TECHNICAL UNIVERSITY OF SOFIA

FACULTY OF MANAGEMENT

R & DS OF TU - SOFIA

CENTRE FOR e-GOVERNANCE AT THE FACULTY OF MANAGEMENT

SELECTED AND EXTENDED PAPERS FROM X -th INTERNATIONAL SCIENTIFIC CONFERENCE "E-Governance and E-Communications"

2019
Sofia

TECHNICAL UNIVERSITY OF SOFIA
R & DS OF TU-SOFIA
TECHNICAL UNIVERSITY OF SOFIA – TECHNOLOGIES

SELECTED AND EXTENDED PAPERS FROM X-th INTERNATIONAL SCIENTIFIC CONFERENCE "E-Governance and E-Communications"

2019
Sofia

The book presents selected and extended papers in the area of e-Governance and e-Communications, challenges of e-Democracy, contemporary aspects and trends of e-Governance and design of knowledge and prediction models. The papers included in this edition contain surveys, theoretical research and practical results concerning some aspects of e-Governance and e-Communications and their involvement in different enterprises and educational institutions. They have been presented at the Xth International Conference "E-Governance and E-Communications", held in Sozopol, Bulgaria and organized by the Faculty of Management at the Technical University-Sofia during the "Science Days of TU-Sofia 2018". The selection has been performed by the International Scientific Committee considering original ideas, approaches and methods, theoretical investigation and implementation issues and contributions relevant to the conference topics.

ISBN 978-619-167-368-1

Preface

The book has been compiled from selected and extended papers, presented at the Xth Anniversary International Scientific Conference (ISC) "e-Governance and E-Communications", held within the Days of Science of the Technical University-Sofia in June 2018. It highlights not only the latest research achievements and practical solutions obtained in the field of e- Governance and e-Communications, but make a retrospection of the then years development of this topics in international aspect also. The topics that have been selected by the editor concerned e- Governance education at universities, e-Democracy, e-Governance in public administration, e-Governance and e-Communications in business organizations and advanced e-Governance trends and perspectives. The topics have been highlighted by the five chapters in the book. The first chapter reflects the crucial importance of e-Governance as a management process for achieving real democracy, made retrospection of scientific research in this then years and reveals challenges of new technologies to civic society and its open government in different countries. The second chapter refers to state of the arts and trends in the E-Governance. It offers theoretical approaches, methods and practical solutions for sustainable regional development. The social effect of e-Communication is evaluated. The third one focuses on e-Government and education revealing the way and extent of its application in Bulgarian and Lithuanian universities. The problem of creative thinking stimulation of the students is wide discussed. The fourth chapter refers to challenges, practical solutions and trends of e-Governance in business services. It covers various fields from electrical consumption of mass user to influence of Industry 4.0 in enterprises management. The last chapter presents theoretical and practical decisions, and social aspects in public services and especially the role of Information and Communication Technologies for management transparency and personalization.

Usually the plenary session is presented on site or online through live broadcast via YouTube. In such a way a lot of invited key speakers from the whole world (United Kingdom, Austria, Italy) participated distance and transparency with very interesting conference presentations. Besides this a part of the scientific achievements and practical issues are presented by remote participation, which has been supported by web-based video conferencing. The video conference sessions involved participants not from Bulgaria only, but from the United Kingdom, the Republic of Nord Macedonia, Ukraine, the Republic of Moldova, Lithuania, etc. The Bulgarian participants represented different universities such as Technical University of Sofia, Sofia University "St. Kliment Ohridski", University of National and World Economy, New Bulgarian University, University of Rousse, University of Forestry, etc . A lot of business representatives, public organizations, ministries, agencies, NPO. took part during the years in the conference. Students participated actively in both the preparation of the conference and papers presentations.

February, 2019

Roumiana Tsankova
Prof. DSc., Technical University-Sofia

CONTENTS

E-DEMOCRACY AND MANAGEMENT PROCESSES

A DECADE INTERNATIONAL SCIENTIFIC CONFERENCE "E-GOVERNANCE"- CREATIVE AND APPLIED RESULTS

Roumiana Tsankova
Technical University of Sofia

Abstract. The chronological development of the International Scientific Conference "E-Governance" is presented for the 10 years of its launch in 2009 until 2018. A retrospective of the achieved creative and applied results has been made. Introduced views on the prospect of the development of both the conference and the field of eGovernment.

1.Chronology

The International Scientific Conference (ISC) "E-governance" started was launched in 2009 with financial support of the Bulgarian National Research in pursuance of the project "Center for Research and Training in e-Governance". The main goal of the conference since then and to date is to integrate and develop continuity between research, innovation and e-Government education.

In the same year, the laboratory for integration of research and learning on E-government was launched. The idea of multi-directional integration - on the one hand the introduction of research results into the learning process and the other integration of management technologies with information communication technologies - is still ongoing. Already for 10 years, human potential has been prepared with new competences and advanced qualification.

The organization of the conference is carried out in cooperation between ISC of TU-Sofia and its Faculty of Economics. After the successful completion of the project "Center for Research and Training in e-Governance" in 2012, from 2013 till nowadays the E-governance ISC is included within the "Days of Science of TU-Sofia". From 2014 The Center for Media Communications and Technologies at TU-Sofia joined the organizers and from 2015 TU-Sofia - Technology also supported it. In 2015, the conference is dedicated to the 75th anniversary of the Technical University of Sofia. Since 2016, the subject of the conference has expanded with electronic communications and its name has been transformed into "E-governance and E-communications".

* 2009 – I ISC „E-government"
* 2009 – start learning laboratory
* 2010. II ISC „E-government"
* 2012 – IV ISC + start „live broadcasting"
* 2015.- VII ISC „E-government", dedicated to 75 years TU-Sofia
* 2016 – VIII ISC „E-governance and E-communications"
* 2018г.- X Anniversary ISC „E-government and E-communications"

* 2019г.- XI ISC, 10 years learning laboratory.

The Organizing Committee is under the auspices of the Rector of TU-Sofia and consists of fourteen members with representatives from nine countries. The program and the scientific leadership are supported by a fourteen member scientific international committee with representatives from ten countries. The ISC issues a collection of papers in book and in electronic form. It also maintains a dedicated section at http://fman.tu-sofia.bg. From 2012, an additional compendium of selected extended English reports has been released, with the awarding to the world's ranked Social Science Research Network (https://www.ssrn.com) with citation indexing. Since 2014, selected conference materials are also published on YouTube.

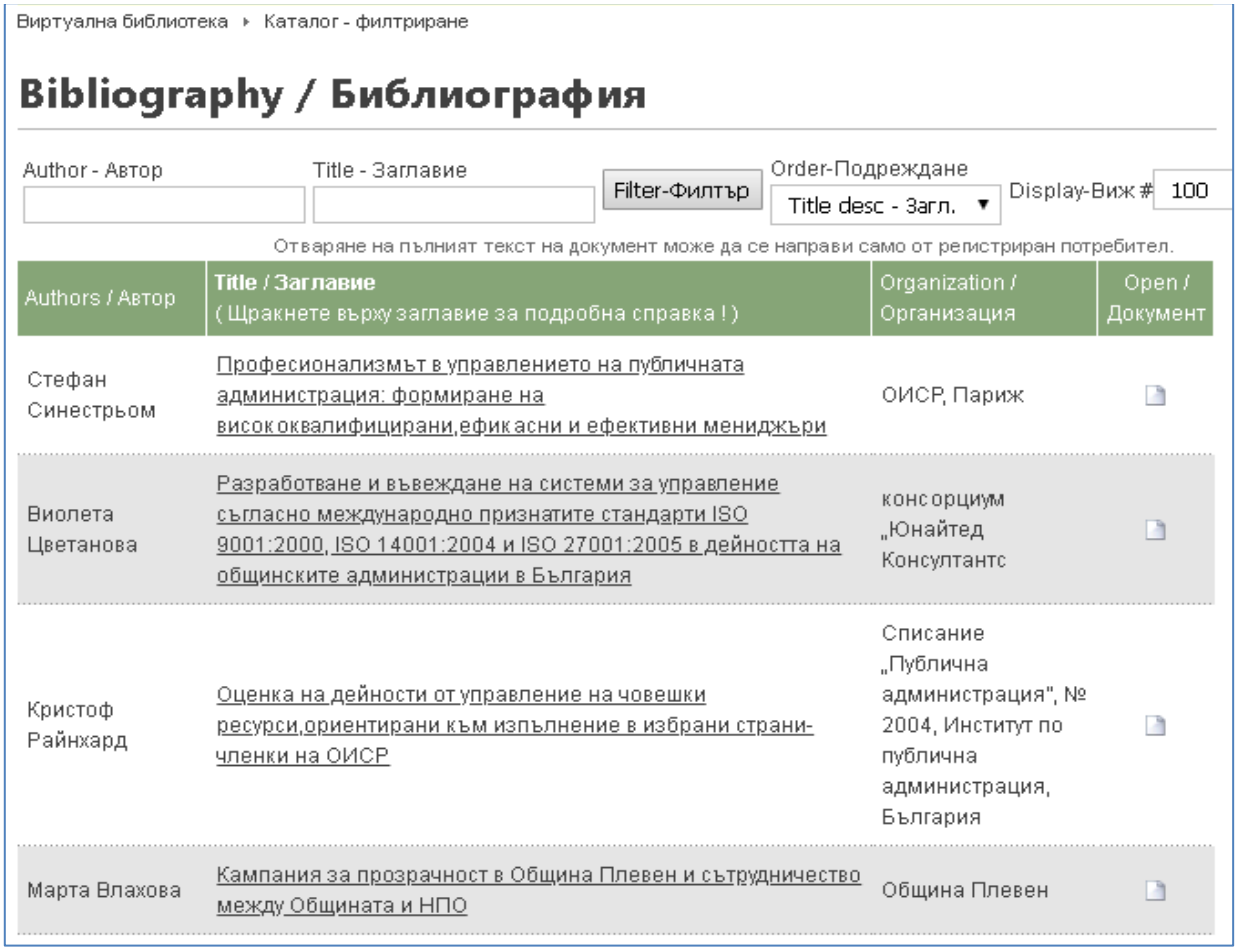
2. Retrospection

The conference starts with four thematic areas: E-Business Management, E-Government in Public Administration, Roads and Methods to distribute E-Governance good Practices, Multiaspect Analysis and modeling Methods for e-Governance.

The interest in the first conference was very great. It was opened byed by the Chief General of the University through video conferencing.

In 2009, the Bulgarian papers were 33, of which 4 were students and 8 were foreign students. At the first conference, the foundations of the conference were laid down,

ending the conference with recommendations and suggestions for future work in the field of e-Government. There are ideas that are summarized and published in a post-conference collection and submitted to the ministry responsible for the problem. A modern review of this collection shows that many of the proposals are up to date and their ideas could be renewed and re-submitted to the new governing bodies (e.g. e-Identification issues for Bulgarian citizens, etc.). In connection with the conference, the foundations of a virtual library of good practices (Tsankova, 2009), (Tsankova, 2012) supported by students in the specially developed site http://fman.tu-sofia.bg , are laid.



Виртуална библиотека ▸ Каталог - филтриране

Bibliography / Библиография

Author - Автор | Title - Заглавие | Filter-Филтър | Order-Подреждане: Title desc - Загл. | Display-Виж #: 100

Отваряне на пълният текст на документ може да се направи само от регистриран потребител.

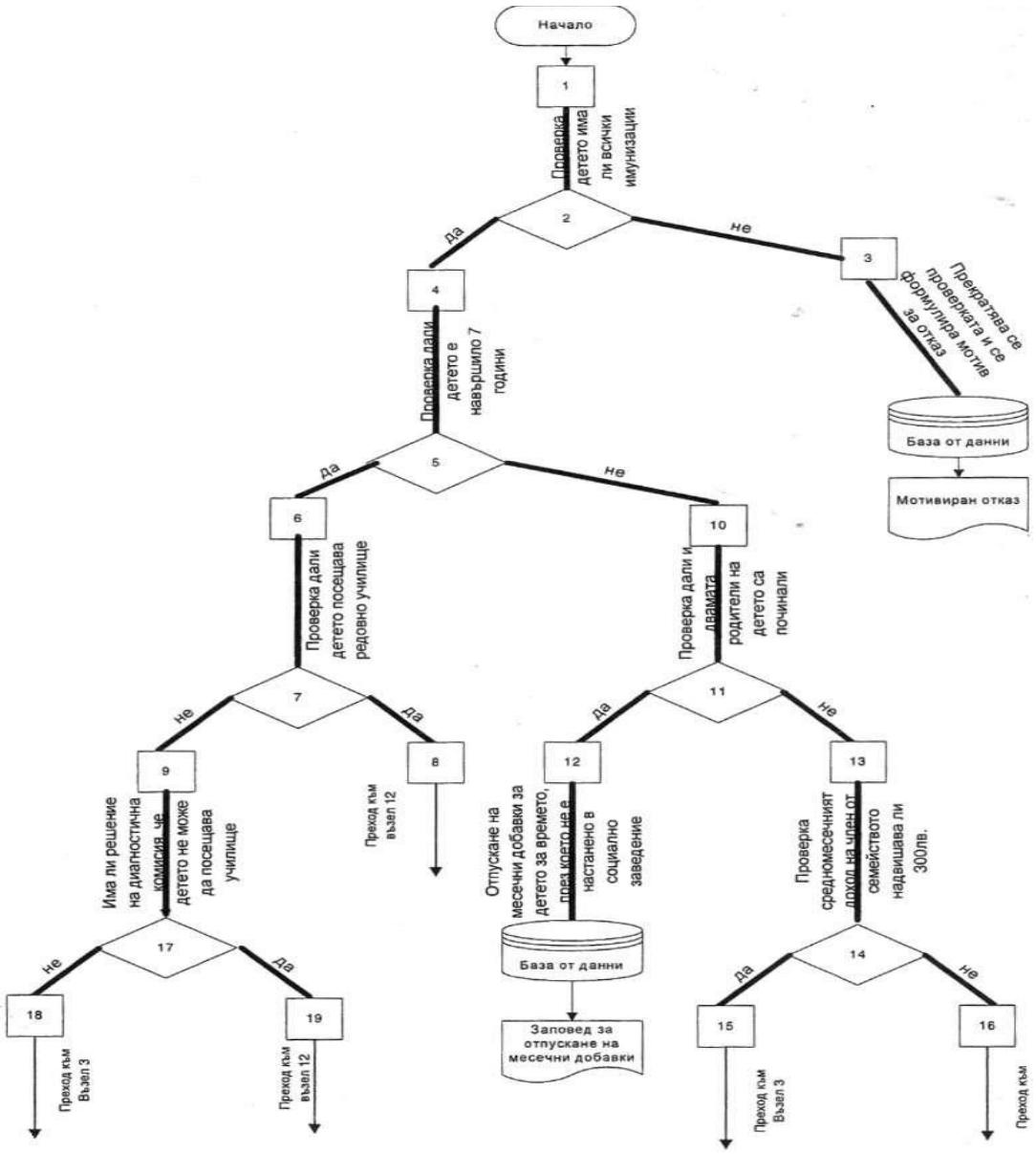
Authors / Автор	Title / Заглавие (Щракнете върху заглавие за подробна справка !)	Organization / Организация	Open / Документ
Стефан Синестрьом	Професионализмът в управлението на публичната администрация: формиране на висококвалифицирани,ефикасни и ефективни мениджъри	ОИСР, Париж	
Виолета Цветанова	Разработване и въвеждане на системи за управление съгласно международно признатите стандарти ISO 9001:2000, ISO 14001:2004 и ISO 27001:2005 в дейността на общинските администрации в България	консорциум „Юнайтед Консултантс	
Кристоф Райнхард	Оценка на дейности от управление на човешки ресурси,ориентирани към изпълнение в избрани страни-членки на ОИСР	Списание „Публична администрация", № 2004, Институт по публична администрация, България	
Марта Влахова	Кампания за прозрачност в Община Плевен и сътрудничество между Общината и НПО	Община Плевен	

A summer school for the training of administrative staff from the public administration field as well as from the field of business administration on the issues of e-Government started. The list of training modules on information technology and management based on them is formed. New, advanced progressive modules have been introduced.The biggest interfaces are attributed to the modules "Marketing in Administrative Service" and "Information Modeling of Administrative Activities". The issue of refining and even standardizing the terminology in this thematic area has been discussed as the issue of the use of the term "e-Governance" rather than the proper "e-Government". For the first time, the issue of the need for information integration, which later became popular with the term interoperability, was raised.

The first certificates of the graduates of the summer school were distributed.

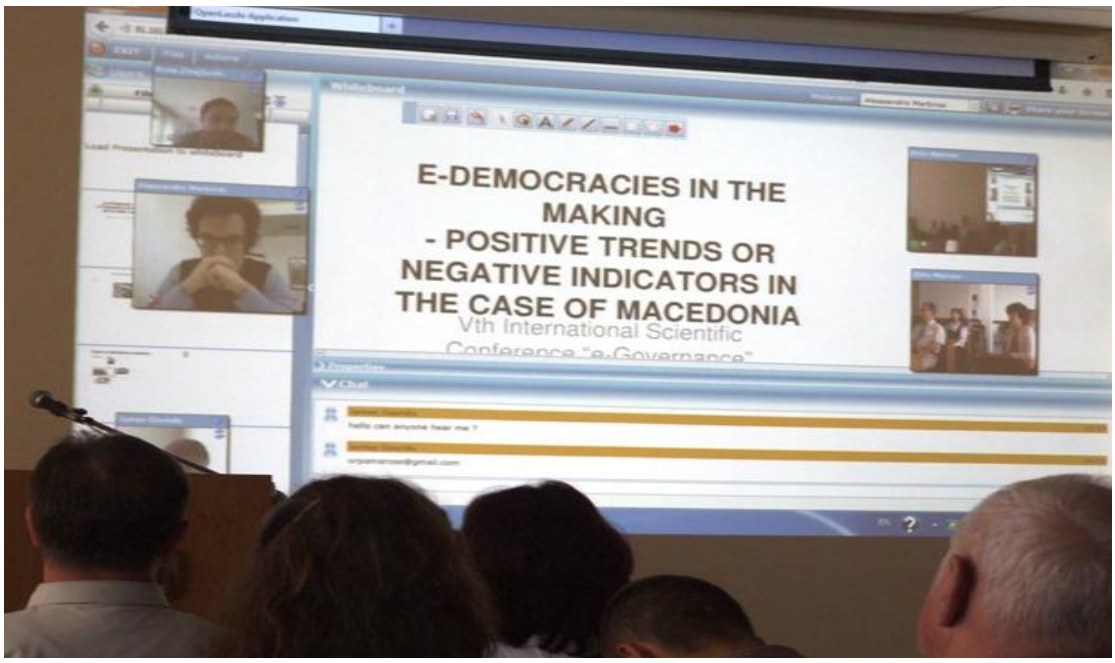
From 2010 the stabilization of the thematic areas of the conference begins. The sustainable directions are: E-Governance in Public Administration, E-Business Management, E-Governance Training. The students participate actively in to conference (Krumova, 2010) and a methodic for project achievement evaluation is created (Dimkov, 2010). The scientific results in the area of project decisions for improving online administrative and management services (Tsankova & Dimitrova, 2010a), (Tsankova &Dimitrova, 2010b) are transferred in learning process in the laboratory. Fourteen virtual administrative services, presented through newly developed methods for information modeling of information flow and for work flow are included in the master degree. The work flow can be presented as a decision tree or as a decision table. The decision tables contain first the computational conditions and then the computational operations. Below is presented tax workflow as a table of decisions.

Conditions				
Up to 2160 lw.	Y	N	N	N
2160-3000 lw.	N	Y	N	N
3001-7200 lw.	N	N	Y	N
Above 7200lw	N	N	N	Y
Activities				
0%	Y	N	N	N
20%	N	Y	N	N
22%	N	N	Y	N
24%	N	N	N	Y



Work flow as a decision tree - Evaluation for monthly child help

Since 2011, attention has been focused on the application of video-conferencing technology for transparency in governance and e-democracy. In 2012, two technologies for remote video-conferencing are being developed, with which interest has increased over the years. This created the opportunity for parallel remote conduct of some of the conference sessions (Marinov & Tsankova, 2012a), (Marinov & Tsankova, 2012b). These technologies have a permanent application not only in the conference but also in the management of doctoral defense and public lectures. Records are kept for all videoconference streams, from which, if necessary, extracts and copies are made.



After the completion of the project "Center for Research and Training in e-Governance, the conference “E-governance” is included in the "Days of Science of TU-Sofia". Over the years, Days of Science have been established as a broad, representative scientific forum. The opening of these days took place in 2013 at the fifth edition of the conference. At this event congratulations and plenary report is presented by a representative of the Council of Ministers of the Republic of Bulgaria.

From 2013 the theme of the fifth conference is to include the presentation of the challenges of e-democracy. The active participation of students and the presentation of good practices in the virtual library continues. These facts protect a place for the professional field "Administration and Management" (AM) in TU-Sofia. They are noticed and reflected by the ranking of the professional field AM in TU-Sofia at the prestigious third position among all Bulgarian universities.

The Sixth ISC in 2014 opens the Annual All-Year Session of "Science Days-2014". Its subject is expanded with the problems of using telecommunication in management, including the Center of TU-Sofia for Media Communications and Technologies. For the first time, there is a Show room with presentations from practice partners. The experience of European Union countries - Great Britain, Germany, Austria, Slovakia, Sweden - is also widely presented. Also, reports from Macedonia, Ukraine, Moldova, Indonesia participate.

In 2015, 70 years have passed since the establishment of the Technical University of Sofia. On this occasion a jubilee session of the conference entitled "Technical University of Sofia - 70 Years of Innovative Decisions" was held. A jubilee plenary session was held under this motto with a separate collection of papers reflecting the scientific contributions of the university during these seventy years presented by immediate participants. It examines the many years of achievements in the field of development of university and national information systems (Kralov, 2015) , the creation and development of television in Bulgaria, the establishment and development of university computing centers in Bulgaria.

CONTENT

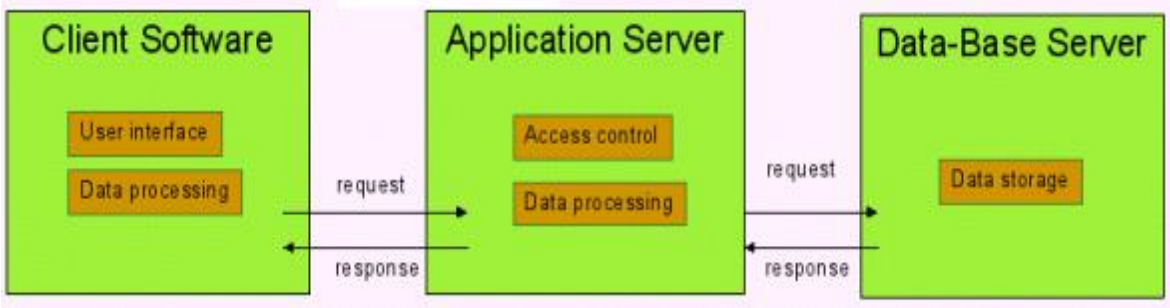
A universal technology for evaluation of management processes is finalized and presented (Tsankova & Georgieva, 2015a), (Tsankova & Georgieva, 2015b). The management process and the data also are organized in Management database hierarchically.

The main discussed topic on conference is the efficiency and effectiveness of e-Governance. In discussions is accepted that the main solution of this problem is is to achieve interoperability for e-Government processes indifferent systems and levels (Gherman & Gherman, 2015).

Types of interoperability	Characteristics
Technical	The ability to exchange digital information, the existence of coordinated interfaces, protocols and mechanisms for access to information resources, exchange of data and signals
Syntactic	The ability to exchange data
Sernantical	The ability to exchange data
Pragmatic	The possibility of joint use of information in the context of solving problems of mutual interest
Dynamical	The property mutual use of the information in functional environmental conditions change
Organizational	The operational capacity of coordinated information exchange
Conceptual	The ability to use information sharing and limitations under agreements and limitations agreed upon
Based on exchange	The ability to convert information to consumer needs
Integrated	The ability to form a space in which the user feels heterogeneous environment

At the eighth ISC in 2016 on the basis of the experience gained in TU-Sofia, an extension of the conference's theme to the problems of the application of the networks and the telecommunication in the management was made and its name was transformed into "E-governance and E-communications". Live broadcasting is also available on both the internal university network and the YouTube-TU-Sofia channel.

The ninth ISC in 2017 confirmed the new expanded themes and decided to prepare for the tenth anniversary conference. The main conference topic is the actual at that time problem “protection of personal data”. It is discussed a three tier architecture for security of data privacy (Rozeva et al., 2017a), (Rozeva et al., 2017b). This architecture includes: client interface logic, application process logic, data control logic.



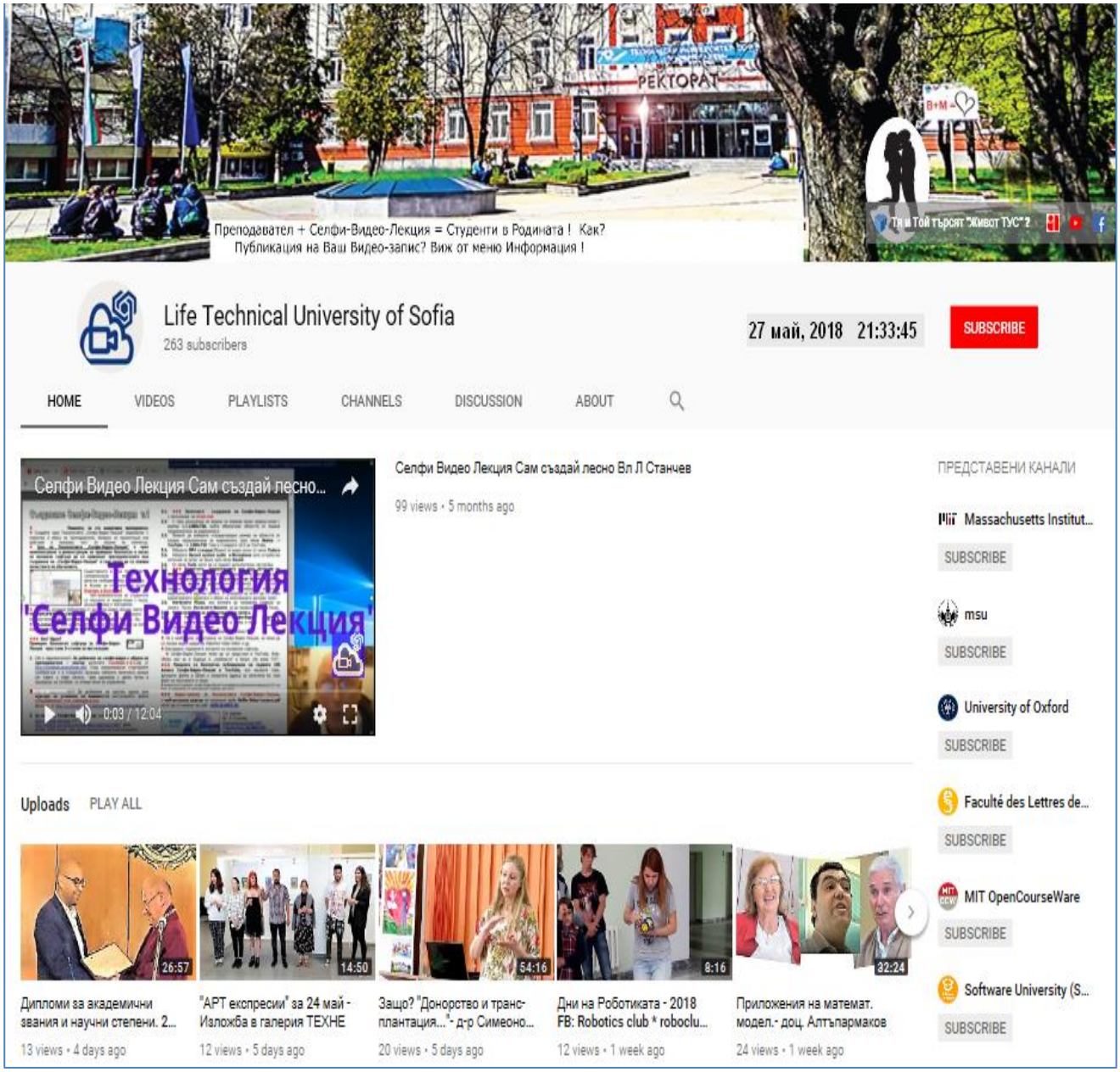
The application logic tier uses for identification so called method of “blind signature” to receive security of the privacy information. The users’ identifiers are encoded by algorithm, accessed by the sender only. For the educational purposes a randomization algorithm is discussed. Through the use of coding mixed notation shows good results (Tsankova, 2008).

