

The most essential part of a system is its set of goals that help to understand the whole reasoning of the system. Goal models express goals and roles and describes the goal hierarchy of the desired system (Sterling and Taveter 2009, 65).Therefore, the model starts with the main purpose of the system and then describes the sub-goals, quality goals and emotional goals.

Table 5 shows the notation for goal models and defines the symbols indicating goals, quality goals, roles, relationships between goals and relationships between goals and quality goals. The set of symbols will be used to define the goal model of the desired automated VAT OSS system for cross-border e-commerce.

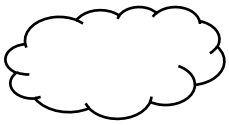
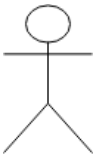
Symbol	**Meaning**
	Goal
	Quality goal
	Role
	Relationship between goals
	Relationship between goals and quality goals

Table 5: Goal Model notation

The hierarchical goal model of the automated VAT OSS system for cross-border e-commerce is shown on Figure 6. The model indicates that the main goal of the system is to provide EU-wide VAT declaration service for companies and that the main roles in achieving that goal are the Tax and Customs Board, e-commerce platform and non-EU company. With the main role being the Tax and Customs Board, the e-commerce platform plays an intermediary role and the company is a customer of the service.

The main goal of the system has three sub-goals that will be described in more detail in the following figures. The sub-goals are providing information about the VAT system and the system, processing VAT declarations and redistributing VAT payments. All the sub-goals will be described through their own sub-goals in Figures 7, 8 and 9 have their separate quality goals that describe them in more detail.

Based on the interviews with the stakeholders, the collected information from existing resources, and the theory and literature that were discussed in Chapters 2 and 3, the following quality goals were set:

- **Secure** – the system needs to follow strict security standards due to the high amount of transaction information and also personal information flowing through it. Data security and security of the systems needs to be paid extreme attention to.
- **Functional** – the system needs to be functional at all times and be built in a way that no shut-downs occur and that any information won't go lost. Since information is collected in real time and transactions take place every minute, there is no time for errors.
- **Efficient and convenient** – the system needs to work efficiently; use time and effort in the best possible way and make the VAT declaration for the companies as reliable and convenient as possible.
- **Simple** – the system needs to be simple to use; with complexity being one of the core reasons behind tax non-compliance, the new system aims to be simple to achieve the highest compliance.
- **Automated** – the system needs to be automated meaning that information will be collected in real time and that as little steps as possible are required from all stakeholders with the tasks being filled out by computers.
- **Trustworthy** – the system needs to be trustworthy and reliable; this means that there needs to be a certain transparency on how is data handled and a trust system needs to be established to assure the stakeholders that all the processes are done correctly and honestly.

Overall, the system aims to result in an invisible tax administration and service delivery, where the simplicity, convenience and good service design will result in high tax compliance that has been for decades been recognized as being the main goal of tax administrations (e.g. Reinganum and Wilde 1985, Feld and Frey 2007, Langham and Paulsen 2017).

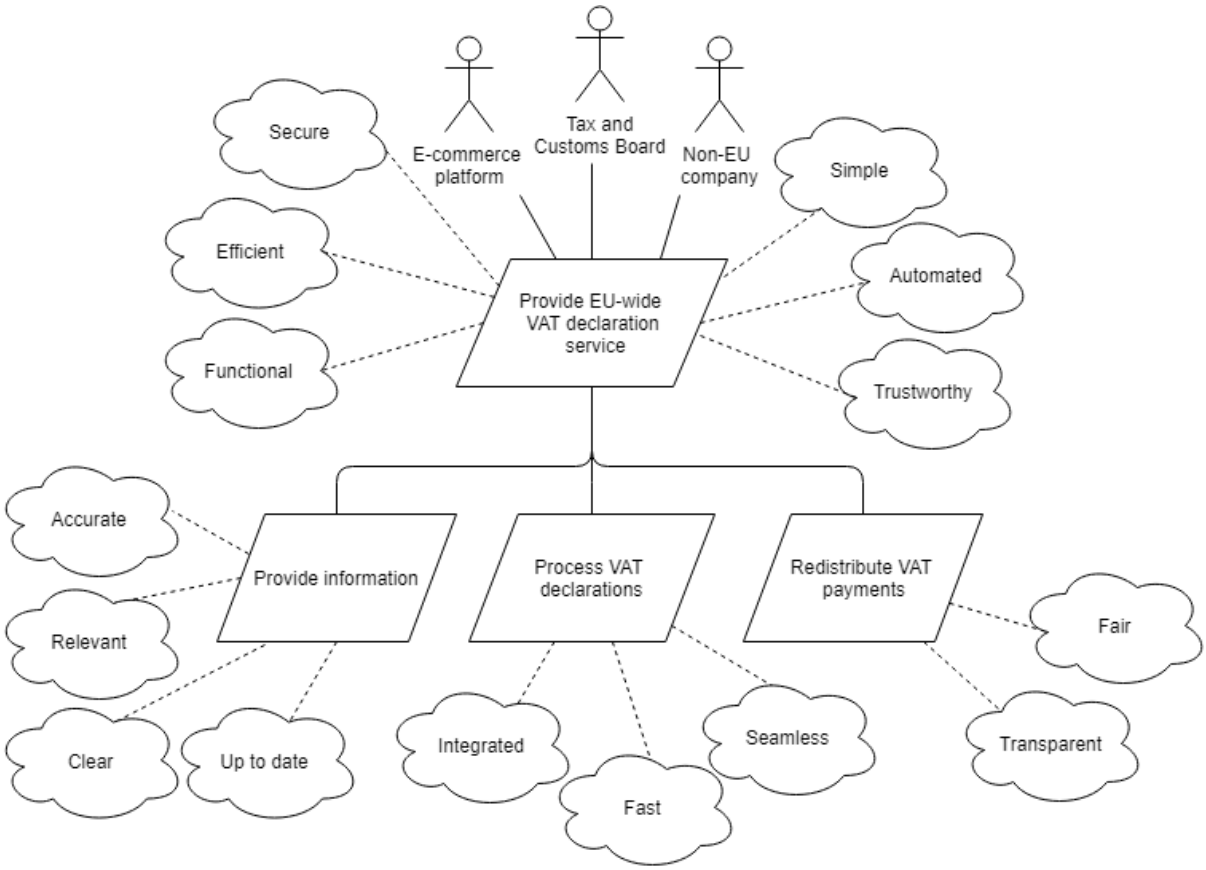


Figure 6: Goal model for automated VAT OSS system

Figure 7 explains the sub-goal of providing information and elaborates on the lower level sub-goals of it. The aim of the sub-goal is to provide information about VAT legislation and requirements that are laid down in law, provide information about the system and how it's functioning, provide information about data protection and handling, provide information about different VAT rates in EU Member States and provide information about registration for the system.

