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STATE INTEGRATED INFORMATIZATION PROGRAM IN POLAND: SINGLE-ENTRY-POINT PORTAL AND TRANS-BOUNDARY CONCEPT

Master's thesis

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RIIGI INTEGREERITUD INFORMATISEERIMISE PROGRAMM POOLAS: ÜHINE PORTAAL JA PIIRIÜLENE LÄHENEMINE

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Author’s declaration of originality

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

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Abstract

In the Master's thesis is presented the State Integrated Informatization Program in Poland. It is considered in aspects of the single-entry-point, which is currently being developed and trans-boundary concept.

In the first chapter are observed the thesis motivation, raised research questions, and analyzed the research methodology. It gives the general view on the paper, being formally an introduction to the main parts of the thesis.

The second chapter of the Master's thesis is devoted to the theoretical background. The literature and sources are presented and analyzed along with the data regarding e-Government indicators for Poland. Also the chapter includes description of applicable theoretical approaches (New Public Management (NPM) and post-NPM).

In the third chapter are analyzed the e-Governance initiatives in Poland in terms of the State Integrated Informatization Program. First of all, here are considered current Polish e-Governance programs and services, e-PUAP (Electronic Platform of Public Administration Services), and national ID-card. The second part of the chapter is devoted to the main provisions of the Program and its implications, taking into account different theoretical frameworks.

The fourth chapter touches upon the issue of the future single-entry-point portal in Poland, world analogs (Canada, the UK, Estonia, Australia) are also analyzed. The current Polish governmental e-Services portal is described here as well.

The international aspect in terms of the EU Digital Single Market in Poland along with examples from few other EU Member States is considered in the fifth chapter.

In the sixth chapter the research outcomes of the Master's thesis are summarized.

This thesis is written in English and is 64 pages long, including 6 chapters, 26 figures and 0 tables.

Annotatsioon

Riigi integreeritud informatiseerimise programm Poolas: ühine portaal ja piiriülene lähenemine

Magistritöös on esitatud Poolas integreeritud informatiseerimise programm. Seda peetakse ühekordse-sisendpunkti aspektiks, mida hetkel arendatakse kui piirivabat kontsepti. Esimeses peatükkis jälgitakse teesi motivatsioone, püstitakse uurimustöö küsimusi ja analüüsitakse uurimustöö metoodikat. Et anda ülevaade ja formaalselt tutvustada teesi põhiosi.

Teine peatükk on pühendatud teoreetilisele taustale. Kirjandus ja allikas on esutatud ja analüüsitud koos Poola e-riigi andmepunktidega. Selles peatükis on ka kirjeldused teoreerilistest lähenemistest (New Public Management (NPM) ja post-NPM).

Kolmandas peatükkis analüüsitakse Poola e-Riigi integreeritud informatiseerimise programmide initsiatiive. Esitakse käsitletakse Poola praegust e-riigi programmi ja teemuseid, e-PUAP (Electronic Platform of Public Administration Services), ja ID-kaarti. Teine pool peatükkist on pühendatud programmi peamiste sätetele ja implementatsioonile. Võttes arvesse erinevaid teoreetilisi raamistikke.

Neljas peatükk puudutab praeguse poola e-teenuseid ja ühese-sisendpunkti portaali tulevikku ning probleeme. Analüüsitakes ka muu aailma analooge (Kanada, Ühendkuningriigid, Eesti ja Austraalia).

Viiendas peatükkis uurime Euroopa Liidu digitaalturu rahvusvahelisi aspecte poolas koos näidetega mõnest muust Euroopa Liiduliikmesriigist.

Kuuendas peatükkis võetakse kokku magistritöö tees.

Lõputöö on kirjutatud inglise keeles ning sisaldab teksti 64 leheküljel, 6 peatükki, 26 joonist, 0 tabelit.

List of abbreviations and terms

API	Application Programming Interface
BIP	Biuletyn Informacji Publicznej (*Polish*) – Public Information Bulletin
B2A	Business-to-Administration marketing
CIT	Corporate Income Tax
CMS	Content Management System
CNS	Digital Certificate system in Italy
CyPRG	Cyber Power Research Group
EESSI	Electronic Exchange of Social Security Information
eID	Electronic identification
eIDAS	eIdentification and Trust services
ePUAP	Elektroniczna Platforma Usług Administracji Publicznej (*Polish*) – Electronic Platform of Public Administration Services
EU	The European Union
EU15	Number of member countries in the European Union prior to the accession of ten candidate countries on 1 May 2004.
EUGO	Points of Single Contact network
EU DESI	The Digital Economy and Society Index
EZD RP	Elektroniczne Zarządzanie Dokumentacją w Administracji Publicznej Rzeczypospolitej Polskiej (*Polish*) – Electronic Document Management in the Public Administration of the Republic of Poland
FAQ	Frequently asked questions
ICT	Information and Communication Technology
ID	Identification
IMI	Internal Market Information System
IS	Information system
IT	Information technology
NGO	Non-governmental organization
NIP	Numer Identyfikacji Podatkowej (*Polish*) – Tax Identification Number
NPM	New Public Management
PDF	Portable Document Format

PESEL	Powszechny Elektroniczny System Ewidencji Ludności (*Polish*) – Universal Electronic System for Registration of the Population
PIN	Personal identification number
PIT	Personal Income Tax
PKI	Public Key Infrastructure
QA	Quality assurance
SMS	Short Message Service
SOLVIT	Network on Effective Problem Solving in the Internal Market
SPID	Public System of Digital Identity in Italy
SRP	System Rejestrów Państwowych (*Polish*) – National Registries System
SSDIP	Scentralizowany System Dostępu do Informacji Publicznej *(Polish)* – Centralized System of Access to Public Information
STAP	Public Administration Network project
STORK	Secure Identity Across Borders Linked project
UK	The United Kingdom of Great Britain and Northern Ireland
UN	The United Nations
USA	The United States of America
USB	Universal Serial Bus

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1 Introduction

1.1 Thesis motivation

Central and Eastern European countries are moving forward in the e-Governance domain now. Looking at 2016 United Nations e-Government Development Index, Poland stands out among them, ranked 36th in the world, while other members of the Visegrad Group (Czech Republic, Slovakia, Hungary) are ranked 50th, 67th, and 46th respectively **[1, pp. 155, 157]**. After considerable political changes in the end of 2015, the former Poland's Ministry of Administration and Digitization was transformed. On 8 December 2015 there was created a separate ministry, which is fully responsible for the state informatization programs implementation, namely the Ministry of Digital Affairs **[2]**.

The newly created Ministry has several strategic action priorities in computerization of public services, e.g. “From Paper to Digital Poland”, eID, Portal of the Republic of Poland, “SRP – National Registries System”, “EZD RP – Electronic Document Management in Administration”, etc. Generally Poland follows the path and experience of the most advanced countries in the e-Governance domain, for instance, the UK, Australia, Estonia, and Canada.

Poland's State Integrated Informatization Program provides the description of projects, which are planned within the framework of the Action Plan of the Minister of Digitization. One of these projects is the upcoming Portal of the Republic of Poland mentioned above. The Portal will basically combine two present portals, one of which is Obywatel.gov.pl (state e-Services) and the second one is Biznes.gov.pl (EU Points of Single Contact).

The main goal of the Master's thesis is to research implementation of State Integrated Informatization Program in terms of creating a single-entry-point portal along with the

aspect of EU Digital Single Market (Points of Single Contact). It is important to compare the future Poland's portal with the existing ones in the UK, Australia, Estonia, Canada, etc. In scope of the Master's thesis will be analyzed the provisions of the Program, performance of the e-Governance initiatives, and built AS-IS and TO-BE models based on the current status as well as design assumptions.

The selection of topic of the Master's thesis was caused by the scientific interests and performed internship at the Department of e-State, Ministry of Digital Affairs of the Republic of Poland in July-August 2016. In addition, there were held a few consultations with the officials from the Department of Cybersecurity, Department of State Registries, Department of IT Infrastructure at the same Ministry along with the consultation at the Department of Electronic Economy, Ministry of Economic Development of the Republic of Poland that contributed to the scientific pursuits as well. The Polish public administration could benefit from the thesis research due to the recent engagement in one of the expert groups. In general it will extend understanding of the e-Governance development in Poland.

1.2 Research questions

The author proposes the following main research objective: *How the single-entry-point portal in Poland will be realized including the trans-boundary concept?*

Coming from the proposed main objective of the Master's thesis, there are few research questions, which are posed to answer as follow:

1. To research implementation of Poland's State Integrated Informatization Program in terms of a single-entry-point portal and trans-boundary concept:

    1.1 To analyze the provisions of the Program and performance of included e-Governance initiatives;

    1.2 To compare single-entry-point portals of the most advanced countries in e-Governance domain with the future one in Poland;

1.3 To research the EU Digital Single Market in scope of Points of Single Contact in Poland and other EU member states comprising the legal aspect.

The abovementioned research questions are posed in order to achieve the main goal of the Master's thesis by describing the transformation processes that are taking place in Poland's e-Governance, especially creating a single-entry-point portal. In particular the business architecture models will be created that are aimed to show, in which way the existing state of art in the Polish digitization is going to be rebuilt.

1.3 Research methodology

Taking into account the nature of the researched topic, the author uses the comparative analysis as a research methodology. Mainly single-entry-point portals in the UK, Australia, Estonia, etc. are compared with the future one in Poland, as well as parallel the operating Points of Single Contact in different EU member states including the legal aspects yet.

According to Charles Perrow (University of Wisconsin) there are a few implications regarding the comparative analysis **[3, pp. 203-204]**. First of all, there is no a particular relationship found in one organization to be found in another unless these both organizations are similar in relation to their technology. Secondly, types of organizations – with reference to their function in society – will vary as much within each type as between types. The third implication is that there is little point in testing the effect of a parameter variable, such as size, age, geographical location, unless there is control for technology. Finally, to call for innovative or organic organizations is to call for a type of structure that can be realized only with certain type of technology, unless there is a willingness to pay a high cost in terms of result. In general, a comparative organizational analysis provides a perspective that attempts to conceptualize the organization as a whole, rather than to deal only with specific processes or subparts **[3, p. 195]**. In this regard the author considers the single-entry-point portals in a comparative analysis as integrated organizations.

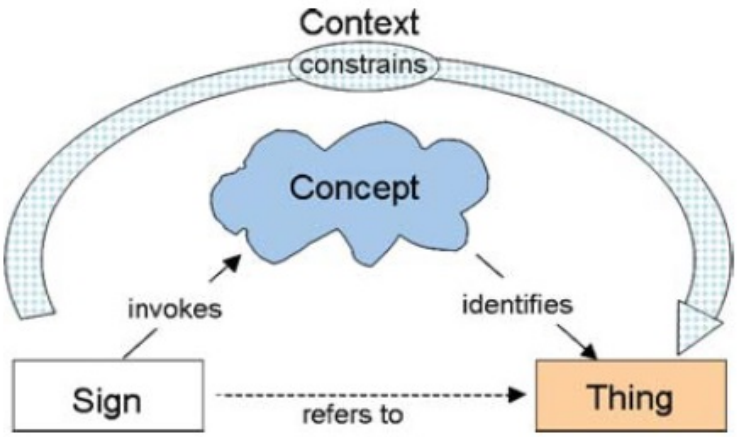


Figure 1: Semiotic Triangle. (Nicola Guarino, et al., 2003)

The term ontology is very important in the context of the comparative methodology. It has several meanings depending on the usage. In this research the computational ontologies are considered. They are defined as a means to formally model the structure of a system, i.e., the relevant entities and relations that emerge from its observation. The ontology consists of a generalization/specialization hierarchy of concepts that combine a taxonomy **[4, p. 2]**.

The above figure shows a semiotic triangle, which depicts the communication between the human and the machine referring to terminology set up in the ontology. The person who sends a message may use a sign like the string “Human” to stand for a concept the sender meant. The sender invokes a concept in the mind of a sign receiver. By turn the receiver uses the concept in order to identify the thing while a sign refers to a thing at the same time. The overall interpretation of the sign as a concept as well as its use in a given situation depends heavily on the receiver as well as the communication context **[4, p. 15]**. In this particular figure represented above the context is illustrated by an arrow from a sign to a thing that constrains possible processes of reference. In terms of comparative analysis the semiotic triangle shows how important is to recognize the communication flows correctly, otherwise an inaccurate perception of signs invokes the wrong concepts and represents different things than the sender had in mind.

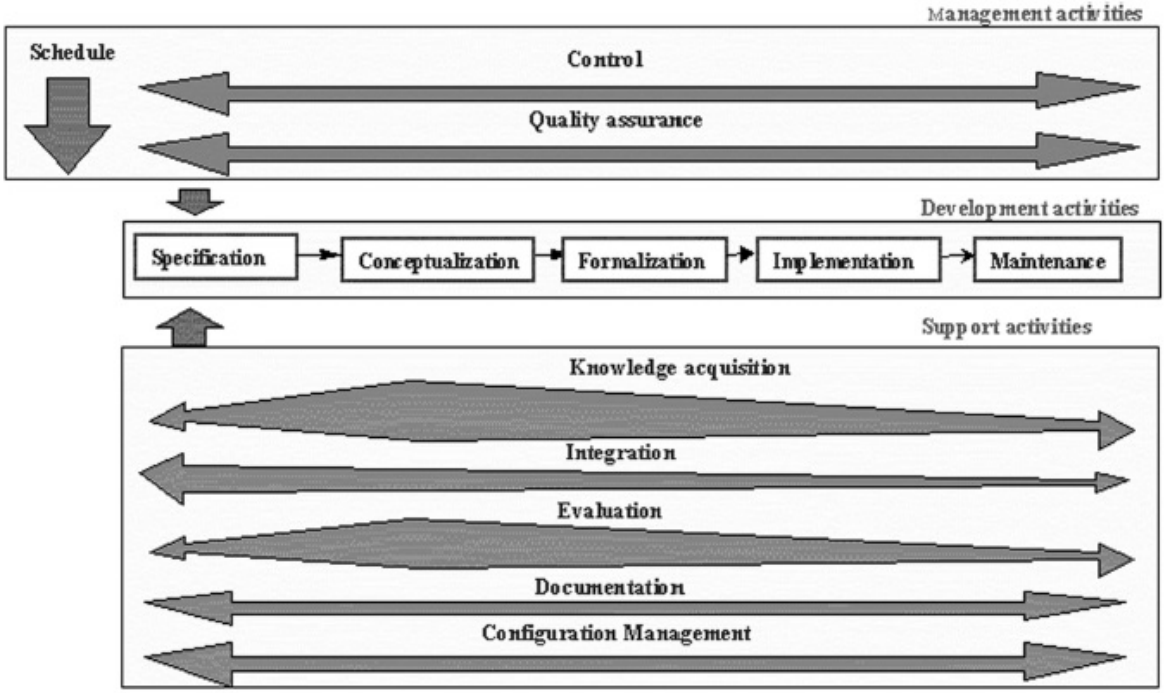


Figure 2: METHONTOLOGY. (Mariano Fernández-López, Asunción Gómez-Pérez, 2002)

Ontologies can be constructed at the knowledge level. The METHONTOLOGY framework that enables it is depicted in the above figure. This methodology includes the identification of the ontology development process, a life cycle based on developing prototypes, and particular techniques to execute each activity. The ontology development process refers to which activities are performed when building ontologies **[5, p. 137]**. Basically the framework, as it is seen on the figure, is divided into three parts: management activities, development activities, and support activities.

Management activities involve scheduling, control and quality assurance (QA). Scheduling includes the timetable, list of tasks which have to be performed, order of execution, resources needed. Control ensures that scheduled tasks are completed in a way that they were intended to be executed. Lastly, quality assurance (QA) guarantees that the quality of every product output (ontology, software and documentation) is satisfactory **[5, p. 138]**.

Development activities include specification, conceptualization, formalization, implementation and maintenance. Specification formulates the cause of ontology building, its intended uses and defines the end-users. Conceptualization is aimed at structuring the domain knowledge as meaningful models at the knowledge level.

Formalization transforms the conceptual model into a formal model. Implementation builds computable models in a language of computation. In the end, maintenance updates and corrects the ontology.

The last block, support activities, involve the whole series of activities which are executed at the same time as development-oriented activities, being indispensable in the building of ontology. At this level the process consists of the knowledge acquisition, integration, evaluation, documentation and configuration management. Knowledge acquisition acquires knowledge of a certain domain. Evaluation means a technical assessment of the ontologies. Integration involves reusing other ontologies when combining a new ontology. Documentation details each of the completed phases and created products. Configuration management records all the versions of documentation, software and ontology code in order to control the changes **[5, p. 138]**.

It should be noted that the METHONTOLOGY framework can be used in the building of the single-entry-point portals in terms of ontology development process as it includes the whole life cycle (management, development, support). It takes into consideration as an input different reusable knowledge resources that are available in governmental agencies, who are responsible of their information systems (IS) as well as resources managed by developers of those information systems **[6, p. 5]**.

The part of thesis research regarding e-Services development in Poland is based on the Capgemini approach (a four-stage model for assessing government e-Services) and WAES (Website Attribute Evaluation System) method of evaluating Internet services in public administration **[7, p. 230]**.

Capgemini consulting group applied a four-grade scale (information, one-way interaction, two-way interaction and transaction) combined with a two-value scale (present-absent) of evaluation of Internet services in its previous researches **[7, p. 233]**. The following method which was indicated and defined by the European Commission, can be used for structuring Polish public e-Services in the entire portfolio:

1. Customers addressed by the service:
- Services addressed to corporate entities;
- Services addressed to citizens.
2. Nature of services:

- Income-generating services – refers to the financial flows from citizens and businesses to central and local budgets (taxes, social contributions);
- Registration services – refers to the registration of persons, vehicles, businesses as well as presentation of statistical data;
- Returns and social services – refers to tax returns for citizens and corporate entities, job services, social services;
- Permits and licenses – refers to the delivery of personal documents (IDs), permits and confirmations **[7, p. 234]**.

Website Attribute Evaluation System (WAES) assessment method is based on experience obtained during the observation of public administration websites worldwide. The research has been done by the Cyber Power Research Group (CyPRG), which is composed of scholars from George Mason University and the University of Arizona. Since 1997 the group has surveyed all national level government web portals to assess how widespread the web has penetrated government organizations, and how the web technologies have been implemented in each organization and country **[8, p. 7]**. The evaluation criteria used in the WAES method are divided into two categories: transparency and interactivity. 'Transparency' category ('data density') includes 23 evaluation attributes, which specify efforts undertaken by a government organization in order to share the information through its website. 'Interactivity' category ('clickability', 'click value', 'link density') includes 22 attributes, which measure the ease with which users can obtain the information published on the web page. Attributes are assigned to the characteristics of binary type. A value of 1 means that a feature exists, 0 – it does not exist **[9, p. 111]**. Transparency is minimal information needed for guiding a large social system. It composes an outsider's basic map of the government organization as depicted in the information on the website. In terms of the Website Attribute Evaluation System 'transparency' category includes 5 elements, such as ownership, contact information, organizational or operational information, citizen consequences, and freshness **[10]**. Interactivity is a web-based standard of the second component of openness. This component measures the extent to which each of the first four attributes of transparency are likely to click for the site visitor. It means that the greater 'click value' the more convenient it is to obtain the data or interact with the government organization, the interaction goes in both ways either. This category includes 4 categories: ownership,

reachability, organizational or operational information, and responses **[10]**. Taking into account the criteria of Capgemini and WAES methods, they are essential for evaluation of government single-entry-point portals and EU Points of Single Contact in Poland and certain countries, which will be mentioned below.

