Tallinn University
Institute of Informatics

State Portal as the Interface of Public e-Services for European Citizens

A Case Study

Master Thesis (20 EAP)

Author: Jana Teder
Supervisor: PhD David Lamas

Author	Supervisor	Head of the Institute
(name, date and signature)	(name, date and signature)	(name, date and signature)

Tallinn
May 2014

Author's declaration

I hereby declare that I am the author of this Thesis and except where explicit reference is made to the contribution of others, that this dissertation is the result of my own work.

This thesis has not and is not being submitted for any other comparable academic degree at the Tallinn University or any other institution.

Thesis has been supervised by PhD David Lamas.

Author

Jana Teder

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(Date and signature)

Abstract

Road accidents as a result of excessive speeding, drinking–and-driving, use of cell phones while driving, account for major deaths on the road. One critical focus of the European Commission is to halve road accidents by 2020. Although not yet enforced, the European Union (EU) regulation described in the 20/82/EL Acts, stipulates that EU citizens should be able to access digital services (e-services) within the EU zone, irrespective of the country of their location. The directive fosters cross-border exchange of information on road safety related traffic offences. The EU e-government Action Plan stipulates that e-government services should be designed around users' needs and developed in collaboration with third parties, as well as by increased access to public information and strengthened.

Many studies have addressed causes and effects of road accidents, but very few have explored the possibilities of designing an interface to give quick feedback to violators, and enhance quick payment of fines, especially when the offence is committed outside a Member State where the involved vehicle is registered.

This master thesis studies and describes the possibilities to use State portals as one of the interfaces of public e-service for the citizens of Estonia and also for other European citizens to exchange of information on road safety related traffic offences.

In addition, this thesis designed, and evaluated an interface that could be integrated to the existing State portal to provide access to EU citizens on cross-border exchange of information on road safety and related traffic offences.

The case study (research through design), uses the user-centred design framework as the dominant design approach for addressing user experience, in order to achieve increased users' satisfaction, transparency and efficiency of Public e-service. The evaluation of the integrated interface reveals users' satisfaction and willingness to use the new interface. Other users from other Member States also show their interest to have the interface adopted for their own State portals.

The thesis contains four chapters.

Keywords: interaction design, user-experience design, user-centred design, human-centred design, prototyping, e-government, public e-service, state portal.

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Introduction

Of huge concern in the European Union (EU), is the number of lives lost on EU roads as a result of breaking traffic rules by vehicles drivers (Ignat D.-A. , 2012). In its bid to enforce traffic rules and penalise culprits, the directive of the European Parliament of Council of 25.10.2011, detailed in 2011/82/EL, stipulates that, effective from 07.11.2013, there should be cross-border exchange of information on road safety related traffic offenses between the Member States. The objective of this directive is to impose financial penalties on drivers who commit a traffic offense in another Member State other than the State in which the vehicle in question is registered (ETSC, 2013). Moreover, the Information Management Strategy for EU internal security aims at finding the simplest and most easily traceable and cost-effective solutions for data exchange. For the first time misdemeanour handler has the opportunity to make automatic queries from the competent authorities of other Member States to obtain the data from the owners or users responsible of vehicles registered in other Member States.

Cross-border police cooperation, the Prüm Decision, provides for the automated exchange of vehicle registration data among various other forms of police cooperation among the 28 EU States and to speed up the procedures in force. Car registration data are exchanged through national platforms that are linked to the online application "EUCARIS" (Council of European Union, 2005; European Parliament, 2011). As a result, all presumptions have been met in order for the Member States to create an Information System that meets the requirements of the EU directives and offers trans-boundary data exchange to help process traffic offences.

Currently, in Estonia there is the readiness to make queries through the EUCARIS Information System into other Member State vehicle owner registries. Estonia is well-known for its e-government and public electronic services. In Estonia there is a widely used State Portal which is a gateway to the e-government and provides public information and various public e-services and reusable information. Attempts to export the Estonian e-government solutions show that they can be internationally promoted. Estonia has almost 20 years of

experience in information society promoting, has been in the top 10 in the United Nations e-Participation Index since 2008 and in the top 20 in the e-government Readiness Index since 2003 (UN E-government Survey, 2003, 2004, 2005, 2008, 2010, 2012). This means that Estonia has the knowledge and experience to create e-services that can offer trans-boundary data exchange and it could set an example by offering a service not only in Estonia but also in Europe.

Many studies have addressed causes and effects of road accidents, but very few have explored the possibilities of designing an interface to give quick feedback to violators, and enhance quick payment of fines, especially when the offence is committed outside a Member State where the involved vehicle is registered. To this day, there are no known existing information systems that any Member State has developed to facilitate traffic violation information exchange through the State Portal. This means that there is paucity of research efforts to provide a road map to facilitate cross-border exchange of information on road safety-related traffic offences for the EU. The link between detection of the offence and sanction has to be sufficiently clear in order to have any deterrent effect.

In Estonia currently the ICT System for Estonian Police for processing the notifications of traffic violations (HIS), is an information system for proceeding traffic violations, which have been fixed by an automatic device of traffic supervision. The system is bonded with several national registries and the process is optimized for maximum automation. There is a good re-use of public sector information in HIS, however, the problem is that at the moment the system is available only for the police officers and there is no public interface for citizens. A public interface would increase the credibility of the service by offering a transparent source of information.

Considering the afore-mentioned, a citizen's interface to HIS should be implemented and integrated into the State Portal for the local citizens and citizens of the Member States to use. By creating a new interface for the citizens and other EU citizens, there would be a clear and transparent overview of citizens' offences in Estonia and financial penalties can easily be paid. By integrating the traffic violation system into the State Portal, an example could be set for further deployments of such kind of currently closed public ICT systems.

This master thesis will provide an overview of the architecture of the Estonian e-government environment and what should be taken into consideration when trying to include a public interface into a State Portal. Furthermore, the thesis will provide a research through design

built on a case study and a prototype of the interface to be integrated into the existing information system and provides lessons learned from the process and recommendations. The main research questions of the thesis are as follows:

- What requirements and presumptions must be taken into consideration in order to create a user interface for closed public ICT service and develop a public interface into the State Portal?
- To what extent can the case study of HIS be used for other deployments into the State Portal in Estonia and also in the State Portals of the European Union Member States?
- What interaction design guidelines should be followed for designing a public e-service interface?

The main goals of the thesis are:

- Describe the causes and effects of road traffic accidents, and ways to improve road safety;
- An overview of the local prerequisites of e-government and State Portal structure;
- Describe the overview of interaction design principles that can be used to design a public e-service interface;
- To design and create a functional prototype for the public interface of the ICT System for processing the notifications of traffic violations and evaluate the prototype for usability;
- Reflect on the case study to provide suggestions for implementing other similar systems into the State Portal of Estonia;
- To provide a basis for other European Union Members States to use when trying to integrate new information systems into existing state portals.

The thesis describes an overview on the presumptions of the Estonian and European Union legislation, an interaction design process with user interviews and use cases, paper, visual and functional prototyping with a qualitative research and an evaluation of the interface created.

The first chapter of the thesis describe the causes and effects of road traffic accidents, and ways to improve road safety; gives an overview of traffic regulations in EU, presumptions of Estonian and EU legislation, presents an overview of e-government, and the relevance of e-government services to provide an integration platform to enhance traffic safety across the EU Member States, irrespective of the point of access. The first chapter also describes the

overview of the ICT system for Estonian police for processing the notifications of traffic violations (HIS).

The second chapter gives an overview of interaction design principles that can be used to design an interface for public e-service. The chapter explore various artifacts used in interaction design and foster user-centred design process in user experience design and user interface engineering as adequate and ideal for designing interactive interfaces.

The third chapter discusses the research through design, which is a case study of designing a public interface for the information system for processing the notifications of traffic violations. The chapter also describes the design process considering the first priority in the European Action Plan 2011-2015, user empowerment, which aims at developing services designed around users' needs, paper prototype testing, visual and functional prototyping and evaluation.

The fourth chapter concludes the research, outlines the lessons learned and recommendations for future design iterations based on the used methods and techniques.

Finally, the conclusions are drawn and the main results of the thesis are provided.

The adopted reference format is the American Psychological Association (APA) 6th edition.

Chapter 1. Literature review

1.1 Improving safety on roads

Existing literature shows that over 1.2 million lives are lost annually from road traffic accidents (Mohan, 2008). Road traffic accidents account for one of the major causes of death in which people in the age groups 15–60 years worldwide are affected. The major causes of road accidents have been reported to include excessive speeding, use of cell phones while driving and driving under the influence of alcohol. According to Mohan (2008), speed control is the most critical area of enforcement. Mohan (2008) reasoned that enforcement on speed control is the most significant measure to make road users less vulnerable. Another important measure is to mitigate driving under the influence of alcohol. Use of seatbelt is another important measure for driving motor vehicles (Mohan, 2008).

The effect of traffic enforcement on vehicle speed and crashes has been a topic of research concern for over forty years. Wang, Quddus, and Ison (2013) reported that factors such as speed, congestion, and road horizontal curvature have unbalanced effects on road safety and suggest further investigation. Wang, Quddus, and Ison (2013) suggest the development of suitable methods and policies to understand better, the causes of road accidents and to enhance road safety. In his study, Tay (2009) explored the differential effects of automated and manned speed enforcements involving motor vehicle accidents using secondary data obtained from the Australian State of Queensland and discovered that, although manned enforcement showed a significant effect on both fatalities and serious accidents, automated enforcement only had an effect on fatalities. Evidence suggests "that manned enforcement targeted the high risk drivers whereas automated enforcement provides a general deterrence effect on a broad spectrum of the driving population, which may partially explain the differential effects observed" (Tay, 2009, p. 178).

Police enforcement of traffic laws is another measure that has been explored to improve road safety and the success critically depends on the attitudes of both the driving public and the police (Cauzard & Quimby, 2000). This suggests the importance of determining the perception of drivers about road safety, causes of road accidents such as speeding and drunk-driving as well as enforcement of traffic laws. The SARTRE consortium (Social Attitudes to Road Traffic Risk in Europe) was introduced to mitigate road accidents and improve road. Surprisingly, some motor vehicle drivers have been penalised the more for speed driving, and this suggests these drivers have not improved their attitudes despite the enforcement. European drivers were asked in the SARTRE survey if they support a harmonisation of safety measures across Europe, and the results show that drivers which oppose enforcement of traffic laws in their Member States also do not favour its harmonisation across European Member States. These drivers also perceive that introducing road devices to prevent excessive speed would only make little impact. The study however shows that harmonisation of traffic laws across Europe is possible as significant proportion of respondents supports such harmonisation (Cauzard & Quimby, 2000).

Carnis (2008) reported that in France, President Chirac, during his presidential address in July 2002, signified traffic safety as a national priority. France launched her automated speed enforcement system (CA) in November 2003. The introduction of CA strengthened the detection of high speed culprits, and to effectively punish them. As at 2008, roughly 1,850 speed radar devices were installed and operating on road networks in France. The objectives of CA are to improve road users' driving options by "combining general deterrence and specific deterrence actions, and to build a consistent grid of detection on the whole territory for enforcing speed limits" (Carnis, 2008, p. 752). Approaches which were used to enforce compliance include:

i. Use of Information Technologies through an automated system based on a computer-led process of enforcement and sanctioning, and the use of digitisation where automated speed cameras were installed on the national road network;
ii. Policy putting an end to offender impunity through a system allowing for large-scale checking of driving speeds;
iii. Administratively introducing a new system and new strategic and organisational configurations in the road safety field;
iv. In terms of the road toll, with a significant decrease in the number of road accident victims.

There was huge improvement in road safety statistics upon the deployment, and this established authorities' belief that the decision on the deployment was right. However, there exists a need to identify the system's effect on the road toll (Carnis, 2008).

Vertical elevation of the road pavement is another widely accepted and commonly implemented measure to reduce road speed. In a study conducted by Antic, Pešic, Vujanic, & Lipivac (2013), comparison was made between data obtained before and after installation of speed bumps at three locations in Belgrade. These locations have been suggested by the citizens to the City Department of Transport for reduction of vehicular speed through installation of speed bumps. The results show a significant reduction of vehicular speed on roads where the bumps were installed. The study suggests installation of speed bumps of 5cm and 7cm heights, where road users are more vulnerable. The study outcome however suggests that "it is necessary to apply the system-educational measures on one hand, and on the other, to increase the police enforcement, what would increase the subjective risk of the drivers that their speeding violation would be detected and sanctioned" (Antic, et al, 2013, p. 312).

Spain was reported during the 1980s and 1990s, to be a major European country with "the highest risk indicators in road accidents with rates only lower than those for other Mediterranean countries, such as Greece and Portugal" (Castillo-Manzano, Castro-Nuño, & Pedregal, 2011, p. 223). The study by Castillo, et al., (2011) also indicated that in 1990, nine thousand, three hundred and two (9,302) lives were lost in road accidents and over 100,000 injuries were recorded on Spanish public roads, which brings the mortality rates to 23.2 per 100,000 people and 5.8 deaths per 10,000 motor vehicles. With a growing concern of high economic and social impacts of these fatalities, Spanish policy makers made great attempts to palliate the situation. Jail sanctions were imposed on culprits, and there has been remarkable progress which enables Spain to have achieved the European Commission's target to halve road fatalities by 2020. Between 2003 and 2009 Spain was reported to have achieved a 52.5% reduction. The reform however remains the "most aggressive strategy on road safety to date" The reform is a strategy to deal with "the impunity of reckless drivers whom it classifies as delinquents at the wheel" (Castillo-Manzano, et al., 2011, p. 227).

Implementation of points systems (PS) for driving licenses is another collaborative measure to guide against road traffic fatalities, and this involves imposing heavy penalties such as withdrawal or suspension of driver licenses of perpetual culprits (Castillo-Manzano & Castro-Nuno, 2012). In Spain, there is a huge reduction in the number of road fatalities as a result of the introduction of the penalty point system. According to Izquierdo, Ramirez, McWilliams,

and Ayuso (2011), measures introduced include imposition of fines, and police surveillance, which resulted in 15 to 20% decrease in road accidents, injuries, and fatalities. However, these measures were ephemeral as they were only effective for just eighteen months after their introduction. Castillo-Manzano and Castro-Nuno (2012) therefore stress the importance of "complementary enforcement to backup" existing systems. The authors also stressed that without complimentary enforcement, "points systems could turn into a boomerang road safety policy and even be abandoned at a later date" (Castillo-Manzano & Castro-Nuno, 2012, p. 191).

Hu, McCartt, and Teoh, (2011) carried a study on 62 US large cities to determine the effects of red light camera enforcement on per capita fatal crash rates at intersections with signal lights. Using secondary data obtained on fatal crashes prior to, and after installation of red light cameras, the study reported higher decline rate for cities where red light camera were enforced than cities with no enforcement. Furthermore the average annual rate of all fatalities at "signalized intersections decreased by 14% for cities with camera programs and increased slightly (2%) for cities without cameras" (Hu, et al., 2011, p. 279). The study confirms empirically that punitive measures are a quicker way to get results in countries with high rates of road fatalities, as was seen in the case of Spain, than in those without punitive measures.

Adequate enforcement process is important in order to make road traffic fines productive. One way that has been suggested to make the process effective is to automatise the process (de Fuentes, Gonzalez-Tablas, Hernandez-Ardieta, & Ribagorda, 2012). de Fuentes, et al, (2012) also reason that current enforcement practices lacks the ability to reliably identify the offender, provide immediate feedback to violators upon violation and completion of offence description. The authors observe that "current road traffic administrative enforcement practices suffer from several drawbacks that affect their effectiveness" (de Fuentes, et al., 2012, p. 279). de Fuentes, et al., (2012) concludes that "the lack of a reliable automated driver and vehicle identification, the absence of immediate feedback after the violation and the usually limited amount of data to describe an offence are remarkable" (de Fuentes, et al., 2012, p. 279). networks.

1.2 Regulations and enforcement of traffic laws in EU

In 1999, Goldenbeld and Rothengatter (1999) investigated the possibility to identify effective strategies for road law enforcement for a range of road law offences. The study examined various offences, such as speeding, drinking and driving, failure to use seat belts, red light offences, insufficient headways, and refusal to obey pedestrian crossings rules, and how these factors contribute to road accidents. For each of the factors, there was identification of road law enforcement strategies. The study concludes that in several EU countries there are uses of automatic detection and registration for offences such as excessive speed and moving against red light. The measures were found to be very cost-effective and deemed relevant for wide adoption in strategies to enforce traffic regulations.

Malenstein (2009) examined the implications of using innovative technologies to enhance traffic safety in the EU identified significant areas which include speeding, drunk-driving, and use of restraint systems. The study provides an overview of the most widely used enforcement technologies and systems and identified the potentialities envisioned for others to be deployed at a later date. The enforcement is defined as the strategies which used technical devices to determine critical levels of various violations such as red light violation, excessive speed, tailgating, and distance travelled, illegal use of bus lanes, among others. In-vehicle technology is a prominent part of passive enforcement which is being built for later deployment. The study also reports that Member States that view traffic law enforcement as critical have recorded about 30% reduction in traffic fatalities over the past years. Furthermore, the mid-term review of the EU's policies on transport, which did not address traffic law enforcement at all, showed a 17,5% reduction in the number of people killed in traffic. In all, a 47,5% reduction on traffic fatalities is perceived as achievable (Malenstein, 2009).

Ignat (2012) provides an overview of the background to the Parliament and EU Council Directive 82, relating to "facilitate cross-border exchange of information on traffic violations affecting road safety[1]." Taking into account increased vehicle traffic between European countries, there was a need to develop a Pan-European convention for the suppressing traffic

[1] EU Directive. 82/2011 on "facilitating cross-border exchange of information on traffic violations affecting road safety" Preamble, section 20

offences. There is also a need for protection of personal data. Member States are required to use the detailed arrangements similar to those adopted for the prosecution of such violations, including ways and, if appropriate, forwarding the recommended regimen. To fulfil these obligations there is a need for compliance with the Framework Decision 2008/977/JHA of 27 November 2008 on the protection of personal data processed in police and judicial cooperation in criminal matters. Without bias to compliance with procedural requirements for judicial appeal of the Member State concerned, the person involved should be properly informed of commission of an offense. To this end, individuals are enabled to respond to information appropriately, in particular, requesting additional information, pay fines and exercising right of defence, especially when there was an error of identification. Subsequent procedures covered legal instruments applicable, including instruments on mutual assistance and mutual recognition, for example, the Framework Decision 2005/214/JHA of 24 February 2005 on the principle of mutual recognition to financial penalties (Ignat, 2012).

The volume and characteristics of cross-border data flows have been evolving, elevating privacy risks, and raising cross-border enforcement challenges. Report of Organisation for Economic Co-operation and Development (OECD, 2006), on the cross-border enforcement of privacy laws describes the current attempts to address these challenges and highlights the need for a more global and systematic approach to cross-border privacy law enforcement cooperation. The report provides an overview of the basic measures required for privacy enforcement in the domestic context and highlights on the cross-border aspects of privacy enforcement, considering the challenges often encountered by authorities as well as recent measures to address them. International Instruments for Privacy Co-operation are namely Council of Europe, European Union, Asia Pacific Economic Co-operation, and other privacy co-operative arrangements (OECD, 2006).

In order to determine critical factors which are required to enforce traffic law in the EU, scrutinize traditional and modern approaches and tools for enforcement, and evaluate their potency to enhance compliance for road traffic safety, Mäkinen, et al., (2003) provide an overview of their report on ESCAPE (Enhanced Safety Coming from Appropriate Police Enforcement) consortium, on traffic enforcement in Europe. The report indicates effects, measures, needs and future direction for traffic law enforcement in Europe. The report shows that 15% to over 50% of vehicles in EU traffic are travelling at least 15 km over the regular speed, at any given time. The report also indicates clear public support for existing traffic legislation in the four major areas of speeding, alcohol, belts, and young drivers as well as

enforcing them effectively. Enforcement is seen as a part of safety management and only by appreciating traffic enforcement as a part of integrated traffic safety work, can remove undue pressures and unrealistic expectations regarding the impacts of enforcement. The use of new technologies to enhance road traffic safety to both assist and control road user behaviour also meets this purpose significantly (Mäkinen, et al., 2003).

1.3 Presumptions of Estonian and European Union legislation

The Estonian Information Society Strategy for 2020 envisions that e-services must be trans-boundary. Thus there is no need for every EU Member State to develop individual base infrastructure elements, but it's worthwhile to join forces. For that purpose, Estonia has shown an initiative to establish the Nordic e-Governance Innovation Institute for Base Infrastructure. The organisation will serve as an international development centre with the purpose to develop together X-road, e-ID, Digital signature and other services (MKM, 2013)

The developed solutions will target both the state and the citizens, the environment and the state of free communication between all parties (Section 5.3 Action 2), thereby promoting an open and unified state governance (MKM, 2013)

The Estonian Ministry of Economic Affairs and Communications has endorsed an Estonian Interoperability Framework. The objective of the interaoperability framework is "to make the operation of the Estonian public sector more effective, improving the services offered to Estonian and EU citizens". The Estonian interoperability framework is harmonized with the European Interoperability Framework. (MKM RISO, 2011)

The presumptions of such an information system as set in EU and local legislation are as follows (EU e-government Action Plan foresees as two of political priority from four):

1) Citizens and businesses are empowered by e-government services designed around users' needs and developed in collaboration with third parties, as well as by increased access to public information, strengthened transparency and effective means for involvement of stakeholders in the policy process;

2) Efficiency and effectiveness is enabled by a constant effort to use e-government to reduce the administrative burden, improve organisational processes and promote a sustainable low-carbon economy (European Commission, 2010).

As can be seen, citizen or user satisfaction must be prioritised when developing and delivering government e-services. Estonia and EU are moving towards user-centred e-government and trans-boundary e-services.

The directive of the European Parliament and of the Council of 25.10.2011 2011/82/EL, envisions that from 07.11.2013, there should be cross-border exchange of information on road safety related traffic offenses between the Member States. Moreover, the information management strategy for EU internal security aims at finding the simplest and most easily traceable and cost-effective solutions for data exchange. For the first time misdemeanour handler has the opportunity to make automatic queries from the competent authorities of other Member States to obtain the data from the owners or users responsible of vehicles registered in other Member States (European Parliament, 2011).

The European Union Location Framework References, 2014 give good overview of National e-Government Strategies and National Location Strategies of Member States. Member States have also developed e-government strategies at regional and local levels and including Estonia.

The document was used as a good source of relevant information about open data initiatives, many Member States have established open data initiatives through policies, legislation and portals to provide access to data. These initiatives are designed to facilitate transparency, enable interoperability through reuse and exchange of data and provide wider and low cost access to public information meeting users' needs without duplication of effort (European Commission, 2014).

The regulation of European Union, though not yet in force, provides that within the European Union citizens have to have the freedom to access digital services wherever they are in the EU and countries have an obligation to allow access to their digital services to citizens of all Member States (Ignat, 2012).

In his article Bignami (2007) describes the first EU law to address data privacy in law enforcement, that is, the Data Retention Directive. Upon the incidents of terrorist attacks in New York, Madrid, and London, cooperation in law enforcement was reported to have

increased. The challenge that is left for the European Union is to protect privacy in its emerging system of criminal justice.

The Subsections 1.1, 1.2, and 1.3 have provided insights into causes and effects of road accidents and how to improve them. None of the studies has however indicated the possibility to facilitate cross-border exchange of data, by designing an interface for integration into State portals, where traffic violators could assess to get feedbacks on the their violations and pay the resulting fine, especially when such violators are in a Member State where their vehicles were not registered. The question that arises is:

- What requirements and presumptions must be taken into consideration in order to create a user interface for closed public ICT service and develop a public interface into the State Portal?

1.4 From Traditional Government to e-Government

"E-government is not about making it possible for people to fill out the same old forms and questionnaires online, but rather is about achieving the goals of administration and services in the most intelligent and citizen-friendly way using the opportunities offered by IT"

Toomas Hendrik Ilves
the President of the Republic of Estonia[2]

Internet and related technologies have made a substantial impact on the way organisations conduct business around the world, European Union local governments have expanded their presence on the Internet and using the Internet to provide public services to its citizens (Layne & Lee, 2001; Singh & Byrne, Performance Evaluation of e-Business in Australia, 2005; Torres, Pina, & Acerete, 2006).

Governments, too, have made major advances in their efforts to govern more effectively to the extent they have adopted web-based and related technologies (Torres, Pina, & Acerete,

[2] http://www.president.ee/et/meediakajastus/intervjuud/7759-president-toomas-hendrik-ilves-foreword-to-estonian-ict-demo-center-newsletter/index.html

2006). Democracies across the world have appreciated the practice of e-governance to improve the quality of services provided to their citizens and to business environments (Layne & Lee, 2001). More recently, the reliance on digital governance has become increasingly popular where digital governance includes both the electronic government and electronic democracy (Riccucci & Rutgers, 2011). One significant components of digital governance is increasing the direction of flow of information, communication, resources and services accessible to the public (Riccucci & Rutgers, 2011).

The quality of e-government and effective public administration have become also as indicators for investors and introducing a successful e-government practice also attracts foreign investments (Pavel, 2013).

1.4.1 What is e-government?

E-government is the new way of public administration. Basically it is a transformation of traditional government by influence of revolution of technologies (Torres, Pina, & Acerete, 2006). Komito (2005) believes that when citizens interact with the state's administrative structure through e-government, they learn that they can participate in the system and benefit by their participation.

According to Palvia and Sharma (2007), e-government is a generic term for web-based services from agencies of local, state and federal governments. The authors believe that in e-government, the government uses information technology and particularly the Internet to support government operations, engage citizens, and provide government services. The interaction may be in the form of obtaining information, filings, or making payments and a host of other activities via the World Wide Web.

Although web sites are becoming essential elements of modern public administration, almost all city governments are shifting from the traditional bureaucratic concept to the e-government concept (Pavel, 2013). The growth of citizens' expectations and needs led to a new approach to delivering services by the public administration in order to respond to this new social demand. Interactive web applications allow citizens to complete many tasks online (Pavel, 2013). The quality of the services provided, results, and customer satisfaction are now at the core of this new approach. The demand by public service consumers for the same level of responsiveness and service from their governments as they expect from the private sector

and the growth of citizens' expectations are leading to a new approach to service delivery by the public administration (Palvia & Sharma, 2007). In order to keep up with expectations, governments are taking a pro-active approach by anticipating the citizen's needs and making changes in how it works in order to meet those needs (Torres, Pina, & Acerete, 2006). One main challenge for governments is to identify user needs and to design egovernment projects according to the identified target users. For every e-government project, coherence must be seen as the ultimate test: users will ignore governments' efforts in carrying out e-government strategies and visions if the service leads to more bureaucracy and/or less societal, economic, and individual benefits (Pavel, 2013). Torres, Pina and Acerete (2005) also directing attention to the point, e-government initiatives can refocus attention on a number of issues such as how to collaborate more effectively across agencies and tiers of public administration (seamless) and how to enhance customer focus. Its potential goes far beyond early achievements, enabling qualitative gains in work processes, results, and efficiency. If implemented properly, it will help to develop and consolidate principles of good governance such as democratization, coherence, effectiveness, transparency, and accountability. An extension of this survey might be to analyze to what extent e-government initiatives meet citizens' demand and needs (Torres, Pina, & Acerete, 2005).

All city governments are involved in e-government initiatives although with different levels of development. There is no clear relationship between public administration styles and e-service developments. E-government needs to be integrated into the broader public management reform framework. It offers the potential to bring citizens closer to their governments, regardless of the type of administration system that a country has (Torres, Pina, & Acerete, 2006).

E-governance is clocely linked to e-government, but have different nuance - e-governance is a set of guiding principles to e-government and can be defined as the group of norms and processes that have an infulence on the exercise of power, particulary from the point of participation, openness and responsibility (Galindo, Marco, & Calleja, 2009; Pavel, 2013). According to UNESCO e-governance is the use of ICT by different actors of the society with the aim to improve their access to information and to build their capacities.

E-democracy builds on e-governance, focuses on the actions and innovations enabled by ICTs combined with higher levels of democratic motivation and intent, and is the way how the government provide the access to the information opportunities for participation in democratic processes for people (Galindo, Marco, & Calleja, 2009). The concept of electronic

governance chosen by the Council of Europe covers the use of electronic technologies in three areas of public action; relations between the public authorities and civil society; functioning of the public authorities at all stages of the democratic process (electronic democracy); the provision of public services (electronic public services). E-governance is defined as the

> *"...application of electronic means in the interaction between government and citizens and government and businesses, as well as in internal government operations to simplify and improve democratic, government and business aspects of Governance."* (Palvia & Sharma, E-Government and E-Governance: Definitions/Domain Framework and Status around the World, 2007, p. 3)

1.4.2 Benefits of e-Governance and e-Services

The successful implementation of e-governance practices leads for better delivery of services to citizens and citizen empowerment through access to information. E-governance enables people to gather information regarding any institution of government and be involved in decision making process; it brings governments closer to citizens.

E-services also provide increase of accountability and trust. For citizens it's like "Light in the black hole of bureaucracy". Traceability of the status of their requests and transactions increases transparency and trust[3].

Rothstein points out that trust is rarely given unconditionally, especially to governments composed on unknown and unaccountable individuals. Trust is earned, based on actual interactions that citizens have with particular agencies of the state. That trust, once gained, can be extended to other agencies of the state and transmuted into a social capital that leads to greater commitment to civil society (Rothstein, Social Capital, Economic Growth and Quality of Government: The Causal Mechanism, 2003).

Satisfaction with e-services is increasing their use of proficiency and service improvement. E-services, the use of which has certain regularity and longevity, consider the positive feedback, such as tax return compliance. Large number of users of e-services has actually fulfilled its purpose, users find that e-services have helped them save time and get the desired information more quickly and reduce the bureaucracy and time spent dealing with the

[3] https://www.ria.ee/public/publikatsioonid/e-Services_for_Citizens_demo.pdf

authorities. The survey findings will nicely point out of a clear guideline for government and owners of e-services, which may help to raise the rankings - definitely should continue promotion campaigns of public e-services and the State Portal as well. Since satisfaction with e-services is high, there is no reason for them not to use e-services, lack of or poor quality, but the low level of awareness. In one campaign to promote all areas of e-services is not possible, therefore, there should be campaigns done for specific target groups for these actors to introduce the e-service. The more useful e-services in a State Portal, that make the life of citizens more easy, the more they start to use it (TNS Emor, 2011; TNS Emor, 2013).

1.4.3 Forms of e-Government

Since the governmental organisations started to use websites and realizing the potential of technologies, they have had the goal to change the government into an automated, citicen-centric operation (Pavel, 2013).

Based on technical, organizational, and managerial feasibility Layne and Lee (2001) posits four developmental stages of fully functional e-government.

Each stage is described in four different but related aspects - definition of the stage, types of functionality involved, and technological and organizational challenges (Figure 1, page 25).

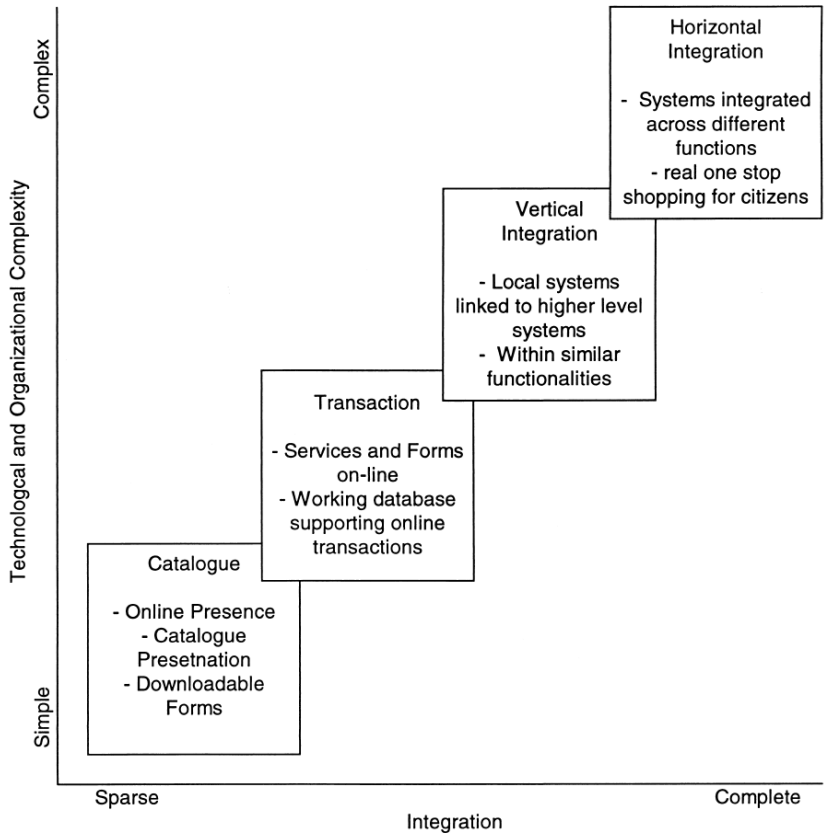

Figure 1:Dimensions and stages of e-goverment development. (Layne & Lee, 2001)

1) Cataloguing - This stage delivers some static or basic information through web sites.

2) Transaction - This stage extends the capability of catalogue and enables citizens to do some simple online transactions such as filling government forms.

3) Vertical integration - This stage initiates the transformation of government services rather than automating its existing processes. It focuses on integrating government functions at different levels, such as those of local governments and state governments.

4) Horizontal integration - This stage focuses on integrating different functions from separate systems so as to provide users a unified and seamless service. (Layne & Lee, 2001)

“Currently, e-government initiatives at federal and state levels are rapidly evolving, butmany challenges are still to be met. In addition, these stages emphasize the citizen as a user of governmental services. In so doing, they suggest that major rethinking about how governments provide services may be needed. Finally, universal access and privacy and

confidentiality issues as well as citizen-focused change must be considered throughout e-government development." (Layne & Lee, 2001)

Moreover, development of e-government does not necessarily have to go through all the stages in order to get to the top and an e-government system in particular country can consist of e-services that are at different stages of development. These four stages of e-government can be presence, interaction, transaction and transformation (Pavel, 2013)

1.4.4 E-Government Portals

Governmental portal is the single access point for citizens and businesses to the governmental and municipal electronic services. Public e-services in State Portal should be well structured and well understandable, in order to meet the perspectives and needs of users (Wimmer & Tambouris, 2002).

The primary delivery models of e-government can be divided into (Palvia & Sharma, 2007; Galindo, Marco, & Calleja, 2009):

1. Government-to-Citizen or Government-to-Consumer (G2C) - relationships between public administrations and citizens based on ICTs, the aim of which is to provide citizens with permanent on-line access to administrative information and services and to citizen participation channels;
2. Government-to-Business (G2B) - relationships between public administrations and companies based on ICTs
3. Government-to-Government (G2G) - relationships between public administrations based on ICTs to facilitate collaboration between different levels of government so central, regional and local administrations provide citizens with services as effectively as possible;
4. Government-to-Employees (G2E) - relationships between public administrations and public-sector employees based on ICTs;

Within each of these interaction domains, four kinds of activities take place (Palvia & Sharma, 2007):

- Pushing information over the Internet, e.g.: regulatory services, general holidays, public hearing schedules, issue briefs, notifications, etc.
- Two-way communications between the agency and the citizen, a business, or another government agency. In this model, users can engage in dialogue with agencies and post problems, comments, or requests to the agency.
- Conducting transactions, e.g.: lodging tax returns, applying for services and grants.
- governance, e.g.: To enable the citizen transition from passive information access to active citizen participation by:
    1. Informing the citizen
    2. Representing the citizen
    3. Encouraging the citizen to vote
    4. Consulting the citizen
    5. Involving the citizen

To maximize the benefits of e-government, service delivery and administration must be integrated across all branches of government, so called One-Stop-Shop e-Government Model.

Its main features according to (Pavel, 2013) are:

1. The citizens can manage all their interactions with the government from one personal account on the Web
2. The government reuses client's existing information to accomplish future tasks.
3. This improves the efficiency of government operations and saves time for the users.
4. Changes appear in the Web interface but mainly they happen behind the scenes where new pathways are created to enable effective data sharing.

1.4.5 Estonian e-Government

Estonia was the first of the countries who implemented the One-Stop-Shop e-government Model in practice. In Estonia, it is common for people to go online to vote, pay taxes, establish businesses, apply for social benefits, register cars, apply for schools, receive prescriptions or apply for building permits. Citizens and permanent residents have access to a personal Internet account where they can choose from hundreds of e-services.

According to the Universal Record Database Estonia is holding a world record. World Record was made by the fastest establishing of an enterprise via Internet, using the e-Business Register. E-Business Register is a single point of contact for entrepreneurs to communicate with the government. It enables to register a new company over the internet, change data in the business register, file annual reports, administrate members list of political parties and make detailed inquiries about other companies. It is a secure and fast tool for administrating your company in e-government. Administrative costs and "red-tape" has been reduced significantly, so that a world record in registering a new legal entity within 18 minutes became possible. E-business register accepts foreign digital signatures which have increased the number of potential users up to 20 million (RIK, 2010).

Example of good practice: "Estonia's portal gateway"

> *Estonia has developed a portal gateway that integrates various key enablers and improves customer experience. The Estonian state portal www.eesti.ee is a secure Internet environment through which Estonian residents can easily access the state's (more than 100) e-services and information. Users can log in using ID-cards and enter a personal, user-based environment. It allows to create documents digitally sign these and send to other for signature. The services provided through the portal withdraw information from various databases and registries, enabling pre-filling of information and consequently reducing the burden for its users. The aim of the portal is to have citizens, business, public administrations and society benefit.*
>
> (European Commission, 2013)

Here is one illustration about "Parental leave benefit"[4]

7 paper documents in real life

=

18 data requests between 5 information systems + calculations

=

3 minutes data input and 1 mouse click online, in State Portal eesti.ee.

To conclude situation of Estonian e-services by 2013:

- All public services are digitally available
- Public infrastructure is service oriented (X-Road, e-ID, m-ID)
- Data is stored where it is collected and exchanged between those who need it
- 100% of schools and government organisations have broadband connection
- 75% of households have internet access at home
- 99% of bank transfers are performed electronically
- 95% of income tax declarations made via the e-Tax Board

Generally speaking, Estonia has managed to save remarkable amounts of time and money by developing and updating e-services, although obtaining accurate data for calculating the cost-effectiveness of e-government investments is very difficult. Employees of the organisations that provide the services find that the introduction of e-services has had a clearly positive impact on service quality. For example, 80% of the e-school users interviewed say that the e-service has considerably improved information exchange between schools and parents.

Full utilisation of information technology often requires major changes in the organisation of work of government agencies and/or communication between them. This concerns the organisation of work in the agency that provides the service as well as the interaction between various information systems (of different agencies). The X-road and ID card are extremely important as infrastructure, because they have created the basis on which the remaining services have been developed, and they have often been the unavoidable prerequisite of various e-services. ID card functionality and the X-Road, the e-services of Estonia are ICT solutions that are relatively easy to copy (Kalvet, Tiits, & Hinsberg, 2013).

[4] https://www.ria.ee/public/publikatsioonid/e-Services_for_Citizens_demo.pdf

Estonian e-Governance Academy supports also other countries to make the steps to the e-Governance. The e-Governance Academy (eGA) is a non-governmental, non-profit organization, founded for the creation and transfer of knowledge concerning e-government, e-Democracy and the development of civil society.

1.4.5.1 The general architecture of e-government environment in Estonia

The e-government in Estonia provides state and local government agencies at all levels with the opportunity to offer citizens and businesses higher quality of services in a faster way. People expect e-government services to be quick and efficient, which makes the providing of such public services quite a big challenge. At the beginning of 2001, the Estonian government together with private companies started to develop an ICT framework in order to create a common system for e-government services. A truly new environment of service management and service delivery was developed. The environment architecture was built on separated customer-centred front and back offices and on seamless connections between organizations (Figure 2) (Kalja, Reitsakas, & Saard, 2005).

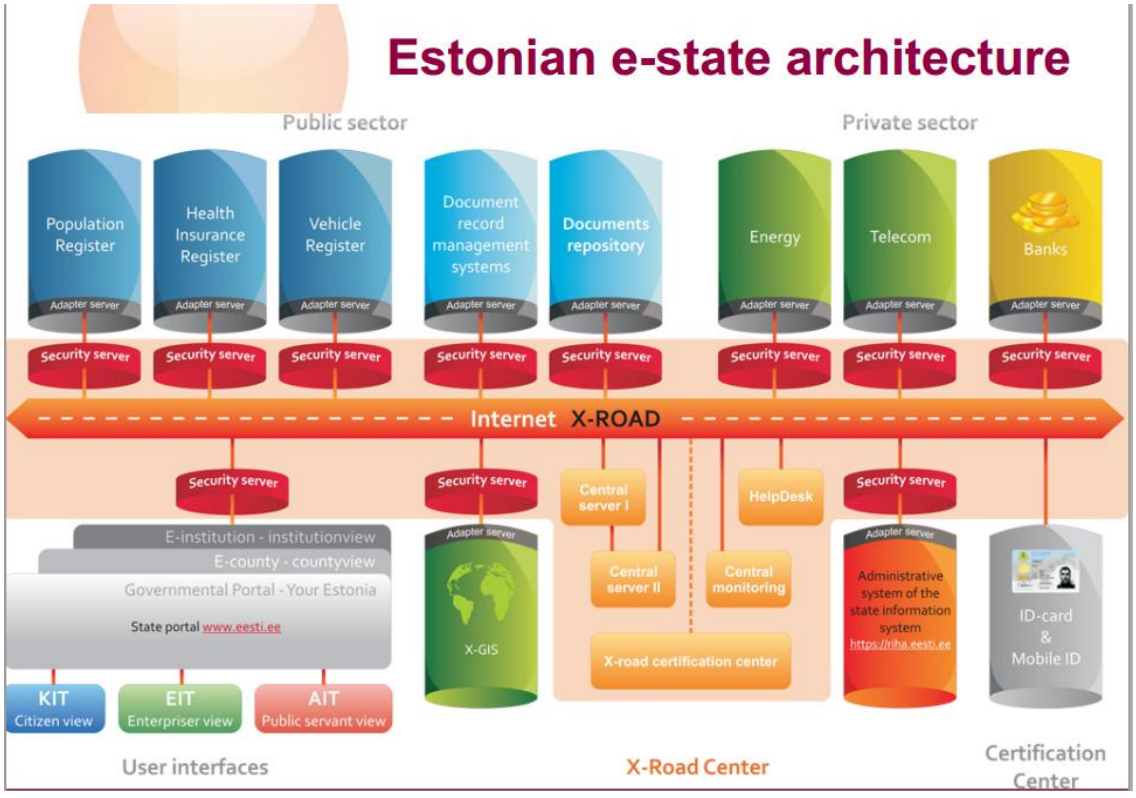

Figure 2:.e-government architecture in Estonia

The architecture of e-government was developed in the framework of the X-road project, what was preliminarily initiated for interconnecting Estonian governmental databases to the common data resource accessible over the Internet. After the successful start of sending database queries and answers over the Internet, the X-road environment was expanded to send all kinds of XML-format electronic documents securely over the Internet. At the same time the X-road started to become a skeleton of all the e-government services (Kalja A. , 2006).