With the new VAT reform being complex in its nature and the system being the first of its kind, the author find it extremely important to offer customers a relevant and up to date information portal, where companies can themselves find answers to all of their questions about the legal system, data handling or on other relevant topics. In addition to being up-to-date and relevant, the information needs to be accurate and clearly presented. The information portal itself should be available in the Tax and Customs Board website, but also integrated into the website/application of the e-commerce platform.

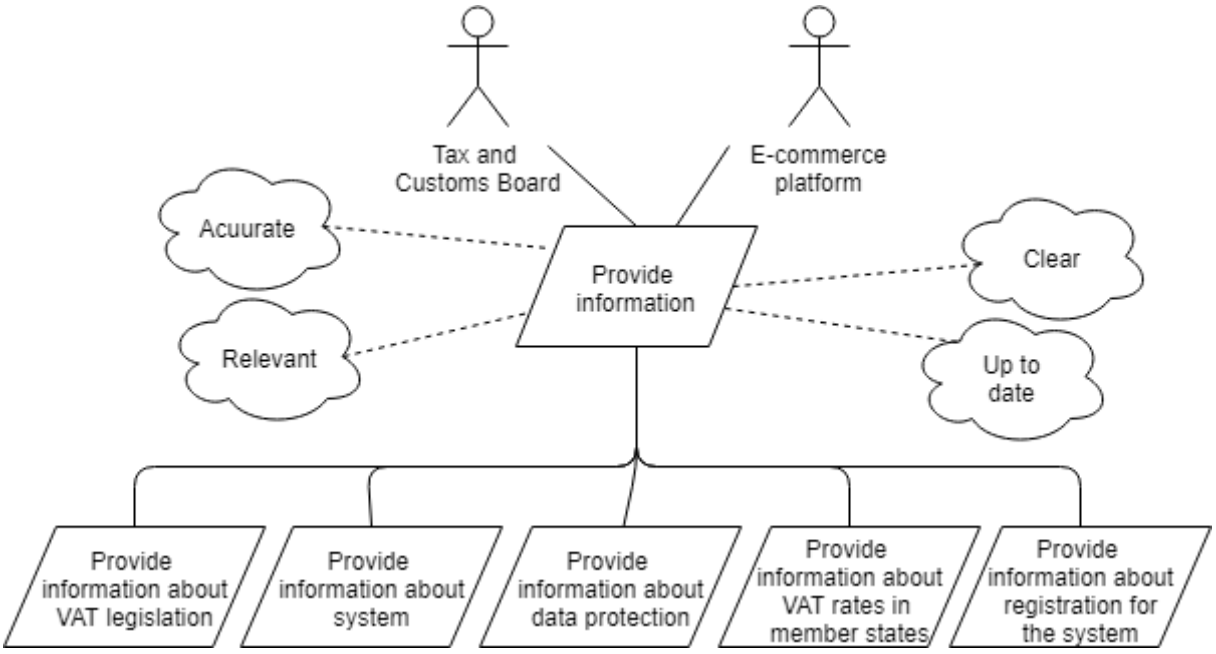


Figure 7: Sub-goal of the system: proovide information

Figure 8 explains the sub-goal of processing VAT declarations through the lower level sub-goals. This is the sub-goal that has the most stakeholders who play a role in achieving the goals – Tax and Customs Board, e-commerce platform, non-EU company and also the postal service provider – and that is also the key goal of the system.

Processing VAT declarations has several sub-goals: the system aims to seamlessly collect information on transactions in real time (also on returns), process information securely, prefill import and VAT declarations, forward order information to postal services for quick border crossings, enable confirming monthly declarations in a simple and convenient way, receive monthly payments through the integration of customer-friendly payment methods and securely store information on transactions for a legally required time.