1.4 Thesis structure

The Master's thesis consists of 6 chapters, which are structured as follow:

1st Chapter – Introduction (thesis motivation, research questions, research methodology);

2nd Chapter – Theoretical Background (literature and sources review, theoretical approaches);

3rd Chapter – State Integrated Informatization Program: e-Governance Initiatives in Poland (analysis of current e-Governance programs and services, main provisions of the Program and its implications);

4th Chapter – Portal of the Republic of Poland: Analogies and Features (description and information architecture of the future Portal, comparison with the world analogs, description of the portal obywatel.gov.pl);

5th Chapter – Polish Developments of the EU Digital Single Market: International Aspect (description of the portal biznes.gov.pl, comparison with other EU Points of Single Contact portals);

6th Chapter – Summary (main outcomes of the Master's thesis).

2 Theoretical Background

2.1 Literature and sources review

There is not much specialized academic literature on e-Governance in Poland. At first in this chapter the background and content of the government documents that are basis for the review are explained. The main source for our Master's thesis is aforementioned Poland's State Integrated Informatization Program **[11]** (*Program Zintegrowanej Informatyzacji Państwa*, its current version – October 2016). Apart from the National Broadband Plan, this program is the executive document for development strategy, i.e. strategy Efficient State 2020 (*Sprawne Państwo 2020*). The document plays an important role in the planning of activities co-financed by the European Union from the current budget for the years 2014-2020. It is also closely linked with the prepared strategic document "Policy Paper on the Digital Development of Poland by 2020" and Operational Program Digital Poland (*Program Operacyjny Polska Cyfrowa*).

The authors of the document state that the previous experience of informatization was characterized by separate solutions, which corresponded to the needs of the various sectors of public administration, however they did not provide a sufficient interoperability between systems that by turn could have a negative impact on the implementation of e-Services in Poland **[11, p. 4]**. It was a profound reason for introducing a new instrument of planning and coordination of public administration digitization process. Followed by the resolution of the Council of Ministers this instrument is Poland's State Integrated Informatization Program along with the Action Plan of the Minister of Digitization.

The Program includes the Minister of Digitization Action Plan regarding the Portal of the Republic of Poland Polska.gov.pl (single-entry-point portal), eID, State Registries System, electronic document management in the public administration, services and

data integration platform, common state digital infrastructure, etc. The Minister of Digitization has several priorities, such as financial rationalization and centralization of IT systems created by the government on the basis that a citizen is the main beneficiary of all governmental activities.

The main part of the Program is a description of the accepted propositions for the integrated informatization of the state, while Annex 1 provides a detailed plan of concrete actions of the Minister of Digitization for implementation during the period of the Program. A detailed description of the various activities which will be implemented within the framework of certain projects is comprised in the annexes to Annex 1. Here will be also analyzed several governmental documents (reports, resolutions) on the single-entry-point portal which were found during the internship at the Polish Ministry of Digital Affairs in July-August 2016.

The performance of the future e-Governance initiatives is described in the Strategic Action Priorities of the Minister of Digital Affairs in Computerization of Public Services **[12]**. There is indicated that according to the latest EU DESI (Digital Economy and Society Index 2016), in the field of digitization of economy, Poland ranked 22nd among 28 EU member states. It all shows that the state needs the profound transformation of its economy in order to make it digital along with the government, infrastructure, jobs, confidence, and security. According to the Digital Agenda for Europe, Poland is obliged to provide access to broadband Internet to everyone by 2020 **[12, p. 5]**.

The Strategic Action Priorities document outlines the up-to-date domestic context in the sphere of digital service state, strategic principles and directions, cooperation between the government and local governments, etc. The ultimate aim is to grant each Polish citizen, organization and entrepreneur to settle any official matter in an electronic way while contacting any level of public administration, either central or local. The Polish government takes into account five fundamental principles to achieve these targets: the state should serve the citizen; access to the public network and services must be safe for state data and all types of transactions conducted in the network; accelerating the development of modern telecommunications network; permanent and easy access to data gathered by public services; stable improvement of digital competences to effectively benefit from digitization and compete on the global market **[12, p. 8]**.

The issue of EU Digital Single Market is quite huge, but in terms of theoretical background the Digital Single Market Strategy for Europe **[13]** can be used that gives the general overview about cross-border e-commerce in order to compare Poland's Point of Single Contact Biznes.gov.pl **[14]** with the specific ones among other EU member states. The Strategy has three basic pillars, such as better access for customers and businesses to online goods and services across Europe; creating the right conditions for digital networks and services to flourish; maximizing the growth potential of the European Digital Economy **[13, p. 3-4]**.

As the European Union is based on the free movement of goods, persons, services and capital, then the Digital Single Market will provide entrepreneurs with new opportunities to cross-border online activity and reducing VAT related expenses. The Strategy also defines an appropriate e-commerce framework and prevents unfair discrimination against customers and businesses on their way to access content or buy goods and services online within the European Union regardless their citizenship, residence or geographical location. Simplified and harmonized rules, which should be adopted by the EU for online and digital trans-boundary purchases in terms of the Strategy, will encourage more businesses to sell online across borders and thus increase customer confidence in cross-border e-commerce **[13, p. 4]**.

'Once-Only' principle is the example of increased efficiency of the Digital Single Market, which indicates that only in 48% of cases public administrations reuse information about the citizen or companies listed already in their possession without asking again. As a result, an annual net saving at the EU level is around 5 billion euro per year by 2017 **[13, p. 16]**. According to the Strategy, Contact Points between public authorities and citizens/businesses are currently evaluated as fragmented and incomplete. The authors of the Strategy assume that “the needs of businesses and citizens in their cross-border activities could be better met by building on the Digital Services Infrastructures of the Connecting Europe Facility and extending and integrating existing European portals, networks, services and systems (such as Your Europe, Points of Single Contact, Product Contact Points, Contact Points for Construction Products) and linking them to the “Single Digital Gateway.” **[13, p. 17]** It is reasonable to conclude that using electronic documents and 'Once-Only' principle can significantly reduce costs, time, and administrative burden both for business and

citizens. Interconnection of business registers and 'Once-Only' principle will enable for any established company the ability to expand its operations trans-boundary online and be pan-European within a month, as the European Commission considers.

In April 2016 the new EU eGovernment Action Plan 2016-2020 has been adopted, which generally aims to modernize the public administration, to achieve the digital internal market, and to engage more with citizens and businesses to deliver high quality services **[15]**. The evaluation outcomes of the previous eGovernment Action Plan 2011-2015 have shown that the Plan had a positive impact on the e-Government development at the European Union and member state level. Citizens and entrepreneurs are not yet getting the full benefit from using digital services that should be available seamlessly across the EU though **[16, p. 2]**. According to the Action Plan's vision, by 2020 all the public authorities in the European Union should be open, efficient and inclusive, providing borderless, user-friendly, end-to-end digital public services to all citizens and entrepreneurs in the EU **[16, p. 3]**.

The Action Plan initiatives have the following underlying principles: Digital by Default (public authorities should deliver services digitally as the preferred option); Once-Only principle (already mentioned above); inclusiveness and accessibility (digital public services should be inclusive and easy-to-use by default both for elder people and people with disabilities); openness and transparency (enabling citizens and businesses to access control and their own data stored in the registries; monitoring administrative principles that involve them; engaging with stakeholders in the service design and delivery); cross-border by default (making relevant digital public services available across borders and preventing further fragmentation to arise); interoperability by default (designing public services for seamless work across the Single Market and organizational silos); trustworthiness and security (integrating personal data protection, privacy, and IT security in the design phase) **[16, p. 3-4]**.

Regarding the Points of Single Contact there is said that currently contact points do not operate as a whole but are dispersed, incomplete, not sufficiently interconnected, and not consistently user-friendly both at the EU and national level. That's why the European Commission will propose the creation of a Single Digital Gateway, based on existing portals, contact points and networks **[16, p. 8]**. Thereafter it will help users to find the right information and assistance required in a better way than before. As an

additional step to support the cross-border mobility of citizens, the European Commission will set up the Electronic Exchange of Social Security Information (EESSI) in order to allow the interconnection between administrations in charge of social security for electronic data exchanges across 32 countries (28 EU member states, Swiss Confederation, Norway, Iceland, Lichtenstein) **[16, p. 9]**.

In its publicly available non-paper regarding the public consultations on eGovernment Action Plan 2016-2020 announced by the European Commission, Poland has expressed the opinion concerning main activities outlined in the document. The Polish government considers that potential of trans-boundary e-Services in the EU has not yet been fully exploited. As partially effective can be such initiatives as large-scale pilot projects, interoperability, prevention of administrative burden, qualifications improvement. In contrast, as the effective solutions are seen the Points of Single Contact for business, IMI system, SOLVIT or the Enterprise Europe Network **[17, p. 2-3]**.

The authors recognize that the key factors negatively affecting the popularity of e-Services include low maturity of services, lack of public awareness about the opportunities and facilities which offer e-Government, non-user-friendly, lack of e-Skills, lack of trust. The language barrier as well as customer concerns related to personal data safety can be regarded as disincentives to the use of trans-boundary services **[17, p. 3]**.

The key constraints in the scope of mobility and trans-boundary services in the EU are, as it was already mentioned below, language barriers, as well as lack of generally agreed data formats and documents structures at the pan-European level, lack of cross-border solutions for electronic identification of citizens. The Polish government proposed such solution to this problem is the usage of pre-defined forms in e-Services, based on the standard data structure and use of large-scale projects experience in the field of mutual recognition of electronic IDs of citizens (e.g. STORK) **[17, p. 3-4]**. Providing equal recognition of documents is also an important issue for mobility (certificates issued by the administration of home country), which are included as the attachments to applications electronically submitted in other countries.

The Regulation No 910/2014 of the European Parliament and of the Council on electronic identification and trust services for electronic transactions in the internal market (eIDAS) can be also an important tool of influence on the development of trans-

boundary services **[18]**. It is aimed to popularize electronic services in order to build confidence in electronic transactions among consumers and public institutions.

As the single-entry-point portal in Poland will be the continuation of the current portal 'Obywatel.gov.pl', it is important to analyze the documents which were fundamental in its creating. One of them is the Resolution No 26/2016 of the Council of Ministers amending the resolution on the preparation and implementation of the initiative 'Obywatel' (*Uchwała Nr 26/2016 Rady Ministrów z dnia 22 marca 2016 r. zmieniająca uchwałę w sprawie przygotowania i wdrożenia inicjatywy "Obywatel"*). According to the document, the main aim of the Portal is to provide citizens with access to primary information source on public services delivery, as well as an integration of ministerial websites in the single information website of the Council of Ministers of the Republic of Poland **[19, p. 1]**.

By using Internet a customer receives the professional and understandable information on public services, the way to get them delivered, and electronic access to the service if possible. Additionally the customer obtains the access to the information on ministries ultimately in a harmonized way visually and complied with standards in terms of format. The users of the Portal are residents of Poland, Polish citizens, and foreigners who know the Polish language **[20, p. 3]**.

There will be the single information portal of the Council of Ministers in the future which integrates the websites of ministries, but for its implementation the analysis of the current state and creating an information architecture concept are crucial **[20, p. 2]**. It concerns the single-entry-point portal of the Republic of Poland as discussed above.

The initiative 'Obywatel' is being realized in three stages as follow: 1st stage - preparation and launching of broadened profile of information service "Portal obywatel.gov.pl", maintenance and development (by 31 December 2015); 2nd stage - further development and maintenance of "Portal obywatel.gov.pl" (since 1 January 2016 until 31 December 2016); 3rd stage - further development and maintenance of "Portal obywatel.gov.pl" (since 1 January 2017 until 31 December 2018) **[20, p. 2]**. The information about at least 50 popular services for citizen should be made available on every stage of portal realization.

There are no special compound researches on Poland's e-Governance, that's why the specific recent articles are used, one of which is written about the Polish state of

development in this domain **[21]**, while European Commission's research provides an overall picture of e-Governance progress in Poland (history, legal framework, actors, etc.) **[22]**.

In the first aforementioned paper by Malwina Popiołek from Opole University, the author presented selected issues of e-Government development in Poland, compiling a review of the most important Polish research and evaluations of the level of e-Government. Looking at the graph below, which shows household computer and Internet access in Poland in years 2003-2011, it seems possible to conclude that only since 2009 the computerization has been beginning to increase exponentially (exceeded 60%), while percentage of those who have had Internet access during 2009-2011 was stable (60%). So a few years ago the problem of digital exclusion in Poland was very serious **[21, p. 400]**.

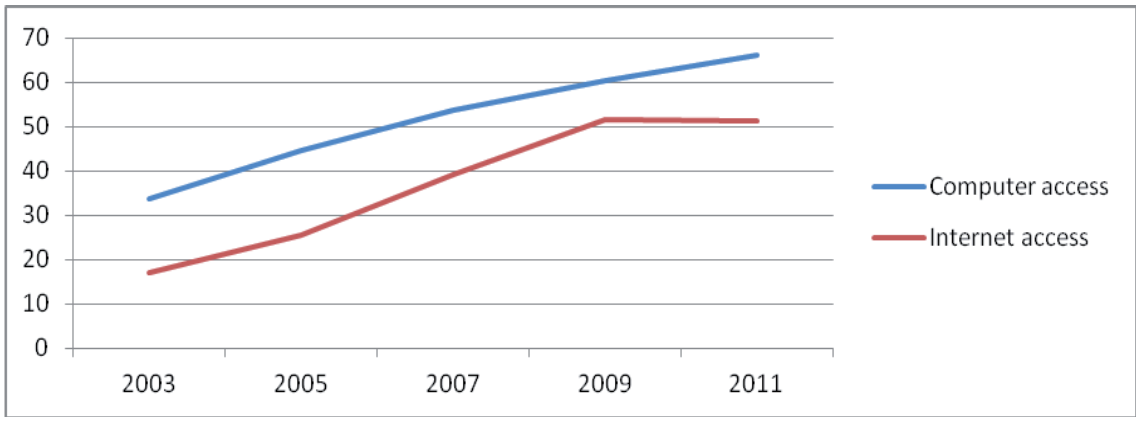


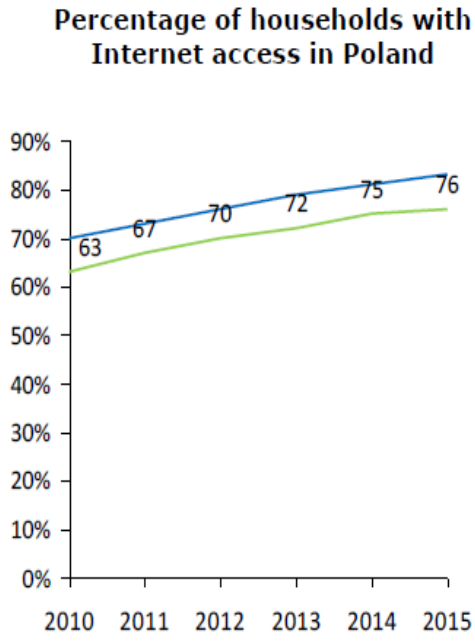
Figure 3: Household computer and Internet access in Poland in years 2003-2011. (Malwina Popiołek, 2013)

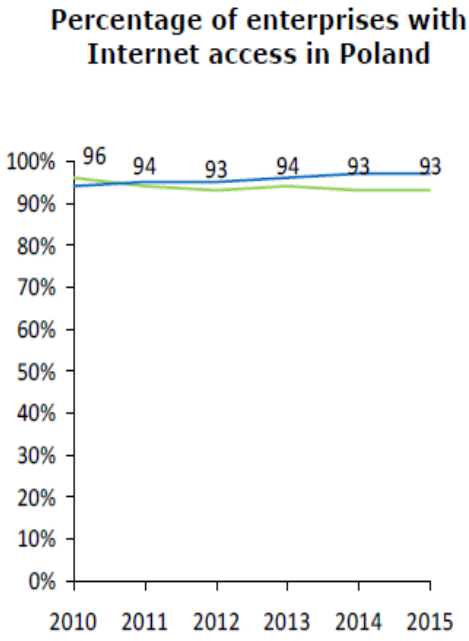
Before accession to the EU, Poland had to fulfill many conditions in e-Governance sphere. One of them was the Public Information Bulletin (*BIP - Biuletyn Informacji Publicznej*), which is a unified system of web pages, designed to make public information available in digital form for the general public **[21, p. 400]**. It consists of websites on which public authorities provide public information required by the Polish law.

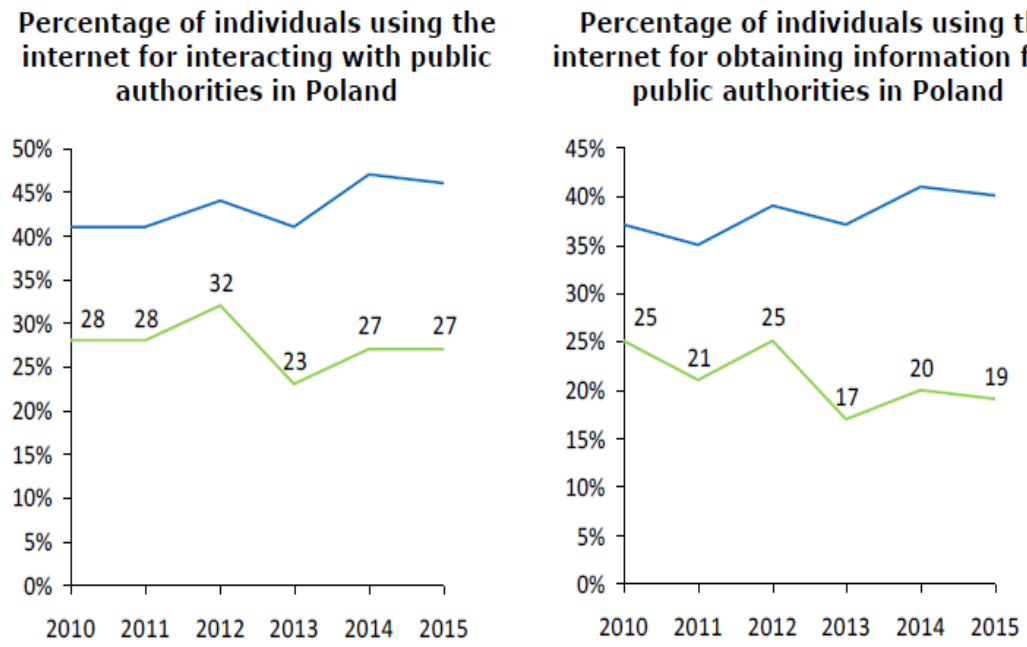
At the beginning of 2000s, namely in 2002, the concept of Polish Gateway (*Wrota Polski*) was presented, its aim was to make an integrated information system, enabling provision of public services via Internet. It was followed by e-PUAP (Electronic

Platform of Public Administration Services), which exists nowadays. However in 2009 report of the Supreme Chamber of Control (*Najwyższa Izba Kontroli*) the implementation of e-PUAP and STAP (Public Administration Network) was evaluated critically due to the lack of progress in STAP development, as well as in e-PUAP, including incomplete functionality and number of errors which had blocked its operation **[21, p. 401]**. As a result, it indicated problems with the development of e-Government structures in Poland.

According to the most recent European Commission's report on e-Governance development in Poland, percentage of households with Internet access is still increasing (data from years 2010-2015), while percentage of enterprises with Internet access has even little decreased in the same period **[22, p. 3]**.







The graphs above show the data on e-Government indicators for Poland (individuals using Internet for interacting with public authorities, individuals using Internet for obtaining information from public authorities) provided by Eurostat as of January 2016 **[22, p. 5]**.

2.2 Theoretical approaches

Taking into account that e-Governance is a new form of public administration execution, the New Public Management (NPM) approach is likely to be the most relevant for the Master's research. NPM was introduced in the early 1980s as the response to government inefficiency, lack of participation opportunities for the public, and the decreasing legitimacy of the public sector as a whole. It is based on ideological dominance of economic norms and their subordination to many other traditionally legitimate norms and values **[23, p. 130]**.

NPM focuses on enforcing managerial accountability, based on result, competition, transparency and contractual relations. Therefore it contrasts with the former public administration practices, where different forms of accountability were based on input processes and procedures, hierarchical control, legality, trust, and cultural traditions.

