Digital Competence in E-Governance Education: A Survey Study

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Abstract

Factors of social change culminate in the development of the so-called networked society. Subsequently, networked society calls for networked governance. The development of e-government in Ukraine is impossible without appropriate training of relevant qualified professionals. Based on e-governance the activity profile a survey was conducted among the stakeholders of electronic government institutions – in-service government officials and students of government management programs. The paper objective is to assess the survey as to the needs and possible avenues of E-governance curriculum development for higher educational institutions, in-service government officials and general public. The Master's Program in E-government, developed within the framework of a Ukraine-Estonia joint project on e-governance curriculum implementation, will promote the state policy in the field of information, e-governance, development and use of national electronic information resources, elaboration of the information society.

Keywords

e-government, digital democracy, digital literacy, e-government curriculum, ICT tools

1. Introduction

Recent decades have witnessed the rise and development of a framework of cultural, economic and technological factors, relevant for societal development in the changing world [3] (see Figure 1):

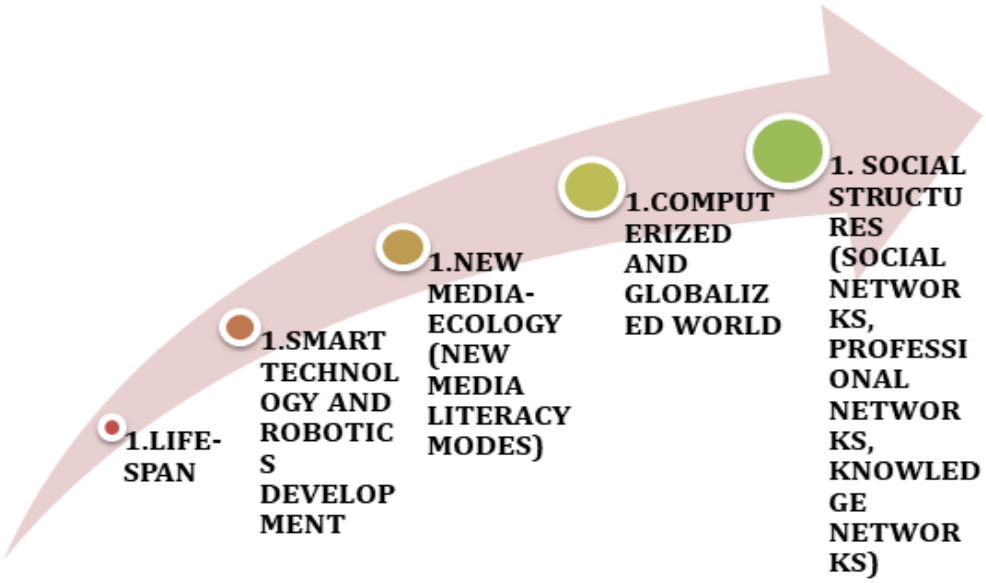

Figure 1: Skills of the Future formation

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Factors of social change culminate in the development of the so-called networked society. Subsequently, networked society calls for a kind of networked governance. E-government is the use of digital communications devices to provide public services to citizens and other persons in a country or region. E-government offers new opportunities for more direct and convenient citizen access to government, and for government provision of services directly to citizens [2]. E-democracy, also referred to as digital democracy, is the use of information and communication technology in political and governance processes to promote democracy [2]. Digital democracy is a form of government in which all adult citizens are presumed to be eligible to participate equally in the proposal, development and creation of laws and services [9]. E-democracy encompasses social, economic and cultural conditions that enable the free and equal practice of political self-determination [14]. According to the Cabinet of Ministers of Ukraine mandate of 13 December 2010 p. Number 2250-r "On approval of the e-government in Ukraine development concept" [10] e-governance is one of the tools of the information society elaboration, the implementation of which will facilitate conditions for open and transparent public administration. As is stated: "Today, one of Ukraine's priorities is the development of the information society, which can be defined as targeting interests of the people, open to all and aimed at forming an innovative model of high-tech society where every citizen can create and accumulate data and knowledge, have free access thereof, use and share it to allow each person to actualize their potential for personal and social development and quality of life improvement" [10]. The development of e-government in Ukraine is impossible without appropriate training of relevant qualified professionals. The **inquiry *object***, thus, is the determined as *e-governance experience and application by relevant stakeholders as a prerequisite of curriculum development*. The **paper *objective*** *is to assess the survey as to the needs and possible avenues of E-governance curriculum development for higher educational institutions, in-service government officials and general public.* The Master's Program in E-government, developed within the framework of a Ukraine-Estonia joint project on e-governance curriculum implementation, will promote the state policy in the field of information, e-governance, development and use of national electronic information resources, elaboration of the information society.