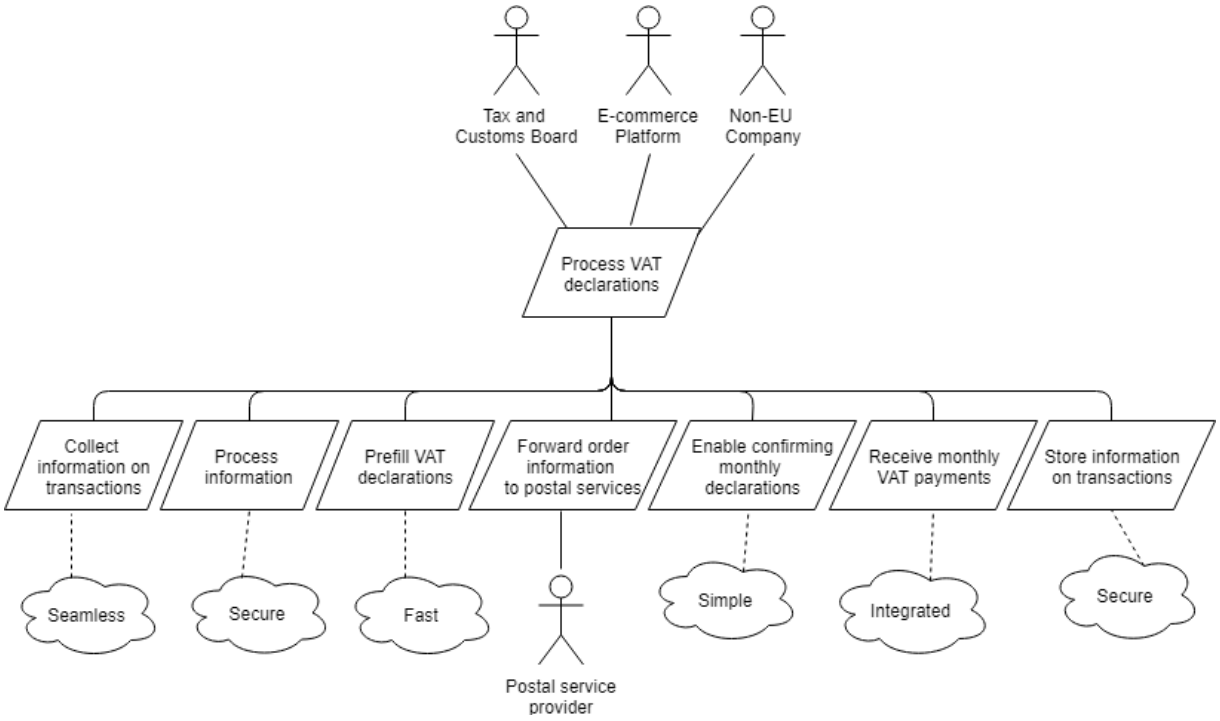


Figure 8: Sub-goal of processing VAT declarations

The last sub-goal of the VAT OSS system is presented on Figure 9, which gives an overview of the subgoals of redistributing VAT payments, which according to the new legal system for VAT is the task of all the member states where VAT payments will be made through the OSS system. The main sub-goals of it include processing and validating VAT information, sharing information about transactions with other member states and transferring money to the required tax boards with the help of banks. The system aims to be fair, transparent and accurate.

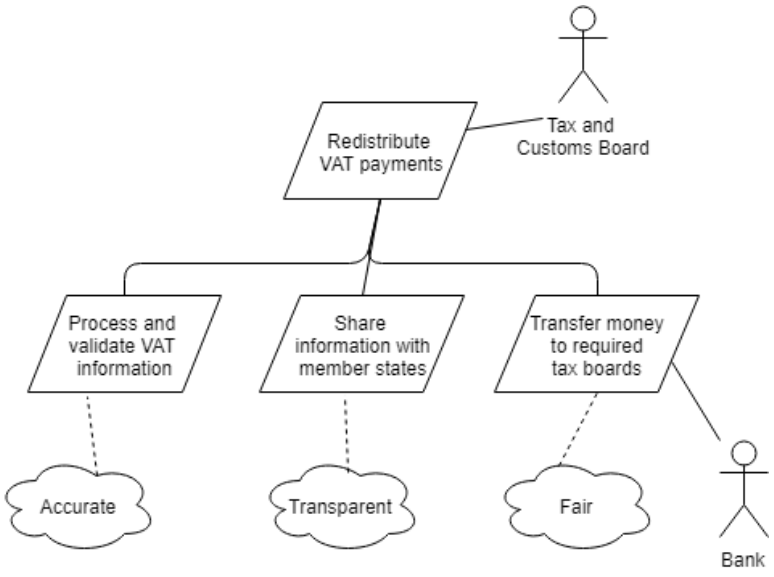


Figure 9: Sub-goal of redistributing VAT payments

7.3.2. Role Models

To achieve the goals pointed out in the last chapter, the system requires some capacities that could be defined as roles (Sterling and Taveter 2009, 73). Roles are determined from the system's goals, but they may share common goals due to the tight cooperation between the different agents involved in the system. To describe the roles, their responsibilities and constraints, role models will be created. The model will consist of the following elements:

- Role name – a name that identifies the role
- Description – description of the role
- Responsibilities – a list of responsibilities that the role or the agent playing the role must perform to achieve the functional and quality goals set for the system
- Constraints – a list of constraints that need to be taken into consideration when aiming to achieve the goals and filling out responsibilities (Sterling and Taveter 2009, 73).

The author has created four different models (Tables 6-9) to describe the four most important roles in achieving the goals of the system – non-EU company/user, e-commerce platform, Tax and Customs Board and postal company. While the first three agents play a very big role in achieving the goals of the system, the postal companies play a significantly smaller part. The author still believes that since one of the benefits of the system is that crossing the borders and delivery of orders will get faster, it requires including the postal companies in the system and thus also analysing their contribution and constraints.

The author acknowledges that there are other actors that could play a marginal role in achieving the more specific goals, but finds that explaining the system through the four main stakeholders provides a holistic overview of the main responsibilities and constraints of the actors playing the roles. Although other agents such as banks and customers were mentioned before in this paper as having a role in cross-border e-commerce and VAT, the author believes that from the view of the new VAT OSS system they do not play a role and cannot contribute to achieving the functional or quality goals of the system. Since the customers are still indirectly influenced by the VAT OSS system in the wider process of cross-border e-commerce transactions, they will be included in the BPMN model presented later in Figure 12.

For future implementation, the author recommends that differentiating between the different departments and actors in the Tax and Customs Board could be beneficial for the detailed implementation. In the following role models it will be assumed that the Tax and Customs

Board will themselves take responsibility for both service provision and system development and maintenance.

Role Name	**Non-EU Company/User**
Description	The role of the user of the service; with the system aimed at non-EU companies, they are the main users of the system
Responsibilities	- Register through simplified process as a user of VAT OSS system and obtain VAT number - Allow sharing information with the Estonian Tax and Customs Board - Obtain provided information - Confirm monthly VAT declarations with a digital signature - Notify a relevant party if any information is missing or incorrect - Pay VAT on monthly transactions through a convenient payment method
Constraints	- Needs to have a valid means of electronic identification (eg. e-ID) - Needs to be registered as a seller on an international e-commerce platform (e.g. Alibaba) - Needs to willingly share their information on all transactions - Must enter correct information on products into the e-commerce platform system