Moreover, the NPM approach is also a customer-driven, where the public interest is defined by bottom-up processes that allow each agency and its clients potentially to determine the content of policy **[23, p. 131]**.

In addition some elements of New Public Management approach potentially present an alternative view of democracy, which is directly oriented towards the individual and gives citizens better freedom of choice over public services **[23, p. 131]**. It is possible to conclude that this notion straightly regards the e-Governance as an enhanced public services delivery along with the broad range of available resources.

Strategic management and change management, which are also the components of New Public Management, reflect the influence of the two branches of public management **[24, p. 17]**. One must differ between transitions from bureaucratic to rational management styles and from rational or bureaucratic to humanistic management styles. The use of information technology is a characteristic of NPM that has no special theoretical roots. It is considered to be strictly a pragmatic idea, used where it is useful **[24, p. 17]**.

Since late 1990s a new generation of reforms initially called 'joined-up government' and later as 'whole-of-government' was launched. This approach is labeled as post-NPM, which is aimed to apply a more holistic strategy, using insights from other social sciences, rather than just economics. The concept of 'joined-up government' was first introduced by Tony Blair's UK government in 1997 **[23, p. 132]**. The main aim was to get a better control over problems and issues reaching across sectors, administrative levels, and policy areas.

'Whole-of-government' concept is defined by the Connecting Government Report in the Australian Public Service as denoting public services agencies working across portfolio boundaries to achieve a shared goal and an integrated government response to particular issues **[23, p. 132]**. The use of private-public partnerships and networks, supporting non-profit organizations, and establishing user forums and user surveys are good examples of application post-NPM approach in the public administration nowadays. The same regards building the single-entry-point portal in Poland as the response of contemporary public sphere to today's challenges.

Conclusions

Based on literature and sources review above, it is seen that there are no special compound researches on e-Governance in Poland with few exceptions only, which were analyzed. The main source for the Master's thesis is aforementioned State Integrated Informatization Program, as well as other Polish governmental documents being fundamental for portal development. The issue of EU Digital Single Market in terms of Points of Single Contact is also discussed and will be used in the research later on. The New Public Management concept with its post-NPM notions seems to be the most relevant theoretical approach in the Master's thesis.

3 State Integrated Informatization Program: e-Governance Initiatives in Poland

3.1 Current e-Governance programs and services in Poland

In January 2013 Poland's government published the document 'Long-term National Development Strategy. Poland 2030. The Third Wave of Modernity' (*'Długookresowa Strategia Rozwoju Kraju. Polska 2030. Trzecia fala nowoczesności'*). As one of the aims it includes creating Digital Poland (*Polska Cyfrowa*) due to aspiration to reach the level of EU15 states at least in terms of infrastructure development, development of services and content as well as increasing level of their usage. This program marked 2015 as the deadline for reducing current infrastructure problems in Poland. In this aspect creating digital infrastructure included several tasks, such as modernization of current infrastructure, ensuring universal access to broadband services, and creating basics of efficient infrastructure in the perspective of further 20 years **[25, p. 92]**. According to the long-term vision, years 2015-2020 will be the period of constructing of digital society fundaments based on the infrastructure built before and short-term activities performed until 2015. The further years 2020-2030 are devoted to work on the use of achievements of Digital Poland and benefits for digital society **[25, p. 93]**.

There are several directions of activities included in Digital Poland. First of all, promoting investment in broadband infrastructure to ensure universal and high-quality access to Internet. Secondly, building digital competencies (teachers, professors, NGO workers) and implementation of universal digital education, and creation of modern network infrastructure and educational resources. The third direction is increasing the amount of public resources (educational, heritage collections, scientific publications and public media content) available on Internet) in order to ensure supply of high-quality content. The fourth direction is creating favorable conditions for the development of e-

Services market. The last one is a collection, storage, protection and sharing of data and electronic documents, and sharing and securing in an electronic form existing resources in the traditional form, including sharing content from the public domain via Internet **[25, p. 93-95]**. In general, the overall aim is creating an efficient state by the skillful and intense use of ICT for the development of Poland.

In the previous strategy document published in 2012, which is called 'Strategy of State Development 2020' ('*Strategia Rozwoju Kraju 2020'*), there was also touched the issue of Digital Poland. It was declared that Digital Poland cannot be reduced to receive content and services, which are generated beyond the borders of Poland. That's why there is a need to ensure effective system of generating services and content in the broadband networks matching to the interests and needs of individual customers and communities **[26, p. 112]**. The role of state is to define strategic objectives and tools that should be used in order to align Polish content and services at an appropriate level, the market will satisfy part of society needs though.

This vision can be called as competition-oriented due to its general mission to increase the competitiveness of Poland. For this aim ensuring the same level of access to the infrastructure and technologies, content and services as well as competencies of its usage, should comply with the 'EU standard' **[26, p. 113]** (authors don't specify it, but it is meant to be defined in the separate documents issued by the European Union institutions). Due to expectations in the document, in the coming years (after 2012) will be strong development of telecommunications services and solutions for state digitization, especially the further development of e-Commerce, e-Health, digital public services (e-Services), ePUAP (Electronic Platform of Public Administration Services) and telework (remote work). As a result, the accelerated digitization of state will have a big importance for spreading development processes **[26, p. 113]**.

Social and territorial cohesion is another strategic area in terms of 'Strategy of State Development 2020'. It is aimed to provide access and specific standards of public services, including improving the quality and accessibility (e-Health, e-Education, e-Culture, etc.) **[11, p. 8]**. Different sectors in their development strategies proposed solutions to meet the objectives set for the whole country. Each of nine sectoral strategies (innovation and efficiency of the economy; development of human capital; development of transport; energy security and environment; efficient state 2020;

development of social capital; national strategy of regional development (regions, cities, rural areas); strategy of sustainable rural, agriculture and fisheries development; strategy of national defence system development) in their content to some extent refers to the issues of improving the functioning of state, including computerization **[11, p. 8]**.

The parent document of the State Integrated Informatization Program is 'Better Government Strategy 2020' (*'Strategia Sprawne Państwo 2020'*). Its main aim is increasing efficiency and effectiveness of state based on the cooperation with citizens. The authors declared that the digital nature of changes in many aspects of the modern world requires state optimum 2.0 in order to achieve the effect of synergy of digital projects to modernize the administration **[27, p. 3]**.

One of the aims is improving relationship between the results and expenditures in the sphere of public services provision, including central registries, and standardization and modern management of public services. This aim takes into account the need to create an integrated platform on public services, ensuring completeness of available public services in cooperation with NGOs **[27, p. 9]**. It also includes promoting interoperability standards and principles of openness and transparency, supporting e-Governance services on the pan-European scale as well as educational and promotional activities. An important part of this aim is smooth functioning of public registries, based on which services will be provided to citizens and entrepreneurs **[27, p. 9]**.

In March 2016 the Strategic Action Priorities of the Minister of Digital Affairs in Computerization of Public Services were presented. As it was mentioned above, this document outlines the up-to-date domestic context in the sphere of digital service state, strategic principles and directions, etc. The plan is based on five fundamental principles: the state has to serve citizen (consistent and simple e-Services, digital technology should connect scattered institutions); access to the network and public services must be safe for personal data and any kind of transactions; accelerating development of modern telecommunications infrastructure for achieving the objectives of e-Governance; development of innovative economy needs a current, easy access to data collected by public institutions; need of constant raising digital skills, regardless of age, in order to use the benefits of digitization effectively and compete in the global market **[11, p. 8-9]**.

The executive document, Action Plan of the Minister of Digital Affairs, which is

attached to the State Integrated Informatization Program, was also based on these principles.

All the current e-Governance initiatives in Poland are included in the State Integrated Informatization Program and being supervised by the Polish Ministry of Digital Affairs as the executive body. One of the most important currently prepared projects is 'From Paper to Digital Poland' (*'Od Papierowej do Cyfrowej Polski'*). Poland's Ministries of Development, Digital Affairs, Finance, Family, Labor and Social Policy, Health and Infrastructure, and Construction lead this Program.

'From Paper to Digital Poland' program aims to develop e-State and digitize the economy. According to the Ministry's of Development 'Plan on Responsible Development' (*'Plan na rzecz Odpowiedzialnego Rozwoju'*), e-Governance is one of the constituents of the Better Government **[28, p. 19]**. Moreover, so called 'playing to one goal' is required that means withdrawal from ministerial Poland, cooperation with the social partners, employers and trade unions. As a result, the government should work for the citizen and not the citizens working for the government **[28, p. 17]**.

The Program, which was mentioned above, includes 13 streams of activities as follow:

1. Digital Public Services;
2. Digital Identity;
3. Increasing Cashless Transactions;
4. National Scheme – making mass e-ID solutions for contact with the public sector;
5. E-Invoice and e-Receipt – enabling participation of the Polish companies in a trans-boundary public procurement market and the European Union's economic relations by including Poland into EU Digital Single Market;
6. E-Levies and e-Benefits – simplifying the payment and accounting of social insurance contributions and other levies;
7. E-Health – automating administrative processes in the health sphere;
8. E-Reporting – reducing administrative burden and improving the use of public information resources;
9. Blockchain and cryptocurrency;
10. E-Box and e-Delivery – accelerating and organizing communication with the authorities through the creation of an official mailbox. Some ministries and

departments in Poland already have Electronic Filling Box System (*System Elektronicznej Skrzynki Podawczej*). According to the legal definition it is publicly available electronic communication mean for transmitting information in an electronic way to a public entity by using publicly available data communications network **[29]**.

11. IT Architecture;
12. Cybersecurity – developing and implementing a comprehensive strategy for the protection of the state in the digital sphere;
13. E-Transport and e-Goods flows – centralization of traffic management systems and charging and unclogging supply chain through the process integration of tax administration systems, customs and road **[30]**.

There are several public e-Services in Poland, which are used more frequently than others and should be mentioned below. First of all, it's the service 'e-Declarations' **[31]** ('*e-Deklaracje'*), which allow the electronic tax settlement. Basically by using this e-service a citizen could pay the personal income tax (PIT), corporate income tax (CIT), the goods and services tax (VAT) and others. If a citizen wants to submit the tax declaration, firstly he/she should download the application from the official web page, fill in the data, and sign it by the secured electronic signature (for natural and legal persons) or authorization data (for natural persons only). The problem is that Poland still doesn't have the ID card with the chip like in Estonia, that's why it's hard to provide the sufficient protection of personal data for a tax payer (absence of PIN1/PIN2 verification); the secured electronic signature is issued separately. The only unique data by which a person confirms its identity is the Polish personal number (*PESEL*). One more disadvantage is the impossibility to get a tax return directly on a bank account without submitting an application with the physical signature to a nearest tax authority. Otherwise a citizen gets money in the post office related to the address of registration; the transaction fee would reduce the sum of tax return.

The second e-Service is 'Border Portal' **[32]** (*Granica.gov.pl*) that includes three options: 'e-Booking' - online reporting of information about the planned crossing of Poland's border with Russia, Ukraine or Belarus by bus or truck that simplify and reduce the time of customs control; 'VAT refund for travelers' - speeding up the customs control via the online application; mobile application 'Border'. It is very useful service,

especially if to take into account that the external Schengen Area border with Ukraine and Belarus in Poland is extremely overloaded all the time. For instance, if a traveler wants to register all his/her Tax Free items purchased in the EU and get VAT tax paid back on a border crossing point, he/she should fill in the form beforehand in 'VAT refund for travelers' service. This form include data about passport's number (the only personal data you need to present), item seller, and Tax Free document.

The next public sector e-Service is the Electronic Services Platform of Social Insurance Institution **[33]** ('*Platforma Usług Elektronicznych Zakładu Ubezpieczeń Społecznych'*) that help citizens to resolve main social insurance matters electronically. Basically by using this service all the citizens could check the data on an individual account, appoint a visit to the local Social Insurance Institution branch, beneficiaries can check information about granted and paid benefits, and the insured persons as well as contribution payers could get the information about account balance and insurances. So, if a citizen wants to submit his/her application, first of all he/she should register in this service and authenticate him/herself by the Electronic Platform of Public Administration Services certificate, and then provide name, surname along with the Polish personal number. The only disadvantage that arises here is requirement to confirm the identity personally in the Social Insurance Institution branch in order to verify own profile on the Electronic Services Platform.

The most important e-Service for foreigners and EU citizens who decide to reside either temporarily, or permanently in Poland, is ticket reservation system for submitting documents personally. Now it works in few Polish voivodeships, for example in Masovian where the capital city, Warsaw, is situated. For the purposes of project realization the private-public partnership was used. It was partially financed by the EU European Fund for the Integration of Third-Country Nationals and realized by the Masovian Voivodeship Administration. This service **[34]** works in 4 languages (Polish, English, Russian and Vietnamese). Once a foreigner has applied for the residence permit, he/she could check its application status via using the respective service **[35]**. Lately the Masovian Voivodeship has launched a new e-Service that makes applicants' endeavors easier. Now a foreigner can fill in the application for different kinds of residence permits online, but still it should be printed out, signed and delivered to the authorities personally **[35]**.

It seems that the Poles used the Dutch service-oriented approach while developing the last service, which has been described. The Immigration and Naturalization Service in the Netherlands handles the admission of foreigners in the country **[36, p. 68]**. As in Poland, it is responsible for the execution of a set of regulations coming from different legal sources (international law, EU law, national law, case decisions and policy directives). Like in the Netherlands, the Polish authorities encountered enormous increase in applicants' numbers who seek for their legal status in the EU, especially labor migrants from Ukraine (500 thousand people were issued long-term visas, 65 thousand were issued residence permits in 2015) **[37]**. Thus it is possible to divide the changes into three types that were implemented to ensure compliance with legislation: general income requirements (about 560 PLN/month for 1 person); additional check for educational institutions (diploma about secondary or higher education completed in Poland; for those who have finished the higher education institution the waiver not to obtain the work permit applies); additional check for work activity (submitted tax declaration within last 12 months).

ePUAP

The main service-oriented actor in Poland to provide administrative services to the public via electronic communications channels is the Electronic Platform of Public Administration Services (*ePUAP*) **[38]**, which was already mentioned above. This web portal enabling citizens and enterprises to take care of official matters and administrative procedures; enables public administration offices to provide their services without paying any costs associated with the services.

By using the platform all official matters can be arranged over the Internet without having to fill in the same information again and again, thus ensuring a convenient way of contact with public administration and vice versa **[39, p. 30]**. In order to create an account in ePUAP, a citizen should fill in a short registration form using its contact and identity data. This account will be used as an email box to receive the incoming government mail. Next step is the confirmation of Trusted Profile (*Profil Zaufany*). It is free portable electronic signature for the contact with authorities. A citizen need to log in to ePUAP account and apply for Trusted Profile confirmation. Then the personal visit to the nearest authorities point with ID or passport is needed. This signature is valid for 3 years. Another option is for holders of special electronic signature (*Certyfikat*

Kwalifikowany) who can confirm their Trusted Profile even electronically. Trusted Profile is used for submitting the electronic applications to the authorities. Action authorization is performed via using SMS codes.

Every sending and receipt are confirmed by the Government Receipt Authentication (*Urzędowe Poświadczenie Odbioru*) that is equivalent to the electronic 'advice note'. If the office does not have a specific service then a citizen can always send so-called general letter with the attachment. Each authority office is obliged to have Electronic Registry Box (*Elektroniczna Skrzynka Podawcza*). Trusted Profile is also used to log in to other systems of electronic administration **[38]**. Although ePUAP looks like the interoperability framework by analogy with the Estonian X-Road, it is not actually, having more common with the portal eesti.ee. The Polish e-Governance system is still quite divided, but the authorities are on the way to combine it though. For instance, Masovian Voivodeship Administration gave access to only a few services via ePUAP (e.g. general letter to authorities, public information request, and archival copy issue) **[40]**.

Since April 2011 various Poland's legal acts have been transmitted to the Government Center for Legislation in electronic form only, using e-Government portal Electronic Platform of Public Administration Services. From that day onwards the electronic version of the legislation will be validated as if it bears a digital signature, the only form of authentication and confirmation of the date of the act and will be made available to the public **[39, p. 33]**. The Polish authorities prefer to use open PDF format provided by Adobe Systems in order to authenticate the documents electronically.

According to the most recent data, more than 1 million people already exploit ePUAP services. Taking into account the current population of Poland is almost 38.5 million people **[41]**, the percentage of those who use the services via ePUAP is quite low (2.59%), 27% of individuals use the Internet for interacting with public authorities though **[39, p. 5]**.

National ID-card and identification number

The second service-oriented actor is the Polish ID-card. Since March 1, 2015 it has a new specimen that includes on the front side a given name, surname, family name (due to the Roman Catholic tradition), names of parents, date of birth, and sex. On the reverse side there is a unique personal number (*PESEL*), identity card number, and

nationality, place of birth, issuing authority, date of issue, and date of expiry. Recently it also included the person's address, but hence the compulsory registration was replaced by registration upon notice, this information was eliminated from ID-cards **[42]**. It should be noted that the Polish ID-card doesn't involve a chip like Estonian one, because Poland still doesn't have the unified standard of the electronic signature as compared with Estonia.

Recently the Ministry of Digital Affairs due to the financial support of the European Union has launched a new web portal in order to help citizens and residents to choose among the bunch of e-Services – obywatel.gov.pl **[43]**. All the services that are presented here were divided into several categories: documents and personal data, drivers and vehicles, going abroad, marriage, children, education, certificates, social insurance, health, work, etc. It is being permanently developed and now includes 176 services, among which 35 services online (as of April 2017). Among the most popular services are checking ID-card and passport issuing status, information about ID, reporting going abroad, and photo for ID/passport. The portal is unilingual, in Polish language.

Each Polish citizen and registered citizen is obligatorily provided with the unique identifier – General Electronic System for Citizens Evidence (*PESEL*). As *isikukood* in Estonia, this number also includes 11 digits that contain the following information: first 6 digits – date of birth including the century; 7-10 digits – series number including the sex (10th digit); 11th digit – control number. PESEL has lifelong validity, but could be changed due to some specific reasons. If a citizen submit its tax declaration, then this identifier is used in the first place. Getting tax refund from the authorities is strictly bound to PESEL. In general, it is the central data storage provided by the Minister of Digital Affairs of Poland. PESEL is granted by the Civil Affairs Administration in case of children and commune authorities in any other cases **[44]**.

Recently one more compulsory identifier for citizens was used – Tax Identification Number (*NIP*) – but now it is transferred mostly to enterprises. With regard to the use of electronic signatures in e-Government applications, both types of numbers (PESEL and NIP) appear particularly relevant as they have been envisaged to be used as the unique identifier of the future e-ID (still under development) **[39, p. 31]**.

Now the new PESEL2 system **[45]** is being developed. It consists in the integration and reorganization of the existing state registers. This storage will only contain the data included in the current PESEL system. Some of the data will be removed (education, level of income, settlements status in the Tax Office, medical treatment and reasons behind it, data regarding bank accounts of citizens (quite controversial point due to extensive court practice), status in the police registers, and information regarding the use of social care benefits. The operational objective of the programme is to allow for the online use of the system to access the data contained in the PESEL system registers (a citizen can publicly verify whether some PESEL number is valid or not only) **[39, p. 32]**.

eID program in Poland has stagnated a lot. The development of a Multifunctional Personal Document, which could be used as an intelligent PKI-ready smart card (Estonian specimen) in order to replace the traditional plastic ID-card, has been studied for many years. The Polish Ministry of the Interior and Administration is responsible for this project that is called 'PL.ID' **[39, p. 32]**. The new State Registries System is planned to be launched which will contain PESEL numbers, ID registry, civil status deeds, etc. This program is continuation of the Polish ID-card that was realized by the IT Projects Center for the Ministry of Internal Affairs by February 2013. The Ministry decided to modernize thoroughly IT infrastructure, some elements of which exist since 1980s as well as to update PESEL database that is based on the former century solutions **[46]**. Necessary legislative changes are the part of the identification documents development strategy. The electronic ID is to be based on existing identification numbers and reference databases.