2. E-government education survey results

2.1 Method and sample overview

The study **design methodology** included the following consecutive steps:

1. E-governance activity, experience and application *profiling*;
2. The *online survey method* (based on D. Dillman's concept of mixed media and mixed mode surveys) applied to assess e-governance experiences and practices by relevant groups of stakeholders;
3. E-governance *curriculum development recommendations*, outline and projected study results, tailored to the overall context of European integration and stakeholders' target group needs.

Based on the activity profile (e-governance) a survey was conducted among the stakeholders of electronic government institutions – in-service government officials and students of government management programs. The survey comprised of 13 questions total (multiple choice and scoring), divided into such categories:

1. questions on overall experiences in e-government;
2. questions on the needs and modes of e-government education;
3. questions on e-democracy as a social framework (to be disclosed fully in the upcoming studies). A sizable sample of 70 respondents total took part in the survey.

2.2 Survey results

Group 1 of survey questions - *overall experiences in e-government* - yielded the following results across the board. The prevailing understanding of e-governance by stake-holders (Figure 2) is disclosed by the such top scoring concepts:

1. Round the clock access to information and e-services (35,7%)
2. ICT implementation for interaction of state and community (22,9%)
3. ICT technologies use for corruption surveillance (20%)

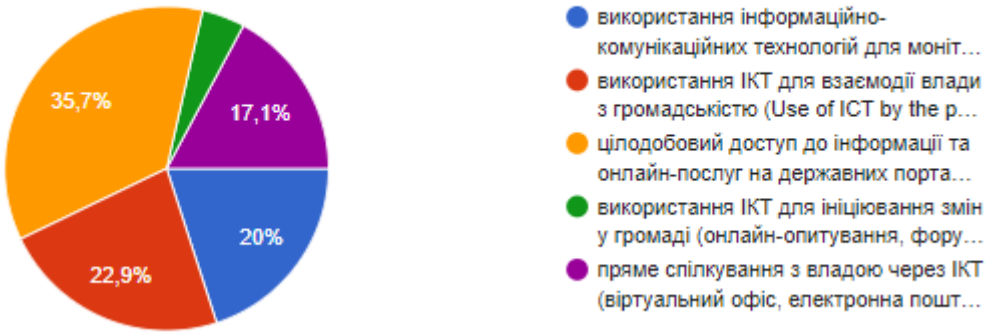

Figure 2: Understanding of e–government

The overall readiness to use and receive e-government services (Figure 3) in digital form is assessed as positive (with no exception) – 68,6; partial and circumstantial – 28,6%.

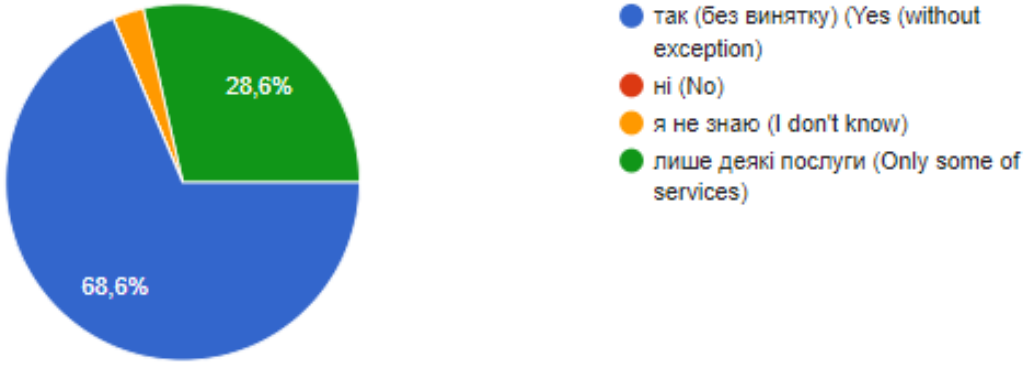

Figure 3: Are you generally ready to use public services in digital form?

Meanwhile, the overall current level of Ukrainian government institutions digital transformation (Figure 4) is assessed by respondents as varying from:

- Very poor (34,3%);
- Poor (27,1%);
- Satisfactory (22,9%).

The top scoring ICT tools and technologies used by e-government officials and e-governance professional stakeholders (Figure 5) are:

- Web-forms and apps (72,9%);
- Digital documentation workflow (64,3%);
- Digital data exchange (47,1%).