Table 6: Non-EU Company role model

Role Name	**E-commerce platform**
Description	The role of the intermediary and cooperation partner for providing VAT declaration service.
Responsibilities	- Guarantee efficient and trustworthy information exchange between companies and the tax board - Notify all non-EU companies selling to EU about the new system and regulation - Integrate VAT information into their own systems for charging customers' VAT on order - Gather confirmations from all non-EU companies selling to EU about sharing their information - Integrate VAT OSS system information portal created by the tax and customs board into the web platform - Send notifications to companies at the end of the month to send them for confirmation
Constraints	- Needs to establish extra control mechanisms to disable companies who haven't agreed to share their information with the tax board from selling to EU - Information that is being exchanged with the tax and customs board needs to be in a unified format and comply with the forms needed - Needs to integrate secure identification methods

Table 7: E-commerce platform role model

Role Name	Tax and Customs Board
Description	The role of service provider and implementer, who in this case is the Estonian Tax and Customs Board.
Responsibilities	- Provide integrated service - Guarantee effective working of the system - Monitor service delivery process and make updates - Keep an eye on new technologies and possibilities to integrate them - Provide information about the service and system to stakeholders - Cooperate with the e-commerce platform in terms of data exchange - Cooperate with the government (foremost the Ministry of Finance) in terms of legal obligations - Guarantee data protection and security - Guarantee a wide selection of payment methods - Provide simplified VAT OSS registration service - Process transaction information into declarations - Share information with other Member States - Store information on transactions for a legally required period - Share information about import and VAT declarations with postal companies/logistics providers - Consult cooperation partners on related topics
Constraints	- Due to limited resources in the public sector, some outsourcing may have to be used in terms of system development and updating - Although Estonia uses an advanced e-ID already for years, some non-EU countries do not have e-IDs that would be of equal security and acceptance. Therefore, cooperation in e-ID and including new electronic identification methods must be considered - The whole system and service provision must abide to EU and Estonian regulations and law.

Table 8: Tax and Customs Board role model

Role Name	Postal company
Description	The role of postal company, who is a partner and a beneficiary of the system
Responsibilities	- Signing up for participating in data exchange via e-commerce platform - Receiving information about import/VAT declarations - Notifying other stakeholders about problems in delivery - Sharing information about product returns with stakeholders
Constraints	- In order to benefit from faster border crossings through trusted channels and receive prefilled import declarations, they need to voluntarily register themselves in the system through e-commerce platform - Needs to be a trusted partner of the e-commerce platform

Table 9: Postal company role model

7.3.3. Organization model

A role is partially defined through its relationships with other roles or agents. Such relationships can be explained through an organization model that can be helpful for defining different interactions between agents (Sterling and Taveter 2009, 75). The different relationships between the roles can be control, benevolence and peer relationship.

Figure 10 shows the organization model of the VAT OSS system. In the organization, the Non-EU company is benevolent to the e-commerce platform as they want to use the service to export their products to the EU consumers and at the same time the platform needs companies to keep its service alive. There is also a benevolent relationship between the e-commerce platform and postal company with both of them needing each other to fulfil their goals, and between the Tax and Customs Board and postal company, who are working together and exchanging information in order to make VAT declarations and border crossings as smooth and fast as possible.

The e-commerce platform is controlled by the Tax and Customs Board as the information that the platform provides from the companies is crucial to provide the VAT declaration service. The control means also that since the Tax and Customs Board has in its essence a controlling function, they control the VAT-compliance of non-EU companies and also e-commerce platform, who is according no new VAT legislation responsible for the VAT payments of the companies selling through its platform.

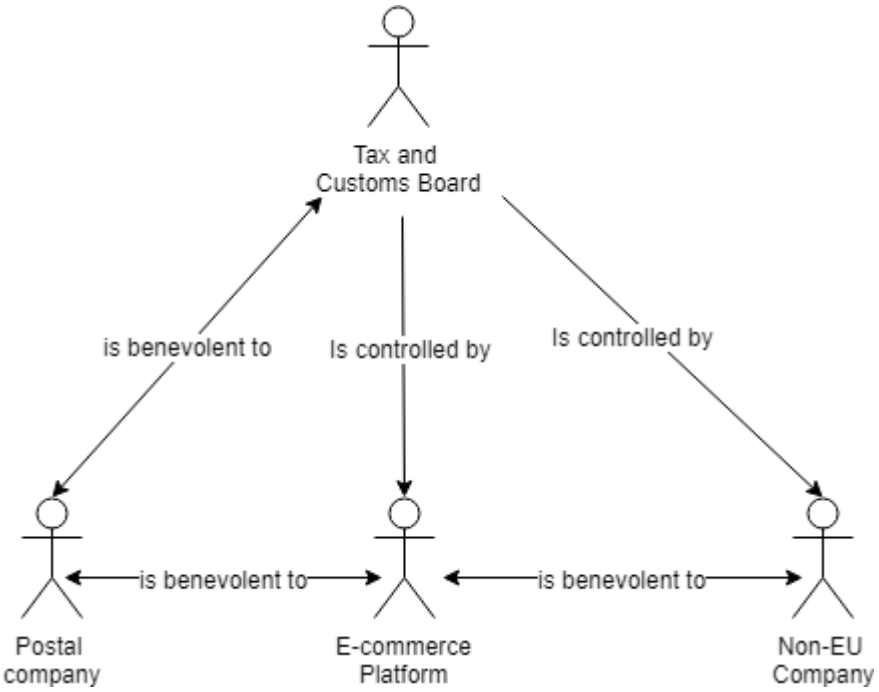


Figure 10: Organization model of the VAT OSS system

7.3.4. Domain Model

A domain model represents the knowledge that a sociotechnical system is supposed to handle and explains the environment in which the agents of the system are situated. The model indicates the relationships between the roles, environments and the resources produced and stored by them (Sterling and Taveter 2009, 341). The main idea of the model is to understand how exactly the automated VAT declaration system functions.

In the domain model presented on Figure 11 the non-EU company sells their products through an e-commerce sales system managed by the e-commerce platform, which creates transaction information every time when the company receives an order. The transaction information means that it automatically contains all the necessary data on the order – the information about the product, its price, the VAT applied on transaction, information about customer and their location. The responsibility of assuring the validity of the information belongs to the e-commerce platform, but the Tax and Customs Board controls the correctness of data (e.g. product price, VAT applied) through the received transaction information that arrives to the service database. Any manipulation of data isn't possible since the information about sales price and other transaction information comes into the service database at the moment when the payment for the order has been done.

