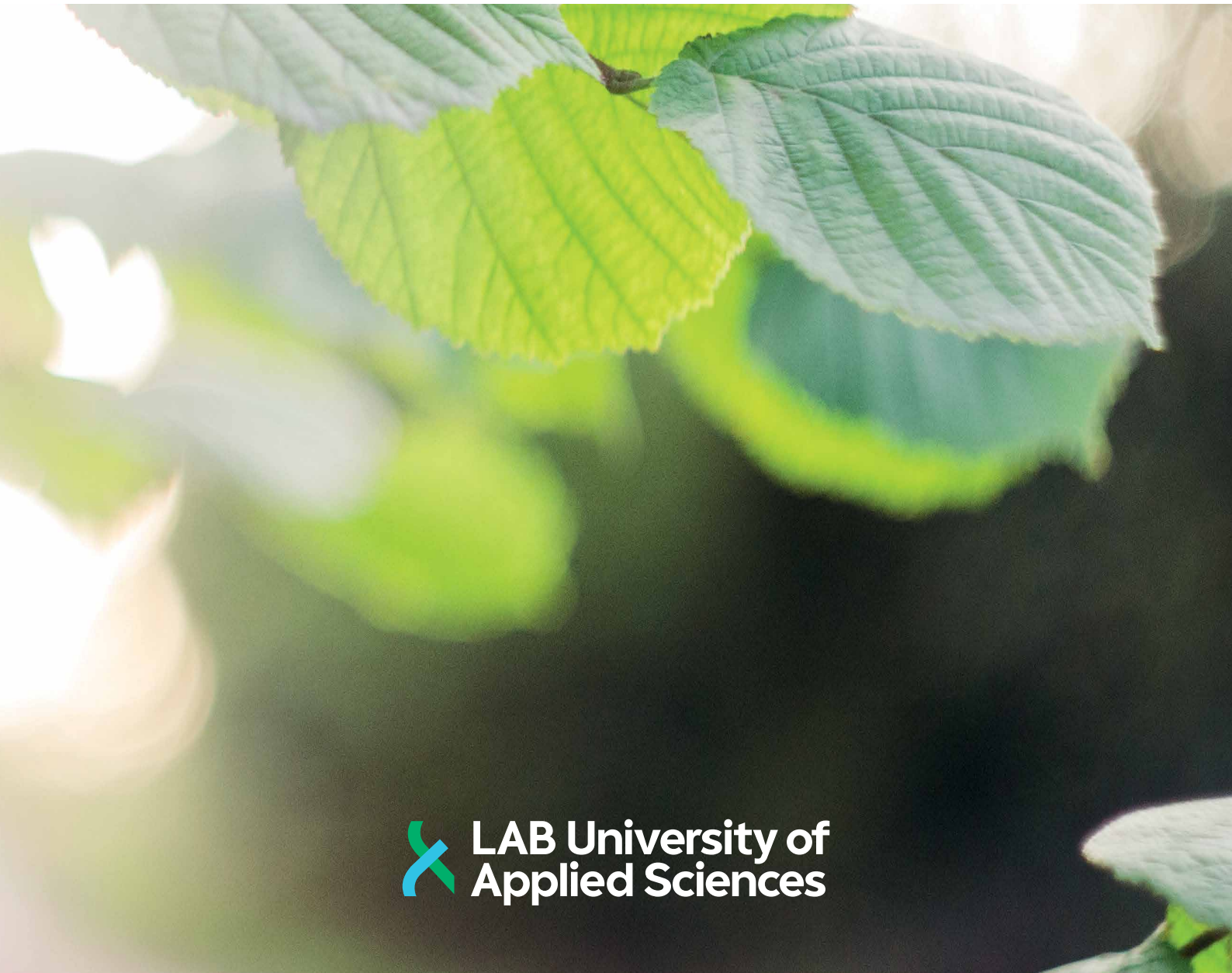
Tuuli Mirola (ed.)

Becoming greener – digitalization in my work

International Week 10.–14.2.2020

The Publication Series of LAB University of Applied Sciences, part 2



LAB University of Applied Sciences

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Foreword

The first international week of LAB University of Applied Sciences was organized in Lappeenranta on 10.-14.2.2020. It carries on the long tradition of Saimaa University of Applied Sciences organizing international weeks and getting together with our partner universities in Lappeenranta annually. The new LAB University of Applied Sciences was born when Saimaa University of Applied Sciences merged with Lahti University of Applied Sciences on 1.1.2020.

This year the theme for the International Week publication is "Becoming greener – digitalization in my work".

The authors of the articles in this publication are sharing their personal experiences and practical examples of digitalization in education. Digitalization offers multiple options and applications on approaches related to the traditional contact teaching in classrooms and online courses. Digitalization has its effects on teaching methods and technology as well as on learning methods and learning environments.

The growing number choices of different online educational platforms, simulation applications and other digital tools used in education, teaching and learning, of course, reflect the respective needs and requirements in real-life working environments.

Digitalization has an increasing effect on working life and doing business. There is a lot of controversy about whether this change is always positive, effective, cost saving, feasible or otherwise beneficial. In addition to all the advantages, it certainly has its challenges as well. It requires people, organizations and processes to be able to adjust to the changes.

This publication addresses the topic of our International Week from various points of view. The articles offer us examples from multiple counties and partner universities on different fields of education. Educational aspects are presented for example from the point of view of language and communication courses and engineering. The authors also share their experiences, research and practices on various fields of business such as transports, architecture and construction, real estate markets, healthcare, tourism and hospitality business.

Thank you for your contribution to this publication and participation to the first International Week of LAB University of Applied Sciences!

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Contents

The education and workplace digitalization in a higher educational institution

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Abstract

In this article information and communication technologies are studied from the point of view of digitalization which has delivered enormous impact on working and studying styles around the world. It is vital that higher educational institutions should modernize and up-to-date curriculum with relevant learning digital environment. Innovative technologies can be used to solve various problems and are universal. Virtual reality provides new opportunities to students and teachers. Our education has to go through a digital transformation to solve the challenges of digitalization which changed and keeps changing the workforce and education.

Key words: digitalization, digital literacy, educational technologies, higher professional education, mobility, learning environment, virtual reality

1. Formulation of the problem

The development of the digital economy in Russia presupposes the active position of the educational community in analyzing and developing new proposals in the context of the digitalization of higher professional education. It is simply impossible for us not to use a number, so as not to lag behind further processes of informatization and digitalization in Russian education. The term "digitalization" appeared in connection with the strengthening of information and communication technologies, some scientists, consider this concept as a translation of information into a number and, at the same time, the infrastructure, managerial, behavioral, and cultural components of the content of education.

The 21st century is the time when our vocabulary cannot do without "tion" words. New generation cannot imagine that once the world has perfectly functioned without globalization, integration, computerization, digitalization etc. Despite it used to function that way once, today times have changed and we live in the society of modern technologies – we live in the era of IT. We cannot imagine our personal life without technologies: we study online, we buy online, and we book holidays online, we communicate online, that means that we are integrating in the EU community and modern world of technical advances, to the world, which is advanced, developed culturally and technologically.

2. Highlighting previously unresolved parts of a common problem

Digital technologies, social networks and instant messengers have changed social values, led to the network identification of a person. A new type of students has appeared who independently determine their educational trajectory. They are motivated by personal development and self-determination, combining work with study. The education system should ensure a confident transition to the digital age, which is characterized by economic growth and new labor

relations. On the labor market should appear artificial intelligence that performs routine processes. In our opinion, the Russian education system should focus on training specialists in new professions with such professional competencies that suggest a tendency to creative non-standard solutions, as well as the development of communication skills.

Digitalization at this relatively early stage has already delivered enormous impact on working and studying styles around the world. The younger generation tends to prefer working and studying online, working from home, becoming freelancers, which gives them opportunity to manage their careers in a manner they want to and on their own terms. Businesses that are not open to changes, companies that do not feel like changing their modus operandi, those who do not wish to become digital are doomed to suffer losses in profits, because they will not be able to preserve competitiveness and good business reactions.

Same is true for higher educational institutions. Those universities, which are not willing to adapt reform and digitalize, will eventually die out. Education is an integral life of every human being, it is basic component of future life as far as good education leads to obtaining good job offers with competitive salary in the future, thus universities, which are not going to offer a modernized and up-to-date curriculum with relevant learning digital environment and conditions are to be extinct.

Digitalization has irrevocably changed the lifestyle, the workforce and educational establishments and thus all kinds of business, including educational establishments are to adjust to this change, which will gradually make them evolve.

One of the main elements of the digitalization of education is digital literacy. Digital literacy is the main priority of education, it is the ability to design and use content using digital technologies, using computer programming, graphic visualization techniques, computer graphics, multimedia development of online courses, etc., search and exchange of information, communication with other students. Digital literacy is referred to as the ability to work with a computer, as with hardware, i.e. the student must understand how digital technology and humans interact, know and understand devices, how digital information is distributed, and what constitutes a network community, as well as features of social media. Among the elements of digital literacy a special place is given to the cultural context of the Internet environment, the ability to work online, and have the skills to use numbers for self-development. All authors of different concepts of digital literacy came to the conclusion that every student should know what digital reality is and how it can teach a person to have control over "information noise" and make interaction with digital technologies a source of development, not stress. Under digital literacy, we consider its various types: media literacy, attitude to innovation, communicative, computer, information literacy. To solve the challenges of digitalization, our education has to go through a digital transformation. The digital transformation of education, according to scientists, is the answer to global information challenges in the world. The focus on the transition to interactive types of interaction, she notes that students should be able to independently acquire knowledge and generate their own innovative knowledge, thereby forming new competencies of the 21st century, which are called four "C": creativity, critical thinking, communication, cooperation.

Distance education is another separate field. Digital technologies are prime prerequisites for distant learning. Digitalization of educational process helps teacher to control practical efficiency, drastically reduce paperwork, systematize great amounts of information (use of laptops or tablets instead of bulky printed sources), assignments can be automatically controlled with the software tools, etc.

On the one hand, one may think that a digitalized workplace or digitalization of educational process may not be beneficial for all parts of the process. But it is not actually a matter. New modern technologies give a great number of opportunities and freedom: the student is not tied up to a classroom, and is able to conduct individual projects or research, while the employee may have a chance to work from any point on the globe, as long as one has access to the internet their location makes no difference.

3. The purpose of the article

The main purpose of this work is to analyze challenges and opportunities of digitalization of workplace and educational process in a higher educational institution. Working online and studying online make people more connected, and it also makes them stay on top of digital novelties and develop their professional skills. It is also beneficial for an employer: companies are not restricted to a region, where they operate; they can operate globally and hire multinational staff. It is also beneficial for the university administration as far as the students' enrollment can be remarkably enlarged.

4. Presenting main material

The modern stage of digitalization in education is to immerse all its subjects in a digital educational environment. Services such as MOODLE, 1C have long been used in universities and allow you to track chan-

ges in the contingent of students and teachers, to determine their rating. Organize the joint work of the participants in the educational process helps placement and exchange of information services, which are available in the personal account of both the student and the teacher. We suggest highlighting the following components of an open digital educational environment when organizing students' independent work: planning, methodological support, including electronic educational publications, technological organization of the learning process, coordinating the joint activities of teachers and students and monitoring learning outcomes.

After analyzing digitalization in education, we note the emergence of new digital technologies that have great pedagogical potential. Among them, the most common are cloud technologies. This is a fundamentally new service that allows you to store a huge amount of information and has convenient network access to information resources, which can be used with the least management effort and interaction with the supplier. The attractiveness of the cloud for creating an information environment is determined by its consumer properties: scalability, payment as it is used, self-service, universal access over the network, pooling of resources, programmability (Ospanova & Kasenova 2018). Currently, educational technologies such as online courses, which are provided by universities for all students, are widely used. Educational technologies such as mass educational training courses applied remotely will help students study in any form convenient for them and will allow them to receive qualified training in a specific area of training. In Russia, online courses are hosted on the educational platforms Open Education, One Window (online.edu.ru), We.Study, Emdesell, GetCourse, Justclick, Innovationbro, Memberlux, Zenclass, and others. They provide the opportunity to register for one or several of these courses and study, then receive a certificate and present to your university for re-enrollment in the relevant discipline. The initiator of this project is "Open Education", which offers its users more than 250 training courses in various disciplines (Digital Russia: a new reality 2017).

Online learning in a digital educational environment provides for the well-known synchronous and asynchronous learning. A synchronized online lesson involves the electronic interaction of a student and teacher at a specific time. Asynchronous courses are distinguished by the fact that the teacher uploads theoretical materials and various assignments on the course to the Internet, and students work with information at any time convenient for them. We are impressed by the "blended learning", which involves the "combination of real learning" face to face with the teacher in the audience and interactive opportunities.

A popular technology at present is the technology of "mobile training", which allows the use of educational information from personal digital devices (smartphones, tablets, etc.).

Teachers use technology such as the Course Management System for online learning. This technology consists of tools (software) that provide the teacher with the opportunity to design educational courses and place them on the network.

Of great importance in digital learning is the E-learning system, which has various applications and processes that enable students to use educational materials.

Among online technologies, an important role is played by the gameplay (gamification) technology used for didactic purposes. It uses the mechanisms of video games.