Also the Polish government has started designing the infrastructure to enable citizens to submit documents electronically. As set out in 2001 Act on Electronic Signatures, the beginning of May 2008 was the deadline for the government to provide services for citizens with electronic signatures. Trusted Profile and incoming correspondence box on ePUAP constitute this program. It should be noted the few e-Services requiring the use of an e-Signature in Poland have not been widely used due to high cost of e-Signature for Polish citizens **[39, p. 32]**. A lot of doublespeak arises in the public sphere regarding e-Signatures. However new e-Declarations system along with new ID-cards that would

be pre-equipped with e-Signatures should change the current situation of uncertainty in this domain.

3.2 Main provisions of the Program and its implications

In order to provide better e-Services for citizens and business, in 2012 the Polish public administration asked for an opinion of Internet users on their needs of completing official matters **[11, p. 12]**. The research's outcomes show that for 89% of respondents access to job vacancies, including Labor Department (*Urząd Pracy*) databases, is important or rather important. For 81% of survey participants the ability to appoint a visit to a doctor via Internet/e-mail is important. The other spheres, which were important for respondents, are access to its health or diseases history via Internet (77%), ability to contact parents with a school via Internet (74%) or participation in the public consultations of laws, regulations and local governments resolutions via Internet (62%). It seems that there is an increase in the need to use available public resources distributed by the state.

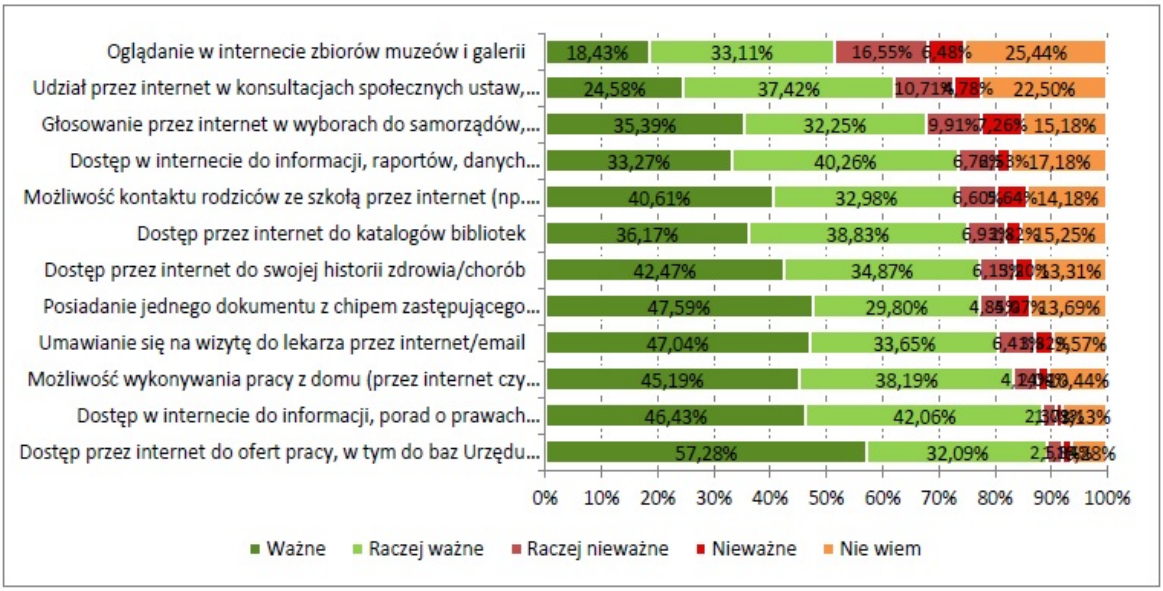


Figure 4: The needs of citizens regarding completing official matters electronically. (Program Zintegrowanej Informatyzacji Państwa, 2016)

The research also showed that the most frequently sought information by respondents on the governmental websites are job vacancies (67% of respondents), as well as issues

related to health (47%) and insurance (40%), and science (41%). Other areas identified by respondents are personal matters (e.g. ID card, passport), natural persons taxes, and economic activity.

Since 2011 the percentage of citizens using e-Government services in Poland is estimated at the level of 27-28%. On the contrary, the use of online services by entrepreneurs is much higher as the level of users in relations with the public administration reached 92% in 2015 **[11, p. 15]**. The level of satisfaction of public e-Services provision according to the survey performed by the Polish Ministry of Administration and Digitization in 2014 amounted to 56% positive or rather positive opinions while 14% of opinions were rather negative or negative. The inability to complete the whole matter via Internet was the biggest reason for dissatisfaction, which proved the low level of services advancement.

Comparing with "Digital Agenda 2020 for Estonia", which is aimed to create an environment that facilitates the use of ICT, information society will be created for all residents of Estonia, while particular attention will be paid to the integration of social groups with special needs, to regional development and to the reinforcing of local initiative **[47, p. 19]**. Moreover, everybody should have access to Internet and the content made available through it, irrespective of the device used. The aspects of inclusiveness and interoperability are very important for building e-Services and information society in general.

In Poland generally e-Services are available on ePUAP platform (more than 70% of offices that provide e-Services). 44% of governmental websites have more than one, Polish, language version. 42% of them are mobile-friendly, and only 18% are available for people with different kinds of disabilities, e.g. meets the Web Content Accessibility Guidelines recommendations (WCAG 2.0). The most common functionality provided by the public administration websites for a user are information search, directory of services with an explanation of how and where citizens can resolve their issues, but the websites have insufficient level of tracking cases **[11, p. 16]**.

According to the most recent report "e-Government in the eyes of Internet users" (*"E-administracja w oczach internautów"*) made by the Polish Ministry of Digital Affairs and presented in July 2016, comparing with 2014 there is observed a lower percentage of Internet users who prefer resolving official matters via Internet. At the same time

there is an increase in the percentage of a positive assessment among people, who over 12 months tried to resolve some official matter via Internet. Those people, who negatively assessed the process, as the main reason indicated that resolving of the whole case via Internet was impossible **[48, p. 12]**.

Coming back to the State Integrated Informatization Program, its strategic objective is a transition from administering to development management by the introduction of a coherent strategy for information management and unified principles, standards of construction and IT solutions construction operation in the public administration (e-Governance) **[11, p. 19]**. It will increase the supply of high-quality public e-Services expected by the society, as well as their usage measured by the percentage of residents and businesses using Internet in relations with the public administration, according to the objectives set by the 'Better Government' (*'Sprawne Państwo'*) strategy.

The operational objective of the Program is creation of a coherent, logical, and efficient information system of the state, ensuring transparency in the functioning of the administration and delivering key services for citizens and businesses in a cost-effective and quality way at the state and pan-European level **[11, p. 19]**. It will also ensure the interoperability of existing and new IT systems of the public administration (including the elimination of duplicate functionality).

Moreover, the Program is aimed to increase the participation of people in the EU Digital Single Market by creating a coherent information system of the state, providing e-Services at the national and pan-European level in the most efficient way. The building of bigger trust to the digital market will be ensured by the adequate protection of personal data. The new legal framework at the EU level regarding this issue was implemented by the EU Regulation 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data **[49]**. Its application should ensure the effectiveness of systems and appropriate guarantees for the rights of data subjects. There is said that in order to assure a consistent and high level of protection of natural persons and to remove the obstacles to flows of personal data within the European Union, the level of protection of the rights and freedoms of natural persons with regard to the processing of personal data should be equivalent in all EU Member States **[49, p. 2]**.

The implementation of State Integrated Informatization Program will be carried out by taking systematic actions in four specific fields as follow: open government and support for civil society development (interactivity of the administration's digital structure, government open to cooperation with the society, transparent and efficient administration); designation of standards and creating conditions for the safe and effective e-Government (unified and secure information system of state authorities, coherent system of user identification and authentication at all levels of communication 'citizen-government' and 'government-government', efficient system of electronic document management in the public administration); provision of the public e-Services (e-Services in the administrative affairs, labor market, healthcare, justice, social security, etc.); informatization of authorities (digitization of document management, usage of available technologies, improving the organization by the use of best practices of IT services management) **[11, p. 20-21]**. The specific measures, which are aimed to carry out these priority actions, are described in the Minister's of Digital Affairs Action Plan (*Plan Działań Ministra Cyfryzacji*) that is attached as Annex 1 to the Program.

Change management

The aspect of change management is really important in the sphere of e-Governance implementation. According to the research of city councils in the Melbourne metropolitan area performed by the group of researchers from La Trobe University (Melbourne, Australia), most of the respondents expressed a need for change management in their city councils for effective implementation of e-Services **[50]**. Some respondents also considered change management as more important issue than the technology. ”Getting the people on side is more important then getting the system working.” **[50, p. 17]**, survey respondent 5 (internal audit manager) said. Survey respondent 8 (IT manager) suggested ”I think in a change management process the first stage is to explain to people what changes are occurring, and the way it is going to effect them.” [50, p. 9] Moreover the respondents supported a need for new ways to communicate, a need to avoid information overload, and a need for reassurance among staff; many employees still regard e-Services as extra work for them.

The depicted figure below shows the model for e-Service change management in local government. It includes four levels: determinants, intervention strategies, implementation (or social interaction) and results. At the first level, determinants, there

forces act for new changes in the organization. A change agent acts as an initiator to respond to identified change stimuli, which are defined by the strategy and environment. At the next level, intervention strategies, the respective framework is created and specific goal for change is set: increase e-Service development in local government. The third level, implementation, includes two sub-levels – change process and implementation tactics.

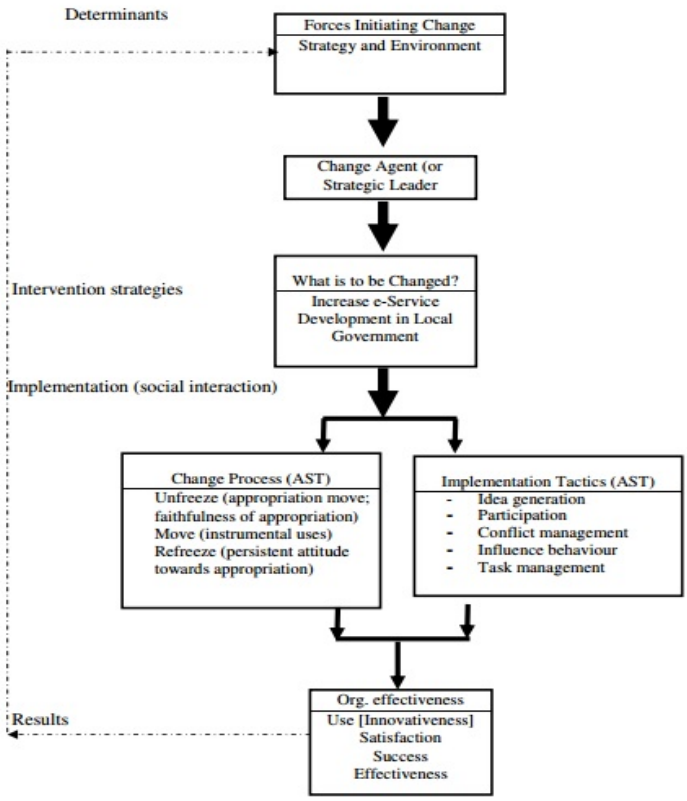


Figure 5: Model for e-Service change management in local government. (Chowdhury Hossan, Terri Joiner, David Brown, 2009)

A change process is performed via 'unfreeze-move-refreeze' chain, where the sub-processes follow respectively: unfreeze – appropriation move, faithfulness of appropriation; move – instrumental uses; refreeze – persistent attitude towards appropriation. An implementation tactics includes idea generation, participation, conflict management, influence behavior and task management. The last level, results, constitutes organizational effectiveness, which consists of such quality criteria as use (or innovativeness), satisfaction, success and effectiveness. Change management, as can be

seen in the figure above, plays one of the key roles in transforming public e-Services in order to make them seamless and more adjusted to people's needs.

The efficiency of actions that are performed by the Polish public administration in terms of the State Integrated Informatization Program execution and promoting e-Services to citizens and businesses, will be measured by levels corresponding to the indicators identified in the Better Government Strategy (*Strategia Sprawne Państwo*), Digital Agenda for Europe, and Digital Agenda Scoreboard. Digital Agenda for Europe was presented in May 2010 yet and it identifies where Europe needs to focus its efforts in order to overcome the flaws depicted in the figure below.

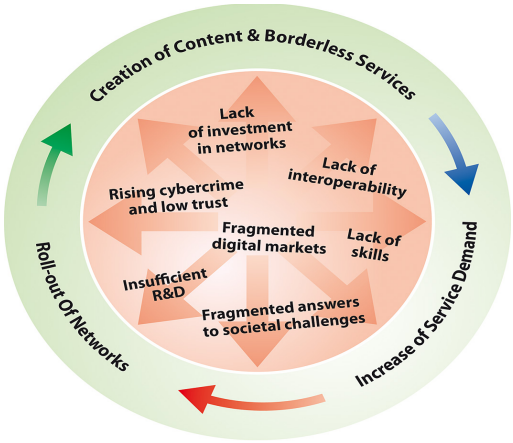


Figure 6: Aims of the Digital Agenda for Europe. (European Commission, 2010)

The document outlines seven priority areas for action: creating a Digital Single Market; improving the framework conditions for interoperability between ICT products and services; boosting Internet trust and security; guaranteeing the provision of broadband Internet access; encouraging investment in research and development; enhancing digital literacy, skills and inclusion; applying ICT to address social challenges (climate change, rising healthcare costs, ageing population) **[51]**. As one of the goals there is said that e-Government should be made an everyday convenience for European citizens and businesses by establishing a list of common cross-border services and setting up systems of mutual recognition of electronic identities. It will allow citizens and businesses to operate independently or live anywhere in the EU **[51]**. Digital Agenda for

Europe will be also analyzed in Chapter 5 in terms of the EU Digital Single Market in Poland.

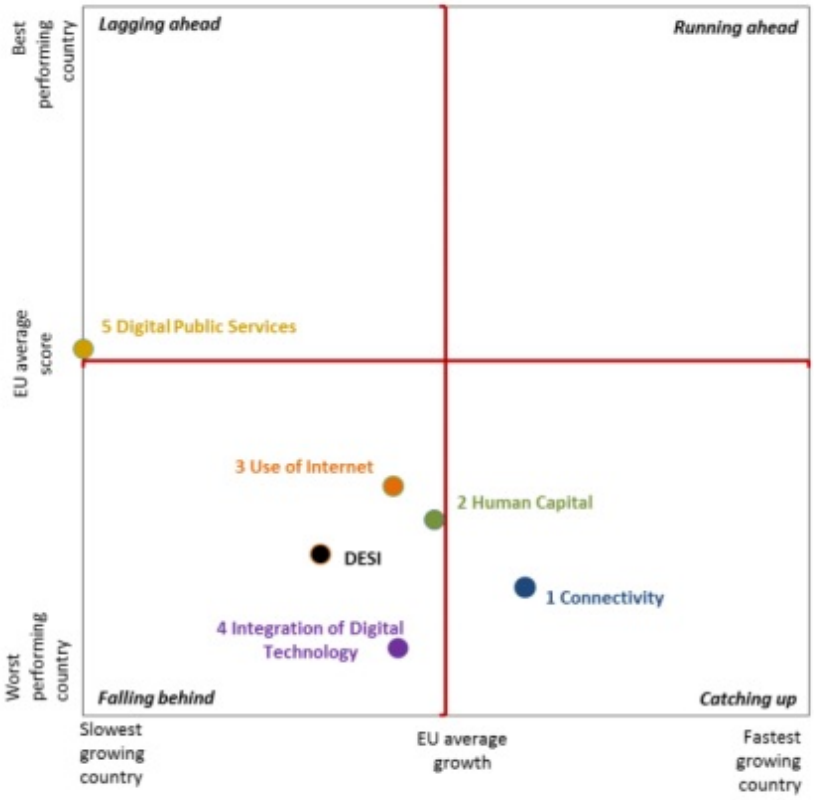


Figure 7: Poland's performance in five Digital Economy and Society Index (DESI) dimensions relative to other EU countries. (European Commission, 2016)

Digital Agenda Scoreboard (or Digital Scoreboard) measures annually progress of the European digital economy. Their reports combine the quantitative evidence from Digital Economy and Society Index (DESI) with country-specific policy insights, allowing to keep track of the progress made in terms of digitalization by each EU Member State and providing an important feedback loop for policy-making at the EU level. Poland ranked 22nd out of 28 EU Member States in the European Commission's DESI 2016. The state still belongs to the falling behind cluster. It means that the Polish performance is below the EU average and improved slower than the European Union as a whole **[52, p. 1]**. According to the Index outcomes, Poland made an average progress in the Use of Internet and Integration of Digital Technology dimensions. The performance in the Connectivity dimension has been also improved. Moreover Poland adopted the Digital

Poland Operational Programme for 2014-2020. The aim of the Programme is to strengthen digital foundations for the national development, which include: common access to a high-speed Internet, effective and user-friendly public e-Services and a continually rising level of digital competences in society **[53, p. 3]**.

In the Connectivity dimension Poland is below the European Union average and is making a moderate progress. The state ranks last in the EU in terms of fixed broadband coverage of only 86%, almost 20% of countryside households are still not covered by fixed broadband, and fast fixed broadband is available to only 61% of households (EU average is 71%) **[52, p. 1]**. In the Human Capital dimension Poland performed below parity and is making a moderate progress as well. According to the data, only 40% of individuals have basic digital skills, however it is improving among 16-24 years old, of whom 80% have basic digital skills **[52, p. 2]**. The percentage of ICT specialists remains low in the general workforce. The Polish government has confirmed the deficit of programming skills and plans to change the core school curriculum in order to launch programming course since the first class of primary school.

In the Use of Internet dimension Poland is below the EU average and is only making a moderate progress. 65% of the Polish population are regular Internet users (EU average is 76%), 27% of individuals have never used Internet. Less than 1/3 of Poles order physical goods online and only 11% of individuals order services online **[52, p. 2-3]**. In the Integration of Digital Technologies dimension Poland performed below parity and is making a moderate progress, however the digitization of Polish businesses is lagging behind. Only 1/10 of Polish enterprises is selling online compared with the European Union average of 17% of enterprises. The percentage of ICT specialists in the Polish workforce remains low at 3%, while the EU average is 3.7% **[52, p. 3]**. In the Digital Public Services dimension Poland ranked the EU average and made a slower progress comparing to the European Union as a whole. Poland is making the best progress in this dimension due to a high number of individuals, who are using pre-filled forms, however the use of e-Government services remains low. The worst situation is in the medical sphere, where an exchange of medical data and share of e-Prescriptions are still at low levels (11% and 4% of general practitioners, while the EU averages are 36% and 27% respectively). Moreover only 7.5% of individuals make an appointment with a practitioner over a website **[52, p. 3]**. Although in the field of e-Health Poland

introduced new legal and institutional measures, there is still a lot of space for improvement. It is expected that all the ongoing initiatives (e.g. “Digital Poland” Programme 2014-2020, “Strategic Directions of Actions of the Minister of Digital Affairs in the area computerization of public services”, etc.) will increase the use of digital public services in Poland.

In general the State Integrated Informatization Program outlines the goal of building a transparent information architecture of state authorities and delivering e-Services to the society, including businesses, to respond to the today's challenges, save their time and provide the convenience of resolving official matters from any geographical point. Responsible public administration bodies will develop these services, which are created in IT systems and made available via Internet. It is also assumed that the information system will be logical and consistent, gradually optimized functionally as a result of implementing a process management in key public administration units **[11, p. 26]**.

The changes in legal and procedural framework are very important for building e-Services, which are initiated and coordinated by the Polish Minister of Digital Affairs. A simplification of procedures, transformation of legal framework from paper-based information to electronic are also impossible without changes in officials' mentality and increasing their competitive competences **[11, p. 26]**. All these ideas regarding facilitation for citizens and businesses are an integral part of the systematic change process associated with the creation of the EU Digital Single Market and are guided by the Program either.