The transaction information is then transferred to service database that is under the responsibility of tax and customs board. The information from service database will be used to prefill import declarations that will be verified by the Tax and Customs Board and shared also with postal companies for quick delivery and border crossing. The information from service database will also be used to prefill VAT declarations at the end of every month, which will be confirmed by the non-EU company through the VAT OSS Web Application and controlled by the Tax and Customs Board. The VAT OSS web application is handled and maintained by the Tax and Customs Board, but integrated into its service by the e-commerce platform.

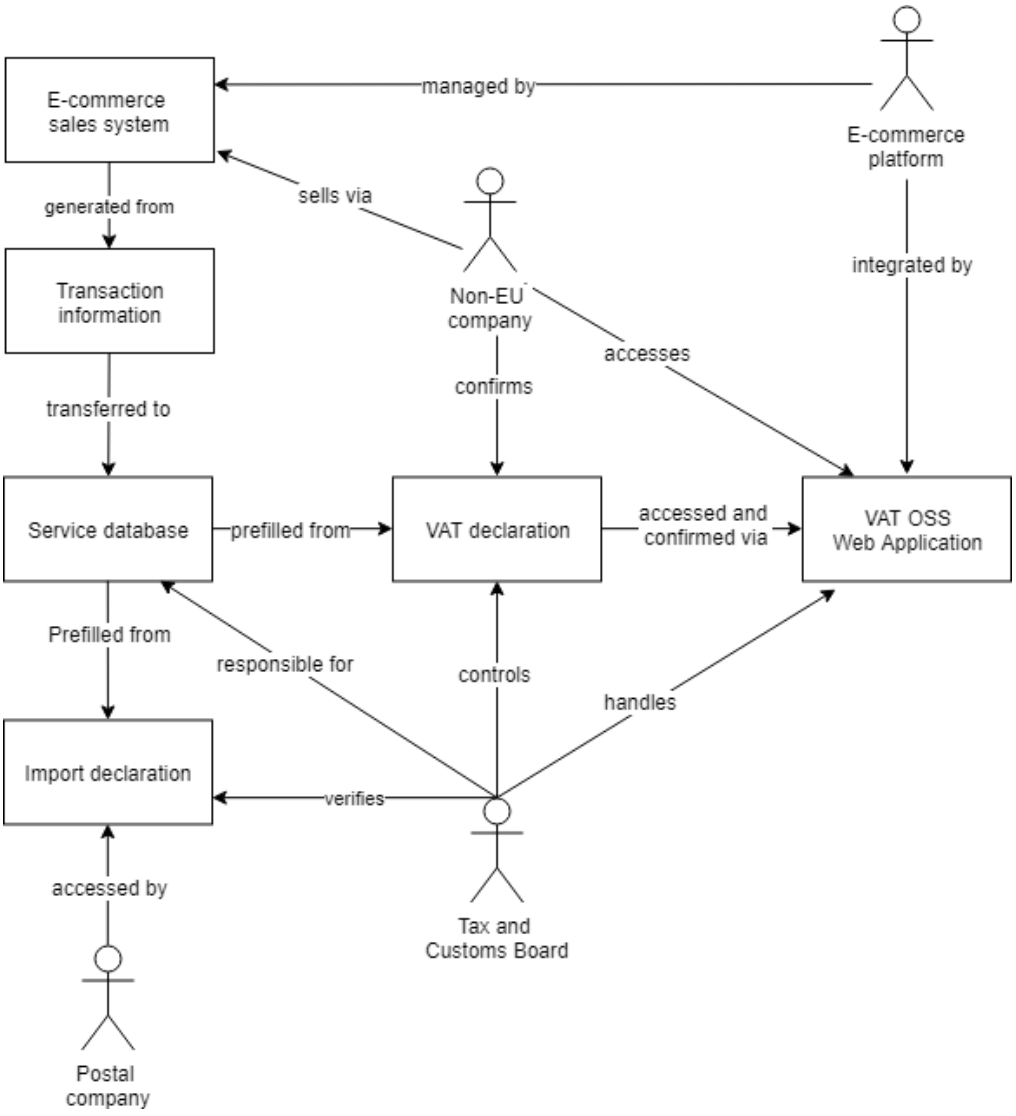


Figure 11: Domain model of the automated VAT OSS system

7.3.5. Business Process Model

Although the previously presented models created a basic framework to understand the automated VAT OSS system, the author believes that in order to understand the innovation and change in VAT declarations in cross-border e-commerce, a bigger picture in terms of the whole process should be perceived. As VAT declarations are a crucial part of cross-border e-commerce transactions, the author finds it necessary to see the VAT OSS system also part as a cross-border e-commerce ordering process. The model also allows to get an overview of how are other indirect stakeholders influenced by the change in the VAT declaration system.

Figure 12 shows cross-border e-commerce sales process together with the integrated VAT OSS system. The process starts with the customer making an order through an e-commerce platform.

The e-commerce platform receives the information, check product availability from available real-time databases and either declines or confirms the order. The systems in place through the help of the tax and customs board then help the platform to automatically detect customer location, the correct VAT amount to be charged and sends the information to the customer, who can finalize the order through a payment. The important note that should be made here is that the tasks of detecting customer's location and correct VAT amount are done by computer systems in less than a second and therefore the customer waiting time is almost unnoticeable.

The payment from the customer goes straight to the non-EU seller, who can hand over the order to the logistics partner for delivery. At the same time information is also sent to the Estonian Tax and Customs Board, who can start handling all the necessary administrative tasks. This means that they register the order number, verify once again the customer location and the order price and then check whether a correct VAT amount is presented in transaction information. The tax board produces a simplified import/VAT declaration that will be sent to logistics service provider and to the tax and customs boards of other Member States to make crossing the borders and releasing the packages faster. The whole process ends with storing all the transaction information in a secure database until the end of the month.