One of the options for gamification is web quests. This technology allows you

- to use and integrate Internet resources into the educational process of the university;
- to effectively form professional competence with their help;
- to organize students' research activities.

Using web-quest technology allows teachers to solve the following problems:

- to increase students' motivation;
- to improve educational achievements;
- to use graphic visualization methods in training;
- to form an information culture;
- to solve creative problems;
- to optimize learning activities.

When implementing educational programs in the framework of the digital educational environment, "1: 1 Technology" is used, which presupposes inclusive education with the provision of each student with personal teaching aids (computer, laptop, or tablet).

The digitalization strategy of education provides for such promising innovative technologies as artificial intelligence, blockchain and virtual reality.

Artificial intelligence is a technology that is used to solve "intellectual" problems, and all its developments are aimed at creating programs for pattern recognition, systems for automatic control of a car and machine translation, etc. In education, a training program is used, which enhances the interactivity and

intellectual component characteristic of the teacher. Intelligent educational programs and an expert system are very promising and are rapidly spreading.

In the education system, the blockchain is used to store information about exams, diplomas and certificates issued, etc., and this information can be obtained immediately, making sure of its authenticity and without resorting to archival data on paper.

There exist the following types of virtual reality systems:

- ordinary (classical) virtual reality (Virtual Reality - VR), where students interact or immerse themselves in the virtual world using a computer program;
- augmented or computer-mediated reality (Amended Reality - AR), where the overlay is applied to the information generated by the computer from above on the images of the real world;
- mixed reality (MR), where the real world is connected with the virtual, and they are interconnected.

Innovative technologies can be used to solve various problems and is universal. Teachers have the opportunity to create virtual laboratories to study global environmental problems, etc. Virtual reality provides the ability to conduct video conferencing, which have the greatest effect compared to web conferences that resemble telephone conversations. These technologies are used for virtual travel, learning about other cultures and learning a foreign language. When studying natural science disciplines, students using virtual reality glasses can find themselves in virtual laboratories and conduct various experiments, interact with various objects and observe the natural science processes occurring in nature.

Digitalization of education changes the content of taught courses, as well as the flow of information, it is not only presentations or videos, it is already directly connected to information networks, databases, forums. When practical exercises are held, it is possible to use social networks. Electronic publications are becoming relevant in training; many publishers specializing in the publication of educational literature are switching to electronic versions of textbooks. Students and teachers received unlimited opportunities for the development of their educational space and its joint use. Despite the huge potential of digital technologies, which is in demand in education, it is not used to the full extent, this is due to the lack of digital literacy of teachers and leads to the emergence of a digital divide, its bridging. Access to digital technology is an urgent task of the digital transformation of education.

Digitalization of a workplace is extremely beneficial in terms of cost saving and time saving regarding the operational model according to Jeff Schwartz, Andrew Liakopoulos and Lisa Barry (Schwartz & Liakopoulos 2013, 98-117). That is also true for digitalization of the educational process: the enlargement of enrolment does not lead to multiplying expenses for facilities management, and other material costs.

However, digitalization of a workplace and educational process apart from pluses may have challenges. One of the main challenges is dealing with security issues, data protection and establishing and cultivating peculiar digital culture. All these factors make students, teachers and later employees act and react in a way that differs from a previous work and study style. They need to adapt the technologies that enable their results. Staff members of different companies can easily conduct business regardless of their location and time zones; they can be connected to team members and partners via a number of various digital applications that enable communication.

There is an opinion that “digital workplace or digital auditorium is not a place at all”. On the big scale, one may perceive digital workplace as a merger of work and life. It is a virtual workplace, or rather an actual location of an employee, where they have all the assortments of gadgets necessary to conduct business. Digital workplace may be defined as a new corporate culture of autonomy, accessibility, accountability, and empowerment. The same is valid for students, teachers and all other members of educational process. More and more people regardless of their age, status, and post in the company or year at university demand more of a work-life balance: they want more time for their families and friends, more time to deal with stress, more time for themselves. They do not want to spend hours and hours of their life to commute to a university campus or to an office; they do not want to spend endless hours in unproductive meetings, etc. For them the work-life balance means using modern technologies to reach their higher goals.

Today, people who were born in the end of the 20th century may be called “digitally native” generation. The US Bureau of Labor Statistics predicts that by 2030 these people, who can also be referred to as millennials, will make up 75 per cent of the workforce (Sheridan 2015). Naturally, this “digitally native generation” will be working according to the vision they have and they will definitely go online to conduct and manage their business. They normally do not like to work solely for a paycheck, biding their time at a work station. They want to achieve result, to be successful, and what is even more important they want to have a balanced healthy lifestyle with minimum stressful situations. (Sheridan 2015). And to

achieve these results they need to have access to the kind of education, which will make it possible, which will lay proper ground and style for the younger generation to follow.

In the recent years another term has appeared – digital nomads – a growing demographic of people who travel the world while working remotely over the internet (Chaika 2018).

Another aspect of the new digital work culture, apart from work-life balance, is mobility. Digitization and automation are transforming the workplace, and the nature of work and education, as never before. In today's always-on world, the lines between the physical place and where work and studying actually happens are blurring (Sheridan 2015), people can work not only from home, but from the beach as well or any other place to their liking. Chain of command, in fact, gets less and less interested about the physical location of an employee if the task, which was assigned to them, is fulfilled. Hence, the employees benefit from this as well, as far as they have more free time to balance their life.

This is also very true for the educational process. Teachers tend to become more and more result oriented rather than attendance checking. The priorities change rapidly, the result, not time wasting in a classroom, is in high demand. Being successful in covering all the relevant study material and wasting time on all practical classes in the university is no longer the same.

5. Conclusions and suggestions

In the conclusion it is worth saying that digitalization changed and keeps changing the workforce and education, bringing new characteristics to business operations and learning environment, which at this stage seem inevitable and positive in terms of profit, culture and other relevant points. Taking into the account opinions of scholars and practitioners who work in this field we have outlined the obvious advantages of taking both education and business online and going digital, one of them is creating a special place that will empower students and employees and thus bring business and education process onto a new level of success and motivation. Basing on the information received from the sources it is clear that digitalizing a workplace is favorable for all those who wish to profit from their business and create positive atmosphere of accessibility, availability, mobility and transparency. While applying the concept to learning it works in exactly same way, empowering both teachers and students and at the same time motivating them significantly.

Changing is a constant process that involves many factors. One cannot deny the fact the world is changing rapidly and all that is left for us is to adapt and adjust to those changes. If there is demand, this demand should be met. Modern technologies are everywhere and people cannot imagine their lives without electronic devices, thus it would be doubtful that those people will not be using those devices for studying and later for work. Technology gives freedom and opportunity and people should use that opportunity and freedom, however, they should use it wisely.

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Digitalization educational environment in Saint-Petersburg State University of Architecture and Civil Engineering

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Abstract

This article is devoted to the challenges of introducing digital technologies into the education system. The development of digital technologies in education is dictated by the relevance of the issue and is supported at the state level and by the general public. Digitalization is an emerging social condition. This article describes the problems of digitalization of education. A wide range of possibilities of digital technologies in the educational process of the University are considered. It is concluded that the digitalization of education changes the content of the courses taught, as well as the presentation of information. Emerging methods include not only presentations or videos, but also direct connections to information networks, databases, forums.

Keywords: Digitalization in higher education, blended learning, BIM programming.

1. Introduction

As the world is becoming more digital every day, I would like to demonstrate how this change has affected my work as a teacher at the St. Petersburg State University of Architecture and Construction. The Federal law" on education in the Russian Federation " defines education as a socially significant good carried out in the interests of the individual, family, society and the state (Kudlaev 2018). The ongoing modernization processes determine new conditions that allow for the effective functioning of various social institutions, including in the field of education. Getting an education is one of the most important stages of a person's life, which helps a student not only to develop comprehensively, but also to choose a certain narrow specialization, the most appropriate to his or her liking. This allows a student in the future to gain experience, professional fulfillment, and earn a good living.

Digitalization involves complete automation of processes and stages of production, starting with the design of the product and ending with its delivery to the final consumer, as well as subsequent maintenance of the product. During the rapid development of science, many corporations require employees who are ready to work with the latest technologies at all levels of their production. The solution to these problems, of course, must come from the reorganization of the education process (Message from the President to the Federal Assembly 1/03/ 2018).

The implementation of digital technologies has not spared the education sector. On March 1, 2018, Russian President Vladimir V. Putin delivered his annual Address to the Federal Assembly: "with the help of advanced telecommunications, we will open up all the possibilities of the digital world to our citizens. And this is not only modern services, online educati-

on, telemedicine, which in itself is extremely important, we are with we understand this... for our vast country, such an Association of talents, competencies, and ideas is a colossal breakthrough resource" (Aleksankov 2017).

2. Discussion

Our University is specialized in architecture and construction education. It trains highly qualified specialists in these areas. In the course of training, students get the necessary design skills in modern 3-d programs, master 3-d technologies, project management, solve modern problems of construction and architecture using BIM-modeling.

First of all, the reform of digitalization of education is to equip educational institutions with high-quality software. For example, information systems that allow access to educational resources, the results of modern research and development, electronic scientific libraries in various languages of the world (Concept of Creation and Development of Information and Educational Environment of Open Education System of the Russian Federation 2019, 54).

But, digitalization of education is not just the introduction of new digital tools or platforms aimed at dramatically increasing the authority of an educational institution. The most important thing in digital transformation is fundamental changes in thinking patterns, working methods and company management. Digitalization implies independent study of the material. The teacher acts as an assistant, a curator, to whom you will have to turn only when necessary. The transition to digital education is a significant step towards the creation of Internet technologies. Now science is developing at a great speed, every day there are new structures.

Each student at our University is assigned an individual user name (login) and password to access the information services of the University. Using this data, the student can access the following information services:

- Moodle, moodle.spbgasu.ru – distance learning system, training courses and materials in electronic format.
- Personal account, portal.spbgasu.ru – access to portfolio and learning information for undergraduates, graduate students, and faculty.
    - Portal Office 365, portal.office.com – access to Microsoft services by student subscription:
    - Student email – corporate mail that entitles you to receive student benefits and subscriptions (<student number.ticket's>@edu.spbgasu.; ru
    - Applications Office 365 – set of web services Microsoft Office (OneDrive, Word, Excel, etc.);
- Schematic map ГАСУ, map.spbgasu.ru – interactive map of University buildings with search for audiences.
    - Disk space – cloud storage for educational materials. Access: on a PC at the University – network drive «Z:/»;
    - at the address mydoc.spbgasu.ru – authorization using EUZS.
- Wi-Fi – access to the Internet on the territory of Spbgasu. network ID: After connecting, enter your login details on the authorization page that opens. EUZS.

Other information resources, rules of network etiquette, instructions and useful articles Can be found on the official website of Spbgasu and on the website of the Electronic information and educational environment (EIOS) of Spbgasu –eios.spbgasu.ru

Such services as MOODLE, 1C have long been used in universities and allow you to track changes in the contingent of students and teachers, to determine their rating. To organize the joint work of participants in the educational process, the services of placement and exchange of information, which are available in the personal account of both the student and the teacher, help. There are quite a lot of services and tools for creating DSP, their saturation in DSP (digital signal processing, DSP) depends on the technical and financial capabilities of the educational organization.

The information and educational environment of digital education includes:

- technical resources: computers, tablets, mobile devices, networks, video systems, interactive screens;
- educational resources: software, electronic educational resources, information and educational portals, distance learning systems, electronic libraries, cloud resources, webinars, teleconferences;
- process management: distance learning, e-mail, social networks, personal account in the cloud, form of training (Shvab 2016).

On the basis of our University created an electronic information and educational environment for students, teachers and employees (http://eios.spbgasu.ru). It includes such information resources as MLS Moodle-e-learning courses management system, Portal of personal offices – personal office of student, graduate student and teacher, Zimbra-cor-

porate mail-reliable mail service for employees and teachers of Spbgasu, Web IRBIS-electronic library system of Spbgasu, RUKONTEXT - full-text database of final qualifying works-plagiarism search and document analysis system, EBS catalog – list of available electronic library systems, technical support portal of the office of information technology (UIT) Spbgasu, Skype for business-web planner Skype for business, the system "Antiplagiat", interactive map Spbgasu-scheme of buildings and buildings with the search for classrooms, Microsoft portal-student email, documents, cloud, Office365, MATLAB SIMULINK-licenses MathWorks Matlab-the ability to get a licensed version of the software for students, AUTODESK-training licenses Autodesk - opportunity to get a licensed version of the software for students, GRAPHISOFT ARCHICAD-ArchiCAD license-get a free full-featured educational version of ARCHICAD, ANSYS license – free ANSYS license for students, Azure-Azure Dev Tools for Teaching-cloud environment, training courses and development tools for students, Indigo-INDIGO testing system-independent assessment of the quality of training of students with special access, # VACANCY-career and career guidance-employment assistance service.

Digitalization of education changes the content of courses taught, as well as the presentation of information, it is not only presentations or videos, it is already direct connections to information networks, databases, forums. When practical classes are held, it is possible to use social networks. Electronic publications are becoming relevant in training, many publishers specializing in the publication of educational literature are switching to electronic versions of textbooks.

