

Comparative Analysis of E-Democracy Implementation in Ukraine and Switzerland

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Abstract. This article provides a comparative analysis of the implementation of e-democracy in Ukraine and Switzerland. The main stages of e-democracy development in these two countries are studied. Key facts from the history of e-democracy in Switzerland and Ukraine are presented. The advantages and disadvantages of implementing e-democracy in Ukraine and Switzerland are compared and analyzed. Having considered the experience of implementing e-democracy in Switzerland, a set of methods and measures to be implemented in Ukraine is proposed: to develop an open data portal, to introduce electronic identification of citizens, to establish effective e-communication between government and citizens by improving existing forms of e-democracy, i.e. petitions, complaints, and the introduction of new ones, such as Swiss forums and blogs, to improve the existing system of web-based means of interaction between government and citizens.

Keywords: Comparative Analysis, E-Democracy, Implementation, Ukraine, Switzerland, E-communication, Web-Based Means.

1 Introduction

The concept of “e-democracy” is considered in two senses. When we talk about e-democracy in the narrow sense, we mean the use of information and communication technologies to ensure (electronic support) the rights of citizens. In this case, only the technological side of submitting applications, appeals, and inquiries to the authorities on behalf of citizens’ changes is changed. That is, using his legal right to receive a certain certificate, a citizen can apply to the court in writing, or, for example, using e-mail. E-democracy in a broad sense involves the involvement of the community through modern information technology in solving various socio-political problems. It is in this context that we will consider e-democracy. An example is the interactive participation of residents in a local council meeting. During the broadcast of the meet-

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ing on the Internet, everyone interested can express their attitude to the decisions of the council, the speeches of deputies, and thus to influence the stance of the authority.

2 Stages of development of e-democracy in Ukraine

The first stage (2000–2001) had a preparatory character: the most general aspects of the use of modern ICT were determined; the necessary basis for further actions of the state in this direction was formed.

The second stage II (2002–2003) was directly related to the formation of e-government mechanisms in Ukraine, which aimed to increase the efficiency and transparency of public authorities and local governments, improve public awareness of the activities of these bodies and enhance feedback between government and society through the Internet.

The third stage III began in 2003 with the adoption of the resolution “On measures to create an electronic information system “Electronic Government” (February 24, 2003 № 208) by the Cabinet of Ministers of Ukraine. The objectives of the proposed measures for the development of the information society were to provide citizens and legal entities with information and other services through the use of electronic information system “Electronic Government”, which provides information interaction between executive authorities and citizens, provides information and other services based on modern information technologies.

3 History of e-democracy in Switzerland

The emergence of e-democracy in Switzerland (Table 1) began in 2003.

Table 1. History of e-democracy in Switzerland

№	Date (month, year)	Event
1.	2003	Introduction of electronic voting
2.	January, 2007	The Swiss Federal Council presents the first national e-government strategy
3.	2007-2015	59 e-government projects were approved
4.	2016	The beginning of the "electronic course"
5.	2016	Creating a common infrastructure for cantonal e-government portals
6.	January, 2017	Creating a lexicon on legal issues of e-government
7.	January, 2017	Development of a system for verifying a digital signature
8.	October, 2017	Tallinn Declaration on e-Government" was signed
9.	November, 2017	Launch of the EasyGov.swiss portal
10.	November, 2017	The first national e-government survey in Switzerland was published

Nº	Date (month, year)	Event
11.	April, 2018	Beginning of VAT declaration on the Internet
12.	June, 2018	Establishment of the joint-stock company "eOperationsSwitzerland".
13.	September, 2018	The Federal Council adopted the Digital Switzerland strategy for the next 2 years
14.	October, 2018	Development of a "virtual rural area"
15.	June, 2019	Presentation of the e-government strategy for 2020-2023 entitled "digital first"
16.	September, 2019	The Law "On Electronic Identification" was adopted
17.	October, 2019	More than 50% of Swiss can use "electronic movement"

The national strategy, adopted in January 2007, aims to enable businesses and the public to interact with the authorities in electronic format. The government, in turn, modernizes its own business processes.

