

THESIS

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Problems of Customs Tariff Regulations in Ukraine and the Application of Electronic Customs Innovations. Evidence from Ukraine

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PREFACE

Despite the complexity of the circumstances and the lack of access to the documents from Ukrainian state institutions to find the needed information for thesis, I am glad that I chose such a challenging and relevant topic. I would like to express my gratitude to Taras Shevchenko National University of Kyiv and Nord University for such a great opportunity of joining this double-degree program and for all the knowledge that I received during this program. I am grateful to all those who kept supporting me during my thesis work. Everyone including the professors, staff members and my groupmates. I would like to separately express my sincere gratitude to my supervisor – Chamara Kuruppu from Nord University, for being responsive, patient and understanding throughout the whole thesis writing. I want to also thank Veronika Vakulenko for constantly helping me. Lastly, I am grateful to dear professors from Taras Shevchenko National University.

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Abstract

International integration into the global economic processes involves active implementation of information technologies in customs operation. The goal of this thesis is to thoroughly analyze the practical aspects of functioning of electronic customs solutions in the customs of Ukraine, to assess the impact of information technologies on the development of customs affairs in the state. The work uses the methods of critical analysis, scientific abstraction and generalization, methods of comparison to highlight and solve topical issues of the introduction of information technologies into the customs practice of Ukraine.

The planned implementation of electronic customs innovations in all spheres of activity of the customs system of Ukraine is hindered by: lack of an agreed position on mechanisms introduction of electronic exchange of information between governing authorities; lack of intrastate communication between the customs authorities of Ukraine and the controlling authorities, which makes it impossible to exchange permit documents; failure to resolve the transition to electronic document management and the creation of a single global system of "electronic government" with numerous subsystems; the imperfection of legislation in the field of electronic declaration and electronic document flow, after all current legislation is focused on paper-based documentation.

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Title: Problems of Customs Tariff Regulations in Ukraine and the Application of Electronic Customs Innovations. Evidence from Ukraine

1. Introduction

The thesis is devoted to an analysis of the current problems of Customs Tariff Regulations in Ukraine and the Application of Electronic Customs Innovations as a response to the existing problems in Ukraine's customs policy. The operation of Ukraine's state customs service and certain tariff regulations are being widely discussed among scholars (Pashko, Shevchuk, 2019; Skorobogata 2017; Storozhuk, Savych 2017; Mykuliak, Stefanyshyn, 2019; Chernetskaya-Beletskaya, Sevruk 2015 and others). The scope of the problem appears to be broad as scholars bring up numerous problems that are to be thoroughly analyzed in the thesis. The present economic situation and the constant growth of trade volume of Ukraine in the light of deepening economic integration with EU states require an adequate response to the deficiencies in the Ukraine's customs. Summing up all the mentioned problems, the main premise would be that the tax procedures in Ukraine are overly complex, expensive, and last too long. Ukraine geographically has an advantageous location being a transit territory, yet it is losing its benefits due to complex legal and organizational situation in customs clearance (Martyniuk,2010).

Most of the scholars dealing with Ukraine's tax & customs studies find that introduction of e-technologies to customs operation and clearance process is inevitable process (Pashko, Shevchuk, 2019; Skorobogata 2017; Storozhuk, Savych 2017; Mykuliak, Stefanyshyn, 2019; Chernetskaya-Beletskaya, Sevruk 2015). Though, there are quite a few restraints that are holding back the implementation of e-customs solutions in Ukraine. Most of these problems have general nature and can be referred as dilemmas as they can be applied to pretty much every country with open economy does not matter whether this country has implemented the electronic customs solution or not. Such

dilemmas comprise the factors like confidentiality issues, technical constraints, high implementation costs and usefulness of e-customs in general. (Ajzen & Fishbein, 1975; Dawes, 1996; Lyytinen & Damsgaard, 2001; Riel, Liljander, & Jurriens, 2001; Rogers, 2003; Urciuoli et. al., Mykuliak, Stefanyshyn, 2019).

1.2 Importance of the research

The analysis of the application of e-customs procedures is important considering the ongoing digitalization processes. Furthermore, the main outcome of fully-implemented e-customs is a streamlined customs clearance which is highly desirable goal for all customs services.

A substantial volume of trade between Ukraine and the EU states necessitates fast and transparent customs clearance procedure. That is considering shifting trade counterparties of Ukraine with greater inclination towards EU states. It is important to acknowledge that prospects for trade growth have not exhausted all opportunities yet. Based on such premise, the thesis is relevant to the ongoing discussion on e-customs implementation worldwide.

1.3 The research questions

That is why the main questions under investigation are
a) how electronic customs can optimize the work of Ukraine State Customs Service (UCS) and b) what are the main concerns pertaining to the implementation of e-customs solutions in general and in Ukraine specifically.

Thesis entails a multitude of other issues that will be answered to assess the appropriateness of the potential introduction of fully-fledged e-customs in Ukraine. The transition of customs system and introduction of new technologies is a vital step towards

optimization of a day-to-day operations of the customs agency the presence of previously highlighted concerns regarding its implementation makes the problem acute and certainly interesting for deeper analysis.

The subject of study is the e-customs solutions and the issues pertaining to its implementation, whereas the object under investigation is Ukraine's Customs Service as the body that deems to utilize the e-solution. In the thesis main hypothesis stating that e-customs solutions optimize the operation of customs by speeding up the customs clearance process, ensuring transparency and security. The central purpose to this work is to analyze the problems related to e-customs implementation and efficient use of customs tariff regulations.

1.4 Objectives

The thesis aims to demonstrate the key features of e-customs as well as to analyze the scholarly debate concerning the e-customs implementation with an experience of countries that already introduced e-customs solutions and highlight the facilitators and barriers for e-customs adoption. Throughout the work on e-customs implementation in Ukraine the roots of this debate along with the potential benefits and hindrances to full-scale introduction of e-customs solutions in Ukraine specifically will be analyzed. Based on the findings the conclusion will either approve or disapprove the main hypothesis of this work.

1.5 Thesis contribution

The thesis will contribute with full range of qualitative analysis on the issues pertaining to implementation e-customs policies. Namely, this work will contribute to ongoing discussion on the main concerns pertaining to implementation of e-customs solutions in the countries with transitional economy. This thesis will provide an in-depth analysis of e-customs implementation in Ukraine. Furthermore, the current e-customs developments are to be presented and assessed. The reasoning behind implementation of e-customs will be provided. Lastly, the projections for development of B2G (business-to-government) are to be highlighted.

II. Definition & Literature Review

2.1 E-customs defined

To proceed further with the research, the main notions are to be defined. There is no single definition for electronic customs as various scholars bring up various definitions highlighting different aspects of e-customs. A. Erceg (2014) states that *e-customs comprise from different activities which are used for a safe exchange of goods, services and information using computers and modern information and communication technologies.*

P. Pashko and V. Shuliak (2007) support this view as they also highlight the security features of e-customs saying that *Electronic customs is a system of the state's principles and directions in the sphere of guaranteeing its interests and security through customs-tariff and non-tariff measures regulating foreign trade.*

Whereas scholars like O. Mykuliak and R. Stefanyshyn underline the simplification and transparency when defining e-customs: *e-customs – is a new approach to regulation of foreign economic activity that simplifies the process of customs tariff control and makes it significantly more transparent. Furthermore, e-customs reduces the time for customs clearance and allows to conduct customs procedures in one place, in any time.*

We suggest all-encompassing definition for e-customs – is a set of automated solutions for customs agency aimed to ensure the safe and prompt movement of goods, increase transparency and to streamline foreign economic activity. This definition concisely explains the main purpose and key aspects of the electronic customs.