The Estonian network of databases works by utilizing data sets. Each e-service is associated with a specific data set that tells the main server where to find only the information that is needed. In practice, it means that the main server sends a request to multiple databases to pool together the information necessary for that one task. If new information is needed, it is stored in the database in which it belongs. The system does not create one massive database (Figure 3) (Pavel, 2013).

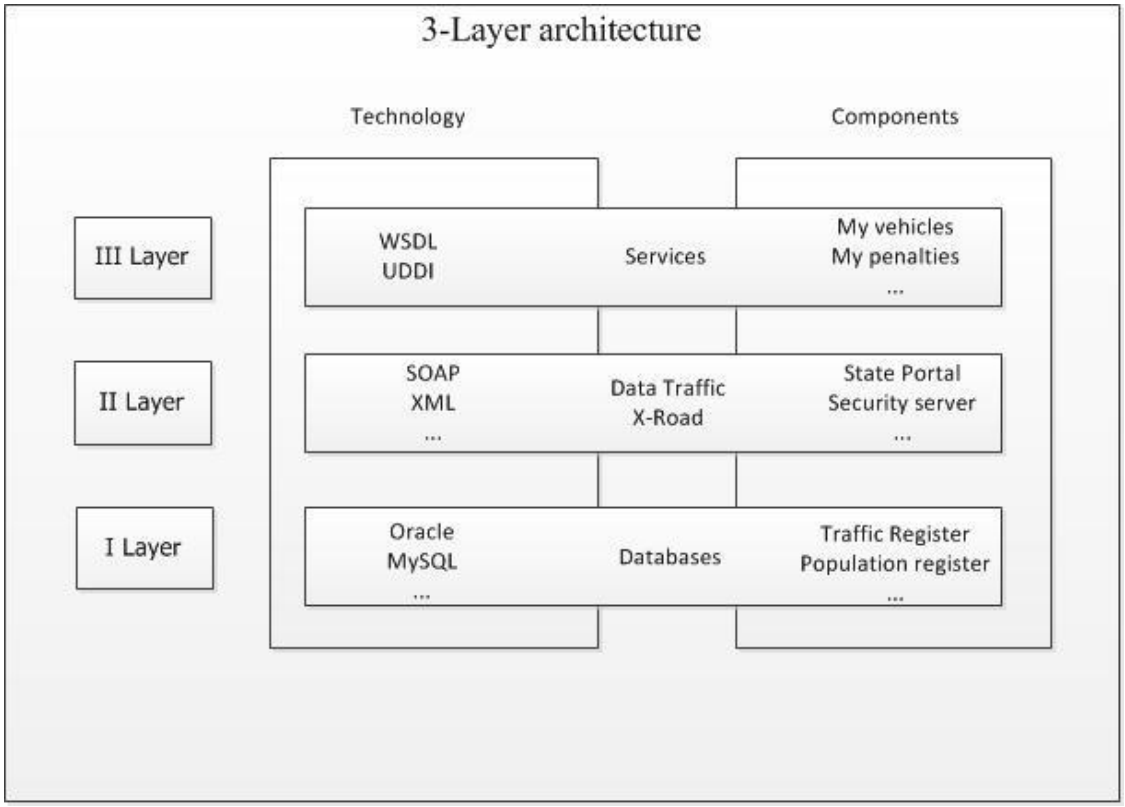

Figure 3: 3-layer architecture of X-Road (Kalja, 2006)

The biggest obstacle to the deployment of the Estonian X-road the rest of the world lies in the personal identification number. In most countries, there is no possibility to that kind of

identification, such as offers Estonian personal code by which a person's identity will be X-road services. Estonian Government has already approved in the cabinet meeting the concept of e-Resident of digital ID. If amendments have been adopted the first e-Resident digital ID could be issued already in this year. Then the state will issue ID cards without picture, which can be used virtually in all X-road services. Recently, the X-road solution was introduced in Finland. Also the New Zealand wants to test it. Interest has also shown up in Japan, the United Kingdom and Oman (Liive, 2014).

1.4.5.2 State Portal eesti.ee

As at 12.03.2003, the Department of State Information Systems (RISO), Ministry of Economic Affairs and Communications, opened Citizens Information Portal (www.eesti.ee), to further develop the previously created e-government portal (www.riik.ee). New Information Portal gave people information about their rights and obligations in Estonia, also practical advice was distributed for contacts with state authoroties. Information Portal was an important step for the future, it would be easier for citizens to deal with public, private and third sector institutions. It was designed to provide one-stop-shop experience (Pavel, 2013). In September 2007 important change was performed as "eesti.ee" (State Portal) merged with the State Information Portal and the Citizen's Portal to enable integrated services for citizens, entrepreneurs and State officials. Since then all public information and e-services are available on a single portal. Citizens, businesses and official information and services are distibuted according the role. Also new functionality – Mobile-ID log-in makes use of State Portal mor convenient. In developing the State Portal increased focus on ease of use. Within a month after the joining portal eesti.ee visited by approximately 110 thousand visitors, eight thousand from abroad, mainly in Finland, Sweden and the USA (RIA, 2014).

The legal regulations and grounds set the management, structure and development of the Estonian e-government Portal eesti.ee by its main target - Estonian e-Government Portal should be as an Estonian information gateway, web site that allows access to public information and information about public, to public e-services and reusable information (Vabariigi Valitsus, 2013; Riigi Teataja, 2000).

The Estonian Information System Authority (RIA) coordinates the development and administration of the state's information system, organises activities related to information security (Estonian Information System Authority, 2014).

The Estonian State Portal www.eesti.ee is a secure Internet environment of the state's e-services and information, it is easy, convenient, quick and secure - it is a gateway to public information and public services (Figure 4). It contains articles on how to resolve important or frequently occurring issues and advice on what to do in certain situations (State Portal eesti.ee, 2012).

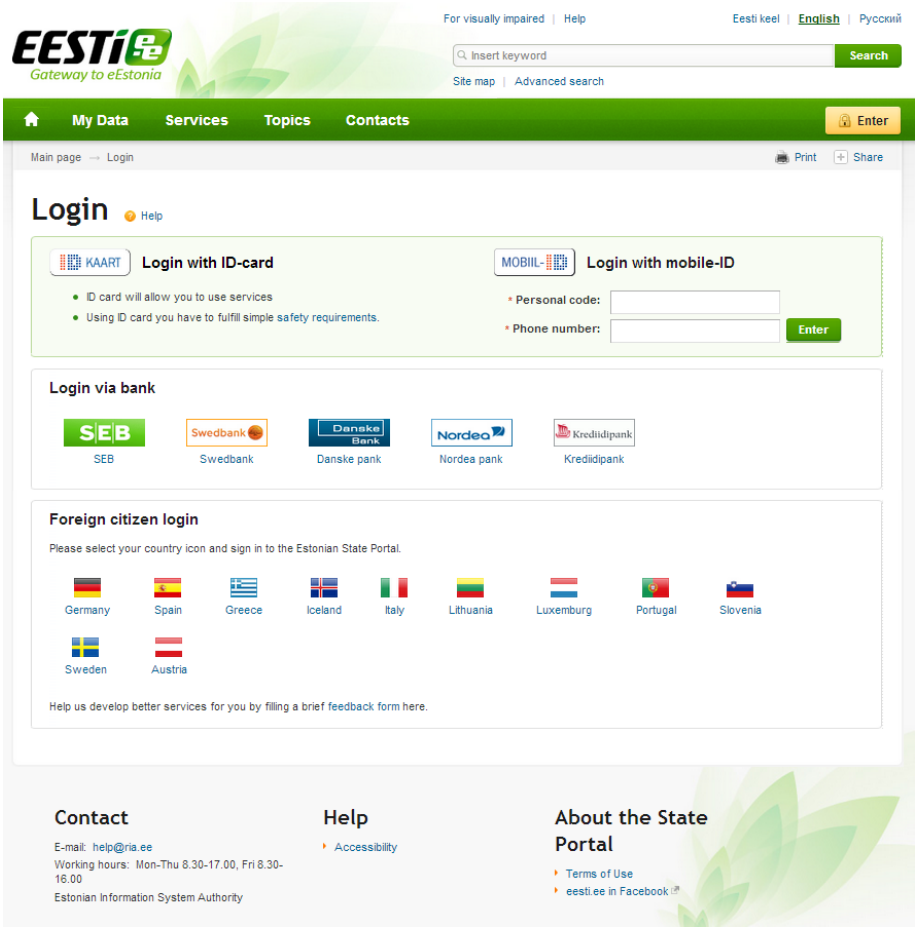

Figure 4: State Portal eesti.ee view "Login"

The e-services, articles and contact details in the portal are linked to make it easy for people to find information related to certain topics. Users log themselves in using their ID cards, which is the most secure form of identification (Figure 5). Once logged into the system with an electronic ID, the user does not have to repeat the log in when accessing each different service. State can better promote new services - the state portal helps create awareness of available e-services, as visitors discover new options while browsing it.

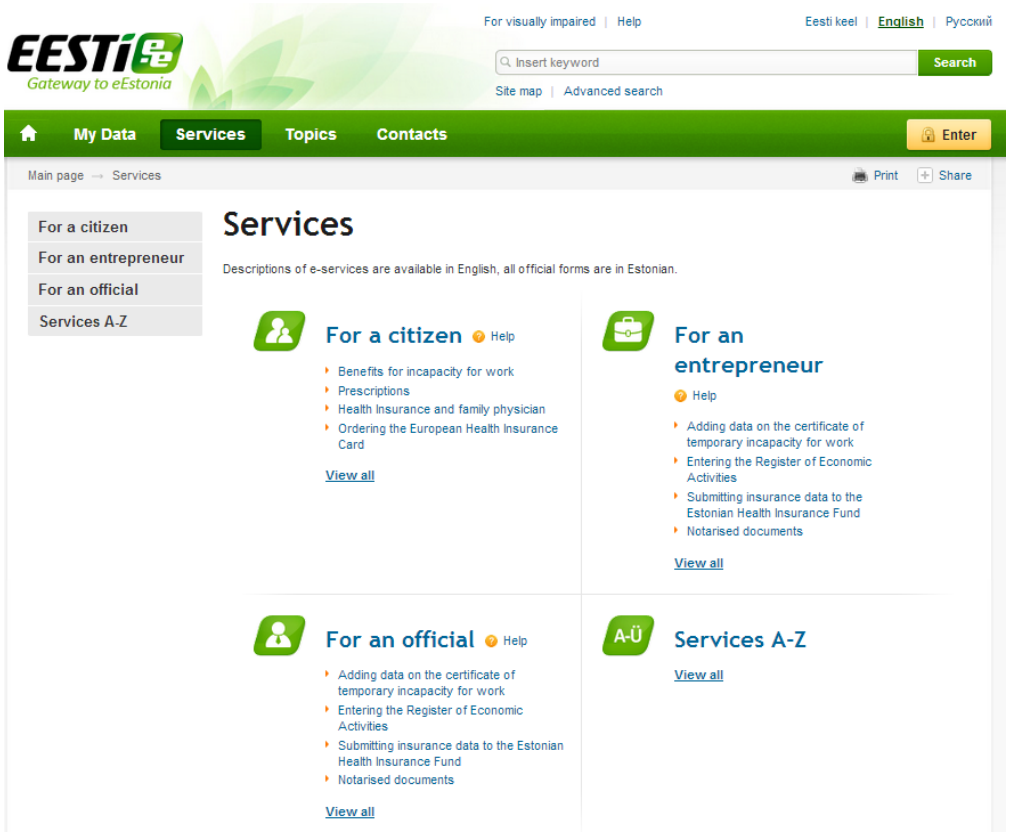

Figure 5: State Portal eesti.ee view "Services"

A personal, user-based environment has been created in the portal as a part of a complete redesign. There, you can create documents, sign them digitally and send them to others for signing, send e-mails, order public sector information services and reviews the services you have used most recently[5].

Ten years after the State Portal was deployed, a new operation menu tagged "My Data" (Figure 6) was integrated. This integration enables for logged-in users to access their personal data, make updates to their "My Data" section, and bring together a variety of information about personal data from the registers in a single page. So can individuals have an overview of own data on one page as shown in Figures 6 and 7. In 2013, "eesti.ee" was upgraded to enable access on mobile devices to make the portal more user-friendly and to access on smaller screen smartphones. In 2014, there was included notifications of identity documents form population register and information from motor vehicles register (RIA, 2014).

[5] https://www.ria.ee/government-portal/

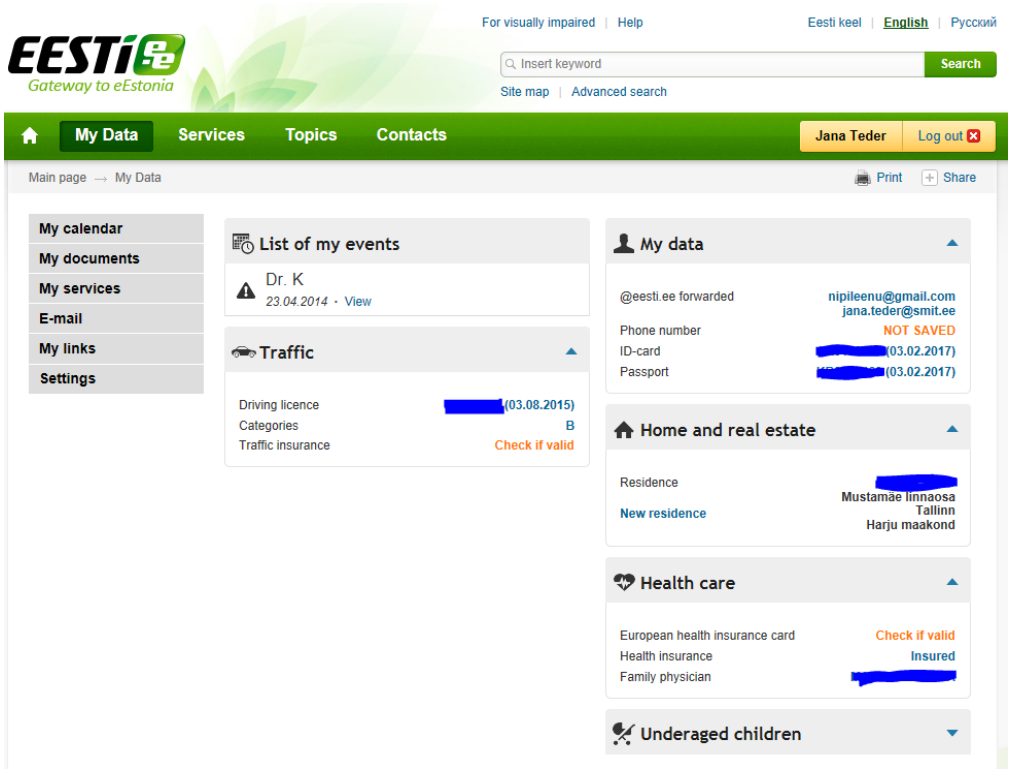

Figure 6: State Portal eesti.ee view "My Data"

The State Portal eesti.ee provides safe Internet environment for communication with the state – offering reliable information and e-solutions for citizen, entrepreneur and state officials.

The portal is useful to[6]:

1. A Citizen – E-services for citizens contain a broad spectrum of task that may be necessary in different life situations. Using the State Portal is convenient and secure and saves time. EU citizens and foreigners alike can find information in the portal about their rights and obligations in communicating with the public authorities in Estonia. The thorough information the portal contains can be used to find answers to potentially problematic issues before they arise. Queries sent via the portal are answered directly by user support or passed on to the relevant department – users do not need to do these themselves. All questions can be submitted in one place, with a guaranteed response.

   It is simple to change settings or order notifications to get the needed information in right channel (Figure 7).

[6] https://www.ria.ee/government-portal/

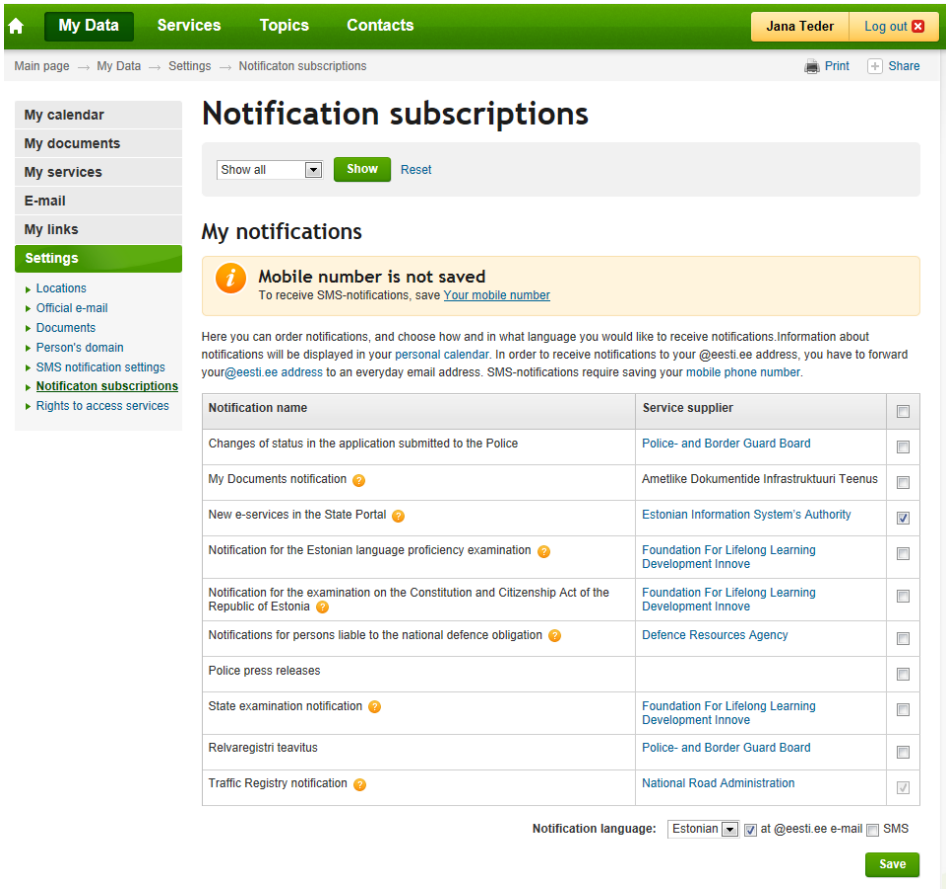

Figure 7: State Portal eesti.ee view "Notification subscriptions"

2. An Entrepreneur -The portal is a simple and secure way to obtain information about launching and running an enterprise and about communicating with public departments. If operating in a certain field is subject to specific requirements, the portal provides entrepreneurs with step-by-step instructions on what to do. For EU business operators, the portal represents a single online contact point.
3. An Official, public sector agencies offering services - The portal is a secure environment via which users are provided with convenient access to public sector information, services and contact details. The more comprehensive information the portal contains, the fewer enquiries public departments receive, since users get the answers they need straight from the portal or from user support.
4. Society - People spend less time dealing with state bureaucracy. Less administrative burden is placed on public sector agencies.

To open an e-service in eesti.ee you must register the ICT system in RIHA.

1.5 A Case Study

The system for processing the notifications of Estonian traffic violations by written caution procedure is the selected case study for the thesis. The written caution procedure in Estonia was implemented in the year 2010. In 2009, the first safety cameras were installed and offenders started to be fined for speeding with effect from 1st of May 2010 according to the directives included in the EU Vision 2020 enforcement of traffic laws (ETSC, 2010). The main reasons for implementing the written caution procedure are for efficiency and effectiveness, especially as a fast procedure, where a large number of speed violations require fast processing and also to increase traffic safety. As reported before, one of the frequent causes of traffic accidents is speeding. It was suggested that increasing the average speed by 1 km/h, will increase the average number of car accidents by 3% (SafetyNet, 2009).

"If every driver slowed down by only 1 km/h, more than 2,200 road deaths per year could be prevented, among them 1,100 on urban roads, 1,000 on rural roads and 100 on motorways." (ETSC, 2010)

The purpose of installing speed cameras is to increase safety for all users of the roads; cars, bicycles and pedestrians alike. Speed cameras promote compliance with traffic code, because they record all incidents of speeding without any filter. Thereby, speed cameras help to slow down the overall traffic, reduce the number of accidents and improve the traffic culture in general. "The experiences of other countries indicate that introduction of cameras reduces the number of traffic accidents with human casualties by 17-20 per cent and the total number of traffic accidents by around 10 per cent"[7].

The link between detection of the offence and sanction has to be sufficiently clear in order to have any deterrent effect. When too much time passes between violation and sanction, the link between both is vague and no immediate effect can be expected because of a diminution in the subjective, perceived risk. Too often Police is overloaded with paperwork and it can cause time gap between violation and punishment (Akkermans & Orozova-Bekkevold, 2007).

The benefits of an automated speed camera over a police patrol include exclusion of the human factor in discovering violations, increased efficiency and a quicker formalisation of the procedure and paperwork. When a police officer would need to stop the car after the speeding has occurred, then this is not the case with the speed camera. The latter records all violations

[7] https://www.politsei.ee/en/nouanded/kiiruskaamerad/

within the range of the camera 24/7, despite the weather. All speeders are treated equally, excluding situations where some types of cars are preferred to be stopped or where one driver has a chance to get away when the previous car is stopped.

ICT System for Estonian Police for Processing the Notifications of Traffic Violations (HIS) is an ICT system (Figure 8) for processing these traffic violations (Figure 9), which have been fixed by an automatic device of traffic supervision. The system is bonded with several national registries and the process is optimized for maximum automation.

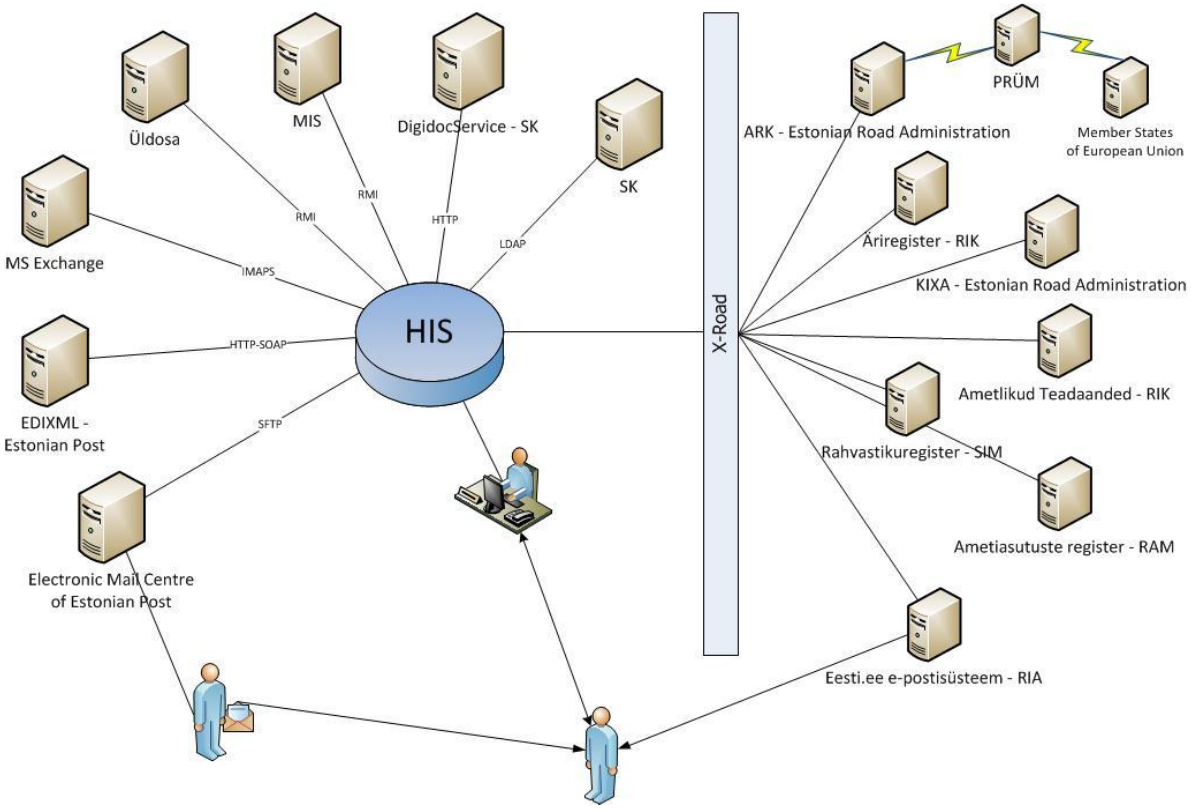

Figure 8: HIS architecture (SMIT)

HIS collects the data for traffic violations from the database of ARK (Estonian Road Administration). Vehicle is established by the record of the registration number and based on information automatic queries are made. Independent of each other, two police officers shall establish uniquely the registration number of the vehicle. Based on correct answers for queries, the notices of fine are prepared. Thereafter an officer shall send the notice of fine for legal entity to the address or e-mail address stated in the commercial register, and for natural person to the address stated in the national register. If a citizen has taken into use or has directed to some of his or her e-mail addresses, an e-mail address which ends with "@eesti.ee", then sends the notice of fine to such citizen's address.

The case shall be automatically excluded from the general information flow, if the registration number established by two police officers does not match in between, then a third officer, who is acting as internal control officer, shall have to resolve whether the license plate is uniquely established or not.

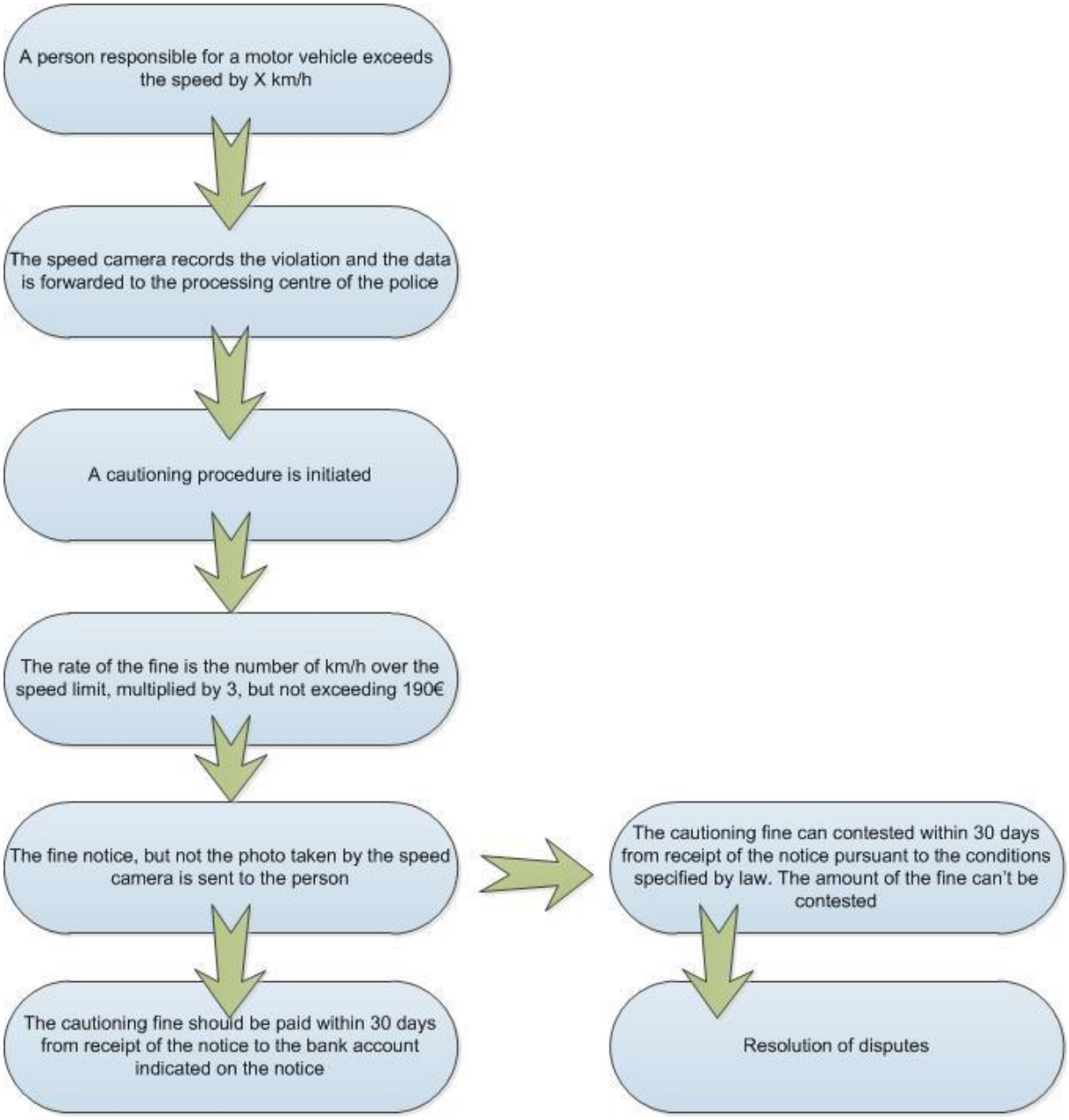

Figure 9: Process of the incidents[8]

[8] Politsei- ja Piirivalveamet

There is a good re-use of Public sector information in this system; however, the problem is that at the moment the system is available only for the police officers, there is no public access interface for citizens.

A public access interface would increase the credibility of the public e-services by offering a transparent process of information. Currently the citizens make enquires to ask for additional info (photos, duplicate of fines) or submit complaints, which could be processed in their case online in State Portal (eesti.ee).

Currently the citizens make many mistakes in payments and police officers need to make an extra effort to correct the data. If not, payments will be lost and ticket not paid. People stay in faith and in their opinion ticket is paid, but in reality it is usually something else. The use of State Portal as a channel for paying for traffic violations, suggests payment order will be pre-filled and big mistakes are avoided.

With the information from the Estonian Police, no copy of the photo shall be enclosed with the notice of fine. The copy of photo shall be sent to offenders upon request. For the purpose of protection of personal data, reflections of all persons besides the driver shall be blurred.

Subsections 1.4 and 1.5, present an overview of e-government, and the relevance of e-government services to provide an integration platform to enhance traffic safety across the EU Member States, irrespective of the point of access. Subsection 1.5 also describes the overview of the ICT system for Estonian police for processing the notifications of traffic violations (HIS). The question which therefore arises is:

- To what extent can the case study of HIS be used for other deployments into the State Portal in Estonia and also in the State Portals of the European Union Member States?

1.6 Closing Remarks on Literature review

The goals of this chapter were to describe the causes and effects of road traffic accidents, and ways to improve road safety; and describe an overview of the local prerequisites of e-government and State Portal structure. Governments worldwide today, are moving towards a more effective governing system. Governments now use web-based services and technologies to enhance the quality of the services provided to the citizens. Recently, the reliance on digital governance has become increasingly popular. In e-government, the government uses information technology and the Internet to support government operations, engage citizens, and provide government services.

The citizens expect the governmental e-services to help them save time and get the desired information more quickly and reduce the bureaucracy dealing with the authorities. An e-service has to provide a safe internet environment for communication between the State and the citizens, entrepreneur, public sector official and the overall society. Therefore, citizen or user satisfaction must be prioritized when developing and delivering public e-services. Currently Estonia and the European Union are moving towards user-centric e-government and trans-boundary e-services.

The regulation of European Union, though not yet in force, provides that within the European Union countries have an obligation to allow access to their digital services to citizens of all Member States.

In Estonia there have been several IT solutions developed in the recent years, the most well-known of them is the “eesti.ee” State Portal and the X-road. In order to effectively use e-services a country has to introduce digital ID-s for authentication. This is why governments around the world are shifting towards e-ID cards. Several EU countries have already deployed national electronic citizen cards and people are becoming more accustomed to them.

The Estonian Government has already approved in the cabinet meeting the concept of e-Resident of digital ID. This will allow foreigners, based on their own citizenship, to get the digital identity in Estonia.

Finally, there is the initiative from the European Parliament to improve cross-border exchange of information on road safety related traffic offences between the Member States. This would mean that any misdemeanour handler would have the opportunity to make automatic queries

from the competent authorities of other Member States to obtain the data from the owners or users responsible of vehicles registered in other Member States.

In Estonia currently the HIS is an information system for proceeding traffic violations. However, the problem is that at the moment the system is a closed service and not available to the public. Thus, a public interface for citizens ought to be created. The most reasonable location in Estonia for such an e-service interface would be in the Estonian State Portal, which would be more cost-effective than to develop a complete new system for it. Moreover, the State Portal is open to all citizens of the European Union, which means that any e-Resident would also be able to use the service. A public interface would increase the credibility of the service by offering a transparent source of information. This is the description of the research problem the thesis is trying to address.

As Estonia has taken on the initiative to promote various e-governments IT solutions worldwide, then considering the above, a citizen's interface to the HIS should be implemented into the State Portal for local citizens and citizens of Member States alike. With the inclusion of the traffic violation system into the State Portal an example could be set for further deployments of such kind of currently closed public ICT systems. Moreover, this would provide a basis for future developments for other EU Members States to use.

Chapter 2 Interaction Design Methodologies

This chapter gives an overview of interaction design and its different design methodologies.

Interaction design is a relatively new field that addresses the ways in which a person can interact with a computer system, be it a mobile device or a mainframe server. According to Quigely (2010) the goal of interaction design is to make products and systems usable and useful, fun and attractive. Interaction Design is a broader concept and includes many academic disciplines, design practices and inter-disciplinary fields (Quigely, 2010).

Interaction Design is a field that can act as a link between hardware and software production (Sikorski, 2012). Final product of interaction designers should be in balance with the ability of human users and the limitations of the technology (Humayoun, Hess, & Ebert, 2014). That's why the designer must be able to mesh both expectations into a design that is as seamless and responsive as possible (Hess, Randall, Pipek, & Wulf, 2013).

A good Interaction Design can be achieved by using a combination of many design methodologies as also shown in Table 1, page 44.

Table 1: Concept of Interaction Design (Quigely, 2010)

Interaction Design…	
…covers	**…tools**
Cognitive Psychology	Metaphors, affordances and mental models
User Experience Design	Storyboarding, personas, mock-ups
Information Architecture	Shared data models, data stores
Communication Design	Visual-auditory communication, graphic design
User Interface Engineering	Prototyping
Human Factors	Human capability, ergonomics
Industrial Design	Aesthetics
Human-Computer Interaction	New interface and interaction techniques
Usability Engineering	Usability testing

Considering one of the goals of the current thesis, that is, designing a prototype of the public interface for the information system for processing the notifications of traffic violations, it may be worthwhile to exclude cognitive psychology, information architecture and industrial design from focus as these elements are not relevant to any of the specified goals. Furthermore from the case study presented in Chapter one, it is also perceived that Communication Design, Human Factors and Usability Engineering, should also be excluded from focus taking into account that all the excluded design fields were considered in the development of the State Portal.

Taking these into account, there are two research fields in the case study which focus on the user of the system. User experience design focuses on hedonic and pragmatic properties by describing how a user feels when interacting with a system (Ardito, et al., 2014). The system could be a website, a web application or desktop software and, in modern contexts, is generally denoted by some form of Human-Computer Interaction. User interface engineering focuses on the experience of the product user (Ahmed & Ashraf, 2007). User experience can be improved by improving the user interface and user interface is the front-end of the e-service (Ahmed & Ashraf, 2007).

2.1 User Experience Design

Regardless of how much the development process of websites has changed, the usefulness still hangs on just one that, how users perceive it. Is it easy to use? Is it likeable? Is it useful? These and other similar questions run through the minds of users as they interact with web products, and depending on the answers, they decide to become regular users or not (Schaffer & Lahiri, 2014). User experience design strives to ensure users answer a "Yes" to all of evaluation questions raised. There are many tools and disciplines within user experience. The elements of user experience design are visual design, information architecture, interaction design, usability and human-computer interaction (Garrett, 2011). User experience and usability have become synonymous, but these two fields are clearly distinct (Ardito, et al., 2014).

User experience designers also look at sub-systems and processes within a system. They could delve deeper by studying components of the sub-system, such as seeing how efficient and pleasant is the experience of users filling out input fields in a web form (Garrett, 2011).

The commonly agreed evaluation metrics to achieve complete user experience are determined by seven quality facets: the product must be useful, usable, desirable, findable, valuable, accessible and credible (Ardito, et al., 2014; Garrett, 2011; Schaffer & Lahiri, 2014). By identifying relevant artefacts, and taking into account the context of design problem, it is possible to create environments for user experiences that are usable, desirable and useful. Typical tools for user experience designers include:

- site audit (usability study of existing assets);
- flows and navigation maps (how the user navigates through the system);
- user stories or scenarios (how the characters will react to the experience);
- user segmentations and persona (fictitious users to act out the scenarios);
- site maps and content inventory (information assets on a website);
- wireframes (screen blueprints or storyboards);
- prototypes (for interactive or in-the-mind simulation);
- written specifications (describing the behavior or design);
- graphic mockups (precise visual of the expected end result).

(Morville, 2004; Tikerperi, 2011)

The terms user experience design and user-centred design are often used interchangeably, but according to Bowles (2013), there is an important distinction: “User experience design is the discipline: what we do; user-centred design is a process: how we do it”.

Initially only practical qualities (pragmatic), such as performance and functionality were evaluated, but recently the perspective has changed towards user qualities, such as satisfaction, impression (WOW factor) and joy (hedonic) (Hassenzahl & Tractinsky, 2006). Besides usability, human factors science, psychology, information architecture and user-centred design principles also play major roles in user experience (Garrett, 2011). Therefore, it is necessary to collect user experience information through user-centred qualitative investigations and then develop the product taking its relationship with users into account (Gube, 2010; Hashizume & Kurosu, 2013).

User centered design is interchangeable with the term human-centered design (Melton, et al., 2010). User-Centred Design is the dominant design approach within user experience (Bowles, 2013).

The specifics of design process steps can vary, but generally are the same. Bowels (2013) suggest the following processes:

1. Research; immerse yourself in your users’ worlds to understand what they do and why they do it;
2. Sketch ideas that address these learned needs;
3. Prototype the most promising ideas to evaluate them more accurately;
4. Iterate through testing, repeating steps as required.

These processes suggest that user interface engineering is already included to the process, by prototyping.

2.2 Human-Centred and User-Centred Design for Interactive Systems

The ISO 9241-210 framework provides requirements and recommendations for human-centred design principles and activities throughout the life cycle of computer-based interactive systems (ISO, 2010). It is intended to be used by those managing design processes, and is concerned with ways in which both hardware and software components of interactive systems can enhance human–system interaction. In the modified ISO 9241-210, user experience is defined as the user's perception and response during the use of an artifact, and one of the major goals of this HCD framework is to address the whole user experience. By this, user experience should include physical and psychological reactions and attitudes on the basis of the user's perceptions and emotions. (Hashizume & Kurosu, 2013; ISO, 2010). This is illiustrated in Figure 10.

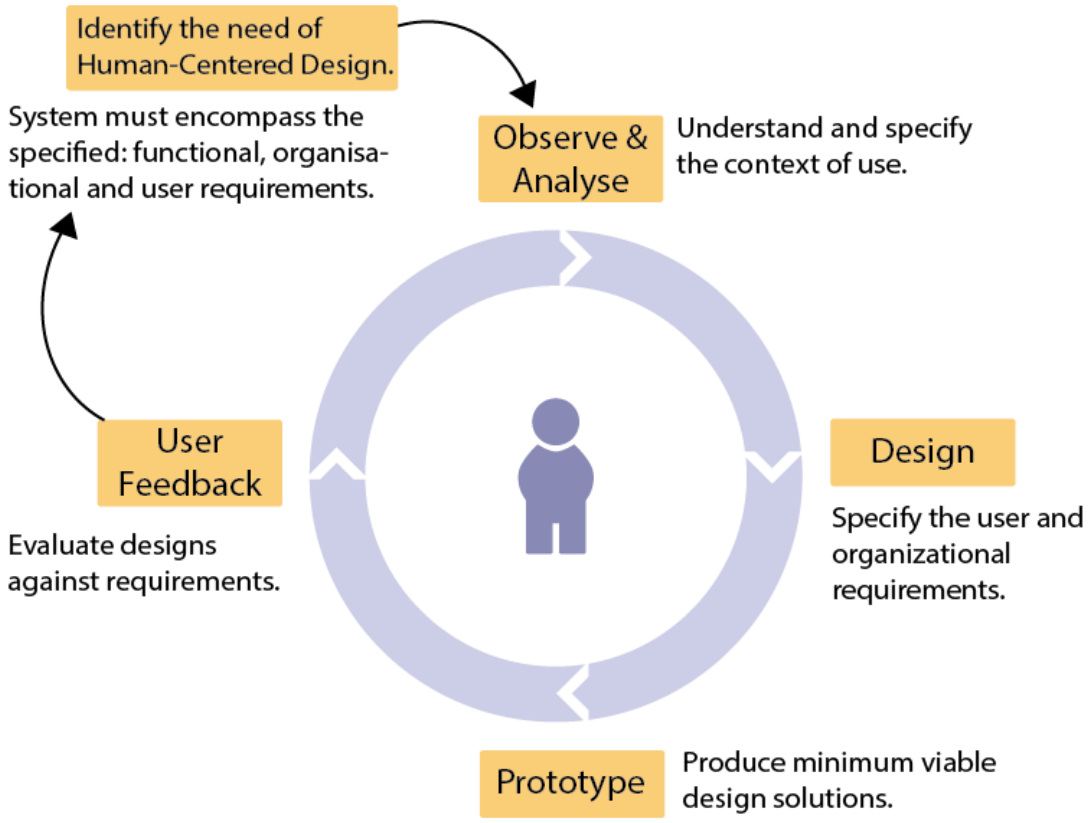

Figure 10: Human-Centred Design for Interactive Systems (Negru, 2014)

The ISO (2010) framework also describes four other important principles of human-centred design:

1. Active involvement of customers (or those who speak for them).
2. Appropriate allocation of function (making sure the human skill is used properly).
3. Iteration of design solutions (allow time for it in project planning).
4. Multi-disciplinary design (but beware of overly large design teams).