$N=n_1+B_1.n_2+B_1.B_2.n_3+...+B_1.B_2...B_{i.ni+1}+...+B_1.B_2...B_{k-1}.n_k$,

where N – new cipher;
B_i –basis of number system i;
n_i – position in the old number system, $n_i < B_i$;
k – index of the last used number system.

One-to-one correspondence and decoding is possible in this case. In the reverse case N is divisible by consistently and recursively on the basis of numbered systems. We consider the private by dividing as a whole and a remainder. We continue to divide the whole recursively until we get the value in the initial numbered system.

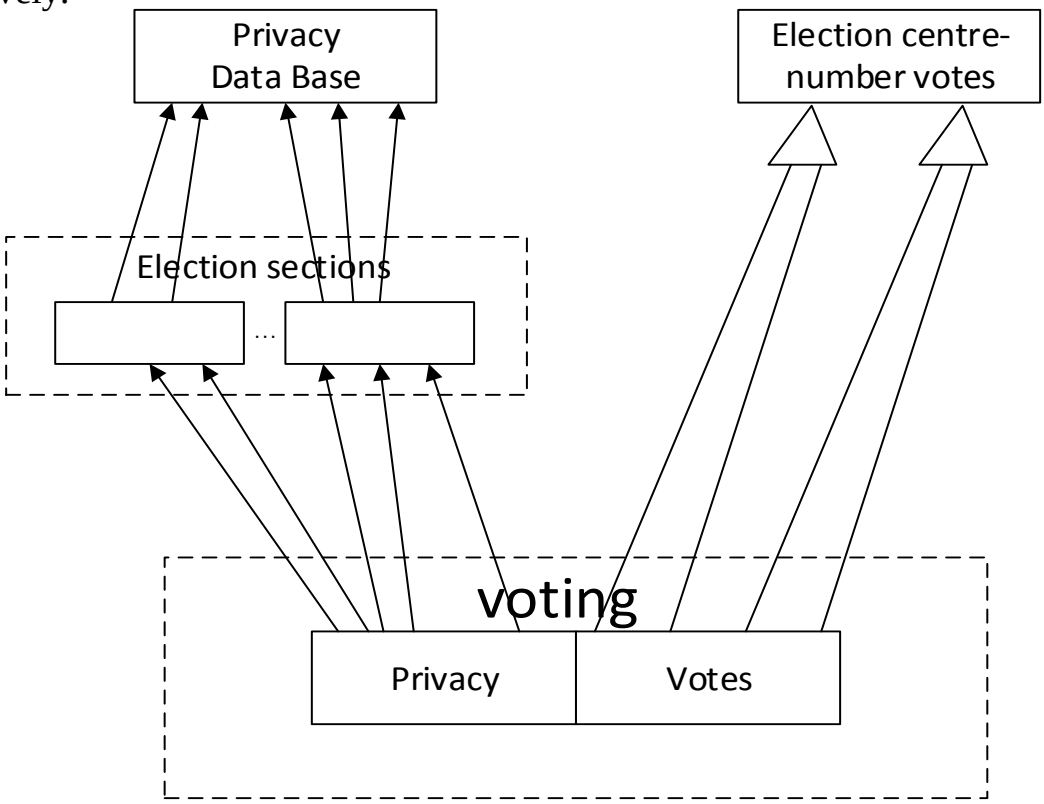
The ninth ISC in decided to prepare the tenth anniversary conference in 2018 year.



During the X-th ISC the main discussed topic is the possibility distributed technologies including blockchain to be used in public management and administration. The auditory was interested in presentation done by Petkova & Jekov (2018) about the currently application of blockchain in four e-Governance areas: identity and security management, land and real estate registration , and supply chain. Some of them are in the implementation by international research groups.

No	Countries	Area of implementation
1.	Sweden, Brazil, Rwanda	Land and Property Registry
2.	Dubai, India	Real Estate Transactions
3.	Estonia, China	E-Governance Cybersecurity
4.	Korea, Austria	Supply Chain Management

A future area of application of blockchain technology could be envisaged – as a tool in election processes for security of the voting.
The main problem with electronic voting is that it combines two controversial processes – privacy processing is public evidence of person participation in voting but the vote has to be secret. In addition, personal information is processed in centralized data base, but the vote has to be handled in a decentralized way. Both processes need to be securely communicated and interoperable.
These requirements can be ensured by dividing the information flow into two parallel streams processed with centralized technology and decentralized technology respectively.



The personal information flow will be processed centralized, using conventional citizens ID. The secret decentralized votes information could be elaborated through blockchain technology. Usually the privacy is involved in centralized conventional national Databases. The blockchain stream could be processed in distributed way (Andreev & Daskalov, 2018) via distributed Data bases (Tsankova, 2000).

3. Achievements and recommendations

In conclusion, we can say with satisfaction that the conference has been well established and that the results of the project „Center for Research and Training on e-Governance“ are also sustainable. Not only good practices for Bulgarian administrative activities are presented, but also the students from both the Faculty of Economics of the Technical University of Sofia and the other Bulgarian universities are involved.

On this basis are prepared young specialists, which are sought after and are very well implemented on the labor market. The scientific themes have been clarified while at the same time achieving stability and flexibility in the issues.

The foundations of fundamental solutions in the field of clarification of terminology and standardization have been laid. Every year, innovative solutions discussed at the conference forum are applied in the management practice. It is a pleasure that students and PhD students participate in their implementation.

All these results and achievements go in ascending gradation and are the prospects for future development both in theoretical and applied aspects. An important and promising direction for future work is the entry of the marked results into educational practice not only through separate courses, but also through modular systems, internships, specializations and even master and bachelor specialties.

More and more labor market demand is directed at interdisciplinary training - managerial qualifications combined with design skills of information and communication technologies. It is precisely the current e-governance training that satisfies these integral needs.

Reference

Andreev, O. & Daskalov, H., 2018. A Framework for Managing Student Data through Blockchain. *Proceedings of X International Scientific Conference „E-governance and e-Communications”.* Technical University-Sofia Publisher.

Dimkov, S., 2010. *Методика за създаване на система за оценяване на изпълнението на административното обслужване*. Издателство на Технически Университет- София.

Gherman, T. & Gherman, D., 2015. Interoperability solutions for e-Government. *Proceedings of VII International Scientific Conference „E- governance”*. Technical University-Sofia Publisher.

Kralov, I., 2015. Modern ICT for academic stuff activities estimation in the Technical University of Sofia. *Proceedings of VII International Scientific Conference „E- governance”- plenary session.* Technical University-Sofia Publisher.

Krumova, M., Kraganova, D., Blagoeva, V., 2010. *Бенчмаркинг изследване и анализ на центрове § мрежи в областта на Е-управление в ЕС.* Издателство на Технически Университет- София.

Marinov, O. & Tsankova, R., 2012a. ICT for Democratization on e-Governance. In: A.Rozeva, R. Tsankova, eds., *Management of Public and Business Administration Processes by Means of Collaboration and Knowledge.* Technical University-Sofia Publisher.

Marinov, O. & Tsankova, R., 2012b. ICT for Democratization on e-Governance. In A.Rozeva and R. Tsankova, eds., *Management of Public and Business Administration Processes by Means of Collaboration and Knowledge*. [Online] Available at: https://papers.ssrn.com/abstract=2094262 [Accessed 22.02.2019].

Petkova, P. & Jekov, B., 2018. Blockchain in e-Governance. *Proceedings of X International Scientific Conference „E- governance and e-Communications".* Technical University-Sofia Publisher.

Rozeva, A., Durcheva, M., Tsankova, R., 2017a. Management of Information Compatibility with e-Assessment in higher Education. *Proceedings of IX International Scientific Conference „E- governance and e-Communications".* Technical University-Sofia Publisher.

Rozeva, A., Durcheva, M., Tsankova, R., 2017b. Management of Information Compatibility with e-Assessment in higher Education. *Proceedings of IX International Scientific Conference „E- governance and e-Communications".* [Online] Available at: http://fman.tu-sofia.bg [Accessed 22.02.2019].

Tsankova, R., 2000. *Information Modelling in Management Information Systems.* Extended abstract for DSc. [Online] Available at: https://www.researchgate.net/publication/330081567_Information_Modelling_in_Management_Information_Systems [Accessed 25.02.2019].

Tsankova, R., 2008. *Information technologies in Public Administration (bul.)*. Technical University-Sofia Publisher.

Tsankova, R, 2009. Virtual Library of Good Administrative practices. *Proceedings of I International Scientific Conference „E- governance".* Technical University-Sofia Publisher.

Tsankova, R. & Dimitrova, S., 2010a. *Design solutions for improving online administrative and management services (bul.).* R. Tsankova, (ed.). [Online] Available at: https://www.researchgate.net/publication/316420440_Design_solutions_for_improving_online_administrative_and_management_services [Accessed 22.02.2019].

Tsankova, R. & Dimitrova, S., 2010b. *Проектни решения за усъвършенстване на он-лайн административно-управленски услуги.* R. Tsankova, (ed.). Издателство на Технически Университет- София.

Tsankova, R., 2012. Virtual Library of Good Administrative practice. In: A.Rozeva, R. Tsankova, eds., *Management of Public and Business Administration Processes by Means of Collaboration and Knowledge*. [Online] Available at: https://papers.ssrn.com/abstract=2094262 [Accessed 22.02.2019].

Tsankova, R. & Georgieva, S., 2015a. Unification of the evaluation in the management processes. *Proceedings of VII International Scientific Conference „E-governance*". Technical University-Sofia Publisher.

Tsankova, R. & Georgieva, S., 2015b. Unification of the evaluation in the management processes. *Proceedings of VII International Scientific Conference „E-governance".* [Online] Available at: http://fman.tu-sofia.bg [Accessed 22.02.2019].

A FRAMEWORK FOR MANAGING STUDENT DATA THROUGH BLOCKCHAIN

Ognyan Andreev
Technical University of Sofia, Bulgaria

Hristian Daskalov
Technical University of Sofia, Bulgaria

Abstract. According to a recent report by the European Commission, blockchain technologies may "*disrupt institutional norms in the field of education and empower learners*" in line with the needs of Industry 4.0. The Commission proposes eight scenarios for the application of distributed ledger technology (DLT) in an educational context, based on the current state of technology development. This paper looks into the theoretical and practical opportunities for OS.UNIVERSITY as a pioneering initiative in the field to be of benefit to the national "Careers Registration" project in the U.K. higher education system for collection and analysis of student career-planning data. OS.UNIVERSITY aims to create a distributed platform on the blockchain that turns the potentially disruptive DLT scenarios into real-life opportunities for modernization of Academia, enablement of businesses, and empowerment of learners.

Keywords: blockchain, education, edtech, open source technology, universities, career development, careers registration

1. Introduction

According to a recent research by EY (2017), not the lack of information, but rather its inefficient exchange is behind skills' demand and supply mismatch that is harming the process of school-to-job transition. In the example of the national "Careers Registration" (CR) project in the U.K., what the universities do is to measure "career readiness", i.e. to establish, track, and analyze where, how and when students make their career decisions and choices whilst at university (Dray; Ives, 2018). While this is an important step in the right direction (traditionally institutions have been tracking students' academic progress, but not their career development), what happens after the data analysis is what is important for the stakeholders in order to achieve a systemic change together.

By analyzing best practices from the national CR conference "*Insight for employability: The implementation and impact of Careers Registration*" (University of London, 2018), the authors of the current research aim to prove that the role of the students as owners of their own data is underutilized and to propose a framework for exchange of the actual career data through a peer-to-peer blockchain-based system.

A recent report by the Joint Research Center of the European Commission (JRC, 2017) includes case studies of blockchain implementations in education from various players. Despite that each of these implementations is still in a piloting phase, the Center concludes: "*It is possible to suggest that blockchain in line with the principles of sharing and transparency of data has the potential to disrupt the information systems market in education by loosening the control that current players have and by empowering learners*."

Within the case of the OS.UNIVERSITY platform that is in the focus of the current research, three sets of "*smart contracts*"[1] are being deployed on the distributed Ethereum blockchain as a method to improve the information-coordination relationships among the various stakeholders in the field of learning and development, instead of relying on centralized systems, closed behind institutional borders. From an informational point of view, they can be represented by distributed federated databases (Tsankova, 2000). Fig 1 highlights the end-to-end logic behind one of the information exchange processes – the validation & verification of learners' credentials, enabled by L2A (learner-to-academia) smart contracts.

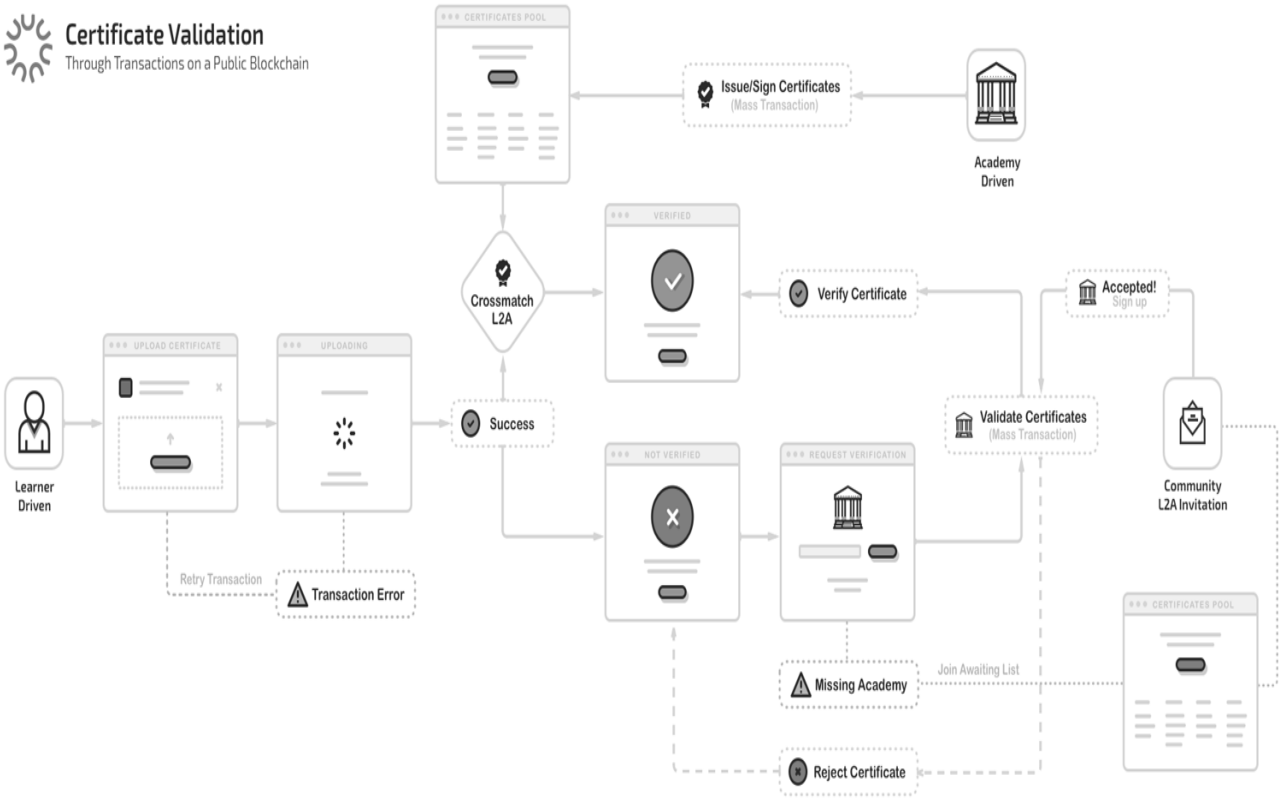


Figure 1. OS.UNIVERSITY L2A process flowchart

[1] According to the definition, provided by "Investopedia", smart contracts are self-executing contracts with the terms of the agreement between buyer and seller being directly written into lines of code. The code and the agreements contained therein exist across a distributed, decentralized network. Beyond cryptocurrencies – the classical blockchain use-case, any number of parties can execute a smart contract that is associated with the registration and transfer of value between them in numerous fields, e.g. property rights, intellectual property, physical assets (Daskalov, 2018).

Beyond L2A, L2B & B2A smart contracts are also deployed on the blockchain, because the blockchain as a DLT (distributed ledger technology) system enhances the transactions of information by offering: authenticity; decentralized trust; less bureaucracy; direct interaction; security (Jambazov, 2017).

2. Careers Registration Data

With at least 34% of UK Higher Education providers involved in the growth of Careers Registration[2] in 2017 (Cobb, 2018), the application and impact of the project as an evidence-based approach for employability support in higher education, continues to gain momentum (*see Table 1*).

Table 1. Careers Registration in numbers

What is it?	**What are the questions?**	**Who is involved?**
2–4 careers focused questions added to compulsory student registration and re-enrolment to track progress in career thinking and employability.	2 areas of research interest: - Self-reported "career readiness" (Decide > Plan > Compete> Sorted); - Useful experience gained (e.g. placements, volunteering, internships).	16 institutions who have implemented or will be implementing CR as part of a national consortium.

The project administrators, i.e. the career centers, typically look at the following:

- Typical progression patterns for various cohorts (discipline, WP, etc.);
- Predictive power for DLHE (Destinations of Leavers from HE) outcomes;
- Correlations to other employability measures;
- Relation to other metrics (NSS, retention, etc.);
- Implementation issues.

While best practices prove that learners' CR data (that is being generated and analyzed) provide a lot of value by offering insights on students' careers thinking and preparedness; identifying specific employability needs of groups, leading to targeted interventions; measuring the effectiveness of employability initiatives, etc., it fails to empower learners to benefit further from their own inputs beyond the limited timeframes of their higher education studies. Some universities, such as Ulster, offer

[2] "Careers Registration and Learning Gain" is a 3-year HEFCE funded pilot project to investigate the use of careers registration as a measure of learning gain in relation to work readiness that is led by the Careers Group, University of London.

access to personalized employability portals (McGivern; McCloy, 2018). Others offer tailored career center services for students to improve their progress throughout the course of their studies, but a review of the most recent use-cases nation-wide reveals that none of the piloting universities looks into the opportunity to hand over the ownership and "empower the learners" in line with JRC's report conclusions.

3. Blockchain as a Next Generation Distributed Database

According to the Knowledge Media Institute at the Open University "*the blockchain technologies may hold an answer to collating the outcomes of the new distributed learning reality*"[3] and they intend to explore the possibilities that this infrastructure could provide. In the spirit of the above statement, the authors extend the concept of a "*distributed learning reality*" and connect it to the concept of a "*distributed career reality*". As an example of the latter, a recent report by the U.S. Bureau of Labor Statistics, reveals that almost 25% of the workforce change jobs annually (2017).

This all leads to the assumption that for the new "*school-to-job-to-school-to-job....*" transition to happen in a frictionless manner. According to (Tsankova, 2000) where data about individual learning and career aspirations and achievements can be recorded in an immutable manner and verified indisputable by multiple sources a virtual federative distributed system is needed (as seen on Figure 2).

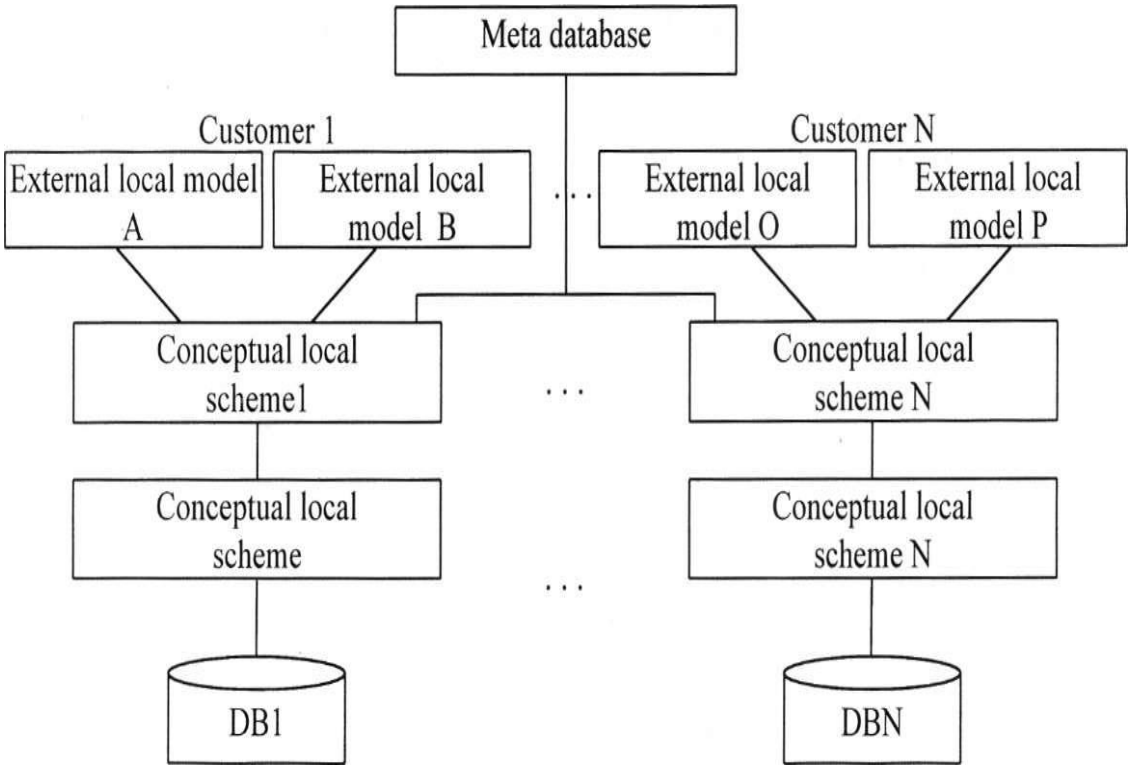


Figure 2. Meta database mapping for virtual federative distributed Database

[3] The new "*distributed learning reality*" can be perceived as both an opportunity and a risk to learns. As an example of the latter, 30+ million U.S. learners are now with some college education, but no degree or certificate, according to the National Students Clearinghouse (NSCH, 2016).

They could be exchanged in a peer-to-peer way without the need for an intermediary and the associated costs around it. The multi-chain architecture of one such open blockchain platform, would allow for this transformation to occur without any changes in the internal systems and operations of the parties involved *(as seen on Figure 3).*

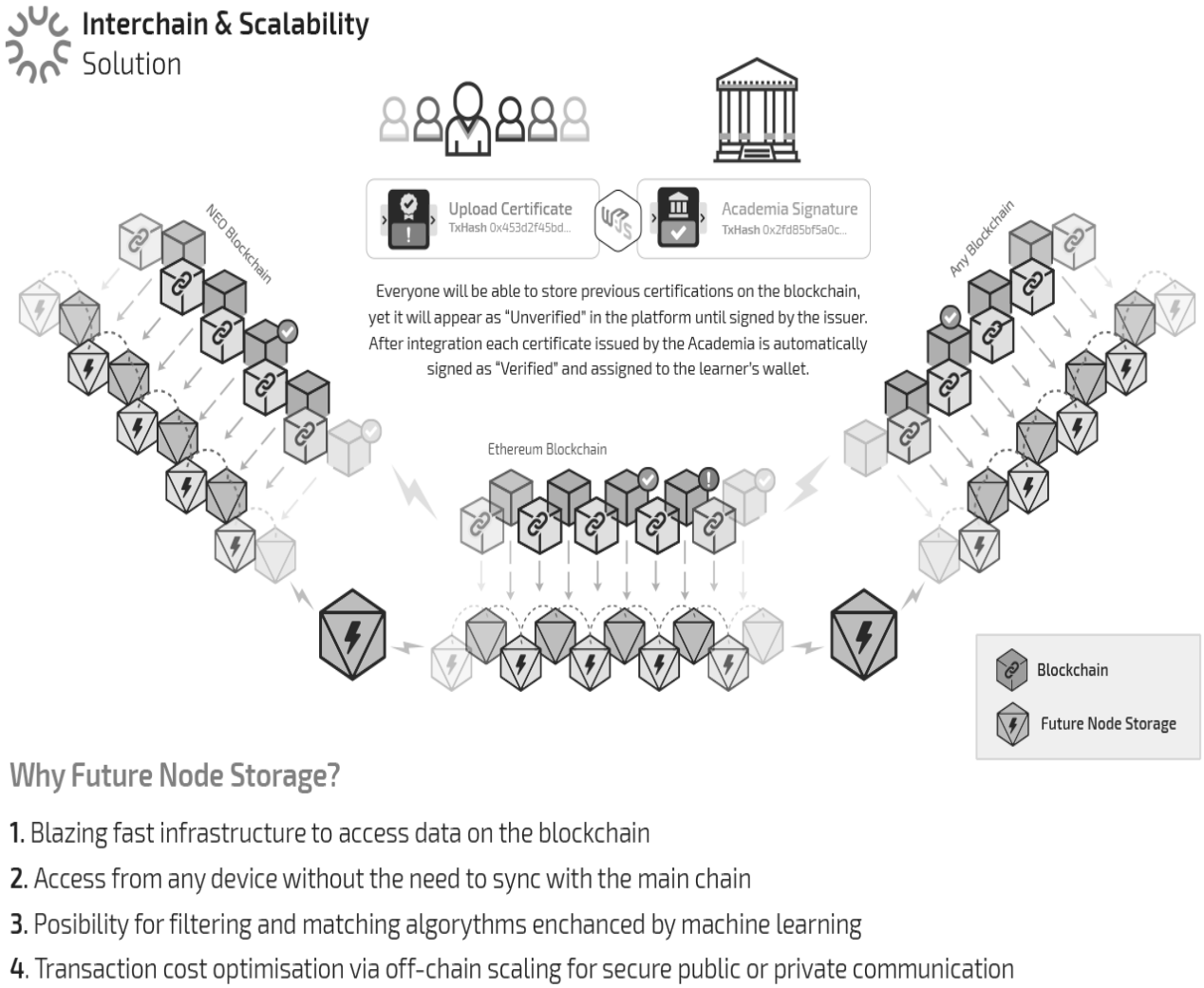


Figure 3. The multi-chain "Future Node Storage" architecture behind OS.UNIVERSITY

Securing the exchange of sensitive learners' information encrypted and transmitted over the blockchain network is of highest priority when it comes to turning a highly innovative project, such as OS.UNIVERSITY, into a success among universities that have a long-time record of difficulties exchanging data in a transparent, unified and cost-effective manner beyond their institutional borders[4].

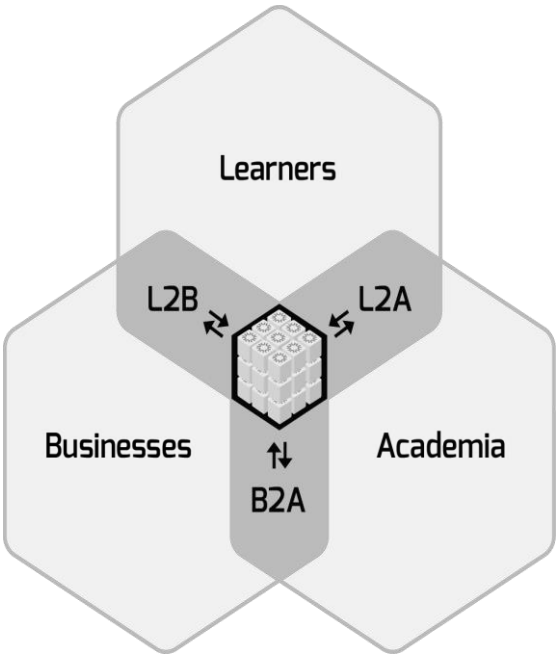
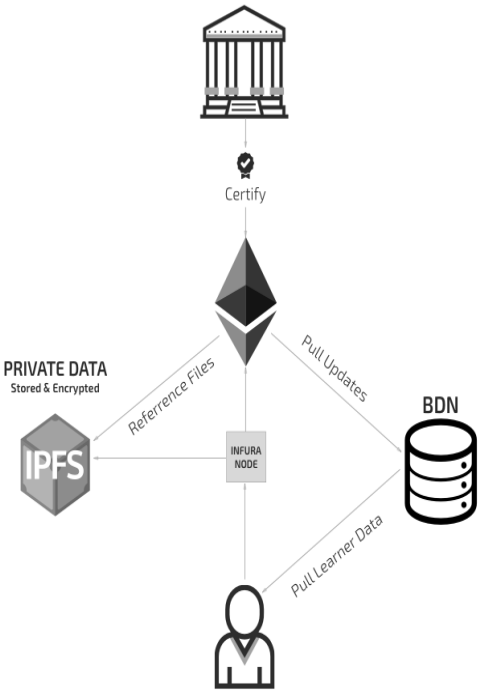
[4] It is known that developers of smart contracts must be more security-focused than their traditional software counterparts as over the blockchain design and programming paradigms evolved exponentially. Unlike traditional software where version upgrades is the norm, smart contracts are immutable once deployed. The overall DApp (distributed application) architecture must be therefore highly modular.