There are several benefits of the Program implementation as follow: efficient public administration (transparency of public authorities, opportunities of the broad use of information resources due to modern IT systems, reducing number of mistakes resulting from the automation of data processing); widespread availability of high quality e-Services provided by the public administration (possibility of using e-Governance services at the pan-European level, standardizing services and adapting public administration to the modern management model (New Public Management), direct access of citizens and businesses to data collected by the public administration); cost reduction (saving time, simplification of procedures, optimal use of equipment, human and financial resources) **[11, p. 26-27]**. The implementation of the State Integrated Informatization Program will boost the development of the information society, which

communicates via electronic media, increase satisfaction of citizens and businesses with the quality and speed of contacts with the public administration, and create new solutions for the public sphere.

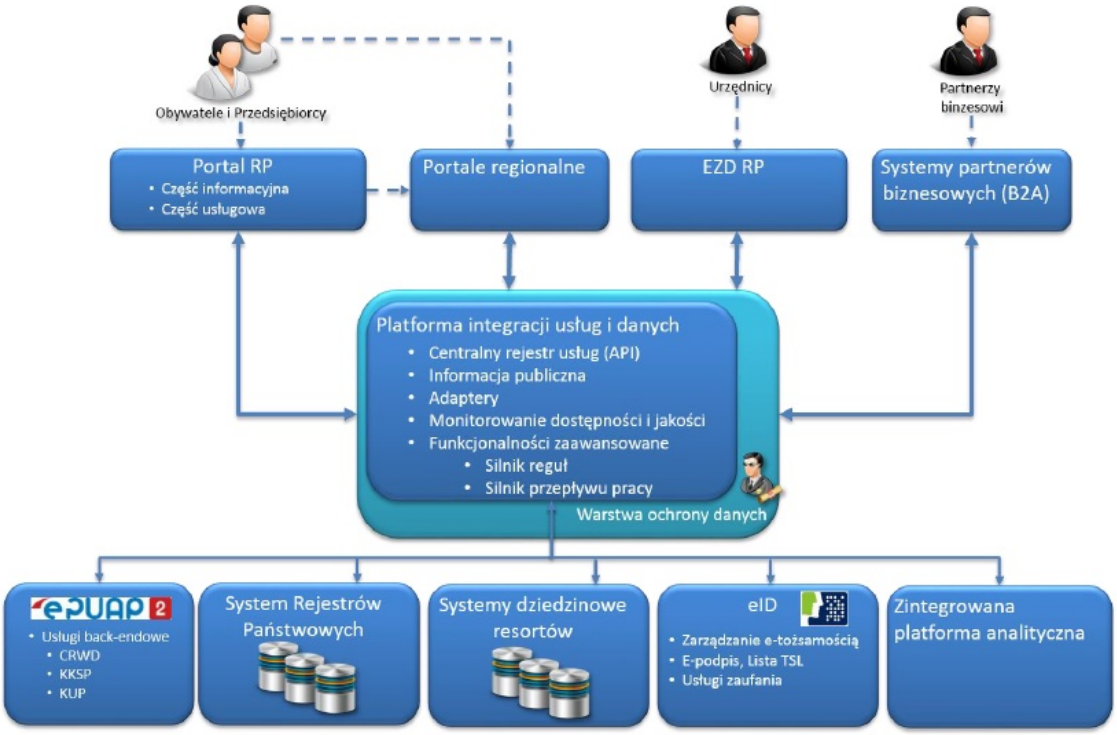


Figure 8: Simplified model of the information architecture of Poland. (Program Zintegrowanej Informatyzacji Państwa, 2016)

In the figure above there is depicted the future information architecture of Poland. It includes the set of actions, which are being realized in scope of projects coordinated by the Ministry of Digital Affairs and being an essential part of "Minister's of Digital Affairs Actions Plan" (*"Plan Działań Ministra Cyfryzacji"*). First of all, it is ;Portal of the Republic of Poland' (*'Portal RP'*), a single-entry-point portal, information and service gateway presenting a catalog of the public administration bodies, which will provide a full roadmap of the Polish institutions along with a basic information about them and deliver e-Services both for citizens and businesses in a convenient way. The portal will consist of two parts – information and service – and this issue is analyzed detaily in Chapter 4. A single-entry-point portal will be connected with regional portals. Secondly, there is Services and Data Integration Platform (*Platforma Integracji Usług i Danych*), which is a tool for maintaining a central services registry, technical integration of systems, and central monitoring and reporting of services availability and data

provided by respective systems of the public administration. The Platform is surrounded by the data protection layer and consists of the central services registry (API), public information, adapters, monitoring availability and quality, and advanced functionality (rules engine, workflow engine). Thirdly, EZD RP (*Elektroniczne Zarządzanie Dokumentacją*, electronic documentation management in the public administration) is a unified system of electronic document workflow management for the officials, which is the basis of domain systems integration. It will be also the benchmark of EZD class systems standards. There are separate business partners systems (B2A or Business-to-Administration), which are connected with the Services and Data Integration Platform **[11, p. 31-32]**.

One more part of the future information architecture of Poland is ePUAP2, new version of ePUAP, which offers back-end services. An important part is eID, the national and pan-European electronic identification scheme, a tool that will allow citizens and businesses access to public services on the Portal of the Republic of Poland and on public administration portals at the state and local levels. It will also authorize an access to information resources of the state for officials. The next part is the state registries system (*System Rejestrów Państwowych*) provided with a reference model for creating and maintaining state key registries in order to simplify and automize administrative processes, and mechanisms for making available the information contained therein. The last parts are the integrated analytical platform and departmental domain systems. The integrated analytical platform is a tool for managing information resources of the state. All the parts of the information architecture are connected by interfaces and API in scope of the unified integration platform **[11, p. 32]**.

As the Polish researchers Agnieszka Demczuk and Agnieszka Pawłowska consider, there are few reasons of delays in building e-Services in Poland. First of all, it is back-office support, because as long as only the information stage is being developed, such support is not extremely necessary, but its deficit prevents further e-Services growth. It is observed by the slow progress in publishing information on access to registers and archives not accessible via Internet and in placing application forms to make them available to citizens and businesses **[7, p. 239]**. Secondly, delays in building e-Services result from an atomistic structure of information resources that are managed on the national level. Each public service collects personal data for its own that means those

data collections are neither compatible nor interrelated. The accomplishment of the information level of e-Government development, as well as the interaction stage, was not hard, because it was not preconditioned by the transformation of internal administrative processes **[7, p. 239]**. Limited access to ICT infrastructure due to poor fixed broadband coverage, does not allow the majority of citizens to experience the advantages of Internet, therefore they do not put pressure on public institutions to develop e-Services. E-Government should be an integral part of building a comprehensive information society. As a result it will facilitate development of e-Services at national, regional and local levels of public administration in Poland.

4 Portal of the Republic of Poland: Analogies and Features

The creation of the Portal of the Republic of Poland, a single-entry-point portal, is the main project in scope of the State Integrated Informatization Program. It will be based on the information model of the Public Information Bulletin (*Biuletyn Informacji Publicznej*). The home page of the Portal will be the formal equivalent of the current home page bip.gov.pl **[11, p. 56]**. The Portal will serve as a unified system of pages within ICT network, being a gateway to public services both for citizens and businesses. According to the layout below, the Portal will consist of two parts – information and services. The information part is responsible for the public information, serving as a current home page of the Public Information Bulletin. The service part is divided into two sub-parts in order to connect Obywatel.gov.pl and Biznes.gov.pl portals.

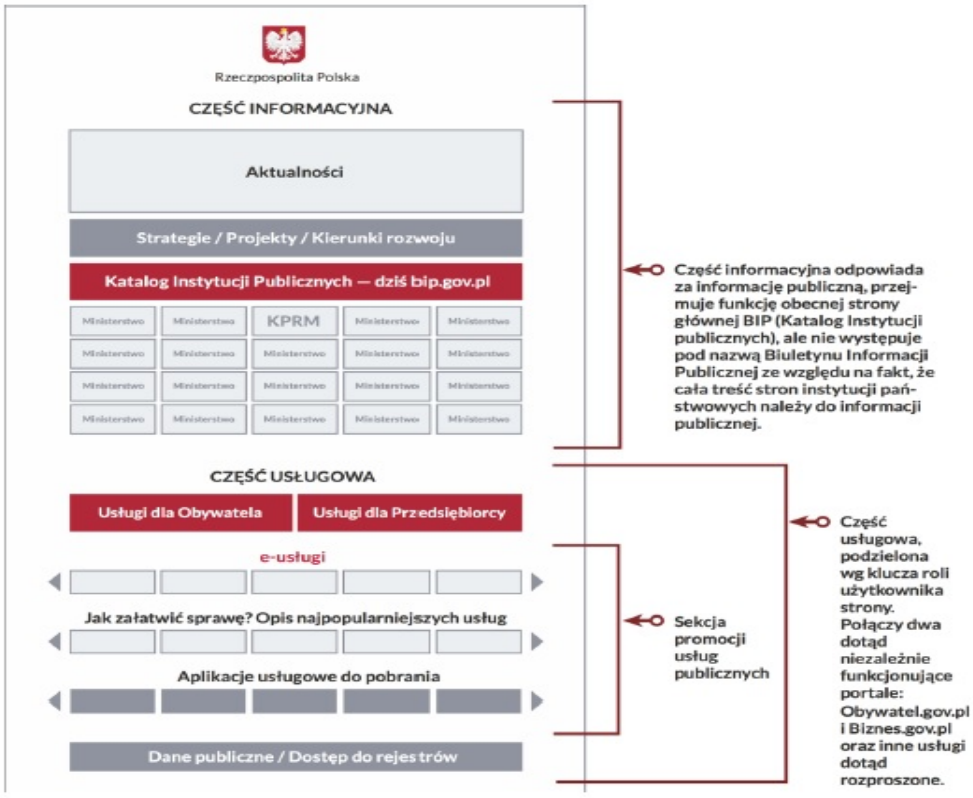


Figure 9: Overview of a home page of the Portal of the Republic of Poland 'Polska.gov.pl.' (Program Zintegrowanej Informatyzacji Państwa, 2016)

The Portal's layout should be designed so that the proportions of home page elements can dynamically change. It is based on the outcomes of User Experience surveys conducted by the Central Informatics Center (*Centralny Ośrodek Informatyki*) and other research centers. There is a unchanged assumption that the information from the area covering Public Information Bulletin should remain in the respective parts of the website, which means that the news, strategies and projects should belong to the sphere of the Bulletin **[11, p. 58]**.

It is said in the Program that a development of services design standard for mandatory use is needed (at least by the government administration and as a recommended solution for the rest of the public administration). Moreover, the standard should be developed on the basis of existing standards used in public administrations of other countries (e.g. the UK, USA) in order to use good practices and experience applied already **[11, p. 67]**. So the layout of the Portal adopted the standard model of the British governmental single-entry-point portal GOV.UK.

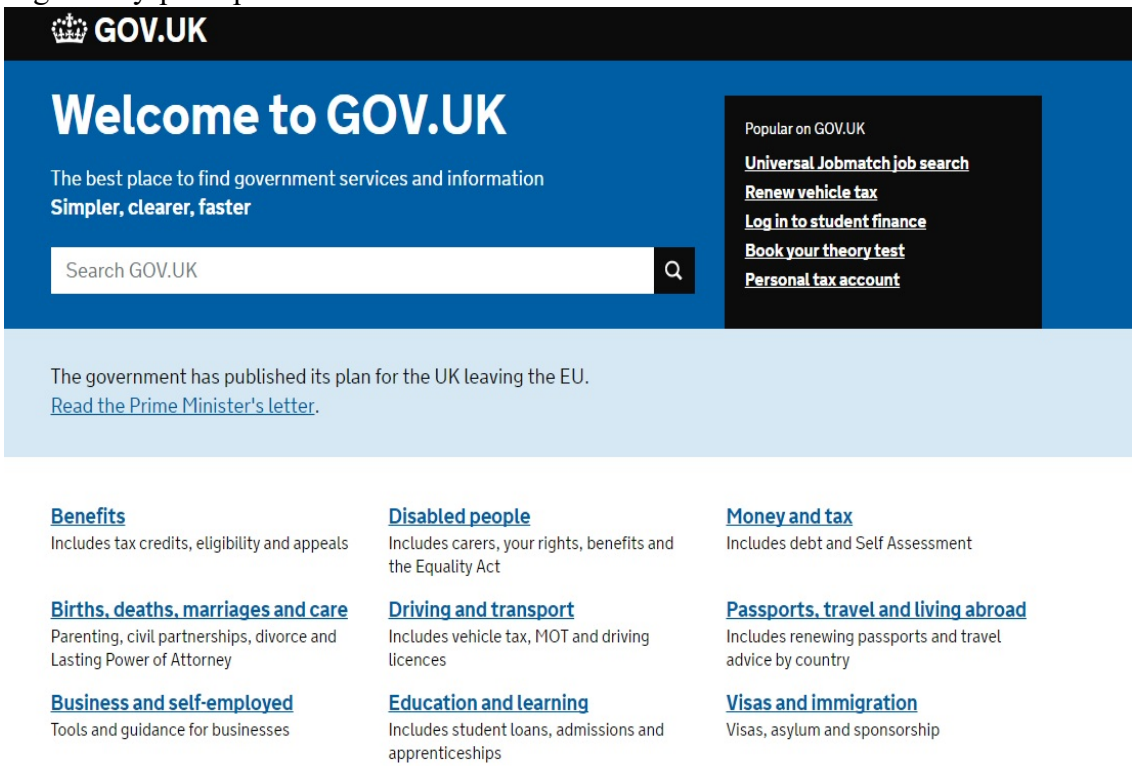


Figure 10: Home page of the British governmental single-entry-point portal GOV.UK. (Government Digital Service, 2017)

As it comes from the sitemap, GOV.UK portal also consists of two parts – services and information, departments and policy **[54]**. The first one can be called as a services part,

because a user chooses some category (e.g. benefits, money and tax, education and learning, etc.) and then gets an access to certain e-Services regarding specific issue. The second part is considered to be an information part, where are the shortcuts to departments, publications, and announcements categories. The portal is available in two languages – English and Welsh.

Figure 11: Sitemap of the British governmental single-entry-point portal GOV.UK. (Government Digital Service, 2017)

The same applies to the Canadian single-entry-point portal Canada.ca – Government of Canada **[55]**. Due to the bilinguality of Canada, the portal has two language versions – English and French, one of which a user can choose on the homepage. At the top of the homepage there are shortcuts to the most popular e-Services divided by the categories (e.g. jobs, immigration, travel, taxes, etc.).

Figure 12: Home page of the Canadian governmental single-entry-point portal Canada.ca. (Canada.ca Web Services, 2017)

Portal Canada.ca consists of two parts as well -services and information. At the bottom of the home page there is a sitemap, where are the shortcuts to departments and agencies, laws and regulations, news, etc. Moreover, the most requested services and information are listed above there. Government department and agency websites are merging to the portal. As of January 2017, since 2013 Canada.ca has received over 590 million visits. Users submitted over 50,000 comments, and the number of users accessing the portal via mobile devices increased by over 150%. The most popular services belong to weather, immigration, jobs, travel and health categories **[55]**.

Figure 13: Outcomes and statistics of the Canadian governmental single-entry-point portal Canada.ca. (Canada.ca Web Services, 2017)

Taking into account that Australia ranked the 2nd country (after the UK) in the UN E-Government Survey 2016 **[56]**, its single-entry-point portal is also an important example to learn.

Figure 14: Home page of the Australian governmental single-entry-point portal myGov. (Australian Government, 2017)

However the Australian Government has the unified portal, where a user can get access to information and services, news, departments and agencies, etc. **[57]**, myGov portal provides users with the direct access to e-Services. In order to create a myGov account, a user should enter own email address, get a confirmation code in the email and enter it, and setup an account afterwards. Once an account is created, a user can sign in to its myGov account using myGov username, email address or mobile number along with a password **[58]**. After creating a myGov account, a citizen benefits from many features, such as myGov Inbox (receiving messages from Medicare, Australian Taxation Office, Centrelink, Child Support, Department of Veterans' Affairs, National Disability Insurance Scheme), Australian JobSearch, My Health Record, My Aged Care, Victorian Housing Register Application, etc. **[58]** Messages in myGov Inbox can include online letters, statements and other types of information.

Coming back to the British single-entry-point portal GOV.UK, it was launched on 1 February 2012 in scope of the Transformation Programme, which was aimed to make 25 major services digital by default. In January 2013 government began to transform 25 major services in 400 days, making them digital by default and simple, clearer and faster to use. During this period 8 departments across government redesigned these digital exemplars based on the needs of users. In March 2015 the Transformation Programme ended and government had delivered a range of highly-performed digital services used by millions of people in the UK and from abroad **[59]**. The structure of the portal is guided by 10 design principles, including “start with user needs, not government needs”, “be consistent, not uniform” and “do less”, which came out of user feedback and developing a cross-platform website **[60]**.

The last country to consider as an analog in the context of single-entry-point portal is Estonia. However it ranked 13th country in the UN E-Government Survey 2016 **[61]** (Canada ranked 14th), its developments and experiences are highly-evaluated in the world, e.g. Poland uses the Estonian approach in the building of the state information architecture. The single-entry-point portal of Estonia – eEesti.ee – which is called “Gateway to eEstonia”, gives residents the access to their own data, miscellany of public e-Services (both for citizens and entrepreneurs), and contacts of governmental institutions and agencies.

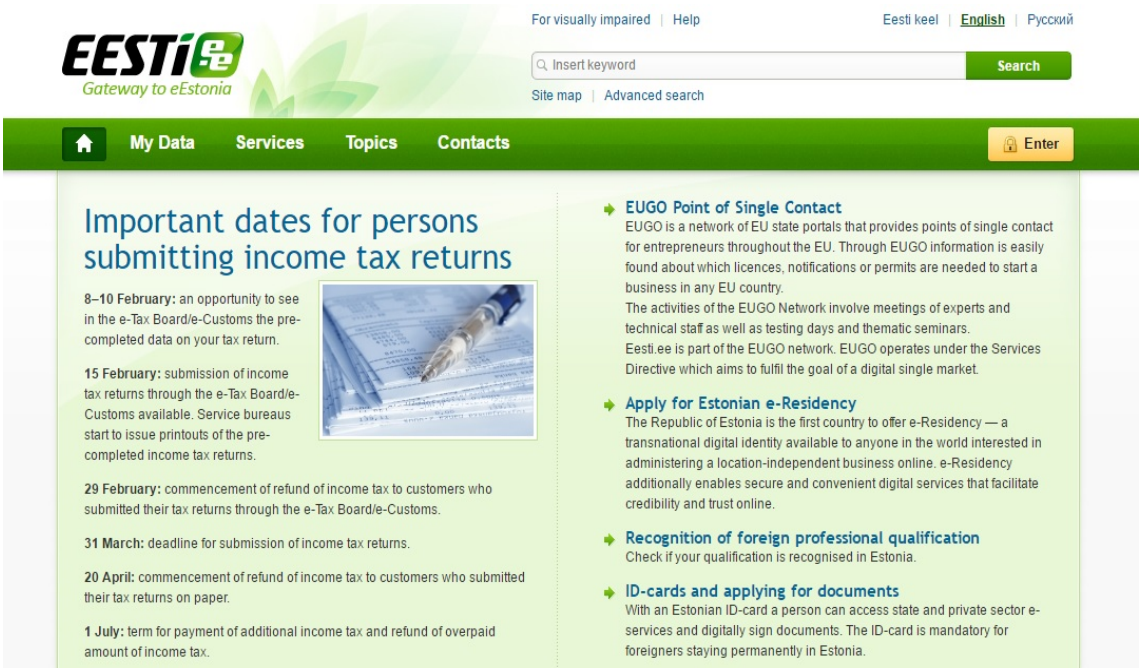


Figure 15: Home page of the Estonian single-entry-point portal eEesti.ee. (Riigi Infosüsteemi Amet, 2017)

The portal is available in three languages: Estonian, English, and Russian. All the Estonian databases are decentralized, so that there is no single owner or controller; every government agency or business can choose the product that is right for them; services can be added one at time, as they are ready **[62]**. The databases are connected via X-Road, the data exchange layer for information systems, a technological and organizational environment enabling a secure Internet-based data exchange between information systems. It ensures authentication, multilevel authorization, a high-level log processing system, encrypted and time-stamped data traffic **[63]**. X-Road also enables residents and officials to operate via different portals and applications more efficiently. For instance, a resident can submit a query about queries of his/her data, which were made by some institutions (e.g. Police and Border Guard Board, bank, etc.) **[64]**. The result of the query shows a list of the queries for the person's data, which includes data of a query, name of institution, and file number. A person can save a list of queries in PDF format, where a person's name and surname, national identification number (*isikukood*), and timestamp are included. This service is open for private persons. However the portal is trilingual, the result of query is available in Estonian only,

because it is an official document. Below there is statistics of the portal eEesti.ee as of 2014 (more recent data as of 2015 and 2016 are absent).