At the end of the programming period 2008-2015, 59 projects were approved. Of these, 27 have been completed and 32 are still being implemented.

The beginning of the "electronic course" started in 2016. The introduction of e-services took place first in the canton of Zurich, then in the city of St. Gallen, and by the end of the year -was introduced in many municipalities in Zurich. Also in 2016, the Canton of Jura together with the Canton of Friborg created the conditions for various authorities, using the infrastructure of the e-government portal.

In January 2017, a lexicon on e-government legal issues was developed, which provided comprehensive documentation on e-government legal issues. Since January 2017, the signature validator has been working in the cantonal and municipal authorities and in the Zug administrative court. This allows individuals and companies to verify the authenticity and integrity of digitally signed PDF documents. In October 2017, Federal Adviser Wally Maurer signed the Tallinn Declaration on e-Government. Therefore, Switzerland emphasizes the importance of e-government in Switzerland. In November 2017, the State Secretariat for Economic Affairs SECO reached an important milestone in the strategic project "Business Transaction Portal" with the launch of EasyGov.swiss. Thus, companies can communicate online with the authorities of the federal government, cantons and municipalities through a single access. The offers of the portal are constantly expanding. The Office of e-Government and the State Secretariat for Economic Affairs SECO published the first national e-Government survey in November 2017. Surveys of the population, business and government are central to the monitoring of e-government in Switzerland. From the beginning of April 2018, downloading an XML invoice with VAT became possible through the ESTV Suisse Tax portal. VAT can be charged electronically. In June 2018, the Swiss Conference on Computer Science (SIK) established eOperations Switzerland with the consent of the Confederation and the cantons to develop and operate IT solutions for the digitization of public services by the federal government,

cantons and municipalities. The Federal Council adopted the Digital Switzerland strategy on September 5, 2018. The Digital Switzerland Strategy 2018 sets out the desired goals and guidelines for digitization in all important areas of life. In October 2018, modules for citizen participation in social and political processes, the so-called "virtual rural area" were created. In June 2018, the Steering Committee of the Confederation, Cantons and Municipalities of e-Government of Switzerland presented the e-Government Strategy for 2020-2023 for consultations. The strategy aims to establish an electronic channel as the main choice in business relations between citizens and the government, guided by the principle of "digital first". On September 27, 2019, the parliament adopted the Federal Law "On Electronic Identification". The Swiss population will be able to continue to receive online services from the authorities and companies in the future. Often annoying new registration is no longer required, it is enough to confirm your identity. By October 2019, 13 cantons had joined the eUmzugCH solution. This means that more than half of Swiss residents can easily register and cancel their registration with the municipality when switching to the eumzug.swiss portal.

Unlike other European countries, the implementation of e-democracy in Switzerland is a long and difficult process. Comparison and analysis of the benefits of implementing e-democracy in Ukraine and Switzerland First, let us analyze the implementation of e-democracy in Ukraine. E-government, by definition of researchers Solovyov and Danylenko, is a technology of e-democracy, that is why it is important to consider the functioning of e-government in Ukraine.

According to the Government portal (<https://www.kmu.gov.ua/services>), the following electronic services are provided in Ukraine in various fields:

1. Sphere of health care and education:

- medical institutions: the electronic map of places of provision contains information on places of provision - with addresses and telephone numbers, distribution of institutions by oblasts, indications of the number of declarations for each doctor, etc. (Fig. 2);



Fig. 1. Electronic map places of medical help

- educational institutions (Fig. 3);



Fig. 2. Search for higher education institutions

- verification of documents: on education, student;
 - e-health: checking the legitimacy of a medical certificate in the Unified State Database of Medical Examinations of Certain Categories of Persons in the Health Care System;
2. Sphere of security and court:
 - police: providing various certificates, as well as the ability to check the phone number in the database;
 - state registration of vehicles: in particular, the electronic driver's office (Fig. 5), there is a service for passing tests on knowledge of traffic rules;
 3. Finance and taxes: provision of certificates, extracts from registers;
 4. Judicial system: provision of certificates, also, citizens have the opportunity to apply to the court online;
 5. Sphere of transport;