Therefore, the development team behind OS.UNIVERSITY is looking to implement a three-step security audit process, as outlined in its technical white paper (2017):

- First step would be for the testers to get fluent in the new paradigm of distributed trust computing (e.g. "Open Zeppelin"; "Oyente" certification);
- Second step would be to test every new version and upgrades of the smart contracts over a test network, while keeping learners' personal information off-chain, exchangeable on a peer-to-peer network, such as IPFS[5]. The key rule for the information-coordination would be: "*you own the data, smart contracts help you exchange it, blockchain ensures the immutability of the exchanges*";
- Third step would be to implement a testing protocol for information security vulnerabilities (e.g. re-entrancy bugs, manipulation of contract outcomes, etc.).

Having taken the strategic, as well as the operational considerations in consideration, a framework to satisfy them all and to successfully enable the exchange of students' "Careers Registration" data through the blockchain from universities to learners to businesses (and back), would need to possess the following characteristics.

Table 2. Careers Registration in numbers

Strategic View of the Framework	**Operational View of the Framework**
	

[5] The InterPlanetary File System (IPFS) is a peer-to-peer distributed file system that seeks to connect all computing devices with the same system of files. In some ways, IPFS is similar to the Web, but IPFS could be seen as a single BitTorrent swarm, exchanging objects within one Git repository. In other words, IPFS provides a high throughput content-addressed block storage model, with content-addressed hyper links.

4. Conclusion

Analyzing the opportunity for expansion of the benefits that CR promises (both qualitatively[6] and quantitatively[7]) and in line with the questions brought forward by the 3-year HEFCE funded pilot project to investigate the use of CR as a measure of learning gain in relation to work readiness (such as "*What is the best way to implement CR?"*), the authors of the current article conclude that there is a meaningful opportunity to enable students' data to yield long-term results by incorporating it into the so called "*individual learner wallet*", which the OS.UNIVERSITY project will offer to learners throughout U.K. as of June 2018 with the launch of its alpha-version on the open Ethereum blockchain.

As a core value proposition, the wallet, also referred to as a "*competence passport*", represents an immutable digital credentials portfolio to store and transfer throughout institutional and national borders credible information about personal accomplishments and achievements (originating from certifications, diplomas, accreditations, etc., which are validated and verified though the blockchain). Thanks to a framework of L2A (learner-to-academia) and B2L (business-to-learner) smart contracts, deployed on the blockchain, the CR data, collected by the universities and fed into the learners' wallets, would achieve the following outcomes:

- ***L2A Smart Contracts*** – data about learners' accomplishments would enable smarter discovery of additional learning opportunities, which on its own will enrich the insights about learners' career aspirations, based on the autonomous choices of the learner in the online space beyond self-reporting.
- ***B2L Smart Contracts*** - the connection between (A) learners' data in regards to their career aspirations, enriched with information on the acquired (and relevant) knowledge and skills at any given point in time and (B) hiring businesses with matching requirements for these profiles, will happen automatically upon a "*handshake"*, enabled through a B2L smart contract.

By giving back the ownership over the CR data and its utilization into the hands of learners, thus enabling them to put it in motion on top of the open blockchain (providing trust and traceability of every event in the individual educational and professional development journey), learning gain has the perspectives to align with work readiness more effectively and efficiently.

[6] According to the World Economic Forum (2016), because of the "Industry 4.0", 35% of core employment skills will change between 2015-2020, thus the one-time measurement of "career readiness" upon graduation and entry in the workforce loses on its trait as an indicator of quality when it comes to the long-term employment and career prospects of the individual learner.

[7] According to latest data from OECD (2016), higher education penetration is as low as 15% in world's 2nd and 5th most populated nations - India and Brazil respectively. Even in developed economies, such as the U.K., only around 50% of population in engaged in higher education, which raises the question on how to bridge the gap with the other 50% when it comes to advancing "career readiness" among young people.

At the end of this article, it should be underlined that as an innovative technology, blockchain creates not only opportunities, but also certain challenges. If it is to be integrated for the purposes of the Career Registration project, these challenges should also be considered. For example, the cryptographic hash function, a function which is infeasible to invert, is a great 'digital fingerprint', but a fingerprint that when it comes to identities, needs to be linked to actual learners, educators, companies by following additional policies and processes, which on their end need to be agreed upon. This, along with other interlinked topics, such as the use of zero-knowledge protocols and blockchain oracles, would be a subject of future research by the authors.

Acknowledgments

This publication is developed and published with the financial support of the Scientific-Research Sector at the Technical University of Sofia under project № **182ПД0016-15** titled "Investigating Open Source Based Projects and Developing a Methodological Approach for Their Management"

References

Cobb, F. (2018). *Careers Registration and Learning Gain*. University of London.

Daskalov, H. (2018). *Academia 4.0: University on the Blockchain*. Open Source University.

Daskalov, H. (2017). *Application of cryptocurrency innovation beyond the financial world. The case of the blockchain as a medium for organization of Academia-Business cooperation*. UNWE Monetary Research Center.

Department for Business, Innovation & Skills. (2016). *Success as a Knowledge Economy: Teaching Excellence, Social Mobility & Student Choice*. HM Government, UK.

Dray, T. & Ives, J. (2018). *Career Readiness Data - Helping to transform careers practitioners' professional practice.* Liverpool John Moores University.

JRC. (2017). *Blockchain in Education*. Publications Office of the European Union.

EY. (2017). *How to improve qualification of young graduates to increase their employability. Workshop on quality education*. Youth Speak Forum, AIESEC Latvia.

Hill, K. & Johnson, S. (2018). *Careers registration for postgraduates - positives, pitfalls and PowerPivots*. University of Bristol.

McGivern, D. & McCloy, S. (2018). *Addressing Metrics and Innovating the Student Experience through Career Registration.* Ulster University.

OECD. (2016). *The Knowledge Triangle: Enhancing the contributions of Higher Education and Research Institutions to Innovation*. High Level Event on the Knowledge Triangle, OECD Paris.

Tsankova, R. (2000). *Information Modelling in Management Information Systems.* Extended abstract for DSc. [Online] Available at: https://www.researchgate.net/publication/330081567_Information_Modelling_in_Management_Information_Systems [Accessed 25.02.2019]

Welch, B. (2018). *Now what do we do with it? Using Careers Registration*. University of London.

World Economic Forum. (2016). *Annual meeting of the new champions*. Tianjin, WEF.

Wright, A. & Frazer-Veli, I. (2018). *Employer engagement: Using registration data to build effective relationships*. King's College London.

E-GOVERNANCE STATE OF ARTS AND TRENDS

THEORETICAL APPROACHES TO REGIONAL DEVELOPMENT AND ELECTRONIC MANAGEMENT IN A TERRITORIAL ASPECT

Associate Prof Dr. Kamen Petrov
petrovk@abv.bg
University of National and World Economy

Abstract:
The development of scientific knowledge in recent years has systematized a set of regional issues. To a large extent this is related to the determination of basic fundamental productions related to the clarification of the subject area of regional development and regional policy. The report examines the possibility of systematization of scientific instruments of regional development and the definition of its problem area. It is expressed in the framing of the different scientific fields and theoretical development of regional science.
Keywords: regional development, regional economy, local, impact, processes, structures and patterns.

1. Introduction

Regional development is a process that reflects the economic reality in spatial and territorial terms. Through it people realize economic processes, acquire knowledge using their conversion to the development of the territory or evaluation of the change in its structure and development. The approach to regional development usually begins with its subject area, with the establishment of the range of issues to be examined as well as the disclosure of specific methods that apply. With regard to the first round of questions the applied chronological and geographical approach reveals evolved and change perceptions of the main theoretical directions in regional development. The second, larger range of problems presented scientific instruments of regional studies and the functions it performs regional science in the context of the development. In this aspect of regional development is the science of the interests and behavior of economic agents for their rational choice if their narrowness of wealth and resources in the territorial and spatial aspect from the perspective of their functional organization and managing.

So the fundamental task of regional development is to describe, explain and predict the rational behavior of economic agents in spatial and territorial terms. Moreover, the systematization of regional theory offers a variety of definitions of their own and primarily in the direction that regional development studies regional relations and peculiarities of production, distribution, exchange and consumption of wealth of society in territorial and spatial aspect. Mostly it takes the view that regional science characterizes everyday business people indirectly by studying changes in social and economic life - production, prices, unemployment, etc. In

practice Regional Development explores how people organize their production and consumption, seeking answers to the basic questions of any business - what, how and for whom to produce. Of course as a scientific discipline and for training purposes Regional Development is to study the behavior of economic actors in territorial aspect, spatially based on resource constraints and interdependence between objectives and alternatives for implementation. Regional development has a functional dimension and in fact is the science of choice caused by spatial and territorial development of society and the planet. Regional Development is tasked to develop theoretical and practical models of geo-economic choices of the people caused by the scarcity of wealth and territorial location of the productive forces and build the foundation of a functioning regional economy and implementation of regional development policies (Georgiev, L. 2012).

In this sequence in a theoretical sense, regional development enables the study of changes in the regional economy through the analysis of dynamics of prices, unemployment and others, while from a functional point of view to develop solutions and strategies for conducting policy impact from the government on national space as a whole and the specificity of its regional variations and peculiarities. So regional development as a science of the impact and the choice shows how people decide to use scarce resources to produce goods and distribute them among members of the public. In this direction we must distinguish between regional economy and regional development. Regional economy studying the functional and causal relationships in the form in which they appear on the surface of the operation of the market mechanism to regulate the economy in terms of territory and mainly in the local election. Therefore, the main object of study is regional and local domestic market and the law of supply and demand in local and territorial aspect (Petrov, K. 2016). Regional Development study management solutions and organization of the environment caused by human relations in the production, distribution, exchange and consumption of material goods and implementing public management. In practice we can say that the regional economy is part of regional development. This allows regional development to enrich and diversify subject to rapid development of economic life with the enrichment of geo-economic theory with new tools. So regional development is a science that explores the stages of development and territorial levels of social production as a whole with a view to rational use of production resources to meet the needs and ranged subject of social justice in spatial and territorial terms. So let's summarize that regional development is the science of the most rational choice of how to best use limited resources in the production, exchange and consumption of tangible and intangible goods and services in spatial and regional dimension in order to develop functional relationships between sectors to more fully meet the growing needs and desires of individuals in society and the imposition of sustainable management decisions and practices. Moreover, regional development is interested in the analysis of various economic systems in terms of rational conservation and use of resources for the purpose of selecting the optimal model of national and regional economic development, especially the least developed countries according to their natural and socio-economic characteristics and regional differences. In purely theoretical aspect it examines regional development needs of

the individual user to explore consumer-related production decisions of the firms pricing and market equilibrium. It justifies rational behavior of firms depending on the development of the national economy and the situation on the world market through the assessment of the labor market (unemployment) inflation, gross domestic product and more. Problems associated with macroeconomic balance and economic growth in the regions, districts and municipalities. This allows for Regional Development to operate between local communities and national space characterized as the meso level, the results of the concentration of capital in production and their trans-nationalization in purely territorial and spatial plan. The research is the investment activities and role of economic entities with different scale affects the entire country and international trade and its impact on regional development of the nation. So regional development studies the behavior of geo-economic forces in business and their impact on the development of national economies and the processes in the world economy. This model of regional development has its mega regional dimension when investigating the relationship between national economies in terms of exchange of goods and services, capital and workforce (Geshev, G. 1999). Then uses the tools of geo-economics through which it reveals the development of the international economy, financial, political and economic systems, international financial markets, international institutions and rights for the functioning of the global economy, the process of integration, etc. in spatial and territorial terms. From a conceptual point of view, regional development is interested in analyzing the various geo-economic systems in terms of rational conservation and use of resources for the purpose of selecting the optimal model of geo-economic development especially in less developed countries, according to their natural and socio-economic characteristics.

2. Theories and approaches to Regional Development and their explicit impact.

In the systematization of knowledge in regional development we can distinguish several scientific fields. The first direction is "Comparative Regional Development (positive regionalism)" it is an explanation and analysis of the facts shows the reality as it was, is and will be. It takes into account practical experience verified facts. Positive is the statement "policies for regional development to stimulate business investment." The second direction is "Management of Regional Development (normative regionalism and regional management) through it responds to how it should have been, is and be in regional development, based on the regulatory environment and morally ethical evaluation the different processes. In practice normative regionalism shows the importance of the regulatory environment governing regional development and opportunities for its rational use and management of processes and phenomena in regional development. So regional development is called to enrich the knowledge of economic life, revealing specifics of the regulatory environment, laws, categories and mechanisms of their action and practical use, building scientific belief system and their application in regional development. Third direction is "Strategic Regional Development "(Regional planning) it consists of statements about what we want to be. In practice, the regional development process and its change and the future require strategic measures so on

the basis of theoretical knowledge Regional Development should develop a strategy plan and a mechanism for transformation of theoretical knowledge in practical skills that help us in our rationality as possible and useful geo-economic behavior and have a real connection with the reality of development. This direction is connected with building a comprehensive geo-economic vision of the world, helps us in the criteria of socio-economic justice, rational economic order against chaos in the management of business processes. In terms of strategic directions and examined regional development by means of roads and principles for disclosure of objective connections and relationships between phenomena and processes (Karakashev, Hr. et al. 1989). The conclusions that regional development is done using their methods are checked in practice. Reaching these conclusions it by examining the facts of the socio-economic life. In this direction important place have thought experiments, which are the only possible ways to study because the phenomena and processes in regional development are not always accessible to direct observation.

So to clarify the processes and phenomena in regional development are constructed theoretical models based on hypothesis reproducing most characteristics of the studied socio-economic phenomena. So in regional development perceived categories, apparatus of scientific abstractions, reflecting the overall quality characteristics (country, properties, relationships) of socio-economic phenomena in spatial and territorial aspect. They are the most important features of abstract thinking, result and basis of learning. Regional categories reflect the quantitative aspects of socio-economic processes in spatial aspect being considered as variables. They can be endogenous - inherent in a socio-economic process and exogenous - external process. Heading time distinguishing dynamic - changing and static - not weather-related. This requires regional development to define the relevant regional principles. They can be listed several basic principles of regional knowledge: economic goods are scarce to use spend money and time; behavior of economic agents is rational; man seeks to optimize its choice; economic thinking is marginal; economic behavior is appropriate, giving it economic nature, any economic activity has a secondary effect and others. This suggests to form and fundamental regional law, which is a generalization of repeated, persistent links between socio-economic phenomena characterized by versatility and validity in territorial and spatial aspect. And as socio-economic processes do not comply strictly with these requirements and exceptions, regional laws are seen as law-trends. The basis of the method lays a certain idea about the nature of regional problems (Christov, Hr. T. Daskalova 2011).

The approach to regional development includes assumptions problems, basic concepts and hypotheses determined by the majority of regional development. So under regional development means everything, making entity. This concept is broader than the transaction because it involved phenomena which are not transactions. The ultimate goal of each regional activity is development. So development is related to these entities in whose interest is carried out in the end management business, which has a final result. Public entities summarized as "State" in spatial terms are central and local bodies of government (municipalities, counties) and institutions for economic policy, budget organizations and public undertakings.

So regional development in the public sphere is carried out by means of regional policy. In our conditions we distinguish two types of regional policy. The first is regional economic policy, which designates study the economic process is set by defining it behaviors and objectives of businesses, institutions, technical and other conditions. In regional economic, policy always starts from the process status at a time or a running process in a given period. Given position or move the process represents a starting situation analysis explores in its change. There is around (middle) of the background situation in spatial and territorial context. The second type is a regional development policy, in some cases, some participants in regional development it is interpreted as state policy regarding the development of municipalities in others - as "territorial projection" and therefore coordination of sectorial policies and actions, third - as a component of overall national development policy in the fourth - as separate independent policy.

To a great extent in this direction cannot be accepted view Marinov on that "the need for regional development policy is conditioned by the fact that the principle of territorial solidarity requires the creation of relatively equal living conditions in various parts of the territory the country that existing in each country regional differences give rise to social and political problems that regional and national economies are closely related (national development can be represented as the sum of development of individual regions of the country) and the fact that only market forces cannot ensure balanced regional development. (Marinov,V. et al 2000) In contemporary social, economic and legal sciences regional development acquires a new fundamental that characterizes socio-economic development of the national space. This warrants us to conclude that regional development is one of the foundations of the nation, it is called upon to carry out those functional and industry relationships that build the architecture of the national economy and promote development policies of the territory.

3. E-government as a new way of organisation and management of public affairs.

A basic prerequisite for the use of e-services by citizens and businesses is the implementation of measures to encourage the development of broadband infrastructure in remote and sparsely populated regions, as transmission infrastructure is brought much closer to the users. In recent years the development of ultra high-speed communications connectivity for next generation (NGA) access already started, which will provide connectivity to the town-hall of each municipal administration, as well as to the buildings of public institutions within them (judicial authority, prosecutor's office, police, school, hospitals). In 2013 the main technical e-Governance center was further developed, as the major components were upgraded – a single access portal to electronic administrative services and a single media for e-documents exchange. In order to meet the need to provide quality services, ensuring data safety, connections' reliability in one entirely secure environment, it is extremely important to further develop the primary and spare technical centers into a primary and spare data centers, thereby initiating the development of a Government 'cloud'. There will be developed and introduced a single common for the entire administration information system to organize and govern processes related to

provision of services. There should be established conditions for the normal functioning of the primary electronic registers and the access to them. In order to implement those services that provide higher added value to the customer and meet the 'hot spots' of the vital life cycle episodes and business events, as well as to discover significant benefits of the integration with other administrative services, it is necessary to set a priority portfolio of electronic services at a national level, as well as at the ministry/aagency and municipal administrations level.

The introduction of electronic invoicing will help to reduce taxation frauds, it will allow better control over budget revenues and reduce administrative costs. Increasing the usability of e-services by introducing electronic payments as a preferable way to pay for state and municipal fees and services. Assisting citizens and businesses to pay for their liabilities and creating administration tool to estimate in advance the value of a certain complex service before placing the order by electronic means. In 2013 the development of a national spatial data portal to provide services with spatial data to national and European users and a link with the European geo-portal. The Portal provides public access to share interoperable spatial data, in accordance with the European standards and the INSPIRE Directive on the Establishment of Spacial Data Infrastructure and a European Community. In recent years overcoming the irrational use of resources, duplication of data, multiple entries of similar information, the lack of automated data exchange between separate systems, even within one administration, was focused on the development of models and standards for digital administration and provision of technological opportunity to transition from paper document exchange and multiple collection of information from users to optimized processes, in which communication among administrations is conducted via the single media of e-documents exchange. An opportunity was provided for each e-service to be tracked as a process and stage of performance in the corresponding administration, in the case of complex services in every participating administration. There will also be an opportunity for this system to be used by administrations that do not have document exchange system, for the purposes of their bookkeeping. In the following years all these tools will be used by each administration, with provided connectivity, so to support the process of document coordination in administrations, a phased introduction and integration of central document exchange system starts. This will allow each e-service to be tracked down as a process and stage of performance in the corresponding administration, in case of complex services - in every participating administration. In order to provide 100 % electronic document exchange between administrations"(Naydenov, Kl., 2004).

The re-engineering of processes in administration will continue at accelerated pace as a necessary and important step to provide integrated e-services, using the methodology to improve working processes description for provision of administrative services, which in turn will lead to the increase of citizens and businesses' satisfaction, achieving greater transparency, saving resources and alleviating the administrative process. Re-engineering of working processes at all levels in state and municipal administration and their introduction as unified services will make it possible to optimize business processes and increase the quality of administrative service, by means of administrative e-services, as for the period the

efforts are focused on the implementation of priority administrative e-services. In order to guarantee a more reliable than e-mail delivery of results from a performed electronic administrative service, it is of key importance to ensure the possibility to verify the validity of a document, issued by a certain administration through a system for delivery of electronic documents and services to validate documents. To unify and formalize the information that central administrations require from local administrations, the definition of a finite number of standardized reports, statements and other similar documents is planned. These must be developed in an electronic version and media, since their preparation should be created. The aim is to allow the opportunity to alleviate the work of administration, to store descriptions and ensure access to publicly available business processes and web-services, provided by administrations in registers with various functionality (of business processes, web-services etc).

Each administration will be able to develop services, according to certain compatibility criteria and respect a pre-defined process, to publish services in the register. There will be developed a system to process events/a newsletter of actions and its integration with other main infrastructure components. A buss for events will be created that enables generating, processing, filtering events, their correlation and analysis. The newsletter of actions in the system will store the history of access to resources and the actions completed with them. It will assist the implementation of the control functionality on the part of citizens to access their personal information. This requires strengthening the foundation of regional science by putting the regional development as a fundamental scientific discipline. In this way regional development needs to be strengthened and new scientific searches in the assessment and analysis of the processes involved in spatial development (in global, national, local and regional level) of the country. After absorption of space by society is increasingly having its optimization, redesign and sustainable development, so new field of scientific development will be in search for answers to how regional policy should realize and what results we can achieve in the context the new global change.

4. Conclusion.

Capital markets have to deal with increasing and investing the money in various businesses. The increased integration of these financial markets between the parties led to the emergence of the global capital market or single market in the world. In the long run, increasing the movement of capital between countries tends to favor the owners of capital, more than any other group in the short term, owners and workers in specific sectors in exporting capital countries bear much of the burden of adjustment to increase movement of capital. Not surprisingly, that these conditions led to political divisions on whether to or not to encourage or increase the international integration of the capital market. Those who are against capital market integration based on issues related to human rights are particularly concerned about the abuses that consider themselves immortalized by global and international institutions that promote neoliberalism without regard to ethical standards.

References:

Geshev, G. (1999) Problems of regional development and regional policy in Bulgaria.
Georgiev, L. (2012) Regional Economy, ed. NBU.
Karakashev, Hr. et al. (1989) "Regional Economy" Ed. Science and art.
Marinov, C. Hauser, Al.Dzhildzhov (2000) Review of regional policy in Bulgaria: Status, evaluation and perspectives.
Naydenov, Kl. (2004) "Methodology for global change vulnerability assessments", First International Conference "Human Dimensions of Global Change In Bulgaria", 22 – 24 April 2004, Sofia, Bulgaria.
Petrov K. (2016) Opportunities for more effective management of the regional development in the region of Plovdiv. BFU Bourgas.
Christov, Hr. T. Daskalov (2011) Management of infrastructure projects. izd.Stopanstvo.
Strategiya za razvitie na elektronnoto upravlenie v Republika Balgariya 2014 – 2020.

E-GOVERNANCE- IMPROVING EMPLOYMENT THROUGH SMEs AND ADDRESSING THE CHALLENGES FOR SUSTAINABLE REGIONAL DEVELOPMENT IN DOBRICH PROVINCE

Velizar Petrov
PhD Student, Sofia University "St. Kliment Ohridski"
e-mail: velizar.v.petrov@gmail.com

Mihaela Georgieva
PhD Student, Sofia University "St. Kliment Ohridski"
e-mail: mihaela.i.georgieva@gmail.com

Abstract: This report is focused on modernization of e-governance as a way to achieve sustainable regional development by creating high levels of employment through SMEs and developing greater social cohesion in Dobrich Province. The main focus of the exhibition is the need for development of electronic technologies to improve the information environment, as well as the benefit for Small and Medium-sized Enterprises (SMEs) of implementing e-government as a way to reduce administrative burdens, optimize management processes and adapting to society transforming technologies. Proposed is the set up of an electronic system at the Province level, which would allow the possibility of providing a number of e-services to the economically active persons in order to improve the connectivity and socio-economic processes in Dobrich Province.
Keywords: e-government, SMEs, regional , employment, adaptibility, development, systems, modeling.

1. Introduction

The main problems in the spatial development of the regions in Bulgaria are overcoming socio-economic lagging and generating high levels of employment. In this sense, SMEs can be a key element in improving regional development as a backbone of the evolving development of the regions in Bulgaria. Our goal is to bring out the specifics of regional development and e-governance that create conditions for improving employment in small and medium-sized enterprises. In addition to focusing on SMEs, attention will be paid to demographic and territorial characteristics, as a basis for determining the need for emergence and operation of small and medium enterprises as the backbone of the European economy. They provide over 60% of private sector employment in the EU and around 85% of newly created jobs. SMEs and entrepreneurship are a key factor in achieving economic growth, innovation, job creation and social integration in the EU. In this direction, by improving e-governance, an information environment can be created to support the development of small and medium-sized enterprises at regional level and to improve their competitiveness at national and international level. Moreover, the development of SMEs offers enormous contribution to social well-being, output and employment opportunities, which can help meet the demographic challenges. In addition, the

development of the SME sector can help boost competition and productivity, and therefore stimulate regional income growth and per capita income in the Dobrich Province. This development will also stimulate structural change as a well-functioning SME sector is linked to innovation, implementing of new technologies and introducing an effective information environment that would serve as a foundation to develop e-governance. E-Governance is the integration of Information and Communication Technologies (ICT) in regulatory interconnections and administrative processes and services with the aim of enhancing government abilities to cater to the needs of the general public. The main purpose is to simplify processes through electronic means for government, businesses and citizens on national, state and district levels, thus promoting simple, moral, acountable and transparent governance.

2. Economic, Technological and Institutional aspects

In spatial and territorial development aspect, it is very important in terms of Bulgaria's membership in the European Union to develop the regional business and the processes of an improved information environment. E-Governance is a tool for enhancing the efficiency of administrative processes as well as facilitating processes in the interactions between administration, employees, citizens, business through the use of e-services.

Territorially, Dobrich Province is located in Northeastern Bulgaria and occupies most of Southern Dobrudzha. It falls into the easternmost part of the Danube Plain. The region is one of the major producers of agricultural products in the country. The natural conditions here are extremely favorable for the development of crop production - for growing cereal, technical and forage crops. The share of arable land in agricultural land is highest compared to other areas in the country - 98.8% on an average of 90.9% for the country. In this respect, the region is a leader in the food industry, accounting for 48% of industrial production. The milling industry has a capacity of over 200 tons per day. A well developed branch is the production of bread and bakery products. More than 35% of pasta products are produced in Dobrich Province. The oil industry has a capacity of 200 tonnes per day. Other production features cheese, yellow cheese, yoghurt, milk butter, dry milk and ice cream. There is a large poultry slaughterhouse in the area, as well as the largest factory in the country for the production of eggs. The strong position of the area as a food producer is determined primarily by established traditions, the availability of skilled labor, the great potential of local agriculture and the good interaction of these industries. The region has developped also other various industries, among which: footwear, clothing, leather, fur, chemical, metallurgy and machine building, textiles and knitwear, logging and woodworking, electronics and electrical engineering, the production of building materials, etc.

All of the above create the conditions for regional development profile of SMEs in the manufacturing industry. These enterprises are the backbone of the economy in the area in terms of employment and income from business. In general,

the characteristic of this group of economic units per year shows that SMEs provide employment for more than 30,000 people, which is a serious potential for employment rates in Dobrich Province. The analysis of the data shows that the peak year in terms of the number of SMEs is 2009, after which the number decreases. This is could be explained by the Global Economic crisis. The number of employees in these businesses peaked in 2008, then declined to 34500 people in 2011, accounting for 47.3% of the employment in the three economic sectors. In essence, in the post-2011 period, there is an increasing share of SMEs, but at a slow pace. Given the declining population and the limited workforce capacity, the 2017 data shows that the area is just bellow 2009. It is important to note that the socio-economic development of Dobrich Province directly corresponds to the increase of the employment in the SMEs. This also means searching for opportunities for the development of these economically active people in the region.

Such views are also underpinned by the 2014-2020 Regional Strategy for Development of Dobrich Province with ideas for increasing the potential of human resources, increasing the level of employment, income and achieving social integration of the disadvantaged groups. In practice, this implies creating conditions for increasing competitiveness in order to achieve a dynamic development of the area by reducing disparities both within and among the neighboring regions. By supporting economically active people at a Province level, it is possible to promote balanced territorial development by establishing adequate spatial planning models, improving environmental conditions, and making effective use of cross-border and interregional cooperation mechanisms. In this context, it is strategically important to improve e-governance at the Province level.