Group 2 of survey questions - *the needs and modes of e-government education* - yielded the following results across the board.

The educational formats (Figure 6), efficient or sought after in the area of governance digitization is distributed as such:

- One-off trainings and workshops (40%)
- Persistent online courses (34,3%)
- Webinars (22,9%).

It should be noted that the survey was conducted before the COVID-19 lockdown measures and, thus, does not reflect the adaptation of educational formats assessed.

Figure 4: Level of Ukrainian government institutions digital transformation

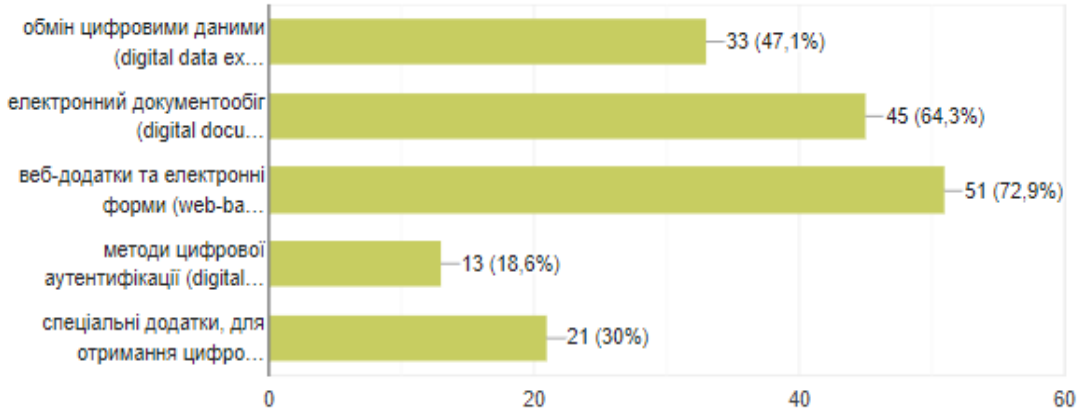

Figure 5: What digital technologies do you use in your activity?

The distribution of demand for e-governance education is generally in keeping with the higher educational landscape estimate of 2020.

Higher education technology landscape 2020 [7] was prognosticated to include the following components (Figure 7):

- college-wide IT infrastructure;
- admissions and enrolment management,
- advancement tools,
- student distinction tools.

When asked to assess the knowledge needed or lacking to use digital technologies (Figure 8), in-service and in-training governance stakeholders identified the following top scoring priorities:

- Digital services development (67,1)
- Digital data bases operation (60%)
- Digital literacy and digital skills (58,6%)
- Digital workplace tools proficiency (48,6)
- Re-engineering of government services (44,3%)

Digital competences, mandatory for any modern in-service government official (Figure 9) were assessed by respondents according to the following ranking:

Figure 6: Online education formats for e-governance sphere

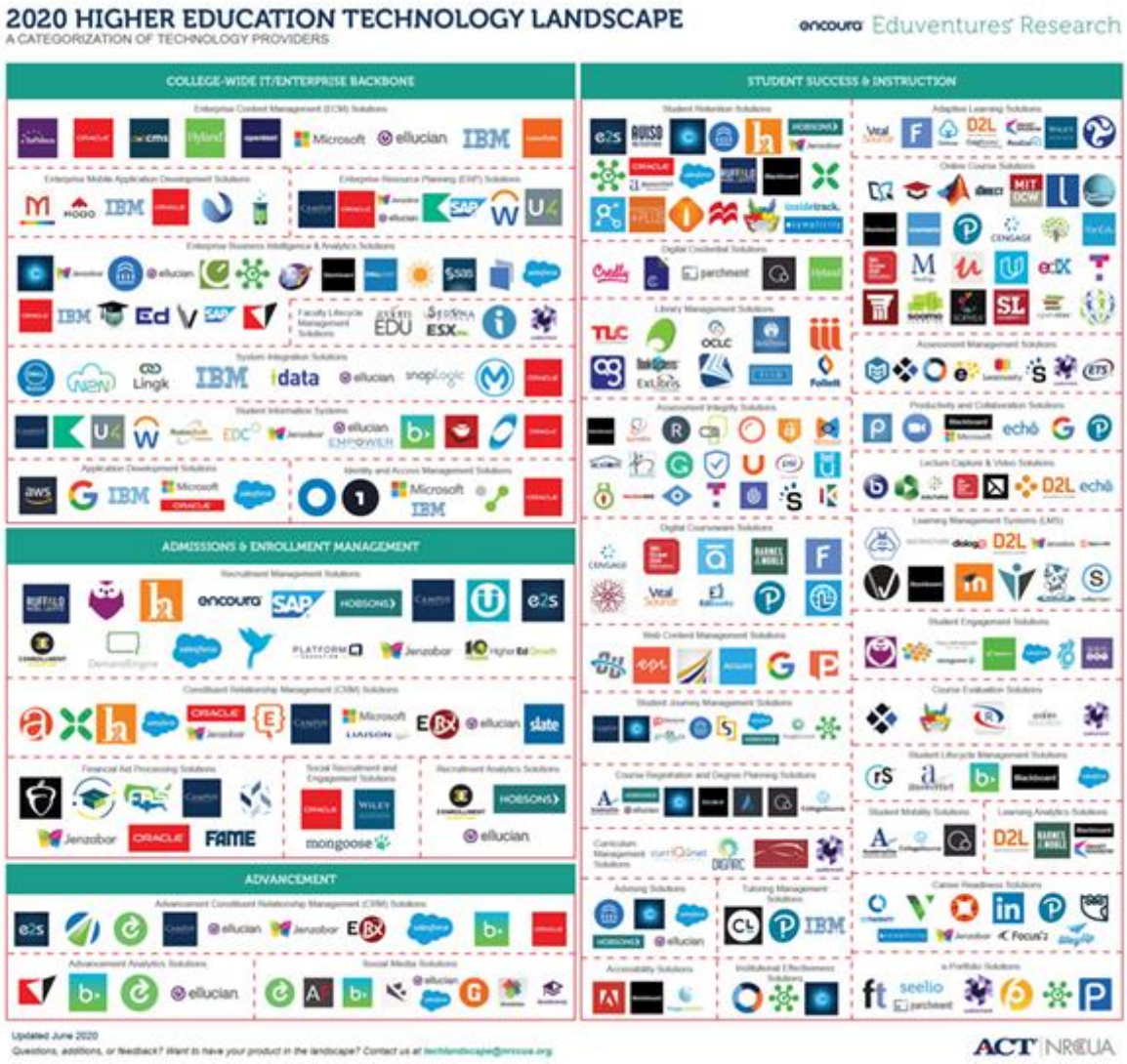

Figure 7: Higher Education technology landscape 2020

- Digital transformations management (50%);
- Electronic democracy and social engagement (41,4%)

- Cybersecurity basics (41,4%)
- Terminology mastery in the realm of digital governance (34,3%)

Survey results in the area of digital competence and structures of knowledge, sought after or in demand by e-governance stakeholders in specialized education, correspond directly to the comprehensive frameworks of digital competences, elaborated and tested in the recent decade.

Therefore, the study elaboration premise included identification of ICT competency principles, derivative of 21st century skills [1, 5, 6, 11, 12, 15] for educational purposes: and projected digital literacy requirements:

Figure 8: Knowledge needed to use digital technologies by government officials

Figure 9: Digital professional competences necessary for public servants

1) *UNESCO Framework* [13] emphasizes that it is not enough for educators to have ICT competencies and be able to teach them to their students. Educators need to be able to help the students become collaborative, problem solving, creative learners through using ICT so they will be effective citizens and members of the workforce. The Framework therefore addresses such aspects of education: Understanding ICT in education, Curriculum and assessment, Pedagogy, ICT, Organization and administration, Teacher professional learning.

2) *Liberal Arts (Digital Humanities) ICT proficiency profile* sampling elaboration, according to the European e-competence framework guideline [8] was conducted. ICT Liberal Arts/Digital Humanities sample profile includes the following components:

- Trains ICT professionals and practitioners to reach predefined standards of ICT technical /business competence.
- Provides the knowledge and skills required to ensure that students are able to effectively perform tasks in the workplace.
- Defines and implements ICT training policy to address organizational skill needs and gaps. Structures, organizes and schedules training programs and evaluates training quality through a feedback process and implements continuous improvement. Adapts training plans to address changing demand.
- Organizes the identification of training needs; collates organization requirements, identifies, selects and prepares schedule of training interventions.
- Acts creatively to analyze skills gaps; elaborates specific requirements and identifies potential sources for training provision. Has specialist knowledge of the training market and establishes a feedback mechanism to assess the added value of alternative training programs.
- Monitors and addressees the development needs of individuals and teams.