It is important to note that since several stakeholders are exchanging information on a constant basis and therefore every stakeholder can start handling their tasks earlier than before, the whole cross-border ordering and selling process gets a lot faster. Due to information being sent to the logistics provider already once the payment is done and the simplified import/VAT declaration sent to them already when the order is in process, the waiting time for the customer is decreased. In addition, since VAT is charged from customers automatically already when confirming the order, they will not have to take care of any administrative paperwork once the package arrives.

It is important to note that although Figure 12 shows a successful e-commerce transaction, the system also needs to take into account that some of the transactions will be unsuccessful with products being returned. A solution by the e-commerce platform needs to be developed on how the system will manage to transfer information about the returned products to the tax and customs board for VAT deductions. Once the information about a product being returned is being registered in the e-commerce platform's system, it can be forwarded to the tax board for the paid VAT to be deducted from next month's VAT declarations. With the information being forwarded to also customs and postal officials on borders, the returned products should be able to move freely and quickly thanks to the information sharing between stakeholders.

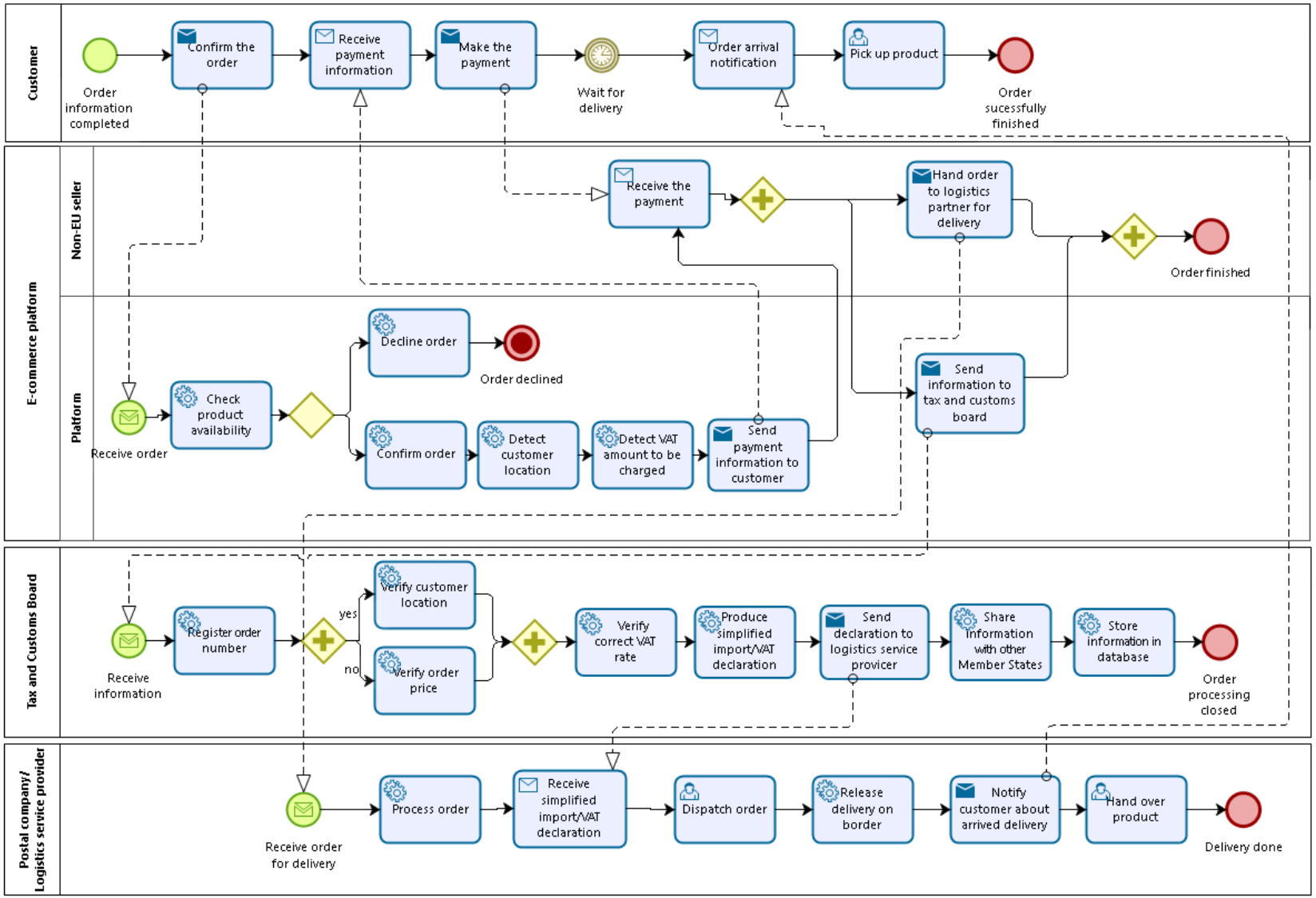


Figure 12: Cross-border e-commerce order process with new VAT OSS system

The process depicted in Figure 12 is being repeated as many times as orders from customers come in until the end of the month arrives, which means that VAT declarations need to be prefilled and confirmed. The process of declaring VAT at the end of every month is shown on Figure 13. The stakeholders in this process are a non-EU company that is selling through an e-commerce platform and the Tax and Customs Board. With the systems being programmed accordingly, the process starts at the end of the month with the tax board retrieving company's VAT information from the database.

With information already being in a correct format and including information about both successful transactions and returned deliveries, it will be gathered together into a prefilled VAT declaration. The declaration will be posted into the VAT OSS web application to be accessed by the specific company. The company receives a notification about a prefilled declaration through the e-commerce platform, enters the VAT OSS web application, logs in with an electronic ID, which enables them to open the prefilled declaration and to verify it. There is still an option to add and edit information if necessary, but if the company hasn't done any sales to EU outside of the e-commerce platform, the information can be assured to be correct.

The company can then confirm the VAT declaration with a digital signature or other method and confirm the VAT payment through a previously chosen payment method (the e-commerce platform has that information already). When the Tax and Customs Board receives the confirmed final declaration and the payment, they can distribute the VAT to the member states where the customers were located and store the confirmed declarations with any extra information needed in the database for a legally required time.