Outlined is the need for implementation of a uniform information model in the administration in Dobrich Province and creating opportunities for e-services for the business. This means at the Province level the digitization of administration has to cover a series of actions related to the introduction and use of databases, switching to fully electronic registers and register production, modeling of information exchange processes, formation of complex electronic administrative services, thus reaching the ultimate goal - "connected administration". This includes all data and unstructured electronic documents subject to administrative document flow (Ivanov, M, 2016). All data that is legally required to be bundled and processed in digital form. To facilitate administrations at municipal level in Dobrich Province, information systems for data modeling have been developed. This means following the policy that each administration is a primary administrator. This means introducing an electronic register and relevant electronic registrar services. These registers must be connected to the central eGovernment infrastructure and by doing so, each administration will be able to obtain the necessary business information from the primary administrator electronically. In this way, the principle of one-off collection and re-use of information will be implemented. Thus, the municipal administrations will be able to model the processes of their administrative services in order to move towards their delivery electronically. This will make it easier for end users of their services. SMEs would require the development of information profiles for access to the local administration. This means that the established information relations of the

administrations with the business should be logically bound according to the processes for providing the complex administrative services. The integration environment will be improved by creating a process management system to provide complex administrative services electronically. In this way a completely automated electronic document exchange between administrations will be gradually achieved. This will create the conditions for a technology model based on open standards, guaranteeing expandability and flexibility when necessary (Budinov, B., Kl., Naydenov, 2016). The usage of technologies and approaches will enable rapid change and implementation of new business processes - rapid deployment of business applications, optimization of their use in accordance with the constantly changing needs of consumers - citizens, business organizations and administration. This means at the regional level to implement the technological framework of e-government in the Republic of Bulgaria by using modern solutions for optimization of the information and communication resources and by remote access to shared resources, including data centers. Subsequently, at the level of Dobrich Province, a regional centralized integration system of e-government should be established with guaranteed and duplicated high-speed communication connectivity with the gradual joining of all administrations and SMEs. This process will also create a new role for the district administration to coordinate, manage and develop communication infrastructure in order to achieve sustainability, service quality and minimize public spending.

A major problem for the e-government is the possibility of employing new and active labor market measures on the part of the employers and, on the other hand, regulating the standards by the public administration (Naidenov, K. 2017). This corresponds directly to structural interventions that will focus on broadening the scope and quality of labor market policies to overcome the significant lagging behind in employment rates in the region and especially in individual municipalities. When building and implementing a new system, the parts that are related to interfaces of other systems and service delivery must be registered in the appropriate format in repositories for future use / reuse. The registration mode must be free as long as a standard format of the information is required.

A large reserve of potential workforce for SMEs is the support of disadvantaged groups with the lowest opportunity to enter the labor market, such as youth, groups with disabilities and the long-term unemployed. We need to seek maximum benefit for Dobrich Province from labor market policies and employment programs, including integrated alternative employment schemes. Priority in the implementation of these activities should be given to the promotion of local employment initiatives in areas in need of gentrification for targeted support and strengthening the social integration of disadvantaged people. This means that the approach and development of small and medium-sized enterprises at regional and local level can help improve employment levels and improve the living environment. Thus, although local and regional authorities have a role to play in promoting the development of SMEs in their early stages, then the success of these enterprises makes them a driving force for Dobrich's regional development. Through these processes successful local and regional development contributes to strengthening social cohesion by creating employment and improving the quality of public

administration (Petrov, K. 2015). Despite the important role of local and regional authorities, most of the initiatives for Small and Medium-sized Enterprises are based on national implementation, ignoring the role of regional and local authorities. Moreover, even when local and regional initiatives are in place, their effectiveness is reduced by limited administrative capacity, both in terms of funding and human resources. Greater importance should therefore be given to action by local and regional authorities to stimulate entrepreneurship and the creation of SMEs. At the same time, the tools needed to create an environment conducive to SMEs must be ensured. In this respect, it is necessary through eGovernment to create opportunities for the implementation of projects in order to strengthen the interaction between the educational and administrative institutions and the business as well as the inclusion of employers and institutions from the labor market in the development and implementation of qualification programs in order to increase entrepreneurial skills and employability.

In order to improve the information environment, it is necessary to introduce a labor market forecasting system that would track the need for workforce and providing conditions for productive and quality employment. Creation of an information environment for implementation of programs for flexible systems for qualification and re-qualification, according to the needs of the labor market (Atanasov, M., Kl. Naydenov, 2016).

Another hurdle faced by SMEs is access to finance, especially in their early stages of their development. The European Commission has launched the European Strategic Investment Fund to improve the investment environment for businesses, including SMEs in Europe. This means improving the information environment with a view to implementing more projects by SMEs to improve competitiveness, the quality of staff, qualifications and introducing innovations in products and services. In Dobrich Province, the creation of an e-government and a database of possible funding is the largest source of external institutional and economic support for start-ups. Thus, information provision is increasingly important in providing capital financing, as well as in supporting economic growth and technological progress. The maturity of the investment market at an early stage in enterprise development is also characterized by the development of supply and demand. The quality of proposals for investment opportunities is crucial for entrepreneurs in the search process. The investment readiness of an SME or entrepreneur seeking funding is the ability to understand the specific needs of investors and meet those needs by providing appropriate structure and relevant information. It helps the entrepreneur to be persuasive and trustworthy. On the other hand, the investment capacity represents the maximum amount of funds an investor is willing to invest in an SME or a start-up enterprise over a certain period of time. Depending on the type of investor and the type of investment, different modes of action will be used. In most cases, it is unlikely that the entire investment will be made directly by a single entity. In addition, issues related to investment readiness and investment capacity need to be addressed to encourage business angel investment.

Last but not least, it is important to introduce standardization with regard to the delivery, development and maintenance of software solutions. In Dobrich rProvince,

a systemic approach should be introduced to ensure the high quality of information solutions and to regulate the minimum requirements in each phase when delivering or developing software. Standardization is the main prerequisite for the re-use of available technologies, solutions and knowledge (infrastructure, applications, solutions, licenses and technological tools). This will increase the stability and maturity of existing solutions, reduce time and resources for developing new ones, reduce maintenance and service costs.

3. Conclusion

In today's society, information and communication technologies are the core around which the most successful organizations and administrations build their businesses and management systems. E-government, e-management and e-services are inherent in the most economically and politically advanced countries. In this respect, it is important for regional development that areas can adapt to these new needs of the information society. The introduction of new technologies and the application of innovations is the shortest path to increase the competitiveness of Dobrich Province. This type of public intervention has proven resilient and able to attract desired investment, creating attractive jobs, retaining human capital, and generating regional growth. Functioning enterprises in the area as well as in the less gentrified areas of the region should strive to preserve their positions and their advantages through the possibility of restructuring, diversification and development of the provided services. To this end, support should be given to activities related to the introduction of new and high-tech solutions and the promotion of market-oriented projects. The development of e-governance is a guarantee for the strong regional development of Dobrich Province and strengthening the role of innovation in addressing major societal challenges such as globalization, climate change, energy and resource efficiency, health and demographic change.

References:

Atanasov, M., Naydenov, Kl., (2016). Population depletion in the Republic of Bulgaria and targeted investment programs - Bulgarian experience and practice, p. 240-248.

Budinov, B., Naydenov, Kl.,(2016) Demographic Behavior of the Population in the Republic of Bulgaria - Trends and Perspectives, p. 252-257.

Ivanov, M., 2016. Problems in deploying and planning of the e-governance in regional administrative structures, VIII International scientific CONFERENCE "E-Governance & E-Communications", 13-16 June, 2016 Sozopol, Bulgaria, p. 181-189.

Naydenov, Kl., 2017. Regional differences and trends in e-governance ix international scientific conference IX International scientific conference "E-Governance & E-Communications", 13-16 June, 2017 Sozopol, Bulgaria.

Petrov, K., 2015. Common aspects and differences in geo-economics and e-government.

E-Government development strategy- 2014- 2020 in the Republic of Bulgaria

THE SOCIAL EFFECT OF ELECTRONIC COMMUNICATION ON PUBLIC HEALTH

Snezhana Kondeva
Second Multiprofile Hospital for Active Treatment – Sofia EAD, Bulgaria
snkondeva@abv.bg

Abstract. Health policy on a global scale redirects efforts and resources to ensure the welfare of the healthy and the chronically ill citizens. Unlike the activity of people with a serious health problem, who relocate seeking medical aid, the increasing of life expectancy in good health requires a different type of activity and communication with the institutions without leaving the place of residence and work. The key focus in support of the possibilities to ensure the sustainability of the health sector are: the existing communication problems in healthcare, the health e-communication in service of the unsatisfied needs, the results of the contemporary method of communication and the change in the vision for public health.
Keywords: communication problems in healthcare, health e-communication, public health

1. Introduction

The common challenges to sustainability of health systems are related to the increased demand of health services and the scarcity of public resources; the aging of population and the increase of chronic diseases; the disrupted age structure and uneven distribution of health professionals; the inequality in the access to health services due to structural, financial, legal, linguistic, age-related and other factors, as well as the health inequalities in the quality of health care due to communication problems.

In response to these challenges and taking into account the potential of the tools and services of e-health, the EU Council recommends the implementation of innovative health care approaches and models, the increasing of health promotion and disease prevention and the application of personalized medicine. (Council of the EU, 2017) The perspective lies in developing the potential for integrated health care of the population and providing effective e-communication between the interested parties.

The key focus in support of the possibilities to ensure the sustainability of the health sector are: the existing communication problems in healthcare, the health e-communication in service of the unsatisfied needs, the results of the contemporary method of communication and the change in the vision for public health.

2. Communication problems in healthcare. Changed reality

For the purpose of this report the problems were grouped as problems in the interpersonal, the intercultural and the inter-institutional communication in health care:

Communication and interpersonal skills complement the knowledge of the doctor and form its competence. By communicating with the patient the doctor learns the medical history and determines the information necessary for decision making,

asking open or closed questions or remaining silent; explains the diagnosis; any possible complications and the prognosis; gives therapeutic instructions and consultations. The result of the treatment depends on the positive attitude of the physician to improve health and not only to treat the disease, as well as on the ability to reduce the worries of the patient and to establish trust between them. This is a bilateral process and professional ethics recognizes the right of the patient to choose a doctor, but also allows the physician to refuse treatment, if he considers that the contact with the patient is not meaningful. This is hard to achieve in practice and that is why the patients become dissuaded and the treatment results are unsatisfactory respectively when the patients sense any irritation, weariness or indifference towards them. In the absence of good communication, even if the professional conversation and conduct complies with the standard requirements, the patients, especially those with chronic disease, might react inadequately – by not asking additional questions, not taking or reducing on their own discretion the dose of the medicines prescribed to them, and may not to act according to the recommendations and the advice given to them because they do not trust their doctor.

In a study reported on the website of the Institute for Healthcare Communication, (IHC, 2011) 25% of the Americans say they have not followed the recommendations of their doctors due to the following reasons: disagreement with what they were instructed to do with regard to the prescribed treatment (39%); the price of therapy (27%); the instructions were difficult to follow (25%); the therapy is contrary to their personal beliefs (20%), while 7 % report that they do not understand what they have to do.

Professional communication with the elderly people is also classified as an interpersonal problem. To a great extent it shows up as a disdain and poor assessment by the specialists of the behaviour of these persons, formed by the milieu and the social and economic pressure, but also by the biological consequences of aging. Social disregard reflects in inadequate care and strengthens the condition of dependence of the elderly and the chronically ill citizens. (BPA, 1999)

The reduced duration of examination by the general practitioners and the treatment in outpatient and home conditions without the supervision of a specialist can be identified as an objective reason for the distance between doctor and patient.

The communication problems of *intercultural character* continue to increase as a result of the global processes in economy, education, technology, information, medicine and the related mobility of human resources, healthcare professionals, patients and asylum seeking refugees. In the national cultural environment there are also differences based on education and ethnicity, and more and more often the members of the medical teams in the healthcare facilities are of different nationalities. Language barrier is the most common problem that leads to misunderstandings and errors in a clinical meeting. At this meeting the two parties exchange a variety of verbal and non-verbal signals. However, even speaking one and the same language they might not understand each other properly or they might misunderstand the signals due to cultural differences. The doctor may not hear, see or perceive correctly some of the signals present and may adopt a wrong hypothesis about the patient's disease and the patient on the other hand may not be able to understand the

explanations and may refuse to undergo an examination, surgery and treatment that will harm him/her. Another problem arises in countries with ethno-cultural immigrant communities - the therapy and the recommendations are not followed due to a different assessment of health and the disease. In some cultures people perceive pain as a test or attribute it to fate or the God's will, they try to normalise it and take it calmly. (Côté, D, 2013) Additionally, when providing health care to refugees there is insufficient information about the medical history because they do not have personal health records which may have a negative effect on safety and the outcome of the treatment of these people.

Modern health care does not provide comprehensive health service and patients must orient in a complex and strictly regulated system of institutions. The poor *inter-institutional communication* causes the problems concerning the provision of universal access to healthcare – individual citizens or groups of the population remain outside the health care coverage because there is no general practitioner in the village or in the region; they have no information about what specialist they need; how and where to continue their treatment, and what additional finances will they need; they are unable to pay the transport costs or have some kind of disability which does not allow them to travel to another settlement; they have to wait long time to visit a general practitioner, a specialist or to be admitted to a hospital; they visit the units for emergency medical assistance if meanwhile their condition deteriorates and do not seek health services for the initial symptoms because they are dissuaded by the created conflict between the conventional and the alternative medicine, which conflict is a disguise for many interests.

A doctor of the emergency medical assistance unit has the complicated task to provide easy access, continuity and coordination of the necessary health care in cooperation with the patient. He carries out preventive activity, diagnoses, draws up a plan and conducts the treatment, evaluates the results and the occurrence of adverse events related to the prescribed medicines, promptly corrects the therapy and where necessary refers the patient for consultation with a specialist, for hospital treatment or for rehabilitation. The clinical competence of the general practitioner requires coordination of all these activities and the ability to listen and to explain in a comprehensible manner to the patient and his/her relatives. More and more rarely, however, sufficient time could be devoted and coordination could be ensured of all necessary health care services for each individual patient. That is why the persons themselves refer to a specialist and a healthcare facility and decide what consultations and examinations they need, including high-tech ones.

In the absence of coordinated care and inter-institutional communication the costs increase due to the abuse of the emergency medical assistance, duplication of services, unnecessary visits to the specialists, carrying out of unnecessary and often costly examinations and procedures. In the USA the health expenditure in 2014 have increased by 5.3%, the GDP for health care have increased from 17.3% to 17.5% in 2013 while the primary health care expenditure represents only about 6 % or about 1 % of GDP. (DeAngelis, 2016) The increased spending on health care is a serious problem for all countries. The pressure on the national health care systems increases due to the shortage of doctors in the emergency medical assistance sector. In

Germany there are 2,600 free medical practices and the forecasts are that there will be a shortage of 10,500 general practitioners by 2030. (KBV, 2018) As far as Bulgaria is concerned, the analysis to the draft National Health Card reports of a nationwide shortage, which is most serious in Kardzhali Region. The general demand for the entire country is 66.6 general practitioners for each 100,000 persons, while the actual availability is 40,44 GPs per 100,000 persons. (MZ, 2018)

The integration of information and communication technologies in education, business, home and free time is a reason to talk about digital transformation, digital health care and new approaches to providing safe and effective health care services as well as policies for management of electronic communication with the aim to improve health in digital society.

The users of online health information are constantly increasing. One of the reasons for this is the pursuit of prosperity and maintaining good health through awareness and commitment of citizens. In 2014, 28.2% of the Europeans have showed interest in general health information and 32.9% have browsed the Internet to seek information about a specific disease. (F Eurobarometer, 2014) In 2015 nearly two-thirds (66%) of the Americans have used mobile application for health management. The interests when downloading and using mobile applications reflect the proactive demand for information, functional and interactive programs for: tracking of diet/meal plan (47%); reminders for taking of medicines (46%); study of symptoms (45%) and reporting of physical activity (44%). (Makovsky, 2015) According to the data for 2017 of the National Statistical Institute, 67.3 % of the households in Bulgaria have access to the Internet in their homes, which is an increase of 3.8 percentage points compared to the previous year. 61.9 % of the persons in the households use the Internet every day or at least once a week and 53.1% have searched health related information (e.g. for injury, diseases, nutrition, health improvement, etc.). (NSI, 2017)

3. Publicly available health information. The effect of e-communication

With the development of public health science the scientific researches started to focus on the impact on the human body of the *social environment and the risk factors* – the socio-psychological and the eating habits, the air pollution, the chemicals, the poor quality of water and the insufficient sanitation. Depending on the cultural differences certain models of behaviour were formed for health promotion and disease prevention as a way to achieve prosperity. At the same time the efforts of the international organizations and the research interest focused on treatment of diseases, limiting the spread of infectious and parasitic diseases and on coping with the pressure on the national systems as a result of the growing demand for health services by the elderly population. These processes influenced the *evolution of online health information and e-communication* between the consumers, the suppliers and the institutions through the online health platforms used by specialists and through the social networks accessible to all citizens. The publicly available online information and the e-communication already have a *direct impact on public health* because they serve as a basis for taking many health decisions in practice.

In addition to improving the health literacy of the population - the promotion of healthy lifestyles and prevention, the Internet access gives more opportunities for choosing health services, improves communication with the health authorities without prejudice to business activity, reduces anxiety and increases the positive effect of self-control in the elderly and the chronically ill citizens. The easily accessible *health information in the mother tongue* reduces the dependence of patients and gives them more confidence in communication and in giving informed consent, even when less time is devoted to them during their visit and even if they have received from their doctor short and vague explanations about the disease, the therapy and the opportunities for healing. *Awareness* also increases the confidence of patients that they can be active participants in the shared taking of health decisions and some of them visit the physician with specific proposals. This poses yet another challenge before communication with regard to searching of online health information and the biased attitude of doctors to such patients. The behaviour and the attitude in such a situation even got presented in an anecdote, in which the doctor advises the patient "If he has diagnosed himself in Google, to seek a second opinion in Twitter". Another part of the patients respect the competence of the doctor and his professional skills to get oriented in the huge volume of information about the disease and to combine in a unique way this knowledge taking into account their state of health and therefore seek the health information recommended to them.

In a survey among 56 participants aged 50 to 87 years (average 69 years), interviewed in Toronto, Canada, where all residents have access to publicly funded health care system (in order the obstacles to communication related to health cover and costs to be avoid), 43% have searched health information instead of visiting the doctor; 41 % have used the Internet to inform themselves about the disease treatment, and have talked with a doctor; 46% have always sought information about the disease after they were already diagnosed by a doctor. Slightly less than half (48%) of the people are satisfied with the results of the search of health information on the Internet. From the replies of the 42 participants who regularly communicate with a doctor, 45 % reflect the general concerns regarding the reliability or limitations of the information available online and the next greater part of the replies (21%) relate to limitations in their own ability to arrange or evaluate online health information. Some of the 14 participants who have never discussed with a doctor the searching of information on the Internet are convinced by their relatives not to do so because this will have a negative effect on treatment. Another participant reports that he is able to find the necessary health information and does not refer to his doctor because on his opinion he cannot help him. (Silver, 2015)

In response to the concerns that people without medical education have when searching information, related to the assessment of its reliability, as well as the insufficient time they can devote to it, the suppliers in the network offer more mediation services for reducing the communication "problems" between the physician and the patient. Thanks to the new technologies consultation with a doctor can be held at any time of the day by phone, email or through a video call through a device convenient for the user.

Regardless of the new challenges, *e-communication limits the adverse effects* from the distance between the doctor and the patient and the poor awareness, thus reducing the likelihood of omission of medical errors and increases the protection from excessive medical intervention. *E-communication ensures a greater degree of* pharmacovigilance and use of medical consumables through expansion and diversification of the relations and the coordination between the sponsor of the clinical study and the regulatory authorities, between the sponsor and the research centres, between the participants in the study and the consumers after the placing on the market.

E-communication promotes the quality of health care through optimized access and compliance with the instructions and its contribution to fair sharing of responsibilities and costs is significant. Indicative is the example with the inter-institutional communication and coordination of emergency medical assistance (EMA). Following the request of BBC was established that in 2014 in London 153,564 patients have sought emergency medical assistance because they did not have a general physician. (Novini.co.uk, 2015) In Germany 53 % of Germans have first visited a hospital in urgent cases and a large part of them have received only an outpatient medical assistance. With the proposal of the Kassenärztlichen Bundesvereinigung the patients who, due to anxiety and lack of information, usually visit the hospital first during the weekends and during the night must call the emergency phone for the future. The personnel answering these calls should find out by asking specific questions as to whether the patient should be transported to a hospital or referred for outpatient services. Thus the outpatient cases will be referred to the doctor's practices and the patients in serious and life-threatening condition - to the hospitals. (Kölnische Rundschau, 2017) The situation in Bulgaria is very much similar - many citizens without medical insurance and insured citizens in their non-working hours visit the emergency units of the hospitals. Each admitted patient, whether transported with an ambulance to the EMA unit or whether vising the unit by himself, must be examined because even the patient who has assessed his state as urgent is considered an emergency patient. The Ministry of Health pays only for patients whose emergency diagnosis was confirmed and the costs for all other non-emergency outpatient examinations have to be covered by the respective healthcare facility, if the patient refuses to pay for them. In a situation of good communication between the institutions and distribution of health care this problem can be solved fairly, the way it is solved in Germany where except the preliminary emergency care selection, so far from the primary medical care budget EUR 350 million have been paid annually to the hospitals for the provided outpatient services.

The spontaneous communication in social networks on health topics is subject of sociological surveys and the data collected from the institutionalised e-communication (reporting of results, monitoring and reporting of public health diseases, personnel training, etc.) may have an immediate effect on the health policy, the application of personalized medicine and the management of health services quality to population.

The improved communication between the institutions, the providers and the users of health services allows public control to be exercised over the healthcare system, the

coordination and flexibility of outpatient health care services to population to be improved; a quality health assistance to be ensured to separate regions as well as the safety of patients in providing cross-border health care service.

4. Conclusion. Health policy in the digital environment

Unlike the activity of people with a serious health problem, who relocate seeking medical aid, the increasing of life expectancy in good health requires a different type of activity and communication with the institutions without leaving the place of residence and work. At the same time the young generation of doctors are not willing to make more compromises with their way of life in their non-working hours and to continue taking the huge social responsibility which is currently being conferred to the practicing doctors, namely constant 24 hour highly qualified medical assistance coverage, night shifts, overtime work and the creation of a huge amount of health documentation. The relationship between them is implemented through the medical assistants, the health professionals and the social professions while the place of the meeting are the centres for complex and integrated health services to citizens applying the multidisciplinary approach in prevention, diagnosis, treatment, tracking and rehabilitation. This approach ensures uninterrupted provision of medical activities, assistance to the specialists in the emergency medical assistance units for the implementation of coordinating health care, communication with the expert centres and reference networks for rare diseases, the development of telemedicine and the provision of remote consultations, health monitoring and medical measurements. The potential of the centres for integrated care lies in the opportunities of the digital environment and the e-communication to provide personal and collective health service from a distance, to ensure timely access to the necessary health information and the taking of clinical decisions without delay and without duplication of services or unnecessary use of inappropriate care with the resultant public and private expenditures. The integrated care will contribute to better communication and sustainability of the national health care systems as well as to the real benefits for the consumers.

Given this perspective, health policy on a global scale redirects efforts and resources to ensure the welfare of the healthy and the chronically ill citizens in the digital environment through reform policies, programs for promotion of operational efficiency, use of innovations in the management of public health, wellness and outpatient health care addressed to the social factors of health.

Quality health care, ensuring emotional and physical proximity between the specialists and those in need of health care, more often in the future will use digital opportunities for communication between multidisciplinary teams and the population.

References

Council of the EU. (2017) Council conclusions on Health in the Digital Society – making progress in data-driven innovation in the field of health. (2017/C 440/05)

Institute for Healthcare Communication (IHC). (2011) Impact of Communication in Healthcare. [online], http://healthcarecomm.org/about-us/impact-of-communication-in-healthcare/ (accessed on 13/04/18).

Balgarska psihiatrichna asotsiatsiya (BPA). (1999) Etichni problemi v psihichnozdravnata pomosht. Pod redaktsiyata na Barkar, Filip Dzh., Stiv Bolduin, s. 73.

Côté, D. (2013) Intercultural communication in health care: challenges and solutions in work rehabilitation practices and training: a comprehensive review. Epub 2012 May 23. [online], https://www.ncbi.nlm.nih.gov/pubmed/22616895 (accessed on 13/04/18).

DeAngelis, CD. (2016) Where Have All the Primary Care Doctors Gone? Milbank Q. 2016 Jun. [online], https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4911721/ (accessed on 05/05/18).

Kassenärztliche Bundesvereinigung (KBV). (2018) Mangel an Medizinern in Deutschland. [online], https://rp-online.de/politik/deutschland/kassenaerztlichen-bundesvereinigung-deutschland-fehlen-tausende-mediziner_aid-17824231 (accessed on 18/04/18).

Ministerstvo na zdraveopazvaneto (MZ). (2018) Proekt na Reshenie na Ministerskiya savet za utvarzhdavane na Natsionalna zdravna karta na Republika Balgariya. [online], https://www.mh.government.bg/bg/normativni-aktove/proekti-na-normativni-aktove/ (accessed on 03/05/18).

F Eurobarometer. (2014) European citizens' digital health literacy. [online], http://ec.europa.eu/commfrontoffice/publicopinion/flash/fl_404_sum_en.pdf (accessed on 03/05/18).

Makovsky. (2015). Fifth Annual "Pulse of Online Health" Survey Finds 66% of Americans Eager To Leverage Digital Tools To Manage Personal Health. [online], http://www.makovsky.com/news/fifth-annual-pulse-of-online-health-survey-2/ (accessed on 03/05/18).

Natsionalen statisticheski institut (NSI). (2017) Izpolzvane na IKT ot domakinstvata. [online], http://www.nsi.bg/bg/content (accessed on 03/05/18).

Silver, MP. (2015) Patient Perspectives on Online Health Information and Communication With Doctors: A Qualitative Study of Patients 50 Years Old and Over. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4319073/ [online], http://www.nsi.bg/bg/content (accessed on 07/05/18).

Novini.co.uk. (2015) Nad 150 hil. patsienti v London, potarsili speshna pomosht, nyamat lichen lekar. [online], http://novini.co.uk/%D0%BD%D0%B0%D0%B4-150-%D1%85%D0%B8%D0%BB (accessed on 07/05/18).

Kölnische Rundschau. (2017) Rufnummer statt Krankenhaus Praxisärzte wollen neue Notfallversorgung. Von Eva Quadbeck. [online], https://www.rundschau-online.de/politik/rufnummer-statt-krankenhaus-praxisaerzte-wollen-neue-notfallversorgung-28572214 (accessed on 07/05/18).

E-GOVERNANCE EDUCATION

THE CONSTRUCTIVIST APPROACH TO E - EDUCATION

Anna Tatarinceva
Professor, Dr.paed
Baltic International Academy, Riga, Latvia
a_tatarinceva@inbox.lv

Abstract
E-Education has captured an important, sometimes the dominant role in the system of education all over the world during last decades. It has its pros and cons for lecturers and students. The author of the present paper investigates some problems, connected with contemporary e- education , the constructivist approach to e-education.
Key words: e-education, constructivism, instructor, knowledge, personality, sense, student

Introduction

" We cannot ever achieve final answers; rather we find new questions, we discover other possibilities which we might try out. Knowledge is ultimately governed by constructive alternativism ; everything can always be reconstructed."

(Salmon, 2012)

The constructivist approach to higher education became the most popular one in European, American universities and higher schools during last decades. Constructivism, in contrast to behaviorism, has the origins of cognitive psychology, concerned with the way in which the human mind thinks and learns, how people become involved in the process of learning in general, and in the process of e-education in particular. A student is seen as an active participant in the educational process according to a cognitive approach.. The present research reveals and evaluates the current status of the constructivist approach to e- education.

The Problem of the constructivist approach to e - education was not investigated in Latvia, but it is very urgent nowadays, because the contemporary situation shows that everybody is influenced by the necessity to acquire new knowledge and skills with the help of new communication technologies. There are many approaches, ways in which human thought was explored, and these ways varied considerably.