Fig. 3. Electronic driver's office

6. Sphere of entrepreneurship:

- issuance of permits;
- business licensing: obtaining licenses;
- business registration;
- providing certificates and extracts from registers;

7. Citizenship and migration: registration of passport documents (Fig. 6), provision of citizenship services to foreign citizens;

The screenshot shows a web interface for passport registration. At the top, there are navigation tabs: "Запис онлайн", "Оплата без талону", "Скасування запису", and "Мой талони та квитанції". The main heading is "Оформлення запису до електронної черги". Below this, there is a form for "Ваш телефон" (Your phone) with a text input field containing "+38 (0) - - -" and a blue "ДАЛІ" (Next) button. A note below the input field says "Введіть телефон у формі +38 (000) XXXX XXXX". Below the form, there are four steps: "Крок 1 Оберіть регіон", "Крок 2 Оберіть послугу", "Крок 3 Оберіть дату", and "Крок 4 Оберіть час".

Fig. 4. Service for registration in the electronic queue to obtain a passport

8. Sphere of land and ecology: issuance of special permits, declarations, various information in this area (Fig. 7);



Fig. 5. Interactive map of landfills in the regions of Ukraine

9. Sphere of construction and real estate;
10. Social protection: provision of certificates, registration of social assistance, pensions and other services.

3.1 Advantages of e-democracy in Ukraine:

- round-the-clock access to e-democracy tools. Earlier, people needed traditional media or they had to read newspapers or go to public hearings, or general meetings in the city hall, which was significantly time consuming. Now the latest technology provides round-the-clock access from a computer or even a mobile phone;
- transparency of the use of e-tools: e-access increases transparency, because people constantly have access to information;
- social inclusion: by providing information with tools, people are directly or indirectly involved in a political sphere that becomes more open to society. This is very convenient for certain categories of the population, for example, for people with disabilities, the elderly, etc.;
- opportunity to express an opinion without intermediaries. Now citizens can directly participate in voting for an electronic petition online, send an e-complaint. That is, it is an exemption from intermediaries - no one acts between a citizen and an executive, for example, a politician;
- e-democracy as a tool to fight corruption, because the human factor is excluded. For example, when receiving a certain electronic service, when a citizen downloads a form from a computer or state source, the services of a third party are no longer required to provide this form;
- collective intelligence and cooperation of citizens - information and communication technologies allow us to be more effective in cooperation and achieve more effective results.

3.2 Advantages of e-democracy in Switzerland:

- convenience. Electronic voting is a method of voting independent of place and time;
- increasing participation. Electronic voting offers alternative electronic tools to people who do not have the opportunity to vote in the traditional way,
- reduction of process costs. After e-voting, after building the infrastructure and accepting the high investment cost, the cost will be redeemed in a few years, and the cost of the process will be lower compared to traditional voting channels, such as polls or postal ballots;
- increasing efficiency due to more accurate organization of electronic voting, prevention of mistakes and falsification;
- the introduction of the smartvote system provides not only electronic voting, but also an innovative and simple way of informing voters, becoming the main source of elections;
- maximum proximity of the state and citizens. A clear example of this is the blog of former Swiss Confederation President Moritz Leuenberger;

- access to open data of the Swiss government through the national portal OGD opendata.swiss (has been operating since 2016). It provides shared public access to open, i.e. freely used state data;
- thanks to the developed Internet portal of election and voting results, as well as the creation of an interactive map, e-services such as “visualization of election results” have become available to citizens, and the voting process has become simpler;
- maximum involvement of citizens in solving state issues: before the adoption of laws, amendments to laws, etc. For example, residents of 3 cantons of Switzerland (Zug, Schwyz, Graubünden) have the opportunity not only to vote for a bill, but also to see voting results via the online portal (Fig. 8).