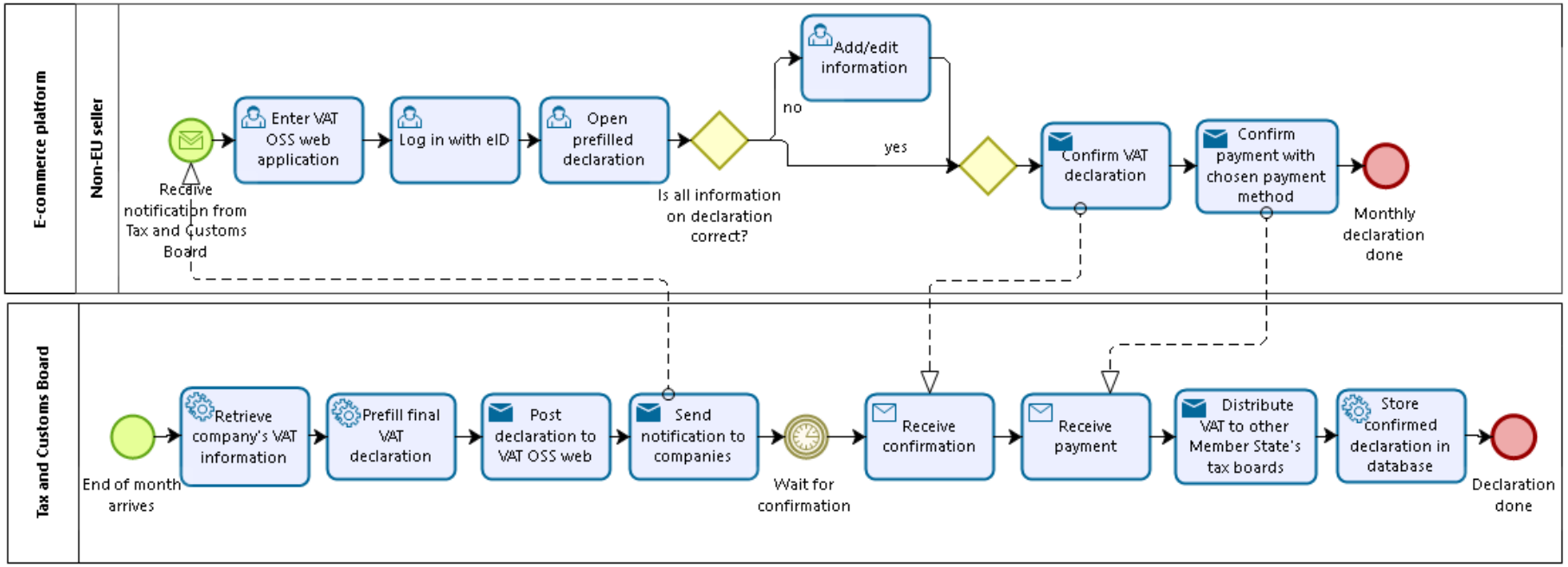


Figure 13: Declaring VAT at the end of the month via an automated VAT OSS system

7.4. Discussion and recommendations

The current chapter provided an overview of the new VAT system for cross-border e-commerce and created a framework for the creation of a new automated VAT one-stop-shop system. With the legal VAT reform initiated by the European Commission already confirmed and going into force in 2021, it is the right time to start thinking about how to find the best way to implement the service in Estonia. Although the legal reform can be in a way seen as a step forward in achieving a better and more efficient VAT system, it also comes with shortcomings that the author believes could be solved through the creation of an automated VAT one-stop shop system by the Estonian Tax and Customs Board in cooperation with multinational e-commerce platforms and aimed at non-EU SMEs.

The system aims to achieve high tax compliance through delivering invisible taxation – a phenomena mentioned in this thesis several times and explained by Langham and Paulsen (2017). Achieving the goal of administrative efficiency means following certain characteristics of good service delivery discussed in Chapters 2 and 3, e.g. efficiency, simplicity, security, functionality, trustworthiness, convenience, etc. It also means taking advantage of the latest paradigms in public administration, such as NPG and including all the relevant stakeholders in the service development processes. This means that the service design should be preceded by a process of conceptualization and defining all the stakeholders that could even indirectly be influenced by it.

While the current thesis provides a good stepping stone for the creation of the new and much needed automated VAT OSS system for non-EU companies selling to EU, extra steps need to be taken to reach a final functional system (planning, developing, testing etc.). Although some legal specification of the new VAT system for cross-border e-commerce will still be specified by the European Commission in the course of a few months, different sources reveal that no big changes will occur and therefore the system framework created in this paper will be applicable in the future with only marginal adjustments.

With the system being a part of a bigger ecosystem, a sociotechnical one, the AOM models presented in this thesis provide a framework to build an agile system capable of responding to the changes happening both in the society, in the legal environment and in technology. The author believes that different developments, especially in technology

should be kept an eye on and innovative technologies, such as cloud technologies and blockchain could be utilized to make the system more efficient. In addition, blockchain technologies could also contribute to assuring the security of the system.

The author recommends that in order to create an automated VAT OSS system, the Estonian Tax and Customs Board should start the process as early as possible and involve different stakeholders in all stages of service design. Since no interviews with non-EU companies were held during the course of writing this master thesis and companies' input was gathered from European Union proposals and analysis, extra attention should be paid to hearing more about the specific requirements and needs of the interest group. Although the need among companies for an automated VAT OSS can be confirmed based on the analysis done in this thesis, further interviews would be beneficial for specifications.

In addition to the contribution provided by this thesis in terms of business development, the author believes that the paper took a step forward from the current literature on taxation and e-commerce. Suggestions have been provided by researchers (e.g. Langham and Paulsen 2017, Ecker, Lang and Lejeune 2012) and organizations such as OECD (OECD 2016, OECD 2014) on how to develop better and more efficient services for tax administration. However, no research has been conducted yet that would use these suggestions for creating a framework for a functional tax declaration system dealing with cross-border e-commerce and aiming to increase tax compliance while benefitting taxpayers.

Moreover, with tax administration in e-commerce being a complex topic, no research yet has implemented newer modelling methods such as AOM and BPMN taking into account all the relevant stakeholders and ecosystem, and innovating the existing services. Therefore, the thesis fills in the gap in current literature by linking together private and public sector and utilizing existing knowledge in current literature and newer modelling methods.