At one extreme, especially in the system of Distance Education, there are information theorists drawn the analogy of the human brain as a highly complex computer, who seek to explain its performance in terms of rules and models of learning. Different examples of this approach one can see in artificial intelligence systems' work particularly, in models of memory and different cognitive processes.

At another extreme, it is so-called the constructivist approach, growing mainly on the base of the research by the Swiss developmental psychologist, Jean Piaget,

also encompassing George Kelly's personal construct psychology, mainly concerned with the ways in which individuals come to make their own sense of the world.

The Aim of the proposed paper is to investigate the constructivist approach to e- education. The Object of the research is the constructivist approach to e-education.

The Method of the research is the scientific analysis of the methodological, psychological and pedagogical literature, connected with the given problem.

According to (Burge & Roberts, 2012:139), the constructivist approach to e-education is a process of creating meaning in which learners are actively engaged in analyzing their own perspectives, organizing new information and developing their own interpretations, where learners interact with each other and with actual, complex, real-world online environments to construct a personal knowledge framework. Let's have a look to the point of view of (Biddel, 2014; 313) to the notion of constructivism that goes beyond the interpersonal.

"They…direct attention to the ways in which activity is structured differently across contexts. If cognitive development proceeds through the construction of meaning from activity, an understanding of the cultural structuring of activity is crucial to an understanding of the ways in which meanings evolve differently in different contexts. Interpersonal interactions cannot provide insight into the sources of variation in developmental pathways unless they are themselves embedded in a cultural level of analysis that addresses the specific cross-contextual differences in terms of which interpersonal relations vary".

But (Slavin, 2016;48), believes that constructivism is a view of the cognitive development as a process in which students actively build systems of the meaning and understanding of reality through their experiences and interactions, actively construct knowledge by continually assimilating and accommodating new information. The author of the present paper shares the point of view of Brooks and (Brooks, 2013), and (Cranton, 2004), that constructivism is the process where learners actively create knowledge and meaning through the experimentation, exploration, manipulation and testing of ideas in reality, where collaboration, shared goals, teamwork, group activities, simulations, the use of open-ended questions are powerful forces in the learning process.

The instructor acts only as a facilitator of the e-education process. This is the essence of self-directed learning, as it empowers students to follow those interactions wherever they may lead and are not dependent on the instructor. (Jonassen, 2015), believes that the facilitation of the online learning environments that foster personal meaning-making, as well as the social construction of knowledge and meaning through interactions with communities of students, is preferred to instructor's interventions controlled the sequence and content of instructions. To the author's mind, the process of e-education is learner-centered, taking the lead and determining the flow and direction of the process.

Let's reconsider the definitional elements of e- education:

- separation of an instructor and a learner in time and place for a majority of the instructional processes;
- the connection through educational media;
- a volitional control of the learning process resting with a learner.

It becomes clear that a more active learning model is the model of choice for the online learning environment. Given the limitations of an access to students, as well as such elements as time and distance, an instructor can't be in control of how or what is being learned. And because they are left to some degree to their own devices, it is up to learners to make sense of the body of knowledge associated with a learning course being delivered. The instructor supports this process through the usage of collaborative assignments, the facilitation of active discussions, and the promotion of the development in critical thinking and research skills. The outcome is an online environment rich in the potential for collaborative learning and social construction of meaning.

The author would like to analyze an example of a constructivist approach to the development of the (Bronfenbrenner, 2017) Ecological Systems Theory, which views a student as developed within a complex system of relationships. According to this theory, learner relationships are affected by multiple levels of the environment from the intimate levels of parent-child interaction-the microsystem-to the immediate settings of a family, school, and neighbourhood-the mesosystem- to the broad contexts of society and culture-the eco-system.

An important implication of the ecological system theory to the process of e-education is that changes at any level have an impact on the development, which supports the idea that the prevention and intervention programs or services can have the significant impact on students' well-being and education.

The constructivist approach to learning means, to the author's mind, that students will be gathering information and analyzing it as they jointly explore topics and test theoretical ideas against the real-life situations and their own practical knowledge. So rather than students listening to the lecturer's constructions of knowledge, they play an active role in being their own "knowledge architect". This type of learning is rooted in the meaning-making process that is central to constructivism, which we have already established as a major feature of the online lecture-room. The predisposition of people for constructing their own meanings is recognized as the key for designed effective learning in all settings, including workplace settings.

According to the constructivist approach, students:

- ❖ analyze concepts, theories, principles;
- ❖ apply them to the real world problems;
- ❖ reflect on their own experiences of learning;
- ❖ perceive the relevance of others' theories and practical experience to own life contexts;
- ❖ contribute constructively to all kinds of discussions;
- ❖ support and challenge group members in their explorations, and
- ❖ carry out some self-assessment of their learning.

The author shares the point of view of many educational researchers (Haynes, Davis , Mckibbon and Tugwel, 2014) that e-education is a constructive process in which the learner interacts with new information in order to establish personally relevant meaning from this information. As the topic is e - education, the interaction with new

information is the essential ingredient in this process. The challenge for instructional designers is to organize learning opportunities to support such an interaction.
Let's have a look to the constructivist approach in connection with e-education more in details.
Jean Piaget is considered to be a father of the Theory of Constructivism.
Jean (Piaget, 1950) is the most dominant figure in the constructivist movement because he is the first researcher done the main emphasis on the constructivist nature of the learning process. The main idea of (Piaget, 1950) is based on the idea that knowledge is constructed by a learner in mental activities. In contrast to the more traditional views seen learning as simply the accumulation of facts or the development of skills, the main underlying assumption of constructivism is that individuals are actively involved right from their birth in constructing the personal meaning that is their own personal understanding from their experiences. A student is brought into the central focus in the educational process, he/she is an active participant seeking meaning. Each of them generates own rules and mental models used to make sense of their experience.
Piaget is mainly interested in the way in which people come to know things as they developed from infancy to adulthood. Thus, his theory is one which is action-based. The constructivist approach by Piaget is more concerned with the process of learning than what was learned**.** It suggests that we come to know things as a direct result of our personal experiences, but we make sense of those experiences at different stages of our lives. Piaget's theory is based on learners passing through a series of stages. For the young infant, the most important way of exploring the environment is through basic senses. It is the sensory-motor stage of learning. The next stage is the intuitive, pre-operational stage, it is between two and seven. The concrete operational stage is at the age of seven of a child, this stage depends on concrete examples. Finally, there is a move into formal operational thinking when abstract reasoning becomes increasingly possible. It happens, for Piaget, during adolescent and adult years.
There are three basic components of Piaget's Constructivist Theory (Piaget, 1950):

- schemas (building blocks of knowledge);
- adaptation processes that enables the transition from one stage to another one (equilibrium, assimilation, and accommodation);
- stages of cognitive development.

Jean (Piaget, 1950) viewed intellectual development as a process of adaptation (adjustment) to the world.
The author supports the point of view of (Piaget, 1950) who defines the human cognitive development as essentially a process of maturation, within which genetics and experience interact. The developing mind is viewed as constantly seeking equilibration, i.e. a balance between what is known and what was currently being experienced. This is accomplished by the complementary processes of assimilation and accommodation. Assimilation is the process by which incoming information is changed in our minds so that we can fit it in with what we already know. Accommodation is the process by which we modify what we have already known to take into account new information. Working together, these two processes contribute to what Piaget terms the central process of the cognitive adaptation. This is the

essential aspect of e-education. Instructors should encourage students to pay attention to the process of learning rather than the end product of it, to use active methods of "reconstructing the truth".

The author would like to draw the reader's attention to some central aspects which are of particular significance for computer-mediated e-education.

- First, everybody can see the importance of a learner to be an individual, actively involved in constructing the meaning. When students learn any subject, they are actively involved in making their own sense of this subject as well as of tasks presented to them.
- Second, the development of thinking and its relationship to a subject and experience

become a central focus of e-education.

- Third, a care should be taken to match requirements of any task to the cognitive level

of a student. These tasks set by an instructor in the electronic lecture-room should be neither too abstract for those who are not yet conceptually capable of functioning at this level, nor too simple for the level of the student's competence.

- Fourth, we can see the application of Piaget's notions of assimilation and

accommodation to learning a new subject. When students receives a new input of the subject, they need to modify what they already know about this subject (accommodation) so as to "fit" the new information into their existing knowledge (assimilation). In this way students' knowledge of how the system of the new subject operates gradually develops.

The next famous follower of the constructivist movement, whose Theory of Personal Constructs (Kelly, 1955) has profound implications for lecturers and educational psychologists, is George Kelly**.** (Kelly, 1955) believes that people as scientists constantly seek to make the sense of their world, they carry out their own personal experiments, construct hypotheses, theories and actively seek to confirm or disconfirm them. The pattern of a man's construction is called a construct, in other words, a construct is the meaning we give to our surrounding reality. Each person sets up his/her own network of pathways leading into the future. In order to understand someone, one should understand his/her personal construct system (Kelly, 1955).

These personal theories or "constructs" people place over their impressions of any new events or persons with whom they come into contact in order to establish some kind of reasonable "fit". For Kelly, learning involves students making their own sense of new information, and this is especially important for e-education. Students are actively involved in constructing their own personal understanding of things, and this understanding will be different for different people. (Kelly, 1955) argues that differences in our behavior largely result from differences in the ways people perceive and construe the world.

This statement completely coincides with the point of view of one of the creators of the Learning Styles' Theory - Rita (Dunn, 1989), who believes that people concentrate on, absorb, process and retain new information differently according to 23 elements of instructional environment;

- ❖ immediate environment (noise, temperature, light, design),
- ❖ emotionality,
- ❖ sociological preference (learning alone; with peers; with adults present),
- ❖ physical characteristics (auditory, visual, tactile/kinesthetic preference, time of day…),
- ❖ psychological inclinations (global/analytic, hemispheric preferences, impulsive/reflective).

All these elements define learning style of students. (Keefe, 1987; 5), gives one of the classic definitions of learning styles:, " Learning styles are the cognitive, affective, and physiological traits that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment**"**. (Kolb, 1987), believes that there are four main styles of learning, which are represented by the Diverger, Assimilator, Converger, and Accommodator.

All these definitions are closely connected with the main postulates of the constructivist movement:

- knowledge is constructed not transmitted;
- prior knowledge impacts the learning process;
- building useful knowledge requires effortful and purposeful activities.
- Knowledge is constructed by a learner, not passively received from the environment.

(Kelly, 1955) believes that students are active participants in deciding how to act and they made such decisions on the basis of what was made the sense to them personally. Each person's individual construction of the world depends upon their previous experiences, which also influences how they anticipate what will happen in the future. Instructors should see the differences related to each style. For example, the Accommodator will get comfortably involved in a task completion and taking the real-world risks and be impatient with too many theoretical talks; the Assimilator, on the other hand, will be happy linking a wide variety of ideas in order to build models or theories. Working together, these two persons may make a great team – once they accept their different ways of getting and processing information.

The author would like to set out some important implication of taking a personal construct approach to e-education.

- First, we can make a clear distinction between meaningful and meaningless learning

activities in e-education. Worthwhile learning does not entail the reception of ready-made facts, but must involve building of new personal meanings and understanding. Only by developing their own understanding of the world it is possible for students to be changed and developed.

The author supports the point of view of Kelly who believes that a meaningful activity is one that encourages the process of making sense, of fitting or mapping the new onto the old to create new understanding.

- Second, as (Salmon, 2012; 22) points out, though each of us inhabits the unique experiential world, if it is to be a social world, we must find ways of reaching a common understanding together with others. The human enterprise

depends on a shared online reality. Instructors and learners are as much as possible involved in e-education and try to achieve some kind of shared understanding of what is happening in their electronic lecture-room.

- Third, instructors should realize that although a curriculum may be set down precisely for them, it inevitably becomes shaped by them into something personal which reflects their own belief systems, their thoughts and feelings about both the content of their lectures and their learners, their view of the world in general.

The usage of the constructivist approach does not imply that learning standards go downhill,
or that the instructor becomes unnecessary. Students work hard to analyze the complexities of
the real world contexts, to figure out solutions to messy problems or apply new skills. Instructors guide and challenge rather than serve only a transmission function.
The author shares the point of view of Burge and Roberts (Burge, 2012:20), who believe that there are the following implications of applying the constructivist approach to e-education:

1. Learning resources should have some or all of these characteristics:
    - Relevance to a learner and to the real-world problems and contexts
    - A variety of problems and contexts (breadth of information)
    - Controversial or complex problems (depth of information)
    - Conflicting ideas and attitudes in a context
    - Personal practical knowledge held by a learner

2. The constructive student in the electronic lecture-room:
    - Challenges her/his own knowledge and values
    - Uses many types of thinking, such as metaphorical, intuitive, creative and logical/analytical
    - Looks to discover and analyze all elements in a complex situation
    - Generates alternative solutions or procedures
    - Reality-checks a proposed solution or new procedure
    - Uses errors as a part of learning
    - Speaks in order to think
    - Revisits new learning to develop ideas in more depth across new situations
    - Accepts the ambiguities in how the real world operates.

3. The constructive instructor in the electronic lecture-room:
    - Encourages students to produce, not reproduce, ideas
    - Helps learners to revisit information for greater depth of analysis
    - Lets learners to struggle a bit to figure things out
    - Offers learners the opportunity to watch an expert in action
    - Asks for proof of learning, for example:

” How did you reach that conclusion?”(a new idea), or ”Show how you do that” (a new skill).

- Confirms, corrects and challenges students
- Helps students to use different perspectives to look at a problem
- Knows when to get out of the students’ space
- Ensures access to adequate resources.

The author would like to add that confusion is an expected stage in all kinds of learning, especially when students try to organize mass of incoming information in a hurry.

Instructors need to resist own desire to rescue students from their confusion, as they need to work through their confusion to develop better learning skills. A careful instructor, to the author’s mind, will assess whether learners can be left alone for a while to handle the confusion and will decide when his assistance should be offered, first by group peers, and then by the instructor. These choices demand good judgment that is based on the instructor’s knowledge of students.

Conclusion

The author can conclude that the constructivist approach to e-education identifies four key sets of factors influenced the learning process on the Information Highway:

- Instructors,
- Learners,
- Tasks, and
- Contexts.

None of these factors exists in isolation. They all interact as a part of a dynamic process.

All instructors in the electronic lecture - room selected tasks according to their beliefs about teaching and learning, should take into account approaches to learning of their students and their cognitive level. Learners interpret tasks in ways that are meaningful and personal to them as individuals. A task, to the author’s mind, is therefore an interface between the instructor and learners.

These three elements: the instructor, the task, and the learner are in this way a dynamic equilibrium. The context in which learning takes place plays an important part in shaping what happens within it.

That includes the emotional environment, the physical environment; the whole educational ethos; the wider social environment; the political environment and the cultural setting. That can be represented as a set of concentric circles, influencing each other, with the participants, playing the important role in shaping these environments. The keys to the creation of a learning community and successful facilitation online are simple. They are, to the author’s mind, the following:

- honesty,
- responsiveness,
- relevance,
- respect,
- professionalism,

- openness, and
- empowerment.

Stressing the importance of the learning community as a central feature, the role and importance of each of these keys to success will become clear. Group members should feel safe in expressing themselves without fear of how they will be perceived, allowing for active, rich discussions.

The implications are that as educators, we should be able to create atmosphere of safety and community in all of our learning settings, whether they are electronic or face to face.

Instructors need to act as gentle guides while participants are developing the norms and rules as they go. Facilitators, participants should become equal partners in the development of an online learning community. The development of community as a part of the learning process helps to create rich and powerful learning experiences.

E-education is concerned not just with theories of instruction, but with learning to learn, developing knowledge, skills and strategies to continue to learn and adapt, with making learning experiences meaningful and relevant to the individual, with the development and growth as a whole unique person. In order to well, we must understand the mental models that students use to perceive the world and assumptions they make to support those models.

Instructors should use the constructivist approach to teaching by their strong support of discovery approaches which requires a student to construct information and knowledge by discovering the relationships that exist among concepts and principles, change their world by active work.

References

Bidell, T.R. Beyond Interactionism In Contextual Models of Development. Human Development 2014, 35; 306-315.

Bronfenbrenner,U. Ecological Systems Theory. Annals of Child Development. Vol 6, pp.187-251.Greenwich, Conn.: JAJ Press.2017.

Brooks, J., and Brooks, M.In Search of Understanding; The Case for Constructivist Classrooms. Alexandria,Va.; Association for Supervision and Curriculum Development.2013.

Burge,E., & Roberts,J. Classrooms With a Difference. Facilitating Learning on the Information Highway. Montreal. Toronto; Cheneliere /McGraw-Hill. 2012.

Cranton, P. Understanding and Promoting Transformative Learning. San Francisco; Jossey-Bass.2004.

Dunn, R. Teaching Secondary Students Through Their Learning Styles. USA. NY.1989.

Haynes,R.,Davis.,D, McKibbon, A. and Tugwell.,P. A Critical Appraisal of The Efficacy of Continuing Education. JAMA.2014, 251:61-64.

Jonassen,D., Davidson, M., Collins,M.,Campbell, J, and Haag, B. Constructivism and Computer-Mediated Communication in Distance Education. The American Journal of Distance Education, 2015, 9(2),7-26.

Keefe, J.W. Learning Style Theory and Practice. Reston, VA; National Association of Secondary School Principals.1987.

Kelly, G. The Psychology of Personal Constructs.NY:W.W.Norton & Company.1955.

Kolb, D.A. Learning Style Inventory. Boston, MA; McBer & Company. 1987.

Piaget, J. The Psychology of Intelligence. NY:Routledge.1950.

Salmon, P. Psychology for Teachers; an Alternative Approach. London; Hutchinson. 2012.

Slavin, R. Educational Psychology.Theory and Practice. John Hopkins University; Allyn and Bacon. USA.2016.

STIMULATING THE CREATIVE THINKING OF STUDENTS IN ADMINISTRATION AND MANAGEMENT SPECIALITIES IN CONTEXT OF EUROPEAN TeSLA PROJECT

Roumiana Tsankova
Technical University of Sofia

Orlin Marinov
Technical University of Sofia

Abstract. The aim of the paper is to present the factors, the ways, the means, which stimulate the development of the "creative thinking" of the students from the administration and management specialties. Attention is paid to clarifying the notion of "creative thinking" by revealing its indicators in the various management functions including e-assessment, evaluation.
In this respect, the impact of the widespread penetration of ICT in education and especially in its online context and particularly in assessment process is shown. There are presented results demonstrating the stimulation of the "creative thinking" of students from the Technical University of Sofia using ICT tools. The attention is focused on the management functions of e-evaluation including authorized function of e-assessment in frame of the European project TeSLA.

Key words: creative thinking, online education, e-evaluation, management process, information communication technologies, e-assessment.

1.Introduction

Nowadays, the educational process not only shapes knowledge, skills and habits, but also a new way of thinking so-called "creative thinking". According to Ryan May (May, 2017a) through the creativity the students can generate ideas, concept, associations that lead to new decisions. The creativity usually is the result of interaction among the individuals in **social environment** - this means that the educational process as a collectively implemented process is appropriate to stimulate the creativity. In this way we will enable students to **discuss** in advance more ideas, their foreseeable risks and creating preliminary plan. Besides this they need **different points of view, discussions** through outside competitors by **motivating** them to share creative ideas (Colgate, 2017). The educational form for organization of students in **team work** is intensive realized.

On the other hand, the process of creativity requires suitable framework to operate with **effectivity and efficiency**, which want management function evaluation or

promoting the usefulness of the results. In the on-line learning process, the requirements for **management functions** are particularly high (May, 2017b). As it is well known, the management process is invariant and the e-evaluation (including e-assessment) of the students as a management function must meet all its requirements. As is shown in (Tsankova, et al., 2017), it is important to ensure **observability** and **detectability** in the case at hand. This means that the value of the initial n-objects system can be determined from the system output and the rank for the so called observability matrix have to be equal to n. The detectability operation is a particularly part of the observability. In this aspect, the relationship between creative thinking, innovation and its transfer in practice is also significantly influenced (Petkov, et al., 2017).

Besides the classical requirements for **availability** and **interactivity** of the information, its full **transparency** and **authorization** in e-assessment are necessary (TeSLA-project.eu). These properties are achieved by using modern information communication tools (**ICT**), which transform the management function of evaluation into electronic evaluation including **information modeling**, **data privacy** (Rozeva, et al.,2017), in e-assessment. According to Simens (2011) the theory approach can be used in learning process modeling and the learning environment it takes place.

According to Learning Analytics theory (Scheffel, et al., 2014) there are five quality indicators and twenties criteria for the educational process. Twelve of them are equivalent to the above done.

2. Methodological statements

According to the Snowflake Model of Creativity, developed by Professor David Perkins of Harvard University (Perkins, 2008), the creativity can be taught and cultivated. Interpreted for the subject of this report, this means that creative thinking can be formed in the educational process.

According to literary sources (Marinov and Tsankova, 2015) for defining the degree of critical thinking we need system of indicators. From management point of view they have hierarchical structure. The highest level is the indicator of the whole evaluation process. At the second level are indicators of the individual units from the observed group. Each indicator is calculated, based on a number of criteria. For the evaluation of the students work is used the so called expert estimations (questionnaires) method. On the figure 1 is proposed a questionnaires' based hierarchical scheme. The concrete expert answers correspond to criteria and could be given by expert group with quantitative estimation Likert scale (from 1 to 5).

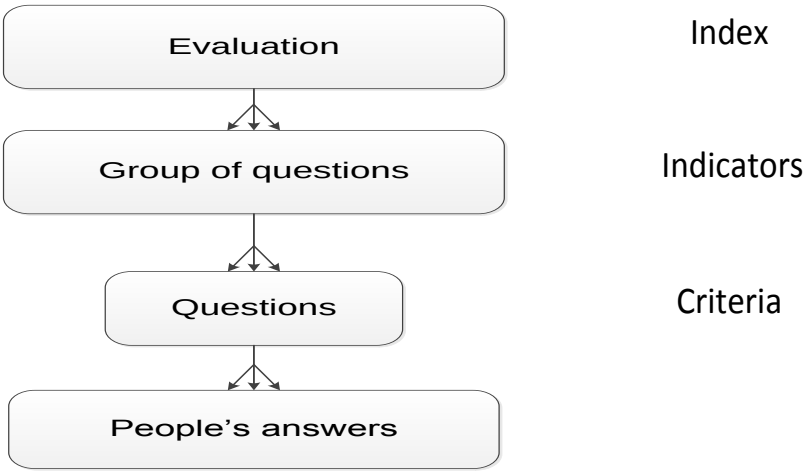


Fig. 1. Questionnaires' based hierarchical scheme

Each group of questions corresponds to one indicator (Marinov, 2013). According to Scheffel, et al. (2014) there are five quality indicators: Objectives, Learning support, Learning measures and output, Data aspect, Organizational aspect. Using this idea we proposed for the purposes of the e-evaluation combine the indicators in two group: pedagogy-psychological and socio-economical. The evaluation scheme elements are shown on the fig. 2.

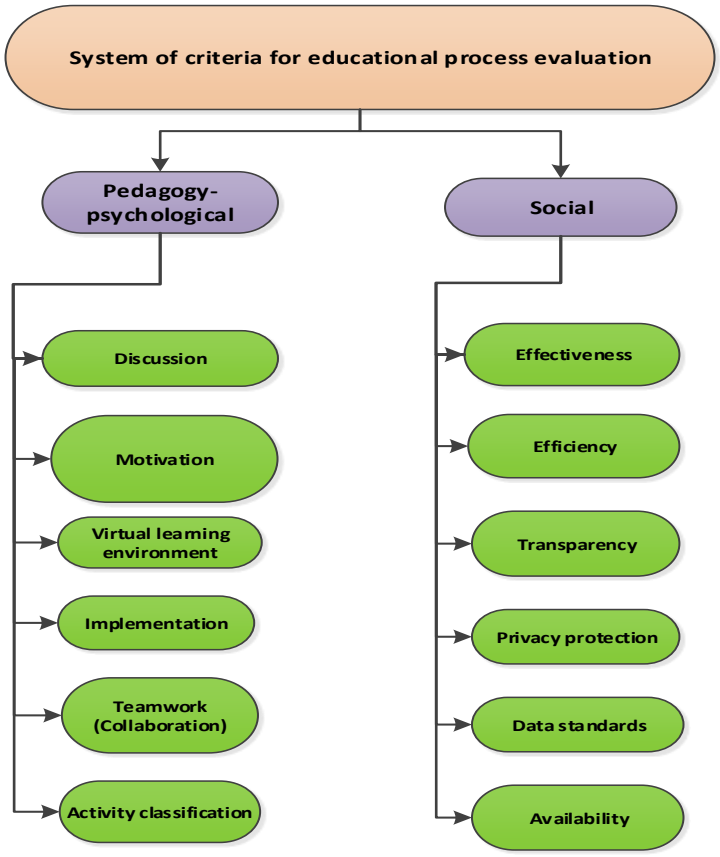


Fig. 2. Criteria for educational process evaluation

They are important factors and for this they have weights. Their weights are done by experts in the method of the Borda (OECD, 2012).

The criteria and indicators are calculated according to the universal algorithm for evaluation of ICT stimulated management processes given by Tsankova and Georgieva(2015).

The educational process is organized in team work with game (modeling) elements. Students are given the task of designing their own business for a particular management goal, motivating them to find innovative solutions. Besides they can be motivated via participation in different competitions. In winter semester of 2017/2018 academic year four students of the target group received European award.

The students from target group implement the purpose for creative thinking with four real tasks, using modern ICT tools and even e-commerce. They discuss and defend their decisions at broad videoconferencing forums.

The student's personal innovative solutions are privacy protected trough three- tiers architecture identification and so called "blind signature".

3. Practical results

According to our questionaries' results there are four steps in our students innovation decision making: identify and analyze the problem, identify the goal and factors which influent into the decision making process, pick up more than one solution, evaluate its and pick the best solution. The results of the actual educational process of the students from the Technical University of Sofia in the subjects "Information Technologies 1" and "Information Technologies 2" from the professional direction "Administration and Management" held in the last years are presented. The target group consists about 60 students including with e-assessment in frame of the European project TeSLA. The students were divided in two groups: target group from 30 students and control group from 24 students, learning via the conventional system.

3.1. The results of the students in the subjects of Information Technologies

In the learning process with the target group of the students from the Technical University of Sofia a perspective effect was established, in particular motivating the students to offer innovative solutions in their professional field under the influence of the wide use of Information and Communication Technologies (ICT). According to Ionescu and Ionescu (2015), innovation is the ability to generate new processes, products and ideas. Jaworski and Koli (1996) include organizational and managerial solutions also. Not only conventional hardware and software tools were used in the learning process, but also specialized ones such as video conferencing, video games, e-commerce, on-line education at VLE system Moodle, etc. The pilot e-assessment

experiment was conducted during the academic year 2016/2017. Techniques and biometrics tools have been used to achieve mutual trust between students, lecturers and university, such as authorizing via recognizing the face and voice, recognizing the style of the individual student's exposure, measuring the response time (fig. 3). The application of these tools was question of students consent. In every moment student could stop his participation in the pilot work.