Digital technologies are rapidly developing and updated (high-speed Internet, smartphones, tablets, etc.). Web 2.0 tools, blogs, wikis, social networks, Google cloud services, Office 365, and others all provide unlimited access to digital tools (Sidorov 2017). Distance education is the acquisition of education at a distance. This method has become available due to the development of the Internet network. Now the teacher and the student do not have to contact each other in person, because this need is replaced by virtual communication.

Online learning in a digital educational environment provides already known synchronous and asynchronous learning. Synchronous online lessons involve electronic interaction between the student and the teacher at a specific time. Asynchronous courses differ in that the teacher posts on the Internet theoretical materials and various tasks on the course, and students work with information at any time convenient for them.

Digitalization is directly related to the learning tools that digital technologies open up to universities and schools that were not previously available. The most prominent of them can be considered online training, which includes both mixed forms of education, i.e. the combination of viewing lecture videos online and seminars at the University, and directly online courses-MOOC (Massive Open Online Courses) (On education in the Russian Federation: Federal law. 2012)

SPBGASU practices "mixed learning", which involves combining" real learning " face - to-face with the teacher in the classroom and interactive opportunities. A popular technology is currently the technology "mobile learning", which allows you to use educational information from personal digital devices (smartphones, tablets, etc.). In online learning, teachers use technology such as the"course management System". This technology consists of tools (software) that provide the teacher with the ability to design educational courses and place them in the network as well as monitor the performance of all tasks assigned to the student. Of great importance in digital learning is the e-learning system "LMS Moodle", which has various applications and processes that allow students to use educational materials.

Among online technologies, the "Gamification" technology plays an important role (gamification)", it is used for a didactic purpose. It uses mechanisms that are used in video games. One of the options for gamification are web quests. This technology allows you to use and integrate Internet resources and digital technologies in the educational process of the University and effectively form their professional competence, this technology allows you to organize research activities of students.

The use of web quest technology allows teachers to solve the following tasks: to increase motivation, improve educational achievements; to use graphic visualization methods in training; to form an information culture; to solve creative tasks; to optimize educational activities. When implementing educational programs in the digital educational environment, which involves inclusive education with the possibility of each student's access to modern technical means of training, a sufficient number of computer classes equipped with modern machines with licensed software are provided. Our Institute hosts annual case Championships and interactive programs, such as the Smart city project office» - SPbGASU http://projectoffice.spbgasu.ru . In the project office « Smart city SPbGASU » you will be offered:

Co – working area with a projector, Internet access, spaces for individual and collective work

- Conference hall-a room with a projector, Internet access, a thermal pool, designed for a large audience of listeners
- BIM-building information modeling laboratory (BIM-LAB)
- SPb Knowledge Management Office - every Wednesday there is a live online conversation with interesting guests, demonstrating the tools "SPb Knowledge Management Office" - how to better understand what you know, know-how and do best
- REEN ZOOM-LAB - created a laboratory for complex energy efficiency and environmental protection of real estate objects using the Russian standard GREEN ZOOM, as well as a description of practical recommendations for achieving the green ZOOM certificate. https://greenzoom.ru

Young professionals need to acquire skills in working with BIM software already in the process of studying at a University. Annually held by the St. Petersburg state University of architecture and construction BIM-championship is aimed at this task – during its conduct, students can test their competence in conditions as close to real as possible.

Head of project office at Spbgasu "Smart city", head of the Department of metal and wooden structures Alexander G. Chernykh said that the scale of this championship would not have been possible without the support of the leadership of the University quickly purchased new computers for the "Smart city", and without the assistance of a professional community – this year co-organized by the Association "National Association of designers, and surveyors".

The head of the Association Alexander Mikhailovich Grimitlin, in turn, stressed how important it is to support universities in their quest to develop educational platforms for teaching digital modeling.

3. Conclusion

Digitalization of higher education will make changes in the qualification requirements for the teaching staff and other employees of the University and affects the delivery of their traditional role. Innovations in digital learning are not so much technical innovations as changes in the content and organization of educational content, in the structure and organizational principles of the University.

Being an integral part of the state's educational policy, the modern educational system for training students of architects and builders at Spbgasu, its infrastructure, educational and material base are actively being modernized, which increases the efficiency of training highly qualified and competent specialists.

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Digitalization in Greek universities: the case of Athens University of Economics and Business

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Abstract

Digital technology has become a ubiquitous feature of the modern era posing challenges to Higher Education Institutions (HEIs). Digitalization in their operation and services they offer to students has brought radical changes. This paper provides an overview of the impact of digitalization on Greece and Greek Universities, and focuses on the extent to which it has influenced the educational and administrative procedures at Athens University of Economics and Business (AUEB) as well as the job content of the authors themselves.

Keywords: digitalization, innovation, grnet, gunet, university, aueb, faculty members, students

1. Introduction

In terms of definition, digitalization is the process of employing digital technologies and information to transform business operations (Muro et al. 2017). From a wider perspective, digitalization is spreading across our society and is a major source of changes encountered in daily life. It changes the content of jobs: some jobs are no longer needed, while new jobs emerge. Digitalization in Universities has impacts on teaching, research and administration (Jaakkola et al. 2016). In our paper we assess the penetration of digitalization in Greece through consolidated sources of information. We focus on its impact on Greek Universities through a description of initiatives and projects implemented by Greek Universities Network for the academic world nationwide. Some emphasis is given on the ways Athens University of Economics and Business makes the most out of digitalization, while we also devote a descriptive analysis on how digitalization influenced the University's operation by presenting the authors' own experiences in their working sectors.

2. Digitalization in Greece

There are many sources of information that allow the determination of the state of play as regards digitalization in a country, e.g. the European Union Digital scoreboard, the United Nations eGovernment survey, the European Commission eGovernment Benchmark report, the Portulans Institute's Networked Readiness Index report, the ITU's Measuring the Information Society report, etc. Greece's performance in digitalization turns out relatively poor as compared to its partner member states in the European Union (Katsikas & Gritzalis 2017). Greece ranks:

- 26th among EU member states in the EU Digital scoreboard 2019. It is among falling behind countries, ranking slightly above the EU average increase.
- 23rd among EU member states and 35th out of the 153 countries surveyed in the United Nations eGovernment survey 2018 – having improved its rank since previous UN survey.
- 23rd among the 36 EU28+ European states for User Centricity (the extent to which a service is provided online, its mobile user-friendliness and its usability); 30th among the 36 EU28+ European states for Transparency (of government authorities' operations and level of control users have over their personal data); 26th among the 36 EU28+ European states for Cross-border Mobility (extent to which public services are available to Europeans across national borders); 28th among the 36 EU28+ European states for Key Enablers (the availability of electronic identification, electronic documents, authentic sources and digital post) in the European Commission eGovernment Benchmark report 2019.
- 25th among EU member states and 43rd out of the 121 countries surveyed in the Networked Readiness Index report 2019.
- 18th among EU member states and 38th out of the 176 countries surveyed in the International Telecommunications Union's (ITU) Measuring the Information Society report 2017.

Greece's strengths in relation to its ability to progress with digitalization lie on its human capital and the research and development output. In contrast, most of its weaknesses lie on the lack of importance of ICT (Information and Communications Technology) in political vision and government agenda, the ineffectiveness of the judicial system in resolving business conflicts and regulation disputes, the ineffectiveness of the public sector administration etc. (Katsikas & Gritzalis 2017).

3. Digitalization in Greek Universities

Greek education policies related to digitalization and ICT integration start from early 1980s when Greek Universities went on receiving financial support from many R&D (Research and Development) programs of the EU and the Greek Community Support Framework. During 1986, a team of researchers under the auspices of Greek Secretariat for Research and Technology developed the first national research and academic network, named Program Ariadne. Ariadne was open to Greek academic community members and to industrial R&D companies. By 1992 Ariadne Network offered services such as remote login via Telnet, E-Mail, File Transfer Protocol and other, and provided an information server for browsing information and keywords about networks and related topics.

Until 1995, researchers had designed and implemented the transition of Ariadne Network from OSI network protocol to the more flexible TCP/IP protocol. The first national network of Greek developers was then established in 1995 under the name of Greek Research and Technology Network (GRnet) as a project of General Secretariat for Research and Technology (Dritsa et al. 2018). Today, GRnet is the national research and education network of Greece. It provides internet connectivity, high-quality e-infrastructures and services to Greek academic and research community. Among other projects, GRnet has developed "Apella", an online service that facilitates the elections and promotions of faculty members of Greek Universities as outlined by Greek law. It hosts the submission forms of the candidacies along with the required documents (such as degrees, CVs, reference letters), the proceedings and the nomination acts signed by rectors.

A civil organization named Greek Universities Network (GUnet) was founded in 2000. Its members are all Greek Higher Education Institutions and its aims include the development and support of the academic network and its services in the broad academic and research community in the framework of Information Society (Kikilia & Barbounaki 2011). GUnet implements nationwide projects such as:

- Tele-education and advanced telematics services for institutions-members that aim to cover the needs for information and use of advanced applications.
- e-Learning and Multimedia Support Centre covering a wide range of needs in the field of e-learning, such as studio for recording lectures, digitization and processing of video and teaching material, publishing video presentations, etc.
- Webcasting and Web-based Videoconferencing. Webcasting in HEIs comprises the broad casting of conferences and workshops whereas it does not support broadcasting of lectures since most Universities use their own streaming server.
- Open eClass, a course management system supporting e-learning services via a browser. It supports electronic management, storage as well as presentation of teaching material, independently of the time limits of conventional teaching (GUnet Open eClass 2006).
- Open Courses, an electronic platform offering

open digital courses for free to University students and to the public. University courses for both undergraduate and post graduate levels are included, and cover a wide spectrum of disciplines from Social Sciences and Humanities to Sciences and Engineering. To date there are 3,810 open courses for students who want to revise course material, prepare for conventional lectures or search for a future subject of study (GUnet Open Courses e-Learning Platform 2015).

- Hellenic Academic and Research Institutions Certification Authority (HARICA), currently the only 'Root CA Operator' in Greece participating in all major Global 'ROOT CA' Trust Programs and operating as a 'Trust Anchor' in widely used application software as well as operating systems. HARICA's Certificates for Qualified eSignatures / eSeals are legally binding in all EU and non-EU states that have a bi-lateral agreement with the European Union (GUnet HARICA 2018).

- Uniway, a communication platform for mobile phones designed to provide the freedom and flexibility of open social networks alongside specialized services for students of Greek Universities. It provides each student with access to detailed grading information, course selection and assessment questionnaires, curriculum, teachers' contact information, and to social networking: chat, uploading files, communication teams, etc. (GUnet Uniway 2016).

4. Digitalization in Athens University of Economics and Business

The proper education of students in new technologies is of great importance to AUEB. Its departments provide students with modern education, knowledge and ability to operate and adopt any technological business environment. The e-learning environment, in addition to upgraded web and information infrastructure, includes cutting-edge technology for distance learning (Athens University of Economics and Business 1996).

AUEB participates in most of GUnet's projects and utilizes all of its services. Apart from these, AUEB implements its own digital services and information systems as well:

- "Plethora", AUEB's online University Administration System. It serves students and teaching staff alike. It offers students the ability to select courses and books, register for semesters, check their course grades, submit requests for certificates, etc. while it offers teachers the ability to see their courses information, submit grades or announcements, keep up to date with statistics, etc.

- AUEB Management Portal, an innovative portal providing access to knowledge related to management and entrepreneurship subjects. It offers many opportunities of participating in business games and conducting entrepreneurship competitions and electronic surveys. It is a valuable tool in practical business problem solving.

- AUEB on Air, a portal for multimedia content, video on demand, live streaming and live broadband requests. It hosts videos from many lectures, seminars, research presentation and conferences.

- AUEB Career e-Services, aiming at bringing University students and graduates into contact with the job market, and providing relevant educational assistance. These services provide online-based educational activities related to workshops and events, electronic queries from AUEB's Career Office, online psychometric professional orientation testing, etc.

- AUEB International, an initiative aiming to strengthen and support international relation-ships and cooperation among University and external parties, mainly from other countries. It also promotes AUEB activities and programs, like Erasmus+. AUEB International provides a set of e-services as follows:

  - Online requests to cooperate with faculty members based on their research interests.

  - Erasmus+ online application forms to support AUEB students planning to study abroad.

  - Electronic facilities for incoming AUEB Program Erasmus+ students to start their studies in the University (Athens University of Economics and Business 2017).

- AUEB's *Quality Management System* (QMS), an information system facilitating the work of the Quality Assurance Department – which coordinates internal and external evaluation processes of AUEB's Departments, gathers quantitative and qualitative information and promotes improvements in order to ensure high quality of services provided to its students, its staff and the educational community. Digitalizing the evaluation procedures carried out by the Quality Assurance Department increased its efficiency during recent years and had such a positive impact on AUEB's educational and administrative services quality that led the University receive the "Recognized for Excellence (R4E), 4 Stars" distinction for year 2019 from the European Foundati-

on for Quality Management (EFQM) as a reward for its high-quality education and administrative performance and its commitment to innovation and excellence (Athens University of Economics and Business 2019).