3) *Digital Competence 2020 framework* [4], consistent of 5 core parameters assessed according to 16 levels of proficiency:

- Information and data literacy: to articulate information needs, to locate and retrieve digital data, information and content; to judge the relevance of the source and its content; to store, manage, and organise digital data, information and content.
- Communication and collaboration: to interact, communicate and collaborate through digital technologies while being aware of cultural and generational diversity; to participate in society through public and private digital services and participatory citizenship; to manage one's digital identity and reputation.
- Digital content creation: to create and edit digital content; to improve and integrate information and content into an existing body of knowledge while understanding how copyright and licences are to be applied; to know how to give understandable instructions for a computer system.
- Safety: to protect devices, content, personal data and privacy in digital environments; to protect physical and psychological health, and to be aware of digital technologies for social well-being and social inclusion; to be aware of the environmental impact of digital technologies and their use.
- Problem solving: to identify needs and problems, and to resolve conceptual problems and problem situations in digital environments; to use digital tools to innovate processes and products; to keep up-to-date with the digital evolution.

The respondents, finally, identified the key educational components (Figure 10) needed in the sphere of governance digitization:

- e-service design and development (72,9%);
- data protection (67,1%)
- cyber security and integrity (47,1%)
- case studies for digital skills development (41,4%)
- case studies for digital transformations (34,3%)

The evaluated educational components, skills and practices provide a groundwork for the the estimated structure of E-governance education curriculum project.

2.1 E-government curriculum development

The survey results corroborate the informed decisions behind elaboration and implementation of a comprehensive curriculum project of an integrated E-governance Master's program.

In the framework of globalization, information society development and social strife against corruption in government, traditional methods of interaction of state and local government with citizens and business become less sufficient. To avoid the emergence of corruption components and to create new and more convenient methods of access to information and services, the state is

implementing e-governance - a form of government which provides a new level of open cooperation between the state and society, due to the widespread use of modern ICT, supplying a full range of public services for all categories of citizens and enterprises. The use of new ICT in public government determines the need for training highly qualified specialists in the field of public administration and management, in possession of the ultimate, up to date ICT skills.

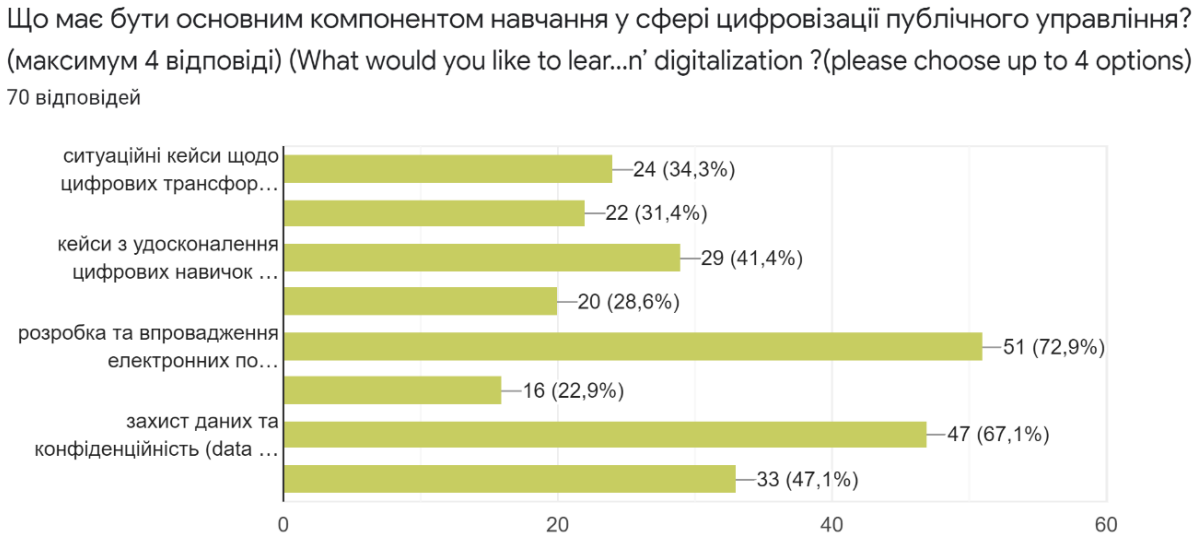

Figure 10: Educational components in the sphere of governance digitization

Borys Grinchenko Kyiv University proposes a master's program of e-government under the auspices of the Ministry of Education of Estonia and in collaboration with the Tallinn University of Technology. "E-government" can be a minor specialty of 281 - Public Management and Administration. The certified qualification is: Master of Public Management and Administration. Specialization: E-government. The total number of hours for the master's program is estimated as follows: 90 credits (ECTS), 2700 hours (practice and master's thesis preparation including). Study terms: full-time education - 18 months, part-time - as of 2017 comprises 30 months. It has been corroborated that government officials prefer study by correspondence, distance learning, so at least 20-25 people is to be enrolled. For specialization of "E-government" the total number of hours can be - 30 credits (ECTS), i.e. 900 hours (practice including).