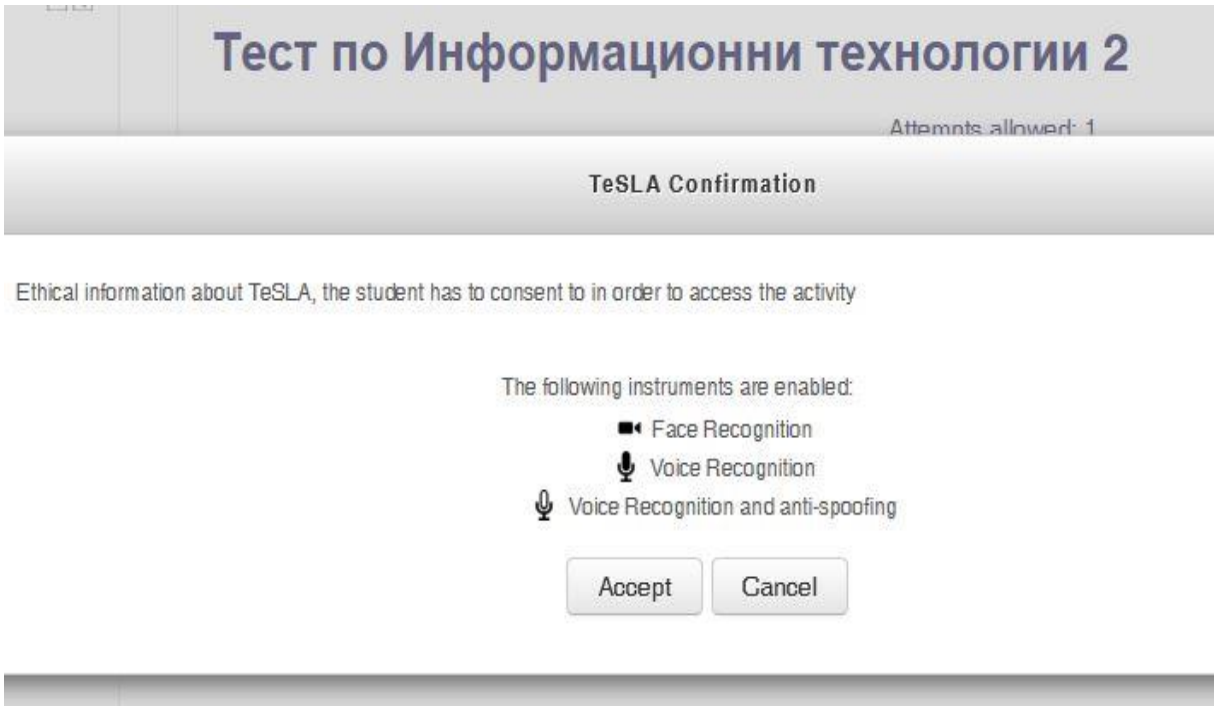


Fig.3. Used authorization tools

As criteria and indicators for determining the students proposed innovative elements were used: functionality of the proposed solution, solution technology, organizational improvement, efficiency and satisfaction with its use (Tsankova, 2011). In order to solve the hypothesis that the wide use of ICT tools in learning process stimulates the student's creative thinking the method given by Vohries (2005) was applied. Student suggestions are made during an electronic assessment via Virtual Learning Environment (VLE) Moodle with a quiz (test) on two open questions. The first question was "Describe the purpose and tasks of your IT2 course work" and the second "What innovative elements do you include in it?". The total number of questions in the test was 17. The two open questions, presenting the innovative students solutions, received the highest scores (figure 4).

Total number of complete graded attempts	30
Average grade of first attempts	73.64%
Average grade of all attempts	73.64%
Average grade of last attempts	73.64%
Average grade of highest graded attempts	73.64%
Median grade (for highest graded attempt)	73.33%
Standard deviation (for highest graded attempt)	11.87%
Score distribution skewness (for highest graded attempt)	-1.5956
Score distribution kurtosis (for highest graded attempt)	3.8665
Coefficient of internal consistency (for highest graded attempt)	34.10%
Error ratio (for highest graded attempt)	81.18%
Standard error (for highest graded attempt)	9.63%

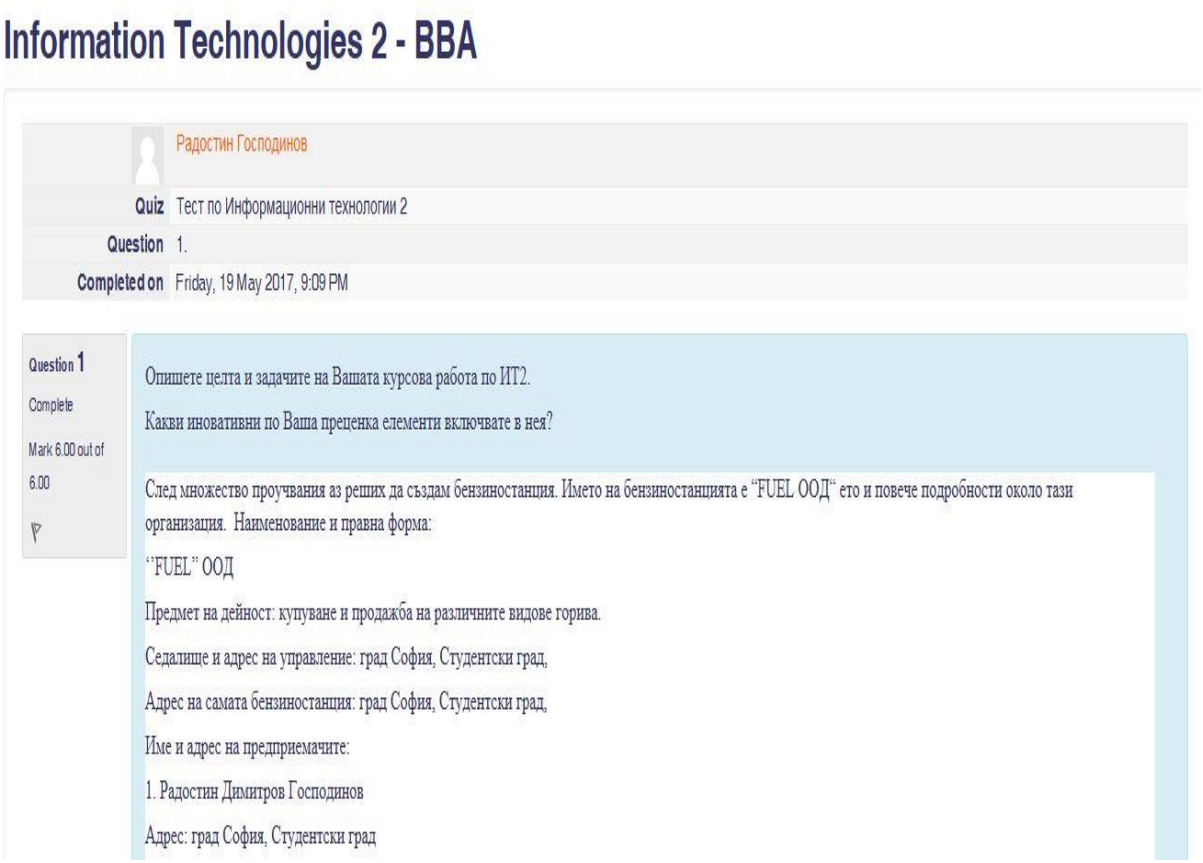
Fig. 4. Tests Scores

Innovations assessment is given in a poll by three lecturers on the Likert 1 - 6 scale. The results show that more then 70% of the students have given innovative ideas, whereas the previous years in the conventional evaluation were about 15%. This experiment has a positive response and confirms that the wide application of the ICT lead to the higher degree of the students creativity.

3.2. Additional effect

An additional effect has been achieved in direction of improving the quality of the learning process. The tool for authorization voice recognition can also be used directly in the assessment functions. It is possible by pre-recording a file with the information which it presents as a voice done answer. The subsequent use of this information in the assessment process help to receive corresponding score (Figure 5). Besides influence in direction of quality assurance this application lead to higher effectiveness and efficiency of the evaluation process.

An other additional effect in direction of students motivation was the new possibility for students to participate in competitions for European students awareness. Four students from the target group received such kind of awareness.



Information Technologies 2 - BBA

Радостин Господинов

Quiz Тест по Информационни технологии 2

Question 1.

Completed on Friday, 19 May 2017, 9:09 PM

Question 1

Complete

Mark 6.00 out of 6.00

Опишете целта и задачите на Вашата курсова работа по ИТ2.

Какви иновативни по Ваша преценка елементи включвате в нея?

След множество проучвания аз реших да създам бензиностанция. Името на бензиностанцията е "FUEL ООД" ето и повече подробности около тази организация. Наименование и правна форма:

"FUEL" ООД

Предмет на дейност: купуване и продажба на различните видове горива.

Седалище и адрес на управление: град София, Студентски град,

Адрес на самата бензиностанция: град София, Студентски град,

Име и адрес на предприемачите:

1. Радостин Димитров Господинов

Адрес: град София, Студентски град

16/05/17, 16:45 Saved After many studies, I decided to set up a gas station. The name of the gas station is "FUEL Ltd." and more details about this organization. Name and legal form: FUEL Ltd. Scope of activity: purchase and sale of various types of fuels. Headquarters and address of management: city of Sofia, Studentski grad.

For the purpose of the project will be purchased land in Sofia on which to build this gas station. The land will be purchased after the owner has taken a notary deed on the land through a purchase contract. After purchasing the land I will become a partner with Gaz Petroleum company. " Depending on the judgment of our specialists, we can build on your terrain a modern complex - a gas station, a gas station, a car wash, a motel, a service station, etc. Gas Petroleum, and you as the owner of the land enter as a partner in a new joint venture with the market share of the market value of the pitch".

1. DISCUSSION OF THE SUBJECT AND OBJECT. PLACING A MANAGEMENT PURPOSE. I want to set up a petrol station and start a business in Sofia because there are a lot of people in the city and there is a shortage of gas stations in the city. The organization will aim to deliver its customers the best quality fuel to its customers at the lowest prices for the whole of Bulgaria.

Objectives of the petrol station: Short-term objectives: * Construction of the first petrol station in Sofia at "FUEL" Ltd. and more precisely in Studentski grad; * Market breakthrough and winning regular customers; * Market Validation;

Long-term goals: * Long-term imposition of the market * Construction of a chain of gas stations throughout Bulgaria; * Recovering the initial invested capital and making a profit.

2. REQUIRED DOCUMENTS 01. Registration of a trader 02. Registration under VATA (Article 96, paragraph 1) 03. Entry into operation of the ESF to report the turnover from sales of liquid fuels

approved in the sense of the Measures Act, means for measuring the cost 04. Rental contract / title deed 05. RIEW permit for waste management 06. Commissioning 07. Authorization for construction of commercial roadside facilities 08. Permission for special use of the road through the operation of a commercial road link 09. CERTIFICATE for relative compliance with fire safety rules and standards 10. Registration under the EDTW. 11. Movement of excisable goods under a deferred payment regime 12. Control over the means of measuring the excise goods under Ordinance № 3 13. Registration of working time at a stationary commercial site In this database, which I develop, I have divided the objects of the species, subspecies and goods. I've put fuel, oils and accessories on the look. I have petrol, gas, diesel, as well as cars and motor oils for motors and various types of wipers and wiper fluids. On goods we sell three types of gasoline A95, A95 + and A98. I have included various types of gas - natural gas and biogas. In goods, I have also included two types of diesel. Diesel - and maxxmotion diesel. In other types of goods, I have already included the various car and motor oils and various types of wipers for different brands and car models as well as various types of wipers.

Fig.5. Voice recognition student's file for assessment process

4. Conclusion and recommendations

Starting from the objective of the learning process in a higher education institution and its general didactic goal - achieving a sustainable quality learning process, the attention is focused on the methods and tools for the creation of the students creative thinking. The theoretical considerations examined were approbated and supplemented by the real educational process. The assessment part of e-evaluation was conducted with 60 students from the first course of the professional field "Administration and Management" at Technical University – Sofia, Bulgaria.

In presenting the structures and the functionality of the real objects and processes of evaluation with the metrics of quality assurance it was proved the necessity of a close connection with the traditional university syllabuses and especially the use of the Information Communication Technologies in educational process. The suggested hypothesis on the stimulated effect of the use of information and communication technologies in the evaluation of the generation of innovative ideas by students with professional orientation was confirmed.

As a result of the experiment, the innovative potential of the students has increased from 15% to 70%. An additional effect in direction of increase of educational process quality is recognized also.

The results obtained so far justify the further expansion of the experiment in two directions:1) extension of the range of the used information and communication technologies for example to authorization and plagiarism recognition and 2) closer connection with the information management system, such as with analyzes and suggestions for improvement of the study documentation.

References

Colgate, A., 2017. *Six Effective Ways to Foster Innovation*. [Online] Available at: http://www.businessdictionary.com/article/510/ways-to-foster-innovation/ [Accessed 23.02.2019]

Ionescu, A. and Ionescu, C., 2015. The relation between the innovation orientation and organizations performance in Romania. *Romanian Journal of Economics,* 40 (49).

Jaworski, B. J. and Kohli., A. K., 1996. Market orientation: review, refinement, and roadmap. *Journal of Market-Focused Management,* 1, no. 2.

Marinov, O. and Tsankova, R., 2015. Impact of ICT on Administrative Management Processes. *Proceedings of VII International Scientific Conference "E-Governance and E-Communications".* Sozopol, Bulgaria: Technical University-Sofia Publisher.

May, R., 2017a. *Creativity and the innovation in the workplace*. [online]. Available at: http://www.businessdictionary.com/article/657/creativity-and-innovation-in-the-workplace/ [Accessed 23.02.2019].

May, R., 2017b. *Principles of Creative Leadership.* [online]. Available at: http://www.businessdictionary.com/article/669/principles-of-creative-leadership/ [Accessed 23.02.2019].

OECD, 2012. *Investing for Innovation for R&D.* [Online] Available at: http://www.oecd.org/site/innovation strategy/45188215.pdf [Accessed 23.02.2019].

Perkins, D., 2008. *Making Learning Whole: How Seven Principles of Teaching Can Transform Education.* San Francisco: Jossey-Bass, USA.

Petkov, A., Nedyalkov, A., Boneva, M., 2017. A Research on Quality Assessment Systems in Higher Education. *Proceedings of IX International Scientific Conference "E-Governance and E-Communications.* Sozopol, Bulgaria: Technical University-Sofia Publisher.

Rozeva, A. Durcheva, M., Tsankova, R., 2017. Management of E-Assessment in Higher Education in Terms of Interoperability. *Proceedings of IX International Scientific Conference "E-Governance and E-Communications".* Sozopol, Bulgaria: Technical University-Sofia Publisher.

Scheffel, M., Drachsler, H. Stoyanov, Sl., Specht, M., 2014. Quality Indicators for Learning Analytics. *Educational Technologies & Society*, 17 (4).

Siemens, G., 2011. Learning Analytics & Knowledge. *Ist International Conference on Learning Analytics and Knowledge, February 27-March 1, 2011, Banff, Alberta.* [Online] Avalable at: https://tekri.athabascau.ca/analytics. [Accessed May 25, 2017].

TeSLA-project.eu, 2016. *Trust Based Autentification and authorship e-Assessment system*. [Online] Avajlable at: http://tesla-project.eu/ . [Accessed 23.02.2019].

Tsankova , R. , Durcheva, M., Marinov, O., Varbanova, E., 2017. Synergy Effect of the TeSLA Project in Management of Engineering Higher Education. Invited paper. *Proveedings of MEDES '17 9th International Conference on Management of Digital EcoSystems* . Bangkok, Thailand: ACM New York, NY, USA.

Tsankova, R. and Georgieva, S., 2015. Unification of the Evaluation in the management process. *Proceedings of VII International Scientific Conference "E-Governance and E-Communications".* Sozopol, Bulgaria: Technical University-Sofia Publisher.

Tsankova, R., 2011. E-Governance as a step of New Public Management in Public Administration. In L.Matei and S. Flogaitis, eds., *The Balkans from Weberian Bureaucracy to New Public Management.* Economic Publishing House, Romania.

Vorhies, D. and Morgan, N., 2005. Benchmarking Marketing Capabilities for Sustainable Competitive Advantage. *Journal of Marketing*, 69.

Маринов, О., 2013. *Усъвършенстване на административно-управленските процеси чрез електроннни форми на сътрудничество и видеоконфериране.* Автореферат. София, България: Издателство на Технически университет-София,.

BUSINESS E-GOVERNANCE

REMOTE A PRIORI DETERMINATION OF ELECTRICAL CONSUMPTION OF THE MASS CONSUMER

Dobromir Malamov - *Higher School of Telecommunications and Posts - Sofia, Bulgaria*
Yordanka Angelova, Dilena Gorcheva - *Technical University - Sofia, Bulgaria*

Abstract. The advantages of the integration of electricity systems in a liberalized electricity market are outlined. The inclusion of part of the household consumers in it is currently based on a limited number of standard load profiles of power consumption. More accurately, their electricity consumption forecasts are based on individual load profiles. For their a priori determination a survey card is offered, which is aimed at the study of persistent (relatively constant) household factors (geographical area, type of dwelling, heat insulation, heating, household appliances, inhabitants, households, stereotype of life, etc.) that have an impact on the specifics of household consumption.

Keywords: free electricity market, standard load profile, individual load profile, questionnaire for the impact of household factors;

Introduction

The European Commission has established within a number of its own documents that over the last decade the statistical trend of energy consumption in the Member States has been monotonously growing. This trend is accompanied by a variety of disruptions in the rhythm of deliveries at unstable prices. The costs of importing energy resources are too high - they are 30% higher than those in the US and amount to about 350 billion Euros annually [1, 2]. At present, the Union imports 53% of the necessary energy resources and is largest importer in the world. A small number of Member States are highly dependent on external suppliers, making their sustainable socio-economic development, as well as their national security, vulnerable [1, 2].

In order to address energy issues and, in particular, those relating to electricity consumption, the European Commission has proposed a package of policies and measures, developed a long-term energy strategy, action plan and a roadmap to promote the development of high-tech networks for efficient energy production (through decarbonisation of the power sector), to ensure conditions for efficient and secure energy supplies, to facilitate access of businesses and households to quality electricity in sufficient quantities and at affordable prices in liberalized market [3,4].

A key strategic goal is the creation of an efficiently functioning unified energy union in which transmission and distribution infrastructures are subject to innovation, markets are integrated on the basis of solidarity and trust and energy supply becomes independent of national boundaries [2].

Within the European Electricity Union, a greater diversity of sources and increased security of supplies, a broadening of the spectrum of electricity services and a higher quality of services at lower prices [5, 6] are envisaged. Thanks to high technology, including e-governance in the energy sector, the European economy will increase its

efficiency, sustainability and competitiveness, it shall become low-carbon and environmentally friendly [19, 20].

There is currently a process of intensive modernization of aging infrastructure and a 10% electricity interconnection between systems in the European Union is planned until 2020. In this context it shall be noted that in May 2018 our country concluded a memorandum with the Republic Macedonia for cooperation in a pilot project the subject matter of which is the creation of a regulatory framework for a 'day ahead' pooling of electricity exchange markets on equal and fair terms for both sides.

The innovative processes also occur in Bulgaria, although with certain delay. At a macro level, a legal basis [7, 8] has been developed for the implementation of the new approach - a step-by-step transition to de-monopolization and a liberalized market compatible with the European electricity market. As a result, radical changes have taken place in the electricity sector over the last decade, and a liberalized and competitive electricity market is currently operating.

Overall, the Bulgarian electricity market is working on a "hybrid" model. There is still a traditionally established segment based on state regulation, which is not insignificant. The prices, quotas and conditions within that sector are determined by an energy regulator for a relatively long period and electricity is supplied not by traders, but by territorially separate electricity distribution companies. Despite the number of benefits for consumers, this model is becoming increasingly inadequate to the current requirements for a differentiated pricing of electricity for every hour of the day, depending on market conjuncture.

There is therefore a liberalized market segment in which customers have an unlimited right to choose electricity services and a supplier of electricity with whom they can freely negotiate prices and conditions. Under the European framework and the national regulatory framework from April 2016, mass consumers in this segment - households and small businesses - should actively migrate from regulated to the free electricity market. The transition determines the need to adequately predict the quality of household electricity consumption. A possible reference point for its a priori determination for a particular consumer is the survey.

The subject of the present work is a survey for studying of the intensity of influence of household factors on the specifics of the household electric consumption in order to produce individualized load profiles.

1. Electricity consumption profiles of mass consumers

At present, the commercial measurement of a small proportion of household consumers in Bulgaria is low voltage - by "ordinary" (electromechanical, induction) electrometers with up to three time tariffs for rendering account for electrical consumption: peak tariff- the most expensive, daily tariff, which is cheaper, and night tariff, being the cheapest, since the demand is the lowest. The lack of technical capacity for remote measuring does not satisfy the basic requirement of the liberalized market - differentiated electricity prices for every hour of the day. Therefore, exit from the regulated market of this type of consumers is possible on the basis of a unified (typified) distribution, the so-called standard load profile (SLP) of

the electricity consumption [9, 10]. Its application is considered a good practice in many developed countries [10, 11, 12].

By content, the SLP is a series of coefficients for each hour of the twenty-four-hour period for one year - a fragment is presented within the table in Fig. 1. The coefficients are determined by averaging and are normalized by months - their sum for each month is 1 and their total sum per year is 12. They statistically reflect the nature of the electricity consumption (active electricity) of a group of similar consumers.

№	Day of the year	Hour	Active Electricity [kWh]	Normalized coefficient
1	1.1.2017	01:00	119,00	0,00128088
2	1.1.2017	02:00	117,43	0,00126396
...	...	...	...	...
8 759	31.1.2017	23:00	124,17	0,00133652
8 760	31.1.2017	00:00	119,73	0,00128873
Total			3096,93	12,00000000

Fig. 1. SLP - normalized coefficients by dates and hours

The figures of the standard load profile can also be expressed analytically, for example in the form of a polynomial trend from n^{th} (6^{th}) degree (with determinant coefficient R2 = 0.9824) based on the least squares method:

$$\mathbf{Y = -6\times10^{-6}\times t^6+5\times10^{-8}\times t^5-1\times10^{-6}\times t^4+2\times10^{-5}\times t^3-1\times10^{-4}\times t^2+3\times10^{-4}\times t+1.1\times10^{-3}}$$

Profiles are standardized because they reflect the hourly statistical distribution of the average electricity consumption of groups of energy consumers. They are produced for each subsequent calendar year and are applied to groups of customers with a similar qualitative "character" of consumption, and their actual consumed quantities of active electricity (in kW/h) can vary over a wide range.

The power distribution companies are fully responsible for preparing the SLP. The final customer has no direct debts and no fees, regardless of whether the trader changes or remains with an existing provider.

For the current 2018, „CEZ Distribution Bulgaria" AD developed 8 items of standard load profiles in three main groups: 2 items for household clients, i.e. households in urban and rural areas; 5 items for non-household customers, i.e. food and agricultural industry (shops, groceries, shops, ovens, nurseries, etc.), high-tech production (bases, workshops, pumping stations, etc.); low-tech production (tailoring, woodworking, small production workshops, slaughterhouses, etc.); retail and daily business (shops, offices, etc.); evening business (restaurants, bars, discos, cafes, gaming halls, etc.); and 1 item for public lighting (street lighting, park lighting, etc.) [11].

The list of „Electric Distribution South" EAD (part of "EVN Group" EAD) for 2018 includes 9 items. standard load profiles also in three groups: 3 items for household customers: general profile, households with electric heating and households with centralized heating, gas heating or alternative heating; 5 items for business clients: general profile, customers with intensive daily consumption (08:00 h ÷ 18:00 h), customers with intensive evening consumption (18:00 h ÷ 22:00 h), customers with intensive night consumption (22:00 h ÷ 08:00 h), customers selling petroleum products; and 1 item for street lighting, uninterrupted through the dark part [12].

With the help of standard load profiles, the technical constraints of „ordinary" electrometers for mass consumers are compromised. They comply with regulatory guidelines, their spectrum varies widely enough, and is based on business perceptions of consumer behavior of traders, suppliers of electricity and electricity services.

Complex analysis shows that the statistically averaged nature of standard load profiles within a year provides an approximate estimate of actual consumption, and the dispersion among specific consumers in the statistical group is not small [13, 14].

Their very nature does not allow them to be individualized to adequately reflect the specifics and dynamics of the customer's electricity consumption.
Restrictions stemming from the essence of standard load profiles can be successfully overcome by applying modern information and communication technologies to periodically (every 15 min, 30 min, 60 min, etc.) remote measuring and development of specialized algorithms and a set of statistical processing applications based on dynamic analysis (time series), correlation and regression analysis, spectral statistical analysis, and more. With the help of these technologies, automated individualized load profiles can be updated and adapted virtually without interruption [13, 14, 15].

2. Survey for a priori study of the impact of persistent household factors on the household consumption

Normally, the specifics and dynamics of the household consumption of a particular household depend on a complex of *heterogeneous factors*. Depending on the time of action, they may be defined as relatively persistent, incidental, and rapidly changing.
Significant impact on household electricity consumption exercise certain *relatively constant* (*stable*) *factors* relating to the geographical location and area of settlement, type of dwelling, type of heating, type of insulation and insulated window frames, number of members and generations in the household, "stereotype" of life (household behavior [18]), type and class of energy efficiency of used electric appliances, etc.
There are also many *incidental factors* that exercise impact on the electricity consumption, such as temporary changes in the household "stereotype" - holidays, vacations, long trips, celebrations, parties and more.
The specific of household consumption is in direct dependence on changing *external factors* such as meteorological characteristics: temperature and humidity, etc. [17].
Business consumers not using "industrial" electricity quantities also have specific consumption. It mainly depends on *functional factors* related to their main activity - production or provision of services, manners of operation, etc. For example, for a company with logistical organization of combined transport in Bulgaria and Europe working on non-stop regime, electricity consumption mostly depends on the number and type of requests, which have a stochastic nature to a large extent [13, 14].
Based on the specialized statistical processing of numerical information about the influence of the factors on the specifics and the dynamics of the electricity consumption, it is possible to refine the forecasts for the consumer energy consumption. It is clear that for a complete individualisation of the load profile, apart from remote measurement data, a significant amount of heterogeneous content is needed. Its systematic provision constitutes a serious problem for every consumer. Good opportunities are offered by Cloud Computing - data from a significant number of electricity consumers at a relatively low cost can be shared. Due to the lack of such data on economically beneficial migration from the regulated market to the free market, the household consumer must first carry out a survey regarding the nature of its electricity consumption in order to select a suitable supplier. In other words, along with the range of prices, conditions and services offered by alternative dealers, he has to analyze his bills (for at least one year) and the household "circumstances" in which he uses his electricity.

For an a priori study the intensity of influence of the sustainable factors on the specifics of household consumption a survey has been elaborated, the essential parameters of which are reflected as follows:

Questionnaire to study the impact of household factors on household consumption

Dear Consumers,

You are going to switch from a regulated to a free electricity market where the electricity prices are not constant. With this survey, we aim to relieve you of this activity. The survey results can help you reduce the cost of your electricity consumption.

We ask you for each question containing blank boxes ☐ to mark ☒ for the correct answer.

In question 16, please further specify the energy efficiency class and the power rating of the household electrical appliance (Class A has the highest energy efficiency, and Class G is the lowest).

Thank you in advance for your precision and for the punctuality in your answers!