5. Digitalization in our work environment

Below we present three distinguished cases showing the extent to which three work sectors of AUEB have been influenced by digitalization through the utilization of the University's digital services, according to the authors' everyday experiences.

First case is about the work sector of Ms. Zoi Saranti, who is Head of Department of Faculty Members (part of Human Resources Division of AUEB). Her responsibilities lie mainly on management of administrative matters concerning the University's faculty members and research staff (their leaves of absences, elections and promotions, their resignation and retirement procedures as well as processes of disciplinary kind). She is the University's "Apella" administrator as well.

Apart from supervising the members of her Department, her duties are:

- Monitoring every procedure carried out for the elections and promotions of faculty members via the "Apella" online service, and inspecting thoroughly their transparency and legality.
- Collaborating with other Departments of AUEB to provide consultation concerning proper interpretation of policies and procedures as well as corresponding laws.
- Providing advice on matters relative to her Department's operations.
- Using the Human Resources Management System (HRMS), an information system that maintains the Department's operations and manages all personal and professional data of faculty members and research staff. This timesaving HRMS offers its users the opportunity to be most productive and spend more time on the rest of their duties – thus increasing their job satisfaction.

Her duties as University's "Apella" administrator involve monitoring and inspection of the phases of complex administrative procedures, collaborating with numerous diverse users of "Apella" online service, and multi-level troubleshooting.

The digitalization of the administrative procedures of elections and promotions of Universities' faculty members through the development of "Apella" service has been a major improvement on their implementation. Faculty members as well as members of relevant committees can submit and have access to documents on a 24/7 basis while transparency of every process is maintained, and more efficiency and accuracy is achieved through the processes' digital structure. According to Ms. Saranti's working experience, GRnet's "Apella" service has had quite a positive impact on her work quality and efficiency as well as her colleagues', since they all left behind the corresponding paper-based time-consuming duties and on the way they developed new skills in order to cope with digital progress.

Second case is about the work sector of Ms. Chrysoula Sakellariou, Head of Secretariat of Department of Management Science and Technology. Her primary responsibility concerns supervision and management of administrative matters regarding the Department's faculty and students. She is involved with:

- Organizing Department' faculty assemblies and imprinting the corresponding proceedings.
- Managing matters of faculty members such as their elections' and promotions' processes, the administrative procedures of their participations in conferences, etc. and students' matters such as the course of their requests, their graduation processes, etc.
- Interacting with public and private entities on matters related to faculty and students.
- Working on "Plethora", AUEB's online University Administration System. This information system proved to be timesaving and resource-saving since it turned every transaction between students and the Secretariat digitalized. "Plethora" allows remote access for students and faculty members in order to enter course declarations, certificate requests, and grades. It also facilitates student registration, grant of diplomas, and course / curriculum management, while it generates reports and statistics on a need to know basis. It also enables easy and fast management of student life cycle data.
- Working on GRnet's "Apella" online service that facilitates the elections and promotions of faculty members in Greek Universities. This service replaced the past time-consuming procedures of faculty members filling their applications of candidacy on paper, submitting a number of copies equal to the number of the members of the Election and Promotion Committee, and so on.
- Collaborating with the University's Quality Assurance Department through its digitalized Quality Management System – thus contributing in mo-

nitoring the educational and the administrative procedures implemented by her Department.

By leveraging its digitalized QMS reports and intelligence tools, AUEB transforms its data analyses and its decision-making. The QMS drives innovation and supports continuous improvements. Its advanced reporting provides the University with the most important of information while reducing (paper) waste.

Third case is about the work sector of Mr. Adam Dontas, who is a Member of Special Technical Laboratorial Staff in the University. His position includes the following duties in general:

- Providing technical as well as network support to Secretariat members of all Departments of AUEB. Most of the technical support provided is taking place remotely, through relevant network applications - and this is quite timesaving compared to the past routine of solving technical problems by physical presence wherever necessary.
- Mapping technical requirements and conducting appropriate market research for electronic procurement acts related mainly to AUEB's technological infrastructure. AUEB's electronic procurement acts are published and conducted online through the Greek Government Transparency Portal named "Diavgeia" – whose main objectives lie on the transparency safeguarding of government actions and making all administrative acts easily accessible and comprehensible regardless of the citizen's knowledge level of the inner processes of digital administration.
- Preparing online users' guides for all members of the University community to read – and therefore use the corresponding software that the University offers them to use.
- Implementing Greek State Certification Authority (abbreviated "APED" in Greek) online procedures for preparation and creation of proper digital certificates for AUEB's faculty members and its staff. Digital certifying offers secure document exchanges over the network throughout Greek public sector as well as internationally. APED is a digital service of Greek Ministry of Interior that provides civil servants with digital certificates of authentication and encryption for use with their electronic signatures. This service allowed AUEB's faculty members and administrative staff to adopt a paperless practice in their administrative transactions through digitally certifying their documents before securely exchanging them online. Thus, the need of documents printing and posting was eliminated (APED, 2020).
- Organizing and supervising all AUEB's Environmental Initiatives, focusing on management of EEE waste as defined by Annex I of Directive 2012/19/EU (European Parliament 2012).
- Acting as Chairman of the Committee in charge of the collection and removal of AUEB's obsolete equipment in collaboration with state approved Collection and Recycling Agencies. Whenever an equipment removal procedure takes place, proper equipment removal records are digitally created and stored in AUEB's Assets Register information system, while at the same time the obsolete equipment and EEE waste is properly managed to be recycled.

6. Conclusion

Despite Greece's mediocre performance in digitalization compared to its partner EU member states, substantial progress on the exploitation of digitalization in Greek Universities occurred during recent years. There are many digital projects and services for the University students, teachers and administrative staff to get their hands on and new practices to adopt in order to improve their skills and performance. Nevertheless, the acquisition of expertise on behalf of the students and the teachers concerning digitalization applications and services, along with the technological infrastructure evolving, are expected to introduce more effective ways of teaching support and organizational innovation in the near future.

Digitalization leads us to adopting advanced technology and facilitates the utmost possible usage of electronic media and the exploitation of digital services in every aspect of the Universities' operation. The impact of digitalization on our work and on education is going to be much bigger and more substantial in the years to come.

In a world of rapid and unpredictable change, Universities must develop strategies to increase their intellectual capital, become digital organizations and support change and innovation. We consider crucial to monitor these transformations induced by the advance of the digital age, especially on the educational process in Greek Universities as well as worldwide in order to keep up with progress and adjust our digital strategies accordingly.

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Going Digi: what for?

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Abstract

I had my first online course in autumn 2013, which was literally my first experience with online teaching. Now, in spring 2020 all but one course that I teach are online. I did not choose to be an online teacher; I would not say that I prefer online teaching to a traditional classroom teaching. The reasons for me being an online teacher are my obedience and my desire to learn something new and to develop my skills. There is a clear demand for online courses now, therefore somebody has to create and teach them. Why not me?

In this article I will share some ideas of mine on online teaching from the perspective of resource saving, studying and teaching. My ideas are based on my experience teaching online English and Russian courses for students of Lappeenranta University of Technology and Saimaa University of Applied Sciences.

Key words: Language teaching, online teaching, classroom teaching

1. Resources: are we saving?

There exists an idea of saving resources, i.e. teacher´s working hours, by implementing online courses. Saving is thought to come from the possibility of having many students working independently, studying materials online, watching online lectures. I believe it might be true for some subjects, where recorded lectures save the teacher from delivering the same lectures repeatedly in different classrooms for different audience. However, language teaching is not about lecturing, it is about developing students' communication skills, both orally and in writing.

Creating a quality online language course is a very time-consuming process. The structure of the course should be very clear, the instructions should be detailed but not overloaded, the materials should be legally accessible online, the assignments should be motivating and engaging. All the above mentioned should be ready before the course starts, before there is a knowledge of the group members. There are many things a teacher can change on the go in the classroom, but there are actually only few things that one can change while the online course is going. Thus, accurate and careful planning is an absolute must for an online course creation.

I do not believe in courses where students are supposed to work totally independently fed up by some illusion of the teacher´s presence and their own inner motivation. How many of us know about the importance of regular physical exercise? How many of us do it totally independently and voluntarily? Regardless our inner motivation, most of us need some outer pressure that makes us get things done. In studying it is performed by a teacher who is present, giving instructions, encouraging, providing feedback. Giving personal feedback is crucial in a language course, as this is where a teacher shows how well a student has developed his/ her skills and what could still be developed to become a more effective communicator. Besides that, receiving a personal feedback creates the feeling of some control on the one hand, and the existence of somebody who cares, on the other. Naturally, providing such personal feedback throughout the course demands tremendous time resources.

Having said that, the time resource saving is not possible in online language teaching. However, saving comes from facility savings. Online courses do not require classrooms, chairs, and desks for a certain group of students at a certain time – students, as well as teachers, can usually work from home.

2. Studying: is it successful?

Online language courses are very popular in Finland now. There are several reasons for students choosing

them: to avoid overlapping of lectures, to be able to work and study, to have more flexibility. Some students take online courses, as they believe that studying online is easier and requires less time. The expectations that students have coming to study online might be very versatile.

Online studying does provide a possibility for a more flexible time planning, but it also demands good time management skills from a student. Most of the activities of the online course can be done independently, but there might be some group activities and meetings as well. The issue that students usually do not realize before they participate in an online course is that online environment allows a teacher to control students' progress much more effectively than in a classroom: tasks and activities should be completed, and each student has to do them by him/herself.

Studying online does not fit everyone, simply because different people study differently. I think that time management skills are vital for a successful online learning experience. In addition to this, online studying requires some basic IT skills, such as the habit of working with a computer, the ability to record and share a video, the courage to participate in an online meeting. Even though it is generally believed that the young are digi-native, it is quite far from being true. The regular use of a smart phone does not cover for solid basic IT skills.

The success of an online studying is very strongly dependent on the quality of the online course, which is a relatively new mode of studying. The majority of the teachers did not have any experience of online studying themselves. Most of the teachers teaching online are learning to do it while doing it. From my perspective, at the moment we are in a situation when quality online teaching demands considerable time investments from a teacher. Due to the lack of time and sometimes lack of skills, there exist online courses that are not planned or performed well from the pedagogical point of view.

Students love challenges, they enjoy learning something new. After all, this is why they are studying. Online studying is an excellent way of developing language skills for many students. However, building the culture of online studying and teaching is just in the very beginning. Different expectations, skills, experiences, as well as course contents and teaching methods play an important role in the results of online studying.

3. Teaching: is it normal?

Many teachers do not want to teach online. Some believe, that teaching online is not really teaching, as it happens somehow differently. Some think that teaching online is for those who do not want to really work, as if you do not physically go to the classroom and stand in front of the group of students – what are you doing then? There might also be a fear of something new.

Online teaching demands the same set of skills from a teacher as it does from a student: good time management skills, solid basic IT skills. In addition to that, an online teacher needs to have excellent planning skills, courage and enthusiasm to try new things and methods, and the ability to learn from mistakes. Teaching online is different: you can work remotely, you can plan your time quite flexibly, but the most striking difference is that the teaching is focused on planning the course and creating the content, as well as providing feedback rather than teaching in front of the group.

Contact meetings are substituted by online meetings, which are very effective for information exchange, professional communication, oral skills practice. However, for some mysterious reason, building standard teacher-student relationships might be different. It is difficult to explain, but something is different in communicating online, when you never meet people face-to-face. Some kind of personal issue, some charm is impossible to transmit online. On the other hand, teacher´s professionalism and skills become of even more importance in building a teacher-student relationship online. Once this personal issue, charm - that is only possible to notice in the contact meeting - is out of question, it is only teacher´s professionalism that students notice and value. Thus, a teacher might gain even more respect from students during an online course, as the relationship built is based solely on professional qualities and skills.

As mentioned before, planning and creating an online course is more time consuming. On the one hand, it is an investment, that a teacher does once. On the other hand, I have not yet created a course that would not need any updates, further developing, improvements. Thus, I am still in this time-consuming business.

Regardless the position and the task, satisfaction from what we do is what drives us and gives us strength to go on. As teachers, we gain satisfaction from the results of our students: when we notice the progress in students' skills. I guess what makes many teachers skeptical about online teaching is the fear of not noticing the progress, missing the moments of student's successful moments. However, a professionally built online course gives even more opportunities for this: checking the assignments and giving personal feedback a teacher is even more focused on an individual student's skills than in a classroom.

The growing demand for online courses is caused by many reasons, the need for a certain kind of flexi-

bility in studying is one of them, the willingness to save is another. However, the most crucial reason is the necessity to teach students professional online communication and the basics of online work. Future workforce will be even more focused on effective collaboration in different online environments. Collaborating and communicating online effectively is totally possible, but it requires some practice, as all other professional skills.

As for my part of this process, I have developed my online teaching skills drastically from 2013, but I know for sure that I will never be ready enough. I believe in online teaching and learning, but I acknowledge that there are still lots of work to be done to make it work properly. I like creating and teaching online course, but I wish I had more time.