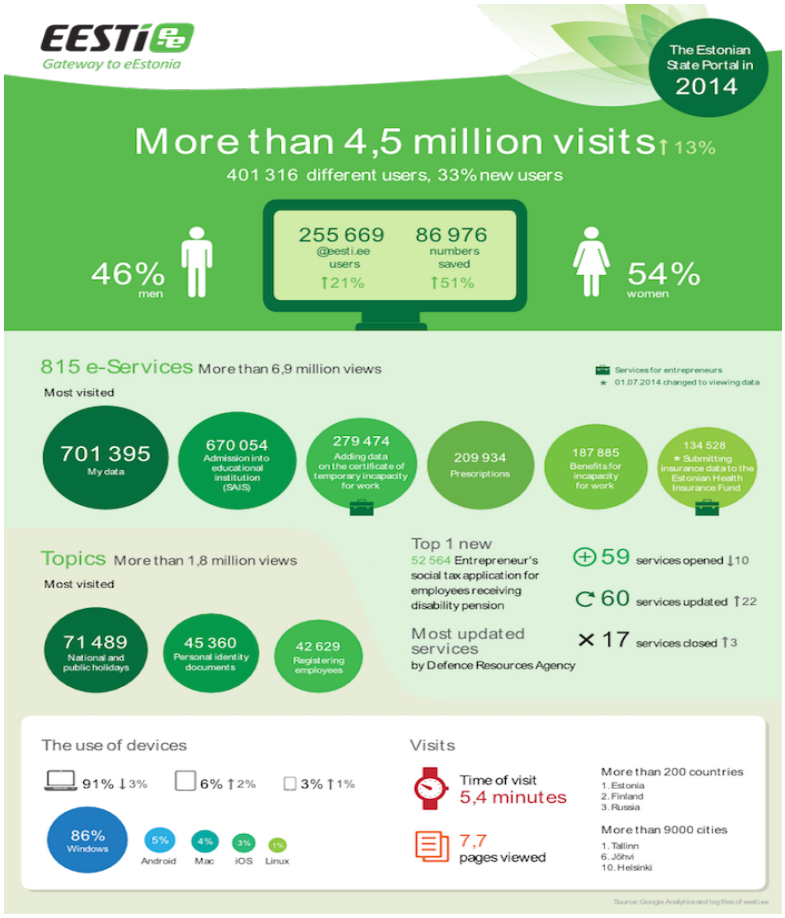


Figure 16: The Estonian governmental single-entry-point portal eEesti.ee in numbers (as of 2014). (Opus, 2015)

Poland's Public Information Architecture Team will be responsible for the architecture of public information, set up at the national level within the Administration Competence Center (*Centrum Kompetencyjne Administracji*) and structurally included in the Ministry of Digital Affairs of the Republic of Poland **[11, p. 59]**. Among the basic objectives of the Center there is defining publication rules of the Portal's of the Republic of Poland content and other public portals. Team tasks include directing the processes of building state information architecture, setting standards and defining good practices, coordinating efforts to update the architecture, e.g. responding to changing social reality and user needs, and coordinating executive work in these areas **[65]**. Public information editorial teams will collaborate with the Public Information Architecture Team at the level of ministries and other governmental institutions. Those teams are responsible for

sharing public information by their parent units. Work in content architecture teams will require good knowledge in electronic forms of communication, creativity, and innovative approach. The results of their work will contribute to the emerging central competence base within the Administration Competence Center **[11, p. 59]**.

The whole portal Polska.gov.pl will operate within an open single Content Management System (CMS). There will be developed the state unified content management system in order to serve the Portal as more public institutions are incorporated into it. For example, Australia uses the single content management system Drupal 8 via aGov, which is a ready-to-go software for all government organizations at federal, state, and local level **[66]**. It is currently used on 550 websites.

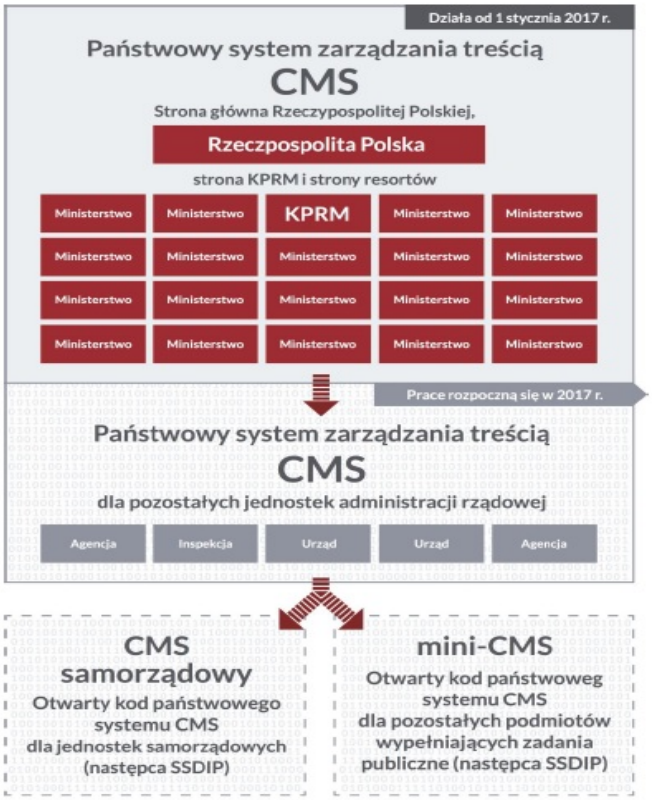


Figure 17: Scheme of the Polish state CMS (Content Management System) (since 1 January 2017). (Program Zintegrowanej Informatyzacji Państwa, 2016)

There was planned that by 1 January 2017 the websites of the Polish ministries will be linked with the Portal via common CMS system, and then in subsequent versions of the

Portal will be joined by other governmental institutions. The state CMS will have an open structure so that institutions working in its environment can develop it and then developed solutions will be available to others in the source codes state repository **[11, p. 60]**.

The source code of the Portal will be also shared for local government institutions. They will be able to create websites connected with the register of public administration authorities. Thus local government CMS will continue the idea of free public information sharing system. Taking into account that CMS system codes are open, it will be possible to compile the functions according to the needs of the institution **[11, p. 61]**. The open, simplified version of the state CMS system, based on which public institutions can easily create their own websites www, should be also created. A designed API in EZD RP environment should be linked to the state CMS system at all levels of the public administration so that their data processing capabilities can be used by all public administration authorities. Websites of governmental institutions will be ultimately maintained on the central server. Versions of the state CMS system dedicated to other public administration institutions will be embedded on their own servers.

Information part of the Portal, which will take over the functions of the Public Information Bulletin (home page bip.gov.pl), will be organized according to the provisions of the Act of 6 September 2001 on access to public information (*Ustawa z dnia 6 września 2001 r. o dostępie do informacji publicznej*) **[67]**. Therefore it will be the page, which contains the list of of public authorities and local government including links enabling connecting with the respective pages along with providing access to public information and possibility of searching it in the system. Moreover it will provide an access to the central repository. The way of addressing depends on the content of the home page of the Portal.

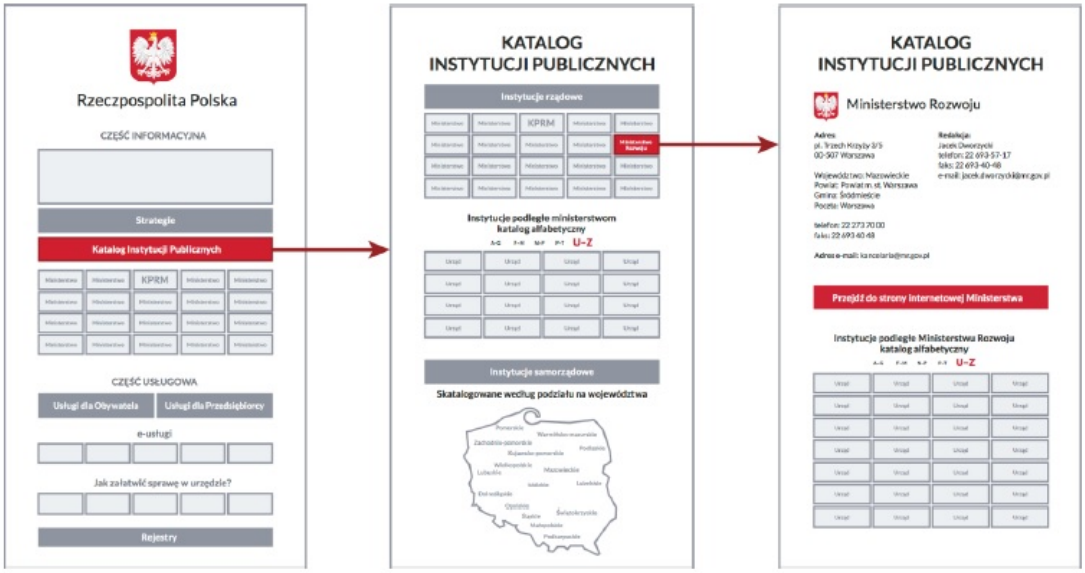


Figure 18: Information architecture scheme on the home page of the Portal of the Republic of Poland. (Program Zintegrowanej Informatyzacji Państwa, 2016)

The figure above shows the pattern of an information architecture of the Portal. Once a user clicks on the button with the catalog of public institutions, he/she enters an institution's information page, where a user can visit an institution's website. The information part of the Portal of the Republic of Poland will meet the standards of the Public Information Bulletin structure, taking into account the changes to be made at the legal level.

There are few requirements for sub-page of the Portal:

2. Ensuring the structure of the Public Information Bulletin page:

a. Applying SSDIP (*Scentralizowany System Dostępu do Informacji Publicznej* – Centralized System of Access to Public Information) or any other ICT system.

b. Form of the page www.

c. Link to the home page of the Public Information Bulletin.

d. Address of the website editor.

e. Name, phone number, and email address of the editor.

f. Instructions for using a sub-page of the Public Information Bulletin.

g. Subject menu to find information.

h. No ads.

3. A person designated by an institution is responsible for:

a. Passing information necessary to run the home page of the Public Information Bulletin.

b. Immediate notification of changes in the content of information provided to the Public Information Bulletin.

c. Making changes to the content of public information on sub-pages of the Public Information Bulletin **[11, p. 64-65]**.

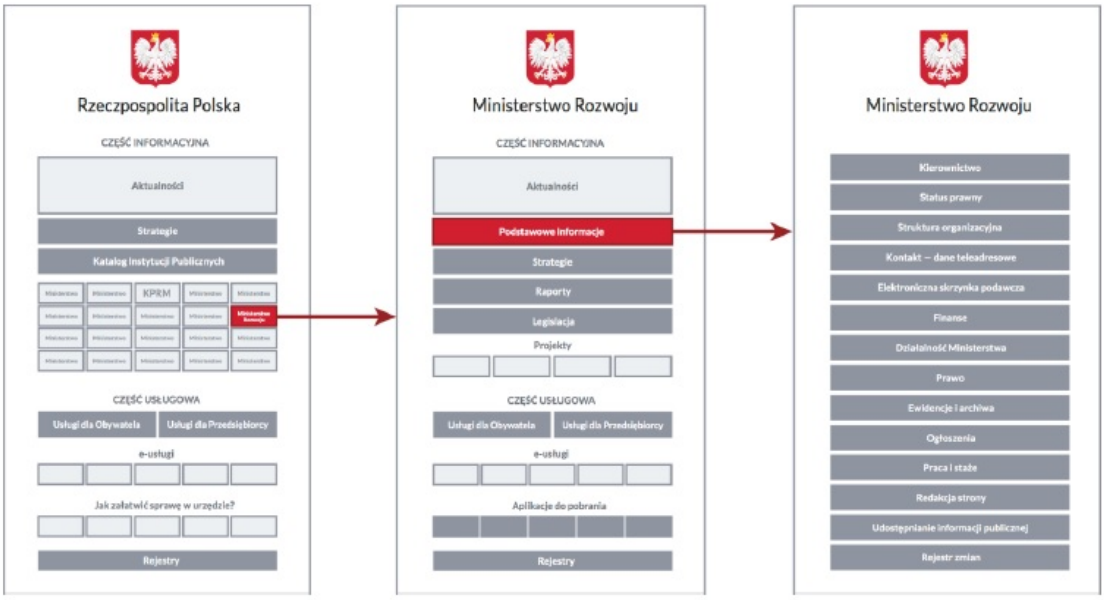


Figure 19: Information architecture scheme on the home page of the Polish ministry on the Portal of the Republic of Poland (Ministry of Economic Development as an example). (Program Zintegrowanej Informatyzacji Państwa, 2016)

The abovementioned figure shows the sample of ministerial page on the Portal. Once a user chooses a page of some ministry, he/she is redirected to the respective ministry's page. For instance, if a user clicks a basic information about the ministry, the Portal redirects to the page with links onto structure, management, contacts, etc. The feature of the Portal is that every page of any institution at the government level will have the same graphical layout.

It was planned that since 1 January 2017 the Portal will unite the governmental administration institutions of Poland, but the overall goal is a single-entry-point portal of the whole Polish public administration. The stable release of the Portal of the Republic of Poland had to be released by 31 March 2017, including home page, page of the Chancellery of the Prime Minister and pages of all ministries. During 2017-2018

content and layout architecture projects have to be prepared for other government administration institutions; during 2017-2019 content and layout architecture projects have to be prepared for pages of local government institutions **[11, p. 66]**.

The service part of the Portal is a development of the existing function of the current portal Obywatel.gov.pl. It is aimed to provide citizens with simple access to a unified Polish government administration website, which could be a primary information source on how to get public services done. Also, its aim is integrating ministerial websites in information website of the Council of Ministers **[20, p. 1]**. Portal Biznes.gov.pl, which will be analyzed in the next chapter, plays the same role for entrepreneurs.

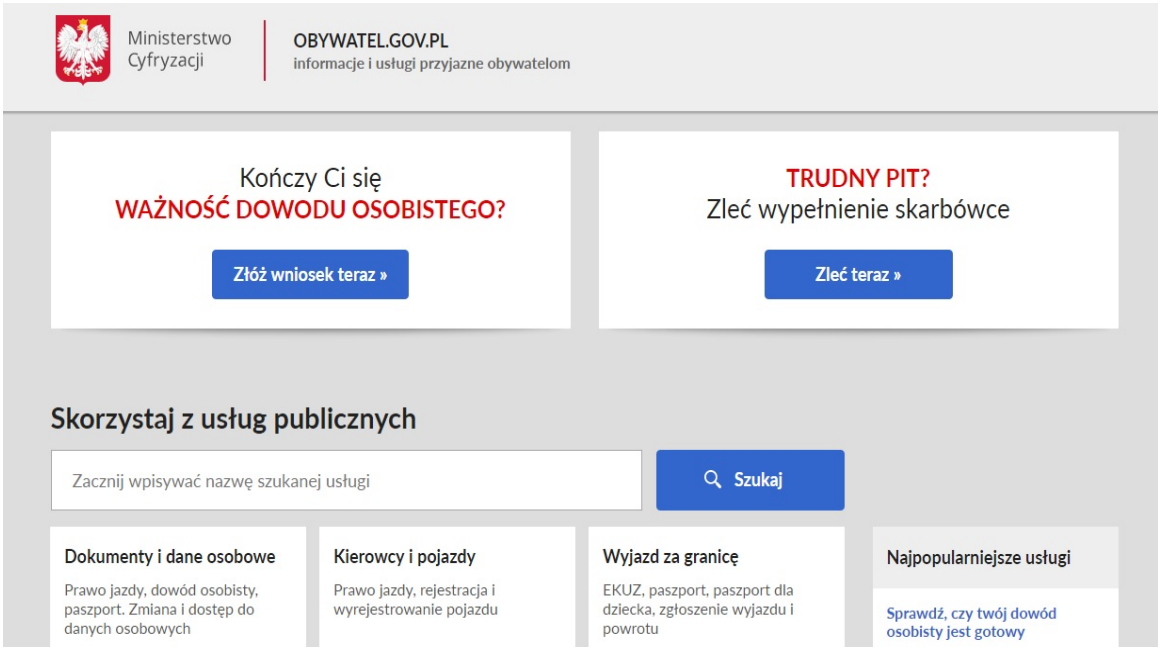


Figure 20: Home page of the Polish governmental e-Services portal obywatel.gov.pl. (Ministerstwo Cyfryzacji, 2017)

The upcoming Portal of the Republic of Poland will offer more e-Services for citizens, enable a secure account for contacts with the public administration along with ability to obtain necessary public information and consult government documents. The service part of the Portal will have two main functions: gateway for domain services; interface for ePUAP services for citizens and entrepreneurs **[11, p. 66]**. Current home page of ePUAP will not be visible to users, but central e-Services will be still available online and will be described in accordance with the description standard required on the portal obywatel.gov.pl. For local services will be allocated the space allowing to search for services provided by specific public administration institutions, including links to

regional portals. Therefore the Portal polska.gov.pl will be the single-entry-point portal for all public e-Services in Poland. The e-Services, which can be designed and implemented nationwide, will be also under construction. Activities in the development of the service part can be implemented by the continuation of the "Obywatel" initiative. It was planned that by 31 December 2017 minimum 50 new high quality public services without law barriers will be digitized, by 31 December 2018 minimum 20 new high quality public services with law barriers will be digitized along with minimum 50 optimized existing e-Services so far **[11, p. 71]**. Moreover during 31 March 2017 – 31 December 2018 the systematic integration into the Portal ecosystem of registries serviced by independent systems in such spheres as healthcare, law, legislation and online consultations is scheduled.

In the most recent report prepared by Capgemini consulting group in May 2014 on e-Government benchmark in Europe, Poland was mentioned as one of a few countries with lack of awareness on the using online channel when dealing with government **[68, p. 19]**. The authors suggest that it could benefit from awareness-raising campaign. Moreover, it raised as one of countries, where saving money emerged more prominently as the principal driver for using online public services **[68, p. 20]**. Finally, Poland ranked in the implementation of e-Government priorities in group C "Steady performers: ship floating nicely" along with Belgium, France, Iceland, Italy, Latvia, Sweden, Slovenia and Turkey. It involves good performance, consistently, across all priorities; most room for improvement as regards cross-border services and transparency **[68, p. 26]**.

In general, the future Polish single-entry-point portal polska.gov.pl can be viewed as a service model in terms of agent-oriented modeling. It is a multiagent system consisting of agents and services, where services make up a computational environment for the system. By turn, services rely on functional objects, which are basic software building blocks. Agents interact with each other in an asynchronous manner and invoke services in a synchronous way **[69, p. 108]**.