And four key steps and activities of human-centred design process lifecycle:

1. Analyse the opportunity - understand and specify the context of use (make it explicit – avoid assuming it is obvious).
2. Build the context of use - specify user and socio-cultural requirements (note there will be a variety of different viewpoints and individuality).
3. Create the user experience - produce design solutions, prototypes (note plural, multiple designs encourage creativity).
4. Track usage and improve - evaluate designs against requirements (involves real customer testing not just convincing demonstrations).

The framework itself is generic and can be applied to any system or product.

According to Travis (2011) the only design methodology that puts users at the heart of the design process is user-centred design. Therefore it is ideally suited to developing products or web sites that must be simple and straightforward to use. There is a need to consider and apply user-centred design throughout development process (Travis, 2011).

The ISO (2010) framework describes 6 key principles that will ensure a design is user centred:

1. The design is based upon an explicit understanding of users, tasks and environments.
2. Users are involved throughout design and development.
3. The design is driven and refined by user-centred evaluation.
4. The process is iterative.
5. The design addresses the whole user experience.
6. The design team includes multidisciplinary skills and perspectives.

“If we explore each of these principles, you'll see why I believe this standard serves as an ideal manifesto for the field of user experience.” (Travis, 2011)

Summing up the theories of human-centred and user-centred design of interactive systems we can also make a conclusion that these processes are essentially similar.

A user-centred/human-centred process requires more investment in the early stages of the lifecycle, but has been found not only to reduce in-service costs but also to reduce development costs (Vredenburg, Mao, Smith, & Carey, 2002). Besides cutting the costs, user-centred design also increases the user satisfaction and productivity (Bertot, Jaeger, & McClure, 2008).

There are hundreds of methods and tools for human factors and user-centred design, various methods and tools can be used, but often User Interface designers even don't know they are using some (Stanton & Walker, 2013). The techniques that can be used are literature review, personas, scenarios, use cases, user interviews, one on one interview, qualitative research, paper prototyping, interface design patterns, user testing, mock-ups and many others (Maguire, 2001; Wever, van Kuijk, & Boks, 2008).

Shortly, before one can choose an activity, one should learn about one's users and product, some techniques to learn about your users are creating user profiles, personas and scenarios (Wever, van Kuijk, & Boks, 2008). Once some understanding of users and product has been obtained, designers will develop a product to satisfy users' needs (Wilson, 2010). To evaluate and test the created scenarios and prototypes it's good to use the methods like the analysis of wants and needs, interviews and surveys (Van Velsen, Van Der Geest, & Klaassen, 2008).

2.3 Closing Remarks on Interaction Design Methologies

The goal of this chapter was to give an overview of interaction design and its different design methodologies. Interaction design is a relatively new field that addresses the ways in which a person can interact with a computer system (Sikorski, 2012). The chapter explore various artefacts used in interaction design and foster user-centred design process in user experience design and user interface engineering as adequate and ideal for designing interactive interfaces. The question which arises is:

- What interaction design guidelines should be followed for designing a public e-service interface?

Chapter 3. Designing the Public Interface for e-service

The chapter provides the case study of designing the public interface for the Information System for Processing the Notifications of Traffic Violations (HIS). The chapter describes the design process considering the top priority in European Action Plan 2011-2015 – user empowerment – to develop services designed around users' needs.

Furthermore the chapter describes the methods and techniques, research sampling, guidelines used to develop an integrated interface to the State Portal eesti.ee, the process of paper prototype testing, visual and functional prototyping and evaluation.

Currently the citizens make enquiries to ask for additional info (photos, duplicate of fines) or submit complaints, which could all be done online in the State Portal eesti.ee.

Furthermore citizens make many mistakes in payments of fines and police authorities would need to make an extra effort to correct the data. If they do not, payments may be lost and the tickets are not paid. People often assume that the ticket is paid; whereas in reality it is not. In the new HIS interface in the State Portal the payments for the traffic violations would be pre-filled and bigger mistakes could be avoided.

By designing the public interface for HIS, it is expected that the workload of police officers who are processing the applications of the citizens and correct the data of payments, should be reduced.

3.1 Methods and Techniques Used

Throughout the design process the following six steps were followed:

- To begin with, standard design research techniques are used to investigate the habits of users, the capabilities of the technology and the environment in which it will be used.
- Once the research is complete it's time for conceptual design and the research must be analysed. There can be many versions of conceptual design.
- The final version of conceptual design will help to analyse the strengths and weaknesses of the primary design.
- After the final conceptual design prototypes are created to emphasize the product's interactivity.
- The implementation of the design requires the oversight of interaction designers to make sure the plans are followed exactly as conceived. Last-minute design changes are often made by designers during the implementation process. If a problem exists in implementing the design, the designer can quickly correct the problem.
- When a final product is ready, it is evaluated or tested before it is released.

Depending on the results of the evaluation and testing, the product can move forward, be sent back for changes or be totally scrapped, requiring the six-step process to be fully restarted.

The methods and techniques used in the design process in this chapter are personas, scenarios, use cases, user interviews, one on one interview, qualitative research, interface design patterns, prototyping and user evaluation.

Because the user's experience is subjective, the best way to directly obtain information is by studying and interacting with users. The user experience designer could interview existing and potential users of the system to gain insight into what would be the most effective design. Knowing the audience is the first step in user experience design and enables to develop experiences that reflect the users, that is, personas.

Based on the findings it's possible to develop wireframes of different layouts and also prototypes.

The dominant interview technique in the field of qualitative research has been face-to-face interviews with users. User testing by interviewing users is another popular user experience

design task. The most effective and cost-saving way to do this is with a survey, but even more informative are face-to-face interviews. In a face-to-face interview there is no significant time delay between the question and the answer; the interviewer and interviewee can directly react on what the other says or does. In a one on one interview one expert is interviewed by a researcher, who's is following a tightly scripted guide or a loose outline. The duration of an interview might range from 20 minutes to an hour or more. Individual interviews are ideal for learning exactly how each person feels about a topic or design, without any concern to the influence of others. An advantage of this synchronous communication is that the answer of the interviewee is more spontaneous, without an extended reflection. But due to this synchronous character of the medium, the interviewer must concentrate much more on the questions to be asked and the answers given (Opdenakker, 2006).

Wireframing and prototyping can be done simply with pen and paper. Paper prototyping, in particular, has many benefits, such as being inexpensive, conducive to group prototyping and quick and easy to produce. During the case study, paper prototyping, visual prototyping and functional prototyping were used.

One of the goals of the current thesis was to create a functional prototype of user interface design for the written cautioning procedure ICT system of Estonian police to the state portal eesti.ee.

The used resources for creating functional prototype were:

- WampServer
- Notepad ++
- Web browsers.

3.2 Research Sampling

Every e-service has at least two sides involved – users and stakeholders. Thus, in this case study – designing the public interface for the information system for European citizens, there are two main groups that belong to the research sample: citizens as users, and organisations as stakeholders. The citizens that participated in the evaluations were selected on a random basis, not segmented by profile, but it was observed that also foreigners would belong to the group.

Concerning the research subject, two organisations were involved; Estonian Police as the owner and key user of HIS, and the Estonian Information System Authority, which coordinates the development and administration of Estonian State portal.

Interviewees from organisations were chosen based on their competency in the topic.

Tabel 1: Names and positions of interviewees

Toomas Kaarepere	Head of the Traffic Proceeding Office , Police and Border Guard Board
Marianne Heinmäe	Police Captain in the Traffic Proceeding Office , Police and Border Guard Board
Kaire Leet	Commissar in the Traffic Proceeding Office , Police and Border Guard Board
Mihkel Tikk	Head of the Department of the State Portal eesti.ee
Timmo Tammemäe	Project Manager, Development of State Portal eesti.ee
Tiina Rekand	Editor, Content Management of State Portal eesti.ee

3.3 User Interface Guidelines of State Portal eesti.ee

The structure of the user interface of the new e-service is expected to meet the design requirements of the State portal. User interface guidelines (Appendix 4) and usability best practices are required to be followed.

The design of the e-service needs to be approved by RIA.

In collaboration with RIA usability professionals, the service users and goals must take into account, service design and architecture. This chapter will outline the official user interface guidelines of eesti.ee State Portal[9]:

- The user interface must be designed taking into account the monitor resolution of 1024x768 pixels and an effective area of size 960x600 pixels.
- If possible, photos must be displayed above the fold, taking max 80% of the display area.
- Dropouts, exaggerated framework and unreasonably large buttons are not recommended.
- It is forbidden to display left and right scrolling and double scrolling (e.g large text fields).
- The use of flashing elements (banners) and Flash components should be avoided.
- Mouse clicks and other actions should be minimized. It is necessary to avoid mixed use of mouse and keyboard.
- A special type of objects should not be visually distinguished - for example, primary and secondary activities are designed with different coloured buttons.
- The buttons are used only to perform the most important activities with basic forms. The buttons should not be used within any form (except for the purpose of opening the modal window).
- The user must get feedback to his/her "location" in the information system through the navigation bar (breadcrumb). The navigation bar reflects the structure of the website according to its design. Each change of the webpage will change “location” in the navigation bar.
- The home page does not need to be displayed on the navigation bar, since it does not contain any new information.

[9] http://proto.eesti.ee/?uig

- The navigation bar should be hyperlinked and lead to the corresponding page for each title. Each page title (the title and the title element) must be distinct from the others. All browser windows (title element) have to have a single naming "[name of page] - [eesti.ee] ".
- The content should always be 100% readable for screen readers. Longer articles should always start with an introductory section that summarizes the entire article, or to reflect the objective described in the article. All text should be as short as possible, but with enough information to convey.
- Each paragraph should contain only one idea and should be as short as possible. If possible, Article Chapters must have a sub-title.
- Lists in articles must been submitted a list of icons. Numbers are added to the list only in the case when there is a hierarchy of steps or processes. Numbers should be used in web content as numbers, not as text.
- Users are authenticated on a late stage in the process and only when the user's future activities require his/her identification. After logging in, the user will see the page where they started the authentication process from. Mobile-ID users can store their cell phone number in the web browser’s cookie for later use. The header displays the name of the person logged in. The role of user is displayed in the upper right-hand section of the page. In the case of a conflict with the user’s role, the user must manually select the relevant role.
- The menu and the environment take into account the user's rights, and thereby the user sees only the part of the application for which he/she is authorized.
- The portal must have a minimum retention period, for example, the loading of the display and the service should not take too long. To ensure this, queries and application code should be optimized accordingly.
- Making mistakes in the system must be difficult, for example, the forms used must have data validation enabled, so that the user is notified of wrong input. The information must be easy to find. This means that the information in the portal should be logically designed and be found exactly there where the user expects to find it. Loss of information should be avoided. System users must be notified if actions could lead to information loss.

- The purpose and need for each UI element must be clear and understandable. The portal must not seem complex, for example, too much noise, too many user interface elements displayed at once, etc. The portal must avoid the use of professional language. All text must be written in plain language, and be understandable.
- The interface is generally always in Estonian, the application defines the specific requirements of other languages (English, Russian), and localization support.
- Situations in which the system processes are incompletely translated, e.g., one page in English, and the rest in Estonian, should be avoided.

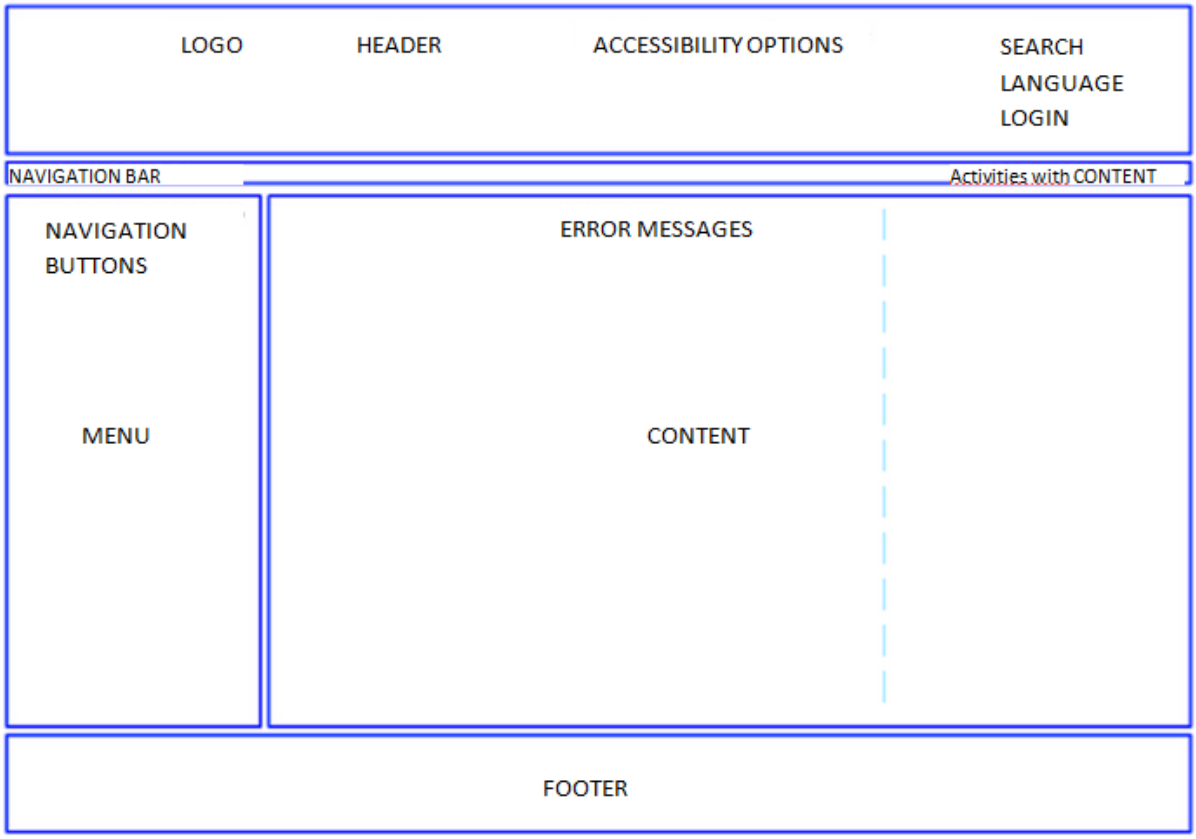

Figure 11: State Portal eesti.ee UIG - the Structure of web-page

The components/elements of State Portal eesti.ee UIG (Figure 11)[10]:

- Information and error messages
- Links

[10] http://proto.eesti.ee/?uig/kasutajaliidese_koostisosad/alad

- Menus
- Buttons
- Tables
- Forms
- Pictures/Photos
- Videos
- Pop-ups
- Filter
- Tabs
- The Exchange of Icons
- File Types
- Editing Help
- Icons of Topics
- Loading
- “Implementation is down”
- “404”

The portal has to generate positive emotions during the first use:

- The user interface must be simple and logical
- The design should be in calm colours
- The system must not seem complex
- The use of flashing elements must be avoided.

3.4 User Study in design process

The Process started from obtaining concerns and expectations of the citizens and system improvement ideas from the Estonian police.

As the first step “one-question-survey” was held on– “Kas eesti.ee võiks sisaldada ka infot kiiruskaameratrahvide kohta?” (“Should ‘eesti.ee’, contain information about the speed camera fines?"). Simple YES/NO answers did give positive feedback that is; citizens do have a will to see the information about violations also in State Portal.

Then Personas (Appendix 2.1) and Scenarios (Appendix 2.2) were created and tested.

All volunteers were asked to read through the scenario and answer the questions posted. Although they represented best one of the persons used in the scenario, they were asked to give insights to all of them.

Here are the results of the interviews and thoughts on the scenarios. (Appendix 2.2.4: Summary of Scenario Testing)

Scenario 1 - Peeter is waiting for his speeding fine to get rid of it quickly:

- The impression of the participants was that the scenario is quite realistic.
- A remark was made that today lots of people use Cruise control, which could help soften the problem of speeding.
- SMS notification would be great to tell you that you got flashed.”
- In case one gets a speeding ticket it is quite realistic that people call the clerk responsible to ask for further instructions.
- If such a system was made I'm sure people would use it, because it would make their life much easier. Currently I pay my fines through the bank, but would use such a system surely.
- “Currently when the notification mail gets sent to you by post I assume the data is all there. I haven't got a speeding ticket in Estonia but in Germany you will be sent a notification mail + all the data involved, the picture etc. So then it is enough.” [Comment: today via post one only gets a notification letter nothing else.]
- The problem is clearly stated, however, I can’t really understand how the process of making the payment works in the new system. [Comment: bank link will be used in the system for that]

Scenario 2 - Maia is looking for information on her possible speeding ticket:

- This situation seems to be quite realistic.
- "If I had no idea where to ask about my speeding ticket then I would start searching from various homepages or the Police."
- Help texts are surely necessary for beginners. Moreover, there should be confirmations when clicking "OK" or "PAY". Just to verify if the person is sure he/she wants to do that.
- If some field was left empty when typing there should also be confirmations that this is empty, please fill - but this is already common sense these days I think.

Scenario 3 - Tõnu is discovering the world of e-services:

- It looks like a realistic scenario, because elderly people really have difficulties using ID-card.
- In case of strong sunlight or reflections you may not notice that you get flashed.
- Today there is no official announcement that the case is closed. So there should be an SMS notification that a case is closed.
- "Almost everybody today uses mobile phones. At least I believe that all people who drive a car have a mobile phone. So using SMS notifications to notify about a speeding ticket is a must. Just like in the hospital one has a notification system: For example, tomorrow you have set a meeting with Dr X at 14:00."
- Tõnu would probably use this system rather than a bank system if everything is in one place.
- The scenario should be changed in this sense that both Tõnu and Peeter are not aware that they got a speeding ticket. So Peeter might be changed to a person who knows but doesn't care that he got a speeding ticket.

Further comments:

- It seems that all necessary personas and scenarios are covered.
- What seems to be missing is a typical hooligan. A person that speeds all the time and doesn't pay tickets. [Comment: Such persons are not really the users of our system thus they were initially excluded. It would have been a negative persona. If such a person wouldn't pay the tickets then already the bailiffs would contact them and demand the sums that way. So they really are not a customer of this service].

3.5 Paper Prototype testing

As the first prototype, the paper prototype was created and the idea was tested by "think aloud" by first using user stories and then evaluated where users have the freedom to determine what should be included in the design (Appendix 3).

Paper prototyping was carried out with early design ideas and concepts. The goal of paper prototyping was to determine if users can interact smoothly with the interface.

The paper prototyping was used to check functionality, terminology, navigation and page layout. This ensures that people can complete the critical user journeys with the interface. Paper prototyping is a rapid way to incorporate direct feedback from real users into a design. Because it requires zero coding effort, designs can go through a number of iterations in a short amount of time. Based on the user-centred design standard, paper prototyping is a key component of our iterative design approach (Travis, 2014).

Testing results were good - reactions from both police and public side were enthusiastic.

Key points from testing results:

- They noticed immediately the highlighted colours.
- They thought more information on the photo could be useful and suggest adding a map of Estonia that shows the location.
- They then clicked to pay the fine, but didn't see how large the fine is.
- They found SETTINGS immediately.
- They pointed out that the fields could be pre-filled.
- They learnt that the layout is basically the same as for personal users.
- They suggested help must be located in same position through navigation

One example can be seen: https://www.youtube.com/watch?v=L2hjRcOVFRA#t=22

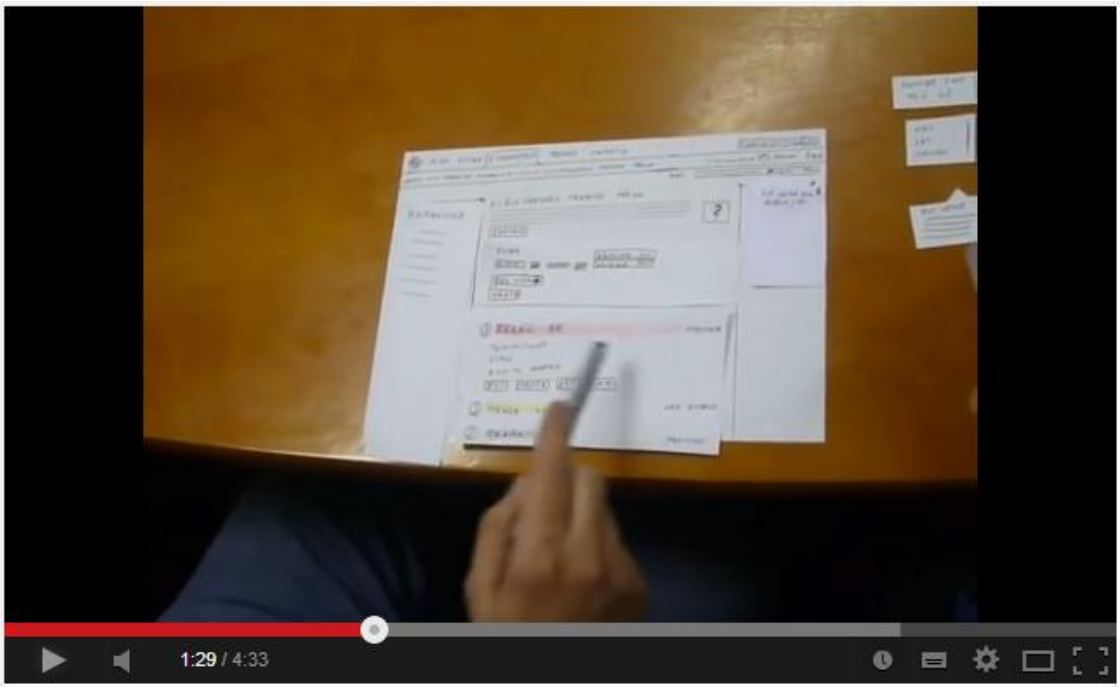

Figure 12: Screenshot of Paper Prototype testing video

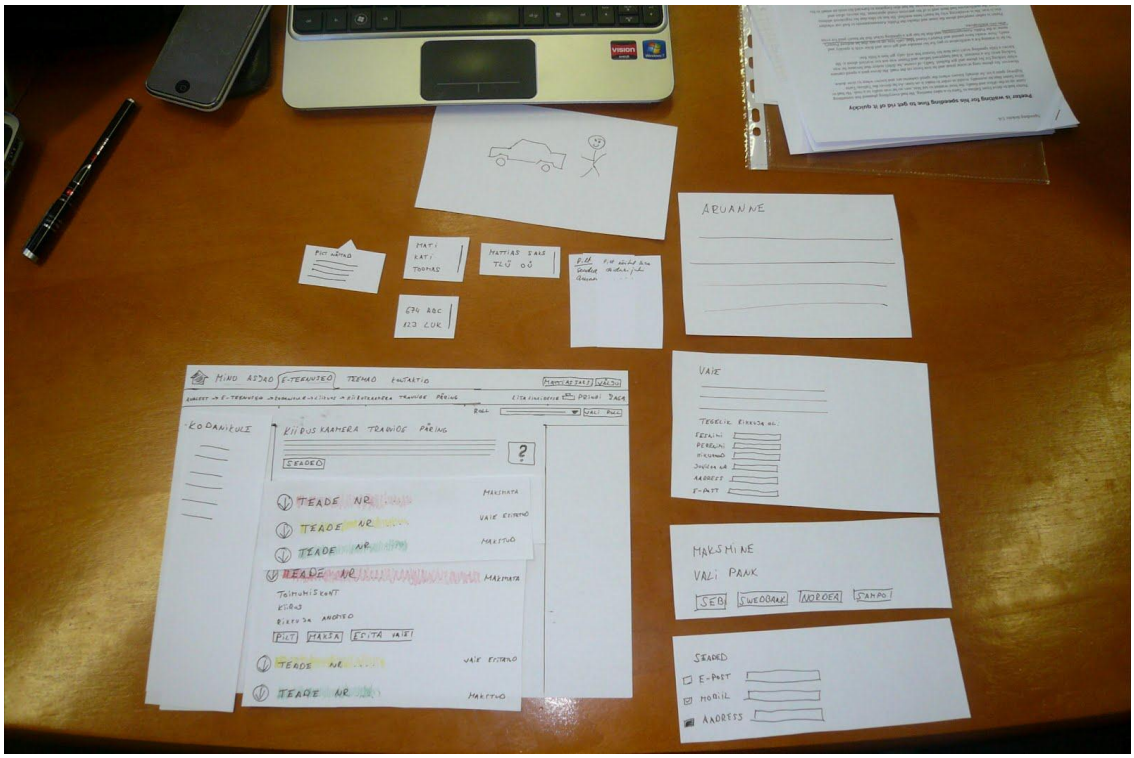

Figure 13: Paper Prototype Testing I

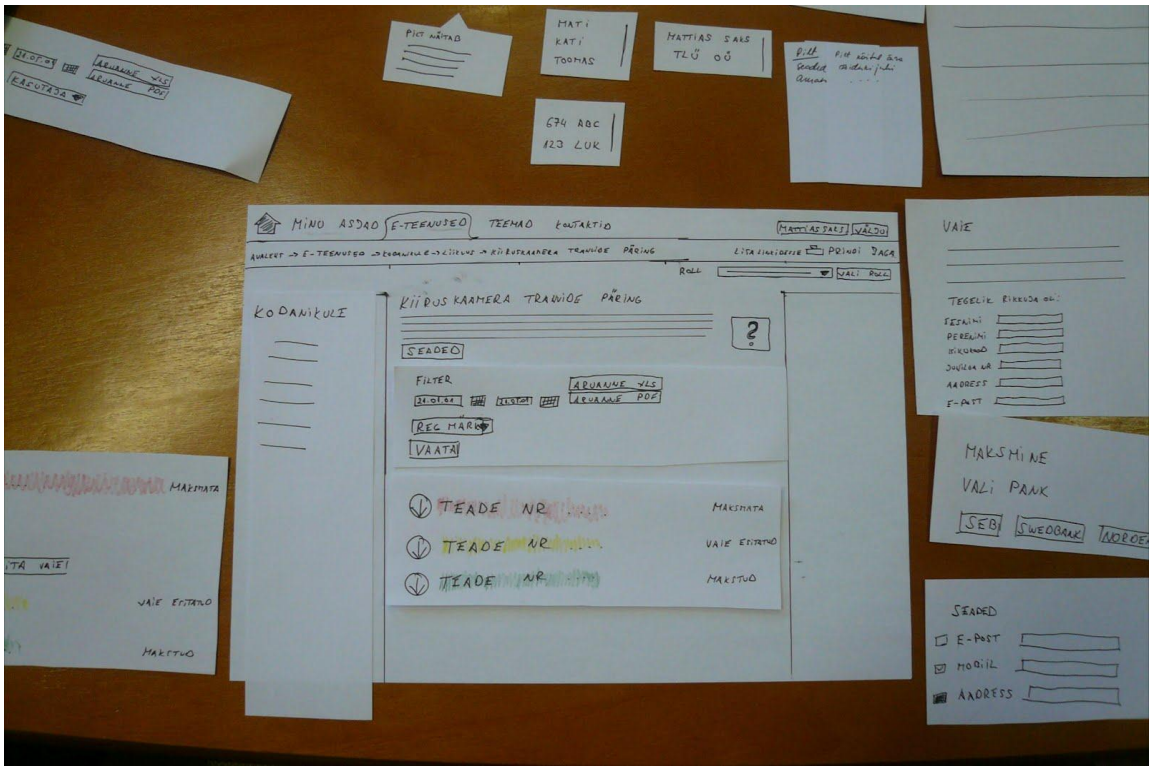

Figure 14: Paper Prototype Testing II

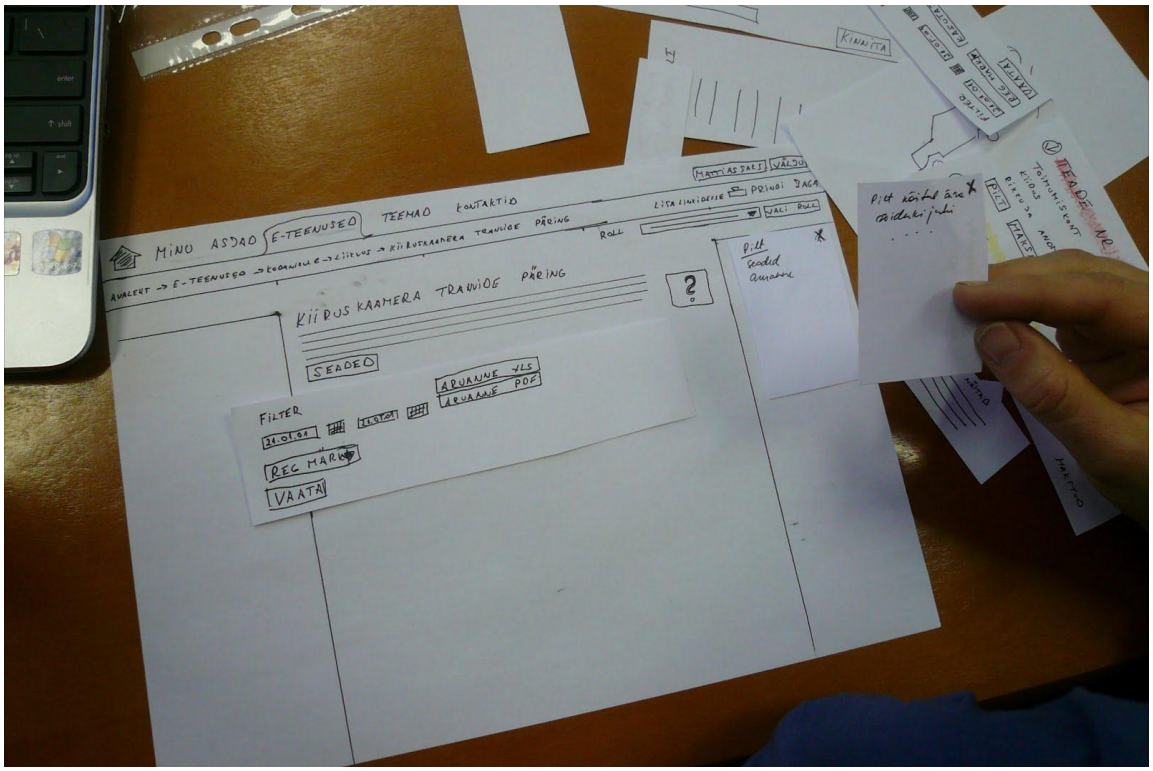

Figure 15: Paper Prototype Testing III

3.6 Visual Prototype evaluation

After Paper prototype testing, suggestions were taken into account and as a next step visual prototype was created in Adobe Photoshop.

Visual prototyping is very important; it shows what the website will eventually look like, even before any website code is written. A visual prototype is an exact visual representation of how the website homepage will appear in the browser, including the website's colour combination, graphic icons, fonts and look of individual components such as menus, tabs, buttons, headings and forms (Webrmedia, 2013).

For functional prototype, the visual prototype was evaluated during interviews. More images of visual prototype can be seen in Appendix 5.

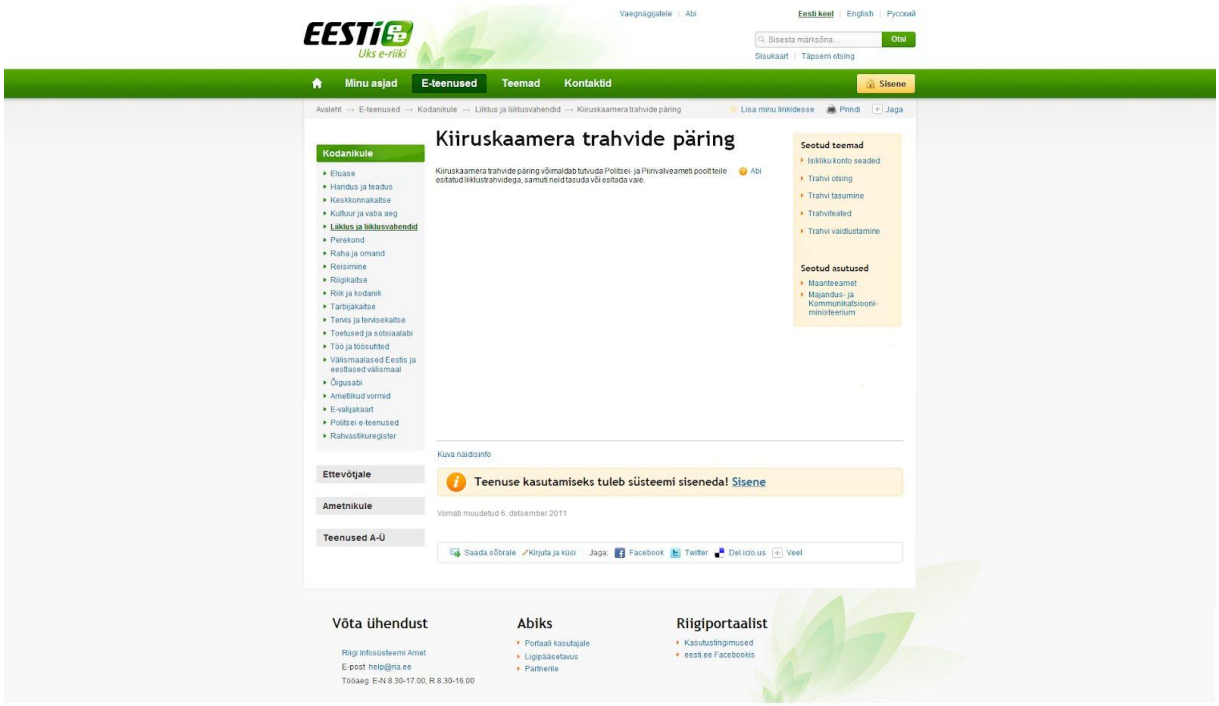

Figure 16: Visual prototype

Input for functional prototype: interviews and testing with the Estonian Police took place on February 17, 2014, and one for the Estonian Information System Authority took place on February 20, 2014 and March 4, 2014.

Estonian police is the owner and key user of the ICT System for Processing the Notifications of Traffic Violations.

The Estonian Information System Authority (RIA) coordinates the development and administration of the state's information system, organises activities related to information security, and handles the security incidents that have occurred in Estonian computer networks. RIA advises the providers of public services on how to manage their information systems as per requirements and monitors them. In addition, RIA is an implementing entity of the structural assistance of the European Union. RIA is a subdivision of the Estonian Ministry of Economic Affairs and Communications (Estonian Information System Authority, 2014).

As a first step, considering the key points in Appendix 7 for Visual Prototype, there should be made different kind of legal, technical and design changes in the design of Mock-up.

One of ideas was to make also visible the photograph taken by the speed camera (Figure 33: Visual Prototype – Photo of traffic violation), but as an automated process it's not possible to solve. Also today copy of the photo is not added to the fine notice, because in case, there are other passengers besides the driver seen in the passenger compartment on this photo recorded by the speed camera, then, with a view to protect the personal data - images of all persons except the driver will be blurred manually by police officer. Photo will be sent to an e-mail or regular post address given by the responsible user as an answer for submission of an application for sending a photo (Kaarepere, 2014).

Still RIA and Estonian Road Administration are really interested to add the photo as an part of violation data (Tikk & Tammemäe, 2014).

The function to pay the traffic feed already in State Portal is really welcome and technically possible. From the side of Police and the citizens the solution will increase the "wrong-payments" and has clear, fast way to finish the case.

3.7 Functional Prototype

If the aim is to provide the end user as the real user experience of the Web application, you will have a view of the user's basically an HTML file that is linked together, such as the effect of the human to worry about making pretty designs. The user experiences the difference between the quality of paper prototype and full functional prototype depicted part is obvious. Especially when fully functional prototypes presented views are linked in real terms. In fact all of the links do not need to work.

For example, each entry can be always one and the same item detail page view data. View the information of the previous and the next must be logical connection, but not one-to-one corresponding. The aim is to convey the idea of how the components are connected. A fully functional prototype environment that allows the end user to provide real user experience created the software, without the software ready for programming.

One of the goals of current thesis was, as one example, to create functional prototype of user interface design for the Written Cautioning Procedure ICT System of Police Estonia to the State Portal eesti.ee

The used tools for creating Functional Prototype were:

- WampServer
- Notepad ++
- Web browsers.

WampServer is a collection of web development tools and softwares. The application contains Apache Web Server, MySQL Database Management System & PHP Programming Language. This program provides an environment for developing web pages and applications. WampServer allows developing without actual servers. It configures itself automatically and runs smoothly. The files/web pages that are hosted on a WAMP server can be accessed by typing http://localhost or http://127.0.0.1 in the web browser's address bar. WAMP must be running in order to access either of the above addresses.

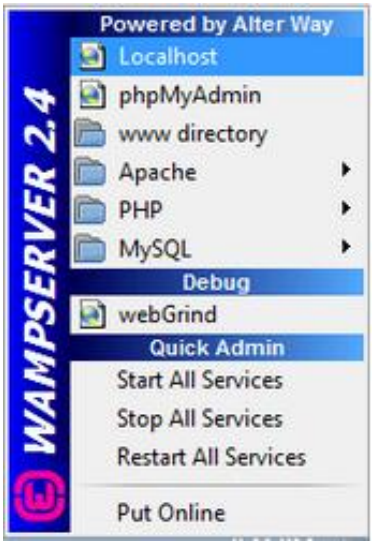

Figure 17: WampServer

Notepad++ is a free source code editor that is designed specifically for text-based code development and supports several languages. Running in the Microsoft Windows environment, its use is governed by General Public License. It helps you see the code more clearly and has more advantages, like when you highlight the starting div tag, the ending tag will be highlighted, so you can check division or section written is “closed” (Figure 18).

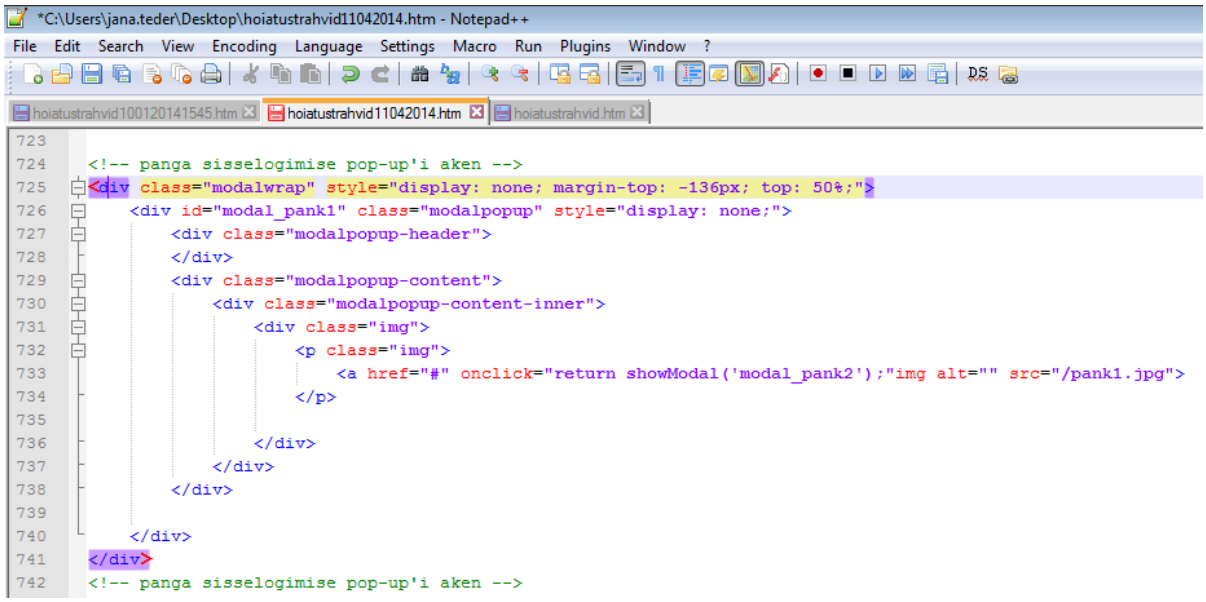

Figure 18: Prototype code example in Notepad ++

Code was written in HTML language and styled with CSS.

Prototype was created and tested in one laptop. No external links and sources were used in the code of the prototype. Almost all ideas were realized and during the development I added some of mine, to improve the result and fulfil some expectations of Estonian Police and users and to follow the guidelines of State Portal.

The guideline of State Portal contains a requirement:

“P*rimary and secondary activities are designed with different coloured buttons.”*

For that reason there was used primary and secondary buttons (Figure 19):

- Green and more visible buttons for functionality “Pay” (“Maksa”) and “Ask Photo” (“Küsi foto”).
- Light coloured and less noticeable buttons for “Send Complaint” (“Esita kaebus”) and “Send Report” (“Saada väljavõte”).

As an example to fulfil the requirement,

”*The portal must avoid the use of professional language”,*

was decided to use the expression “Ask Photo” instead of “Submit the request for the recording of violation”

Figure 19: Improvement of Visual Prototype in Functional Prototype

First there was a need for the button “Send Complaint” (“Esita kaebus”). But to make the cognition and User Experience more positive it was divided for two types of citizen’s applications and the primary button “Ask Photo” (“Küsi foto”) was added (Figure 19 and Figure 25). As a result there is still possible to send a complaint, but it doesn’t dominate.

Improvement was approved by Service Manager.

To fulfil the requirement,

“The buttons should not be used within any form (except for the purpose of opening the modal window”,

the solution for the functionality of the buttons in the code were modal windows: modal_kaebus, modal_taotlus, modal_maksa, modal_pank1, save_modal.