Language, discourse and literacy

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Abstract

The purpose of the paper is to reveal the difference between language and discourse. Analyzing texts is considered to be a key skill and learning new ways to upgrade different types of literacy is highlighted, evaluating the social imprint on the popular arguments is emphasized. The relevance of the topic is based on the necessity to develop discourse and rhetoric's skills in contemporary multilingual community. The cultural context for arguments is discussed and the tools for analyzing texts are viewed. The paper focuses on the study and practice of communicating effectively, with attention to the role of style, genre, audience, and purpose; it offers the opportunity to work on speaking and intercultural communication skills.

Key words: Language, intercultural communication, discourse, literacy, ideology

To exist, humanly, is to name the world, to change it.
- Paolo Freire

Rhetoric scholar James Paul Gee writes, "Language is a misleading term; it too often suggests 'grammar." (Gee 2015, 300) So what is language, then? At a much more basic level, language refers to an interaction recognized by a specific community. Kenneth Burke asserts that language is "a symbolic means of inducing cooperation in being that by nature respond to symbols" (Burke 1969, 357). That includes words, of course, but this definition of language opens up some new possibilities. An image, a gesture, a line of computer code can all function as language when they become forms of symbolic exchange in communication.

Language brings with it an imprint of the society from which it originated. As long as language isn't regarded as "dead" – i.e. no longer used by any group, such as Latin today – then language is ever-evolving based on the way it gets used. Language shapes what we perceive to be our reality: What language we have and use affects the way we think-for instance, based on the ways expressions and thoughts are constructed in that language. If you want an example, just think a word you use that your parents don't. Language is an adaptive human instrument, and those who use it also determine its future (Burke 1969).

When a group shares a common set of language – use practices, this forms a discourse – and the group that uses it makes up a discourse community. James Paul Gee writes," Discourses are ways of being in the world; they are forms of life which integrate words, acts, values, beliefs, attitudes, and social identities as well as gestures, body positions, and clothes" (Gee 2015, 300-311). Discourse communities may be related to professions, such as biologists or doctors, or may refer to social groups, such as Dominican – American residents of New Your City or users of the web forum. In our networked society, we often move quickly between broadly global and highly local forms of communication. Our audiences, too, might jump between Twitter users around the world to friends or coworkers right where we are. Whenever you use language, consider whom that language is directed to. Not only do we not know what we think until we write or speak it, but we also don't think in isolation; we think with others, and we know what we know because of the discourse community we are in. In some ways, no research is done in a vacuum; the best is done for a reason that is relevant to you and is written to a particular audience becau-

se of a real problem or challenge (Blommaert 2010).

Literacy refers to one's knowledge of a discourse. That includes but is not limited to written language. Up to 1070s, literacy was traditionally regarded as the ability to read and write in a given named language (such as English or French), but since then, the definition of literacy has broadened to the ability to utilize language within a specific discourse space, within or beyond named languages. Think of literacy as a word that can be easily made plural: There are multiple "literacies" such as digital literacy, rhetorical literacy, cultural literacy – that refer to an understanding of used ability to participate in the literacy practices of a discourse community (Freire 1970). In making judgments about online sources you need to be especially mindful and to rely on the same criteria and principles you use to assess print sources (relevance, credentials of the author or publisher, stance of the author or publisher, accuracy, level of specialization, audience, currency, availability). On the outset of your project, determine what kinds of sources you will need to support your ideas. Audiences play the largest role of any factor in determining what we write and how we write it. What we write and whom we write for are deeply connected to the times in which we live, and we live in a digital age. This kind of digital literacy is radically different than previous kinds of writing and reading practices. Reading on phones and screens represents a new, revolutionary moment: genres shift and change in response to readers and to new technologies. In our networked society, we often move quickly between broadly global and highly local forms of communication. Our audiences, too, might jump between Twitter users around the world to friends or coworkers right where we are. So, whenever you use language, consider whom that language is directed to: what audiences exist for what you are composing? What audiences do you want to communicate to or with? And you are certainly your own audience. Author Austin Kleon reminds us that when it comes to creating your own work, it's important sometimes to "play the music you want to hear." (Kleon 2012). Writing is often about striking this balance. You can compose as a way to discover yourself and reach out to others, but it remains true that we must listen carefully to the world in order to think about how best to reply.

Literacy is connected to how people use different texts (different value systems for legal writing, religious writing, or fan fiction). It is a "social phenomenon" about how one participates with language in social groups (Gee 2015). One aspect of gaining literacy skills is in understanding the genre conventions of the kinds of language used in a given discourse community. One's social environment affects what literacies they acquire and how they acquire them. For example, generally, "Standard Russian" (SR) is taught in the Russian schooling system, while other forms of Russian exist alongside it, such as regional dialects.

Literacy acquisition ad practices can be controlled and have a strong relationship to power. They can shape ideology. For example, applicants for citizenship in the Russian Federation have to take an exam that requires a certain, local kind of knowledge – and more understanding of Russian history that many who are already Russian citizens have today. Literacy can also be withheld to oppress others. Consider how serfs in the Russian country estates were violently outlawed from reading and how literacy was used as a means of controlling Russian peasants in 17-18 centuries. Literacy is also shaped by our understanding of what is possible. For example, how might digital literacy practices change if you could only go to certain websites based on what your specific internet provider (and, perhaps, whatever company owned that provider) allowed? If we could only go to, say, a few apps and not the World Wide Web how might that shape the way we think about what is possible online?

As you can see, "reading" and "writing" can be much more complex than they seem. You can learn about yourself by examining our own literacy practices and developing a metacognitive awareness of why you write, speak, and act within the context of your life (Warmer 2018). It is possible to integrate digital technology in ways that can enhance the experience of your course for both you and your students. Digital tools can help you easily distribute reading materials and other artifacts to your students, while facilitating the storing and organizing of those materials for later revising and reuse during or across semesters, or across classes. Delivering materials over the web can also facilitate the easy integration of both open-access and primary source materials into the reading your students do.

Additionally, asking students to write in a networked, digital space (such as a blog) encourages them to imagine a range of audiences and gives them practice producing multi - and mixed – media compositions. Networked digital spaces also provide the instructor with a great opportunity to assess what's worked and what hasn't over the course of a semester. Networked digital spaces provide students who are reluctant to participate in class discussions a potentially more controlled environment for engaging with their classmates, course materials, and you. Such reticence in the moment can result from a number of cultural, emotional, social, intellectual, and psychological factors. Digital spaces for informal participation can thus foster a more inclusive learning environment.

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Digitalization in the commercial real estate market

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Abstract

The article reveals the role of the commercial real estate market in the economic system. Qualitative parameters of the commercial real estate market are revealed. Their expert assessment was carried out. The necessity of improving the information support of the commercial real estate market is justified. Developed proposals for the creation of electronic passports of real estate.

Keywords: real market estate, commercial estate, information support, qualitative parameters.

The commercial real estate market is a basic element of the economy and part of national wealth. Its role is due to the need to meet the needs of society in commercial real estate, the share of the sector in GDP, the multiplicative effect of the impact on related industries. Commercial real estate markets in progressive economic systems are seen as a source of capital, which is the basis for the functioning of a market economy. This is made possible thanks to the institution of ownership, with the help of which it is possible to extract the potential energy of capital from real estate and not be limited to using buildings exclusively for its intended purpose - to shelter from the weather (Pelih 2011, 461).

According to experts, the total residential and commercial real estate in the world is approximately 200 trillion US dollars, of which 16% are commercial real estate, 84 % are residential real estate. The total value of the largest USA commercial real estate market is 8.0 trillion US dollars, in China - 3.3 trillion US dollars, in Japan - 2.8 trillion US dollars. In 10 countries (China, USA, Japan, Great Britain, India, Germany, Brazil, Italy, Russia), 70 % (141.5 trillion US dollars) of the total world commercial and residential value is concentrated. At the same time, 42% are in China and the United States, which in monetary terms is 84.8 trillion US dollars. The distribution of real estate is the same for China and the United States at 21%, but in terms of value, a large amount of assets falls on China - 42.7 trillion US dollars. The United States accounts for 42.1 trillion Japan, the United Kingdom, India, Germany, France, Brazil, Italy and Russia own 28% of commercial real estate, which in value terms is 56.8 trillion dollars. In 2018, in the USA, the development of new and operation of existing commercial real estate provided the following economic advantages: 7.6 million jobs were supported and $ 286.4 billion received in wages; The sector contributed $ 935.1 billion to US GDP. In 2019, it is planned to introduce 49,000 thousand square meters. m of new commercial space, which will provide employment for more than 1.3 million workers. In 2018, every 1 dollar of expenses for the construction of commercial real estate brought an average of 2.87 dollars of contribution to the US economy.

The organizational and economic mechanism of the commercial real estate market should be aimed at ensuring its sustainable development, full functioning and effective regulation, which directly determines the stability of the functioning of the regional economy and, in general, national financial and economic well-being (Manjynski 2014, 100).

“Sustainable development” means development that meets the needs of the current generation without compromising the ability of future generations to meet their needs.

The organizational and economic mechanism of the commercial real estate market will be improved through the use of the following generally accepted concepts of sustainable markets: the concept of effective management, which assumes effective decision-making and implementation of policies in the field of commercial real estate.

One of the determining factors in increasing the economic potential of the state, ensuring national sustainable development of each region and the state as a whole is active investment activity in the field of commercial real estate. It is stimulation of the development of the commercial real estate market that should act as a platform for the growth of existing organizations (the business sector), their achievement of a state of stability, the increase in the economic efficiency of their activities, the creation of conditions for increasing revenues, further expansion and stabilization of their activities. This can be achieved by increasing the investment attractiveness of the market, increasing the volume of investment resources invested in the market, optimizing their composition in the context of segments of regional commercial real estate markets and maximizing the effective use of commercial real estate.

In the process of determining directions for improving the organizational and economic mechanism of the commercial real estate market, the objectivity of assessing the importance and significance of the parameters determining the investment development of the commercial real estate market is of great importance. An increase in investment activity in the commercial real estate market can be achieved through an assessment of the quality parameters that determine the investment attractiveness of the commercial real estate market, and can serve as the basis for improving the organizational and economic mechanism of the commercial real estate market, which is reflected in the author's assessment of the qualitative parameters of the commercial real estate market, which involves drawing up information Table 1 (Chyhryna 2019a, 60).

Table 1. Information table of the results of assessing the impact of quality parameters on the investment attractiveness of the commercial real estate market.

The country (level of investment development, rate of return)	Place the quantitative parameter for the commercial real estate market expert assessment					
	1	2	3	4	5–6	5–6
	F2	F1	F6	F5	F3	F4
IV level of market - low income - average profit - highly profitable						
III level of market - low income - average profit - highly profitable						
II level of market - low income - average profit - highly profitable						
I level of market - low income - average profit - highly profitable						

To formalize the quality parameters of commercial real estate markets, the codes F1, F2, F3, F4, F5, F6 are used: F1 The current tax system for commercial real estate; F2 Foreign investor access to the market; F3 Promising areas of investment development of the commercial real estate market; F4 Assessment of investment sentiment for the current year of the analytical company Knight Frank; F5 Advantages of the current state of the commercial real estate market; F6 Shortcomings and threats of the current state of the commercial real estate market.

Since the listed parameters are qualitative, therefore, for their measurement there are no specific units of measurement. To solve the problem of evaluating and comparing such parameters, qualimetry proposes to use heuristic methods, in particular, the method of expert evaluations. The need to use this method in the work is justified by the fact that the selection and justification of the assessment of the result cannot be made on the basis of accurate measurements and calculations. When determining specific indicators, it is necessary to take into account the degree of their significance and active impact on the commercial real estate market. As part of the assessment of investment development, experts involved professional real estate market participants with experience in commercial real estate, as well as specialists involved in the theoretical study of this type of real estate. All experts are directly related to the process of managing commercial real estate or provide information for managing the commercial real estate market.

By questioning the experts, the importance of each parameter was assessed from the point of view of investment attractiveness of the commercial real estate market on a scale of 1 to 4 (1 - the parameter is not important for the investor, 2 - the investor can pay attention, 3 - an important parameter for the investor, 4 - a very important parameter for investor), after which, based on the sum of the estimates, the factors were ranked by importance. It has been established that the greatest influence on investment development and investment attractiveness of the commercial real estate market is provided by parameter F2 - access of a foreign investor to the market. In second place, the parameter F1 is the current tax system for commercial real estate. In third place is parameter F6 - the shortcomings and threats of the current state of the commercial real estate market. In fourth place, parameter F5 is the advantage of the current state of the commercial real estate market. The fifth and sixth places were shared by the F3 parameters - promising areas for the development of the commercial real estate market, F4 - investment sentiment assessment for the year of the analytical company Knight Frank. Evaluation and comparison of the selected qualitative characteristics in the context of the estimated profitability clusters, as well as the importance of qualitative factors, is of great information and analytical value, as it allows us to evaluate the current development of national commercial real estate markets and highlight strategic directions for improving the organizational and economic mechanism of the commercial real estate market.

In European countries, the development of the commercial real estate market is included in the system of macroeconomic and macroprudential regulation. The role of the organizational and economic mechanism in this is to create a favorable investment climate in the markets, optimal tax incentives not only in terms of the fiscal function of taxes, but also incentives. So, in the countries, the commercial real estate markets of which we assigned to 1 high-income level and 2 medium-income level (Finland, Sweden and Ireland), there are no restrictions on the purchase of real estate by foreign individuals and legal entities.