2.2 Literature Review

The problems of Customs Tariff Regulations in Ukraine in the light of general transformation of Customs procedures worldwide are subject to a fierce debate among

scholars (Pashko, Shevchuk, 2019; Skorobogata 2017; Storozhuk, Savych 2017; Mykuliak, Stefanyshyn, 2019; Chernetskaya-Beletskaya, Sevruck 2015 and others). The problem is well described by Martyniuk: despite all positive features (of Ukraine's customs), the tax procedures in Ukraine are overly complex, expensive and last too long. Ukraine geographically has an advantageous location being a transit territory yet is losing its benefits due to complex legal and organizational situation in customs clearance. Finding the solution should become an important reserve for increased incomes to a state treasury. Even though the scholars highlight the problem of inefficiency of Ukraine's customs policy, the objects of criticism tend to differ from one another.

L.Skorobogata draws attention to Ukraine's inability to withstand against fraudulent activity on the customs, especially the manipulations with a declared value of goods and creates a framework for value manipulations on Ukraine's Customs. P.Pashko teams up with S.Shevchuk, 2019; and V.Shulyak, 2007; and criticizes the current order for existing imperfections in customs regulations and a poor system of information supply for the operational service of the agency; a weak level of managerial processes exacerbated by inappropriate material and technical base; a low level of unification of customs technologies and poorly performed cooperation with companies involved in foreign economic activity; lack of strategy or conception for realization of customs policy considering the global concerns and internal socio-economic disbalances. They admit that the current customs regulations might be workable, but the poor implementation creates a central problem to this issue.

As the solution authors recommend: first of all, to update the current technical base to increase efficiency and transparency, they recommend to consider the experience of EU states implementing electronic customs especially considering the Ukraine's determination to deeper integrate with the EU. Secondly, scholars and experts recommend the institutional restructuring switching certain responsibilities between the institutions and introducing e-technologies to streamline the cooperation between the institutions.

O.Mykuliak and R. Stefanyshyn are calling for the implementation of IT-technologies for customs practices in Ukraine criticizing the current system for a lack of

transparency and openness of clearance procedures, slow clearance procedure, corruption, absence of impartiality, intrusion in customs operations, lack of motivation in the agency and the need to operate 24/7/365, improve the business climate in Ukraine and the equal distribution of workload among the agents considering their specialization and qualification. As a solution authors advice sticking to the EU ‘Single Window’ Customs system, thus they support harmonization of Ukraine’s customs system to the EU standards and analyze the hindrances for the implementation of e-customs in Ukraine.

N. Chernetskaya-Beletsakaya and K. Sevruck complement the ideas of Mykuliak and Stefanyshyn saying that the way how Ukraine’s customs operate is dated and requires not only a new information department, but needs the changes in executive board in the central apparatus of Ukraine’s State Customs Service. Scholars admit the pressure of the international institutions and governments pertinent to e-customs implementation and the need for Ukraine’s government to gain the legitimacy in eyes of international actors. (Petrov,2020; Kril,2021)

When it comes to e-customs, the scholars mainly analyze the process of implementation (Nguyen et al.,2021; Erceg, 2014; Salamzadeh et al., 2015; and others). S. Henningson and H. Henriksen are analyzing the implementation of e-customs in EU and show that from the user’s prespective e-customs in EU are still not perfect when it comes to cutting transaction costs. There is also a lively discussion on how to theorize the e-customs issue. Previous works applied DOI – diffusion of innovation theory that aims to explain the enablers and barriers to the use of e-customs solutions (Urciuoli et al., 2013; Raus et al., 2009, Gilbert et al.,2004, Mykuliak ,Stefanyshyn, 2019). The theory of Technology Acceptance Model (TAM) and the Theory of Reasoned Action was considered by the pioneers of the study. (Ajzen, Fishbein 1975; Davis, 1989). A semiotic theory was used by Henningsson and Bjørn-Andersen to explain the process acceptance of e-customs solutions by less-developed countries (LDC’s). The theory is concerned with signs and/or signification (the process of creating meaning) in the certain decisions (Henningsson, Bjørn-Andersen, 2009). Raus (2010) in her work chose TOE Model comprising (1) technology, (2) organization, (3) environment. According to the creators of the theory DePietro, Wiarda, Fleischer (1990) *the main focus of the technological context is on how*

technology characteristics themselves can influence the adoption process. The organizational context considers and describes the characteristics of an organization is size, structure, quality of human resources, etc., and looks at the structure and processes of an organization that constrain or facilitate the adoption and implementation of innovations.

In this thesis the diffusion of innovations theory will be applied. According to the theory suggested by Rogers (2003), there has to be an innovation: *The innovation-development process consists of all of the decisions, activities, and their impacts that occur from recognition of a need or problem, through research, development, and commercialization of an innovation, through diffusion and adoption of the innovation by users, to its consequence.* For further analysis we need to assess the innovation in 6 steps: 1) identifying the need or problem, 2) basic and applied research, 3) development, 4) commercialization, 5) diffusion and adoption, 6) end consequences (Rogers, 2003; Raus, 2010).

When analyzing e-customs implementation scholars brought a myriad of reasons for the implementation and a substantial factor against. The most frequently voiced reasons for are cost-savings, ease of use, reliability, time and usefulness. (Davis, 1989; Dawes, 1996; Overbeek, Klievink, Hesketh, Heijmann, & Tan, 2011; Raus et al., 2009, Chernetskaya-Beletsakaya, Sevruk, 2015; Mykuliak, Stefanyshyn, 2019). However, rather exotic evidence like ecological purposes (Henningsson, Henriksen, 2009), streamlined operation during the war or pandemics turned out to be extremely relevant in case of Ukraine. (Baida et al., 2007, Henningsson, Bjørn-Andersen, 2009).

As for the hinderances, the most frequent ones are confidentiality issues, technical constraints, costs and usefulness (Ajzen & Fishbein, 1975; Bharosa et al., 2013; Choi, 2011; Gilbert et al., 2004; Lyytinen & Damsgaard, 2001; Riel, Liljander, & Jurriens, 2001; Mykuliak, Stefanyshyn, 2019). The most frequently mentioned pros and cons for e-customs adoption based on this research you may find in the table below.

Strengths	Weaknesses
Speeding up document processing.	Reforms are required.
Control.	Technical issues.
Transparency.	Implementation costs.
Lowering the transaction costs for business.	Issues of confidentiality.
Lower costs for document processing at customs.	Need to do trainings to the personnel.
National security.	Lack of interest among Ukrainian business
Economic security.	Availability of working corruption schemes and direct opposition to reforms among involved actors (in Ukraine).
Ease of use	
Ecology	
Great importance for countries in war and during the pandemic.	

Table 2.1 Pros and Cons for e-customs adoption

Using the aforementioned literature and diffusion of innovations theory the thesis will analyze the current problems of Customs Tariff Regulations in Ukraine and the Application of Electronic Customs Innovations.