Code example of modal window:

```
<!-- Taotluse saatmise pop-up'i aken -->
<div class="modalwrap" style="display: none; margin-top: -136px; top: 50%;">
   <div id="modal_taotlus" class="modalpopup" style="display: none;">
      <div class="modalpopup-header">
         <div class="modalpopup-header-inner clear">
            <h1>Foto küsimine</h1>
            <p class="close"><a href="#" onclick="return hideModal();">Sulge</a></p>
         </div>
      </div>
      <div class="modalpopup-content">
         <div class="modalpopup-content-inner">
            <p>Siit saate esitada taotluse salvestise saamiseks. Vastuseks saadab Politsei- ja
Piirivalveamet Teile foto automaatse järelevalve kaamera tuvastatud rikkumise kohta.</p>
                  <table class="form">
                  <tr>
                     <th>
```

```
                        <label for="from">Kellelt:</label>
                    </th>
                    <td><input type="text" readonly="readonly" name="from" id="from" value="jana.teder@eesti.ee" class="wide"><img title="Abiinfo" alt="Abiinfo" class="help-toggle ico" src="/riigiportaal/gfx/ico_help.gif">
                        <div class="help" style="display: none;">
                            <div class="help-header">
                                <div class="help-header-inner clear">
                                    <p class="title">Saatja meiliaadress</p>
                                    <p class="close">
                                        <a title="Sulge" href="#">Sulge
                                        </a>
                                    </p>
                                </div>
                            </div>
                            <div class="help-content">
                                <div class="help-content-inner">
                                    <p>Vaikimisi näidatakse alati teie esimest eesnimi.perekonnanimi.nnn@eesti.ee aadressi. Juhul, kui teil on ametlikke e-posti aadresse rohkem kui üks või teil on näiteks ka ettevõttega seotud aadress, siis saate valida, mis aadressi alt soovite kirja saata.</p>
                                </div>
                            </div>
                            <div class="help-footer"></div>
                        </div>
                    </td>
                </tr>
                <tr>
                    <th>
                        <label for="to">Kellele:</label>
                    </th>
                    <td class="data">
                        menetluskeskus@politsei.ee
                    </td>
                </tr>
                <tr>
                    <th></th>
                    <td class="options">
                        <input type="checkbox" id="cc_me" checked="checked" name="cc_me" value="Y">
                        <label for="cc_me">Saada mulle koopia</label><img title="Abiinfo" alt="Abiinfo" class="help-toggle ico" src="/riigiportaal/gfx/ico_help.gif">
                        <div class="help" style="display: none;">
                            <div class="help-header">
                                <div class="help-header-inner clear">
                                    <p class="title">Saada mulle koopia</p>
                                    <p class="close">
                                        <a title="Sulge" href="#">Sulge
                                        </a>
                                    </p>
                                </div>
                            </div>
                            <div class="help-content">
                                <div class="help-content-inner">
```

```
                                <p>Koopia kirjast saadetakse ka teie ametliku e-posti aadressiga seotud aadressile.</p>
                            </div>
                        </div>
                        <div class="help-footer"></div>
                    </div>
                </td>
            </tr>
            <tr>
                <th>
                    <label for="subject">Teema:</label>
                </th>
                <td class="data">
                    Trahviteate 223012051490 salvestise taotlus
                </td>
            </tr>
            <tr>
                <th>
                    <label for="body">Sisu:</label>
                </th>
                <td>
                    <textarea class="resizable" id="body" name="body" cols="89" rows="12"></textarea>
                </td>
            </tr>
                <tbody>
                </table>
        </div>
    </div>
    <div class="modalpopup-footer">
        <div class="modalpopup-footer-inner">
            <div class="modalpopup-footer-inner2">
                <p class="action clear">
                    <button type="submit"><span><strong>Saada</strong></span></button>
                    <a href="#">Tühista</a>
                </p>
            </div>
        </div>
    </div>
  </div>
</div>
<!-- Taotluse saatmise pop-up'i aken -->
```

The navigation flow of the Functional Prototype can be seen in Figure 20, more detailed screenshots can be found in Appendix 8.3.

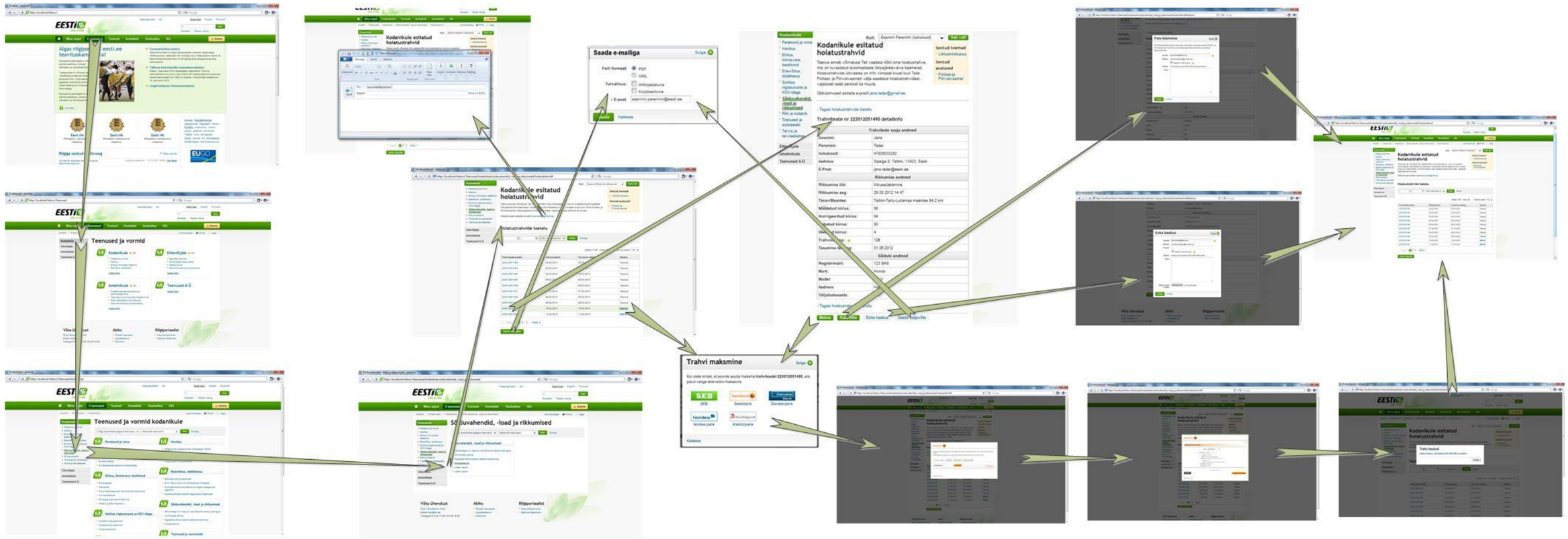

Figure 20: Functional Prototype page navigation flow

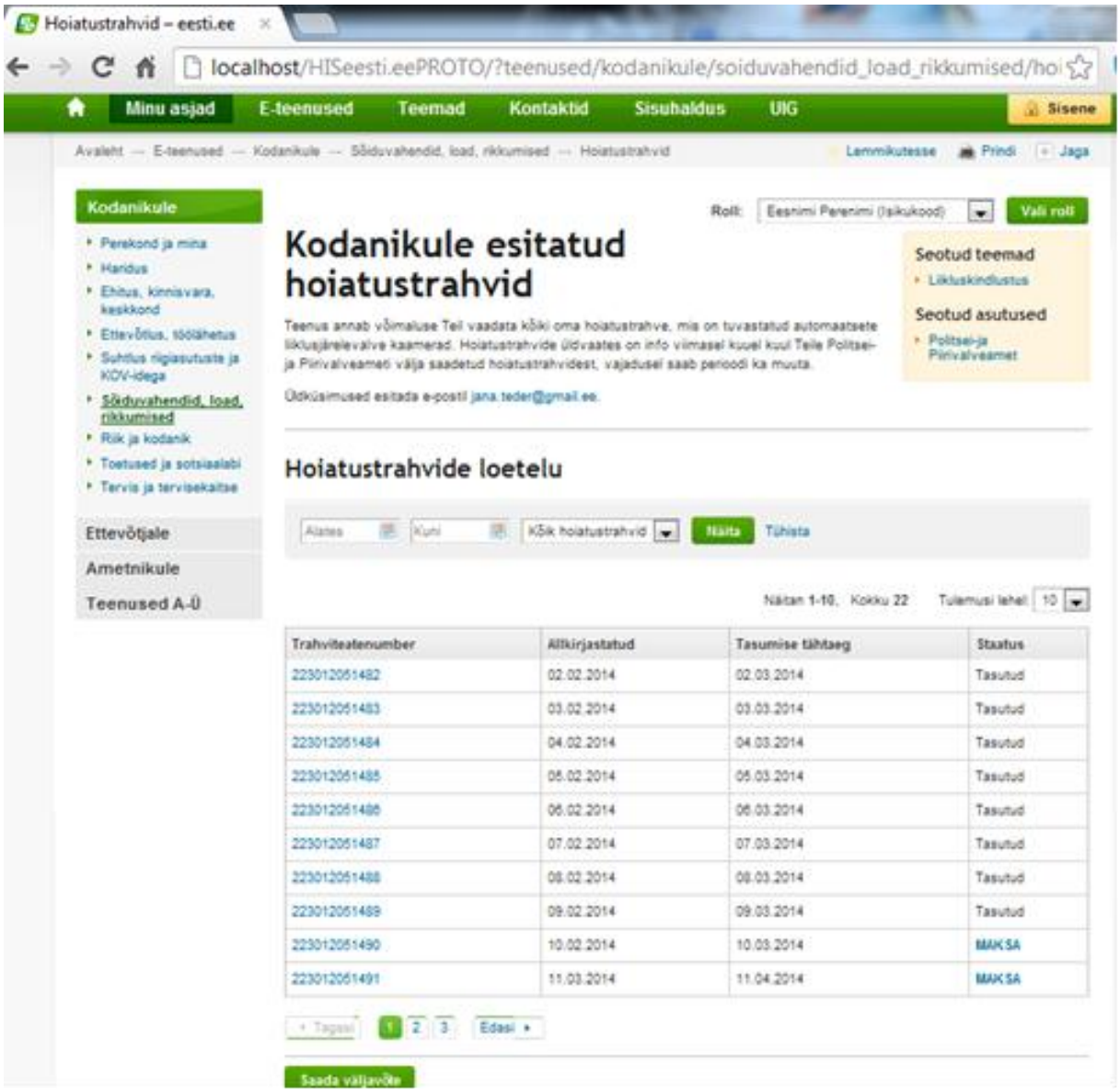

Figure 21: Functional Prototype – Main view of the service HIS in State Portal

As the primary functionality on the main view of the interface (Figure 21), citizen logged into the State Portal, will have an overview of his/her traffic notifications from Estonian Police and already opportunity to pay the unpaid fines (Figure 22).

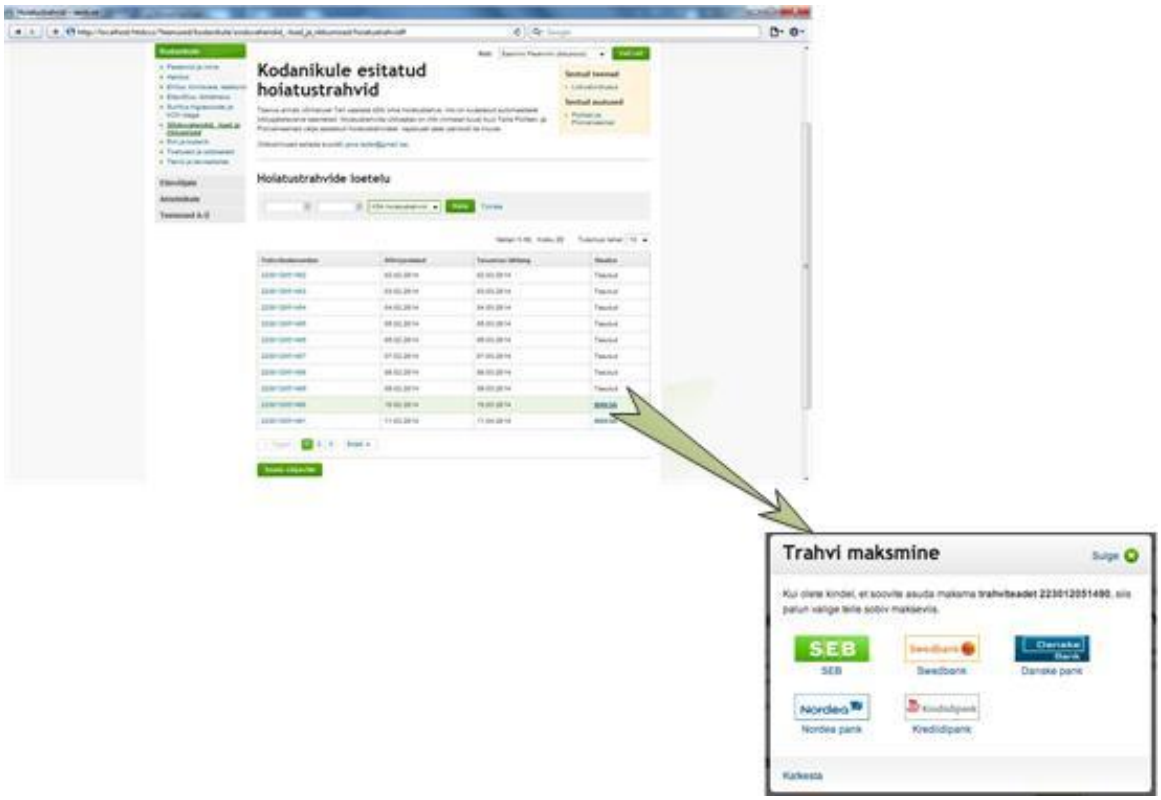

Figure 22: Functional Prototype - Payment of the fine in the main view of the service in State Portal

By clicking to the specific fine, the detailed information will be displayed (Figure 23).

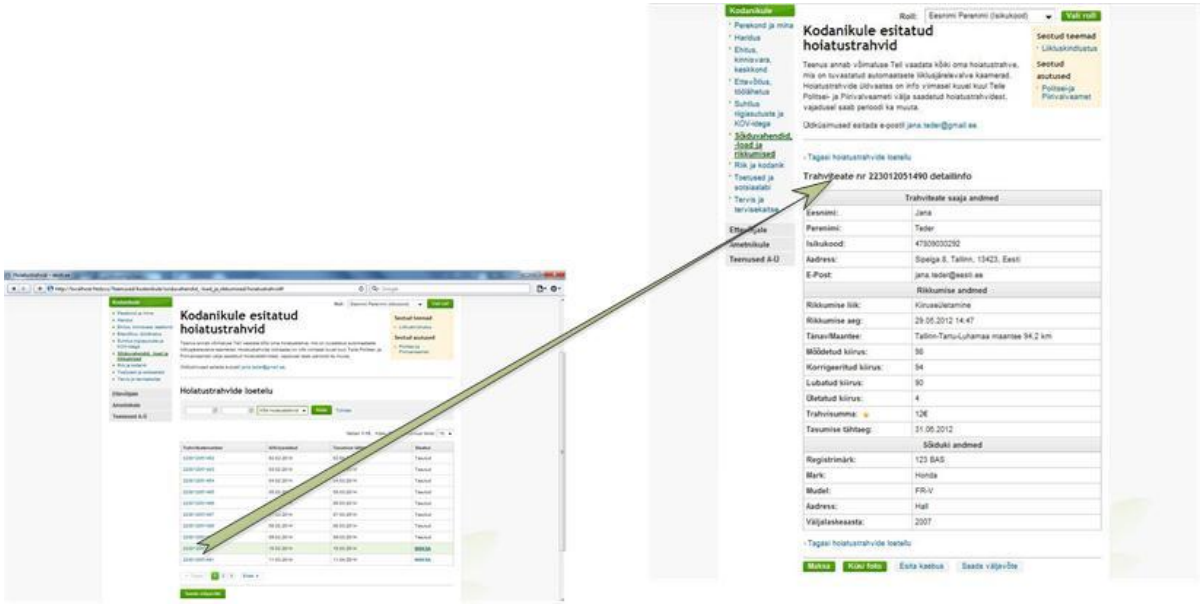

Figure 23: Functional Prototype – Detailed view of the fine in State Portal

The page of the detailed information about the fine contains ihe information of the recipient of the fine, information of violation and information of the vehicle used. On the page the citizen can use functionality by clicking on link “Back to the list of fines” (“Tagasi trahviteadete loetellu”) or on the buttons “Pay” (“Maksa”), “Ask Photo” (“Küsi foto”), “Send Complaint” (“Esita kaebus”) and “Send Report” (“Saada väljavõte”) (Figure 24).

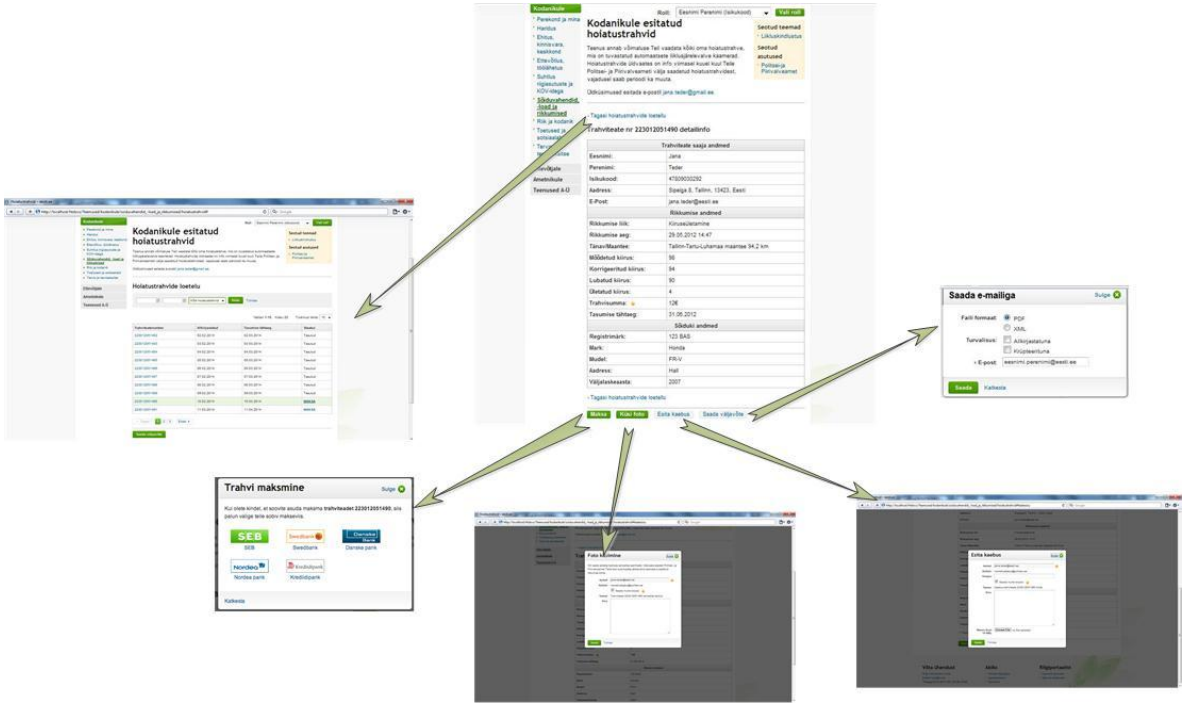

Figure 24: Functional Prototype - page "Detailed info of fine" navigation flow

The example of Visual and Functional Prototype differences can be seen on Figure 25:

1. Changed title of the page
2. Changed functionality of filter
3. The detailed view of the fine will be in Functional Prototype opened in new view
4. Extra functionality to send an e-mail with the topic of traffic violation to the Estonian Police
5. Extra functionality to send a report of traffic violations to your e-mail
6. Functionality “check the photo” is removed
7. “Choose your bank” will open in modal window
8. The name of the button “Send complaint” is changed and functionality is divided under two buttons

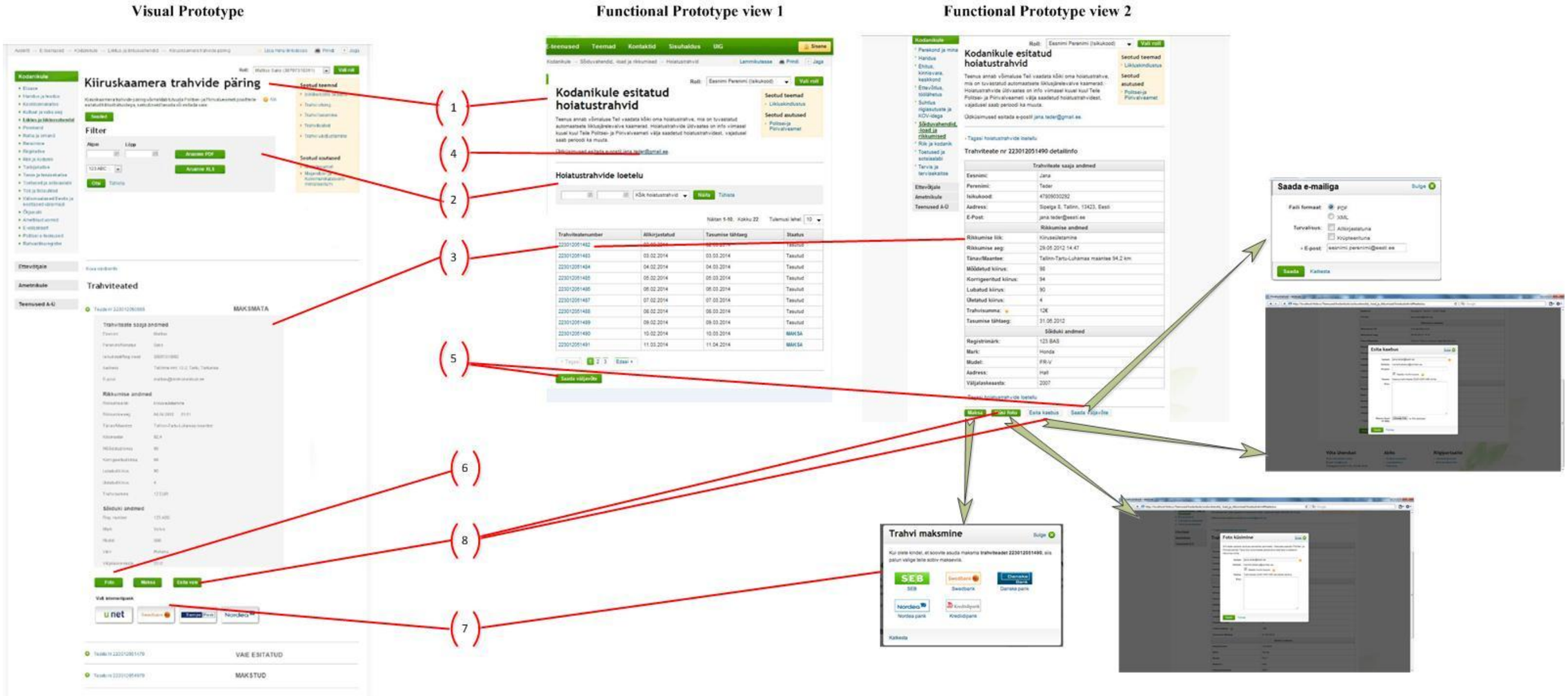

Figure 25: Example of differences - Visual and Functional Prototype

3.8 Functional Prototype evaluation

In the beginning only practical qualities, such as performance and functionality were evaluated, but recently the perspective has changed towards user qualities, such as satisfaction, impression (WOW factor) and joy. Besides usability, also human factors science, psychology, information architecture and user-centred design principles also play major roles in User Experience. Therefore, it is necessary to collect User Experience information through User-Centred qualitative investigations and then develop the product taking its relationship with users into account (Hashizume & Kurosu, 2013).

Functional prototype was evaluated and approved by Estonian Police, and Service Manager of IT and Development Centre, Ministry of Interior (SMIT).

Face-to-face interviews and evaluation with potential users were held on in IT and Development Centre, Ministry of Interior, in the lobby of Tallinn University of Technology and in the lobby of Building 4 “Tallinn Science Park Tehnopol”.

Tallinn Science Park Tehnopol is a center for technology based companies in Estonia, bringing together science and entrepreneurship.

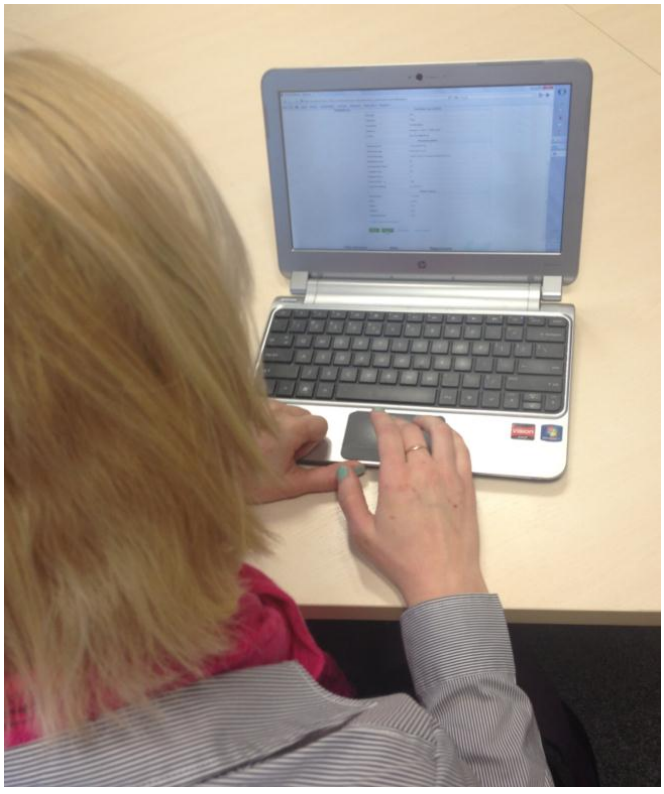

Figure 26: Functional Prototype evaluation

During face-to-face interviews 100 people were asked to evaluate the Functional Prototype. The elapsed time and comments about satisfaction and impression were added for each test ID. (See Appendix 8.2)

There were six questions asked from users after the functional prototype was evaluated:

Table 2: Questions for Functional Prototype evaluation

Question	Yes/No
Olen saanud politseilt trahvi kiiruseületamise tõttu/ I have got speed ticket	
Olen ka kasutanud Riigiportaali eesti.ee/ I have used State Portal eesti.ee	
Informatsioon hoiatustrahvide kohta on esitatud arusaadavalt/ The information found about speed tickets is clearly understandable.	
Lisatud e-teenus võimaldab toiminguid teha kiiresti ja mugavalt (nagu näiteks rahaasjade ajamine internetipangas)/ Thanks to the e-service I can quickly reach my goal.	
Leian, et hoiatustrahvide info ja maksevõimalus võiks olla kättesaadav Riigiportaalis / The information about speed tickets should be in State Portal	
Oled Sa Eesti kodanik?/ Are You citizen of Estonia?	

Answers can be divided into ten types of personas:

1. YYYYYY – Person has got speed ticket, used State Portal, likes the idea about new e-service, and is local
2. YYYYYN - Person has got speed ticket, used State Portal, likes the idea about new e-service, and is a foreign citizen.
3. YNYYYY - Person has got speed ticket, has not used the State Portal, likes the idea about new e-service, and is local
4. YNYYYN - Person has got speed ticket, has not used the State Portal, likes the idea about new e-service, and is a foreign citizen
5. NYYYYY - Person has not got speed ticket, used State Portal, likes the idea about new e-service, and is local

6. NYYYYN - Person has not got speed ticket, used State Portal, likes the idea about new e-service, and is a foreign citizen
7. NNYYYY - Person has not got speed ticket, not used State Portal, likes the idea about new e-service, and is local
8. NNYYYN - Person has not got speed ticket, not used State Portal, likes the idea about new e-service, and is a foreign citizen
9. NNNYYY - Person has not got speed ticket, not used State Portal, likes the idea about new e-service, but doesn't quite understand all the information, and is local
10. NNNYYN - Person has not got speed ticket, not used State Portal, likes the idea about new e-service, but doesn't quite understand all the information, and is a foreign citizen

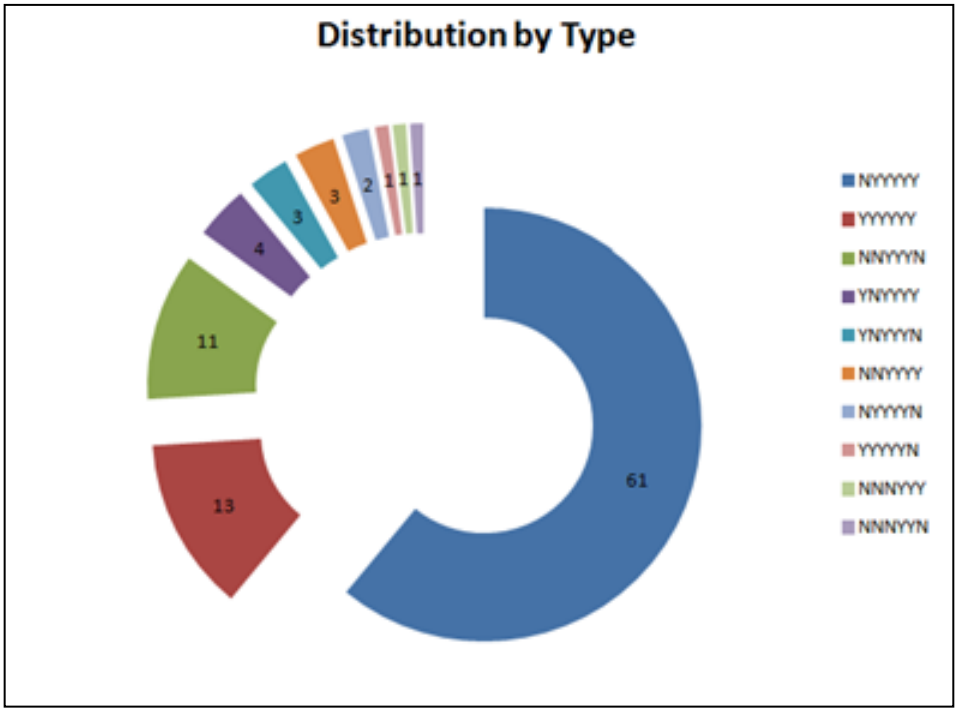

Figure 27: Distribution of Personas by type

The results show that most of the test-group, that is, 61% can be defined as the type NYYYYY (Person has not got speed ticket, used State Portal, likes the idea about new e-service, and is local).

Second most is the group that is, 13%, which indicate persons who have got speed ticket, used State Portal, like the idea about new e-service and are locals.

Third most is the group with 11 %, where the people have got no speed ticket, not used State Portal, like the idea about new e-service, and are foreign citizens.

18 persons out of 100 were foreign citizens, but three of them have already used the State Portal (eesti.ee). Foreign citizens were positively surprised about IT-solutions in Estonia and would recommend Estonian's ICT solutions to their States.

Two percent of the test-group was sceptical at the beginning, but generally also they like the idea about more clear, transparent and convenient e-service.

During testing many interesting ideas came up:

- Government could deduct unpaid speed tickets from tax refunds.
- Design don't make you feel, like it's punishment – it's just like notification or information
- Would like to see immediately the photo (Comment of author: Not allowed by police)
- Buttons under the detailed info could look all the same (Comment of author: Not allowed by RIA, buttons should be prioritized)
- Could be used over the Europe – like one central-system
- It's unbelievable it doesn't exist jet
- EU could create general ICT system for citizens – so you could use it also for visa-applications and others.
- Government could introduce and popularize the State Portal.

The feedback to the functional prototype of case study was positive; citizens were really enthusiastic and impressed of the ease of the system. Citizens are sure, the new interface will give them clear and transparent overview of their offences in Estonia and that through the State Portal, they can also easily pay their fines.

Chapter 4. Lessons learned and recommendations

This chapter outlines the lessons learned and recommendations for future design iterations.

In this Chapter, the thesis would provide reflections on the questions that arose through the study in line with the goals posed at the beginning of the study and provide answers to each question based on the insights gained from the study.

Through the review of the literature, the following questions arose:

- What requirements and presumptions must be taken into consideration in order to create a user interface for closed public ICT service and develop a public interface into the State Portal?
- To what extent can the case study of HIS be used for other deployments into the State Portal in Estonia and also in the State Portals of the European Union Member States?
- "What interaction design guidelines should be followed for designing a public e-service interface?"

Firstly, what requirements and presumptions must be taken into consideration in order to create a user interface for closed public ICT service and develop a public interface into the State Portal?

The regulation of European Union, though not yet in force, provides that within the European Union countries there should be creating obligations to allow access to digital services by the citizens of all Member States. The citizens expect the governmental e-services to help them save time and get the desired information more quickly and reduce the bureaucracy dealing with the authorities. The e-service has to provide a safe internet environment for communication between the State and the citizens, entrepreneur, public sector official and the overall society. Therefore, citizen or user satisfaction must be prioritized when developing and delivering public e-services.

Currently Estonia and the European Union are moving towards user-centric e-government and trans-boundary e-services. Menu and the environment of State Portal should take into account the user's rights, and thereby the user sees only the part of the application for which it is authorized. The portal must have a minimum retention period, for example, web-page display and service load should not take too long. To ensure this, queries and application code should be optimized accordingly. The portal should enhance positive emotions on first use; the user interface must be simple and logical, design should be used in calm colours, must avoid seeming complexity, must avoid the use of flashing elements. The portal should not make users prone to making mistakes, for example, the forms must be inserted in the validation of information to inform the user that the data has been entered in the wrong form. Information must be able to be found quickly. The portal should be easy to use. For example users should be able to save their data automatically instead of having to start operations from the beginning. The system should prompt users of information loss, if such users accidentally trigger a wrong action. The purpose and need for each UI element must be clear and understandable. The portal must avoid seeming complexity, for example, too much noise, too many user interface elements displayed at once, etc. The portal must avoid the use of professional language. The interface is generally always in Estonian, the application defines the specific requirements of other languages (English, Russian), and localization support. Choice of language is the language used for the desired value of the appropriate language (Estonian, English). Language selection screen reader must be visible on the textual title of "Application Language". Situations in which the system processes are incompletely translated should be avoided. For example, starting the process with the English language, but on the next page shows the Estonian version, as part of this process. Existing literature on traffic safety and e-government have not shown the possibility of developing an interface that could be integrated into State Portals, which could facilitate cross-border exchange of data across EU Member States and how such interface could facilitate transparency and payment of traffic offenses fine. This thesis has shown this possibility and contributed to the body of knowledge on traffic safety and e-government.

The second question that the thesis was trying to answer was, what extent can the case study of HIS be used for other deployments into the State Portal in Estonia and also in the State Portals of the European Union Member States?

The growth in citizens' expectations and needs led to a new approach of delivering services by the public administration in order to respond to this new social demand. As already mentioned regulation of European Union, provides that within the European Union, countries have the obligation to allow access to their digital services to citizens of all Member States. For every e-government project, coherence must be seen as the ultimate test: users will ignore governments' efforts in carrying out e-government strategies and visions if the service leads to more bureaucracy and/or less societal, economic, and individual benefits. The successful implementation of e-Governance practices leads for better delivery of services to citizens and citizen empowerment through access to information. Satisfaction with e-services is increasing their use of proficiency and service improvement. It is expensive to open closed ICT Systems, which contains sensitive data, of citizens. To improve already existing e-service by developing a user interface could cost approximately 2000-4000 work hours, which means at least 100 000€. To create an interface as the front-end of the e-service to the State portal is assumed to take less work hours and to be less expensive. To create the interface to the State portal requires an analysis, and creation of a query connector and web-interface. The biggest obstacle to the deployment of the Estonian X-road is its compatibility with the rest of the world in terms of use of personal identification numbers. In most countries, there is no possibility to that kind of identification, such as offers by Estonian personal code, where a person's identity could access X-road services. Estonian Government has already approved in the cabinet meeting the concept of e-Resident of digital ID. If amendments have been adopted the first e-Resident digital ID could be issued already in 2014. Then the state will issue ID cards without picture, which can be used virtually in all X-road services. Recently, the X-road solution was introduced in Finland. Interest has also shown up in New Zealand, Japan, the United Kingdom, Oman and many others. E-services provide increase of accountability and trust. For citizens it's like light in the black hole of bureaucracy. Traceability of the status of their requests and transactions increases transparency and trust. Integration of back-office and self-service processes enables officials to reduce the cost and time of responding to queries and requests. Recently perspective user qualities, such as satisfaction, impression (wow factor) and joy, have been emphasized.

Therefore, it is necessary to collect user experience information through user-centred qualitative investigations and then develop the product taking its relationship with users into account. User experience can be improved by improving the user interface and user interface is the front-end of the e-service. Human-centred/user-centered processes require more investment in the early stages of the lifecycle, but have been found not only to reduce in-service costs but also to reduce development costs. In particular it will reduce the risk of unexpected changes in requirements and reduce re-work and installation costs. Because the user's experience is subjective, the best way to directly obtain information is by studying and interacting with users. The structure of the user interface of new e-service must meet the design requirements of the State Portal. User interface guidelines and usability best practices should be followed. The design of the e-service needs to be approved by RIA. In collaboration with RIA usability professionals the service users and goals must take into account, in service design and architecture. It was really worth for the good final result - to create a functional prototype - first to create personas, use paper prototype testing and visual prototype evaluation and face-to face interviews. The feedback to the functional prototype of the case study was positive; citizens were really enthusiastic and impressed of the ease of the Interface. Majority had an opinion that HIS should be implemented into the State Portal for the local citizens and citizens of the Member States to use. The link between detection of the offence and sanction has to be sufficiently clear in order to have deterrent effect. By creating a new interface for the citizens and other EU citizens, they will have a clear and transparent overview of their offences in Estonia and can easily pay their fines. As Estonia has taken on the initiative to promote various e-government IT solutions used worldwide, then an interface into the HIS should be implemented for integration into the State Portal for local citizens and citizens of Member States alike. With the inclusion of the traffic violation system into the State Portal an example could be set for further deployments of such kind of currently closed public ICT systems. Moreover, this would provide a basis for future developments for other EU Members States to use. The outcome from this thesis shows that to a large extent, HIS could provide an integrated platform to the State portal and those of other Member States for fast access to digitalised services and for quick and transparent resolutions of traffic and related offences.

Thirdly, the thesis tries to answer what interaction design guidelines should be followed for desiging a public e-service interface?

To create an interactive interface for e-service that meets the needs of users in terms of hedonic and pragmatic properties. There must be paid attention on the aspects of user experience design. Recently perspectives on user qualities, such as satisfaction, impression (wow factor) and joy, have been emphasized. Therefore, it is necessary to collect user experience information through User-centred qualitative investigations and then develop the product taking its relationship with users into account. Human-centred processes require more investment in the early stages of the lifecycle, but have been found not only to reduce in-service costs but also to reduce development costs. In particular Human-centred processes reduce the risk of unexpected changes in requirements and reduce re-work and installation costs. Because the user's experience is subjective, the best way to directly obtain information is by studying and interacting with the users. User experience designer could interview existing and potential users of the system to gain insight into what would be the most effective design. Knowing the audience is the first step in User experience design and enables to develop experiences that reflect the users using personas. Based on the findings of this thesis, it is possible to develop wireframes of different layouts and also prototypes. It's good and effective to use paper prototype testing and visual prototype evaluation and face-to-face interviews to create functional prototype. Through these steps we approach to the solution what fulfils the expectations of users and as a result to have an interface for e-service that enhances customer satisfaction. Already in the early stage of designing it is good to consult with all parties involved. In this case study RIA becamed involved after paper prototype was done and therefore it was found during visual prototype testing, that some solutions are not favored by RIA. Some changes were made in functional prototype and the feedback to the functional prototype of case study was positive, organizations involved also approved the interface and the citizens were really enthusiastic and impressed of the ease of the system. By developing user-centred e-service interface for the currently closed public service, this study also fulfils the challenge posed by the Estonian President, that is,

"E-government is not about making it possible for people to fill out the same old forms and questionnaires online, but rather is about achieving the goals of administration and services in the most intelligent and citizen-friendly way using the opportunities offered by IT"

The reccomendations this thesis provides are:

- As significant components of digital governance is increasing the direction of flow of information, communication, resources and services accessible to the public, therefore governments should take a pro-active approach by anticipating the needs of citizens.

- Member States could explore their State portals to find the possibilities to create interface that could be accessed trans-boundary within Member States to facilitate exchange of data and to enhance road traffic safety, and resolution of traffic offenses such as payments of fines.

- Functional e-services are not only essential but such services should have interfaces that have hedonic properties such as those that give users fun, joy, satisfaction, and impression (wow factor), among others.

Conclusions

This thesis studies and describes the possibilities to use State Portal as one of the complementary enforcement tool for speeding by creating interfaces of Public e-service for the citizens of Estonia and also for other citizens of Member States of the European Union. The purpose of this thesis was to understand what should be taken in account while by using Sate Portal eesti.ee for creating Public Interface/e-service for currently closed public IT system.

The Introduction of the thesis provides background and explains the need of the case study. Also research problem, questions and goals were presented in the Introduction.

The first chapter is a research by literature review of related works.

The second chapter gives an overview of the design process considering the top priority of European Action Plan 2011-2015 on user empowerment that is to develop services designed around users' needs. From one side there are IT systems and from other, the citizens. Public IT systems should serve the interests of the citizens.

In the following chapter, the case study, of designing a public interface for e-service, using the User-Centred design approach, is presented.

The results of research fulfilled the goals of the thesis and in the chapter four "Lessons learned and recommendations" the detailed answers to the research questions are presented.

This thesis will conclude by answering to the questions that arose in chapters one and two:

- The first question is "What requirements and presumptions must be taken into consideration in order to create a user interface for closed public ICT service and develop a public interface into the State Portal?"

Citizens expect the governmental e-services to help them save time and get the desired information more quickly and reduce the bureaucracy dealing with the authorities. An e-service has to provide a safe internet environment for communication between the State and the citizens, entrepreneur, public sector official and the overall society. Therefore, citizen or user satisfaction must be prioritized when developing and delivering public e-services. Currently Estonia and the European Union are moving towards user-centric e-government and trans-boundary e-services. The user interface in State Portal must be simple and logical, design should be used in calm colours, must avoid seeming complexity, must avoid the use of flashing elements. Situations in which the system processes are incompletely translated should to be avoided.

- The second question is "To what extent can the case study of HIS be used for other deployments into the State Portal in Estonia and also in the State Portals of the European Union Member States?"

The growth of citizens' expectations and needs led to a new approach to delivering services by the public administration in order to respond to this new social demand. The regulation of European Union, though not enforced, provides that within the European Union, countries have the obligation to allow access to their digital services to citizens of all Member States. For every e-government project, coherence must be seen as the ultimate test. The successful implementation of e-Governance practices leads to better delivery of services to citizens and citizen empowerment through access to information. Satisfaction with e-services is increasing their use of proficiency and service improvement. To create an interface as the front-end of the e-service to the State Portal is assumed to take less work hours and to be less expensive than open the closed ICT system for citizens. There is the need to make an analysis, create a query connector and web-interface. The biggest obstacle to the deployment of the Estonian X-Road is its compatibility to the rest of the world lies in terms of use of the personal identification number, to access X-Road services. Estonian Government has already approved in the cabinet meeting the concept of e-Resident of digital ID. E-services provide increase of accountability and trust. Recently perspectives on user qualities, such as satisfaction, impression (wow factor) and joy, have been emphasized. Therefore, it is necessary to collect user experience information through user-centred qualitative investigations and then develop the product taking its relationship with users into account. User experience can be improved by improving the user interface and user interface is the front-end of the e-service. Human-centred/user-centred processes require more

investment in the early stages of the lifecycle, but have been found not only to reduce in-service costs but also to reduce development costs. Because the user's experience is subjective, the best way to directly obtain information is by studying and interacting with users. The structure of the user interface of new e-service must meet the design requirements of the State Portal. User interface guidelines and usability best practices should be followed. The design of the e-service needs to be approved by RIA. In collaboration with RIA usability professionals the service users and goals must take into account, in service design and architecture.