Noteworthy is the tax incentive used in the commercial real estate market in Ireland - the rate of real estate rates depends on the value of the property, so the rate is 0.18 % (for real estate, the value of which is less than 1 million euros) and 0.25 % (for real estate, the value of which exceeds 1 million euros. In Germany, real estate worth up to 20 000 euros are not taxable.

To stimulate investment activity in the real estate market and all related markets in the UK, there is the right to receive a special Entrepreneur visa in the first 2 years. During this time, it is necessary to invest the agreed amount in the development of the real estate object and creating on its basis a business, to create at least 2 jobs. After two years, the opportunity is granted to extend the visa for another 3 years in the event that no violations of immigration law have been recorded.

The commercial real estate markets of progressive economic systems are characterized by the presence of extensive information databases, which allows them to be analyzed, evaluated and compared. The subjects that form the information base, allowing to ensure market transparency for investors, are the British consulting company Knight Frank, which annually conducts global research of commercial real estate markets in 21 countries, European commercial property outlook; the largest privately owned commercial real estate company Cashman $ Wakefield, annually publishing The Atlas summary The stories driving the market ahead, and Colliers International, an international consulting company that provides a full range of commercial real estate services.

Due to the organizational leverage of the organizational and economic mechanism of the commercial real estate market, it is necessary to continue stimulating

the development of entrepreneurship support infrastructure (Chyhryna 2019b, 109), raising the standards for the construction and reconstruction of commercial real estate by segments in order to improve the quality of retail, office and industrial-warehouse real estate to world standards and classiness, increasing the efficiency of using commercial real estate in the interests of regional development aimed at to obtain in the short, medium and long-term growth of income from real estate, broadening the tax base, increase the volume of investments in commercial real estate, the growth of the value of the property complex, increasing the efficiency of regional and national economy.

Through the organizational lever of the mechanism of the commercial real estate market, it is also necessary to implement the principle of preservation of historical heritage, taking into account the tourist orientation in the development priorities of individual regions of the state.

The availability of sufficient and relevant information on commercial real estate creates the conditions for the stable functioning of self-regulation and self-organization of the commercial real estate market. Researchers question the effectiveness of local real estate markets, where information support does not make it possible to conduct a comprehensive analysis and identify development trends. Markets that are sufficiently informational are more attractive to potential investors. The availability of information on the composition, structure and dynamics of indicators of individual segments of the commercial real estate market according to the levels of the subject structure, which meets the requirements of reliability, relevance, comprehensibility, comparability and completeness, makes it possible to conduct a retrospective and current market analysis, assess economic efficiency and investment attractiveness. The availability of relevant information relating to a specific commercial property and factors affecting its value is the most important condition for the formation of an effective management system for both the commercial real estate market in the whole country and an individual commercial property.

Increasing the degree of information support for commercial real estate objects, intensifying investment activities and increasing the economic efficiency of the commercial real estate market, based on existing systems for collecting information through the state cadastre system, should be carried out on the basis of creating a new information base that allows linking all the characteristics of commercial real estate objects - legal, property, technical, - into a single information database of commercial real estate . Such a tool of the commercial real estate market will ensure the coordination of all the blocks of the subject structure of the commercial real estate market, will streamline the relationship between government bodies and the private sector, coordinate actions in regulation, effective development, self-organization and self-regulation, ensure economic efficiency and increase the investment attractiveness of commercial real estate market. The introduction of the Unified Database of Commercial Real Estate Objects and a unified electronic passport of a commercial real estate object corresponds to the priority direction of the development of the information society, as it will increase the number of high-quality electronic services, and also corresponds to the economic strategy to reduce production costs and save resources.

The introduction of a single database and the creation of electronic passports of commercial real estate objects involves combining existing certificates of ownership, technical passports of objects, as well as land cadastre data into a new, innovative and technological tool for managing both the commercial real estate market as a whole and each individual object. A single technical and economic passport of a commercial real estate should be considered as a comprehensive document, a tool for collecting, processing and storing data on commercial real estate objects of various types, types and affiliations.

The introduction of a unified technical and economic passport of commercial real estate is an administrative way of state regulation of the commercial real estate market and management of commercial real estate, a certain way of intervention of professional and state units in a self-organizing market system, with their integration with information technology. The implementation and integration of the two technologies (a single certification of commercial real estate and automated systems) will become the basis for creating a fundamentally new conceptual system for managing commercial real estate.

The transition to the formation of a single database of commercial real estate will ensure the modernization of software for information support of the commercial real estate market, improve the quality of management of registration actions and technical inventory of commercial real estate. Automatic updating and updating of unified technical and economic passports of commercial real estate objects according to the degree of receipt and updating of data on a commercial real estate object, about changes in the legislation will improve the information interaction of the real estate register with basic and other state information resources.

The practical importance of using common technical and economic passports based on automated systems provides an opportunity for interested users to

group and process the necessary information about commercial real estate objects with a view to their use in the process of managing the commercial real estate market. The collection and grouping of data will make it possible to create a single graphic model of the commercial real estate market, which will include models of all objects in this market, which will allow more thorough study of the impact of the object on the economic environment, and conduct a current and retrospective analysis of the commercial real estate market by segments. The application of a systematic approach to the development of an informational analytical base will allow more efficient management of the life cycle of not only new commercial real estate objects (from the moment of their design to liquidation), but also existing objects, as well as using the appropriate tools to quickly determine and carry out the necessary maintenance work real estate on the basis of technical documentation (after filling in the data, the system will automatically be able to inform about the approaching deadlines Reconstruction and overhaul of facilities). The presence of a multifunctional system of creating information databases equipped with innovative technologies will allow you to compile reports on the state of the commercial real estate market and its individual segments, summarize the assessment of the value of real estate, analyze the current state and calculation of depreciation of the real estate object, conduct an economic analysis of the real estate market for the needs of the state, owners, investors and property managers.

The practical significance of the implementation of the Unified technical and economic passports of commercial real estate can be represented in the process of urban planning. During the development of projects, in the presence of the Unified technical and economic passports of commercial real estate objects, you can quickly examine all possible options and make the best decision on the construction of the object. Using the information contained in the Unified Passport, the necessary information on the technical properties and characteristics of buildings and buildings from the cadastre database and the corresponding parameters of the new project, entered into the system by specialists, the system automatically, using tools and layers of GIS and graphic information (map, images and etc.), displays all available options for construction interchanges, their interaction or relationship to other real estate. All this will enable builders to obtain preliminary information before the start of work, effectively plan organizational processes and avoid undesirable consequences during construction work.

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Pediatric patient with acute neurological symptoms and tele-care of the problem: from diagnosis to modern treatment

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Abstract

In the paper, the Authors decided to focus on the possible tele-care of pediatric patients after arterial ischemic stroke (AIS). Thanks to tele-stroke, which is one of the applications of telemedicine, the knowledge and experience of specialists in the field of stroke may be shared and used in hospitals that, in turn, do not have an experience with AIS. The tele-stroke network is under constant development in the United States and around the world. In this review, we put special emphasis on AIS in pediatric population as this problem is flagship example of acute neurological disease in children in the meaning of clinical presentation as well as the need of urgent action as "time is brain". We do consider the light and dark sides of remote care over pediatric stroke patients with focus on it in Poland.

Keywords: ischemic stroke, telemedicine, telestroke, children, treatment

1. Introduction

Children with acute neurological symptoms present challenge for pediatricians in emergency units all over the world. The range of neurological signs and symptoms in children is wide and it is commonly up to the age as well as co-existing health problems. The most typical acute CNS (central nervous system) symptoms in pediatric populations are: consciousness disturbances, convulsions, muscle weakness and paralyses, cranial nerves palsies, ataxia, and some non-specific like headache, nausea and vomiting, fever, malaise and meningismus (Taghdiri et al. 2019).

The proper and fast diagnosis, which is essential for treatment administration, is not possible without wide range of diagnostic procedures. The results, however, require specialist's evaluation, not available in every center. The most important of them are radiological methods of brain imaging. Both computed tomography (CT) of the brain and magnetic resonance imaging (MRI) have an important place in acute CNS symptoms diagnosis in children. In some clinical situations, like head trauma, computed tomography is the method of choice. In others, like AIS, computed tomography, even if for organizational reasons performed as the first CNS imaging ,still MRI provides more

thorough information and some cases is the only way to diagnose ischemic brain lesions in children (Gupte et al. 2003; de Seze et al. 2007).

Arterial ischemic stroke is defined as CNS ischemia with symptoms lasting over 24 hours (Aho et al. 1980). Although most cases of stroke concern adult population, it is not an unprecedented diagnosis among children and is associated with high mortality and the risk of long term consequences.

The tele-care of AIS develops quickly in US and European Union (EU) countries. Remote consultations of acute brain ischemia cases, both phone and tele-conferences, are very effective way to decrease the onset-to-treatment as well as door-to-treatment time; the thrombolysis given in local centers is as effective and safe as administered in Stroke Units. No need for patients transportation and decrease number of paper documents makes it also more green. On the base of AAN (American Academy of Neurology) the role of tele-care in adult stroke patients seems to be established; tele-neurology in the meaning of tele-care in other neurological problems also develops quickly (Hatcher-Martin et al. 2020).

Pediatric stroke, however, is a very specific problem not only for its frequency but also specific needs and therapeutic possibilities in this group of patients.

2. Pediatric patient with stroke

Childhood AIS affects about 1.2-2.4 per 100 000 children per year (Fullerton et al. 2003; Agrawal et al. 2009; Mallick et al. 2014). The differences come from ethnic and genetic variability as well as the age range of the population studied; by definition of pediatric stroke which is an acute brain ischemia in a child older than 28th day of life and younger than 18 year of life, and most papers on AIS exclude newborns.

Risk factors for pediatric AIS as well as of its recurrence are highly specific for childhood population and differ from adults. For both first ever and recurrent brain ischemia in children, the arteriopathies are considered to be one of the most important. Focal cerebral arteriopathy of childhood (FCA) is defined as brain arterial vessel stenosis of medium or large artery, confirmed by neuroimaging results and not concerned to any specific etiology, like moyamoya disease and syndrome, sickle-cell disease, post-varicella or post-radiation arteriopathy or dissection. The FCA location may be uni- or bilateral, mostly monophasic , and main risk factor for it is recent upper respiratory tract infection (URI) (Amlie-Lefond et al. 2009).

Even if pediatric AIS is considered to be a rare condition and mortality in the acute phase of the disease decreases in last few years still- cerebrovascular diseases are in the group of 10 top reasons of childhood death in United States. Nearly 3 % of children with AIS dies in acute phase of disease in hospital and the most important risk factors are the ischemic focus size and location, especially anterior and posterior circulation infarct, as well as congenital heart defects (National Center for Injury Prevention and Control, CDC 2015; Beslow et al. 2018).

Clinical presentation of the acute phase of AIS in children depends on the age of patient as well as on ischemic focus location and size. The most typical symptoms on the stroke onset in children are motor deficits (in most cases hemiparesis or hemiplegia), VII nerve palsy, consciousness disturbances and speech disturbances (aphasia) (Kopyta et al. 2012).

3. Telemedicine

Currently, telemedicine is developing the fastest in high income countries since it is the opportunity for effective medical care. A report prepared in 2010 (Perlitz 2010) indicated that the entire European e-health market should grow by around 5% in the years 2006-2020 and the telemedicine services sector will grow by around 10% per year on average.

The EU has for several years supported the implementation of innovative IT techniques in the field of health protection. As indicated by the analysis of legal acts recommended by the European Commission, the priorities are: facilitating access to health services and increasing the efficiency of medical facilities. In 2004, the European Commission set out a specification plan to create the European e-Health Area (European Commission 2004). The goal of this plan was to implement e-Health technology by the end of 2010. All EU member states have been called to develop national and regional e-Health strategies. Particular emphasis of the Commission was placed on: reducing the waiting time for an appointment, preventing queues of patients wanting to take advantage of health services and minimizing the occurrence of errors when diagnosing patients. According to the aforementioned plan, one of the goals to be achieved by the end of 2008 was the launch of on-line services such as tele-consultations, e-prescriptions, tele-monitoring, tele-medicalcare (European Commission 2004).

The prospect of high subsidies for programs that disseminate innovative solutions in the healthcare system creates a solid foundation for the development of the entire telemedicine market in Poland.

In 2018, Medical University of Silesia in Katowice received funding under the project "Silesian Digital Medical Platform eCareMed - Telemedicine and medical data mining" (SUM 2018). This platform was

created in response to the needs of patients in the field of early diagnosis in the field of oncology, cardiology and neurology. The assumption is that the implementation of the platform will minimize the patient's waiting time for diagnostics, treatment and rehabilitation in the field of medical teleconsultation, telemonitoring and telerehabilitation. In addition, it will increase doctors' access to the results of patient examinations. The project will use e-health technologies. The implemented services will focus on improving safety and convenience in the treatment of patients. The platform will enable comprehensive diagnostics and therapy tailored to individual patients, taking into account the specificity of their disease by means of teleconsultation between medical entities. An integrated regional platform, compatible with the national medical platform will result from the project (SUM 2018).