Fig. 6. Results of e-voting in the canton of Zug

- with the help of the eumzug.swiss web application (it has been operating since 2017), citizens have the opportunity to report electronically about movements, relocations within cantons and countries (Fig. 9). You can also use this web application to report the movement of dogs;

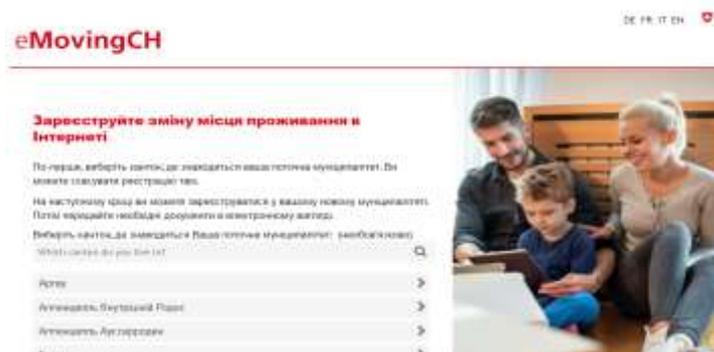


Fig. 7. Portal for providing information about the movement

- in order to improve the usability of official websites, the Federal Office created the concept of "Electronic public access at home and abroad to the services of the Swiss authorities" in 2016-2019. That is, through various forums the authority bodies communicate with citizens, for example, the forum "ch.ch" answers about 13 million users' questions a year;
- an electronic service such as a "digital vehicle identifier" which helps to track the vehicle in many administrative processes is also available;
- the open-source Ki-Tax program has been in effect since March 2017 and allows families to apply for financial support for child care;
- using Chabot, the city of St. Gallen offers residents and tourists access to information and services from the administration. By the end of 2018, various topics had been demonstrated in the chat. These include a calendar of events, parking information, mobility information request, and use of eUmzugCH, departure information request and feedback input;
- thanks to the e-participation module for citizens, Swiss municipalities establish e-communication with communities. This is similar to the Ukrainian form of e-democracy, i.e. electronic petitions, but much more perfect;
- it is interesting to introduce conversational e-government - voice assistants, who, for example, inform residents about the date of waste removal;
- with the help of block chain technology, citizens are provided with the service of electronic identification (identification) and electronic signature;
- citizens are provided with access to geo data and metadata through the interactive map viewer map.geo.admin.ch and the geodienste.ch geo data portal (Fig. 10);

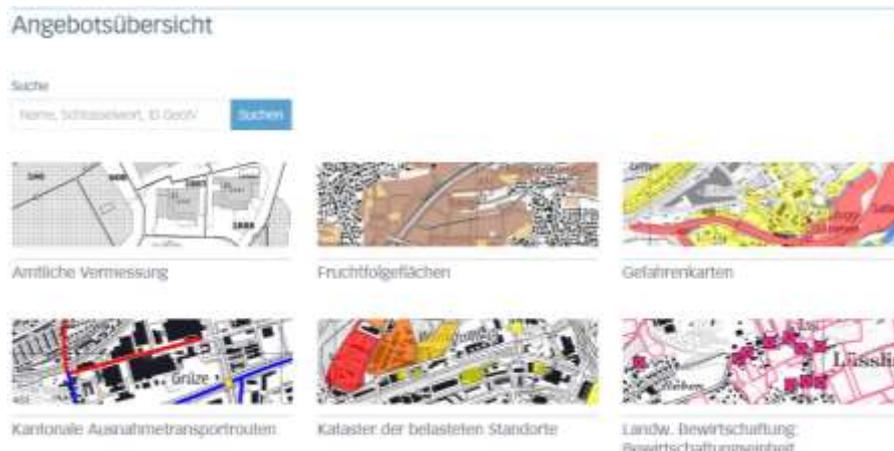


Fig. 8. Swiss geo data portal

- the Federal Administration has been able to position itself as a center of competence for electronic invoices in Switzerland, as evidenced by the fact that there are about 700 million invoices in Switzerland every month, and paper invoices are almost never used;

- with the help of IDV, citizens can enter the applications of different authorities with the same login information. This allows, for example, registration in the municipal web application to apply for childcare subsidies outside the family with data on the registration of the cantonal tax portal;
- in the case of many administrative proceedings, such as the collection of military dues or insurance premiums or the collection of debts, the responsible authority shall contact the person in writing. To do this, they need the current address. This issue has been resolved in Switzerland through the establishment of a national address service;
- electronic service "search for real estate by AHV number will help in the future to identify people by this number.