2.3 Theoretical framework

The vital for the analysis is to choose an appropriate theory the most frequently used in scholarly debate in the field of e-government is diffusion of innovation (DOI) theory (Rogers, 2003; Nguyen et al., 2021; Raus et al., 2009). The theory was developed in 1962 to explain the processes of adoption and diffusion on innovations (Rogers, 2003). The theory is grounded on the attributes of innovation and considers the users' view of these attributes as a key factor deciding if the innovation will be implemented. The theory explains that there are five attributes of innovation and each one represents a certain aspect that innovation under investigation is analyzed against. These attributes are relative advantages, complexity, compatibility, trialability and observability. The relative advantage stands for the degree to which an innovation is perceived as better than the idea it supersedes (Rogers, 2003; Nguyen, 2021). The second aspect is 'complexity' defined as the degree to which an innovation perceived as difficult to understand and use. Next one is 'compatibility' which is explained as the degree to which an innovation is perceived as being consistent with existing values, past experiences and needs of potential adopters. The fourth aspect is 'trialability' that stands for the degree to which an innovation may be experimented on a limited basis, i.e. the degree to which user e.g customs officer or any other user believes that there are possibilities to experiment with an IT application on a limited basis. Lastly, there is an aspect of 'observability' which is a degree to which a user (e.g. customs officer) can observe an IT application and tell others including his colleagues about its main features (Rogers, 2003; Nguyen, 2021).

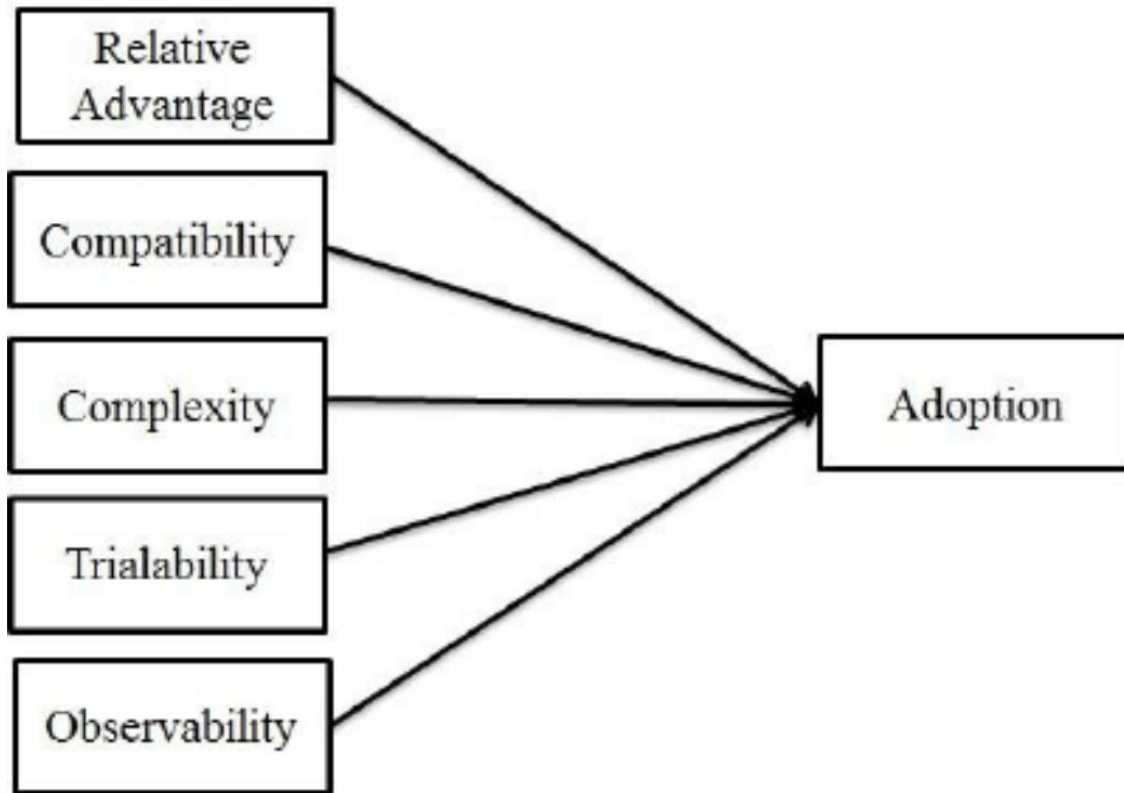


Figure 2.2 Diffusion of Innovations Theory (Rogers,2003)

All in all, E.Rogers concludes that innovations offering more relative advantage, compatibility, simplicity, trialability and observability will have a better chance to be adopted and the implementation period will be shorter.

These ideas are supported by David et. al., 2019

III. Methodology

3.1 Research philosophy

The term research philosophy refers to a system of beliefs and assumptions about the development of knowledge (Saunders et al., 2015). The research philosophy comprises assumptions of various kind, assumptions based on human knowledge (epistemological), assumptions formed during the research process (ontological) and the extent to which researcher's own values impact the research process (axiological). The

understanding of own research questions is shaped by the assumptions researcher is using. It is highly important for the researcher to assure a good level of reflexivity to understand and build the relations between philosophical position and how the research will be undertaken (Alvesson, Sköldbberg, 2000).

The main philosophical positions in social sciences study are: internal realism, nominalism and relativism (Easterby et al. 2015, p.140-141). The internal realism relies on the assumption that there is a single reality however it is not fully accessible to the scientists who can only ascertain the indirect evidence from fundamental physical processes (Putnam, 1987). The nominalist ontology provides that no truth and facts were created by a human and relativists state that different individuals can treat the phenomenon differently and the facts are affected by one's viewpoint (Easterby et al. 2015).

The nature of the research on the e-customs implementation presupposes the use of epistemological approach aiming at gathering the available information to either approve or disapprove the main rationale of the research (i.e. figuring out if the use of e-customs solutions is a sensible solution in general and its applicability in Ukraine in particular). Furthermore, following the guidance on the social science research conduct, it must be acknowledged that social constructionism and positivism are crucial in defining the research approach. The main premise of social constructionism is that factors of social reality are defined by people, whereas in positivism these factors are identified through independent (of social actors) metrics which is an objective modality that can clearly be measured.

Naturally, in social science study both paradigms are frequently used together. This thesis will incline towards positivism aiming to highlight the measurable impact of implementation of e-customs. Relying on this methodological toolkit the research will be conducted.

3.2 Research Design

There are multiple research design types: descriptive, causal (or explanatory), and explorative. Descriptive approach is used when the author intends to describe certain phenomenon using data collected throughout the research process. Causal research commonly referred as explanatory research analyses the cause-and-effect link between the different situations that are pertaining to the topic in question. Researchers can utilize statistical data and relevant formulas to prove the hypothesis. For instance, Pearson correlation can easily be adapted to prove the interrelation between measurable (thus, quantitative) parameters of the study. Explorative research is the approach that is likely be applied to the phenomenon that has not been defined clearly, as it often based on qualitative methods of analysis. Explorative research answers why, what and how questions and aims to find new aspects of the phenomenon. (Mitchell, Jolley, 2007). Moreover, it also aims to find cause-and-effect relations the way causal research does, however the toolkit used in explorative research is different.

The descriptive approach will be utilized in the first part of the thesis to introduce the reader to the crucial importance of efficient work of Ukrainian customs and the evident problems of Ukrainian customs. The explanatory approach will also be used to explicate some points that may not be obvious for non-experts. The rationale behind using explanatory approach is to highlight the relations between certain variables as for instance use of e-customs solutions and increased operations efficiency.