It was really worth for the good final result, to create a functional prototype, first to create personas and scenarios, use paper prototype testing and visual prototype evaluation and face-to-face interviews. The feedback to the functional prototype of the case study was positive; citizens were really enthusiastic and impressed of the ease of the Interface. Majority had an opinion that HIS should be implemented into the State Portal for the local citizens and citizens of the Member States to use. By creating a new interface for the citizens and other EU citizens, they will have a clear and transparent overview of their offences in Estonia and can easily pay their fines. As Estonia has taken on the initiative to promote various e-government IT solutions used worldwide, then an interface into the HIS should be implemented for integration into the State Portal for local citizens and citizens of Member States alike. With the inclusion of the traffic violation system into the State Portal an example could be set for further deployments of such kind of currently closed public ICT systems. Moreover, this would provide a basis for future developments for other EU Members States to use. Therefore it is possible to a large extent to integrate HIS to Estonia State portal and enable the integration for a trans-boundary exchange of information on traffic and related offences, with other Member States.

- The third question is "What interaction design guidelines should be followed for designing a public e-service interface?"

To create an interactive interface for e-service that meets the needs of users in terms of hedonic and pragmatic properties. There must be paid attention on the aspects of user experience design. Recently perspectives on user qualities, such as satisfaction, impression (wow factor) and joy, have been emphasized. Therefore, it is necessary to collect user experience information through user-centred qualitative investigations and then develop the product taking its relationship with users into account. Human-centred processes require more investment in the early stages of the

lifecycle, but have been found not only to reduce in-service costs but also to reduce development costs. Because the user's experience is subjective, the best way to directly obtain information is by studying and interacting with the users. User experience designer could interview existing and potential users of the system to gain insight into what would be the most effective design. Knowing the audience is the first step in user experience design and enables to develop experiences that reflect the users using personas. Based on the findings of this thesis, it is possible to develop wireframes of different layouts and also prototypes. It's good and effective to use paper prototype testing and visual prototype evaluation and face-to-face interviews to create functional prototype. Through these steps we approach to the solution what fulfils the expectations of users and as a result to have an interface for e-service that enhances customer satisfaction. Already in the early stage of designing it is good to consult with all parties involved. In this case study RIA becamed involved after paper prototype was done and therefore it was found during visual prototype testing, that some solutions are not favored by RIA. Some changes were made in functional prototype and the feedback to the functional prototype of case study was positive, organizations involved also approved the interface and the citizens were really enthusiastic and impressed of the ease of the system.

This thesis has shown this possibility and contributed to the body of knowledge on traffic safety and e-government; and that public interface would increase the credibility of the service by offering a transparent source of information.

The outcome from this thesis shows that to a large extent, HIS could provide an integrated platform to the State portal and those of other Member States for fast access to digitalised services and for quick and transparent resolutions of traffic and related offences.

Kokkuvõte (summary in Estonian)

"Riigiportaal kui avalike e-teenuste kasutajaliides Euroopa kodanikele. Juhtumianalüüs" on magistritöö, mis annab ülevaate võimalusest kasutada riigiportaali, kui ühte täiendavat kiiruseületamiste menetlemisega seotud vahendit.

Kiiruseületamine, joobesjuhtimine ja mobiiltelefonide kasutamine sõidu ajal on põhjustavad suurima osa surmadest maanteedel. Nii Euroopa Liidu Komisjon kui ka Eesti on võtnud eesmärgiks vähendada liiklussurmade arvu. Paljud uurimused on suunatud liiklusõnnetuste põhjustele, kuid vähe on uuritud inimeste teadvustamise võimalusi. Uurimuste tulemused näitavad ka, et säiliks karistuse hoiatav mõju, peaks olema seos rikkumise ja karistuse vahel piisavalt selge. Automaatsed liiklusjärelevalvekaamerad välistavad suures osas inimfaktori, tõhustavad liiklusrikkumiste avastamise ja kiirema vormistamise.

Euroopa Liidu direktiiv 82/2011 kohustab liikmesriike piiride ülese liiklusrikkumistega seotud infovahetuseks ning hetkel veel mitte jõustunud Euroopa Liidu määrus 20/82/EL näeb ette, et Euroopa Liidu kodanikel peab olema, sõltumata asukohariigist, ligipääs nendega seotud e-teenustele. Euroopa Liidu e-valitsemuse tegevuskava näeb ette, et e-teenused tulev arendada kasutajate vajadusi silmas pidades ja välja arendada koostöös kolmandate osapooltega.. Nimetatud tegevuskava näeb ette ka parema juurdepääsu avalikule teabele.

Töö lõppesmärgiks on luua kasutades juhtumiuuringut - olemasolevale, kuid kodanikele suletud, infosüsteemile "Hoiatusmenetlusinfosüsteem" (HIS), väljund riigiportaali eesti.ee. Läbi riigiportaali pääseks oma automaatse liiklusjärelvalvekaamerate poolt fikseeritud rikkumiste andmetele ligi nii kõik Euroopa Liidu kodanikud. Lisaks ülevaatele võimaldaks loodud kasutajaliides ka mugavalt tasuda saadud trahvid, ning esitada taotlusi ja kaebuseid.

Käesoleva magistritöö uurimisküsimusteks on:

1. Millised on nõuded ja eeldused loomaks suletud IT-süsteemile kasutajaliides riigiportaali eesti.ee?
2. Kuidas saab juhtumiuuringut, HIS näitel, kasutada teiste e-teenuste laiendamisel riigiportaali eesti.ee või teiste Euroopa liikmesriikide e-teenuste arendamisel?
3. Milliseid interaktsiooni disaini suuniseid tuleks järgida avaliku e-teenuse loomisel?

Lähtudes ülalnimetatuist on töö peamisteks eesmärkideks:

1. Kirjeldada liiklusõnnetuste põhjuseid ja tagajärgi, ning liiklusohutuse parandamiseks kasutatud viise
2. Anda ülevaade e-valitsusemise eeldustest ja struktuurist
3. Anda ülevaade nendest interaktsiooni disaini põhimõtetest, mida saab kasutada avaliku e-teenuse liidese loomisel.
4. Kavandada, luua ja hinnata kasutajate tagasisidet infosüsteemile HIS, riigiportaali eesti.ee loodava kasutajaliidese prototüübile.
5. Peegeldada juhtumiuuringut andes tagasisidet ja soovitusi tulenevalt saadud kogemustest.
6. Luua alusinfo teistele Euroopa liikmesriikidele, juhuks kui soovitakse luua või kaastata uusi infosüsteeme olsmasolevasse riigiportaali.

Töö annab ülevaate Eesti ja Euroopa Liidu õigusaktidest tulenevatest eeldustest ja kirjeldab interaktsioonidisaini protsessi, kasutades intervjuusid, juhtumianalüüse, prototüüpimist ja kvalitatiivseid uurimusi kasutajaliidese hindamiseks.

Esimene peatükk annab ülevaate liiklusõnnetuste peamistest põhjustest ja liiklusohutuse parandamiseks kasutatud viisidest; toob välja Eesti ja Euroopa Liidu õigusaktidest tuleneva eeldused; kirjeldav e-valitsuse aluseid ja strukttuuri ning kirjeldab ka juhtumianalüüsiks valitud infosüsteemi HIS.

Teine peatükk annab ülevaade nendest interaktsiooni disaini põhimõtetest, mida saab kasutada avaliku e-teenuse liidese loomisel. Peatükis tutvustatakse erinevaid kasutajakeskse- ja kasutajakogemuse disaini meetodeid.

Kolmandas peatükis käsitletakse juhtumiuuringut läbi kasutajaliidese loomise. Juhtumiuuringus kasutati kasutajakeskse- ja kasutajakogemuse disaini meetodeid.

Neljas peatükk peegeldab saadud kogemust ja annab vastused uurimusküsimustele.

Lõpuks antakse kokkuvõte tööst.

Peamised magistritööst tulenevad järeldused on järgmised:

- Kodanikud ootavad, et e-teenused võimaldaks neil säästa aega ja vähendada paberimajandust, ootused on järjest kasvavad ning avalik haldus peab sotsiaalsele nõudlusele vastu tulema.
- Kogu Euroopa on liikumas e-valistemise ja piirideüleste e-teenuste suunas.
- Hetkel veel mittejõustunud Euroopa Liidu määrus näeb ette, et EU riikidel on kohustus võimaldada kodanike ligipääs avalikele e-teenustele kõikides liikmesriikides
- Kasutajarahulolu peab olema e-teenuste loomisel prioriteediks, see tõstab nende kasutatavust ja usaldusväärsust.
- E-teenuste kasutajaliidese disain peab olema lihtne, rahulik ja loogiline.
- Uus lähenemine e-teenuse kvaliteedile hõlmab endas uusi omadusi nagu kasutajarahulolu, mulje, tunnetus. Seega on vaja koguda ka teavet mitte ainult tehniliste vaid ka kasutajate tunnetuslike nõudmiste ja "peidetud soovide" kohta.
- Riigiportaali loodav kasutajaliides peab vastama ka RIA poolt etteantud nõuetele.
- Parima tulemuse saab kombineerides erinevaid kasutajakeskse- ja kasutajakogemuse disaini meetodeid, nagu näiteks intervjuud, juhtumianalüüsid, prototüüpimine ja erinevate disaini etappide hindamine.
- Riigiportaali kasutamine suletud infosüsteemile kasutajaliidese loomiseks on kuluefektiivsem, kui päris uue funktsionaalsuse loomine olemasolevas infosüsteemis.

Käesolev magistritöö annab teadmuse ja ülevaate liiklusohutuse ja e-valitsemise võimalustest. Näitab, et e-teenuse kasutajaliides kodanikele suurendaks teenuse usaldusväärsust.

Käesolev magistritöö näitab, et riigiportaali võib suurel määral pakkuda integreeritud platformi HISi ja teiste liikmersiikide jaoks, tagamaks kiire ligipääs elektroonilisele infole

Töö on kirjutatud inglise keeles ja kasutatud APA viitamissüsteemi 6. versiooni.

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Appendices

1 Appendix : Glossary

ARK - Estonian Road Administration

CA - Automated speed enforcement system in France

eGA - The e-Governance Academy

e-ID – Electronic identification (card)

EU28 - The European Union is a union of 28 member states located primarily in the Europe

G2B - Government-to-Business

G2C - Government-to-Citizen or Government-to-Consumer

G2E - Government-to-Employees

G2G - Government-to-Government

HCD – Human-Centred Design

HCI – Human-Computer Interaction

HIS - Written Cautioning Procedure ICT System of Police Estonia

ICT - Information and Communication Technology

OECD - Organisation for Economic Co-operation and Development

PS - Penalty point system

RIA - The Estonian Information System Authority

RIHA - Administration System of the State Information Systems

RISO - Department of State Information Systems, Estonia

SMIT – IT and Development Centre, Ministry of Interior, Estonia

UCD - User-Centered Design

UX – User Experience

2 Appendix : User Study

2.1 Personas

2.1.1 Peeter – primary persona

Age: 35

Occupation: Salesman

Language: Estonian (can be other – for example Russian or English)

Computer skills: Excellent

Peeter lives in Tartu (Tampere, Finland) but the company he is working for is situated in Tallinn; clients are scattered all over Estonia. Lots of driving means many boring hours on roads every day. He hopes to get work done quicker and reach home to meet family and friends; therefore speeding is often, also fines in post-box. He thinks that his "crime" is not so serious, just +10 km/h, but cameras aren't forgiving. Peeter is an experienced and skilled user of Estonian e-services and hopes to get everything done behind the computer.

Goals:

- Clear overview: "I often find speeding fines in my post-box, but sometimes the paper labels get lost and I find out when more serious warnings appear. I would like to have clear and simple overview what fines I have (paid and unpaid)."
- Easy payment option: "I want to get it done quickly and easily, without need for further proceedings. I would like to pay the fine and forget about it."
- Variety of notification possibilities: "It is important to me to get the information about speeding immediately and via channels I use (e-mail, SMS)."

2.1.2 Maia – primary persona

Age: 55

Occupation: Nurse

Language: Estonian

Computer skills: Poor

Maia works at a hospital nearby her home. Usually she likes to take a refreshing walk to work but sometimes when she has to pick up grandchildren after work from kindergarten and do some serious shopping, she takes her husband's car. Also when they go to their summer cottage, Maia drives. Maia is very careful in traffic but sometimes thoughts about work or arguing kids on the backseat draw off her attention and traffic violations may happen.

Goals:

- Awareness: "It was a long time since I got a ticket for speeding and I had no idea how these processes ran today. Finally I was advised by my more experienced colleague. I wish I was always informed immediately when it happens, I may not notice it myself."
- System with help-texts: "I felt quite helpless clicking around in eesti.ee. I wish the system was easier and more unambiguous. I request there were help-texts to guide me along the way."
- Personal guidance: “I missed somebody who would take me by hand and show around the system. It would be helpful if I could call or write someone when I´m in trouble finding relevant information”.

2.1.3 Tiiu – customer persona

Age: 50

Occupation: Clerk

Language: Estonian

Computer skills: Average to good

Tiiu is working in the Estonian Police as a clerk. Her job is to verify and sign speeding camera fines. Moreover, if the citizen asks for further details on the case, then she has to answer the inquiries and provide the data necessary. If the fine is not paid on time, the person will be notified through Public Announcements of his/her fine. If after several notifications the fine is still not paid, the case will be sent to the bailiff. Tiiu's interest is that the citizen who gets the fine had all the information in one place, so she wouldn't have to put too much effort into each and every case but could deal with the overall case management. Then she could handle more cases at a time and make the system faster and more effective that way.

Goals:

- Double work: "I would like to get all tasks done related to one person at once, not to send snail mail/email back and forth, hassle with evidence etc. If all the information is available in one place at one time, I can focus on new cases and improve efficiency."
- Less paperwork: "I want to keep paperwork to the minimum, to use electronic ways for communication instead of paper. Think eco!"
- Payments: "If the user has an easy way to pay the fines, then I don't have to involve bailiffs into the case."

2.2 Scenarios

2.2.1 Scenario 1: Peeter is...

... waiting for his speeding fine to get rid of it quickly

Peeter had to drive from Tallinn to Tartu to a sales meeting. He had everything planned but something came up in the office and finally the boss wanted to see him, too, so he was really in a rush. He had to drive faster than he normally would in order to make it on time. As he drives the Tallinn-Tartu highway quite a lot, he already knows where the speed cameras are and knows when to slow down.

However, his phone rang at some point and he lost focus on the road. He drove past a speed camera while looking for his phone and got flashed. Sadly, of course, he didn't notice that because he was looking away for a moment. It had happened before and Peeter was not too worried about it. He knows a little speeding won't cost him his licence but will only get him a little fine.

So he is waiting for a notification to pay for his mistake and get over and done with it quickly and easily. Now weeks have passed and Peeter's friend Mati calls him up to say that he noticed Peeter's name in the Public Announcements and that he has got a speeding ticket that he hasn't paid for even after two notifications.

Peeter is rather surprised about the issue and checks the Public Announcements to find out whether this is true. He is wondering why he hasn't been notified. He has no idea that his registered address where the notifications had been sent is of his previous rental apartment. He moves often and changing addresses is bothersome. Moreover, he has also forgotten to forward his eesti.ee email to his personal email, thus he couldn't be notified that way either.

Peter has used this system before already and gets his ticket paid with ease. This time is different from previous times because he has moved to another apartment and hasn't changed his official address.

He prefers to process his traffic fines online as well as pay online. He likes to have a good overview of his fines. He wants to know when the payment has gone through and the case has been closed. He has to make sure his eesti.ee e-mail address is forwarded to the e-mail he uses regularly. Furthermore, he would like to have alternative notification possibilities like SMS.

Distinguishing features:

- Peeter knows he got a speeding ticket
- He wants to pay for his mistake and get over and done with it quickly and easily
- He is an experienced user of e-services (including eesti.ee), doesn't use snail mail but checks his e-mail regularly
- He hasn't forwarded his eesti.ee email and hasn't updated his official address
- He would like to have alternative notification possibilities

Questions:

- Is this a valid problem? Does the scenario look realistic?
- Did this scenario wake up any thoughts and if yes, which ideas arouse?
- Is there anything you would like to change in that scenario? Is there anything missing?
- Could you image yourself in the role of Peeter?
- Have you had a similar experience struggling to find relevant info, what did you feel?

2.2.2 Scenario 2: Maia is...

... looking for information on her possible speeding ticket

Maia isn't an everyday car user. She drives when it is really necessary or one might also say – when she has no better option. She is a really careful driver, but sometimes thoughts about work or solving problems of arguing grandchildren on the backseat really carry her attention away and traffic violations are common to happen.

The last time she was driving to the family's summer cottage she saw the speed camera flash when she drove past. Maia knows that the cameras take photos of cars that exceed the speed limit and she is really worried what her driving speed was. A week later when she gets back home she wants to check if she was speeding and if yes, what the consequences are.

Maia is confused and doesn't know where to start the research, she considers calling the Police to ask for information but hesitates which department to contact. Finally she asks a colleague at work who advises to visit eesti.ee where most of the information that the state has about an individual is gathered.

Maia has trouble finding her ID card PIN codes, since she has never used them before. She feels hesitant using the ID card reader and is thankful that it is also possible to access the state portal via Internet bank. She logs in using bank codes and tries to find the relevant e-service. After some clicking and a bit of desperation she finds the right place. She sees that her inner feeling about getting a speeding ticket was right. After some more searching she finds the bank link and makes the payment.

She hopes that there is no need to repeat the action in the future but if there is, it will be easier next time. Maia felt the need for help-texts and personal guidance and missed her daughter to assist her, but she also felt proud solving the "puzzle" alone.

Distinguishing features:

- Maia believes she got a speeding ticket but is not sure
- She has no idea how to find out or where to start searching
- She finds help asking a colleague at work and is advised to use eesti.ee
- Maia uses computer but needs encouragement, guidelines and to take time to get acquainted with the e-service
- Solving the problem successfully inspires her to use other e-services in future

Questions:

- Is this a valid problem? Does the scenario look realistic?
- Did this scenario wake up any thoughts and if yes, which ideas arouse?
- Is there anything you would like to change in that scenario? Is there anything missing?
- Could you image yourself in the role of Maia?
- Have you had a similar experience struggling to find relevant info, what did you feel?

2.2.3 Scenario 3: Tõnu is...

... discovering the world of e-services

Tõnu is 59 years old and works as a chauffeur, a real "old school man". He spends all day on the wheels and is not afraid to get his hands dirty. He is a man-for-all-job but due to his age, he is not so familiar with the Internet world. He knows how to read news and how to pay bills but that's about it.

One morning, Tõnu goes to pick up post from his mailbox. He finds a registered letter amongst the newspapers and is quite surprised. He opens the letter and finds out to his surprise that he has got a speeding ticket from the Tallinn-Pärnu highway. However, he knows he has been there several times and admits he might have speeded. Tõnu doesn't use e-mail often; his eesti.ee email is not forwarded, so he doesn't receive any email notifications.

As a decent citizen, he goes to the bank and pays the fine. However, weeks pass and Tõnu has no idea whether his case is now closed or not. He calls the number on the letter to find out. The clerk tells him that nowadays there is the possibility to check and pay fines on the state portal eesti.ee. It is easier and quicker and gives the citizen a good overview as well as the current status of his case.

Tõnu decides to give it a shot and starts to look for his ID card, PIN and ID card reader and switches on his computer. He opens eesti.ee website and is confused by all the information there. He calls the clerk again for help to navigate on the website. After a short explanation he is told that he can also log in with his bank account (which he has used before)knows that he has to log in with the ID card and search for the Police database. He finds the database and manages to open his case. He is relieved to see his ticket is paid and the case is closed.

Tõnu is happy he has learned to use e-services. If this happens again, he no more needs to go to the bank. However, he still prefers to be notified by post rather than e-mail. Both options are available. Yet it would be useful to collect Tõnu's phone number (preferably mobile) as notifications can also be sent by SMS and that would help to reduce paper mail.

Distinguishing features:

- Tõnu has no idea he got a speeding ticket
- He finds out about his unpaid traffic fine when he receives a letter by post
- He is not used to e-services and doesn't check his e-mail often
- He needs guidance (customer support) to become acquainted with the e-service
- He considers it possible that he will be using the e-service again, however prefers to be notified by post

Questions:

- Is this a valid problem? Does the scenario look realistic?
- Did this scenario wake up any thoughts and if yes, which ideas arouse?
- Is there anything you would like to change in that scenario? Is there anything missing?
- Could you image yourself in the role of Tõnu?
- Have you had a similar experience struggling to find relevant info, what did you feel?

2.2.4 Summary of Scenario Testing

All volunteers were asked to read through the scenario and answer the questions posted. Although they represented best one of the persons used in the scenario, they were asked to give insights to all of them.

Here are the results of the interview and thoughts on the scenarios:

2.2.4.1 Scenario 1 - Peeter has no idea he got a speeding fine

- The impression of the participants was that the scenario is quite realistic.
- A remark was made that today lots of people use Cruise control, which could help soften the problem of speeding.
- Person 2: "In my experience a friend of mine tried to overtake another car and got flashed but he wasn't sure if he got the ticket or who did. So an SMS notification would be great to tell you that you got flashed."
- In case one gets a speeding ticket it is quite realistic that people call the clerk responsible to ask for further instructions.
- If such a system was made I'm sure people would use it, because it would make their life much easier. Currently I pay my fines through the bank, but would use such a system surely.
- Scenario doesn't specify if one is late with payments then whether he/she gets overdue charges or not.
- Person 3: "Currently when the notification mail gets sent to you by post I assume the data is all there. I haven't got a speeding ticket in Estonia but in Germany you will be sent a notification mail + all the data involved, the picture etc. So then it is enough." [Comment: today via post one only gets a notification letter nothing else.]

- The problem is clearly stated, however, I can't really understand how the process of making the payment works in the new system. [Comment: bank link will be used in the system for that]

2.2.4.2 Scenario 2 – Maia, a "young" grandmother

- This situation seems to be quite realistic.
- What is missing from the scenario is that when one is disturbed by the children on the backseat then one cannot really pay attention to the speedometer at all. So the driver probably has no idea how fast he/she was driving, thus whether he/she gets a speeding ticket, what's the probably fee, or whether he/she will lose the driving licence, which is the case today with +30km/h. So the person is anxious until he/she gets a notification on what-where-how much, etc.
- Person 1: "If I had no idea where to ask about my speeding ticket then I would start searching from various homepages or the Police."
- Help texts are surely necessary for beginners. Moreover, there should be confirmations when clicking "OK" or "PAY". Just to verify if the person is sure he/she wants to do that.
- If some field was left empty when typing there should also be confirmations that this is empty, please fill - but this is already common sense these days I think.

2.2.4.3 Scenario 3 - Tõnu is discovering the world of e-services

- It looks like a realistic scenario, because elderly people really have difficulties using ID-card.
- In case of strong sunlight or reflections you may not notice that you get flashed.
- Today there is no official announcement that the case is closed. So there should be an SMS notification that a case is closed.

- Person 2: “Almost everybody today uses mobile phones. At least I believe that all people who drive a car have a mobile phone. So using SMS notifications to notify about a speeding ticket is a must. Just like in the hospital one has a notification system: For example, tomorrow you have set a meeting with Dr X at 14:00.”
- The scenario doesn’t specify who taught Tõnu to use the ID card. Perhaps there should be a flayer added when the new system is implemented. So that people would know how to use the new system.
- Tõnu would probably use this system rather than a bank system if everything is in one place.
- When one is a chauffeur then it is quite probable that something like this happens. However, chauffeurs should already have a "biological speedometer" that tells them how fast they are going by listening the sound of the engine or looking at how fast the trees go by.
- The scenario should be changed in this sense that both Tõnu and Peeter are not aware that they got a speeding ticket. So Peeter might be changed to a person who knows but doesn’t care that he got a speeding ticket.

Further comments:

- It seems that all necessary personas and scenarios are covered.
- What seems to be missing is a typical hooligan. A person that speeds all the time and doesn't pay tickets. [Comment: Such persons are not really the users of our system thus they were initially excluded. It would have been a negative persona. If such a person wouldn't pay the tickets then already the bailiffs would contact them and demand the sums that way. So they really are not a customer of this service].

2.3 User Stories

Kiiruskaameratrahvide päring

- Ava riigiportal eesti.ee.
- Sisselogimine: Logi sisse kasutades ID-kaarti, Mobiil-ID või panga kaudu.
- Navigatsioon: E-teenused -> Kodanikule -> Liiklus ja liiklusvahendid -> Kiiruskaameratrahvide päring.

2.3.1 Saada ülevaade trahvidest

- Olles kiiruskaameratrahvide päringu vaates, avaneb loetelu kõikidest maksmata, ootel, makstud trahvidest.
- Maskmata trahvid – punane markeering, vaidlustatud trahvid – kollane markeering, makstud trahvid – roheline markeering.
- Alternatiivina võib FILTER kirjest valida piirangud, milliseid trahviteateid näidata.

2.3.2 Saada ülevaade konkreetsest trahvist

- Olles kiiruskaameratrahvide päringu vaates, avaneb loetelu kõikidest maksmata, ootel, makstud trahvidest.
- Loetelust otsi välja konkreetne trahv, mis pakub huvi.
- Vajuta trahvi kõrval vasakul olevat alla noole nuppu.
- Avaneb konkreetse trahvi informatsioon (rikkumise koht, kiiruseületamise määr jne, koos võimalusega vaadata PILTi, MAKSTA või ESITADA VAIE.

2.3.3 Maksta konkreetset trahvi

- Olles kiiruskaameratrahvide päringu vaates, avaneb loetelu kõikidest maksmata, ootel, makstud trahvidest.
- Loetelust otsi välja konkreetne trahv, mis pakub huvi.
- Vajuta trahvi kõrval vasakul olevat alla noole nuppu.
- Vajuta MAKSA nuppu.
- Vali pank, mille kaudu soovid makset teha.

- Sisesta PIN1 kood, et logida sisse.
- Vajuta ALLKIRJASTA nuppu.
- Sisesta PIN2 kood.
- Vajuta TAGASI KAUPMEHE JUURDE nuppu.
- Makse teostatud, trahvi markeering muutunud roheliseks ehk tasutud.

2.3.4 Saada ülevaade, kas trahvimakse on läbi läinud ning menetlus lõpetatud

- Olles kiiruskaameratrahvide päringu vaates, avaneb loetelu kõikidest maksmata, ootel, makstud trahvidest.
- Kontrolli, kas Sinu poolt makstud trahv on rohelise markeeringuga.
- Järelikult trahv on makstud ja menetlus lõpetatud.

2.3.5 Seadista e-posti või SMS teavitus

- Olles kiiruskaameratrahvide päringu vaates, avaneb loetelu kõikidest maksmata, ootel, makstud trahvidest.
- Vajuta nupule SEADED.
- Sisesta e-posti aadress/mobiiltelefoni number.
- Lisa linnuke soovitud teavitusviisi juurde.
- Vajuta KINNITA.
- Edaspidi tulevad trahviteated Sinu e-postile ja/või mobiiltelefonile lisaks registreeritud aadressile.

2.3.6 Kasutada juhendtekste trahvide maksmisel

- Olles kiiruskaameratrahvide päringu vaates, avaneb loetelu kõikidest maksmata, ootel, makstud trahvidest.
- Vajuta suurele ? nupule.
- Paremal menüüs kuvatakse kiiruskaameratrahvide päringute manuaali.
- Vajuta Sind huvitava teema peale ja loe, kuidas süsteemi kasutada.

- Alternatiivina liigu hiirega vastava nupu peale, mille kohta soovid täpsemalt teada. Aknas avaneb selgitav juhendtekst, mida nupu vajutamine teeb ja mida järgnevalt lehelt teha saab.

2.3.7 Esitada vaie

- Olles kiiruskaameratrahvide päringu vaates, avaneb loetelu kõikidest maksmata, ootel, makstud trahvidest.
- Loetelust otsi välja konkreetne trahv, mis pakub huvi.
- Vajuta trahvi kõrval vasakul olevat alla noole nuppu.
- Vajuta nuppu ESITA VAIE.
- Täida nõutud väljad (ees- ja perenimi, isikukood, juhiloa number, aadress, e-post, vaide sisu [tekstiväli].
- Vajuta ALLKIRJASTA nuppu.
- Sisesta PIN2 kood.
- Trahvi markeering muutunud kollaseks ehk vaie esitatud.

2.3.8 Vaadata kiiruskaamera pilti

- Olles kiiruskaameratrahvide päringu vaates, avaneb loetelu kõikidest maksmata, ootel, makstud trahvidest.
- Loetelust otsi välja konkreetne trahv, mis pakub huvi.
- Vajuta trahvi kõrval vasakul olevat alla noole nuppu.
- Vajuta nuppu PILT.
- Pop-up aknas avaneb kiiruskaamera pilt.

3 Appendix : Paper Prototype testing

THINK ALOUD

3.1 Choose one of the unpaid fines, go through the payment process.

- He notices immediately the highlighted colours.
- He clicks on the title, the information expands and he reads the info and goes to see the photo.
- He thinks more information on the photo could be useful and suggests to add a map of Estonia that shows the location.
- He then clicks to pay the fine, but doesn't see how big the fine is.

3.2 Set up the SMS notification.

- He finds SETTINGS immediately.
- He types in his mobile number and eesti.ee e-mail.
- He points out that the fields could be pre-filled.

3.3 Change your role and pretend to be Tallinn University.

- He uses the FILTER option.
- He clicks to see the fines.
- He learns that the layout is basically the same as for personal users.

- **General Comments:**
- Missing “Cancel” buttons
- Missing “Close” buttons
- Help must be located in same positions through navigation

4 Appendix : UIG of State Portal eesti.ee

Siinolevad nõuded on ülimuslikud RIA üldisest mittefunktsionaalsete nõuete dokumendist, kuid täiendavad neid (st nimetatud dokumendis olevaid põhimõtteid peab kasutama, kuni need ei lähe vastuollu siinolevaga.

Riigiportaalis eesti.ee X-tee teenuste avaldamise nõuded (RIA, 2013):

4.1 Teenuse sisuline ülesehitus ja disaini põhimõtete järgimine

Teenusepakkuja tegevused: edastada RIA-le (help@ria.ee) loodava teenuse kirjeldus ning teenusepakkuja kontaktandmed

Lisatava e-teenuse kasutajaliidese ülesehitus peab vastama riigiportaali disaini nõuetele,kasutajaliidese juhistele, kasutusmugavuse headele tavadele ning läbima teenuste disaini kooskõlastuse RIA-s. Koostöös RIA kasutusmugavuse spetsialistidega loodud e-teenuse ülesehitus ja disain peab arvestama teenuse kasutajaid ja teenuse eesmärke.

Enne e-teenuse arendamist peab teenusepakkuja edastama RIA-le (help@ria.ee) e-teenuse kirjelduse, milles on vastatud järgmistele küsimustele:

- Mis on kavandatava e-teenuse peamised ja reaalsed eesmärgid? Milliseid väärtusi e-teenusega luuakse? Näiteks võib eesmärgiks olla teeninduspunkti elavjärjekorra vähendamine, andmete elektrooniline töötlemine, infoteenindajate koormuse vähendamine, kasutajate sõltumatus teeninduspunkti geograafilisest asukohast vms. Tasub silmas pidada, et teenuse ülesehitus ja disain saab kindlustada ärieesmärke vaid juhul, kui need on teenusepakkujale endale teada.
- Milline on teenuse avaldamise tähtaeg? Arvesse tasub võtta sõlmimisel olevad või juba sõlmitud lepingud teenuse arendajaga, võimalikud tähtajad struktuurfondidest vahendite taotlemisel, seadustest või määrustest lähtuvad avaldamise tähtajad jne.

Samuti lisada teenusepakkuja kontaktisikute andmed (projektijuht, arendaja).

Kvaliteetse ja kasutajasõbraliku e-teenuse loomise tagamiseks tuleb esitada enne arendamist RIA-le:

- detailsem sihtrühma ülevaade - kellele on teenus mõeldud.
- kõikvõimalik lisainfo teenuse kohta.
- esialgne navigatsioonimudel - skeem teenuse sisesest navigatsioonist, mida mingi nupp teeb.
- esialgne teenuse kuva ja/või HTML prototüüp - skeem/joonis teenuse kasutajaliidese ülesehitusest. Protoüübi näide

- testimise tulemused - kui on tehtud testimisi kasutajatega.

Nende puudumisel kindlasti võtta ühendust RIA-ga.

Kui teenus vastab kõigile nõuetele ning disaini kooskõlastus on läbitud, saab arendaja hakata teenust looma, arvestades arenduspaketti.

.

4.2 Dokumenteerimine riigi infosüsteemi haldussüsteemis (RIHA)

Teenusepakkuja tegevused: registreerida ja kooskõlastada andmekogu/infosüsteem ning dokumenteerida loodav teenus RIHA-s.

E-teenust pakkuv andmekogu/infosüsteem peab vastama RIHA nõuetele, sh peab olema läbitud asjakohane RIHA menetlus (dokumenteerimine ja kooskõlastamine).

Andmekogu/infosüsteemi kooskõlastamine on kahes osas. Esmalt kooskõlastatakse andmekogu/infosüsteemi asutamine ja seejärel selle kasutusele võtmine. Kui andmekogu/infosüsteem on varem loodud, kuid vajab tagasiulatuvalt RIHAs registreerimist, siis olemuselt on vahe väike.

Sõltuvalt andmekogu/infosüsteemi eesmärgist on kooskõlastajateks kuni viis asutust: Majandus- ja Kommunikatsiooniministeerium, Andmekaitse Inspektsioon, Statistikaamet, Rahvusarhiiv ja Maa-amet. Kui kooskõlastavate asutuste hulka kuulub Majandus- ja Kommunikatsiooniministeerium, siis annab omapoolse hinnangu Riigi Infosüsteemi Amet. Rohkem infot kooskõlastamisest.

RIHA rakendus asub aadressil: https://riha.eesti.ee ning küsimuste korral võtke ühendust aadressil: help@ria.ee.

4.3 Kasutajatugi, hooldustööd ning katkestused e-teenuse töös

Teenusepakkuja tegevused: edastada enne e-teenuse toodangukeskkonnas avaldamist RIA kasutajatoele (help@ria.ee) teenuse registreerimise taotlus.

Taotlus peab olema allkirjastatud teenust pakkuva andmekogu või infosüsteemi volitatud töötleja (pidaja) allkirjaõigusliku isiku poolt.

1. Enne e-teenuse avaldamist tuleb teenusepakkujal RIA kasutajatoele (help@ria.ee) edastada teenuse registreerimise taotlus, milles sisaldub info teenuse kirjelduse, kasutajatoe ja tehniliste parameetrite kohta. Muuhulgas **järgnev info:**

- Teenuse lühikirjeldus riigiportaalis avaldamiseks ning tõlge vene ja võimalusel inglise keeles (välja arvatud ametnike sihtgrupi teenused).
- Teenuse sihtgrupp (kodanik, ettevõtja, ametnik, muu).

- Teenuse kasutajale esitatud eeldused teenuse edukaks kasutamiseks (näiteks Tallinna elanik, pensionär vms).
- Teenuse osutamise õiguslik alus, viited teenuse osutamist reguleerivale õigusaktile.
- E-posti listiaadress, kuhu RIA edastab lõppkasutajate pöördumised, mille vastamine ei kuulu RIA kasutajatoe pädevusse. E-posti listis peab olema vähemalt kahe inimese aadress maandamaks ühe inimese haigestumisest, puhkusel olemisest jms olukordadest tulenevaid riske.
- Telefoninumber, millele oleks võimalik suunata lõppkasutaja pöördumisi ning periood, millal nimetatud telefoninumbril pöördumistele vastatakse.
- Võimalusel kasutajatoe juhendküsimustik, mis abistab kasutajatuge teenuse häirete/probleemide lahendamisel. Küsimustik peab sisaldama olulisemaid küsimusi, mida tuleb teenuse kasutajalt kindlasti küsida. Sobiva juhendküsimustiku korral on RIA kasutajatugi võimeline iseseisvalt kasutajate tüüpküsimustele vastama. Sellest tulenevalt saab kasutaja kiiremini vastuse ning väheneb ka teenusepakkuja töökoormus.
- Teenuse kättesaadavuse aeg.
- Maksimaalne üheaegselt teenust kasutavate kasutajate arv jne.

2. Kõikide RIA kasutajatoelt teenuse omanikule suunatud lõppkasutajate pöördumiste lahendused tuleb edastada ka RIA kasutajatoele. See tähendab, et e-posti teel kasutajale vastates tuleb edastada koopia RIA kasutajatoele (help@ria.ee) koos viitega pöördumise ID numbrile.

3. RIA kasutajatoelt saadetud e-kirjadele tuleb edastada automaatvastus, mis sisaldab hiliseimat vastamistähtaega.

4. Teenusega seotud **planeeritud katkestustest peab teenusepakkuja RIA kasutajatuge teavitama** (lisaks RIHA kaudu edastavale teatele teenuse kasutajatele) **vähemalt 48 tundi enne katkestuse toimumist** (nädalavahetusel ja/või esmaspäeval toimuvatest katkestustest tuleb teavitada hiljemalt reedel kell 10.00). Katkestuse info peab olema selge, lõppkasutajale arusaadav ning sobilik riigiportaalis avaldamiseks.

5. Teenusega seotud planeerimata katkestustest peab teenusepakkuja RIA kasutajatuge aadressil help@ria.ee teavitama niipea kui võimalik, märkides võimalusel ära katkestuse eeldatava lõppaja.

6. RIA kasutajatugi teavitab teenusepakkujat riigiportaali üldistest hooldustöödest ja katkestustest teenusepakkuja edastatud e-posti listiaadressil vähemalt 48 tundi enne nende toimumist.

4.4 Teenuse muutmine ja sulgemine

Teenusepakkuja tegevused: edastada RIA kasutajatoele info teenuse muutmisest või sulgemisest.

1. **Riigiportaalis avaldatud teenuse muutmine või sulgemine RIA kasutajatuge teavitamata on keelatud.**
2. Teenuse muutmise soovist, mis puudutab teenuse kasutajaliidest, tuleb RIA kasutajatuge teavitada vähemalt 5 tööpäeva enne planeeritavat muudatust. Muudatuse soovis tuleb kirjeldada, mis ja kuidas muutub teenus lõppkasutaja jaoks. Muudatus peab saama RIA kooskõlastuse.
3. **Teenuse sulgemise soovist** tuleb RIA kasutajatuge (help@ria.ee) teavitada vähemalt 5 tööpäeva enne planeeritavat teenuse sulgemist. Kirjas peab olema teenuse sulgemise põhjendus ning alternatiiv teenuse kasutamisele.

4.5 Muud tingimused

1. Teenuse lisamisega riigiportaali nõustub teenusepakkuja riigiportaali üldiste tingimustega**.**

2. Riigi Infosüsteemi Amet menetleb teenuse registreerimise taotluse esimesel võimalusel, kuid mitte kauem kui 20 tööpäeva jooksul.

3. Riigi Infosüsteemi Ametil on õigus keelduda teenuse riigiportaali lisamisest, kui teenus ei vasta riigiportaali üldistele eesmärkidele, teenuse riigiportaali lisamise nõuetele või teenuse avalik huvi on kaheldav.

4.6 X-tee päringute esitluskihi tehniline kirjeldus

E-teenuste arendamine toimub riigiportaali partnerite arenduskeskkonnas aadressil www.koolitus.eesti.ee. Arenduskeskkonnale ligipääsu taotlemiseks palume edastada soov kasutaja nime, isikukoodi, asutuse nime ning ligipääsu vajaduse põhjendusega Riigi Infosüsteemi Ameti kasutajatoele (help@ria.ee). www.koolitus.eesti.ee keskkonna päringute esitluskiht on vaikimisi ühendatud vastu X-tee arenduskeskkonda.

E-teenuste vormid on kirjeldatud kasutades XForms standardit, millest tulenevalt on vormidel võimalik kasutatada näiteks väljade eeltäitmist erinevate andmeallikatega (sh ka teiste X-tee päringutega), erinevaid loogikatehteid sisestatud ja eeltäidetud andmetega, reaalajas väljade valideerimist jm.

E-teenuste vormid genereeritakse X-tee teenuste WSDL faili põhjal, vajadusel saab loodud vormikirjeldust hiljem muuta ja täiendada.

Riigiportaali eesti.ee prototüübiga (HMTL) on võimalik tutvuda aadressil:http://proto.eesti.ee/. Kasutajaliidese juhise ning e-teenuse vormil kasutatavate erinevate elementidega (nupud, lingid jne) on võimalik tutvuda aadressil: http://proto.eesti.ee/?uig

X-tee päringute esitluskihi arendaja juhend (1,36 MB) ning Lisa1 - XForms generaator (130 kB).

X-teest lähemalt: https://www.ria.ee/x-tee/ ja X-tee liitumise abimees:https://www.ria.ee/30192

Täiendavat abi X-tee ning X-tee päringute esitluskihti puudutavates tehnilistes ja teenuse arendust puudutavates küsimustes saate, kui kirjutate Riigi Infosüsteemi Ameti kasutajatoele:help@ria.ee.

NB! Kui riigiportaalis hakkavad teenust kasutama kodanikud, siis tuleb andmekogu/infosüsteemi poolses turvaserveris avada päringud registrikoodile 'CNKODANIK'.

- Teenuse tööaeg ning kasutajatoe aeg peab olema vähemalt E-R 09:00-17:00.
- Teenuse tööajal planeeritud katkestuste maksimaalne kogukestvus aastas võib olla kuni 24 tundi.
- Teenuse ühe planeeritud katkestuse maksimaalne kestvus võib olla kuni 2 tundi.
- Soovituslik planeeritud katkestuste arv teenuse tööajal ühes kuus on kaks.
- Teenuse tööajal planeerimata katkestuste kogukestvus aastas võib olla kuni 24 tundi.
- Teenuse ühekordse planeerimata katkestuse kestvus võib olla kuni 12 tundi.