1	***In what geographical area is the dwelling?***
☐	mountain, mountain massif, semi-mountainous area
☐	plane, lowland
☐	valley, hollow
☐	gorge, passage, paddle
☐	sea, lake
☐	dam, large reservoir, river
☐	other: (please specify)
2	***In what location is the dwelling?***
☐	town
☐	village
☐	hamlet, villa zone
☐	other: (please specify)
3	***What is the type of dwelling where you live?***
☐	separate house
☐	apartment in a block of flats
☐	building (prefabricated house, shed)
☐	other type: (please specify)
4	***What is the structure of the building?***
☐	massive (with concrete carrier skeleton and brick or stone masonry)
☐	semi-massive (brick-bearing brick and brick or stone masonry)
☐	(with a wooden frame and brick or brickwork)
☐	other type: (please specify)
5	***What is the type of construction?***
☐	skeletal (with reinforced concrete columns, beams, washers, plates)
☐	large-format shuttering (with reinforced concrete columns, washers, plates)
☐	pick-up plates (with reinforced concrete columns, washers)
☐	panel (whole reinforced concrete panels)
☐	other type: (please specify)
6	***What is the area of the living space?***
☐	up to 25 m^2
☐	26÷50 m^2
☐	51÷75 m^2
☐	76÷100 m^2
☐	101÷125 m^2
☐	126÷150 m^2
☐	over 150 m^2 (please specify area)
7	***What is the number of living quarters (rooms, kitchen, living room)?***
☐	up to 2
☐	3÷4
☐	5÷6
☐	over 6 (please specify)
8	***What is the type of joinery?***
☐	wooden windows
☐	polycarbonate aluminum joinery
☐	PVC window frames
☐	wooden glazing
☐	other: (please specify)
9	***What is the thermal insulation of the dwelling?***
☐	thermo-insulating plaster on internal walls
☐	heat-insulating plaster on exterior walls
☐	thermo-insulation plaster on the ceiling
☐	additional thermal insulation of exterior walls
☐	additional thermal insulation of internal walls
☐	additional thermal insulation on the ceiling
☐	additional thermal insulation of sandwich type
☐	other type: (please specify)
☐	no heat insulation

10	***What kind of thermal insulation materials do you have?***
☐	artificial materials (EPS, graphite EPS, XPS, polyurethane)
☐	mineral (rock) wool (basalt, limestone, dolomite, bauxite)
☐	glass wool (recycled glass)
☐	natural thermo-insulating materials (flax, hemp)
☐	vacuum isolation
☐	transperate isolation
☐	other type: (please specify)
☐	no heat insulation
11	***What kind of energy is the heating of the dwelling?***
☐	central heating
☐	electricity
☐	natural gas
☐	solid fuel (wood, coal)
☐	propane butane, naphtha
☐	biofuels (pellets, fuel chips)
☐	other: (please specify)
☐	is not heated
12	***What kind of appliances do the house heat up?***
☐	radiators for central heating (cast iron, aluminum)
☐	radiators (convector), convectors, stoves (fan)
☐	storage heaters (energy-saving, convection)
☐	air conditioner (inverter)
☐	floor heating
☐	infrared panels
☐	heat pump system
☐	other: (please specify)
☐	are not used
12	***How many households are occupying the dwelling?***
☐	one
☐	two
☐	three
☐	more: (please specify how much)
13	***What is the number of the generations of inhabitants?***
☐	one
☐	two
☐	three
☐	more: (please specify how much)
14	***What is the number of occupants in the dwelling?***
☐	1 ,2
☐	3y4
☐	5 ,6
☐	more: (please specify how much)
15	***What is the dominant time of staying at home?***
☐	constantly
☐	seasonally
☐	periodically
☐	episodically
☐	other: (please specify)

In the additional explanations for completing the questionnaire, it is useful to emphasize that free market registration does not amount to an automatic fall in consumer prices because they are largely dependent on the level of market prices, regulated prices, the choice of trader- supplier of electricity and electricity services.
Based on the developed questionnaire, a remote (internet) pilot survey of households was conducted. It showed that consumers encountered serious difficulties in answering the last 16th question, an example of which is given in the following table:

16	*What household appliances are equipped with?*								
	Type of household electrical appliance	Energy Efficiency Class							Power [Wh]
		A	B	C	D	E	F	G	
☒	air conditioner	1							200
☒	air conditioner		1						280
☐	heating radiator								
☐	heating radiator								
☐	heater (fan, infrared)								
☐	heater (fan, infrared)								
☐	accumulating stove								
☒	cooker, cooking hob	1							1 800
☒	microwave oven, household oven			1					700
☒	grill, toaster, hob								
☒	absorber	1							60
☒	refrigerator	1							35
☒	freezer			1					82
☒	washing machine	1							2 900
☒	drying machines	1							2 600
☒	disinfecting machines	1							1 760
☒	vacuum cleaner	1							700
☐	steam cleaner								
☐	boiler, heater, hotplate								
☒	coffee maker, coffee-brewing machine, electric kettle	2							1 025
☒	television, home cinema system			1					120
☒	computer stationary system (aggregate)								380
☒	type of lighting (averaged)		1						240
☒	another appliance: facsimile			1					8
☐	another appliance:								
☐	another appliance:								

Fig. 2. Example to describe the types of household electrical appliances used

The survey has no representative (exemplary) character. Its results refer to the consumption of 28 households from Sofia-city (64%) and Sofia-region (36%), consisting of 1÷6 members (average 3.1); 1÷2 generations (average1.29); permanent residents (96%) in apartments (72%) or in separate houses (28%); with (28%) and without (72%) thermal insulations; with (79%) and without (21%) heat-insulating window frames; with air conditioning systems (14%), with solid fuel (14%); equipped with basic electrical appliances (stove 100%, refrigerator 100%, washing machine 100%, boiler 26%, etc) of energy efficiency classes A (28%), B (44%) and C (28%).
The comparison of the obtained results in the form of systemized, summarized and processed numerical data with the amount of household consumption for the previous two years (unrepresentative) shows correlation dependence with the electric heating

(in winter) ρ = 82%, air conditioners (in the summer) ρ = 66 %, electric water heating ρ = 78% and others.

On the basis of the a priori obtained numerical information by applying specialized software [13, 14] it is possible to determine (with a certain accuracy) the specifics and dynamics of the household electricity consumption of a particular consumer and to offer him rational possibilities for his (including remote) management.

It shall be noted that suppliers and traders of electricity and electricity services also do (free of charge) a free analysis of the nature of household consumption, predict its size (by seasons) and on the basis of an adequate SLP offer corresponding tariff plans for the supply of electricity.

Conclusion

At present, household consumers do not have a pronounced economic interest in massive exit to the free market at existing levels at regulated and market prices. At the same time, traders offer more innovative electricity services and the liberalized market is becoming more attractive. In this sense, it can be concluded that, in order to meet the current requirements, the electricity trade becomes an increasingly specialized and high-tech sector. For a cost-effective participation, it is necessary for the mass consumer to significantly increase his common knowledge in energy consumption in order to avoid gross errors, especially in the process of migration, which he / she needs to pay further.

The realization of individualized load profiles as a specific type of electricity service creates solid prerequisites for efficient electronic management of the electric consumption by competent consumers. Periodically corrected for changes dependent on persistent (household) factors, according to weather forecasts, etc., they can dynamically adapt for the purpose of producing more precise power consumption orders (on a "day ahead" market) resulting in lower imbalances, lower energy emissions and cheaper electricity. This is in line with the spirit of creating and maintaining a sustainable development of the European Energy Union.

References

1. *Quarterly Report* on European Electricity Markets (2018). Market Observatory for Energy. vol. 10 (issue 4; fourth quarter of 2017), European Commission, Directorate-General for Energy, Market Observatory for Energy <https://ec.europa.eu/energy/sites/ener/ files/documents/quarterly_report_on_european_electricity_markets_q4_2017_final.pdf>

2. *Energy union for Europe* (2018). Council of the European Union <http://www.consilium.europa.eu/en/policies/energy-union/>

3. *Resolution on Energy Strategy* for Europe 2011-2020 (2010). Adopted at the Executive Committee on 1÷2 December 2010 <https://www.epsu.org/sites/default/files/article/files/Energy_definitif_ GB.pdf>

4. *Energy roadmap* 2050 of European Commission (2012). Luxembourg: Publications Office of the European Union, 20 pp., ISBN: 978-92-79-21798-2 <https://ec.europa.eu/ energy/sites/ener/files/documents/2012_energy_roadmap_2050_en_0.pdf>

5. *Energy Union Package* (2015). A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy, European Commission Brussels, 25.2.2015 <http://eur-lex.europa.eu/resource.html?uri=cellar:1bd46c90-bdd4-11e4-bbe1-01aa75ed71a1.0001.03/DOC_1&format=PDF>

6. *Energy union and climate* (2018). European Commission, Priorities <https://ec.europa.eu/commission/priorities/energy-union-and-climate_en>

7. *Law on Energetic* (2018). promulgated SG, issue 107 of 9 December 2003, .., amended and supplemented SG, issue 98 of 8 May 2018 <https://lex.bg/bg/laws/ldoc/2135475623>

8. *Law on Energy Efficiency* (2014). promulgated SG, issue 98 of 14 November 2008, amended and supplemented SG, issue 98 of 28 November 2014 <https://www.lex.bg/en/laws/ldoc/2135605212>

9. *Rules on the Commerce with Electric Energy* (2017). Commission on Energy and Water Regulation, promulgated SG, issue 66 of 26 July 2013, last amended and supplemented SG, issue 100 of 15 December 2017 <http://www. dker.bg/uploads/normative_docs/ptee_15122017.pdf>

10. *Standard Load Profiles* (2018). Retail Market Design Service (RMDS) <https://rmdservice.com/>

11. *Standard Load Profiles* (2018). „CEZ Distribution Bulgaria" EAD <http://www.cez-rp.bg/bg/svoboden-pazar/za-klienti-sus-standartiziran-tovarov-profil/2-standartizirani-tovarovi-profili>

12. *Standard Load Profiles* (2018). „Elektrorazpredelenie Yug" EAD <https://elyug.bg/getdoc/cee4b759-8af0-49a8-92d2-c78308d97999/Standardized_load_profiles.aspx>

13. *Malamov*, D., B. T. Sekirarski, D. Gorcheva, D. Velinov (2016). Remote Forecasts for Daily Use of Electrical Energy from the General Public within a Free Market, Scientific Project № 4 of FSI of the University of Telecommunications and Post, Sofia.

14. *Malamov*, D., D. Gorcheva (2016). Statistical analysis of electricity consumption for remote construction individualized load profile to the general public, VIII International Scientific Conference "E-Governance and E-Communications", TU-Sofia, Sozopol <http://fman.tu-sofia.bg/Pokani/ 8-ISC-Proceedings-2016.pdf>

15. *Malamov*, D., D. Gorcheva (2015). Information technology forecasting electricity consumption by the general public in a free market. I International Scientific Conference "Telecommunications, Informatics, Energy and Management TIEM`15" of University of Telecommunications and Post–Sofia and University "St. Kliment Ohridski"–Bitola; Bitola, Macedonia <http://www.utp.bg/wp-content/uploads/TIEM_2015.pdf>

16. *Gorcheva*, D. (2016). Technical support of a computerized system to remote control reporting of electricity to the general public in a free energy market, Student Scientific Session of University of Telecommunications and Post, Sofia <http://www.utp.bg/2016/05/21/6322/>

17. *Malamov*, D., D. Gorcheva (2017). Statistical model for remote projection of electricity consumption to the general public based on synoptic forecasts, IX International Scientific Conference "E-Governance and E-Communications", TU-Sofia, Sozopol <http://fman.tu-sofia.bg/Pokani/ Proceedings-2017-7.pdf>

18. *Rangelov*, N., Y. Nikolaev, K. Gerasimov (2012). Analysis of the domestic's behavior of electrical energy consumption, Third International Scientific Congress, TU-Varna, Varna <https://www. researchgate.net/profile/Nikolay_Nikolaev2/publication/236686690.pdf>

19. *Tsankova*, R. (2003). Information System for Environmental Technological-based Processes Choice. Journal of Balkan Ecology, volume 6, No 4, 2003, p.347-351.

20. *Tsankova*, R., S. Georgieva (1998). Information technologies in environmental management. Bulvark, Sofia, 100 p.

PROBLEMS CONCERNING OPERATIONS SYSTEM OF THE ENTERPRISE IN THE CONTEXT OF INDUSTRY 4.0

Ognyan Andreev[1], **Gabriela Peneva**[2]
[1]*Department of Economics, Industrial Engineering & Management, Technical University – Sofia, Bulgaria,*

[2]*Department of Economics, Industrial Engineering & Management, Technical University – Sofia, Bulgaria,*

Abstract. Undoubtedly, industrial production is the backbone of the national economy. The manufacturing enterprise, besides a source of profit for its owners, is also a generator of a national gross product and hence of economic prosperity. Industrial enterprises are one of the largest employers and importers of taxes in the state budget.
When talking about industry, however, we must not forget that its development depends directly on scientific and technological progress and in particular on the achievements in automation, mechanization and robotics.
The innovation in enterprises is a continuous process. Industrial production today takes maximum advantage of the scientific and technological achievements of the 1980s and 1990s – Internet, mechanization, advanced production lines, computational power, maximum flexibility and production systems integrity. It is the accelerated automation and robotization that makes experts believe that we are on the verge of a fourth industrial revolution, and according to others – it has already occurred.
The importance of new technologies to society and the economy is determined by the definition of the term "Fourth Industrial Revolution (Industry 4.0)".

Keywords: Industry 4.0, Manufacturing, Automation, Production, Flexibility, Cybersecurity, Digitalization, Cyber-Physical Systems.

1. Introduction

During 2011, the term Industry 4.0 was defined for the first time in Germany as the "logo" of an initiative to adopt a high-tech strategy for the development of the country's economy. Two years later, the German National Academy of Science and Engineering presented the so-called "Manifesto for Industry 4.0" (European commission, 2016). Leading European countries such as France, Austria, the UK, the Netherlands, Spain etc. also published strategies for their industries (McKinsey and Co., 2012). In the US, Industry 4.0 concepts gain recognition through the Industrial Internet Consortium / ICC in 2013 (Department of Defense USA, 2008).

Initially, key technologies in industrial strategies have been identified as having a high degree of digitization like Industrial IoT, Simulations (Tsankova & Marinov, 2006), Virtual/Added Reality - VR/AR, Autonomous Robots, Cloud Computing, Cybersecurity, 3D printing, horizontal and vertical system integration (Tsankova, 2003), Big Data analyzes, and so on. The list is supplemented by new solutions such as artificial intelligence and cognitive systems, machine learning, block technologies, digital platforms, etc. In practice, this list is expanding due to the strong dynamics of technological innovation.

In the **Bulgarian concept** for Industry 4.0, the latter is defined as *„a set of connected digital technology solutions that support the development of automation, integration and real-time data exchange in manufacturing processes“* (Republic of Bulgaria, Ministry of Economy, 2017).
The vision outlined in the concept is that Bulgaria should be recognized up to 2030 as a regional center of the digital economy. At this stage, as the priority areas laid down in it, are put the following ones: (1) strengthening the link between science and industry and (2) accelerated the integration of Bulgaria into the European and international programs, initiatives and networks related to the Industry 4.0.

Technological upgrading of the Bulgarian economy is the second priority direction. Here the State has marked the introduction of standards, the establishment of systems and business models, building a broadband infrastructure for the industry, the introduction of incentives for the development and market introduction of new products, services and production processes.

The third strand is building human, scientific, organizational and institutional capacity.

Industry 4.0 strategy should not contradict, but build on already existing ones like the Convergence Program, the Innovation Strategy for Intelligent Specialization and so on.

Bulgaria has three big pluses on the way to the Industry 4.0. The first developed industrial sectors that are leaders in digitalization, as "electrical and Electronics" and "Machine", which together make up almost 20% of the Bulgarian export. The second plus is the potential of the ICT sector, and the third one – the high speed Internet connection in the country.

2. Current State Overview
2.1. The Status

For the vast majority of business organizations the digitalization is still just a prospect. The digitalization (a very narrow term characterizing Industry 4.0) of almost all spheres of our life is helping now all business branches as well (Scholz at al, 2018) and, by itself, it is a very big step of humankind’s development – like former industrial revolutions themselves are. By its nature, it is a paradigm change too (Takács-Sánta, 2004); (Črešnar, et al., 2018).

Scholz et al. (Scholz, et al., 2018) define the digitalization as a process of presenting real world objects by the means of digital symbols. These digital processes are performed through digital/information technologies and machines, which possess not

only computing, but also self-learning capabilities. This way, during 1990s, as well as in the beginning of the new millennium, the humankind faced the new "Digital Era" (Wang, et al., 2016). In the meantime, the digitalization had a huge impact on the economic systems as well, so that now one can speak of so-called Digital Economy (Tapscott, 1996), and this served as a mean and a "fast lane" for entering into the next – Fourth Industrial Revolution (Scholz, et al., 2018); (Wang, et al., 2016).

Small and medium-sized companies (SMEs) are still far from these innovations. The companies, where new technologies are entering, are mostly the large ones and usually are owned by international corporations – less than 25% of SMEs use automation to manage their supply chains. Among the biggest ones (with over 250 employees) barely 34% perform business processes automatically bound to those of their suppliers and customers, while 60.8% of large businesses are using ERP (Enterprise Resource Planning) systems (DESI, 2017). That is why, according to the Bulgarian Association on Electrical Engineering and Electronics (BASSEL), the foreign ownership in Bulgarian industry should be used as a channel for the acquisition of these technologies. In the Electric and Electronics Sector, 60 out of 400 businesses are foreign-owned, as they account for 40% of production (Todorova, 2017).

The effect is a radical transformation of the traditional industries, which change their approach to work – meaning use of new production technologies, new machinery, new materials etc. (Nikolov, 2010) (Nikolav, 2011). In this context, this is becoming an essential knowledge (intangible asset) (Koleva, 2018). Furthermore, there is a full integration between physical and cyber dimensions.

2.2. Brief History

The First Industrial Revolution occurs during eighteenth century with the mechanization of manufacturing processes, using the energy of water and steam. This fosters developing increasingly complex and diverse machines, as well as improving their efficiency (Fig. 1).

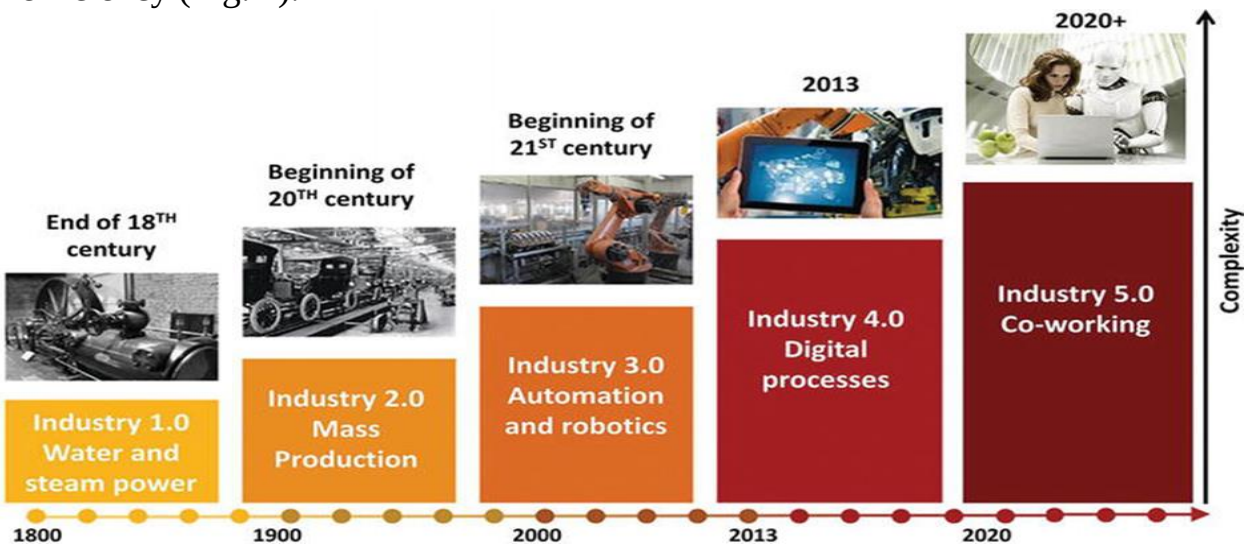


Fig. 1. Historical Flashback (Todorova, 2017)

The Second Industrial Revolution is unfolding with the widespread introduction of electricity and mass production, leading to the so-called Economies of Scale and further improving manufacturing effectiveness and efficiency.

The Third Industrial Revolution is characterized by the introduction of automation in production processes using electronics and information technology (IT).

The Fourth Industrial Revolution (Industry 4.0) is integrating IT systems with the physical ones, in order to obtain the so-called Cyber-Physical Systems that actually combine the real world with the virtual one. However, there are also opposing views. Some authors (de Vries, 2008) believe that Industry 4.0 is just an evolution of the third one.

Industry 4.0 is characterized by the cooperation between intelligent machines, information storage systems and production systems into intelligent networks, bringing together the real and the virtual world in cyber-physical systems (CPS). These innovative technologies allow companies to become "Smart", which helps to a great extent making customized products/services on a large scale, while providing opportunities to improve the flexibility and efficiency of enterprise operations system.

Until now, each industrial revolution, launching new technologies and ways of organizing operations into the manufacturing and/or service companies, has been inducing a continuous increase in the organizational management complexity (Kagermann, et al., 2013). The reason for that used to be the need for an increasing quantity of the work force in the managing subsystem of the enterprises, because of the so-called Span-Of-Management or Graikunas' Principle. However, in contrast to the previous ones, the present Fourth Industrial Revolution – just because of the digitalization and Internet opportunities – allows these organizational management levels to be dramatically reduced, achieving the so-called Flat Organizational Structures.

Another characteristic of Industry 4.0 is that contemporary industrial development is not based anymore on a prevalent increase in fossil fuel mining and usage, but on the human creativity and innovation instead, further enabled by the digitalization and IT (Scholz, et al., 2018); (Črešnar, et al., 2018).

Some authors (Department of Defense USA, 2008) have already begun talking about emerging of the Fifth Industrial Revolution, which is going to be based on the co-operation and interaction between human and machine.

2.3. Main Characteristics of Industry 4.0

• *Optimization in decision-making*

This is becoming a key factor in terms of the global competition. The opportunities for different kinds of analysis and real-time processing of large data enables a real

time decision-making process. In the field of manufacturing and services this means flexible, adequate and timely deliveries. It is quite easy now to optimize the entire value chain during planning and scheduling;

• *Resource productivity and resource efficiency*
Industry 4.0 retains the existing strategic objectives set in the first place by industrial production: producing as much as possible given the available resources (resource productivity) in the most cost-efficient manner of resources for available products (resource efficiency). Moreover, in order to optimize resources utilization, reduce energy and emissions, certain systems can be optimized and adapted continuously in course of their work;

• *Individual approach to the customer*
Industry 4.0 allows taking into account the specific customer criteria in terms of product design, configuration, ordering, planning, manufacturing, and delivery, including changes made during communications with customers (Koleva & Andreev, 2015). That is why, applying its principles reflects to more cost effective production of customized products;

• *Flexibility*
Cyber-physical systems enable dynamic network organizing of business processes in different dimensions: time, quality, risk, sustainability, cost, environmental impact etc., in a way that the logistics chains could be kept in an optimal balance. At the same time, operations are designed to be able to quickly change substantially production volume and offset market demand fluctuations;

• *The potential to create value by offering new services*
Industry 4.0 enables the emergence of new forms of value creation and employment, for example by offering certain services in the supply chain. Big Data processing could be used by intelligent algorithms for the provision of innovative services. Within the Industry 4.0 there is a large development potential of B2B (Business-to-Business) services namely in the SMEs and Start-ups.

In summary, the impact of new technologies and Industry 4.0 on business processes can be presented in the following way:
1. Creation of new products and services with built-in intelligence, innovative business models and opportunities for customization and adaptation to the needs of clients;
2. Digitization of the complete production cycle, accelerating development through digital prototyping and virtual production, flexible organization of production process;
3. Miniaturization trend in product design and development.

3. Issues Arising During Implementation of Industry 4.0

In order to achieve adequate flexibility and efficiency, companies have to decide a number of issues, the most important according to Shvab (Shvab, 2016), are:

1) Cyber-Security and management of artificial intelligence

Cyber-Security and privacy of personal data is the first and most urgent challenge, given the growing number of attacks and data breaches due to increased connectivity;

2) Interoperability between existing systems

A functional digital environment requires a seamless sharing of data between machines, production units – enterprise and between enterprises. The same problem exists with the integration of the data due to the diversity of the types of data sources;

3) High business risk

The uncertain return on investment, as well as their high amount is mainly an obstacle that deters so far companies to deploy new technologies more quickly (Nikolav, 2016);

4) Still a low degree of maturity of new technologies;

5) Insufficient digital culture developed and competence as a whole

The forecasts of the experts are that machines will initially take the work related with the monotonous and repetitive movements so typical in the Assembly lines. This does not mean that the work done by the humans will surely be unnecessary. People are still better at creating unique and innovative products.

Industry 4.0 will benefit the most of the achievements in the field of software programming of resources. This means more and better programs, better predictive algorithms that will draw more and more qualitative analyses. This will allow the manufacturing process to be even more effective, optimal, cost effective and easy to manage, control and maintenance. In this way, the losses as a technological marriage, defects in the operational process will be kept to a minimum. The companies of the future will increasingly focus on operations management (Koleva, 2018); (Koleva & Andreev, 2018), while the machines perform monotonous and repetitive tasks. Consequently, the management science will gain new meaning and even greater importance. Business management and business models of governance will have to be adapted to the new technological realities. Interaction between various units in the industrial enterprise will be subject to radical changes due to the increasingly shrinking role of man in favor of machinery.

In terms of human resources, the Fourth Industrial Revolution brings many unknowns about losing traditional jobs. Once automation and robotics are at its core, the most vulnerable groups will of course be low-skilled workers. According to some forecasts from the beginning of 2016, 47% of the current occupations in the US occupied by people are at risk of disappearing as a direct result of automated labor (Schwartz, et al., 2017). Another report by the World Economic Forum envisages losing 5 million jobs in the next five years (World Economic Forum, 2016). On the issue of "What will these people work for?" it is obvious that a problem with a future "technological" unemployment is growing. What can be done is training and retraining programs for workers who lose their traditional work so that they can continue in other direction(s). However, the retraining does not mean a complete solution to the problem, because many employees will still be out of work and will not be able to be recruited back into the company.

The prediction of the effects of Industry 4.0 is characterized by a high degree of

uncertainty. One cannot predict precisely what will happen in the next 10 to 15 years, especially when the human factor is involved, with all its complexity and dynamics. However, it is certain that the role of education, in-house training and national re-training programs for people of so-called "risk groups" is of paramount importance. The efforts of both the business and the state, which need to increase their investment in science – practical applications, strategies, industrial innovation, etc. are needed.

3. Conclusion

The Fourth Industrial Revolution has the potential to fundamentally change the structure of the economy as a whole. The production process will rely on automation, with high-tech robotic machines taking the lead. A basic requirement for the employees in the enterprise will be the Digital Competence.

Industry 4.0 will bring the need for new skills and abilities. Change will not be easy, but if we look at the past, we will see that there have always been professions that have vanished precisely because of technological advances.

From the present point of view, we cannot accurately predict how the problems caused by the coming of Industry 4.0 will be answered. In addition, as every root change, the industry of the future comes with its benefits and negatives. Humans have to adapt as much as possible and realize their place in the new world, which in any case must remain a leader. It can be summed up that Industry 4.0 will be more technological, more optimized and more research-intensive one.

4. Acknowledgments

This publication is developed and published with the financial support of the Scientific-Research Sector at the Technical University of Sofia under the project № **182ПД0013-15** titled “Investigating POM System of Bulgarian Industrial Enterprises and Analyzing Opportunities for Implementing Industry 4.0”.

References

Črešnar, R., Potočan, V. & Nedelko, Z., 2018. *Management Tools for Supporting the Transition of Manufacturing Organizations to Industry 4.0: The Case of Slovenia.* Maribor, University of Maribor.

de Vries, J., 2008. *The Industrious Revolution: Consumer Behavior and the Household Economy, 1650 to the Present.* s.l.:s.n.

Department of Defense USA, 2008. *Systems Engineering Guide for Systems of Systems, Version 1.0..* 1 ed. Washington, DC: DC: ODUSD(A&T)SSE.

DESI, 2017. *Index for digital technology and society,* s.l.: s.n.

European commission, 2016. *GROW/F3 - Strategic Policy Forum on Digital Entre - Accelerating the digital transformation of European industry.* [Online] Available at: http://ec.europa.eu/DocsRoom/documents/15856/ [Accessed 23 January 2019].

European commission, 2018. *Digital economy in the European Union.* [Online]. Available at: https://ec.europa.eu/growth/sectors/digital-economy/importance.bg. [Accessed 21 May 2018].

Kagermann, H., Wahlster, W. & Helbig, J., 2013. *Securing the future of German manufacturing industry: Recommendations for implementing the strategic initiative*

INDUSTIR 4.0: Final report of the Industrie 4.0 Working Group, Frankfurt: National Academy of Science and Engineering; Federal Ministry of Education and Research.

Koleva, N., 2018. Industry 4.0's Opportunities and Challenges for Production Engineering and Management. *International Scientific Journal Innovations,* Issue 1, pp. 17-18.

Koleva, N., 2018. *Metodika za izsledvane stepenta na razvitie na digitalizatsiyata na proizvodstvoto v balgarskite industrialni predpriyatia.* Sozopol, XVI-th ISC "Management and Engineering'18".

Koleva, N. & Andreev, O., 2015. Influence of Degree of Customer's Co-Participation on Their Assessment of Products Design and Functionality. *Economic Alternatives Journal,* Issue 1, pp. 91-99.

Koleva, N. & Andreev, O., 2018. *Aspects of Training in the Field of Operations Management with Respect to Industry 4.0.* s.l., International conference on High Technology for Sustainable Development 11-14 June.

McKinsey and Co., 2012. Manufacturing of the future: the next era of global growth and innovation. *Fall,* 9(2), pp. 28-34.

Nikolov, B., 2011. *Upravlenie na reinzheneringovite proekti i tehnia risk v proizvodstvenite predpriyatia.* Tryavna, Bulgaria, International Science conference "Upravlenie na proekti".

Nikolov, B., 2016. *Upravlenie na riska pri reinzhenering na biznes protsesite.* 1st ed. Sofia: King.

Nikolov, B., 2010. Analiz na riska pri preproektirane na biznes protsesite v industrialnite predpriyatia. *Technologies & Management, Materials,* Volume 2, pp. 66-69.

Republic of Bulgaria, Ministry of Economy, 2017. *Kontseptsia za tsifrova transformatsia na balgarskata industria (Industria 4.0),* s.l.: s.n

Tapscott, D., 1996. *The Digital Economy: Promise and Peril in the Age of Networked Intelligence.* 1st ed. New York: McGraw-Hill.