The research strategy is the way how the researcher will approach the research question(s) in his or her work. Also, it is the methodological link between philosophy and subsequent choice of methods to collect and analyze the data (Denzin, Lincoln, 2011). These methods include, but not limited to methods like :case study, survey, archival research, experiment, action research, etc.

While analyzing the implementation of e-customs innovation, the case study of Ukraine was selected due to ongoing nature of the process of transformation from paper-based to e-customs solutions in Ukraine. This choice provided the author with a few issues that are considered and discussed among policymakers, customs workers and businesses that are heavily involved in foreign economic activity.

The empirical investigation will be conducted in order to grasp the context of the analysis and unveil the topic that previously was only rarely considered. The cross-sectional approach constitutes the essence of this research. Meaning that it covers only a particular phenomenon within a designated time and space. This work is based on data sourced in the period from November 2021 to February 2022 which is fairly short period to unequivocally claim the applicability of this case study in all other cases. The further works still have a room for better study and assessment.

3.3 Data Collection Strategy

As for data collection strategy the qualitative research method was chosen to be utilized in this work. In qualitative research, the researcher is the main responsible for gathering the words or pictures, analyzing them, focuses on the language of participants, and describes different processes (Creswell, Poth, 2017). The qualitative research comprise a multiple options for data collection. Data can be collected through interviews, content analysis, document analysis, ethnography etc. Considering the current circumstances and time limitations the only sensible approach to analyze the process of e-customs implementation in Ukraine was to apply documentary and literature analysis as well as own observations.

In this research the author relies on primary sources such as government bills and reports, statistical data from the official resources together with secondary sources scholarly articles from scientific journals both from international and Ukrainian authors to grasp the interpretation and sentiment towards Ukraine's customs service operation and introduction of e-solutions in general.

3.4 Data Analysis

The process of data analysis is much interconnected to the process of proposition development and verification. In essence, the qualitative research depend on aspects like: qualitative data, social interaction that are very likely to be more varied and less precise

comparing to quantitative data. Analysis and understanding of the data therefore need to be sensitive to the characteristics to be meaningful (Easterby-Smith et al., 2015).

Researchers commonly utilize the inductive and deductive reasoning principles to analyze the way the work conclusions are drawn. In this work the deductive approach will be used that presumes that the conclusion stems from a set of premises and the conclusion being true when all premises are true. Deductive approach was chosen to ensure that research questions will be fully covered and research mission to be completed.

Considering a vast scope of data used, the data was properly processed, similar discussions should be aggregated and respective priorities set to make work concise, reader-friendly and to ensure that main objective of this research is reached.

3.5 Ethics, validity, and reliability of the research

Ethical aspect is an integral part of each scientific work. The entire process of completing this work goes in line with the Code of Conduct and respects the principles of impartiality and fairness.

Validity and reliability aspects can easily be misinterpreted thus it is necessary to draw a red line between both. Reliability questions the transparency of data collection and interpretation, whereas validity questions if the study clearly gains access to the experience of those in research setting (Easterby-Smith et al., 2015). The researcher's goal is to ensure high standards of validity and reliability of his work by collecting only pertinent high-quality data.

When it comes to reliability the key goal for the researcher is to make his work applicable for the analysis in the different circumstances. The ability to replicate this research by other researchers or in other time and/or situation reflects a good level of reliability of the research.

Usually, scholars differentiate the notion of research validity between internal and external research validity. Internal validity assesses the result of the entire research process so to ensure internal validity, whereas external validity is preoccupied with

generalizability of the research. This works included certain adjustments to ensure good level of validity of the research.

4. Research Context

This chapter is meant to give a brief overview of e-customs implementation in Ukraine, describe the government authorities responsible for implementation of customs policy and highlight the main dilemmas of customs implementation worldwide. This information will provide for a better understanding of the research context.

4.1 State authorities regulating Ukraine's Customs Policy.

The direct responsibility for e-customs implementation in Ukraine is a prerogative of the State Customs Service of Ukraine (SCS). Entire activities of the institution are directed and coordinated through Ministry of Finance of Ukraine (MoFin) that in turn are subordinated to the Cabinet of Ministers of Ukraine (CabMin) which is the top-rank institution in the executive branch. The institutional hierarchy is displayed below.

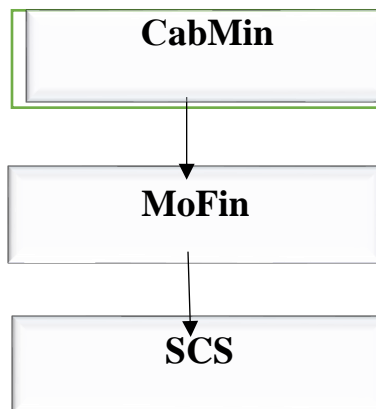


Figure 4.1 Customs Policy implementation hierarchy

The primary goal of the State Customs Service of Ukraine is the implementation of state customs policy and proposal submission to the Ministry of Finance regarding proper implementation of state customs policy. Both activities are meant to ensure customs security, protection of customs interests of Ukraine and creation of advantageous

environment for foreign economic activity, balancing between tax control and lifting tax burdens, ensuring the implementation of state policy on customs as well as the prevention of smuggling and other fraudulent activities.

4.2 E-customs implementation in Ukraine.

Ukrainian authorities follow a clear path of cooperation on simplification of customs procedures. The initial steps were completed more than decade ago when Ukraine became a signatory to the International convention on the simplification and harmonization of customs procedures in 2006, and in 2008 the Cabinet of Ministers of Ukraine embarked upon creation of e-customs when Resolution 1236 “On creation of multifunctional and complex system: Electronic Customs”(Mykuliak, Stefanyshyn, 2019).

So far, Ukrainian customs authorities managed to lay the groundwork (eco-system) for e-customs implementation through Unified automated information system of customs service (UAIS) that comprises the Automated system of customs clearance (ASCC), Automated information system “Tsentr” (AIS “Tsentr”) that comprises minor subsystems (e.g. the database for copies of cargo vehicle customs declarations (CCD)), etc.) and serves as a central program for storing customs data. This framework of programs provides for: a) collection, systematization, and processing of the information ready for further analysis and customs statistics; b) automated support during customs controls and clearance; c) automated system of risk-management through completion of risk-profiles for further utilization and fraud mitigation; d) general managerial support: e) general data protection and sensitive data access limitation. (Koposov, 2011)

This UAIS eco-system provides for streamlined customs operations, however it neglects the possibilities for interaction with external actors (e.g the frequent users of cross-border trade).

In 2019 the Parliament of Ukraine (Verkhovna Rada) passed a law no.78-IX : “On Common Transit Regime and the Introduction of National Electronic Transit System aimed at harmonization of Ukraine’s legislation in relation to the Convention on procedure of common transit regulations in frame of EU-Ukraine association agreement

(MOF.gov.ua, 2021). Such changes significantly optimized the operation of Ukraine Customs Service as from this period onwards Ukraine obtained the possibility to submit the transit declarations by electronic means via New Computerized Transit System between signatories to this agreement. In fact these are the 35 states including EU member states, all EFTA member states (Norway, Liechtenstein, Switzerland and Iceland and the remaining 4 countries including Turkey which has maritime border and one of the highest trade volume with Ukraine. Furthermore, such reform will allow to exchange the information online on transited goods using a common customs declaration and a single financial guarantee for the movement of goods from the country of departure to the country of destination, which are Contracting Parties to the Convention (MOF.gov.ua, 2021).