4.7 Ülesehitus

1. Kasutajaliides tuleb kujundada arvestades monitori resolutsiooni 1024x768 pikslit ja efektiivse ala suurust 960x600 pikslit.
2. Võimalusel peab saama ekraanipildi kasulikult pindalast kasutusele võtta 80% pinnast. Tühjad kohad, liialdatud raamistik, põhjendamatult suured nupud ei ole soovitatavad.
3. Keelatud on kuva kerimine paremale-vasakule ja topelt kerimine. Viimane kehtib näiteks suurte tekstiväljade puhul.
4. Tuleks vältida vilkuvate elementide (bännerite) ja Flash komponentide kasutamist.
5. Klõpsamiste ja muude hiire tegevuste arv peab olema minimaalne. Tuleb välistada hiire ja klaviatuuri segakasutamist.
6. Eritüüpi objektid peaksid olema visuaalselt eristatud, näiteks primaarsed ja sekundaarsed tegevused on kujundatud erinevat värvi nuppudena.
7. Nuppe kasutatakse ainult vormide põhitegevuse (kõige tähtsama tegevuse) teostamiseks. Vormisiseselt või alternatiivsete tegevuste puhul nuppe ei kasutata (v.a modaalsete akende avamise eesmärgil). (RIA, n.y.)

4.7.1 Navigatsiooniriba

1. Kasutajale peab andma tagasisidet tema „paiknemisest" infosüsteemis läbi navigatsiooniriba (breadcrumb).
2. Navigatsiooniriba kajastab veebilehe struktuuri vastavalt selle ülesehitusele.
3. Iga lehevahetus muudab navigatsiooniriba.
4. Navigatsioonireal olevate lehekülgede pealkirjad algavad avalehest.
5. Avalehel olles ei ole vaja kuvada navigatsiooniriba, kuna see ei sisalda uut informatsiooni.
6. Navigatsiooniriba on lingitud ja iga pealkiri viib vastavale lehele. (RIA, n.y.)

4.7.2 Lehekülgede nimetus

- Iga lehekülje nimetus (pealkiri ja title element) peab eristuma teistest.
- Kõik veebilehitseja aknad (title element) peavad omama ühtset nimetamisloogikat: "[Lehe nimetus] - [eesti.ee]". (RIA, n.y.)

4.8 Kasutaja tuvastamine ja õigused

1. Kasutajad autenditakse võimalikult hilises protsessi staadiumis, siis kui edasised kasutaja poolt sooritatavad tegevused eeldavad kasutajate tuvastamist. Peale sisselogimist kuvatakse kasutajale leht, millelt ta alustas sisselogimist.
2. M-ID kasutamisel pakutakse kasutajale võimalust salvestada hilisemaks kasutamiseks mobiili number oma veebilehitseja küpsisena (cookie).
3. Peale sisenemist kuvatakse sisse loginud isiku nimi päises. Rolliinfo kuvatakse lehe sisu osas üleval paremal siis, kui tekib konflikt ning kasutaja peab vastava rolli käsitsi valima.
4. Menüü ja keskkond arvestab kasutaja volitusi ning kasutaja näeb seeläbi ainult seda osa rakendusest, millele tal on volitused. Volitused tulenevad rollidest ning kasutajale kuvatakse kõikidest rollidest tulenevad võimalused (juhul kui need ei lähe omavahel vastuollu). Kui kasutaja soovib kasutada funktsionaalsust, mis antud rollile pole lubatud, kuid tal on vastav volitus mõne teise rolli all, siis toimub rollivahetus automaatselt (kasutajat teavitatakse infoteatega vahetusest). (RIA, n.y.)

4.9 Mittefunktsionaalsed nõuded

1. Portaalis peab olema minimaalne ooteaeg, näiteks lehtede kuvamine ja teenuste laadimine ei tohi võtta liiga kaua. Selle tagamiseks peavad olema rakenduse kood ja päringud vastavalt optimeeritud.

2. Portaal peab tekitama positiivset emotsiooni esmakordsel kasutamisel:
    a. kasutajaliides peab olema lihtne ja loogiline
    b. kujunduses peavad olema kasutatud rahulikud värvid
    c. peab vältima näilist keerukust
    d. peab vältima vilkuvate elementide kasutamist.
3. Vigade tegemine peab olema raske, näiteks vormides peab olema sisestatud informatsiooni valideerimine, et teavitada kasutajat sellest, et info on sisestatud valel kujul.
4. Infot peab saama kiiresti leida. Selleks peab portaali informatsioon olema loogiliselt kujundatud ja olema leitav sealt, kust kasutaja ootab seda kätte saada (näiteks kontekstabi, sisestusmallid, viited juhenditele).
5. Portaalis peab olema lihtne tööd jätkata, kasutaja ei pea alustama tegevust algusest peale. Peab vältima informatsiooni kadumist. Süsteem peab kasutajat hoitama juhul, kui tema tegevus võib põhjustada informatsiooni kadumist.
6. Iga kasutajaliidese elemendi eesmärk ja vajadus peab olema selge ja arusaadav. Kasutajal ei tohiks tekkida küsimust, milleks on vaja üht või teist asja või mida üks või teine element tähendab. Iga element, mille eesmärk võib olla arusaadud erinevat moodi paneb kasutajat mõtlema ning soodustab negatiivse emotsiooni tekkimist portaali suhtes.
7. Portaalis peab vältima näilist keerukust, näiteks liiga palju müra, korraga liiga paljude kasutajaliidese elementide kuvamine jne.
8. Portaalis peab vältima erialase keele kasutamist. Kõik tekstid peavad olema koostatud lihtsas keeles ja ühtlasi arusaadavad. (RIA, n.y.)

4.10 Mitmekeelsus

- Kasutajaliides on üldjuhul alati eestikeelne, rakenduse eripärast lähtuvalt määratletakse muude keelte (inglise, vene keel) ja lokaliseerimise tugi. Kõik keelelaiendused ja lokaliseerimine peab olema kergelt lisatav sõnaraamatute, keelepakkide jms abil, need esitatakse rakenduses eraldi ressursifailidena.
- Keelevalikuks on kasutatud soovitava keele vastavakeelset väärtust (Eesti keel, English). Keelevalikul peab olema ekraanilugejale nähtav tekstiline pealkiri „Rakenduse keel“.
- Peab vältima olukordi, kus süsteemi protsessid on poolikult tõlgitud. Näiteks alustatakse tegevust inglise keeles, kuid järgmisel lehel kuvatakse eestikeelset teksti, kuna antud osa protsessist on tõlkimata. (RIA, n.y.)

5 Appendix : Visual Prototype

Figure 28: Visual Prototype - view 1

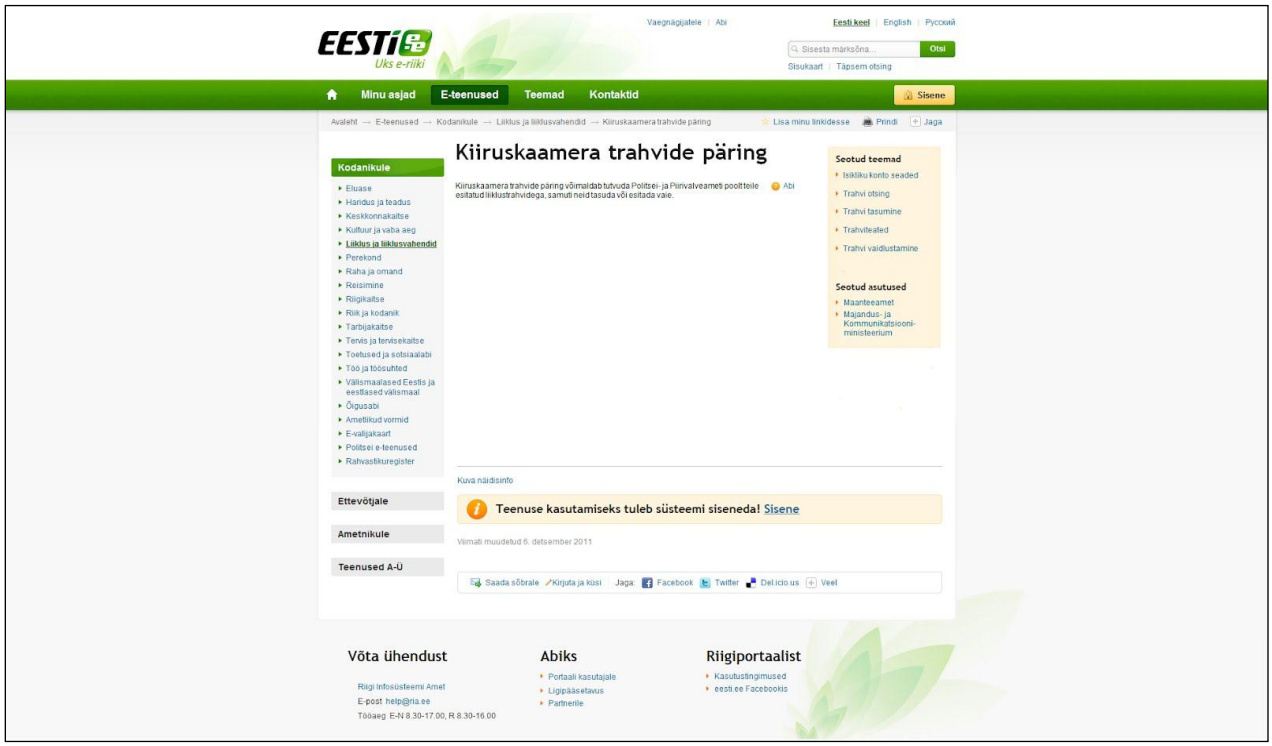

Figure 29: Visual Prototype - view 2

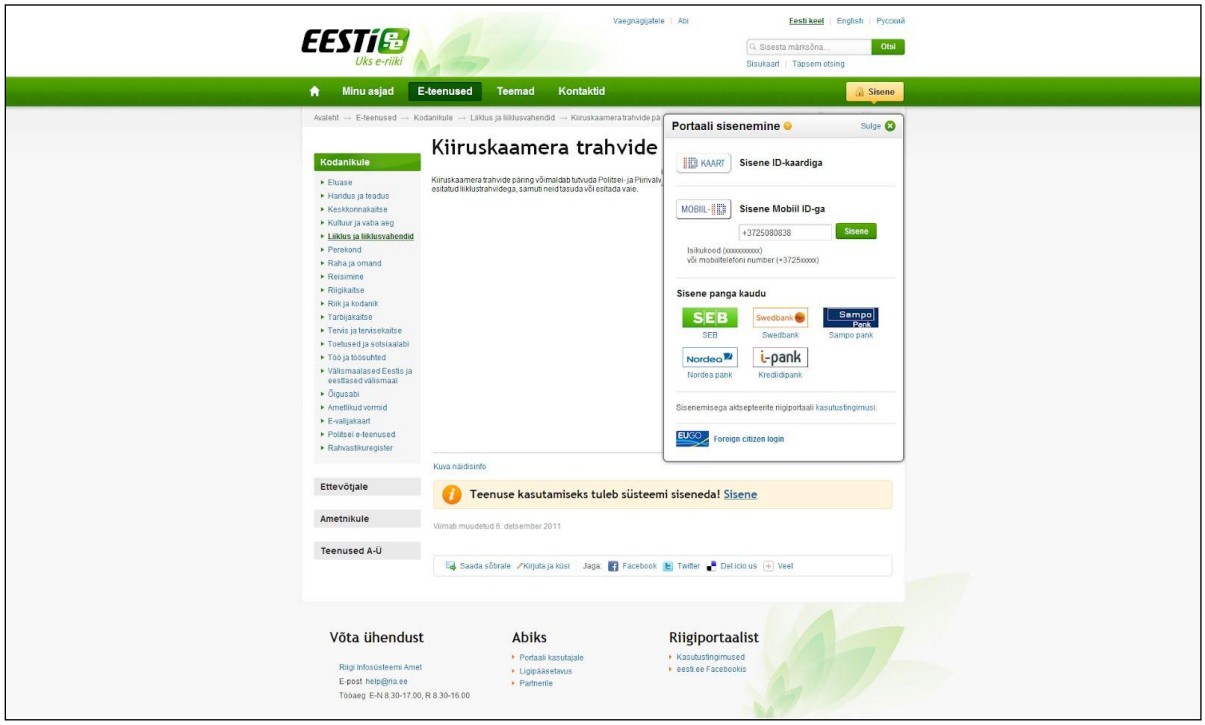

Figure 30: Visual Prototype - view 3

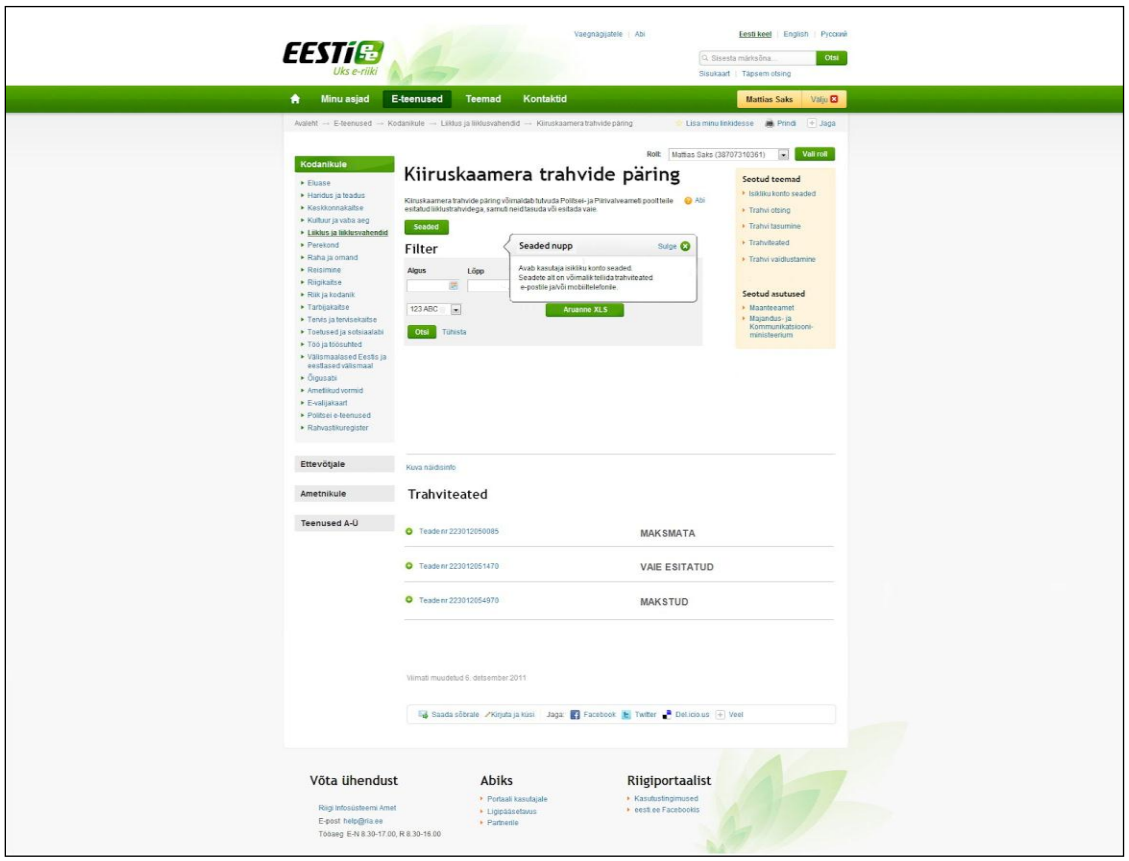

Figure 31: Visual Prototype - view 4

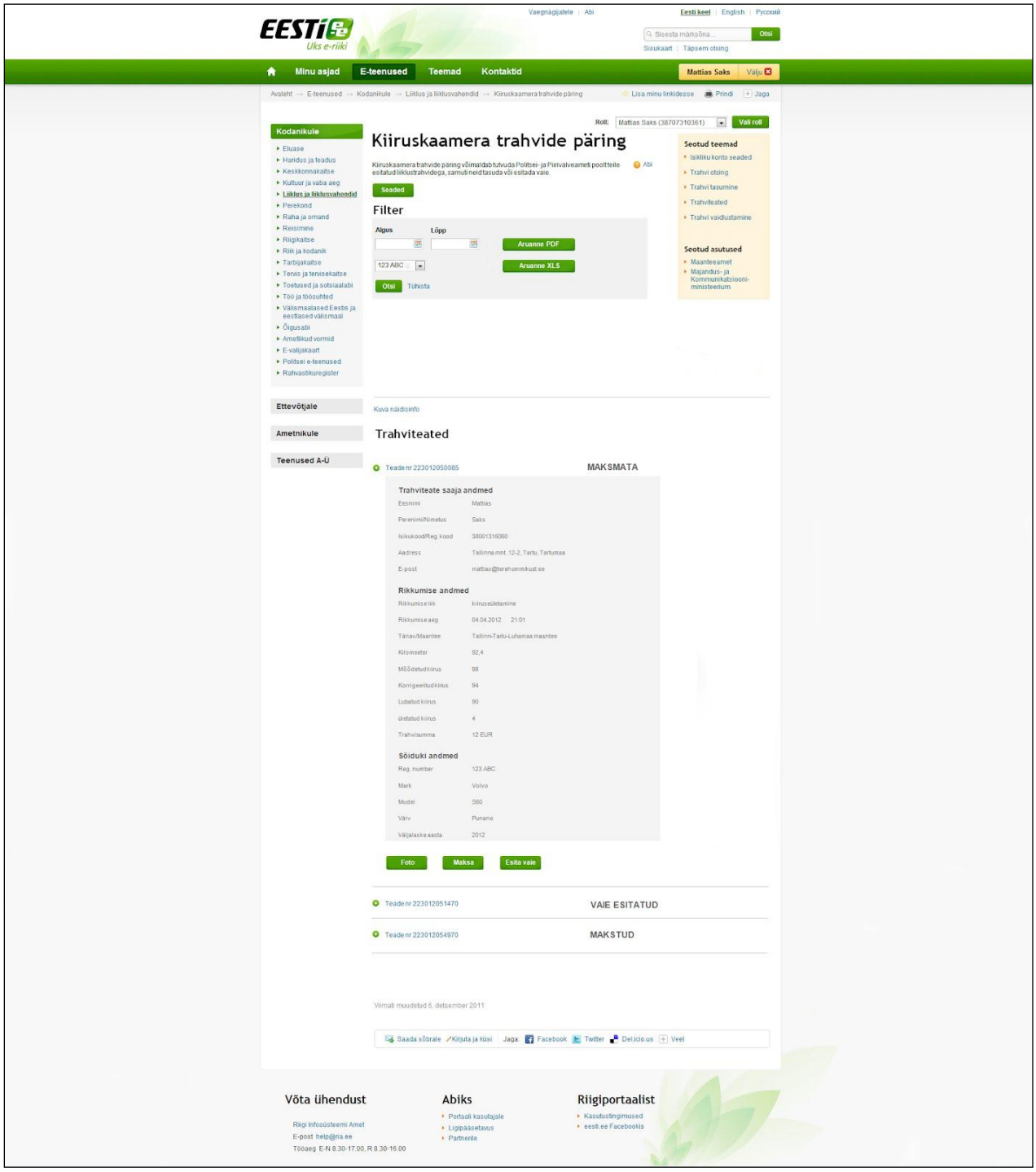

Figure 32: Visual Prototype - view 5

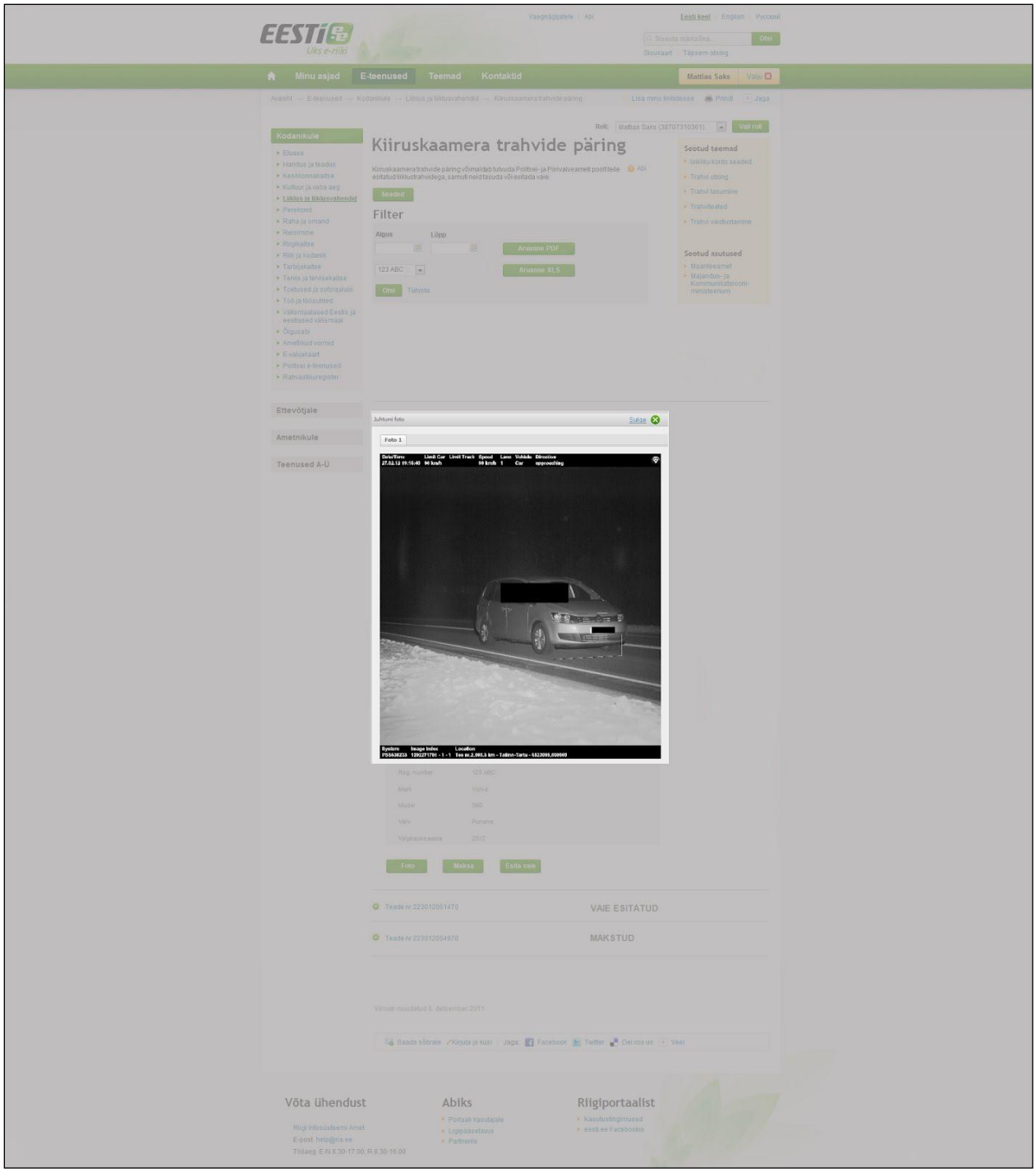

Figure 33: Visual Prototype –view 6 - photo of traffic violation

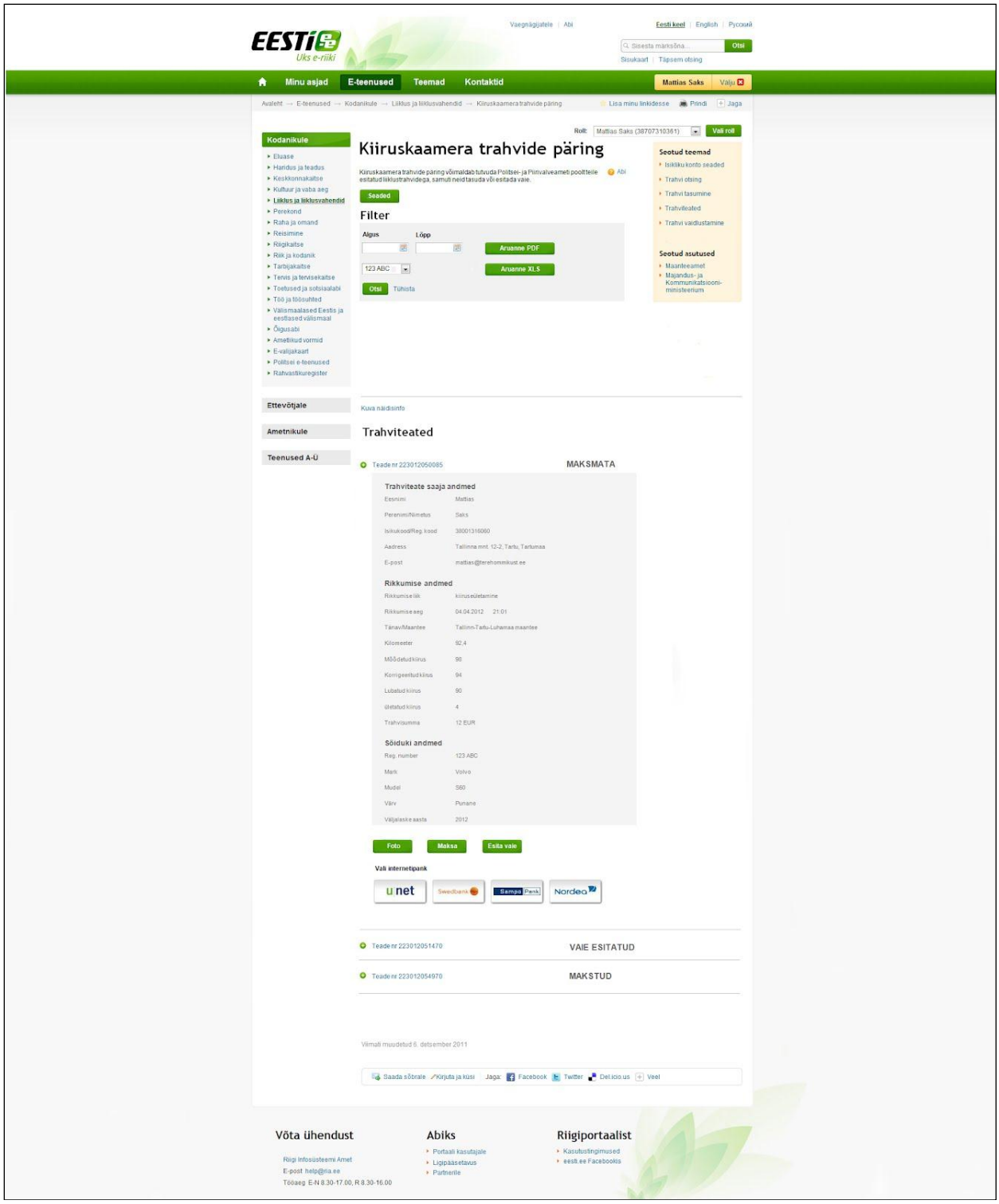

Figure 34: Visual Prototype - view 7

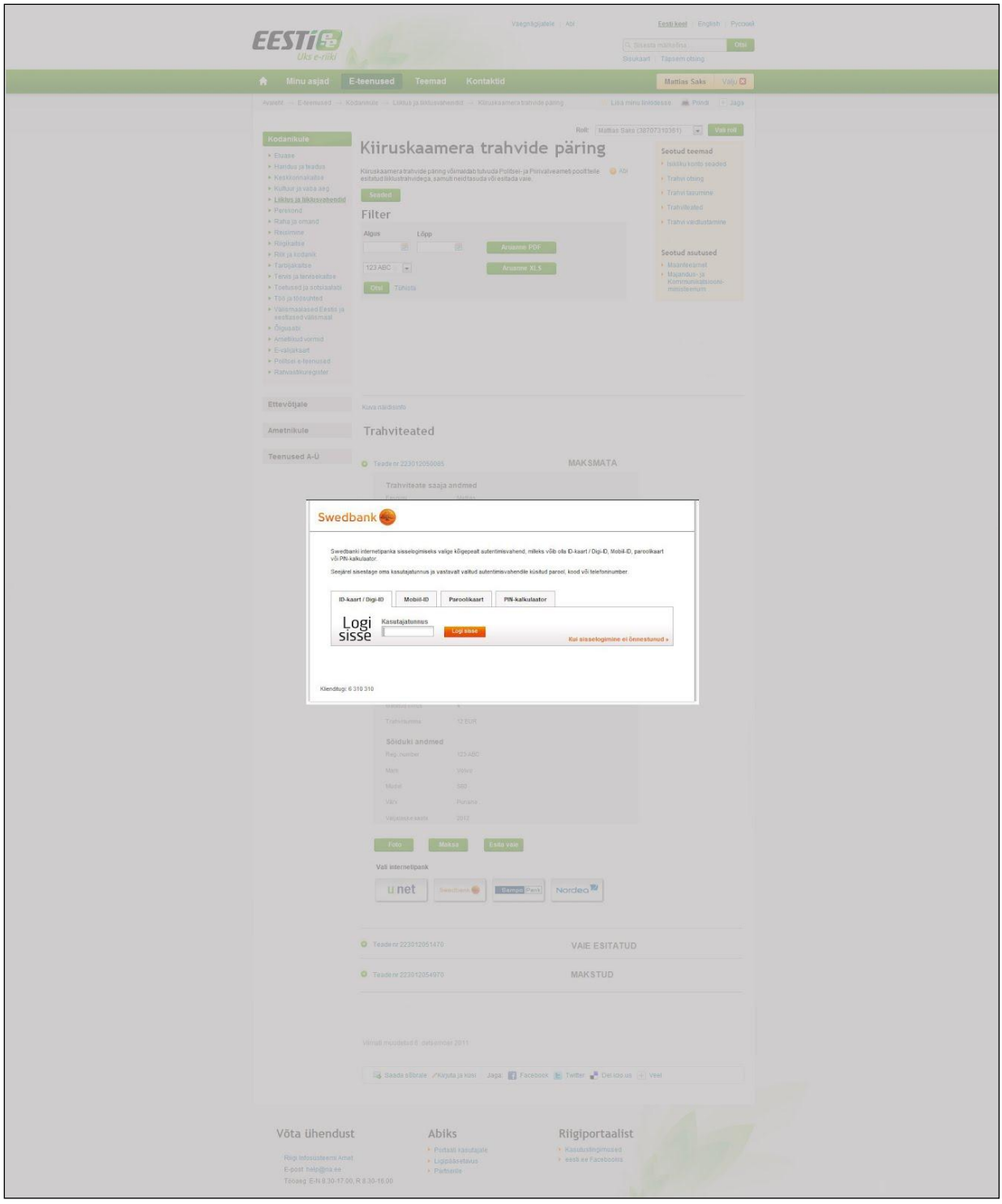

Figure 35: Visual Prototype - view 8

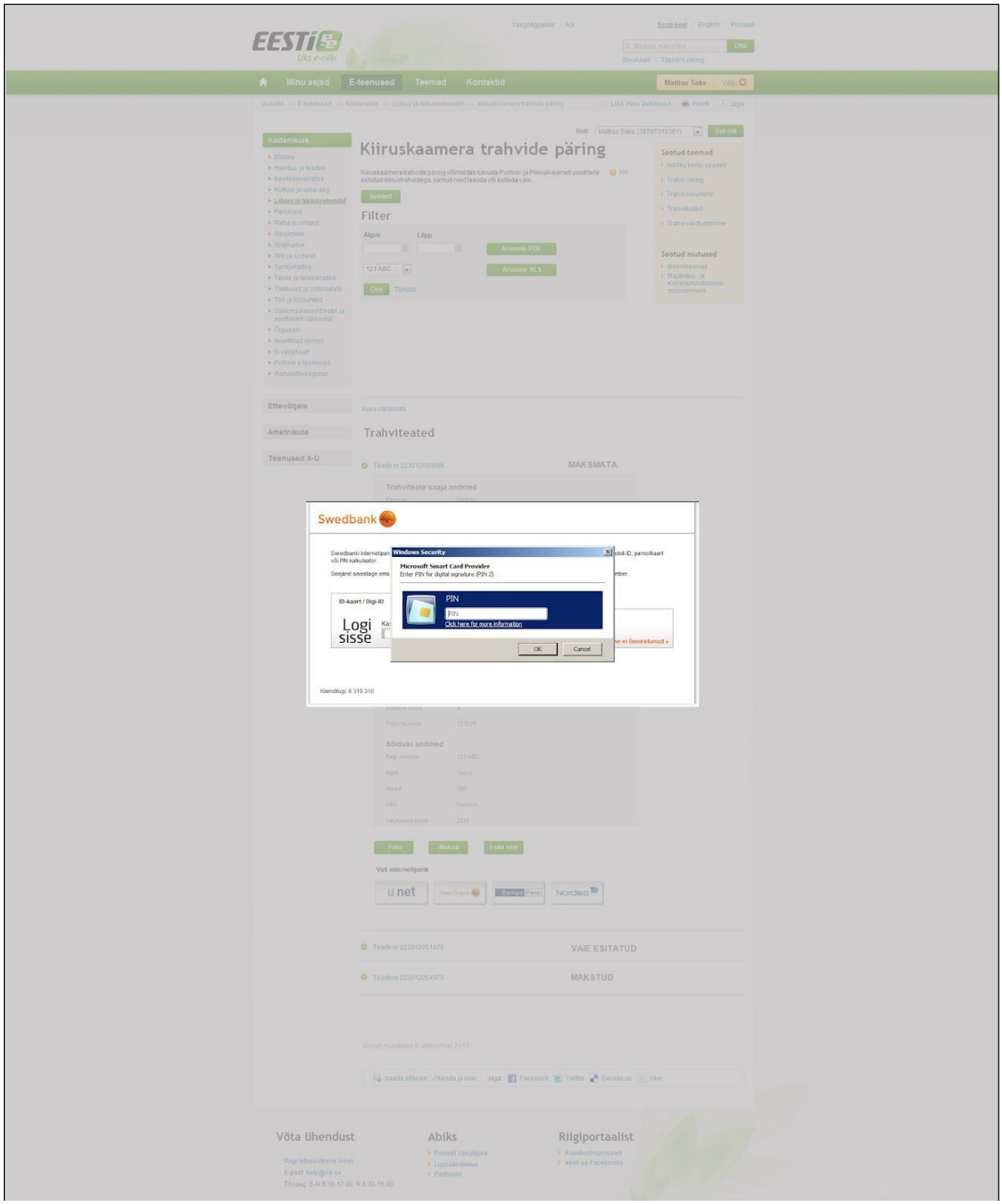

Figure 36: Visual Prototype - view 9

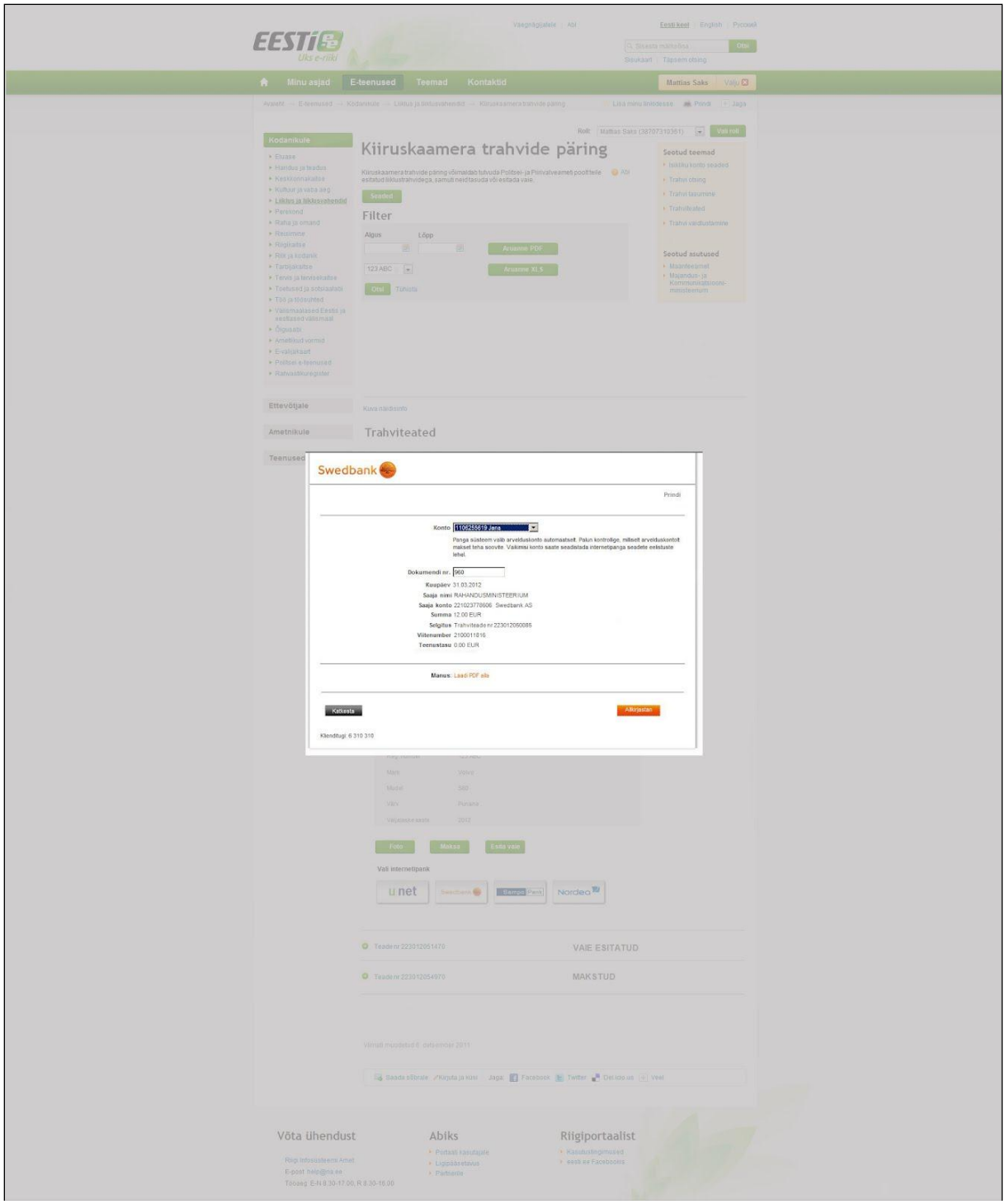

Figure 37: Visual Prototype - view 10

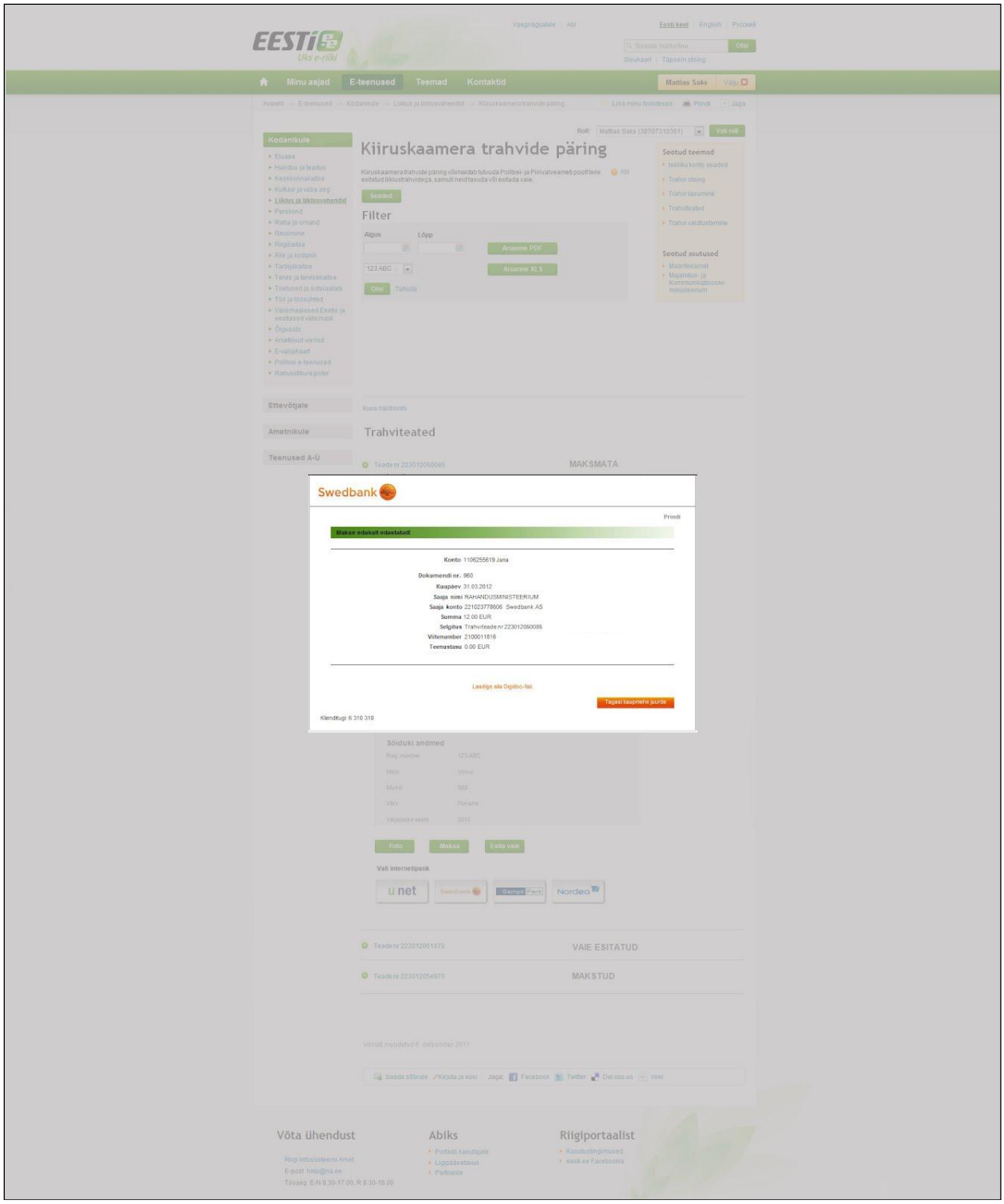

Figure 38: Visual Prototype - view 11

6 Appendix : Frame of the Interview, guiding Questions

6.1 Interview Questions - Police Estonia

- Nimi, ametikoht – põhitööülesanded/vastutus
- Mis on Hoiatusmenetlusinfosüsteemi eesmärk riigi jaoks?
- Mis kasu on Hoiatusmenetlusinfosüsteemist kodanikule?
- Keskmine Menetluskeskusesse pöördumiste arv kuus? Milline on ressursikulu?
- Millised on kasutajate vajadused arvestades seniseid pöördumisi? (kaardistame vajadused, eraldame olulisimad, lisame olulisustasemed)
- Tulevikunägemus, ettepanekud ja *visual prototype* parendused.