Todorova, T., 2017. *Bulgaria i Industria 4.0 – golyamoto predizvikatelstvoto.* [Online].Available at: https://www.publics.bg/bg/publications/334/България_и_Индустрия_4_0_-голямото_предизвикателството.html [Accessed 21 May 2018].

Tsankova, R., 2003. *Data Modelling in Corporative Databases for the Discrete Production, Proceedings of the Technical University of Sofia,* vol. 52. Technical University – Sofia Publishing.

Tsankova, R. & Marinov, O., 2006. Simulatsionno modelirane na proizvodstvena programa v industrialnoto predpriyatie (bul.). *Industrial management,* VI(3).

Wang, S. et al., 2016. Towards smart factory for Industry 4.0: a self-organized multi-agent system with big data based feedback and coordination. *Computer Networks,* Volume 101, pp. 158-168.

World Economic Forum, 2016. *The Future of Jobs.* [OnlineA]. Available at: http://www3.weforum.org/docs/WEF_Future_of_Jobs.pdf. [Accessed 21 May 2018].

PUBLIC E-GOVERNANCE

INFLUENCE OF E-GOVERNANCE ON THE INTERACTION OF CITIZENS AND PUBLIC ADMINISTRATION

Yoana Pavlova
Technical University-Sofia, Bulgaria

Abstract. The public administration is a guarantor and executor of the State policy of the country. The administration is the connection between the citizens and the State. The use of e-governance in public administration aims to provide information and services to citizens and businesses; to encourage civic participation in the decision-making process; to increase the transparency of administrative work and to increase the control of the administration by the citizens and businesses.
The active exercise of civil rights is a corrective for the government. In their attitude to central and territorial administrations, citizens can improve the provided administrative services by expressing opinions, submitting complaints, making suggestions and recommendations.
The purpose of this report is to present the implementation of civil rights as a basic prerequisite for a good interaction between the citizens and the public administration.
Keywords: public administration, management, organization, e-governance, citizens, interaction, good practices

1. Introduction

The development and functioning of the laws in every country are inconceivable without the construction and improvement of an administrative apparatus, whose aim is to serve and ensure the proper implementation of state policy and laws. The unified administrative structure treats all citizens as equal subjects before the law and thus ensures the functioning of the state.
The socio-political and economic change that has occurred in recent years has led to a change in lifestyle, which also reflects on the requirements and expectations of citizens towards the administration. One of the functions of the administration is to provide services to citizens who insist on reducing / eliminating the bureaucratic burdens. Requests for trivial administrative services such as the issuing of certificates, references, the issuing of documents or driver's licenses, etc. should be allowed from the comfort of one's home.
Technological development offers an opportunity to solve these problems. E-governance allows for the elimination of administrative complicated procedures, which will improve the interaction and attitude of citizens and public administration.

2. Chapter one

2.1 Importance of public administration

Public administration can be defined as a structure of organizations and individuals involved in the implementation of laws and other legal acts and which participates in the formulation and implementation of government policy.

The main activity of the public administration is the satisfaction of the public interest and the public interest manifests itself as a general direction and basis for the functioning of the public administration.
The main task of the public administration, along with the realization of public interest, is the implementation of state policy (Kandeva, 2007a).
Each administrative structure has the necessary status and competence to carry out its administrative characteristics.
The purpose of the public administration is to serve the citizens and to provide daily services to the population. Civil servants are obliged to perform their duties accurately, lawfully and to protect through them the rights and interests of the citizens.
The main features of the administrative apparatus as a manifestation of the executive apparatus are the following: state work, legal work, subordinate work, executive work, prescriptive character (Kandeva, 2007b).
In Bulgaria, the administrative structure that governs state policy is divided into ***central and regional.***
The central administration includes the Council of Ministers, the individual ministries, the state and executive agencies.
The regional administration includes the district, municipal and regional administrations that serve local citizens and help with the implementation of local self-government.
A local government is defined as the legal and real ability of local authorities to regulate and manage, within the legal limits, a substantial part of public affairs, for which they are responsible, and for the benefit of their people. This right is exercised through councils and assemblies whose members are elected by free, secret, fair, direct and general elections and which may have executive bodies accountable to them. This provision does not impair the rights of the citizens for civic meetings, referenda or any other form of direct citizen participation, where permitted by law.
The local government in the country is carried out by 265 municipalities. The Local Self-Government and Local Administration Act regulates the public relations of local self-government and local administration. The municipality is mentioned as the main unit for local self-government in different spheres of competence such as: municipal property, municipal finances, taxes and fees, municipal administration; the structure and development of the territory of the municipality and of the cities, towns and villages in it; education; healthcare; cultural activities; developmental and communal activities; social services; protection of the environment and rational use of natural resources; maintenance and preservation of cultural, historical and architectural monuments; development of sports, recreational activities and tourism (*ZMSMA, 2018*).
The principles of local self-government are also in line with the *European Charter for Local Self-Government* adopted in 1985 and ratified by Bulgaria in 1995.
The "*Code of Practice for Citizen Participation in Decision-Making*" was approved by the Council of Europe on 1 October 2009. The main objective of the Code is to contribute to the creation of a favorable environment for non-governmental organizations in the member states of the Council of Europe. The Code recommends

the encouragement of civic participation by introducing transparency for the institutional activities, the involvement of NGOs and associations that can protect the interests of citizens. It is recommended that citizens be given access to information and a direct dialogue and partnerships with the authorities.
The Code also provides for horizontal instruments and mechanisms for civic participation, among which the most important is ***electronic participation***, which allows citizens to participate at any time and from a distance.
Bulgarian legislators have taken all these practices into account and have provided an opportunity for Bulgarian citizens to participate in the decision-making and management process at the local and central level. The direct participation of citizens is based on the following principles: free expression of the citizens' will, ensuring equal access to information on issues that need to be solved, ensuring equal conditions for different opinions, and the citizens' joint, equal and direct participation in elections through a secret voting process. There are three forms of direct participation of the citizens: a local referendum, a citizens' initiative and a general assembly of the population *(ZPUGDVMS, 2018).*
The central and territorial structures of the administration, through their actions, ensure the implementation and the opportunity for citizens to participate in the country's governance process.
Citizens are subject to certain state rights and responsibilities, but they are also subject to rights. The active exercise of civil rights is a corrective for the government. In their attitude towards central and territorial administrations, citizens can improve the provided administrative services by expressing opinions, submitting complaints, suggestions and recommendations.
The exercising of civil rights is one of the basic prerequisites for the good interaction between the citizens and public administration.

3. Chapter two

3.1 E-governance

The processes of globalization influenced by the development of technology have also led to changes in social relations. The use of information and communication technologies has become a part of everyday life. This change in the way of communication also determines the need for a new way of governance that responds to the dynamic social environment. The e-governance provides citizens with the ability to perform multiple activities without leaving their home or office.
UNESCO's definition of "e-Governance" is: the use of information and communication technologies by different individuals and groups in society to improve their access to information and improve their capacity (Trifonow, 2013), (Tsankova, 2008). The impact of ICT on administrative management process is evaluated via hierarchical organised indicators (Tsankova, 2015).
The practices of good governance, such as transparency, control, citizens' participation, are also envisaged in the e-Government.
The use of e-governance in public administration aims to provide information and services to citizens and businesses; to encourage civic participation in the decision-

making process; to increase the transparency of administrative work and to increase control of the administration by the citizens and businesses.
The documents of the Bulgarian administration reveal a mixture of terms, principles and elements of *e-Government, e-governance and good governance*. In 2002, in the *E-Government Strategy*, our country defines e-Government as a part of the transition from an industrial to an information society and as means of accelerating the process of Europeanisation (Pavlova, 2018).

Among the main goals of e-governance is the increase of citizens' satisfaction, the encouragement of their participation in the country's governance, and the improvement of the efficiency of the work and quality of services provided by the executive, judicial and legislative authorities. E-governance provides the exchange of information between different administrative information systems, which improves the performance of individual administrations and thus offers better services to citizens and businesses.
In 2011, a decision was made to implement the Estonian e-Government model in Bulgaria. Estonia is the leading country in the European Union that uses e-governance. The e-services that Estonian citizens can use are over 5 000, a link has been established among all administrative levels, police, hospitals, etc. The time has been minimized not only for administrative but also for any other types of services - subscribing to a new electrical power distribution network, Internet, etc.
The goal of the Bulgarian politicians is to build an equally successful system that will make life easier for citizens and businesses.
Unfortunately, attempts to this date have not very successful. International rankings on the use of e-governance put our country in the last place. In the 2016-2017 report of the World Economic Forum: under the "Public Institutions" index, Bulgaria is ranked 107th out of 137 countries, while Estonia is in 22nd place.
According to the indicator "Government use of ICT", Estonia ranks 1st in Europe and 8th among the 139 countries surveyed and Bulgaria ranked 102nd in the global ranking and 36th in the European one, including non-EU countries. The "Governmental Use of Information and Communication Technologies" indicator gives an insight into the importance of governments in implementing ICT policies for competitiveness and well-being purposes, as well as into the efforts they make to realize their visions for ICT development and the number of government services provided online.
The European Commission ranks Bulgaria 25th in the e-Governance classifications, while Estonia ranks 1st (Bulgarian Economic Kamara, 2017).
The introduction of e-governance through the years has been entrusted to various administrative institutions - the *E-governance* directorate of the Ministry of Transportation, Information Technologies and Communications, the executive agency *Electronic Communications Networks and Information Systems*, and after 2016 to the *State Agency for Electronic Management* (*ESAE*).
The *State Agency for Electronic Management* was established by the Electronic Governance Act in 2016,promulgated in the State Gazette, issue 50 from 2016.
The functions of the agency are to implement state policy in the areas of:

electronic control; electronic certification services; electronic identification; network and information security; infrastructure for spatial information.
The government assumed that the creation of an administrative structure to monitor and control the e-governance activities will help with the more successful implementation of the information technologies in the administration and will improve the position of our country in the international rankings.

4. Chapter three

4.1. Interaction between the citizens and public administration

In Bulgaria, e-governance represents several online services offered by separate administrations - *the National Revenue Agency* (*NRA*), the *Commercial Register* (*TR*), the *National Social Security Institute* (*NSSI*) and some municipal administrations. In 2017, the *State Agency for Electronic Management* launched the electronic document delivery system. Administrations need to make profiles of their e-services, and the citizens can make an inbox from which they can submit requests for their electronic servicing.
According to a report by the *Bulgarian Industrial Chamber*, in 2016 the Bulgarian administration offered 2 900 electronic services, 87% of which were "primary" and only 13% are "complex". "Primary" services do not facilitate citizens and businesses and do not replace services at the "counter".
It is also disturbing that only 19% of administrations provide e-services. In small municipalities and settlements, electronic services are virtually unavailable, even the websites for municipalities are not maintained and updated.
Paper media are still required and used. Registers for electronic services are supported by only 12% of administrations, while 27% only support hard copies (Pavlova, 2018).
A positive direction towards the development of e-governance can be seen in the activities of several municipalities. Regarding the transparency of the actions of municipalities category, we can point out the activities of the Municipality of Sevlievo as a good practice with their live broadcast of the municipal meetings. Another good practice can be found at the Municipality of Sandanski with their initiative to promote civic engagement in local self-government through the application "***See, Mr. Mayor!***" (Pavlova, 2018).
The introduction of forms of "opinions and recommendations", "complaints and alerts" that can be submitted online, should also be positively assessed. All of this has a favorable impact on civic initiatives and on the work of the administration. The exercise of control (anonymous in most cases) by the citizens on the activities of the administration has a positive influence on their interaction.
The intentions and willingness of the government to implement the Estonian e-governance model in the country have encountered several difficulties. The primary factor for the implementation of e-governance is internet access. In Bulgaria, 60% of citizens use the Internet, while in Estonia the percentage is 87%. Another factor is the computer literacy of the population. 34% of Bulgarians do not use a computer, while in Estonia only 8% do not. Other factors include the aging of the population, the depopulation of entire regions, the lack of qualified staff in many municipalities, etc.

All these factors are the reason for the unsuccessful introduction of e-Governance across the country (Bulgarian Economic Kamara. 2017).
A large part of the country's population is concentrated in and around large cities. Perhaps, after when specificities and efforts are considered, the introduction and usage of e-governance should be directed primarily to large municipalities and the central administration.

5. Conclusion

In conclusion, we can say that the information society has new rights of interaction, and anyone who does not comply with them will be dropped out of the system. This applies both to individuals and to states and institutions. The public administration is obliged to comply with technological developments and to make the most of the opportunities they offer. But as the administration must improve to provide better, faster, cheaper services to citizens, citizens are also required to exercise their civilian control functions. Improving the interaction between citizens and public administration is an active and constant process. Citizens are not a passive user of services provided but an active participant in policy making and decision making. It should not be expected that the public administration will improve on its own without the active participation of its users - the citizens. The use of e-Government in public administration not only makes life easier for the citizens and businesses, but also improves the activities of the administration and the state.

References

AR. 2018. *Annual reports on the state of the state administration 2010-2016.*

Bulgarian Economic Kamara, 2017. *Do you!*. [Online] Available at: https://www.bia-bg.com/news/view/23682/ [Accessed 21.03.2019].

Kandeva, E., 2007a. *Publichna* administracia. Ciela, Sofia, pp.22-23.

Kandeva, E., 2007b. *Publichna administracia.* Ciela, Sofia, p.67-68.

MRRB. 2018. *Administrativno-teritorialno ustrojstvo.*. Available at: http://www.mrrb.government.bg/bg/administrativno-teritorialno-ustrojstvo/ [Accessed 21.03.2019]

Pavlova, Y., 2018. *Grajdanite I mestnoto samoupravlenie: dobri praktiki I problemni oblasti.* Izd. Kompleks - UNSS, Sofia, pp. 92-101,

Trifonow, R., Nakov, O., Manolov, S., Tashev,T., 2013. *Elektronno upravlenie*. Avangard Prima, Sofia, p.7-16

Tsankova, R.& Marinov, O., 2015. Impact of ICT on administrative management processes, *Proceedings of VII International Scientific Conference "E-Governance"*. Technical University-Sofia Publisher.

Tsankova, R., 2008. *Information Technologies in Public Administration.* Technical University.-Sofia Publisher,

ZMSMA. 2018. Zakon za mestnoto samouprawlenie I mestnata administracia. *Biblioteka zakoni - APIS, b. 1, p. 4, № 350*

ZPUGDVMS. 2018. Zakon za priako uchastie na grazhdanite v darjavnata vlast I mestnoto samoupravlenie. *DV. No.17/26. 02 2019г.*

TRANSPARENCY AS A FORM OF SOCIAL ORGANISATION AND EXCHANGE VALUE: AUTHENTICITY, PERSONALITY, DEMOCRACY

Nataliya Atanasova
Bulgaria
nataliya.atanasova@protonmail.com

Abstract.

This research project explores the way transparency is used and applied, on a performative and symbolic level, as (1) a device for managing the establishment of sociocultural norms and values and (2) an expedient for understanding the boundaries between oneself and *the other*. A focus is given to the digital online and offline spaces, seen as places of visibility, circulation of information flows and open-data exchange.

Drawing on cultural studies, semiotics and information studies, this interdisciplinary project aims to uncover values, rationales and theories behind the use and non-use of authenticity, truth and personality, in social decision-making and public participation. It will be taken account of the possible responsibilities connected to being transparent and visible, and it will be considered the social expectation for a perfect state, which a term like transparency is charged with, while trying to understand if a politics of total transparency is in opposition with democracy.

Keywords: transparency, truth, authenticity, personality, participation, knowledge, social values, visibility management.

1. Introduction

As an effective understanding of a transparency is a key element of knowledge transmission, targeted at impacting both public and private participation in life, in the following paper, I aim to describe the behaviour and expectations of the individual, the mass and the state, in front of a transparent/open information transmission. The perspective of transparency is in a state of similitude to the Foucauldian view of the institutionalised gaze and Jeremy Bentham's Panopticon, as transparency has an educational purpose aiming to discipline through external observation – just as with the Kantian definition of Enlightenment and Peace, Steve Mann's proposal of Sousveillance and Rousseau's idea of revolution driven by transparency. With these vision at stake, I try to identify values concerning the importance of being transparent and ultimately, to reveal the purposes, flaws and paradoxes, which a system of transparency brings forth.

I will try to answer the questions, with a special reflection on the issues of state democracy, and individual freedom, through visibility. Importance is given to the analysis of how a *transparency system*, circumscribes the individual in a pre-established order of things.

The project of visibility might apparently seem democratic, as well as radiating a sense of a positive communism (to give oneself to others) – but it is limiting, under a behavioural, thus personal level.

2. Visibility Management

Thus, transparency can be viewed as a sign of a social contract, directed into forming relations, while securing the possibility for future bonds between subjects with each other, or with institutions. Openness and transparency are externalised socio-cultural concepts, into managing relationships (by giving something intimate to the other, in exchange for trust) – while also internalised, as moral and ethical values. In this sense, the primary function of transparency is to guarantee the stability and rightfulness of the social order.

On a performative level, transparency, relates to visibility management, that is, the management of one's own visibility, or: the decision of how much to give of oneself, to the others (Derrida with Ferraris, 2001). Accordingly, transparency, within the field of government and public administration (as the Open Government project) is a desirable aspect, as it enables the citizens to participate in a democratic decision-making. Transparency on a social and performative level has become synonymous with openness and publicity, merging together the spheres of private and public.

Transparency, openness and visibility within the management of social and cultural relations are now moral and ethical obligations, as well as, they are regarded as a good personal virtue. Especially on the internet, transparency is a must, when taking part of online communities, groups, or social networks – generally, when communicating with others. Internal forums on the online social space, are indeed a reality and a possibility for the individual. He or she may enter and take part of a discussion, so can he or she have their point of view heard, among a well informed community.

However, it can be stated that transparency, does not exclude anonymity. On the other hand, anonymity on the web is often exchanged for "pseudonymity" – obligating one to be individualizable and traceable in any case. In fact, transparency is a highly misunderstood concept nowadays: we give up our personal data as singular individuals, to become "dividuals" as for the peculiarity of a subject is enounced and traced, thus tearing off the possibility for any autonomy in private and public life, as well as for public decisions or any possibility for reform. The mass is individualizable, divisible and customisable.

The major issue that needs to be addressed is transparency as a means of social organisation and the use of the digital space, as both application and a tool for resistance and social change.

With my research I will try to answer the question, whether a politics of total transparency is a democratic tool, or it is just a reiteration of the authorities upon the individual. Is it possible to adopt an inverted panoptic system in assessing the state

management by those who govern it, or are we under their scrutiny of it and for which reason.
The launch of *FindFace,* in February 2016, dramatically increased the public awareness of tools for mass surveillance, in the hands of the mass itself. The main difference between FindFace and other dating, or social apps, is that the former entitles its users to *impose* participation on *others*, that is, on occasional people who are unaware of giving up their data (face-data) to the platform and its actual users. The accuracy of the face recognition algorithms of the software, have spread paranoia and deepened the debate on the impossibility to dispose with one's own choice of participation, in a sphere of a public circle. FindFace is one of the many social media tools to signal the closure of visibility management as a personal right, and reiterated the subjection of individual, with no "right to be let alone". "The right to privacy ceases upon the publication of the facts by the individual, or with his consent" (Warren and Brandeis, 1890).
Social Media platforms have normalised the visibility and transparency factor, The contemporary social set instigates the individual to embrace an attitude of exposure and constant visibility, by touching the sphere
of one's own peculiarities, in order to willingly reveal personal data. The precondition of social relations is, indeed, the revelation of something which is proper to oneself, and accordingly this lays the basis for the common ground of communication, and stabilises relationship with a perspective of a future bond (Simmel, 1906). Following Derrida, an exposure can in fact determine our future, based on what we give as information to *the other* (Derrida and Ferraris, 2001).

2.1. The *Other*

In this sense, the mass tendency to reveal intimate content over social platforms, is a clear reflection of conformity within the general ideology that, sharing is inherently a good social value, which guarantees security and integrates the subject within the public life. Hence, instead of conveying a sense of respect for silence, secrecy has become synonymous with immorality and consequently, embarrassment when wanting it on a personal level (Birchall, 2016).

On the other hand, there is a risk related to being too open, as it has the capacity to turn out to be discriminating. In forming a social sphere, openness can serve as a device of inscription and can thus, produce the criteria of judgment, in deciding the inclusion or exclusion of the group, based on the subject's tastes, tendencies or previous history. As, in fact, in their dialogue over Secrecy, Derrida and Ferraris deconstruct the word *community* into – "*comme un"* (as one), concluding that *belonging* refers to making something personal, available to others - depersonalising *oneself* to being shared with others, becoming a common property for all.

Yet, now people are no longer needed to be open to a particular other person: revealing personal thoughts, feelings and intentions, is at the base of an ordinary day - as we are continuously reminded and invited to share our information on every

social platform, through status updates or pictures uploads. Social Media platforms have normalised the visibility and transparency factor, The contemporary social set instigates the individual to embrace an attitude of exposure and constant visibility, by touching the sphere of one's own peculiarities, in order to willingly reveal personal data.

The sensation that internet is a liberating tool, of self-expression and knowledge retrieval, as well as one that give you infinite possibilities of self-realisation is a paradoxical one. The mass tendency to release personal content over social platforms and networks is an attitude of conformity of the general ideology that sharing is inherently a good social value, which gives you access and integration in society and facilitates one's participation in social activities. In public life activities, "reciprocal knowledge (…) is the positive condition of social relationship" (Simmel, 1906).

2.2. A tool for an open dialogue

On a public level, and in politics, transparency entails public participation, collaboration and more generally speaking - levelling of the common shared knowledge, in favour of the successful accomplishment of social relations. The precondition for Transparency is trust and its primary social purpose is, to be used as a tool to shed light over the objective state of the things.

As a political and governmental tool, a transparency policy, prevents corruption and informs the citizens of the state where it comes applied, for society to be able to "participate in democratic decision—making" (Schmitt, 2010).

In thinking about how to manage transparency (or the visible), a useful viewpoint should be to consider transparency as a public tool – and therefore, to distinguish between the private and the public spheres, in considering its purpose, for the context where it is applied. In both *What is Enlightenment* (1784) and *Perpetual Peace* (1795), Kant emphasises the importance of distinguishing the public from the private, and the individual from the mass need for change and betterment, on a social and governmental levels, through transparency. In this sense, one should be able to choose if being visible, according to the context of his or her interest. Transparency should be an open dialogue, instead of an imposition. A politics of transparency is giving less freedom to identity formation and is not helping the government to be more open or less corrupted.

3. Free Circulationism

The ideology of "circulationism" (Steyerl, 2013) is to be found at the roots of the current capitalist system and its holistic organisational structuring. The circulation of goods and capital, fosters the need for more information about everything related to society and the use society might make of it.

The deliberate release of information which one is inclined to give about themselves, gives the freedom to others to use such information against those who released it, in the first place. Choosing to be visible brings the same responsibilities for a subject, as

for the one who chooses not to be visible. Thus, the information which one chooses to release about himself or herself, will always integrate them into society, more than if one chooses not to give any information at all.

Giving information about oneself forms an identity on the outside – it is meant for others to look and assess, subsequently giving a form to a clearly defined and contoured objective self. In this sense, the *online identities* are now the same as the identities offline. To this removal of the possibility to choose who to be online, has contributed the politics of circulationism, the seriousness of making business online and therefore, the inclusion of the new definition of terrorist and what can he be looking for on the internet. While you choose to look what is happening in the world, someone is looking at you. The choice and freedom to look at something depends on who you are and what you are.

Anonymity is a device which can be used even less now and it is generally used when one needs to confess, tell or search (the anonymity tab) something inadequate to her objective image or generally, something shameful. The tool of anonymity is used now, as there is too much information available on the personality of a subject, who needs not to be linked to what he or she states or stands for in a given context, which might compromise them, as for they are differently known. Nevertheless, when the objective image of someone's identity, needs to remain separate from the usual conception the others have of him or her, anonymity needs to be used for the sake of knowledge sharing.

4. Conclusion

A significant amount of analysis, within the proposal, is influenced by scholars, as Michel Foucault, Gilles Deleuze, Jacques Derrida and Maurizio Ferraris, and visual artists like Hito Steyerl, Metahaven. In sum, my insights were influenced by their argument on the disciplining power of the gaze, and its behavioural conditioning.

Visibility, accessibility and openness, are fundamental features on which Bentham's idea of the Panopticon was based – meant to "obtain power of mind over the mind" – a state of visibility, furtherly enforced by the "reign of opinion" that transparency allows.

This research, being highly interdisciplinary in nature, contributes towards goals within the social, cultural and humanistic fields. Strong research, ranging from evidence of literary to visual documentation and archives, could enrich the understanding of the social responsibility behind decisions of visibility and openness. This, can help to shape an insightful comprehension of the boundaries, which a visibility system cannot cross or influence, such as the construction of identity, opinion and feelings within the digital space, and to limit requirements and expectations of *others'* visibility.

Application developers and Policy Makers of Social Media platforms need to rearrange some points in their Terms and Conditions, which should always be an open dialogue between them and the users.

References

Baudrillard, J. 1988. Simulacra and Simulations. In Mark Poster (ed.) *Selected Writings*. Stanford University Press, pp.166-184.

Birchall, C. 2016. Managing secrecy. *International Journal of Communication. 10,* 152-163.

Birchall. C. 2011. The politics of opacity and openness: Introduction to 'Transparency'. *Theory, Culture & Society*, Vol. 0, 1-19.

Brin, D, 1998.*The Transparent Society*: *Will Technology Force Us to Choose Between Privacy and Freedom?* Perseus Press.

Brandeis, L. and S. Warren. 1890. The right to privacy. *The Harvard Law Review, 4 (5),* 193-220.

Derrida, J. with M. Ferraris. 2001. A taste for the secret, trans. G. Donis. In G. Donis and D. Webb (eds). *A Taste for the Secret.* Cambridge: Polity Press.

Deleuze, G. and Felix Guattari F. 1992. Postscript on Societies of Control. *The MIT Press, Vol. 59,* 3-7.

Fenster, M. *Seeing the State: Transparency as Metaphor,* Admin L. Rev, 617. 2010. Available at http://scholarship.law.ufl.edu/facultypub/572

Foucault, M. 1980. The eye of power. In C. Gordon (ed.) *Power/Knowledge.* Hemel Hempstead: Harvester.

Foucault, M. 1977. *Discipline and Punish: The birth of the prison*. Trans. Alan Sheridan. Penguin Books.

Hegel, G.W.F. 1977. *Faith and Knowledge.* Trans. W. Cerf and H. Harris. State University of New York Press.

Kant, I. 1784. What is Enlightenment. Trans. Mary Smith. Columbia Press.

Kant, I. 2010. *Perpetual Peace (1795)*. Trans. W. Hastie (1891). Slought Foundation, Philadelphia and the Syracuse University Humanities Center. Shapco Printing.

Lovink, G. 2012. What is the social in social media? *The Internet Does Not Exist,* e-flux journal Kindle (ed.) Sternberg Press.

Metahaven. 2016. *Black Transparency: The Right to Know in the Age of Mass Surveillance*. Sternberg Press.

Peters, A. 2010. Transparency, secrecy, and security: Liaisons dangereuses. *Rule of Law, Freedom and Security in Europe*. Julia Iliopoulos-Strangas, Oliver Diggelmann & Hartmut Bauer (eds.) Societas Iuris Publici Europaei (SIPE) 6.

Reiman, J. 2007. *Philosophical Dimensions of Privacy*, In F. Schoeman (ed.) 1984, Cambridge University Press.

Schmitt, M. 2010. Transparency for what? Restoring Justice, *The American Prospect, 21(2).* Retrievable from: http://prospect.org/article/transparency-what-0

Simmel, G. 1906. The sociology of secrecy and of the secret societies. *American Journal of Sociology, 11*, 441-498.

Steyerl, H. 2013. Too Much World: Is the Internet Dead?, *E-Flux Journal*, Journal #49, available at: https://www.e-flux.com/journal/49/60004/too-much-world-is-the-internet-dead/

Steyerl, H. 2016. Visual material viewable at:

Being Invisible Can be Deadly, TateShots. Available at*:* https://www.youtube.com/watch?v=kKAKgrZZ_ww

How Not to Be Seen, Available at: https://www.youtube.com/watch?v=WbOmXEnluzg

Hiperòptica: visibilitat o invisibilitat · Màquines de transparència · Arts Santa Mònica: https://www.youtube.com/watch?v=IUE4tN6k1iI