For example, for the movement of goods from Ukraine to UK or from Poland to Ukraine, one transit declaration will be drawn up according to common regulations with the provision of a single guaranteeing document. A single declaration will be valid for the customs authorities of all listed countries through which the cargo will pass. The main rationale behind signing this Convention is to receive reliable information about the transit movement of goods bound for Ukraine from the customs authorities of the countries participating in the Convention before the import of these goods into the customs territory of Ukraine.

4.3 Dilemmas of e-customs implementation.

Main dilemmas of e-customs implementation in Ukraine are similar to the countries experiencing transit to fully-fledged e-customs. The need for reforms is a significant obstruction as such factor are always time-consuming. Legal aspects behind such innovation should also be considered as the establishment of new practices in customs policy inevitably will require an intervention and amendments to current legal framework. Slowdown in regulation execution is likely to take place as the likelihood of missing link between innovation development and innovation adoption is always high in such cases.

Another key aspect are technical issues with the implementation and limitations of digital solutions. The proper operation of customs service is crucially important for country's external trade activities and possible disruptions related to the process of transition to a new digital solution that in turn will require practical implementation in order to do troubleshooting. The digital solutions have their limits and not all regulative changes can be expressed electronically in the same manner (Raus,2011). In addition to that, in Ukraine Customs service not all internal processes related to document processing shifted to electronic hardware. Thus, despite the positive aspects of e-declaring in Ukraine, numerous customs processes are still based on paper documents which is inconsistent with technical progress and efficient global practices (Uhryn,2018).

No wonder, the implementation costs of e-customs are significant. It is not only the direct expenses on creation of specialized software with sufficient level of data protection, but also hardware procurement for the implementation of this reform. As Customs Service of Ukraine is characterized by imperfections of customs regulations and information supply systems for operational activities and poor-quality management processes due to low capacity of available hardware (Pashko, Shevchuk, 2019). Furthermore, the expenses on maintenance and continuous update of software for implementation of e-customs presents constant long-term expenses. Last but certainly not least are the staff training expenses those refer not purely to financial aspect but also timewise, especially while considering the introduction of new tools when entire staff must complete the trainings. As it was previously highlighted the introduction of new processes will inevitably lead to operations disruptions that is a significant problem for customs service operations.

The dilemma of data protection is not widely considered however, the importance of data protection is vital. At this point we are not talking about individual data protection, which is undoubtedly important, but now we should consider business secrecy and even state security. The military and high technology sectors frequently use secret procurements, thus the data that customs service is processing is extremely sensitive. The transparent operations of customs service is prerequisite for facilitation of cooperation between customs service and private sector. Currently, the lack of trust in private sector

to Ukraine's customs authorities halts the further development of framework for cooperation between the private traders and government (Storozhuk, Savych, 2017).

The e-customs reform implementation modality is a significant dilemma as it touches the approach to reforms in the customs sector of Ukraine. Should it be solely the implementation of EU standards for e-customs in line with legislature harmonization expectations or should there be any local developments utilizing own capacities and experience? On the one hand application of European e-customs solutions might be taken out of the context and introduced into another setting (Henningsson, Bjørn-Andersen, 2009). Yet, on the other there is a detailed guidelines for implementation with proper benchmarks for performance-measurement. These guidelines may facilitate quicker adoption of the reforms excluding the discussion points that are covered by the guidelines. However, the guidelines were not tailored for Ukraine's legislature and that is a critical point when concerns may arise.

Abovementioned issues present the most important topics for discussion while considering the e-customs innovations and reforms. The next chapter with empirical part of the work will display how each e-customs implementation dilemma is being approached in case of Ukraine.

5. Implementation of e-customs. Empirical findings

This chapter aims to present the key empirical findings and contributes to discussion on e-customs implementation. The research provides an analysis of theoretical reasoning behind the adoption of e-customs as well as its practical implementation and respective concerns. In the first part of the chapter the Diffusion of innovations theory will be utilized to assess the efficiency of e-customs solutions implementation in Ukrainian context and discuss the present concerns. In the second part of the chapter the practical importance of the current developments in Ukraine's customs policy with particular

attention to the New Computerized Transit System (NCTS) and prospects for further reforms in the Ukraine's customs.

5.1. Theoretical framework and practical implementation of e-customs solutions.

In the section 2.3 the theoretical framework of Diffusion of Innovations (DOI) was covered briefly. The main reason for choosing this theory and not the other is the previous use of such theory in similar discussions and simplicity of key criteria for the assessment of applicability of e-customs solutions. Prescott and Conger (1995) concluded that in period of 1984 to 1994 70 articles based on DOI theory were published and hundreds of various articles were published after. That proves the robustness and wide applicability of the theory in the context of implementation of computerized solutions. The list of five criteria (relative advantage, compatibility, complexity, trialability and observability) serves as a simple set of principles to facilitate the fair assessment of applicability of the e-customs solutions in Ukraine.

The process of innovation development.

As all innovations are the activities their application requires proper planning, in another words it needs the diffusion among the concerned authorities to gain momentum and become widely accepted. An innovation is communicated through certain channels over time among the members of a social system (Rogers, 2003). Therefore, it must be understood that the innovation adoption is a process. The innovation-development process suggested by Rogers 2003; Raus 2010 distinguishes six main steps that constitute the innovation-development process: 1) problem recognition, 2) basic recognition and applied research, 3) development, 4) commercialization, 5) diffusion and adoption, 6) consequences. The process is sequential and is illustrated below in Figure 5.1.

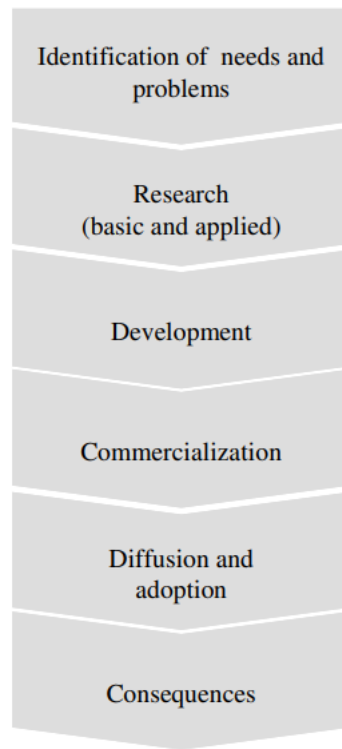


Figure 5.1 The process of innovation development

Applying the case of Ukraine, we can identify the following: as for the identification of needs and problems in Ukraine's customs, the greatest problem is a slow and complex process of processing the customs declarations and lack of harmonized approach to the functioning of customs between Ukraine and the neighbor countries that causes the slow operation. Because of the rapid development of the latest technologies, the developed countries of the world are using the maximum automation of customs. Since Ukraine seeks full membership in the EU and shares roughly one third of its border with EU states, then the course of the customs policy should be directed in an effective direction - to improve the system of electronic document circulation at customs. After all, the electronic method can not only minimize declarations the time of carrying out customs procedures, but also fight corruption, develop international cooperation and interaction with the information systems of state organizations of the country (Mykuliak, Stefanyshyn, 2019). Furthermore, the reduced pace of customs processing data minimizes state income and attractiveness for trade activities utilization of means and methods of e-

customs can save time has become notably important these points constitute the identification of needs phase of innovation development process.

Next, the research phase implies the vast number of policy papers and scientific articles on e-customs and its implementation, and a significant number of these articles is mentioned and some of them is analyzed in this work.