4. The use of tele-medical solutions in AIS patients

The purpose of telemedicine in stroke is to provide the immediate expert judgment, test reviews, diagnosis and emergency care plans to patients with signs and symptoms of AIS. The crucial matter for stroke outcome is time of treatment, after the diagnosis of AIS is administered. Till late 2018 in Europe the treatment with rt-PA (recombinant tissue plasminogen activator) was only available for adult stroke patients in the literal meaning of the age ≥ 18years. Since 2018 it is also registered for patients ≥ 16years of age which is a landmark event in acute brain ischemia in this population. According to product characteristics this treatment must be administered intravenously in the dosage of 0.9 mg in "therapeutic window" of 3 hours (The National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group 1995). For organizational and logistic reasons many patients would have to be excluded from the treatment for delay of transportation and diagnosis especially if , for local or country regulations and solutions, the treatment must be initialized in stroke centers. In many developed countries the hub-and-spoke networks are working to improve and speed rt-PA treatment of adults (Pervez et al. 2010).

In the USA, the rt-PA networks have been developed to initialize the treatment in outlying spoke hospital(OSH) under supervision of vascular medicine specialist/ neurologist at the dedicated regional stroke center (RSC) who assists the local hospital physician with diagnosis and treatment of AIS by phone or telemedicine enable ("telestroke"). The main idea of the tele-care of AIS adults is "drip and ship" meaning initialization of rt-PA treatment in OSH and transportation to RSC thereafter. In some places the acute vascular consultation was only available by phone but others, using telemedicine programs, can use full-motion videoconferences with tele-radiology. The results on research of safety and efficacy of intravenous rtPA thrombolysis show that "drip and ship" treatment model is safe and long-term follow up of post-stroke outcome of patients treated in OSH and RSC is similar (Silverman et al. 2005; Schwamm et al. 2009a; Schwamm et al. 2009b).

One of the most recent meta-analyses showed that the tele-rehabilitation interventions in adult patients after stroke were associated with significant improvements in recovery from motor deficits, higher cortical dysfunction, and depression (Sarfo et al. 2018). However, another study demonstrated barriersand facilitators of tele-rehabilitation. These, identified by patients, contained: equipment setup-related difficulties and limited scope of exercises. In turn, tele-therapists indicated patient assessments, interface problems and limited scope of exercises as barriers (Tyagi et al. 2018).

European experience in stroke tele-care come from Germany and Finland. According to German's experience tele-care for stroke patients made the onset-to-treatment time shorter as well as door-to-needle time which is crucial for patients with brain ischemia. The number of patients treated with thrombolysis increased from 2.6% to over 15 % in the area under TEMPiS (TeleMedical Project for integrative Stroke Care) within nearly nine years from program implementation (Müller-Barna et al. 2014). The number of patients transported to upper-reference center decreased as well as the number of in-hospital 7-days deaths; the treatment in remote centers was also as safe as in stroke units as 7-day mortality after thrombolysis remained stable. All the aspects of remote stroke treatment in South Bavaria rural area were the compared with the results achieved in urban area of Helsinki with centralized treatment system showing similar results. These proves that in rural and large areas stroke tele-treatment would be the method of choice for decrease the treatment delay, and makes it more ecological for less need of transportation and paper use (Hubert et al. 2016).

5. Conclusions

The most important question is: Are we ready, in mental and technical meaning, to enter tele-medicine in Polish, both for pediatric and adult patients with acute AIS? According to Future Health Index 2019, which is a platform to help to determine readiness of tackling global health challenges, in Poland nearly 80% of medical care employees use in everyday practice at least one digital solution and / or mobile application (Future Health Index Polska 2019). Approximately 36% of Polish patients is ready

to use remote visit (comparing 44% in other European countries). Both doctors and patients in Poland are most concerned about data security and most satisfied with remote access to medical data.

Weak points of tele-care of AIS children, difficulties, problems:

1. economic issue in the meaning of equipment and software, but first of all -24-hours access to specialist in vascular medicine and pediatric neurology

2. legal issues in the meaning of legal liability for potential treatment failures or diagnostic errors

Strong points:

1. no delay in treatment administration, shorter hospitalization period- lower costs, better outcome- lower long-term costs

2. less "paper" documentation and in some cases no need for patients transportation; thusthe patient's care is more ecological.

We did not find even a pilot-study description on tele-medicine in AIS or other acute brain problem in pediatric patients' population.

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Jupyter Notebook, JupyterHub and Nbgrader

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Abstract

In modern university teaching, students are encouraged to learn on their own initiative and in a self-regulated way. This applies in particular to e-learning offers and requires an environment that allows to test your own knowledge and skills at any time, i.e. carry out a self-assessment. With the help of digital methods, it is possible to set individualized tasks, automatically test student submissions and provide appropriate feedback. The project "OWL – Offene digitale Werkzeuge in der Lehre" (open digital tools in teaching) originated from this idea and enables

- **Supporting students by self-assessment platforms**
- **E-learning for independent learning**
- **creation of feedback**
- **reduced burden on deadlines**
- **platforms for easy interaction and submission, including bonus tests**

In this part, the integration of Nbgrader based on Jupyter Notebook into a JupyterHub server was realized using the authorization system of University of Applied Sciences Augsburg, to build a useful platform for all teachers who are interested in using Jupyter Notebook as a standard tool in teaching.

Keywords: digital teaching tools, project jupyter

1. Overview on Jupyter

1.1 Jypyter Notebook

Jupyter Notebook (Project Jupyter 2020a) is a particularly well-established webserver for creating mathematical-scientific, statistical, IT and programming, but also data and graphics content. Integration of various programming languages such as Python, R, Java, Javascript and many others is possible as well as integration of various markup languages such as HTML, Markdown, Scalable Vector Graphics, LaTeX and others. The base structure to include any of this different content are cells. In a nutshell, Jupyter Notebook is therefore quick and easy to create of all kinds of content on a webpage. The advantages of Jupyter Notebook are described in more detail in a short manual (Klever 2020a).

1.2 JupyterHub

Like Jupyter Notebook, JupyterHub has been developed as part of the worldwide open source Project Jupyter (2020b) creating single Jupyter Notebook webservers for every authorized user of the JupyterHub server. The advantage of JupyterHub (Project Jupyter 2020c) is on the one side that a Jupyter Notebook installation on the user's own computer is no longer necessary and on the other side a permanent accessibility of the user's Jupyter Notebook in the cloud. An example of an intensive use of JupyterHub is the Libre Text Project (Libre Text Project 2020) at the University of California, Davis, with an Open Textbooks

Pilot Program and support from the American Department of Education (University of California, Davis 2020).

1.3 Nbgrader

Nbgrader (Project Jupyter 2020d) arose on the basis of Juypter Notebook to allow the creation of Jupyter Notebooks with exercises in cells whose solutions are hidden in a copy for the students. After solving the exercises in this copy, students can submit it back. After the deadline, the lecturer can collect all submissions and grade the individual solutions either automatically (currently only for Python) or manually (for all programming languages or pure text questions), correct them in a simple manner, provide them with feedback and return them to the students.

2. Teaching and Learning with Jupyter

The idea and motivation for this part of the OWL project is based on the work on Jupyter Notebook for teaching, which was presented to the participants of the first conference "Digital teaching - challenges and opportunities" at the University of Applied Sciences Augsburg (Klever & Rösch 2016) . In the meantime, Jupyter Notebook has established itself both as a tool for the exchange of scientific results and publications and, together with Nbgrader and other tools, also has a major influence on teaching. A clear indication of this can be seen in particular in the online book "Teaching and Learning with Jupyter" published in 2019 (Barba et.al. 2019).

2.1. Jupyter Notebook

After Jupyter Notebook had been used successfully by the author for several years, a sufficient number of Jupyter Notebooks was available, especially in programming with Python. These include the lectures network programming, data management 1 and image processing in the course interactive media, computer science 1 and 2 in the course systems engineering, programming 3 and image processing in the course computer science.

2.2. JupyterHub

A JupyterHub server (Klever 2020b) was set up in 2016 and used for the creation and use of the Jupyter notebooks in the lectures computer science 1 and 2 in the first year of the course systems engineering before the start of the project OWL. The project could therefore be built upon these experiences. The course systems engineering is ideally suited for this project in particular due to its mixture of digital teaching and its modern forms of teaching such as flipped classroom and face-to-face teaching in its venues in Nördlingen and Memmingen for simultaneous lectures via videoconference tools. In addition, the concept of this course has already been awarded twice with a special award of the VDMA (Mechanical Engineering Industry Association) award "Bestes Maschinenhaus 2017" (Hochschule Augsburg 2017) and second with the teaching award „Preis für herausragende Lehre" of the Bavarian Ministry for Science and Art (Jacob et. al. 2018). A detailed description of the concept for this course can be found in Jacob et. al. (2017). For this first JupyterHub server, the connection to the authorization system LDAP (Wikipedia, 2020) of the University of Applied Sciences Augsburg Computing Center (Hochschule Augsburg 2020) was realized using the available integrated extension of the JupyterHub LDAP authenticator (Klever, 2017) as well as a separate LDAP2LocalUserAuthenticator (Klever 2020c) based on the LDAP authenticator. The latter creates local users with corresponding directories on the local file system, so that user data in the IT department are separated from the user data on the JupyterHub, but authentication is still carried out via the university's authentication system. The experiences of using the JupyterHub, as well as the feedback from students was positive, however, submission and collection from student's exercise notebooks was carried out with scripts of the author and an individual correction of the exercises was only discussed with the students on request.

2.3. Nbgrader

One of the features of Nbgrader is submission and collection of Jupyter notebooks. One year after the first publicly available version of Nbgrader (Version 0.1.0 from July 17th, 2015 (Hamrick 2015)) the author used Version 0.3.0 (Hamrick 2016) from June 25th, 2016 for the first tests in the project OWL. Version 0.4.0 (Hamrick 2017) from February 2nd, 2017 was then used in this productive beta test as part of the lectures computer science 1 and 2 for the third year of the course systems engineering. This test received also positive feedback, especially because of the automated, and if necessary manually reviewed, feedback response to the students. However, scripts had to be written for the exchange of this response and all registered students could use all available courses at the same time. With version 0.6.0 (Hamrick 2019) it was possible to configure and set up various courses by different lecturers and different students. This version was used for the fourth year of the course systems engineering and is the basis for a common platform used at the University of Applied Sciences Augsburg. Corresponding to the intensive use, appropriate patches for eliminating bugs

have already been introduced for this version (Kleve, 2019). The disadvantage of this setup is that all lecturers must be registered as JupyterHub admin users, which implies that all lecturers can both create and delete users in the database of the JupyterHub server. As deletion of a user from the database is relatively easy to restore this disadvantage is not that serious. However, it is absolutely necessary that the parameters in the configuration of the JupyterHub

JupyterHub.admin_access = False

is set to prevent the lecturers from creating and deleting Jupyter Notebooks from other users.

3. Example for the Use of JupyterHub and Nbgrader

The lectures computer science 1 + 2 in the course systems engineering are an introduction to programming with Python. For this, a total of 12 chapters - in Nbgrader named Assignments - were created for the lecture computer science 1, each with a different number of Jupyter notebooks (see Fig. 1).

In addition, for almost all notebooks, between 1 and 4 screencasts were developed with programming examples in Jupyter notebooks, including the explanations for every single programming step. Fig. 2 shows an example of a notebook with an autograded answer and an autograder tests cell from a lecturer's perspective, while Fig. 3 shows the same notebook from the students' point of view.

While working on the notebook, students can validate the code at any time, which lights up green when executed correctly, otherwise red. In order to enable the students to carry out a simple self-examination, the programming tasks should be divided into minimal steps to clarify when and where an error occurs in a non-validating programming step. This is not always easy and sometimes impossible. After submitting the finished Jupyter notebook, feedback is provided via the autograding process including the points achieved, whereby either no points or the entire number of points can be awarded (according to the validation of the notebook) (see Fig. 4)

Manual correcting is essential for an accurate grading. However, this is complex and cannot be performed for all 30-50 notebooks in a lecture during the everyday life of a lecturer. For this reason, only one Jupyter notebook for each assignment was created as an exercise notebook and therefore manually corrected and used for a bonus rating. Both the feedback on the individual exercise notebooks and the bonus rating was very well received and acknowledged by the students.