5 Polish Developments of the EU Digital Single Market: International Aspect

One more important aspect to highlight in scope of the Master's thesis is an international aspect, which includes the EU Digital Single Market in Poland. The Polish Ministry of Economic Development launched the separate portal of e-Services for entrepreneurs – biznes.gov.pl **[14]**. On 28 December 2009 the first Point of Single Contact in Poland was created in order to support persons who conduct business or are planning to start a business. It was established for execution of the Services Directive (Directive 2006/123/EC) and Polish Act of 2 July 2004 on Freedom of Economic Activity **[14]**. Points of Single Contact (EUGO network) were created in order to simplify administrative procedures; it is a single point through which each provider can complete all procedures and formalities needed for access to his service activities, particularly all declarations, notifications or applications necessary for authorization from the competent authorities, including applications for inclusion in a register, roll or database, or for registration with a professional body or association **[70]**.

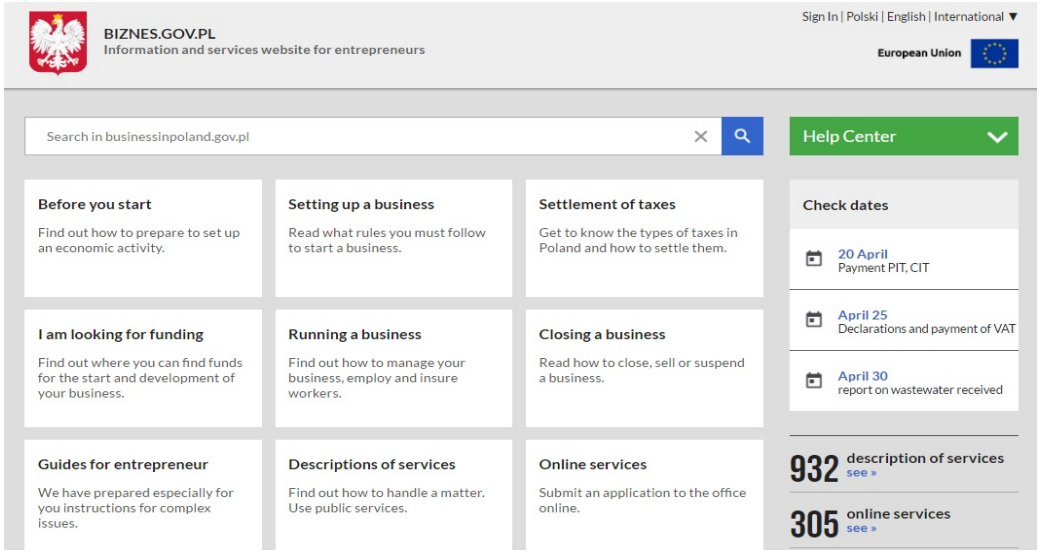


Figure 21: Home page of the central Points of Single Contact portal in Poland – biznes.gov.pl. (Ministerstwo Rozwoju, 2017)

EU countries are not legally obliged to make available tax and social security procedures through the Points of Single Contact, however a large number of EU countries already provide for this possibility, and all others are encouraged to do so too **[71]**.

After creating the Point of Single Contact in Poland, the next step was project "Central Register and Information on Economic Activity" (*Centralna Ewidencja i Informacja o Działalności Gospodarczej*) realized by the Polish Ministry of Economic Development (*Ministerstwo Rozwoju*) as the leader, and the Institute of Logistics and Warehousing (*Instytut Logistyki i Magazynowania*) and the National Chamber of Commerce (*Krajowa Izba Gospodarcza*) as partners, which created the platform of information on the conditions of business activity within the framework of the activity "Launch of the Electronic Contact Point" **[14]**. In scope of the project the portal biznes.gov.pl was created. "Simplification of setting-up and conducting business procedures through their electronization and implementation of the one-stop shop concept" project outcomes were used during creation of the portal.

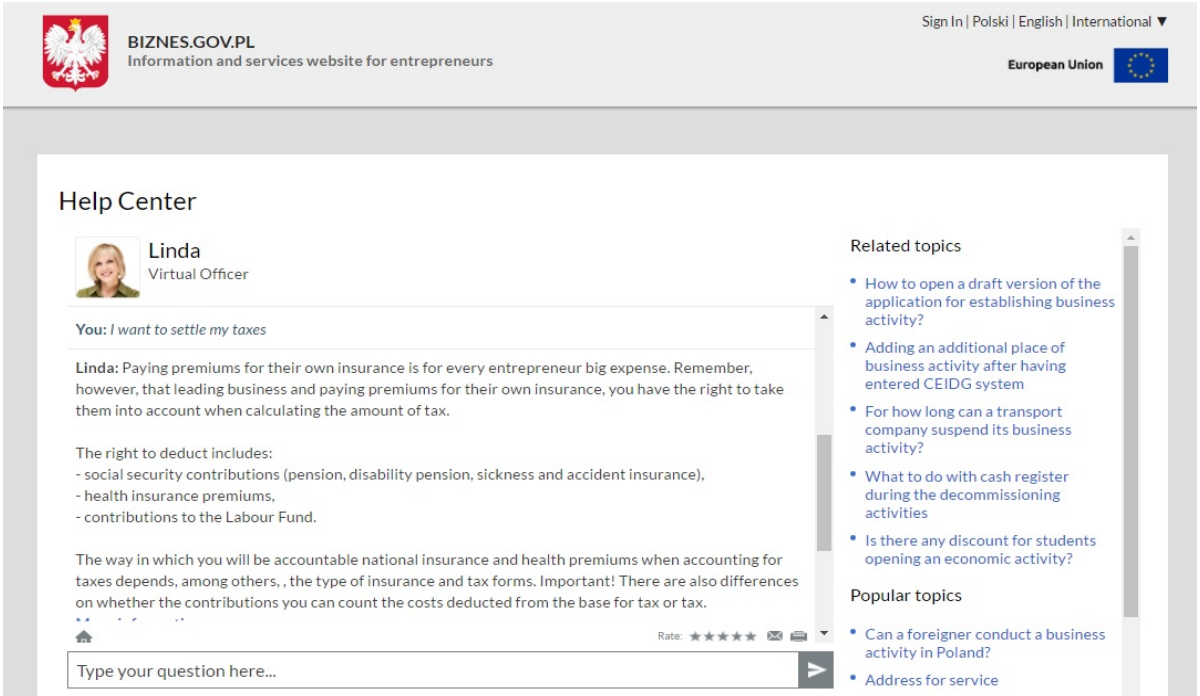


Figure 22: Help center with virtual officer on the Polish portal biznes.gov.pl. (Ministerstwo Rozwoju, 2017)

Biznes.gov.pl website was also mentioned in 2014 Capgemini report as one, which has embraced the concept of life events to guide entrepreneurs and provide information

suited to their needs **[68]**. The portal is multilingual, basic languages are Polish and English, other language versions have a machine translation. It includes 932 descriptions of services, 305 online services, and 144 guides (as of April 2017). The feature of the portal is the help center in the form of virtual officer as a chatbot, which is depicted above. For creating an account on the portal a user needs to enter his/her name, surname, email address, password, tick a consent box on processing of personal data, and tick a box on setting-up an account in the administrative panel of the portal (in case a user is a civil servant who fulfills its official duties). Logging in is possible via created account on the portal, Facebook profile or Trusted Profile (*Profil Zaufany*) **[14]**.

In order to compare the Polish Points of Single Contact portal with other ones in the EU Member States,three countries from abovementioned Capgemini report's group C "Steady performers: ship floating nicely" in the implementation of e-Government priorities were chosen – Belgium, Italy, and Sweden respectively. First of all, Belgium will be considered. It should be noted that it made a significant progress in the e-Governance development among EU Member States. In November 2004 Belgium became the first country in the world to start issuing electronic ID cards that contain a

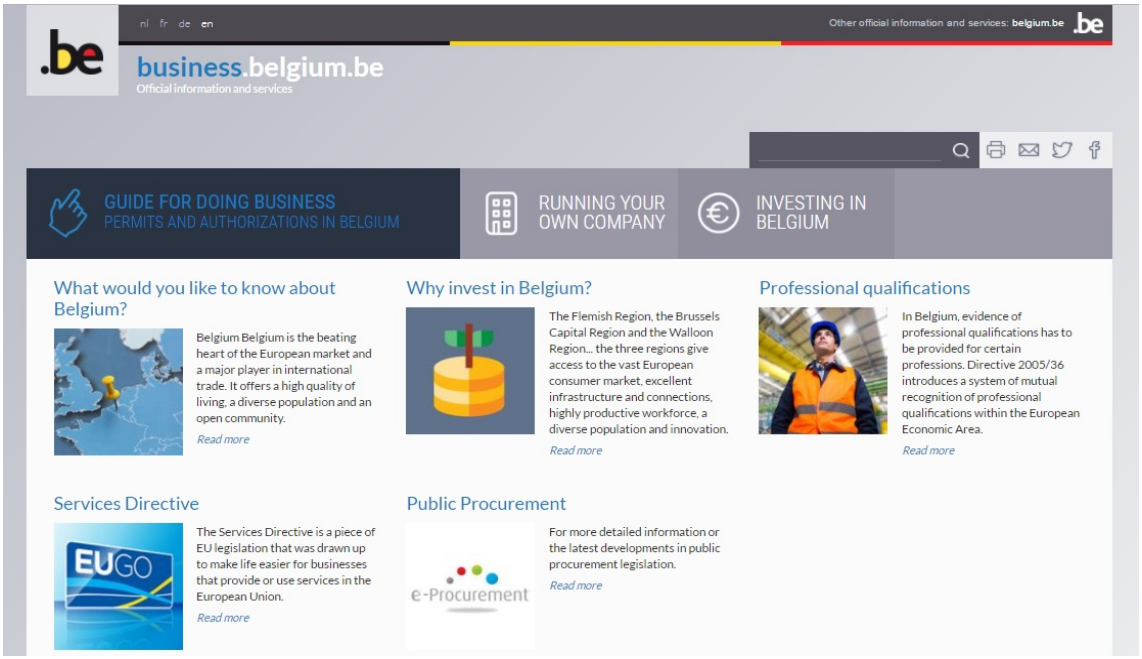


Figure 23: Home page of the central Points of Single Contact portal in Belgium – business.belgium.be. (Belgian Federal Government, 2017)

facial image of the holder stored in a microchip **[72, p. 20]**. In 2015 'Digital Belgium' program was presented. It is aimed at transforming the Belgian economy in order to meet the today's requirements of the running digital revolution. The program would become as a guideline to grow the economy, create more jobs, and sustain well-being in the country. Belgian Federal Government clearly marked its goals and objectives in the digital domain they are going to achieve by 2020 **[73, p. 1]**.

The portal business.belgium.be is quadrilingual, available in Dutch, French, German and English respectively. It includes the procedure guide for doing business with built-in search engine, which allows to find an information about the procedures and requirements required for Belgian and foreign businesses wishing to set up a business in Belgium or carry out temporary activities in the country **[74]**. The next sub-part of the portal is running own company, where is placed information on creation, taxation and accounting, regulated occupations, etc. The last sub-part is investing in Belgium, which contains important information on tax benefits, tax support, and reasons to invest in the country.

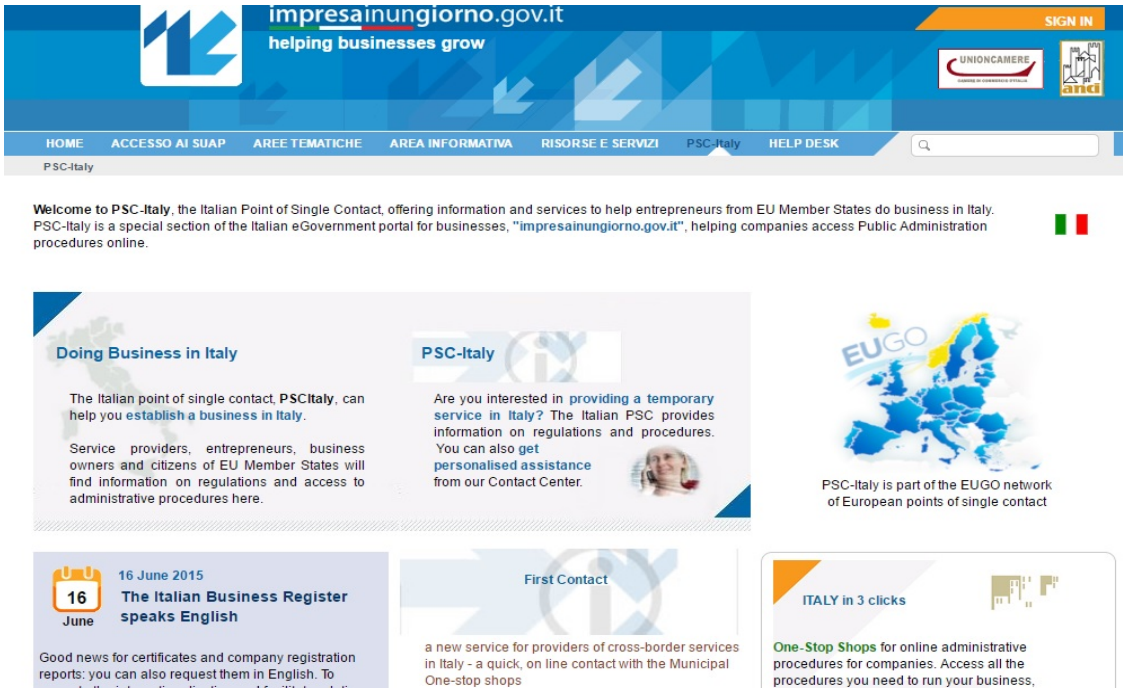


Figure 24: Home page of the central Points of Single Contact portal in Italy – impresainungiorno.gov.it. (InfoCamere, 2017)

The portal impresainungiorno.gov.it is the central Points of Single Contact portal in Italy. It is bilingual, available in Italian and English. The portal offers information and

services to help entrepreneurs from EU Member States conduct business in Italy, helping companies access public administration procedures online **[75]**. The portal, connected to the Public Connectivity System, fills the gap in the IT shortcomings of the Italian municipalities **[80, p. 62]**.

Establishing business sub-part includes information on providing a service and setting-up a new legal entity. The sub-part on cross-border provision of services contains EU legal regulations on free provision of services. There is said that EU Member States shall not impose their national requirements on incoming providers who practice on a temporary and occasional basis **[75]**. According to Article 16 of the Services Directive (Directive 2006/123/EC), application of national requirements to cross-border provision of services can only be justified if necessary for the protection of public policy, public security, public health or protection of the environment **[70]**. Since November 2015 the portal offers a new service for providers of cross-border services in Italy, which allows future businesspersons to fill out an online form to be sent directly to a municipal one-stop shop in the municipality of interest in order to find out about the local procedures or licenses needed to carry out a business **[75]**.

A new user can register on the portal using a Digital Certificate, Telemaco account (Chambers of Commerce) or sign up initially. In order to sign in, a user can access the services via three channels – SPID (Public System of Digital Identity – accessing all online services of the Italian public administration with a single digital identity) **[76]**, Digital Certificate (CNS, using smart card or USB token) or registered account on the portal. The portal fills the gap in the IT shortcomings of the Italian municipalities [80].

The last country to analyze the EU Points of Single Contact in the Master's thesis is Sweden. Its central portal – verksamt.se – is bilingual, available in Swedish and English **[77]**. It is divided into five sub-parts, which follow a life cycle of an average business (considering, starting, running, developing and closing down) Considering business sub-part contains the important information about requirements to meet before starting a business in Sweden. Starting business sub-part includes information about types of business, business registration and tax, opening a branch, etc. Running business sub-part is devoted to information on business documents, accounting, employing staff, and so on. Developing business sub-part includes information about financing growth and managing a growing company. Lastly, closing down business sub-part contains useful

information on deregistration and liquidation, selling, and bankruptcy. The contact section of the portal comprises customer service, help desk technical support, and help desk Services Directive. Moreover, the portal has a broad FAQ section, which lists questions and answers on starting and running a business in Sweden.

Figure 25: Home page of the central Points of Single Contact portal in Sweden – verksamt.se. (Tillväxtverket, 2017)

Likewise the Belgian portal business.belgium.be, the Swedish portal verksamt.se does not support user accounts directly. It provides a comprehensive single point for entrepreneurs to access state e-Services and information from three public authorities: the Swedish Companies Registration Office (*Bolagsverket*), the Swedish Tax Agency (*Skatteverket*), and the Swedish Agency for Economic and Regional Growth (*Tillväxtverket*) **[78, p. 26]**. Verksamt.se portal combined in itself guidance and information parts, which include the company registration and company tax filling e-Services. Finally, it introduced a new toll for creating a business plan.

The biggest disadvantage of the portal is that the use of different application services seems to be fairly low. Business users have to navigate between many websites from

organizations on national, regional and local level in order to find adequate information and service opportunities **[79, p. 56]**. The web portal deals with many digital resources competitors, which provide information and services to businesses, so it is unhelpful to some extent.

In May 2015 the European Commission approved the Digital Single Market Strategy for Europe. Regarding contact points there was said that they are currently fragmented and incomplete. It is mentioned that the needs of businesses and citizens in their cross-border activities could be better met by building on the Digital Services Infrastructures of the Connecting Europe Facility, extending and integrating existing European portals, networks, services and systems (e.g. Your Europe, Single Points of Contact, Product Contact Points, etc.), and linking them to the "Single Digital Gateway" **[13]**.

Yet in 2010 in the Digital Agenda for Europe establishing a list of common cross-border services along with setting-up systems of mutual recognition of electronic identities were noted as one of ICT-enabled benefits for society. There was said that it will allow businesses and citizens to operate independently or live anywhere in the EU **[51]**.

In case of Poland the future single-entry-point portal polska.gov.pl will combine functions of two existing portals – obywatel.gov.pl and biznes.gov.pl. It will extract data from the EU and Polish databases, as it is presented in the figure below. All this will help to deliver better e-Services for citizens of Poland and foreigners who live there, allowing direct contact with the public administration in more fast and efficient way.

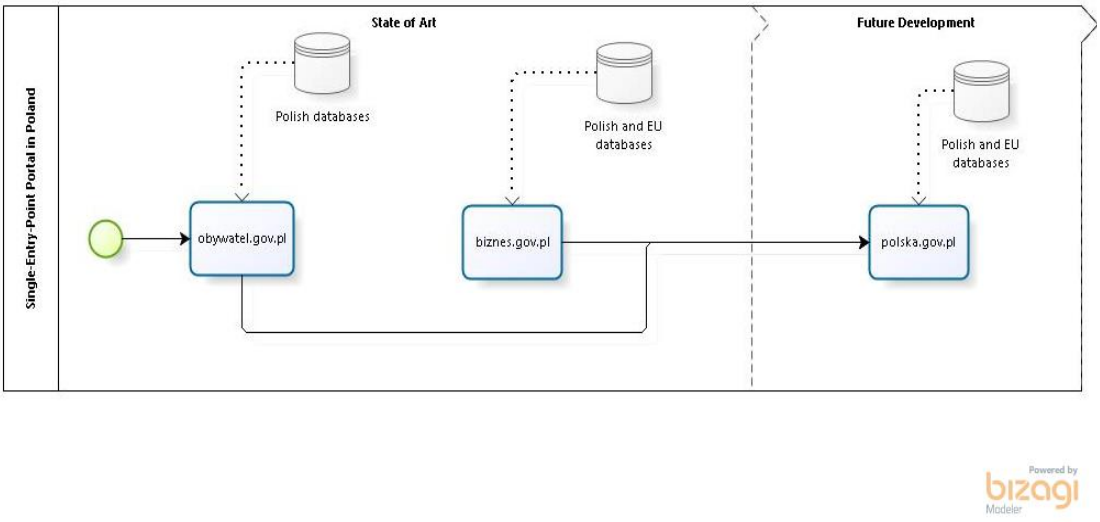


Figure 26: Development of the Polish single-entry-point portal polska.gov.pl. (own model created with Bizagi Modeler, 2017)

6 Summary

The performed research of the State Integrated Informatization Program in Poland gives the basis for following conclusions:

1. According to 2016 United Nations e-Government Development Index, Poland ranked 36th in the world. In the end of 2015 there was created the Ministry of Digital Affairs, which is fully responsible for the state informatization programs implementation. It has several strategic action priorities in computerization of public services. Poland follows the path and experience of the most advanced countries in the e-Governance domain (e.g. the UK, Australia, Estonia and Canada). The author used the comparative analysis as a research methodology. Single-entry-point portals in the abovementioned countries were compared with the future one in Poland, as well as paralleled the operating Points of Single Contact in Belgium, Italy, and Sweden including the legal aspects yet. The term ontology is very important in the context of the comparative methodology, especially a semiotic triangle, which means the communication between the human and the machine referring to terminology set up in the ontology. Ontologies can be constructed at the knowledge level, one of enablers is the METHONTOLOGY framework, which includes the identification of the ontology development process, a life cycle based on developing prototypes, and particular techniques to execute each activity. The METHONTOLOGY framework can be used in the building of the single-entry-point portals in terms of ontology development process as it includes the whole life cycle (management, development, support). There are also the Capgemini approach (a four-stage model for assessing government e-Services) and WAES (Website Attribute Evaluation System) method of evaluating Internet services in public administration.