7.4.1. Piloting the project

The author also suggests that as a first pilot project, cooperation between the Estonian Tax and Customs Board and the Chinese e-commerce platform Alibaba could be considered. Alibaba is currently the biggest marketplace for Chinese companies selling

to EU and presents a great platform to reach a high number of Chinese SMEs selling low-value products to EU, who are the most influenced by the new VAT legal reform.

With Estonia and China having recently signed two Memorandums of Understanding on e-commerce and ICT (ERR 2017), the political situation couldn't be better. In addition, cooperation is already underway between the Estonian Government and Alibaba with a meeting held in Januray 2018 in Davos between the Estonian Prime Minister and the President of Alibaba Group (ERR 2018a) and a follow-up meeting in Beijing in April 2018 (ERR 2018b). In addition, the Estonian postal company Omniva already has existing partnership with Alibaba in logistics (Omniva 2016).

The author sees that the system proposed in this thesis could in addition to the benefits pointed out in Chapter 7.2, be in align with their interests of making cross-border e-commerce faster and more efficient and to deliver products to anywhere in the world in under 72h (Xinhua 2017). With Alibaba and its CEO Jack Ma being the biggest promoters of an Electronic World Trade Platform (eWTP), which aims to create a borderless e-commerce shopping experience (Alibaba Group 2016), and the new VAT legal reform creating more barriers for e-commerce between EU and non-EU countries, innovative systems such as the one proposed in this paper could help Alibaba and other relevant stakeholders to achieve their goal.

One important aspect that need to be taken into account when cooperating with Alibaba or any other non-EU e-commerce platform, is that differently from Estonia, many companies selling through these platforms don't have an electronic identity card or other similar means that would allow them to digitally sign documents. Therefore, work in the field needs to be done to reach mutual agreements in terms of what kind of security standards need to be met in order to make already existing electronic authentication methods qualify as secure and legally valid digital signatures.

Based on the legal requirements of the People's Republic of China, users of Alibaba must register through a thorough process, which requires them entering detailed information about their company and their own identity. Due to the strict regulatory mechanisms, the e-commerce platform already has enough information about the company registered on the platform and is providing also secure methods for identification (passwords, fingerprints, biometrics). Legal adjustments in Estonia may have to be done though to reach a consensus about whether those electronic identification methods are enough to

meet Estonian legal and security standards. At the same time it is important to note that cooperation in the field of eID and establishing a mutual trust mechanism for electronic identification is already underway between Estonia and China (YiCai Global 2017).

8. Conclusion

Cross-border e-commerce and tax administration have both in recent decades shown significant advancements in terms of service provision and integrating new technologies, but despite that, problems in both areas still exist. With cross-border e-commerce aiming at high speed and efficiency, the biggest problems cited by stakeholders concern VAT obligations that are applied on crossing the borders.

Due to the persisting problems in the current VAT system for cross-border e-commerce and the perceived need for improvements, this thesis aimed to develop a framework for an automated VAT one-stop-shop system developed by the Estonian Tax and Customs Board in cooperation with multinational e-commerce platforms and aimed at non-EU companies selling to EU customers. Through defining the current challenges in today's VAT declaration process and analysing the new VAT legal reform going into force in 2021, the author defined the features, goals, roles and processes of the new desired system and provided an answer to the main research question by delivering a set of recommendations for a successful development of the system.

The thesis firstly gave an overview of current situation in research and defined key characteristics of good services in tax administration and e-commerce and thus set the main theoretical goals for the developed system. Since the main idea to develop the automated VAT OSS system was inspired by two different factors – the problems in today's system and the new VAT legal form initiated by the European Commission – the analysis consisted of two parts: analysing the current system and the system that could be applied since 2021.

Analysis of European official documents and of interviews conducted with several stakeholders provided an answer to the first research sub-question and revealed that today's VAT declaration system is problematic from several aspects and causes dissatisfaction among companies, customers, tax authorities and logistics providers. The system was considered as financially burdensome, complex, time-demanding, inconvenient, not integrated and uncertain. While the system is strongly opposing the characteristics of good service provision, it moreover fails to achieve the main goal of tax administration – compliance – and falls short to achieve the aim of invisible taxation.

The European Commission has also recognized the problems in today's system and proposed a legal VAT reform that will in some ways solve the current issues while aiming

at higher compliance, but which makes doing business in EU more complicated for non-EU companies and gives higher responsibility for VAT compliance to international e-commerce platforms. Through analysing the legal changes that will occur since 2021, the author provided an answer to the second research sub-question by defining specific changes in the system and their results for the future.

While the proposed automated VAT OSS system answers to the challenges in the current system and also in the new system being implemented in 2021, the system aims to use excellent service design and fulfilling the needs of relevant stakeholders. The framework and models created for the development of the automated system provided an answer to the third research sub-question and aim to create an efficient, simple, secure, functional, trustworthy and convenient system capable of adapting to changes. Since the system is a part of a bigger field of cross-border e-commerce, the innovation of the system was also shown through answering to the last research sub-question by illustrating how the system is applied into the bigger cross-border e-commerce ordering process.

The models and recommendations for the automated VAT OSS system provide answer to the main research question established in the beginning of this thesis and provide a good stepping stone for the creation of an agile and functional system. The paper pointed out that the automated system could benefit the Estonian Government, non-EU companies selling to EU, e-commerce platforms, and other stakeholders like customers, logistics providers and the tax boards of all Member States.

Further analysis should be done on how to control the movement of goods through implementing new technologies such as blockchain on supply chain and how to integrate also smaller e-commerce shops into the system. For future research and business development, the author also recommends to look into customs tariffs and procedures and into how to integrate them in the automated system. Since the automated VAT system proposed in this thesis can only be applied to consignments valued under 150€ due to legal restrictions, there is still a need for a system that would manage to simplify also customs procedures that are applied to products over the 150€ threshold. With customs and VAT having different procedures and legal requirements, this field demands for even more analysis and research and perhaps even legal changes on the governmental level.

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