The most common forms of e-democracy in our country include e-appeals, public budgets, e-consultations, e-petitions. It is worth noting that open data resources also function, but they still need to be improved.

Instead, Switzerland has a National e-Government Strategy. This strategy was developed in close cooperation with representatives of cantons and municipalities, under the leadership of FSUIT. The strategy lays the groundwork for the Confederation, the cantons and the municipalities to focus on common goals.

In Switzerland, the emphasis is placed on round-the-clock access to public information, the introduction of the principles of efficiency and remote nature of public administration, primarily due to the lack of queues for administrative services and cooperation with the private sector (business structures).

In Switzerland, likewise in Ukraine, in accordance with the Convention on the National Cyber Administration Strategy approved by the Federal Council in 2015, the current phase of the cyber administration strategy is aimed at creating an electronic identity card, and among the most important sectors is the ability to notify about the change of addresses and electronic registration of VAT tax deduction for commercial companies.

In Ukraine, in connection with the introduction of biometric passports (ID-cards), the idea of remote provision of public administration competence (regarding the issuance of public administration acts, payment of taxes) seems reasonable. Introduction of electronic parking tickets by local governments, etc.) also seems appropriate. The aspect of financing e-democracy reform deserves special attention. In Switzerland, the National Cyber Administration Strategy is funded by the Confederation and the cantons on an equal footing in the total amount of 5 million francs per year (but the budget for 2016-2019 was halved, and under the loan for economic development, the parliament approved the allocation of funds in the amount of 17 million 700 thousand francs for the next 4 years) . Such a budget will help create a single window for small and medium enterprises. For Ukraine, the practice of providing loans or grants for the implementation of reforms in the field of e-government and e-democracy is extremely relevant, given the difficult political and socio-economic situation.

Overall, the average voter turnout in Switzerland is 43%, 75% of Swiss people use the Internet to interact with public authorities, and 65% of Swiss companies use the

Internet to obtain information from the government. Consider the example of e-voting in the process of implementing e-democracy in Switzerland.

Electronic voting in Switzerland began in 2003 in the canton of Geneva, where residents of Agnes voted online. This was the first e-voting trial in Switzerland. In the following years, the number of people who were able to use electronic voting increased as more and more cantons began to adopt such a system.

The Swiss government has several reasons for using electronic voting. This can reduce costs and increase the speed of counting ballots. Swiss residents “on board” are able to vote more reliably. It may also help increase voter turnout (declining since the 1970s), as online voting is considered more convenient by the majority. The country uses several electronic voting systems, including CHVote (open source software developed by Geneva) and sVote (from Swiss Post, proprietary software developed by ScytI).

Electronic voting (e-voting) allows citizens to participate in elections regardless of time and location, using a smartphone, computer or tablet. To vote, the Swiss must register on a special website (<https://smartvote.ch/>), indicating their individual code, which they receive by mail along with other documents required for voting (Fig. 11). Then you need to select the desired candidate or party list and confirm your vote, which will be encrypted and sent to the e-mail ballot box.



Fig. 9. Demonstration site for voting in Switzerland

After that, next to the name and surname of the selected candidate (s) one can see verification codes, which are compiled specifically for each encrypted vote. That is, each voter receives separate control codes designed specifically for him, which can be compared with the codes sent on sheets of paper by mail. If all the numbers on the electronic media and paper match, it means that the electronic vote was saved without various manipulations. Otherwise, it is necessary to interrupt the voting and apply to the electoral commission.

It is also worth noting that Switzerland now uses an improved version of electronic voting - "smart vote".

Instead, in Ukraine such a form of e-democracy as electronic voting has not yet been introduced, as it requires significant funds and improvement of the protection system, although the first steps have already been taken, i.e. biometric passports in the form of ID-cards have been introduced, as well as electronic digital signatures, and electoral lists.