6.2 Brainstorming with Tiina Rekand (RIA)

- ettepanekud ja *visual prototype* parendused. *Brainstorming*

6.3 Interview Questions - Mihkel Tikk (RIA)

- Nimi, ametikoht – põhitööülesanded/vastutus
- Kodanikuportaali eesmärk, mis teenuseid sisaldab, kanalistrateegia?
- Makselahendused kodanikuportaalis.
- Arendustööde jaotus sisuteenusepakkuja ja kodanikuportaali vahel?
- Tulevikunägemus, ettepanekud ja *visual prototype* parendused. *Brainstorming.*

7 Appendix : Key points of Interviews

7.1 Toomas Kaarepere – Police Estonia; (Kaarepere, 2014)

- Figure 29: Visual Prototype - view 2 - Tutvustusosa tekst vajab muutmist, et oleks selge, et tegemist on automaatse liiklusjärelevalve poolt tuvastatud hoiatustrahvidega
- Figure 29: Visual Prototype - view 2 - Filter ei ole vajalik
- Figure 32: Visual Prototype - view 5 - Foto kuvamine pole lubatud, kuna seda tuleb enne kuvamist käsitsi hägustada.
- Figure 32: Visual Prototype - view 5 - On kaebus, mitte vaie
- Figure 37: Visual Prototype - view 10 - Makseandmetes peab selgitus sisaldama ka trahviteate määramise kuupäeva

7.2 Marianne Heinmäe ja Kaire Leet – Police Estonia; (Heinmäe & Leet, 2014)

- Tutvustusosa tekst vajab muutmist – "esitatud liiklustrahvide" asemel kasutatada "koostatud trahviteadetega" (Figure 29: Visual Prototype - view 2)
- Figure 31: Visual Prototype - view 4 - Trahviteadete nimekirjas võiks olla lisaks infole "maksmata" ka "tähtaeg…"
- Figure 31: Visual Prototype - view 4 - Trahviteadete nimekirjas võiks olla lisaks infole "makstud" ka "tasumise kuupäev…"
- Figure 31: Visual Prototype - view 4 - Trahviteadete nimekirjas peaks olema ka trahviteadet märkega "tühistatud"
- Figure 32: Visual Prototype - view 5 - "Esita kaebus" – digiallkirjastatud kaebus saadetakse menetluskeskuse üldmeilile.
- Figure 37: Visual Prototype - view 10 - Selgituses puudu kuupäev

7.3 Tiina Rekand – RIA; (Rekand, 2014)

- Dubleerida -> eesti.ee keskkonnas olevad hoiatustrahvid kalendrisse-> siis tuleks nad välja “minu asjade” sündmuste voos
- “Minu asjad” – “Liiklus” - Info tuleb teenusest, näiteks juhiloainfo, integreerida ka maksmine sinna?
- Figure 29: Visual Prototype - view 2 – “Kiiruskaamera trahvide päring” asemel “Minu kiiruskaameratrahvid”
- Figure 29: Visual Prototype - view 2 – seotud teemade-teenuste all on portaalis olevad teemad-teenused.
- Figure 29: Visual Prototype - view 2 - Teenuse kirjeldus peab olema mahukam ja ülevaatlikum. Võiks sisaldada ka infot tasumise kohta – a’la “andmeid uuendatakse”
- Figure 29: Visual Prototype - view 2 – “abi nuppu pole vaja – kogu tekstiaken peab sisaldama vajalikku infot!
- Kui on soov kasutada filtrit siis peab see olema teenuse sisuosas. Filter peab olema ühe realine.
- Figure 34: Visual Prototype - view 7 – trahviteate andmeteväli on portaali tabelielement.
- Figure 34: Visual Prototype - view 7 – nupud – üks nupp peab olema peamine ja rõhutatud – näiteks “maksa”.
- Figure 35: Visual Prototype - view 8 – tulemas on single sign-in, võiks kasutada seda.

7.4 Mihkel Tikk and Timmo Tammemäe – RIA; (Tikk & Tammemäe, 2014)

- Aastatel 2017-2020 plaanis luua kõikidele riigi portaalidele ühtne visual
- Kaovad pisiportaalid – luuakse liidesed eesti.ee’sse
- Pilt võiks olla ikkagi lisatud ja kättesaadav kodanikuportaalist.
- RIA annab nõu ja kooskõlastab prototüübi – äripool arendab
- Tõlgete jaoks klassifitseerida rikkumised
- Info nõuete kohta - personaalne järelteenindus “inkasso”
- Võtta aluseks 80/20 - keskenduda sellele, et kaetud saaks 80% kasutajate põhivajadused

8 Appendix : Functional Prototype

8.1 Questions for Functional Prototype evaluation

YES/NO Answer Questions

1. Olen saanud politseilt trahvi kiiruseületamise tõttu/I have got speedticket
2. Olen ka varem kokku puutunud Riigiportaaliga eesti.ee/I have used State Portal eesti.ee
3. Informatsioon hoiatustrahvide kohta on esitatud arusaadavalt/The information found about speedtickets is clearly understandable.
4. Lisatud e-teenus võimaldab toiminguid teha kiiresti ja sama mugavalt kui näiteks rahaasjade ajamine internetipangas/Thanks to the e-service I can quickly reach my goal.
5. Leian, et hoiatustrahvide info ja maksevõimalus võiks olla kättesaadav Riigiportaalis /The information about speedtickets should be in State Portal
6. Oled Sa Eesti kodanik?/ Are You citizen of Estonia?

8.2 Results of Functional Prototype evaluation

Table 3: Functional Prototype evaluation result - count of Personas by type

Type	Count
NYYYYY	61
YYYYYY	13
NNYYYN	11
YNYYYY	4
YNYYYN	3
NNYYYY	3
NYYYYN	2
YYYYYN	1
NNNYYY	1
NNNYYN	1

Table 4: Functional Prototype evaluation - Answers

	Type	Q1	Q2	Q3	Q4	Q5	Q6	Total time (minutes)	Comments
ID001	NYYYYY	N	Y	Y	Y	Y	Y	4	ÄGE MÕTE
ID002	NNYYYN	N	N	Y	Y	Y	N	6	Pole teadlik riigiportaali olemasolust
ID003	YYYYYY	Y	Y	Y	Y	Y	Y	5	kõlab nagu e-riigi lahendus :)
ID004	NNYYYY	N	N	Y	Y	Y	Y	4	Pole tulnud selle peale, et eesti.ee'd kasutada
ID005	NYYYYY	N	Y	Y	Y	Y	Y	6	pole kindel, kas tahaks trahvi saada, kuid niimoodi oleks mugav see teema lahendada
ID006	YYYYYN	Y	Y	Y	Y	Y	N	8	sama lahendus võiks olla ka teistel riikidel (Belgia)
ID007	YYYYYY	Y	Y	Y	Y	Y	Y	3	sujuv ja parasjagu infot
ID008	YNYYYN	Y	N	Y	Y	Y	N	7	Pole tulnud selle peale, et eesti.ee'd kasutada
ID009	NNYYYN	N	N	Y	Y	Y	N	7	Pole olnud vajadust riigiportaali kasutada
ID010	YYYYYY	Y	Y	Y	Y	Y	Y	4	annab hea ja kiire ülevaate
ID011	NYYYYY	N	Y	Y	Y	Y	Y	4	võiks olla link kohe avalehel :)
ID012	YYYYYY	Y	Y	Y	Y	Y	Y	5	olen juba enne mõelnud, miks seda lahendust ei ole olemas
ID013	NYYYYY	N	Y	Y	Y	Y	Y	5	pole paha mõte
ID014	NNNYYY	N	N	N	Y	Y	Y	11	Lisainfot võiks olla rohkem
ID015	NYYYYY	N	Y	Y	Y	Y	Y	4	kas seda ei olegi praegu? Imelik (inimene eeldas, et kõik sellised lahendused on juba rakendatud)
ID016	NYYYYY	N	Y	Y	Y	Y	Y	5	rahulik kuid samas informatiivne kujundus
ID017	YNYYYY	Y	N	Y	Y	Y	Y	4	Pole teadlik riigiportaali olemasolust
ID018	NYYYYY	N	Y	Y	Y	Y	Y	3	Kõik mis teeb elu lihtsamaks, tuleb ka rakendada päriselt
ID019	NNYYYY	N	N	Y	Y	Y	Y	6	pole tundunud vajadust portaali kasutamiseks
ID020	YNYYYY	Y	N	Y	Y	Y	Y	5	pole tundunud vajadust portaali kasutamiseks
ID021	NYYYYY	N	Y	Y	Y	Y	Y	4	maksmise lahendus on väga hea mõte
ID022	NNYYYN	N	N	Y	Y	Y	N	12	pole teadlik riigiportaalist, kuid mõte tundub väga hea
ID023	NYYYYY	N	Y	Y	Y	Y	Y	5	ma kasutaks küll, kui peaksin trahvi saama - tundub väga dünaamiline ja

									usaldusväärne
ID024	NYYYYY	N	Y	Y	Y	Y	Y	4	maksmata trahviteade võiks kuidagi "ninna karata"
ID025	YYYYYY	Y	Y	Y	Y	Y	Y	6	tundub täitsa asjalik
ID026	NYYYYY	N	Y	Y	Y	Y	Y	7	maksmata trahviteaded võiks ka maksuamet tulumaksutagastusest maha arvata :)
ID027	NYYYYY	N	Y	Y	Y	Y	Y	4	hea optimaalne lahendus
ID028	NYYYYN	N	Y	Y	Y	Y	N	8	võiks olla realiseeritud riigiportaalis
ID029	NNYYYN	N	N	Y	Y	Y	N	11	Tundub lihtne kasutada, seni pole olnud põhjust riigiportaali kasutada
ID030	YYYYYY	Y	Y	Y	Y	Y	Y	6	väga asjalik
ID031	NYYYYY	N	Y	Y	Y	Y	Y	5	kasutaks küll, kui oleks vaja
ID032	NYYYYY	N	Y	Y	Y	Y	Y	7	mõte on hea, kuid loodetavasti pole põhjust kasutada :)
ID033	NYYYYY	N	Y	Y	Y	Y	Y	4	kõik on arusaadav ja intuitiivne
ID034	YYYYYY	Y	Y	Y	Y	Y	Y	8	tundub ok, pilt võiks olla kohe nähtav
ID035	NNYYYN	N	N	Y	Y	Y	N	8	äge, ulmeline :)
ID036	NYYYYY	N	Y	Y	Y	Y	Y	5	miskit ei häiri. Meeldib, et disain on ühtlane. Ei teki karistuse tunnet, vaid ongi teade.
ID037	NYYYYY	N	Y	Y	Y	Y	Y	4	arvas, et kui teha maksmine sel viisil lihtsamaks, siis makstaks ka paremini.
ID038	NNNYYN	N	N	N	Y	Y	N	13	Riigiportaali mõiste oli täiesti tundmatu, kuid arvas, et kasutaks, kui harjuks sellega.
ID039	NYYYYY	N	Y	Y	Y	Y	Y	5	tundub, elementaarne ja tavaline - heas mõttes
ID040	NYYYYY	N	Y	Y	Y	Y	Y	4	normaalne
ID041	NYYYYY	N	Y	Y	Y	Y	Y	7	nupud võiks olla ühesugused
ID042	NYYYYY	N	Y	Y	Y	Y	Y	3	täitsa bro
ID043	YNYYYY	Y	N	Y	Y	Y	Y	8	pole olnud põhjust riigiportaali kasutamiseks
ID044	NYYYYY	N	Y	Y	Y	Y	Y	5	kasutaks küll, kui oleks vaja
ID045	YYYYYY	Y	Y	Y	Y	Y	Y	5	täitsa nagu päris
ID046	NNYYYN	N	N	Y	Y	Y	N	9	pole riigiportaalist midagi kuulnud, kuid mõte meeldib
ID047	NYYYYY	N	Y	Y	Y	Y	Y	7	potensiaali on
ID048	NYYYYY	N	Y	Y	Y	Y	Y	4	võiks olla ka lives
ID049	NYYYYY	N	Y	Y	Y	Y	Y	5	Rahulik lahendus, ei tundu hoiatusena
ID050	NYYYYY	N	Y	Y	Y	Y	Y	9	Väga huvitav mõte, samamoodi võiks kõik trahvid olla koondatud ühte kohta - a'la nõuded
ID051	YNYYYY	Y	N	Y	Y	Y	Y	8	Pole olnud vajadust riigiportaali

									kasutada, kuid kui teaks, et seal saab trahvi maksta, siis teeks sealt kaudu küll
ID052	NYYYYY	N	Y	Y	Y	Y	Y	12	eeltäidetud kaebuse ja taotluse vorm ja maksmise võimalus vähendab vigade tegemise võimalust, hea mõte
ID053	NYYYYY	N	Y	Y	Y	Y	Y	7	proto testimine jättis mulje päris lehe kasutamisest, meeldis
ID054	NYYYYY	N	Y	Y	Y	Y	Y	5	miks mitte - asjalik ja vajalik
ID055	YYYYYY	Y	Y	Y	Y	Y	Y	3	kasutaks küll, kui oleks vaja
ID056	YNYYYN	Y	N	Y	Y	Y	N	11	pole riigiportaalist midagi kuulnud, kuid mõte meeldib ja soovitaks ka teistele riikidele
ID057	NNYYYN	N	N	Y	Y	Y	N	11	pole riigiportaalist midagi kuulnud, kuid mõte meeldib ja soovitaks ka teistele riikidele
ID058	NYYYYY	N	Y	Y	Y	Y	Y	6	meeldib, informatiivne
ID059	NYYYYY	N	Y	Y	Y	Y	Y	3	täitsa ok, kasutaks küll
ID060	NYYYYY	N	Y	Y	Y	Y	Y	3	täitsa ok, kasutaks küll, loodetavasti pole vaja :)
ID061	NYYYYY	N	Y	Y	Y	Y	Y	5	töötab nagu päris ja tundub, et teeks elu lihtsamaks
ID062	NYYYYY	N	Y	Y	Y	Y	Y	7	meeldib, et saab oma asjadest ülevaate ja kõik on läbipaistev
ID063	NYYYYY	N	Y	Y	Y	Y	Y	6	ei tundu nii keeruline ja võiks olla juba olemas
ID064	YYYYYY	Y	Y	Y	Y	Y	Y	9	väga hea, inimene võiks enda kohta käivat infot ise hallata, mitte seda taga ajada
ID065	NYYYYY	N	Y	Y	Y	Y	Y	4	jah, miks mitte
ID066	NYYYYY	N	Y	Y	Y	Y	Y	5	jätab hea mulje
ID067	NYYYYY	N	Y	Y	Y	Y	Y	4	ei ole kirju ja infot on tasakaalukalt, meeldib
ID068	NYYYYY	N	Y	Y	Y	Y	Y	6	kasutaks küll, kui oleks vaja
ID069	NNYYYN	N	N	Y	Y	Y	N	11	Huvitav lahendus, meeldis e-riigi mõte ja kasutaks küll
ID070	NYYYYY	N	Y	Y	Y	Y	Y	4	kasutaks küll, kui oleks vaja
ID071	NYYYYY	N	Y	Y	Y	Y	Y	6	potensiaali on
ID072	NYYYYY	N	Y	Y	Y	Y	Y	5	pole paha
ID073	NNYYYY	N	N	Y	Y	Y	Y	8	pole riigiportaali kasutanud, kuid vajadusel kasutaks
ID074	NYYYYY	N	Y	Y	Y	Y	Y	4	meeldiv
ID075	NYYYYY	N	Y	Y	Y	Y	Y	6	võiks olla realiseeritud riigiportaalis
ID076	NNYYYN	N	N	Y	Y	Y	N	10	pole riigiportaalist midagi kuulnud, kuid teab ei Eesti-suguses IT-riigis on

									kõik võimalik
ID077	NYYYYY	N	Y	Y	Y	Y	Y	6	huvitav mõte, võiks olla rakendatud küll
ID078	NYYYYY	N	Y	Y	Y	Y	Y	4	täiesti asjalik
ID079	YYYYYY	Y	Y	Y	Y	Y	Y	5	kasutaks küll, kui oleks vaja
ID080	NYYYYN	N	Y	Y	Y	Y	N	12	teadis riigiportaalist, kuid polnud süvenenud, kasutaks küll, kuna tundub, et teeb elu lihtsamaks
ID081	NYYYYY	N	Y	Y	Y	Y	Y	5	lahe mõte!
ID082	YYYYYY	Y	Y	Y	Y	Y	Y	4	kasutaks küll, kui oleks vaja
ID083	NYYYYY	N	Y	Y	Y	Y	Y	9	riigiportaali on kasutanud küll ja vajadusel kasutaks ka seda lahendust - tundub loogiline
ID084	NYYYYY	N	Y	Y	Y	Y	Y	6	väga äge, kasutaks küll
ID085	NYYYYY	N	Y	Y	Y	Y	Y	4	sujuv ja loogiline
ID086	YNYYYN	Y	N	Y	Y	Y	N	10	täitsa huvitav mõte, riigiportaaliga pole kokku puutunud, Eesti on ikka lahe e-riik.
ID087	NYYYYY	N	Y	Y	Y	Y	Y	4	tundub mõistlik lahendus
ID088	NYYYYY	N	Y	Y	Y	Y	Y	5	täitsa rakendatav
ID089	NNYYYN	N	N	Y	Y	Y	N	14	riigiportaaliga polnud varem kokku puudet olnud, kuid selline lahendus tundub tark mõte
ID090	NYYYYY	N	Y	Y	Y	Y	Y	4	täitsa ok
ID091	NYYYYY	N	Y	Y	Y	Y	Y	5	trahvi saada ei taha, kuid niimoodi oleks mugav ülevaadet omada
ID092	YYYYYY	Y	Y	Y	Y	Y	Y	7	asjalik ja kasutatav
ID093	NYYYYY	N	Y	Y	Y	Y	Y	3	miks mitte
ID094	NYYYYY	N	Y	Y	Y	Y	Y	4	loogiline ja lihtne kasutada
ID095	NYYYYY	N	Y	Y	Y	Y	Y	6	huvitav ja kasulik
ID096	NYYYYY	N	Y	Y	Y	Y	Y	9	riigiportaalist võiks rohkem teada ja seda ka aktiivsemalt kasutada
ID097	NYYYYY	N	Y	Y	Y	Y	Y	5	kasutaks küll, kui oleks vaja
ID098	NNYYYN	N	N	Y	Y	Y	N	11	riigiportaal võiks olla üle Euroopaline - siis saaks sealt ka viisasid ja muid asju teha, see mõte meeldib
ID099	NYYYYY	N	Y	Y	Y	Y	Y	4	kasutaks küll, kui oleks vaja
ID100	NYYYYY	N	Y	Y	Y	Y	Y	6	väärt mõte
SUM - Yes		21	77	98	100	100	82	10,31667	
SUM - No		79	23	2	0	0	18	hours	

8.3 Functional Prototype – screenshots

Figure 39: Functional Prototype – Main view of the State Portal eesti.ee

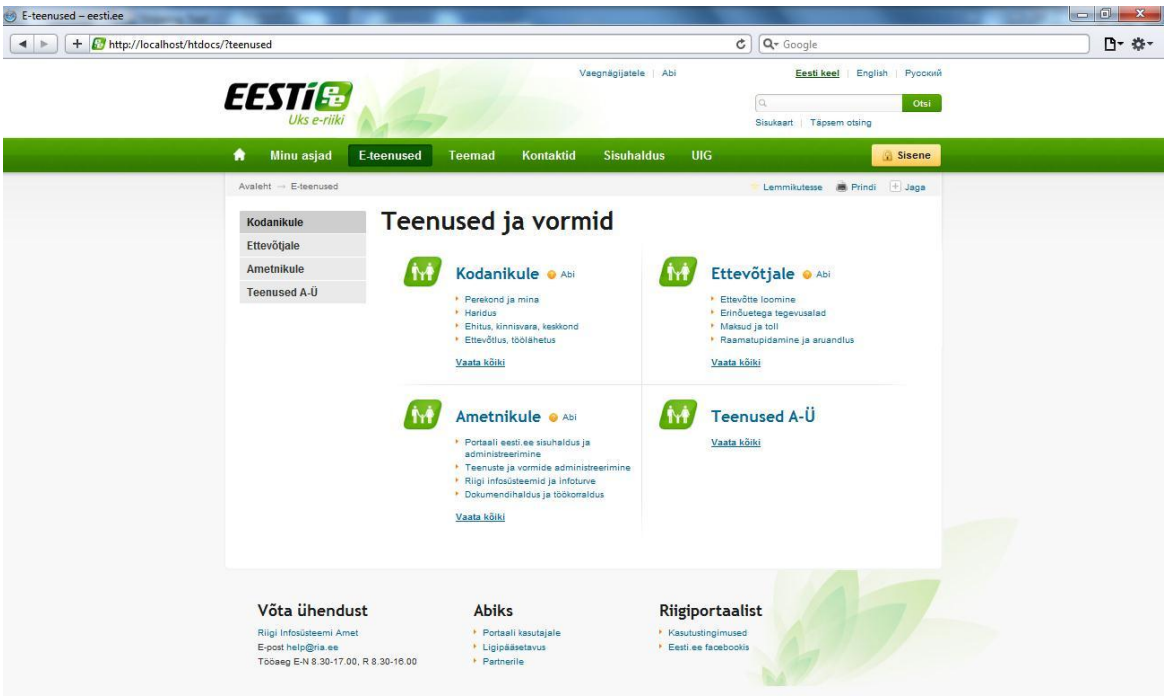

Figure 40: Functional Prototype – e-services by type of user in the State Portal eesti.ee

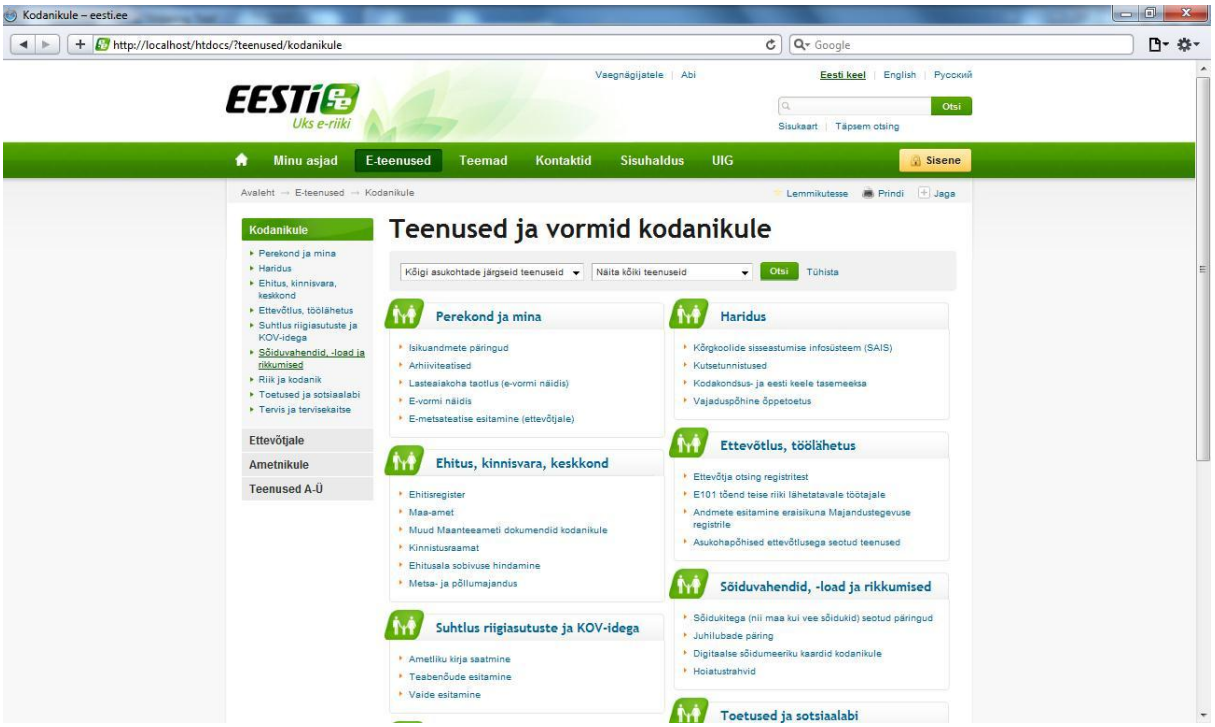

Figure 41: Functional Prototype – e-services for the citizen in the State Portal eesti.ee

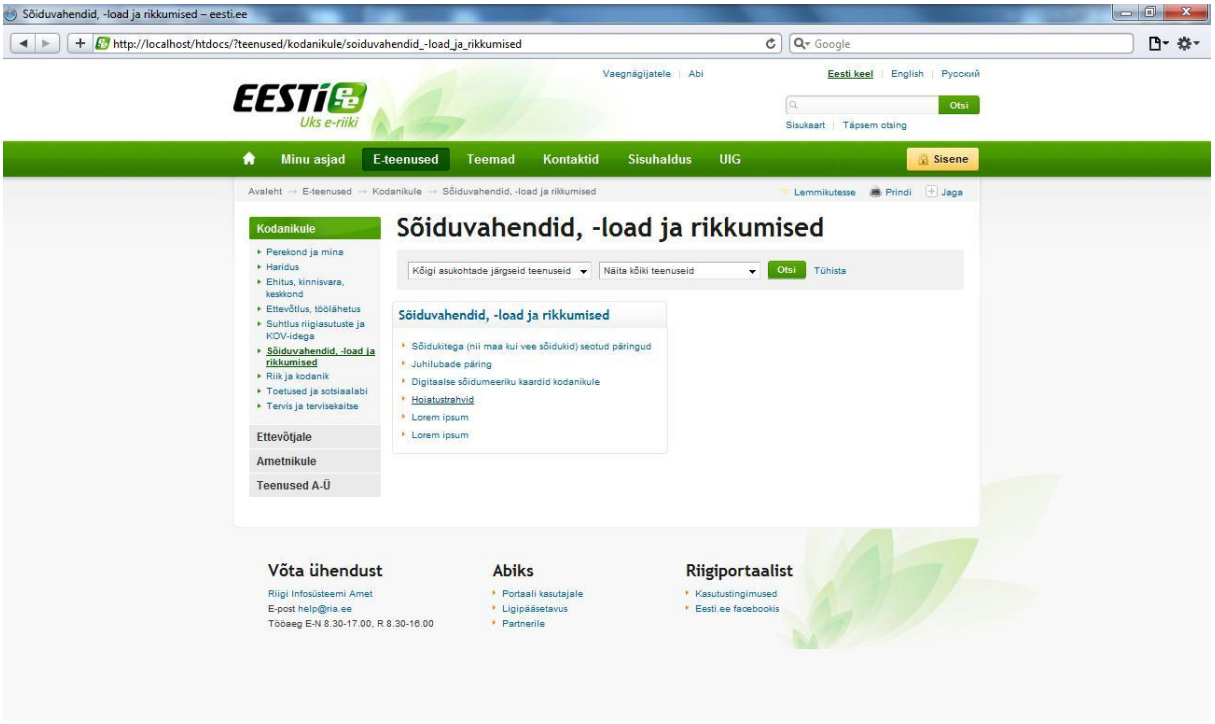

Figure 42: Functional Prototype – e-services in the State Portal eesti.ee, traffic sub-section

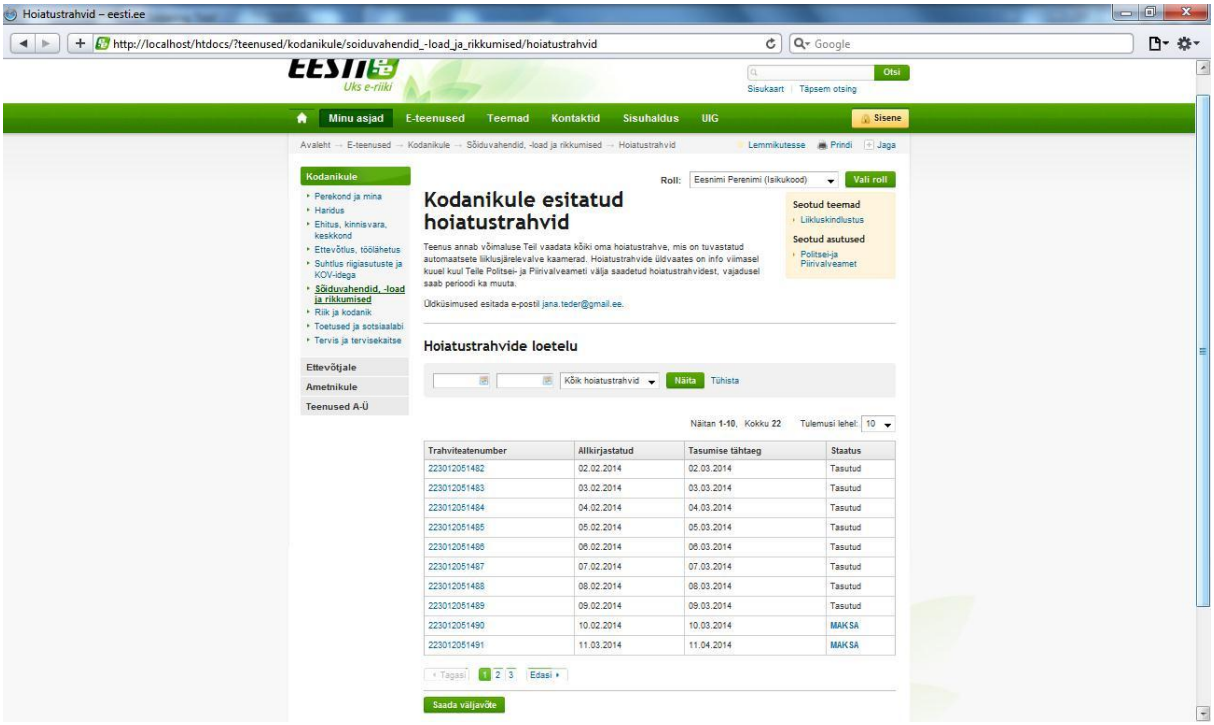

Figure 43: Functional Prototype – e-service for traffic violations in the State Portal eesti.ee

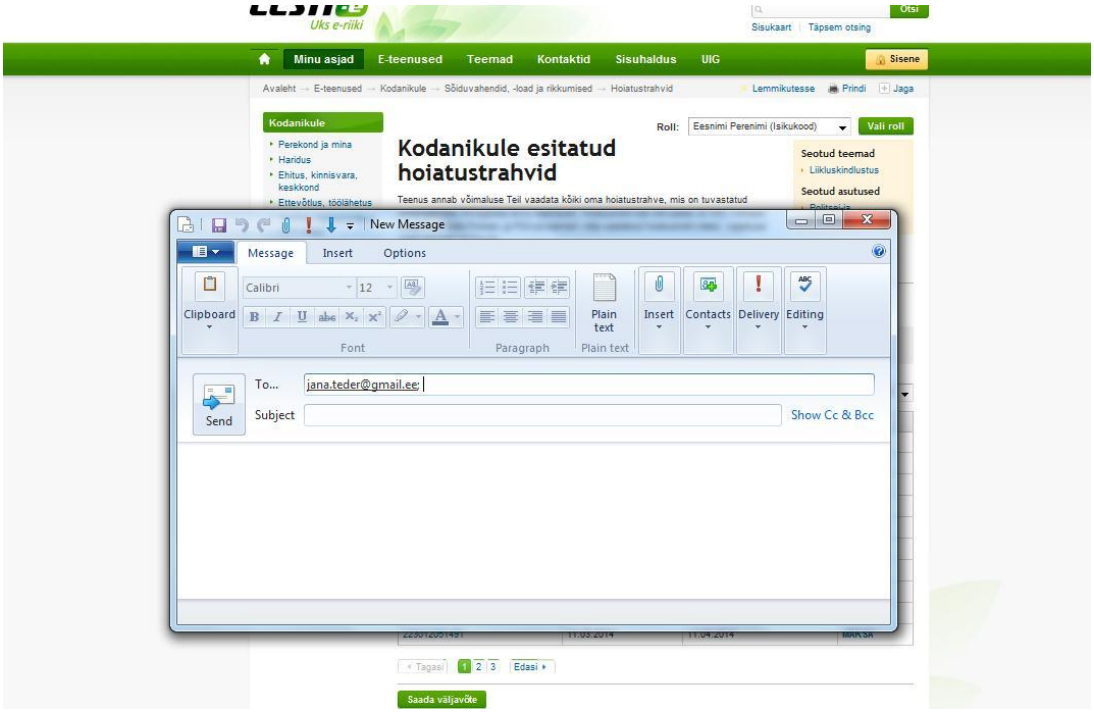

Figure 44: Functional Prototype – send a free message to the Police from traffic violations e-service interface in the State Portal eesti.ee

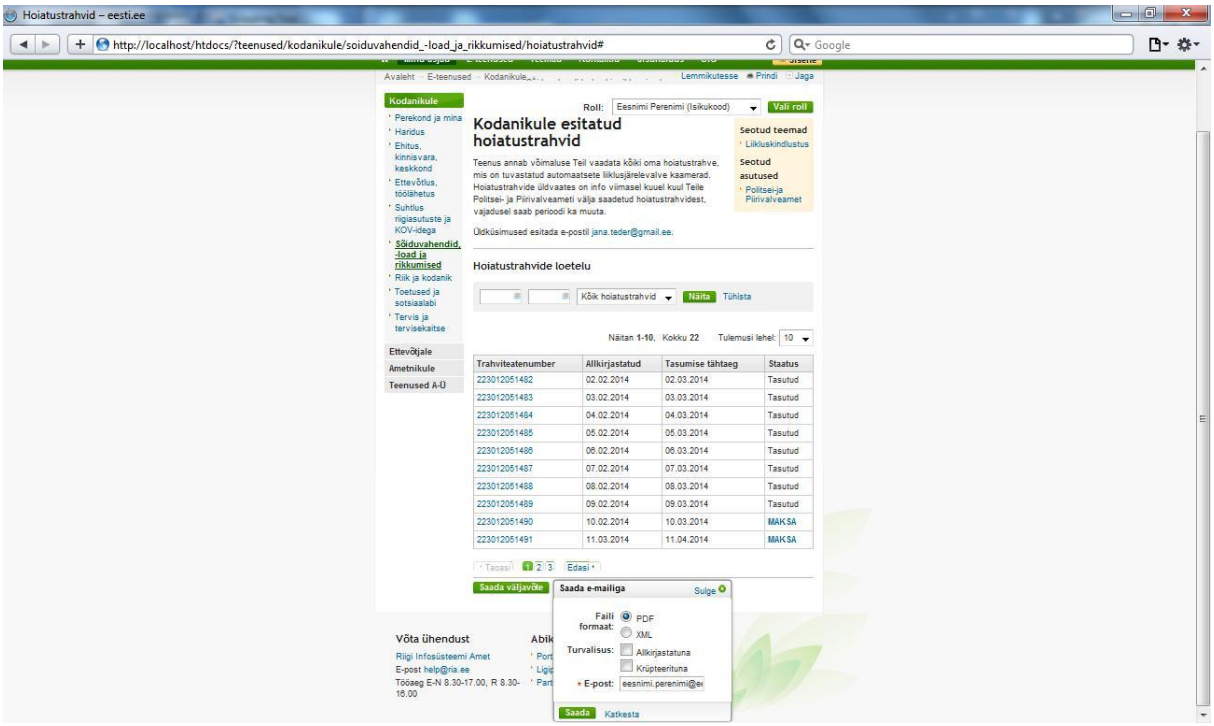

Figure 45: Functional Prototype – send a report to the e-mail from traffic violations e-service interface in the State Portal eesti.ee

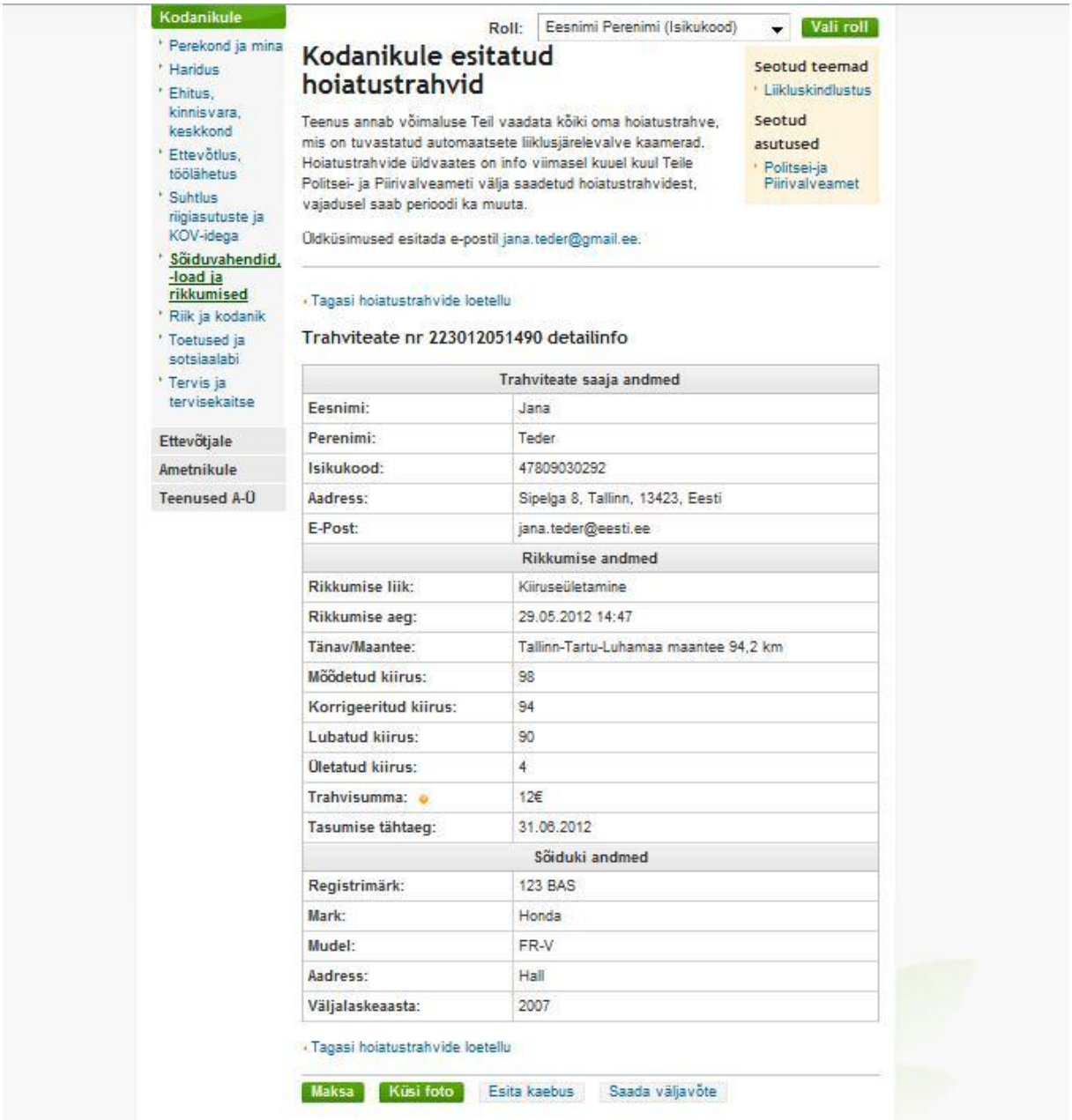

Figure 46: Functional Prototype – detailed view of traffic fine

Figure 47: Functional Prototype – modal window “Start to pay the fine”

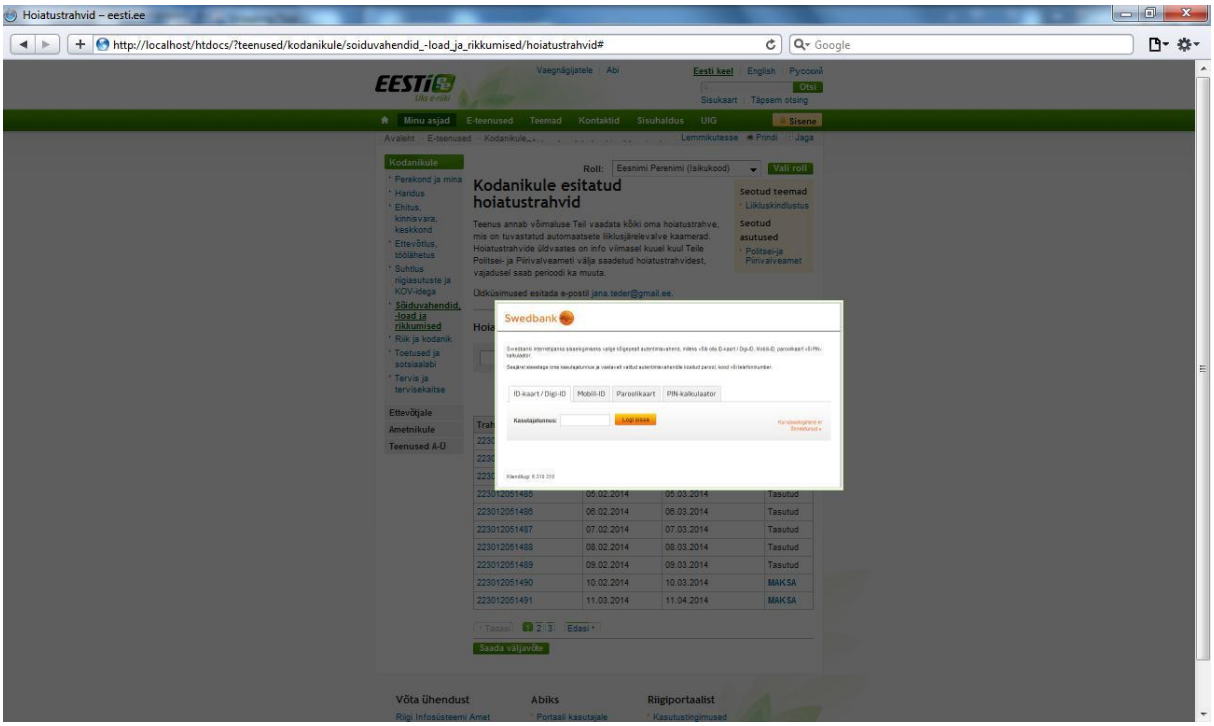

Figure 48: Functional Prototype – modal window “Enter to the bank”