The Development phase mainly relies on expert works drafting the policy papers for further analysis and potentially the acceptance, promulgation and implementation of the law passed by government. However, in order to reach such progress, the policy proposal has to have the appropriate level of commercialization to thoroughly deliver the message to policymakers to gain the acceptance. Instead of referring to policy papers we will identify the main concerns that can be addressed through implementation of e-customs solutions. The delay in customs is the significant impediment to proper functioning of state's customs policy. The previous research indicated that each day of delay in transaction will incur a loss of 0.5% to 1.5% of total value of cargo. If the transaction process normally takes a span of 20 days, a method that can reduce it to 10 day can save 5% of total value for trader and the other research showed that each day of delay can incur a loss of 1% of business profit (Salamzadeh et. al, 2015). Yet, another finding to back up the implementation of e-customs and NCTS in particular is taken from Croatian customs (a similar case of a country harmonizing local customs policy to the EU standards back in 2011) that shown that in less than 2 years local customs service reduced the operation costs by more than 1.6 billion USD (Ercog, 2014) In Ukraine according to local business, the customs clearance procedure (when additional documents are requested) could last 80 hours, and in the case of taking multiple samples - up to 336 hours. At the same time, in EU countries, customs clearance of imports takes less than 5 minutes in 63% of cases, up to 1 hour in another 28% of cases, and only in 9% of cases it exceeds 1 hour (and can last no more than 48 hours) (Pashko,2009).

According to Henningsson and Andersen (2009), ICT applications can reduce administrative burden by 25% eliminating the paper-based documents that are circulating in Ukraine's customs as well as the other states with transitional economy.

Abovementioned factors can play commercialization role in eyes of policymakers and

customs specialists supporting the idea of proper implementation of e-customs innovations. Next, while analyzing the process of diffusion the institutional theory is highly relevant. The e-customs innovations (or various policies, practices) can diffuse in the shape of elements (e.g., various policies, practices) and the diffusion of such elements leads to increased acceptance of an element as an appropriate component of well-managed and legitimate unit (organization, government agent etc.) (David et. al.,2019) Therefore, these widely accepted elements turn out to be reinforcing as more similar units adopt a certain this element, it gains wider social acceptance and becomes more institutionalized. This process creates conformity pressures on actors which not yet accepted or implemented such elements. In our case the conformity pressure on Ukraine is evident. Choosing the most straightforward example of the implementation of NCTS in Ukraine's customs, the institutional pressure on Ukrainian policymakers is imposed mainly by EU, but also from Turkey as key trading partners parties to NCTS agreement. From EU-side the implementation of NCTS serves as a prerequisite to the further development of ties with EU economy. In the end of the day, NCTS adoption is a requirement set in EU's Acquis Communautaire (the EU's accession criteria, legally binding document to be signed for new member-states prior being accepted in EU). Therefore, NCTS adoption inevitably is a goal for Ukraine's government in light of Ukraine-EU integration aspirations.

Lastly, the consequences or the results of innovation. In best case scenario, consequences are tangible and measurable and constitute the value of this innovation.

Application of the Diffusion of Innovation Theory to the context of Ukraine and its Custom service.

Moving on to the application of the Diffusion of Innovation theory, it will be assessed and highlighted the key components of the theory and the linkage between each of the aspects provided in DOI theory and the customs policy of Ukraine will be drawn. The DOI theory consists of the following components relative advantage, compatibility and complexity trialability and observability.

The aspect of relative advantage is crucial as it reflects how the solution under consideration is viewed as better than the idea it supersedes. The proper implementation of e-customs solutions will provide for: – transparency and openness of customs clearance procedures;

- reduced time for customs clearance and control;
- minimization of leeway for corruption;
- absence of subjectivism and manual intervention in customs control procedures;
- increase motivation to carry out customs control procedures properly;
- improvement of the business climate in the country, etc.

These and multiple other factors constitute the solid basis for relative advantage of e-customs solutions over the paper-based customs operation modality.

The next aspect is compatibility which can be understood as the extent to which innovation (i.e. e-customs solutions) is consistent with current values and matches the needs of its potential adopters. According to the American Chamber of Commerce report on Ukraine 2020, the key goals for Ukraine to improve the customs operations were to ensure the sufficient level of automation of management processes at customs and to introduce the electronic document management. Automation of customs procedures and application of modern information technologies. The customs allow to significantly speed up the release of goods, simplify control during the time customs clearance, reduce the role of the "human factor" and reduce opportunities for corruption at customs. That is to be done through: a) reduction of physical contact between business and government bodies that minimizes corruption risks.

b) Facilitation of the automation processes for registration and achieving

greater convenience of declaration for enterprises.

c) Facilitation of remote declaring to streamline the processes and limit the operation costs for traders.

d) corruption prevention (including corruption prevention through simplification and automation of customs procedures.

e) To form a more comprehensive approach on the activity of the customs service.

These targets are compatible with fundamental ideas of e-customs implementation therefore the application of e-customs solutions is relevant according to the aspect of compatibility.

Next, the principle of complexity. The level of complexity for a implementation of fully-fledged e-customs solutions raises concerns among experts due to a few reasons. There is a significant change has to be done in order to harmonize the Ukraine's legislature to adopt NCTS as a most developed example of e-solutions that experts and Ukraine's policymakers deems feasible to adopt. There are certain discrepancies between national legislation and the requirements of international legal acts regulating the functioning of customs regimes, especially with the entry into force of the Law of Ukraine "On the Common Transit Regime and Introduction of the National Electronic Transit System." This determines the importance of improving the legal framework for transit. Apparently, two customs regimes do co-exist in Ukraine in parallel to each other: common transit (as a type of customs regime) and "transit" (regulated by the Customs Code of Ukraine). The present problem of solving a number of issues related to the harmonization and implementation of legislative acts regulating the institute customs regimes of Ukraine is highly relevant and requires an immediate solution. Analysis of the main provisions of the Law "On the Common Transit and Introduction of the National Electronic Transit System" happens to introduce a significant number of fundamental norms into domestic legislation of Ukraine. At the same time, there are practical questions that should be additionally regulated by relevant regulatory documents. In addition, before the legislator appears the task of further reforming the functioning of customs regimes by making appropriate changes and additions to the Customs Code of Ukraine and other normative legal acts that need to be developed sufficient theoretical basis for improving the legal regulation of customs regimes, in particular customs regime of transit (Hladka,2020).

Another practical concern for implementation of e-customs is that some of Ukraine's executive bodies have its own customs or tradition to rely on paper-based documentation. In particular, it is the case with control bodies that carry out sanitary-epidemiological, veterinary, phytosanitary, radiological, ecological control and control over the movement of cultural values that significantly reduces the effectiveness of the application of digital procedures. The permission documents issued by these departments mainly relies on paper form. This is a restraining factor in the development of electronic declaration.

The development of E-Customs falls within the development of G2B (government-to-business) solutions that likely to be the next hot trend in the research agenda of scholars. This estimation is based on the impact that both services have on governmental revenue, the enhancement of transparency and the reduction of administrative burden they offer to businesses. However, another substantial issue is the confidentiality problem, technical constraints, and high implementation costs are the main hindrances for customs administrations (Panayiotou, Stavrou,2021). The problem with confidentiality has multiple dimensions and pertains to such topics as a) data sharing and protection, b) cybersecurity, etc. The confidentiality and data sharing legislation varies significantly around the world, in case of Ukraine the local legislation gives a sufficient leeway for implementation of digital solutions without additional constrains present in Western Europe.