The curriculum project outline presupposes 4 stages of implementation:

1. Resources accumulation;
2. Theoretical premise of teaching e-democracy development;
3. Teaching e-democracy development methodology development;
4. E-democracy and e-governance studies dissemination.

Stage of Resources accumulation presupposes:

- Accumulation of educational materials,
- ICT tools and media resources, research data and research resources
- Selection and orientation of human resource,
- Accumulation of research personnel,
- International mobility for the exchange of experiences and best practices.
- Theoretical analysis of the problem, the degree of insight for various branches of social sciences and Humanities,
- Creation of theoretical and empirical framework to analyze the e-democracy of the subject in the education system of Ukraine, Estonia and the European Union;
- Accumulation of research materials that will be the basis for the preparation of publications, designed to identify the phenomenon of e-democracy subject and analyze the features of its manifestation in the competitive environment of a multicultural Europe.

Borys Grinchenko Kyiv University is experienced in instruction of higher education stakeholders in the specialty "Public Management and Administration" on the Master's level. Students are taught such subjects as communication and information support of government, electronic workflow. For future masters of the "Social Informatics" program a course in E-government is taught. Borys Grinchenko Kyiv University plans to contribute to the development of e-government in Ukraine by establishing a new specialization "E-government" for the "Public management and administration" program. Target groups of stakeholders:

- Students of e-government Master's program coming from a wide range of social sciences background.
- heads of government agencies and their deputies, responsible for implementing e-government;
- Local government authorities and their deputies who implement e-government;
- managers and staff of specialized structural units of government institutions;
- managers and employees of enterprises, businesses, and political parties and public organizations;
- Government officials receiving advanced training in e-democracy and e-services;
- General public (through a MOOC on E-governance platform).

3. Conclusions

Impact areas of E-governance curriculum development include the following public sectors:

- higher education (development of a generic study program of e-governance in Ukraine)
- civil society institutions and public sector (development of a comprehensive e-democracy educational standard)
- democratic institution (raising awareness and provision of comprehensive advanced training for institutional decision makers in principles and vehicles of e-governance).

E-government curriculum implementation risks include:

- low ICT competence of major stakeholders;
- low awareness in the sufficiency of advanced training in e-democracy;
- impaled access to e-learning resources.

The contingency measures are:

- to apply the supplementary ICT-competence development and ICT tools implementation methodology, derived by the project team
- to raise awareness in the public sector on the sufficiency of e-democracy training for civil society development through augmentative dissemination means (social media, mass media, public engagement).

The project holds the potential to supply a reinforced context to advance equal opportunity for women in democratic institutions management, gender-blind education in e-governance, e-access and e-services provision, to promote political correctness in institutional governance discourse.

E-governance curriculum dissemination is to be achieved through the following avenues:

- E-democracy study programs implementation (higher education, teacher training, government officials training);
- E-democracy studies interdisciplinary standard development;
- public sector implementation (training, coaching);
- business implementation (coaching, research).

The project sustainability is to be achieved through the following contingency means:

- The implementation of a functional educational system in e-democracy and e-government, sustained by the national and regional level institutions involved in the project consortium
- Advanced continuous training of staff and faculty to sustain the implemented master's program
- Elaboration of sustainable LMS and other e-learning (b-learning and u-learning) platforms, namely a MOOC of comprehensive parameters of e-government.

E-governance curriculum development project corresponds fully to the National standard of e-government implementation in Ukraine.The 8th Framework project of European Commission Horizon 2020 academic collaboration incorporates a specific creed of Europe in the Changing World studies, which unfolds into a range of problematic issues open for project studies and development,

including Understanding Europe – Promoting. The European Public and Cultural Space, including civil society development as an operative foundation for e-democracy elaboration. E-governance comprehensive curriculum development is also in keeping with key priorities of the 9th Framework project of European Commission Horizon Europe.

4. Acknowledgements

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