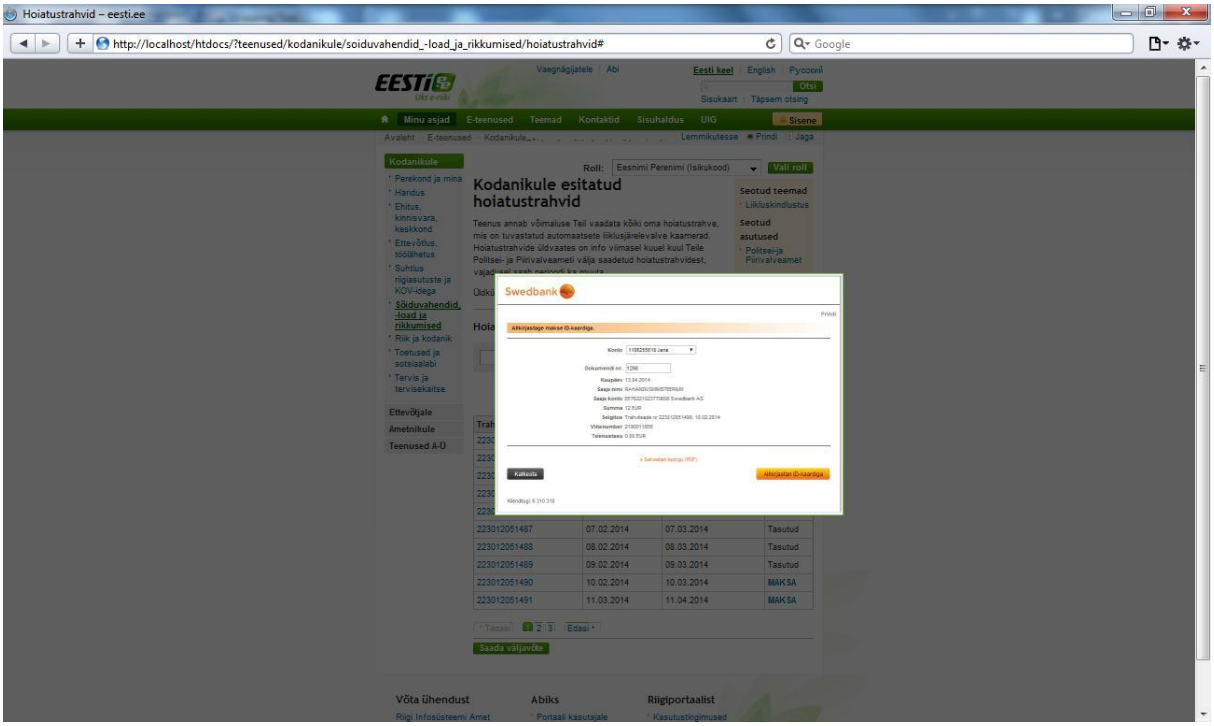

Figure 49: Functional Prototype – Modal window “Confirm the payment”

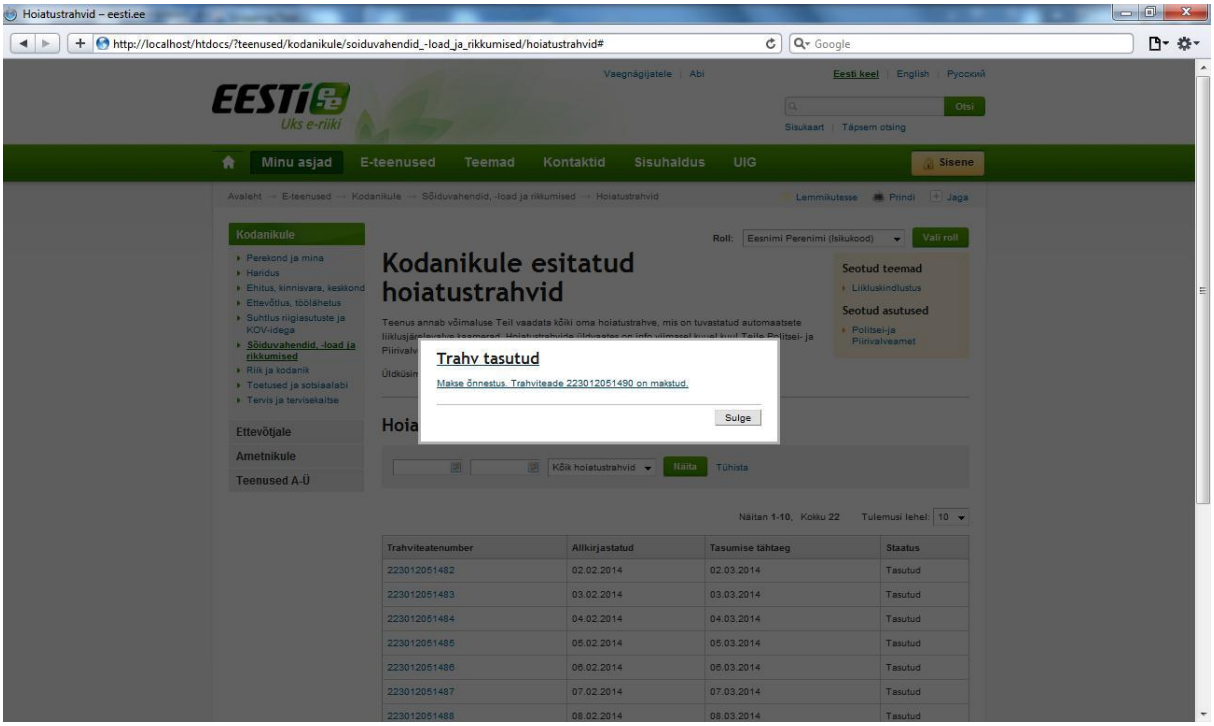

Figure 50: Functional Prototype – Modal window “Payment made”

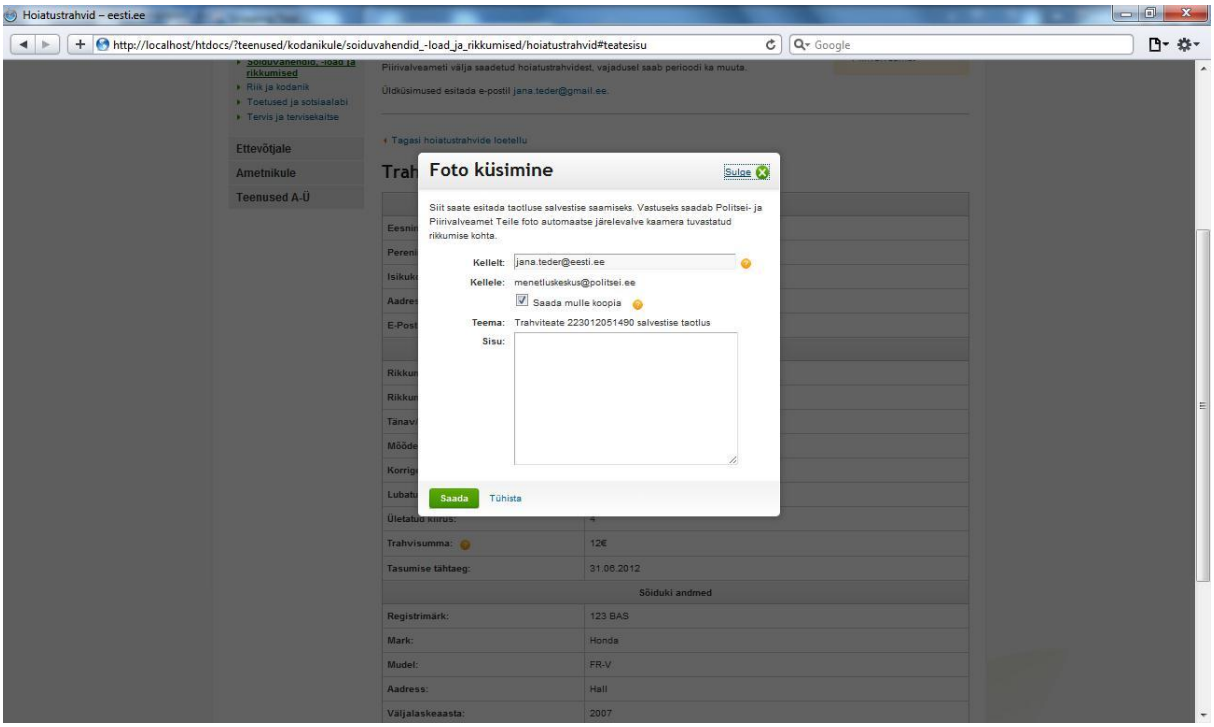

Figure 51: Functional Prototype – Modal window "Ask photo"

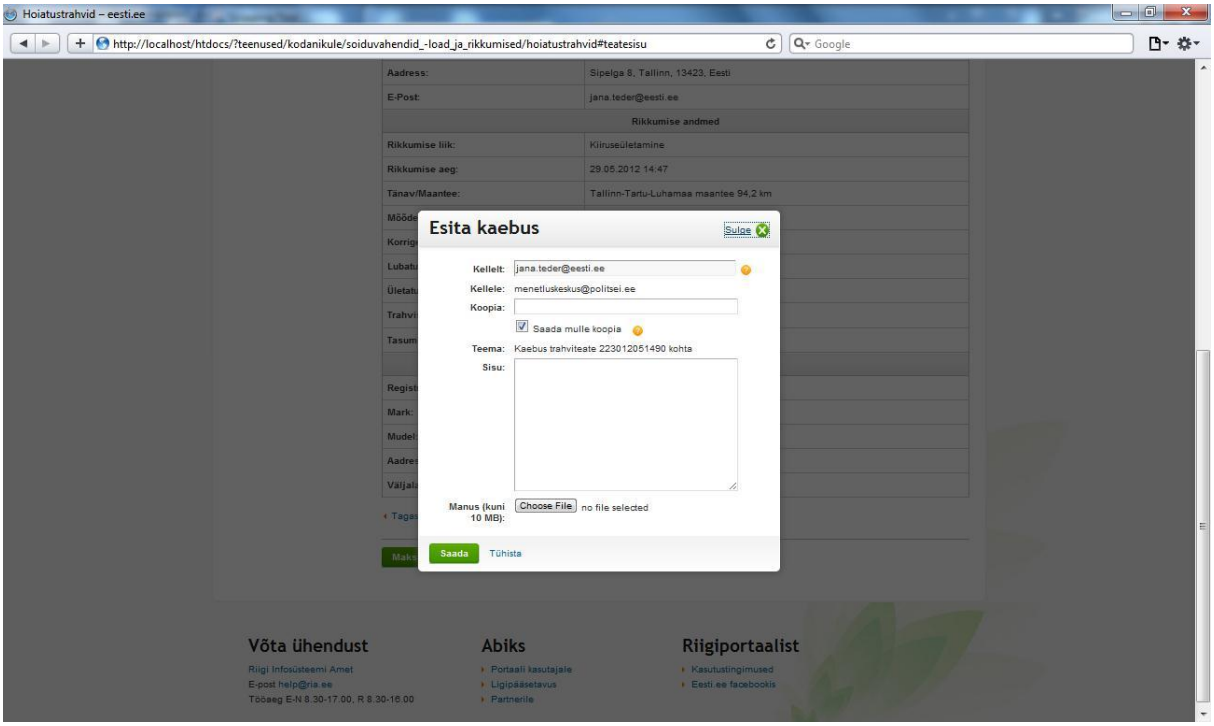

Figure 52: Functional Prototype – Modal window "Send complaint"

8.4 Functional Prototype, the Code – hoiatustrahvid.htm

```
<!-- content template name "hoiatustrahvid"" starts here (file last updated @ 10.04.2014 13:35) -->
<?php require_once 'teenuse-rollivalik.php'; ?>
<!--Teenuse tutvustus-->
<div class="box05 clear">
    <div class="box05-a">
        <h1>Kodanikule esitatud hoiatustrahvid</h1>
        <p>Teenus annab võimaluse Teil vaadata kõiki oma hoiatustrahve, mis on tuvastatud
automaatsete liiklusjärelevalve kaamerad. Hoiatustrahvide üldvaates on info viimasel kuuel
        kuul Teile Politsei- ja Piirivalveameti välja saadetud  hoiatustrahvidest, vajadusel saab perioodi ka
muuta.</p>
        <p>Üldküsimused esitada e-postil
        <a href="mailto:jana.teder@gmail.ee">jana.teder@gmail.ee</a>.
    </div>
    <div class="box05-b">
        <a tabindex="0" id="s-menu"></a>
        <p class="s-reader"><a href="#foot">Liigu järgmisele sisuosale</a></p>
        <div class="box06">
          <div class="a">
            <div class="b">
              <h2 class="first">Seotud teemad</h2>
              <ul>
                <li><a href="#">Liikluskindlustus</a></li>
              </ul>
              <h2>Seotud asutused</h2>
              <ul>
                <li><a href="#">Politsei-ja Piirivalveamet</a></li>
              </ul>
            </div>
          </div>
        </div>
    </div>
</div>
<div class="action2 clear"></div>
<!--//Teenuse tutvustus-->
<!--Teenuse raam-->
<div id="xformsframe" class="clear">
    <!--Hoiatustrahvide loetelu-->
    <div id="proto-0c853e06defb680c82f1151dca28b9bc"
    class="proto-initial proto-block"
    style="display: block;">
        <h2 class="type4">Hoiatustrahvide loetelu</h2>
        <div class="filter-outer">
          <p>
            <input type="text" title="Alates" maxlength="10" class="date">
            <input type="text" title="Kuni" maxlength="10" class="date">
            <select title="Hoiatustrahvi staatuse valimine">
              <option>Kõik hoiatustrahvid</option>
              <option>Maksmata</option>
              <option>Tasutud</option>
            </select>
            <button type="button"><span><strong>Näita</strong></span></button>
            <a href="#">Tühista</a>
```

```
  </p>
</div>
<div class="tools clear">
  <div class="tools-b">
    <p class="results">
      <span class="shows">Näitan <strong>1-10</strong>,</span>
      <span class="all">Kokku <strong>22</strong></span>
      <label for="t01">Tulemusi lehel:</label>
      <select id="t01">
        <option>10</option>
        <option>50</option>
      </select>
    </p>
  </div>
</div>
<table class="data">
  <thead>
    <tr>
      <th>Trahviteatenumber</th>
      <th>Allkirjastatud</th>
      <th>Tasumise tähtaeg</th>
      <th>Staatus</th>
    </tr>
  </thead>
  <tbody>
    <tr>
    <tr>
      <td><a href="#" onclick="location.href='#teatesisu'; return false;">223012051482</a></td>
      <td>02.02.2014</td>
      <td>02.03.2014</td>
      <td>Tasutud</td>
    </tr>
    <tr>
      <td><a href="#" onclick="location.href='#teatesisu'; return false;">223012051483</a></td>

      <td>03.02.2014</td>
      <td>03.03.2014</td>
      <td>Tasutud</td>
    </tr>
    <tr>
      <td><a href="#" onclick="location.href='#teatesisu'; return false;">223012051484</a></td>

      <td>04.02.2014</td>
      <td>04.03.2014</td>
      <td>Tasutud</td>
    </tr>
    <tr>
      <td><a href="#" onclick="location.href='#teatesisu'; return false;">223012051485</a></td>

      <td>05.02.2014</td>
      <td>05.03.2014</td>
      <td>Tasutud</td>
    </tr>
    <tr>
      <td><a href="#" onclick="location.href='#teatesisu'; return false;">223012051486</a></td>
```

```
                <td>06.02.2014</td>
                <td>06.03.2014</td>
                <td>Tasutud</td>
              </tr>
              <tr>
                <td><a href="#" onclick="location.href='#teatesisu'; return false;">223012051487</a></td>

                <td>07.02.2014</td>
                <td>07.03.2014</td>
                <td>Tasutud</td>
              </tr>
              <tr>
                <td><a href="#" onclick="location.href='#teatesisu'; return false;">223012051488</a></td>

                <td>08.02.2014</td>
                <td>08.03.2014</td>
                <td>Tasutud</td>
              </tr>
              <tr>
                <td><a href="#" onclick="location.href='#teatesisu'; return false;">223012051489</a></td>

                <td>09.02.2014</td>
                <td>09.03.2014</td>
                <td>Tasutud</td>
              </tr>
              <tr>
                <td><a href="#" onclick="location.href='#teatesisu'; return false;">223012051490</a></td>

                <td>10.02.2014</td>
                <td>10.03.2014</td>
                <td><strong><a href="#" onclick="return
showModal('modal_maksa');">MAKSA</a></strong></td>
              </tr>
              <tr>
                <td><a href="#" onclick="location.href='#teatesisu'; return false;">223012051491</a></td>

                <td>11.03.2014</td>
                <td>11.04.2014</td>
                <td><strong><a href="#" onclick="return
showModal('modal_maksa');">MAKSA</a></strong></td>
              </tr>
              </tr>
            </tbody>
          </table>
          <div class="pager clear">
            <ul>
              <li class="prev"><strong><span>Tagasi</span></strong></li>
              <li class="active"><strong><span>1</span></strong></li>
              <li><a href="#"><span>2</span></a></li>
              <li><a href="#"><span>3</span></a></li>
              <li class="next"><a href="#"><span>Edasi</span></a></li>
            </ul>
          </div>
          <table class="form" style="margin-top: 0">
          <tbody>
            <tr class="action">
```

```
            <td>
                <button
                    onclick="return toggleLayer('send_modal');"
                    type="button"
                    class="send_modal">
                    <span><strong>Saada väljavõte</strong></span>
                </button>
            </td>
        </tr>
    </tbody>
</table>
</div>
<!--//Hoiatustrahvide loetelu-->
<!--Trahviteate detailinfo-->
<div id="proto-teatesisu"
class="proto-block"
style="display: none;">
    <div class="clear">
      <p class="back">
          <a href="#">
          Tagasi hoiatustrahvide loetellu</a>
      </p>
    </div>
    <h2 class="type4">Trahviteate nr 223012051490 detailinfo</h2>
    <table class="data equal-columns">
      <thead>
          <tr>
              <th
              id="saaja_andmed"
              class="center"
              colspan="2">Trahviteate saaja andmed</th>

          </tr>
      </thead>
      <tbody>
          <tr>
              <th id="eesnimi">Eesnimi:</th>
              <td headers="saaja_andmed eesnimi">Jana</td>
          </tr>
          <tr>
              <th id="perenimi">Perenimi:</th>
              <td headers="saaja_andmed perenimi">Teder</td>
          </tr>
          <tr>
              <th id="isikukood">Isikukood:</th>
              <td headers="saaja_andmed isikukood">47809030292</td>
          </tr>
          <tr>
              <th id="aadress">Aadress:</th>
              <td headers="saaja_andmed aadress">Sipelga 8, Tallinn, 13423, Eesti</td>
          </tr>
          <tr>
              <th id="e-post">E-Post:</th>
              <td headers="saaja_andmed e-post">jana.teder@eesti.ee</td>
          </tr>
```

```
        </tbody>
                <thead>
            <tr>
                <th
                id="rikkumise_andmed"
                class="center"
                colspan="2">Rikkumise andmed</th>

            </tr>
        </thead>
        <tbody>
            <tr>
                <th id="liik">Rikkumise liik:</th>
                <td headers="rikkumise_andmed liik">Kiiruseületamine</td>
            </tr>
            <tr>
                <th id="rikkumise aeg">Rikkumise aeg:</th>
                <td headers="rikkumise_andmed rikkumise aeg">29.05.2012 14:47</td>
            </tr>
            <tr>
                <th id="tanav_maantee">Tänav/Maantee:</th>
                <td headers="rikkumise_andmed tanav_maantee">Tallinn-Tartu-Luhamaa maantee 94,2
km</td>
            </tr>
            <tr>
                <th id="m_kiirus">Mõõdetud kiirus:</th>
                <td headers="rikkumise_andmed m_kiirus">98</td>
            </tr>
            <tr>
                <th id="k_kiirus">Korrigeeritud kiirus:</th>
                <td headers="rikkumise_andmed k_kiirus">94</td>
            </tr>
            <tr>
                <th id="l_kiirus">Lubatud kiirus:</th>
                <td headers="rikkumise_andmed l_kiirus">90</td>
            </tr>
            <tr>
                <th id="y_kiirus">Ületatud kiirus:</th>
                <td headers="rikkumise_andmed y_kiirus">4</td>
            </tr>
            <tr>
                <th id="trahvisumma">Trahvisumma:
                    <a class="help-toggle" href="#">
                        <img
                        src="/riigiportaal/gfx/ico_help.gif"
                        class="help-toggle"
                        alt="Abiinfo">
                    </a>
                    <div class="help normal-font">
                        <div class="help-header">
                            <div class="help-header-inner clear">
                                <p class="title">Abiinfo</p>
                                <p class="close"><a href="#" title="Sulge">Sulge</a></p>
                            </div>
                        </div>
                        <div class="help-content">
```

```
                        <div class="help-content-inner">
                            <p>Liiklusseaduse järgi määratakse suurima lubatud sõidukiiruse ületamise korral hoiatustrahv, mille suurus eurodes saadakse lubatud sõidukiirust ületanud kilomeetrite arvu korrutamisel arvuga 3. Hoiatustrahvi maksimaalmäär on 190 eurot.</p>
                            <p>1 km/h = 3€</p>
                        </div>
                    </div>
                    <div class="help-footer"></div>
                </div>
            </th>
            <td headers="rikkumise_andmed trahvisumma">12€</td>
        </tr>
        <tr>
            <th id="tahtaeg">Tasumise tähtaeg:</th>
            <td headers="rikkumise_andmed tahtaeg">31.06.2012</td>
        </tr>

    </tbody>

            <thead>
        <tr>
            <th
            id="soiduki_andmed"
            class="center"
            colspan="2">Sõiduki andmed</th>

        </tr>
    </thead>
    <tbody>
        <tr>
            <th id="reg_nr">Registrimärk:</th>
            <td headers="soiduki_andmed reg_nr">123 BAS</td>
        </tr>
        <tr>
            <th id="mark">Mark:</th>
            <td headers="soiduki_andmed mark">Honda</td>
        </tr>
        <tr>
            <th id="mudel">Mudel:</th>
            <td headers="soiduki_andmed mudel">FR-V</td>
        </tr>
        <tr>
            <th id="varv">Aadress:</th>
            <td headers="soiduki_andmed varv">Hall</td>
        </tr>
        <tr>
            <th id="v_aasta">Väljalaskeaasta:</th>
            <td headers="soiduki_andmed v_aasta">2007</td>
        </tr>

    </tbody>
</table>
<div class="clear">
    <p class="back">
        <a href="#" >
        Tagasi hoiatustrahvide loetellu</a>
```

```
          </p>
        </div>
        <table class="form" style="margin-top: 0">
        <tbody>
          <tr class="action">
            <td>
              <button
                onclick="return showModal('modal_maksa');"
                type="button"
                class="pay_modal">
                <span><strong>Maksa</strong></span>
              </button>
              <button
                onclick="return showModal('modal_taotlus');">
                <span><strong>Küsi foto</strong></span>
              </button>
              <button class="alt" type="submit"
                onclick="return showModal('modal_kaebus');">
                <span><strong>Esita kaebus</strong></span>
              </button>
              <button class="alt" type="submit"
                onclick="return toggleLayer('send_modal');"
                type="button"
                class="send_modal">
                <span><strong>Saada väljavõte</strong></span>
              </button>
            </td>
          </tr>
        </tbody>
    </table>
    </div>
</div>

    <!--//Hoiatustrahvi detailinfo-->
    <!--Maksmise detailinfo-->
    <div id="proto-maksmine"
    class="proto-block"
    style="display: none;">
        <div class="clear">
          <p class="back">
            <a href="#">
            Tagasi hoiatustrahvide loetellu</a>
          </p>
        </div>
        <h2 class="type4">Trahv number 114345 maksmine</h2>
        <ul id="layer-banks" class="data3 clear">
            <li class="seb"><a href="#">SEB</a></li>
            <li class="swedbank"><a href="#">Swedbank</a></li>
            <li class="danske"><a href="#">Danske pank</a></li>
            <li class="nordea"><a href="#">Nordea pank</a></li>
            <li class="krediidipank"><a href="#">Krediidipank</a></li>
          </ul>

</div>
</div>
        <!--//Maksmise detailinfo-->
```

```
    <!--//Nupud-->

</div>
    <!--//Nupud-->
    <!--Modaalsed aknad-->
<div class="modalwrap" style="display: none; margin-top: -173px; top: 50%;">
    <div id="modal_kaebus" class="modalpopup" style="display: none;">

    <!-- Kaebuse saatmise pop-up'i aken -->
        <div class="modalpopup-header">
          <div class="modalpopup-header-inner clear">
            <h1>Esita kaebus</h1>
            <p class="close"><a href="#" onclick="return hideModal();">Sulge</a></p>
          </div>
        </div>
        <div class="modalpopup-content">
          <div class="modalpopup-content-inner">
            <table class="form">
              <tbody>
                <tr>
                  <th>
                    <label for="from">Kellelt:</label>
                  </th>
                  <td><input type="text" readonly="readonly" name="from" id="from"
value="jana.teder@eesti.ee" class="wide"><img title="Abiinfo" alt="Abiinfo" class="help-toggle ico"
src="/riigiportaal/gfx/ico_help.gif">
                    <div class="help" style="display: none;">
                      <div class="help-header">
                        <div class="help-header-inner clear">
                          <p class="title">Saatja meiliaadress</p>
                          <p class="close">
                            <a title="Sulge" href="#">Sulge
                            </a>
                          </p>
                        </div>
                      </div>
                      <div class="help-content">
                        <div class="help-content-inner">
                          <p>Vaikimisi näidatakse alati teie esimest
eesnimi.perekonnanimi.nnn@eesti.ee aadressi. Juhul, kui teil on ametlikke e-posti aadresse rohkem kui
üks või teil on näiteks ka ettevõttega seotud aadress, siis saate valida, mis aadressi alt soovite kirja
saata.</p>
                        </div>
                      </div>
                      <div class="help-footer"></div>
                    </div>
                  </td>
                </tr>
                <tr>
                  <th>
                    <label for="to">Kellele:</label>
                  </th>
                  <td class="data">
                    menetluskeskus@politsei.ee
                  </td>
```

```
                    </tr>
                    <tr>
                        <th>
                            <label for="cc">Koopia:</label>
                        </th>
                        <td>
                            <input type="text" id="cc" name="cc" class="text wide">
                        </td>
                    </tr>
                    <tr>
                        <th></th>
                        <td class="options">
                            <input type="checkbox" id="cc_me" checked="checked" name="cc_me" value="Y">
                            <label for="cc_me">Saada mulle koopia</label><img title="Abiinfo" alt="Abiinfo"
class="help-toggle ico" src="/riigiportaal/gfx/ico_help.gif">
                            <div class="help" style="display: none;">
                                <div class="help-header">
                                    <div class="help-header-inner clear">
                                        <p class="title">Saada mulle koopia</p>
                                        <p class="close">
                                            <a title="Sulge" href="#">Sulge
                                            </a>
                                        </p>
                                    </div>
                                </div>
                                <div class="help-content">
                                    <div class="help-content-inner">
                                        <p>Koopia kirjast saadetakse ka teie ametliku e-posti aadressiga seotud
aadressile.</p>
                                    </div>
                                </div>
                                <div class="help-footer"></div>
                            </div>
                        </td>
                    </tr>
                    <tr>
                        <th>
                            <label for="subject">Teema:</label>
                        </th>
                        <td class="data">
                            Kaebus trahviteate 223012051490 kohta
                        </td>
                    </tr>
                    <tr>
                        <th>
                            <label for="body">Sisu:</label>
                        </th>
                        <td>
                            <textarea class="resizable" id="body" name="body" cols="89" rows="12"></textarea>
                        </td>
                    </tr>
                    <tr>
                        <th>
                            <label id="attachment_label" for="attachment">Manus (kuni 10 MB):</label>
                        </th>
                        <td id="attachments">
```

```
                        <input type="file" name="attachment" id="attachment">
                    </td>
                </tr>
            </tbody>
        </table>
      </div>
    </div>
    <div class="modalpopup-footer">
      <div class="modalpopup-footer-inner">
        <div class="modalpopup-footer-inner2">
          <p class="action clear">
            <button type="submit"><span><strong>Saada</strong></span></button>
            <a href="#">Tühista</a>
          </p>
        </div>
      </div>
    </div>
  </div>
</div>
<!-- Kaebuse saatmise pop-up'i aken -->

<!-- Taotluse saatmise pop-up'i aken -->
<div class="modalwrap" style="display: none; margin-top: -136px; top: 50%;">
  <div id="modal_taotlus" class="modalpopup" style="display: none;">
    <div class="modalpopup-header">
      <div class="modalpopup-header-inner clear">
        <h1>Foto küsimine</h1>
        <p class="close"><a href="#" onclick="return hideModal();">Sulge</a></p>
      </div>
    </div>
    <div class="modalpopup-content">
      <div class="modalpopup-content-inner">
        <p>Siit saate esitada taotluse salvestise saamiseks. Vastuseks saadab Politsei- ja
Piirivalveamet Teile foto automaatse järelevalve kaamera tuvastatud rikkumise kohta.</p>
          <table class="form">
          <tr>
            <th>
              <label for="from">Kellelt:</label>
            </th>
            <td><input type="text" readonly="readonly" name="from" id="from"
value="jana.teder@eesti.ee" class="wide"><img title="Abiinfo" alt="Abiinfo" class="help-toggle ico"
src="/riigiportaal/gfx/ico_help.gif">
              <div class="help" style="display: none;">
                <div class="help-header">
                  <div class="help-header-inner clear">
                    <p class="title">Saatja meiliaadress</p>
                    <p class="close">
                      <a title="Sulge" href="#">Sulge
                      </a>
                    </p>
                  </div>
                </div>
                <div class="help-content">
                  <div class="help-content-inner">
                    <p>Vaikimisi näidatakse alati teie esimest
eesnimi.perekonnanimi.nnn@eesti.ee aadressi. Juhul, kui teil on ametlikke e-posti aadresse rohkem kui
```

üks või teil on näiteks ka ettevõttega seotud aadress, siis saate valida, mis aadressi alt soovite kirja saata.

</td>
</tr>

<tr>
<th>
<label for="to">Kellele:</label>
</th>
<td class="data">
menetluskeskus@politsei.ee
</td>
</tr>

<tr>
<th></th>
<td class="options">
<input type="checkbox" id="cc_me" checked="checked" name="cc_me" value="Y">
<label for="cc_me">Saada mulle koopia</label><img title="Abiinfo" alt="Abiinfo" class="help-toggle ico" src="/riigiportaal/gfx/ico_help.gif">

Saada mulle koopia

Sulge

Koopia kirjast saadetakse ka teie ametliku e-posti aadressiga seotud aadressile.

</td>
</tr>

<tr>
<th>
<label for="subject">Teema:</label>
</th>
<td class="data">
Trahviteate 223012051490 salvestise taotlus
</td>
</tr>
<tr>
<th>
<label for="body">Sisu:</label>

```
                    </th>
                    <td>
                        <textarea class="resizable" id="body" name="body" cols="89" rows="12"></textarea>
                    </td>
                </tr>
                    <tbody>
                    </table>
          </div>
        </div>
        <div class="modalpopup-footer">
          <div class="modalpopup-footer-inner">
            <div class="modalpopup-footer-inner2">
              <p class="action clear">
                <button type="submit"><span><strong>Saada</strong></span></button>
                <a href="#">Tühista</a>
              </p>
            </div>
          </div>
        </div>
    </div>
</div>
<!-- Taotluse saatmise pop-up'i aken -->

<!-- maksmise pop-up'i aken -->
<div class="modalwrap" style="display: none; margin-top: -136px; top: 50%;">
    <div id="modal_maksa" class="modalpopup" style="display: none;">
        <div class="modalpopup-header">
          <div class="modalpopup-header-inner clear">
            <h1>Trahvi maksmine</h1>
            <p class="close"><a href="#" onclick="return hideModal();">Sulge</a></p>
          </div>
        </div>
        <div class="modalpopup-content">
          <div class="modalpopup-content-inner">
            <p>Kui olete kindel, et soovite asuda maksma <strong>trahviteadet 223012051490</strong>,
siis palun valige teile sobiv makseviis.</p>
            <ul id="layer-banks" class="data3 clear">
            <li class="seb"><a href="#" onclick="return showModal('modal_pank1');">SEB</a></li>
            <li class="swedbank"><a href="#" onclick="return
showModal('modal_pank1');">Swedbank</a></li>
            <li class="danske"><a href="#" onclick="return showModal('modal_pank1');">Danske
pank</a></li>
            <li class="nordea"><a href="#" onclick="return showModal('modal_pank1');">Nordea
pank</a></li>
            <li class="krediidipank"><a href="#" onclick="return
showModal('modal_pank1');">Krediidipank</a></li>
          </ul>
          </div>
        </div>
        <div class="modalpopup-footer">
          <div class="modalpopup-footer-inner">
            <div class="modalpopup-footer-inner2">
              <p class="action clear">
                <a href="#" onclick="return hideModal();">Katkesta</a>
              </p>
            </div>
```

```
          </div>
        </div>
    </div>
</div>
<!-- maksmise pop-up'i aken -->

<!-- panga sisselogimise pop-up'i aken -->

<div class="modalwrap" style="display: none; margin-top: -136px; top: 50%;">
    <div id="modal_pank1" class="modalpopup" style="display: none;">
        <div class="modalpopup-header">
        </div>
        <div class="modalpopup-content">
          <div class="modalpopup-content-inner">
            <div class="img">
              <p class="img">
                <a href="#" onclick="return showModal('modal_pank2');"><img
src="/riigiportaal/gfx/pank1.JPG">
              </p>

            </div>
          </div>
        </div>
    </div>
</div>
<!-- panga sisselogimise pop-up'i aken -->

<!-- panga makse kinnitamise pop-up'i aken -->

<div class="modalwrap" style="display: none; margin-top: -136px; top: 50%;">
    <div id="modal_pank2" class="modalpopup" style="display: none;">
        <div class="modalpopup-header"></div>
        <div class="modalpopup-content">
          <div class="modalpopup-content-inner">
            <div class="img">
              <p class="img">
                <a href="#" onclick="return showModal('modal_pangast');"><img
src="/riigiportaal/gfx/pank2.JPG">
              </p>
            </div>
          </div>
        </div>
    </div>
</div>
<!-- panga makse kinnitamise pop-up'i aken -->

<!-- pangast tagasi portaali pop-up'i aken -->
<div class="modalwrap dialog" style="display: none; margin-top: -136px; top: 50%;">
    <div id="modal_pangast" class="modaldialog" style="display: none;">
            <h1>Trahv tasutud</h1>
            <p>Makse õnnestus. Trahviteade 223012051490 on makstud.</p>
            <p class="action">
          <input class="button alt" type="button" value="Sulge" onclick="hideModal();">
        </p>
          </div>
        </div>
```

```
<div id="overlay" style="display: none;"></div>


<!-- pangast tagasi portaali pop-up'i aken -->


        <script type="text/javascript">
        function addAttachment(ths) {
            var attachment = $(ths).siblings().first();
            var name = attachment.val();
            if (name.length == 0) {
                return;
            }
            attachment.addClass('hidden');
            var i = name.lastIndexOf('\\');
            if (i >= 0) {
                name = name.substring(i + 1);
            }

            var cls = null;
            try {
                cls = mimeToClass(attachment.get(0).files[0].type);
            } catch (e) {}
            if (cls == null) {
                i = name.lastIndexOf('.');
                if (i >= 0) {
                    cls = extensionToClass(name.substring(i + 1));
                }
            }

            if (cls != null) {
                cls = ' class="' + cls + '"';
            } else {
                cls = '';
            }

            var li = $('<li class="doc-type clear" id="' + attachment.attr('id') + '"></li>').append(attachment)
                .append('<a href="#"' + cls + '>' + name + '</a><a href="#">'
                    + '<img src="/riigiportaal/gfx/ico_delete2.gif" alt="Eemalda" title="Eemalda" onclick="return
removeAttachment(this);">'
                    + '</a>');
            var ul = $('#attachments ul');
            if (ul.length == 0) {
                ul = $('<ul class="data" />');
                $('#attachments').append(ul);
            }
            ul.append(li);
            var id = null;
            while (id == null) {
                rnd = Math.floor(Math.random() * 100);
                if ($('#attachment_' + rnd).length == 0) {
                    id = 'attachment_' + rnd;
                }
            }
            $('#attachments').prepend('<input type="file" id="' + id + '" name="' + id + '">');
            $('#attachment_label').attr('for', id);
```

```
        }

        function removeAttachment(ths) {
            $(ths).parentsUntil('ul').remove();
            return false;
        }
        function checkMailForm
            var success = true;
            var crypt = $('#crypt').attr('checked');
            var cryptAvailable = true;
            $('#to, #cc, #subject, #crypt').parent().find('span.error').remove();
            var toParent = $('#to').parentsUntil('tr').parent().removeClass('error');
            var ccParent = $('#cc').parentsUntil('tr').parent().removeClass('error');
            var subjectParent = $('#subject').parentsUntil('tr').parent().removeClass('error');
            var cryptParent = $('#crypt').parentsUntil('tr').parent().removeClass('error');
            var toEmails = new Array();
            var ccEmails = new Array();
            if ($('#to').val().length > 0) {
                toEmails = $('#to').val().split(',');
            }
            if ($('#cc').val().length > 0) {
                ccEmails = $('#cc').val().split(',');
            }
            var toError = new Array();
            var ccError = new Array();

            for (i = 0; i < toEmails.length; i++) {
                toEmails[i] = $.trim(toEmails[i]);
                if (!isValidEmail(toEmails[i])) {
                    toError.push(toEmails[i]);
                } else {
                    if (crypt && cryptAvailable) {
                        cryptAvailable = isCryptAvailable(toEmails[i]);
                    }
                }
            }
            for (i = 0; i < ccEmails.length; i++) {
                ccEmails[i] = $.trim(ccEmails[i]);
                if (!isValidEmail(ccEmails[i])) {
                    ccError.push(ccEmails[i]);
                } else {
                    if (crypt && cryptAvailable) {
                        cryptAvailable = isCryptAvailable(ccEmails[i]);
                    }
                }
            }

            if (crypt && !cryptAvailable) {
                cryptParent.addClass('error');
                $('#crypt').parent().append('<span class="error">Krüpteeritud kirjade saatmine ainult eesti.ee
ja riik.ee aadressidele. </span>');
                success = false;
            }

            if ($('#subject').val().length == 0) {
                subjectParent.addClass('error');
```

```
                $('#subject').after('<span class="error">Teema kohustuslik. </span>');
                $('#subject').focus();
                success = false;
            }
            if (toEmails.length > 100) {
                $('#to').parent().append('<span class="error">Maksimaalselt 100 aadressi (' +
toEmails.length + '). </span>');
                toParent.addClass('error');
                $('#to').focus();
                success = false;
            }
            if (ccEmails.length > 100) {
                $('#cc').parent().append('<span class="error">Maksimaalselt 100 aadressi (' +
ccEmails.length + '). </span>');
                ccParent.addClass('error');
                $('#c').focus();
                success = false;
            }
            if (ccError.length > 0){
                $('#cc').parent().append('<span class="error">Aadressid "' + ccError.join('", "') + '" ei ole
korrektsed.</span>');
                ccParent.addClass('error');
                $('#cc').focus();
                success = false;
            }
            if (toError.length > 0){
                $('#to').parent().append('<span class="error">Aadressid "' + toError.join('", "') + '" ei ole
korrektsed.</span>');
                toParent.addClass('error');
                $('#to').focus();
                success = false;
            }
            if (toEmails.length == 0) {
                toParent.addClass('error');
                $('#to').parent().append('<span class="error">Saaja e-post kohustuslik. </span>');
                $('#to').focus();
                success = false;
            }
            if (!success) {
                $('#content form.preventDouble').unregisterEventFire('submit');
            }
            return success;
        }
        $(document).ready(function(e) {
            $('#content form.preventDouble').submit(function(e) {
                if (!checkMailForm()) {
                    e.preventDefault();
                }
            });
        });
        </script><script type="text/javascript">setNavTab(1);</script>

    </div>

                            <!--//content-->
    <div id="save_modal" class="layer">
```

```
    <div class="layer-header">
      <div class="layer-header-inner clear">
        <p class="title">Salvesta failina</p>
        <p class="close">
          <a href="#" title="Sulge">Sulge</a>
        </p>
      </div>
    </div>
    <div class="layer-content">
      <div class="layer-content-inner">
        <table class="form">
          <tbody>
            <tr>
              <th>Faili formaat:</th>
              <td>
                <input
                  id="i01-01"
                  type="radio"
                  value="pdf"
                  name="save_format_retseptide_loetelu"
                  checked="checked">
                <label for="i01-01">PDF</label>
                <br>
                <input
                  id="i01-02"
                  type="radio"
                  value="xml"
                  name="save_format_retseptide_loetelu">
                <label for="i01-02">XML</label>
              </td>
            </tr>
            <tr>
              <th>Turvalisus:</th>
              <td>
                <input id="i01-03" type="checkbox">
                <label for="i01-03">Allkirjastatuna</label>
                <br>
                <input id="i01-04" type="checkbox">
                <label for="i01-04">Krüpteerituna</label>
              </td>
            </tr>
          </tbody>
        </table>
      </div>
    </div>
    <div class="layer-footer">
      <div class="layer-footer-inner">
        <p class="action clear">
          <button type="button">
            <span><strong>Salvesta</strong></span>
          </button>
          <a href="#" onclick="closeAllLayer(); return false;">Katkesta</a>
        </p>
      </div>
    </div>
  </div>
```

```
<div id="send_modal" class="layer">
    <div class="layer-header clear">
      <div class="layer-header-inner clear">
         <p class="title">Saada e-mailiga</p>
         <p class="close">
            <a href="#" title="Sulge">Sulge</a>
         </p>
      </div>
    </div>
    <div class="layer-content">
      <div class="layer-content-inner">
         <table class="form">
            <tbody>
               <tr>
                  <th>Faili formaat:</th>
                  <td>
                     <input
                        id="i02-01"
                        type="radio"
                        value="pdf"
                        checked="checked">
                     <label for="i02-01">PDF</label>
                     <br>
                     <input
                        id="i02-02"
                        type="radio"
                        value="xml">
                     <label for="i02-02">XML</label>
                  </td>
               </tr>
               <tr>
                  <th>Turvalisus:</th>
                  <td>
                     <input id="i02-03" type="checkbox">
                     <label for="i02-03">Allkirjastatuna</label>
                     <br>
                     <input id="i02-04" type="checkbox">
                     <label for="i02-04">Krüpteerituna</label>
                  </td>
               </tr>
               <tr>
                  <th>
                     <span class="req">* </span>
                     <label for="send_email_retseptide_loetelu">E-post:</label>
                  </th>
                  <td>
                     <input
                        type="text"
                        value="eesnimi.perenimi@eesti.ee"
                        id="send_email_retseptide_loetelu"
                        class="text">
                  </td>
               </tr>
            </tbody>
         </table>
      </div>
```

```
        </div>
        <div class="layer-footer">
          <div class="layer-footer-inner">
            <p class="action clear">
              <button type="button">
                <span><strong>Saada</strong></span>
              </button>
              <a href="#" onclick="closeAllLayer(); return false;">Katkesta</a>
            </p>
          </div>
        </div>
    </div>
    <!--//Modaalsed aknad-->
</div>
<!--//Teenuse raam-->


<!--
```