The technical concerns and high implementation costs are a crucial issue in Ukrainian context. Considering poor and inefficient material base, lack of strategy and conception of implementation of customs policy of Ukraine (Pashko,2019). It has to be acknowledged that the implementation costs are not only related to material base (i.e. hardware, software and its maintenance), but also trained staff able to deliver trainings and sufficient time to perform such activities without disruptions of customs operation activity.

Also permeated corruption is likely to halt the implementation process due to direct interest in sustaining the regime without e-customs implementation (Chernetska-Biletska, Sevruk.,2021).

Therefore, the aspect of complexity is a significant burden for e-customs solutions implementation as there is a few problems that are likely to slow down the process of implementation. The different origin of the issues discussed requires a tailored approach to most of the problem in order to create proper e-customs solutions.

Trialability aspect suggested in DOI theory envisages room for testing, updating and removal of inappropriate functions. In case of e-customs implementation the costs for amendments and other changes is significant as such actions necessitates further training of staff and potential disruptions of operations that are costly.

Lastly, the observability of the change of customs operations modality is undoubtedly quantifiable and observable. The reduced document processing time, increased efficiency, greater level of standardization, digital approach to entire customs operations process is a tangible change, so this aspect of DOI theory in case of Ukraine and e-customs solutions implementation ensures full observability.

To sum up this part, the Diffusion of Innovation theory was utilized to assess the main concerns related to e-customs implementation and the ways how e-customs solutions can optimize the operations of Ukraine's customs service. The concerns were predominantly related to the implementation costs, however the variety of options to improve the operations of the customs service significantly outplayed the implementation problems. Thus, it can be concluded that implementation of e-customs innovations in Ukraine is sensible.

5.2. Practical developments in e-customs of Ukraine

This section aims to analyze the current developments of e-customs in Ukraine and discuss the current developments with New Computerized Transit System and the importance of the process of its application in Ukraine.

The current developments of e-customs in Ukraine

The customs structure of the state must have robust information support, preferably in form of well-structured and arranged system of information and analytical support. That can be created through a system of information modules. However, the

development of modern customs system is impossible without development of network with appropriate software. Improvement of the customs system of Ukraine led to creation of new activities for customs service like e-customs and international customs data sharing (Mykuliak,2019). The creation of "Electronic Customs" as a multifunctional system that provides for significant contribution to the efficiency of customs activities and aimed at strengthening of Ukraine's customs security. However, due to insufficient financing of innovations processes by the state and business entities, this project still is functioning not perfectly.

The basis of electronic customs administration in Ukraine today is the single automated information system of the State Fiscal Service (SFS), which covers a complex of subsystems including Common Automated Information System of Custom Authorities of SFS (CAISCA of SFS) and ASMO "Inspector" as part of it was created to automatize and support almost all daily operations performed by customs of Ukraine, improve administering, . Most customs functions are performed at the local rather than central levels and transferred to the digital storage (Chernetska-Biletska, Sevruk, 2021).

The structure of e-customs in Ukraine ensures centralized monitoring and management of the central and reserve databases of the SFS of Ukraine. As for today, the most developed subsystem in Ukraine's e- customs is of electronic declaration and electronic document circulation that ensures proper interaction of the subsystems belonging to declarant (broker) and the customs authority, as well as employees of various customs authorities during customs control procedures and customs clearance of goods. The e-customs system and respective subsystems are illustrated below (Fig. 5.2).

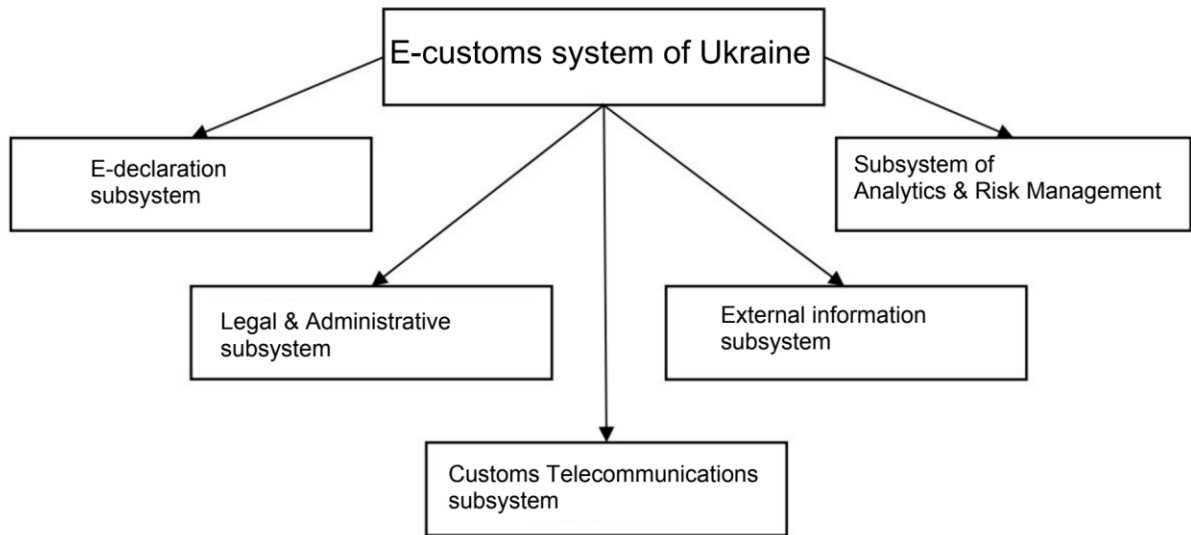


Figure 5.2 The Framework of Ukraine's E-customs system

The subsystem of risk analysis and risk management encompasses a complex of software tools that enable automatic analysis of information. That is in turn, helps to increase efficiency of customs control .and legal subsystem provides management of customs authorities.

The administrative and legal subsystem ensures management and control over all customs authorities and obedience of law during the automated customs clearance process.

The external information subsystem is involved in the exchange of necessary information with other institutions in Ukraine, foreign states, and international organizations.

Customs telecommunication subsystem controls the routing and operation of requests (receiving messages in on-line mode and transmitting messages in off-line e-mail mode).

However, there are significant shortcomings as local e-customs system is oriented towards internal usage with absolutely no synchronization or harmonization data and standards with customs system of EU or other states. The options for traders in frame of

B2G cooperation in Ukraine e-custom system are not foreseen. Furthermore, the internal implementation capacities are limited as there is practically no data sharing feature between other institutions. The operation of e-customs is significantly constrained by dated legislation tailored for paper-based customs operations (Mykuliak,2019). The custom clearance process through national e-customs solution do not provide for quick processing of data either: according to Ukrainian companies, the customs clearance procedure in the case of a request for additional documents (during current regime) could last 80 hours, and in the case of taking samples and samples – it is up to 336 hours. At the same time, in EU countries perform customs clearance of imports in less than 5 minutes in 63% of cases and up to 1 hour in another 28% of cases, and only in 9% of cases it exceeds 1 hour (and can last no more than 48 hours).

All in all, the e-custom system of Ukraine is very truncated system with limited application capacities which has only internal usage.