That is, having analyzed and compared the benefits of e-democracy in Switzerland and Ukraine, the following conclusions can be drawn:

- Ukrainian e-government is in a less advantageous position in comparison with the e-government of Switzerland, because in Switzerland the principle of "maximum openness of power to citizens" really works. In Ukraine, unfortunately, many projects still remain in the "project" stage, but the main difference is that Ukraine has only just begun to implement mechanisms and tools for electronic interaction between government and citizens, built on the principle of "openness", which would prevent various corruption and bureaucracy processes. That is, Ukraine, despite the rapid development of e-government over the past 4 years, still needs to improve much to get closer to the level of Switzerland;
- regarding e-democracy, the advantage is again on the side of Switzerland, because in Ukraine citizens do not have the opportunity to participate in e-voting, do not participate in e-voting for the adoption or rejection of certain bills, there are not any e-forums where one could openly address questions to a certain politician. However, in Switzerland, such electronic means of democracy are quite accessible to citizens.

4 Comparison and analysis of the shortcomings of the implementation of e-democracy in Ukraine and Switzerland

Among the disadvantages of the introduction of e-democracy in Ukraine are the following (Fig. 12):

- low level of involvement of the Ukrainians in e-government, lack of digital literacy;
- the problem of "digital inequality" among citizens;
- failures in the work of information and communication systems as a result of the lack of proper testing of software products and intensive implementation of e-democracy mechanisms;
- the presence of threats to security in the information sphere, including Russia's propaganda and information war against our state, which may be manifested through various falsifications;
- lack of accountability mechanism in case of abuses or falsifications in the application of e-democracy mechanisms;
- problems with using e-petitions, namely: imperfect interface, complex user registration procedure, no information about the features of the site, etc .;

- the use of e-petitions as a tool for manipulating public consciousness by the authorities;
- high cost of implementing e-democracy mechanisms, in addition, it is necessary to allocate funds from the state budget;
- low level of efficiency of e-democracy application, due to low level of digital literacy of citizens, and development of information and communication technologies;
- lack of reliability, full protection, resulting in various threats to the introduction of e-democracy.

4.1 Disadvantages of implementing e-democracy in Switzerland.

1. Disadvantages of the electronic voting system:

- high investment costs. After all, the development of e-voting infrastructure is expensive because it includes computers, setting up servers, hiring experts and purchasing software. Estimates suggest that the introduction of e-voting across the country will cost between 400 and 600 million Swiss francs;
- complexity and lack of transparency. Electronic voting is a very complex process that requires expertise to fully understand it. For this reason, only a few work in the system, on which every citizen depends and whom they trust. Thus, the whole system can be interpreted by the community as a "black box" that minimizes transparency and undermines trust;
- security. A significant disadvantage of electronic voting is the low level of protection, as there is no one hundred percent guarantee of non-interference;
- quality of voting. Political parties are taking advantage of new opportunities to advertise and spread their message online at low cost. For users, this can lead to information overload and confusion about the origin of information, as well as reduced political debate and interaction between e-voters;
- many electronic services are in the process of being finalized, which means that citizens do not have full access to a particular service.

The main shortcomings of the implementation of e-democracy, both in Ukraine and in Sweden are attributed to the following main problems: lack of funds for the implementation of certain e-democracy projects (Switzerland is now solving this problem by creating a company), inability to implement projects due to computer imperfections, computer technologies and others.

5 Conclusions

Having analyzed the experience of implementing e-democracy in Switzerland, it is advisable to take the following measures in Ukraine:

- to develop an open data portal from which citizens could obtain information, including state information. Perhaps in this way we will take a step towards reducing bureaucracy and corruption;

- to introduce electronic identification of a citizen, so that the user will not need to register every time in order to receive a certain public service online,;
- to establish effective e-communication between government and citizens by improving existing forms of e-democracy i.e. petitions, complaints, and the introduction of new ones, for example, such as Swiss forums and blogs. However, it is necessary to overcome the secrecy of the government, to make it as open and transparent as possible;
- to improve the existing system of web-based means of interaction between government and citizens.

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