2. There is not much specialized academic literature on e-Governance in Poland. The main source for the Master's thesis is Poland's State Integrated Informatization Program along with other government documents and programs. The EU Digital Single Market Strategy for Europe gives the general overview about cross-border e-commerce

including Points of Single Contact. There are no special compound researches on Poland's e-Governance, that's why the specific recent articles were used. The New Public Management (NPM) approach with its post-NPM notions was used for the Master's research.

3. All the current e-Governance initiatives in Poland are included in the State Integrated Informatization Program and being supervised by the Polish Ministry of Digital Affairs as the executive body. The main service-oriented actor in Poland to provide administrative services to the public via electronic communications channels is the Electronic Platform of Public Administration Services (ePUAP). The second service-oriented actor is the Polish ID-card that still doesn't have the unified standard of the electronic signature as compared with Estonia, however a legal framework for e-Signatures is well-developed in Poland. The Polish public administration authorities launched a lot of e-Services, most of which are dispersed. Also the Polish government has started designing the infrastructure to enable citizens to submit documents electronically, however a lot of doublespeak arose in the public sphere regarding e-Signatures.

The level of users in relations with the Polish public administration reached 92% in 2015. Poland ranked 22nd out of 28 EU Member States in the European Commission's DESI 2016. The state still belongs to the falling behind cluster. It means that the Polish performance is below the EU average and improved slower than the European Union as a whole. Thus the operational objective of the State Integrated Informatization Program is creation of a coherent, logical, and efficient information system of the state, ensuring transparency in the functioning of the administration and delivering key services for citizens and businesses in a cost-effective and quality way at the state and pan-European level.

4. The creation of the Portal of the Republic of Poland, a single-entry-point portal, is the main project in scope of the State Integrated Informatization Program. It will be based on the information model of the existing Public Information Bulletin. The Portal will be developed on the basis of current standards used in public administrations of other countries. The single-entry-point portals in Estonia, the UK, Australia and Canada were analyzed. All these portals are an evidence of changes in the public administration thinking. The stable release of the Portal of the Republic of Poland had to be released by

31 March 2017, including home page, page of the Chancellery of the Prime Minister and pages of all ministries, but still it does not exist (as at the end of April 2017). It should combine two existing portals – obywatel.gov.pl and biznes.gov.pl – in its service part.

5. The Polish Ministry of Economic Development launched the separate portal of e-Services for entrepreneurs – biznes.gov.pl, which is the integral part of the EU Points of Single Contact (EUGO network) in terms of the EU Digital Single Market. It extracts data from Poland's Central Register and Information on Economic Activity, and EU databases. The Polish central Points of Single Contact portal was analyzed with respective portals in Belgium, Italy, and Sweden according to the classification of Capgemini consulting group.

In general, Poland made an average progress in the e-Governance development. Despite significant political and managerial changes in this domain, it still stagnates a lot. Delays in building public e-Services result from an atomistic structure of information resources that are managed on the national level. It needs deeper consideration by the Polish government. The future single-entry-point portal should combine information and services parts along with trans-boundary services both for citizens and businesses from Poland and other EU Member States.

References

[1] United Nations Department of Economic and Social Affairs. *United Nations E-Government Survey 2016: E-Government in Support of Sustainable Development*, 2016.

[2] About us, *Ministry of Digital Affairs*, https://mc.gov.pl/en/the-areas-of-our-activity. 24 November 2016.

[3] Perrow, Charles. "A Framework for the Comparative Analysis of Organizations." *American Sociological Review*, vol. 32, no.2, April 1967, pp. 194-208.

[4] Guarino, Nicola, et al. "What Is an Ontology?" 2003. *Handbook on Ontologies*. Edited by Steffen Staab and Rudi Studer. Springer-Verlag, 2009, pp. 1-17.

[5] Fernández-López, Mariano, and Asunción Gómez-Pérez. "Overview and analysis of methodologies for building ontologies." *The Knowledge Engineering Review*, vol. 17, issue 2, June 2002, pp. 129-156.

[6] Haav, Hele-Mai. "A Practical Methodology for Development of a Network of e-Government Domain Ontologies." Building the e-World Ecosystem: 11th IFIP WG 6.11 Conference on e-Business, e-Services, and e-Society, I3E 2011 Kaunas, Lithuania, October 12-14, 2011, Revised Selected Papers, pp. 1-13.

[7] Demczuk, Agnieszka, and Agnieszka Pawłowska. "Progress Toward e-Government in Poland: Issues and Dilemmas." *Information Polity*, vol. 11, no. 3-4, 2006, pp. 229-240.

[8] Han, Jongwoo, and Hyun Joon Kim. "Governance of Electronic Government: The Experiences of the United States and Canada." Final Report to the Electronic Governance, Research Institute of the University of Seoul, June 2002, pp. 1-28.

[9] Ślusarski, Marek. "Propozycja oceny geoportali internetowych poziomu lokalnego." *Infrastruktura i ekologia terenów wiejskich*, vol. 1, issue 3, 2012, pp. 109-115.

[10] Demchak, C. Chris, and Christian Friis. "Webbing Governance: National Differences in Constructing the Face of Public Organizations." *Handbook of Public Information Systems*, G. David Garson, ed., (New York: Marcel Dekker Publishers, 2000), http://classes.maxwell.syr.edu/PSC300_103/webbing%20Cyprg%20paper %20050102.htm. 26 November 2016.

[11] Program Zintegrowanej Informatyzacji Państwa, *Ministerstwo Cyfryzacji*, October 2016, https://mc.gov.pl/files/pzip_rm_v1_dba_tbs_tk_2016-10-21_fin_kg.pdf. 8 December 2016.

[12] Strategic Action Priorities of the Minister of Digital Affairs in Computerization of Public Services, *Joinup*, March 2016, https://joinup.ec.europa.eu/sites/default/files/mdas_strategic_action_priorities_in_public_services_-_final_0.pdf. 12 December 2016.

[13] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Digital Single Market Strategy for Europe, *EUR-Lex: Access to European Union law*, May 2015,

http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52015DC0192&from=EN. 15 December 2016.

[14] *BIZNES.GOV.PL – Information and services website for entrepreneurs*, https://www.biznes.gov.pl/przedsiebiorcy/. 15 April 2017.

[15] European eGovernment Action Plan 2016-2020, *European Commission*, October 2016, https://ec.europa.eu/digital-single-market/en/european-egovernment-action-plan-2016-2020. 20 December 2016.

[16] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: EU eGovernment Action Plan 2016-2020. Accelerating the digital transformation of government, *EUR-Lex: Access to European Union law*, April 2016, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016DC0179&from=EN. 21 December 2016.

[17] Non-paper w zakresie ogłoszonych przez Komisję Europejską konsultacji publicznych do "eGovernment Action Plan 2016-2020", *Ministerstwo Cyfryzacji*, https://mc.gov.pl/files/non_paper_dot_egovaction_plan_2016-2020_po_konsultacjach.pdf. 25 December 2016.

[18] Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC, *EUR-Lex: Access to European Union law*, August 2014, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0910&from=EN. 26 December 2016.

[19] Uchwała Nr 26/2016 Rady Ministrów z dnia 22 marca 2016 r. zmieniająca uchwałę w sprawie przygotowania i wdrożenia inicjatywy "Obywatel", *Kancelaria Prezesa Rady Ministrów,* 2016.

[20] Uchwała Nr 26/2016 Rady Ministrów z dnia 22 marca 2016 r. zmieniająca uchwałę w sprawie przygotowania i wdrożenia inicjatywy "Obywatel", *Kancelaria Prezesa Rady Ministrów,* 2016, załącznik nr 1.

[21] Popiołek, Malwina. "E-Government in Poland – Selected Issues." *Journal of Education Culture and Society*, no. 2, 2013, pp. 397-403.

[22] European Commission. *eGovernment in Poland*. Edition 18.1. Brussels, 2016.

[23] Christensen, Tom, and Per Lægreid. "Democracy and administrative policy: contrasting elements of New Public Management (NPM) and post-NPM." *European Political Science Review*, vol. 3, issue 1, 2011, pp. 125-146.

[24] Gruening, Gernod. "Origin and theoretical basis of New Public Management." *International Public Management Journal*, vol. 4, 2001, pp. 1-25.

[25] Długookresowa Strategia Rozwoju Kraju. Polska 2030. Trzecia fala nowoczesności, *Ministerstwo Administracji i Cyfryzacji*, January 2013, https://mac.gov.pl/files/wp-content/uploads/2013/02/Strategia-DSRK-PL2030-RM.pdf. 20 January 2017.

[26] Strategia Rozwoju Kraju 2020, *Ministerstwo Rozwoju Regionalnego*, September 2012, https://www.mr.gov.pl/media/3336/Strategia_Rozwoju_Kraju_2020.pdf. 22 January 2017.

[27] Strategia Sprawne Państwo 2020, *Ministerstwo Administracji i Cyfryzacji*, December 2012, https://mac.gov.pl/files/wp-content/uploads/2011/12/SSP-20-12-2012.pdf. 24 January 2017.

[28] Plan na rzecz Odpowiedzialnego Rozwoju, *Ministerstwo Rozwoju*, February 2016, https://www.mr.gov.pl/media/14840/Plan_na_rzecz_Odpowiedzialnego_Rozwoju_prezentacja.pdf. 26 January 2017.

[29] System Elektronicznej Skrzynki Podawczej, *Nowoczesny Urząd*, http://www.nowoczesnyurzad.pl/Oferta/Pakiet-e-Urzad/System-Elektronicznej-Skrzynki-Podawczej.aspx. 28 January 2017.

[30] Od papierowej do cyfrowej Polski. Opis projektu, *Ministerstwo Cyfryzacji*, https://mc.gov.pl/projekty/od-papierowej-do-cyfrowej-polski/opis-projektu. 27 January 2017.

[31] e-Deklaracje, *Finanse*, http://www.finanse.mf.gov.pl/pp/e-deklaracje. 28 January 2017.

[32] *Granica.gov.pl*, https://www.granica.gov.pl/. 28 January 2017.

[33] O Platformie Usług Elektronicznych (PUE), *Zakład Ubezpieczeń Społecznych*, https://www.zus.pl/o-platformie-uslug-elektronicznych-pue-. 28 January 2017.

[34] *Ticket Reservation System ver. MUW*, http://kolejka-wsc.mazowieckie.pl/webakis_muw/. 29 January 2017.

[35] *MUW.WSC*, https://wnioski.mazowieckie.pl/MuwWsc/EN. 29 January 2017.

[36] Yiwei, G. and Janssen, M. "From policy implementation to business process management: Principles for creating flexibility and agility." *Government Information Quarterly*, vol. 29, pp. 61-71.

[37] Ambasador: Ukraińcy w Polsce to imigranci zarobkowi, a nie uchodźcy – Polska – Newsweek.pl, *Newsweek Polska*, http://www.newsweek.pl/polska/ambasador-ukraincy-w-polsce-to-imigranci-zarobkowi-a-nie-uchodzcy,artykuly,377852,1.html. 29 January 2017.

[38] ePUAP – Strefa klienta, *ePUAP*, https://epuap.gov.pl/wps/portal. 29 January 2017.

[39] European Commission. *eGovernment in Poland*. Edition 17.0. Brussels, 2015.

[40] Elektroniczna Skrzynka Podawcza ePUAP – Biuletyn Informacji Publicznej Mazowiecki Urząd Wojewódzki w Warszawie, *Mazowiecki Urząd Wojewódzki w Warszawie*, http://bip.mazowieckie.pl/contents/content/232/268. 6 February 2017.

[41] Wyniki badań bieżących – Baza Demografia – Główny Urząd Statystyczny, *GUS*, http://demografia.stat.gov.pl/bazademografia/Tables.aspx. 7 February 2017.

[42] Wydawanie dowodów osobistych – lite.mserwer.pl, *Gmina Kwilcz*, http://www.kwilcz.pl/wydawanie-dowodow-osobistych.html. 8 February 2017.

[43] OBYWATEL.GOV.PL – Informacje i usługi przyjazne obywatelom, *Obywatel.gov.pl*, https://obywatel.gov.pl/. 18 April 2017.

[44] PESEL – Numer PESEL – Ministerstwo Spraw Wewnętrznych i Administracji, *Ministerstwo Spraw Wewnętrznych i Administracji*, https://mswia.gov.pl/pl/sprawy-obywatelskie/numer-pesel/14216,PESEL.html#Co_to_jest_PESEL. 9 February 2017.

[45] Implementation of the PESEL 2 Project – statement of Piotr Piętak, Deputy Minister of Interior and Administration – News – Ministry of the Interior and Administration, *Ministry of the Interior and Administration*, http://www.mswia.gov.pl/en/news/331,dok.html. 10 February 2017.

[46] Prezentacja programu pl.ID – Obywatel, *pl.ID*, http://plid.obywatel.gov.pl/prezentacja-obywatel. 12 February 2017.

[47] Digital Agenda 2020 for Estonia, *Republic of Estonia Ministry of Economic Affairs and Communications*, November 2013, https://www.mkm.ee/sites/default/files/digital_agenda_2020_estonia_engf.pdf. 15 February 2017.

[48] E-administracja w oczach internautów, *Ministerstwo Cyfryzacji*, Sopot, July 2016, https://mc.gov.pl/files/raport_pbs_mc_e_administracja_12.09.2016.pdf. 16 February 2017.

[49] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), *EUR-Lex: Access to European Union law*, May 2016, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0679&qid=1489237411955&from=en. 18 February 2017.

[50] Hossan, Chowdhury, et al. "Enhancing eServices in Australian Local Government: The Role of Strategic Leaders and Employee Commitment to Change" *Australian & New Zealand Academy of Management*, 2009, p. 9, http://www.anzam.org/wp-content/uploads/pdf-manager/987_ANZAM2009-259.PDF. 21 February 2017.

[51] Digital Agenda for Europe: key initiatives, *European Commission*, May 2010, http://europa.eu/rapid/press-release_MEMO-10-200_en.htm. 22 February 2017.

[52] Europe's Digital Progress Report (EDPR) 2016: Poland, *European Commission*, http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=15411. 24 February 2017.

[53] Operational Programme Digital Poland for 2014-2020, *Polska Cyfrowa*, https://www.polskacyfrowa.gov.pl/media/1655/POPC_eng_1632015.pdf. 25 February 2017.

[54] *GOV.UK*, https://www.gov.uk/. 4 March 2017.

[55] *Canada.ca*, https://www.canada.ca/en.html. 6 March 2017.

[56] UN E-Government Survey 2016, *UN Public Administration and Development Management Department of Economic and Social Affairs*, 2017, https://publicadministration.un.org/egovkb/en-us/reports/un-e-government-survey-2016. 8 March 2017.

[57] *Australia.gov.au*, 2017, http://www.australia.gov.au/. 9 March 2017.

[58] *myGov*, 2017, https://my.gov.au/LoginServices/main/login?execution=e10s1. 9 March 2017.

[59] Digital Transformation, *GOV.UK*, https://www.gov.uk/transformation. 10 March 2017.

[60] Wainwright, Oliver. "'Direct and well-mannered' government website named design of the year." *The Guardian*, 16 April 2013, https://www.theguardian.com/artanddesign/2013/apr/16/government-website-design-of-year. 10 March 2017.

[61] Data Center, *UN E-Government Knowledge Database Department of Economic and Social Affairs*, 2017, https://publicadministration.un.org/egovkb/Data-Center. 11 March 2017.

[62] X-Road, *e-Estonia*, https://e-estonia.com/component/x-road/. 11 March 2017.

[63] Data Exchange Layer X-Road, *Republic of Estonia Information System Authority*, 2017, https://www.ria.ee/en/x-road.html. 11 March 2017.

[64] Query of a person about queries of his/her data, *eEesti.ee*, 2015, https://www.eesti.ee/eng/services/citizen/riik_ja_kodanik/isiku_paring_tema_andmete_parimise_kohta. 12 March 2017.

[65] Kompetencje – Centrum Kompetencyjne Administracji (CKA), *Ministerstwo Cyfryzacji*, https://mc.gov.pl/konsultacje/program-zintegrowanej-informatyzacji-panstwa/kompetencje-centrum-kompetencyjne-administracji-cka-0. 14 March 2017.

[66] Features, *aGov – The Drupal CMS for Australian Government websites*, 2017, https://agov.com.au/features. 16 March 2017.

[67] Ustawa z dnia 6 września 2001 r. o dostępie do informacji publicznej, *Internetowy System Aktów Prawnych*, http://isap.sejm.gov.pl/Download?id=WDU20011121198&type=1. 20 March 2017.

[68] European Commission. *Delivering on the European advantage? - 'How European governments can and should benefit from innovative public services', eGovernment benchmark.* Brussels, 2014.

[69] Sterling, Leon S., and Kuldar Taveter. *The art of agent-oriented modeling*. The MIT Press, 2009.

[70] Directive 2006/123/EC of the European Parliament and of the Council of 12 December 2006 on services in the internal market, *EUR-Lex: Access to European Union law*, December 2006, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0123. 16 April 2017.

[71] Points of Single Contact – Internal Market, *European Commission*, September 2013, http://ec.europa.eu/internal_market/eu-go/index_en.htm. 17 April 2017.

[72] European Commission. *eGovernment in Belgium*. Edition 17.0. Brussels, 2015.

[73] Strategy Unit of the Minister for Development Cooperation, Digital Agenda, Post and Telecom. *Digital Belgium*. Brussels, 2015.

[74] *Business Belgium – Official information and services*, 2017, http://www.business.belgium.be/en. 21 April 2017.

[75] PSC-Italy, *impresainungiorno.gov.it*, 2017, http://www.impresainungiorno.gov.it/psc-italy. 22 April 2017.

[76] *SPID – il Sistema Pubblico di Identità Digitale*, 2017, https://www.spid.gov.it/. 23 April 2017.

[77] Start, run and develop a business in Sweden, *verksamt.se*, 2017, https://www.verksamt.se/eugo. 24 April 2017.

[78] European Commission. *eGovernment in Sweden*. Edition 18.0. Brussels, 2016.

[79] Goldkuhl, Göran, et al. "Visionary Design Research: Renewing e-government Support for Business Set Up." *New Horizons in Design Science: Broadening the Research Agenda. 10th International Conference, DESRIST 2015, Dublin, Ireland, May 20-22, 2015, Proceedings*. Edited by Brian Donnellan, et al. Springer International Publishing Switzerland, 2015, pp. 55-70.

[80] Alfonsi, Elena, et al. "The One Stop Shop for Productive Activities (SUAP): How to lower the barriers to enterprises' start-up, simplifying and streamlining the procedures to reduce the costs of starting a business." *Organizing for Growth: Theories and Practices.* Edited by Francesca Visintin, et al. CreateSpace-Uniud, BISAC: Business & Economics / Management, 2014, pp. 51-71.