Unlike the national e-customs framework, the NCTS is a proven e-customs solution for transited goods that provide transparent mechanism of implementation, equal regulations for signatories of this agreement as well as it involves the possibilities for B2G cooperation. Ukrainian government already tested the pilot version of the mechanism back in mid-2021. Now, the discussion continues towards harmonization of legislature in order to meet legal criteria for adoption and further efficient use of this solution for e-customs. The B2G opportunity for traders to streamline the customs procedures through e-declarations for customs clearance attracted more than 1000 companies as of June 2022 (Kapitanets, Brendak, 2022).

To summarize this section, the author characterized the current capacities of Ukraine's e-customs system. The main conclusion is that despite the existence of the own e-customs system in Ukraine the operational capabilities of local e-customs are very limited and the system is inwards oriented meaning the operation of Ukraine's e-customs system is designed for streamlining the internal operations.

The ongoing discussions regarding the adoption of NCTS as a part of Ukraine – EU integration is way more appealing comparing to Ukrainian e-customs system. Mainly

because of profound functionality, harmonized legislature, mutual benefits for member states and optimized data processing of transit declarations.

6. Discussion

The research aims to understand how electronic customs can optimize the work of Ukraine State Customs Service (UCS) and what are the main concerns pertaining to the implementation of e-customs solutions in general and in Ukraine specifically. This is highly important because in the literature the criticism towards, or at least concerns about the implementation of electronic customs innovations are rarely raised (Mykuliak,2019), (Hladka,2020) and others. The efficiency of such innovations is often taken for granted. During the analysis of Ukrainian context, the multiple scientific works were covered and hardly any author managed to highlight any single point that would question the efficiency or capabilities of the local actors to implement one e-customs solution or another. The point regarding the application of foreign e-customs practices in completely different setting was not previously considered either. In fact, there are quite a few impediments to application of e-customs that were thoroughly discussed in chapter 2 and throughout the empirical part of this work (Ch.5). For reader’s convenience the table 6.1 is attached to summarize the main concerns that has to be acknowledged prior drafting a policy paper on e-customs related matter.

Strengths	Weaknesses
Speeding up document processing.	Reforms are required.
Control.	Technical issues.
Transparency.	Implementation costs.
Lowering the transaction costs for business.	Issues of confidentiality.

Lower costs for document processing at customs.	Need to do trainings to the personnel.
National security.	Lack of interest among Ukrainian business
Economic security	Availability of working corruption schemes and direct opposition to reforms among involved actors (in Ukraine).
Ease of use	
Ecology	
Great importance for countries in war and during the pandemic.	

Table 6.1 Pros and Cons for e-customs adoption

The theoretical assessment on feasibility of e-customs implementation in Ukraine was based on (Rogers,2003) and (Raus,2010) and their contributions to the theory of Diffusion of Innovations, which perfectly complemented research context and was used as a solid groundwork for research analysis.

During research quite a few unexpected factors were unveiled as for e-customs implementation supportive factors, like ecological preservation and importance of optimized operation of customs service in contingency period. (Henningsson, Bjørn-Andersen,2009) and (Urciuoli, Hints, et al. 2013). As for the hinderances, the most frequent ones are confidentiality issues, technical constraints, costs and usefulness (Ajzen & Fishbein, 1975; Bharosa et al., 2013; Choi, 2011; Gilbert et al., 2004; Lyytinen & Damsgaard, 2001; Riel, Liljander, & Jurriens, 2001; Mykuliak, Stefanyshyn, 2019). Pashko (2009) contributed with valid and significant list of facilitators and barriers to adoption of e-customs the key points were discussed at the outset of this work.

Facilitators of adoption	Barriers to adoption
Benefit potential of the public sector	Slowdown in regulations execution due to missing procedural templates
Procedural improvements and streamlined business processes	Increased complexity in the standardization process itself
Avoidance of misinterpretations of standardized regulations	Electronification of operations
Standardization of processes, messages, and data model	

Table 6.2 Pros and Cons for e-customs adoption (continued)

In the second part of the chapter 5 the essential importance of NCTS Convention was highlighted. First, in context of EU-Ukraine integration as well as the importance of liberated and streamlined policy for transit of goods.

Finally, the discussion on opportunities of Business-to-government (B2G) cooperation and e-customs took place. The result is clear that the framework of NCTS Convention can provide substantially more opportunities for traders, than available e-customs system in Ukraine.

7. Conclusion

The aim of this thesis was to complete a profound analysis on the implementation of e-customs in Ukraine and to understand a) *if e-customs innovations can provide for efficient solutions for Ukraine's customs service* and b) *how e-customs can optimize the work of Ukraine State Customs Service.*

These questions were answered throughout the thesis. Despite numerous concerns and shortcomings of e-customs implementation the number of positive aspects outweigh the shortcomings and the evidence provided can clearly confirm that proper implementation of e-customs policies can significantly streamline and optimize the operations of customs service. Namely, to speed up document processing, ensure transparency through elimination of human factor during the customs declaration submission and its

processing. However, the implementation of e-customs solutions is a time-consuming and costly process that requires the appropriate preparations to be in place ranging from harmonization of legislation to update or procurement of hardware and software to ensure full operational capabilities of the customs service.

The theory of Diffusion of innovations laid the groundwork for the assessment of applicability of e-customs innovations to Ukrainian context. Using the DOI framework the benefits and potential difficulties in implementation were highlighted. Upon completion of DOI framework, it became evident that the proper utilization of e-customs innovations brings multiple benefits to the customs service and significantly optimizes the day-to-day operations of customs.

In the second section of the empirical chapter the current developments of Ukraine's e-customs strategy were discussed. The emphasize was put on implementation of NCTS as the prerequisite for trade optimization with EU countries and Turkey (Ukraine's key trade partners). Furthermore, it was concluded that NCTS is an example of fully fledged e-customs policy that serves as a good example for other endeavors in e-customs developments worldwide

The prospects for further study

As the process of innovation creation is always evolving, therefore the chance for further elaboration of this topic is available. Considering the case of Ukraine many wartime reforms were implemented aimed to streamline the customs operation, however this topic have not received much attention yet. Furthermore, the broader perspective can be used to study the digitalization of Ukraine's public sector that is developing with impressive pace.

The Limitations of Research

The limitations of research should be analyzed in light of a limited access to statistical data and only available statistical projections when it comes to efficiency assessment of e-customs solutions efficiency assessment. Some important performance areas will be

analyzed, but some key figures will hardly be possible to find. That inevitably will create the situation when qualitative key performance will be thoroughly assessed, but only quantitative key performance

When it comes to theoretical analysis, the theories that were used for the research were not geared to conduct analysis of e-customs implementation and was meant to explain the general innovation implementation process. Although both theories are adequately compatible with the research. The research itself may not consider all stakeholders involved in the analysis as e-customs are mainly business-to-government (B2G) solution with businesses and customs agency being the main actors. There are quite a few other actors, for instance IT-solution providers, other government actors, etc. That were not considered due to a limited scope of this thesis.

Based on diffusion of innovations (DOI) framework we proceed with assessing the plausibility of fully-fledged e-customs implementation. When it comes to comparative advantages we highlight the key strengths of e-customs such as increased efficiency through speeding up the processing of declarations, transparency and accountability as well as the other benefits that prevail in number comparing to potential negative aspects. The table below shows the potential strengths and weaknesses of e-customs implementation.

The research was performed in period from January 2021 until February 2022, thus the latest developments were not tracked, despite the fact that customs policy was significantly affected, and certain e-solution were utilized in war period to streamline the customs operation.

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