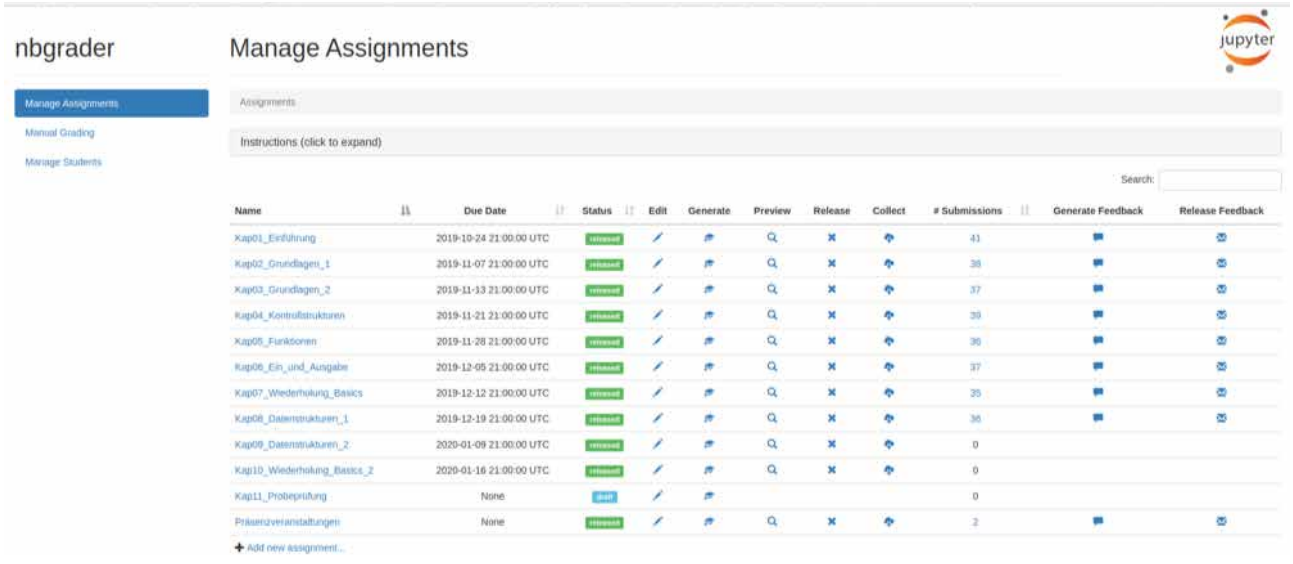

Figure 1. Manage assignment view with all 12 chapters of the lecture computer science 1.

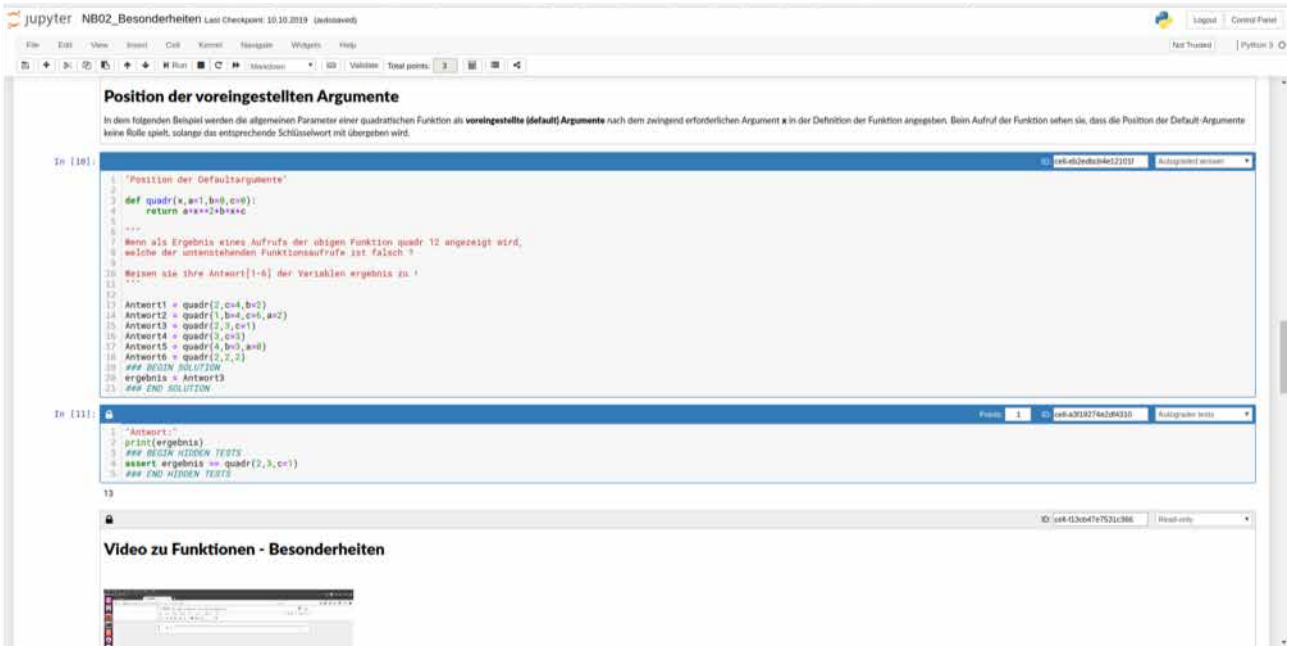

Figure 2. Section from a Jupyter notebook with an Autograded answer and an Autograder tests cell (from the lecturer's perspective).

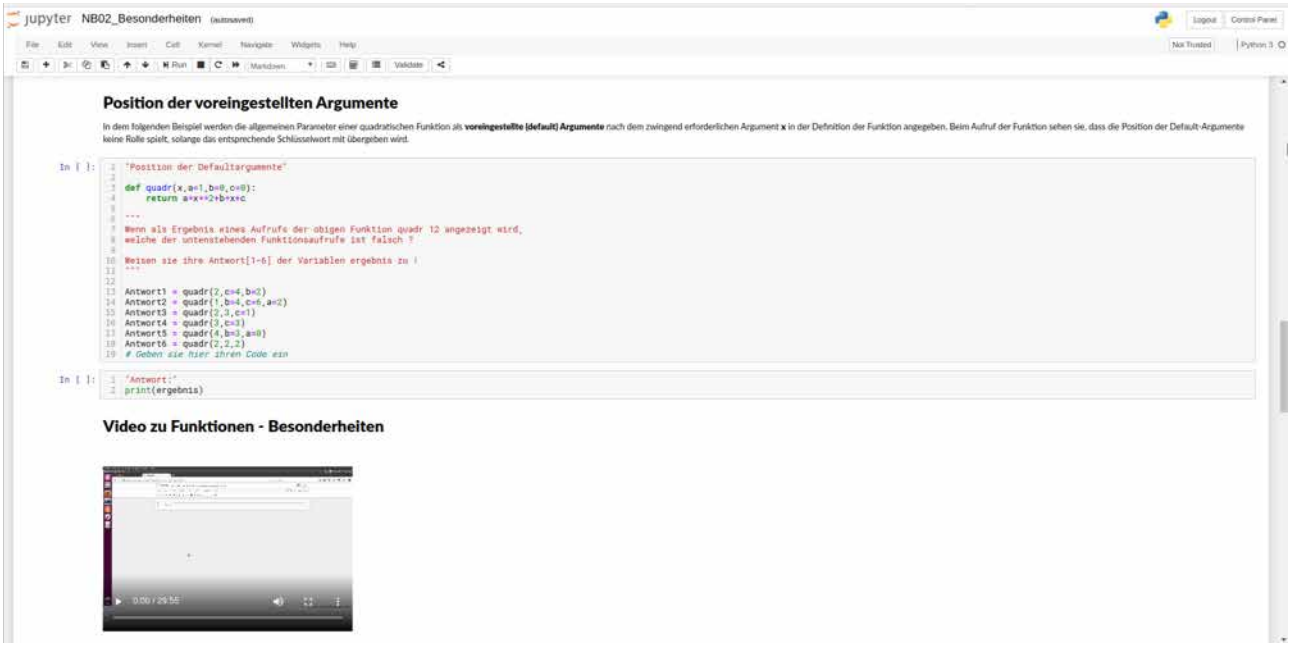

Figure 3. The section from the Jupyter notebook corresponding to Fig. 2 from a student's perspective.

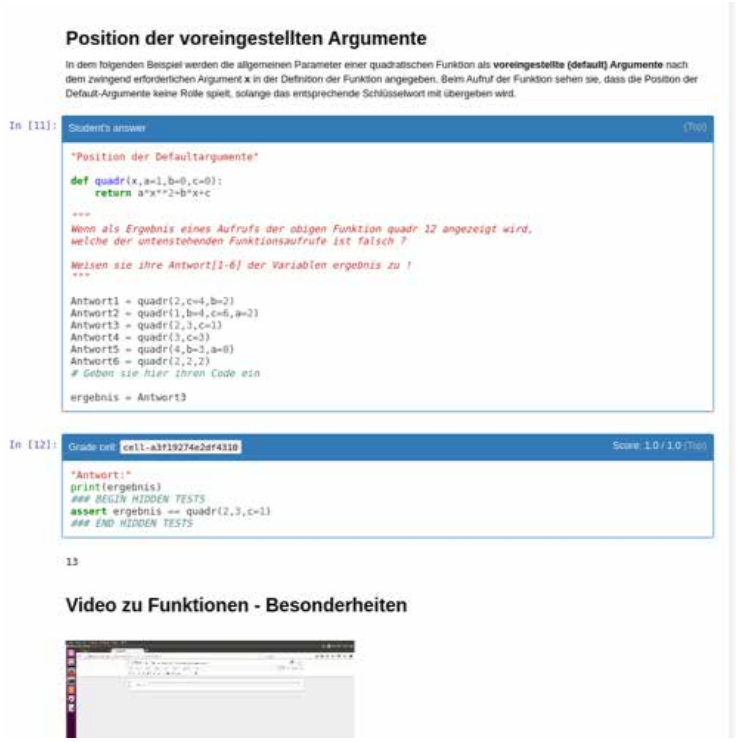

Figure 4. The same section from the Jupyter notebook corresponding to Fig. 2 and Fig. 3, after the autograding as feedback to the students.

4. Sustainability

The positive experiences using Nbgrader in the lectures computer science 1 + 2 in the course systems engineering encouraged the author to open and release the JupyterHub server for other courses and lecturers. Therefore, first discussions about the administration of this server by the IT department of the University of Applied Sciences Augsburg were held. Setting up new courses is more complex in the environment at the University of Applied Sciences Augsburg with its own authorization service than in the multiple courses demos provided by Nbgrader (Project Jupyter 2020e). To set up new courses in a suitable manner without major effort, a script, which has already been published in Github (Klever 2020d) was written as a significant relief for administrators. To install a new course is therefore reduced to call a script with two parameters, the name of the course and the useraccount of the corresponding lecturer:

$ python createMultipleCourse.py -a Name_of_Course Useraccount_of _Teacher

A further step is necessary to register all students of this course afterwards. If a list of the students enrolled in this course is available electronically in a file with their first name, last name, email address and user account, these students can be registered in one step into Nbgrader using the same script with the following call:

$ python createMultipleCourse.py Name_of_Course Useraccount_of_ Teachers Students_list.csv

As an alternative to the disadvantage of the JupyterHub administration rights for all lecturers, it would also be conceivable to assign a JupyterHub server for each lecturer in separate LXC containers instead of one JupyterHub server with multiple lecturers in one LXC container (linuxcontainers.org 2020). In this approach the corresponding lecturer could get also extended administration rights with the parameter

JupyterHub.admin_access = True

to be able to access the Jupyter notebooks of the students in his lecture and to be able to respond to questions or problems better and easier.

In summary, it can be said that the approach of this project is successful and can be used sustainably with the planned reorganisation of the JupyterHub server to be operated by the computing center. Further and additional research could also be done with this JupyterHub environment, e.g. with regard to automatic hint generation with support for faulty or partial solutions by evaluating solutions from previous years in order to form the basis for a data-driven algorithm (Rivers 2017).

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Course Systems Engineering in Project Digital and Regional

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Abstract

As part of the regionalization offensive of the Bavarian State Government, the Universities of Applied Sciences Augsburg, Kempten and Neu-Ulm have developed a joint study concept named Digital and Regional (Hochschule Augsburg, 2020). It offers new opportunities for practical university teaching through the combination of the elements of part-time study, digital teaching and classroom teaching. The course appeals to both school graduates with the aim of practically integrated study as well as interested professionals who are looking for part-time enhanced academic qualifications. This results in a group of students with heterogeneous learning biographies, which are matched with suitable didactic concepts. The combination of blended learning concepts with a new study time model gives the students great flexibility in terms of time for the development of the course content, which enables them to work in companies parallel to their studies (Jacob et.al. 2017).

Keywords: digital teaching, part-time course

1. Partnership of Universities and Regions

As part of the structural and regionalization concept initiated by the Bavarian State Government in 2014, the competition "Partnership of Universities and Regions" was launched, in which concepts for extramural locations could be introduced. The aim was to strengthen the Universities of Applied Sciences and Technical Universities in rural regions in Bavaria. The Swabian Universities of Applied Sciences in Augsburg, Kempten and Neu-Ulm prepared an application in which a joint concept for the Bavarian-Swabian region was developed.

2. Study Model of the Project Digital and Regional

As part of the regionalization concept, students in all regions should have access to academic education. When developing the study model for the project Digital and Regional, particular attention was paid to the aspect that companies that are located in rural regions often lose workers who gain further qualifica-

tions through studies to companies in metropolitan regions, that are close to the place of their university. The concept is based on a part-time study model with 20 CP / semester (ECTS), in which a high proportion of teaching is offered as digital content. This makes it possible to limit the presence at the learning centers in Memmingen and Nördlingen to two days a week. In the remaining three days, students should work practically in companies (Fig. 1). The primary aim of this concept is to keep prospective students in the region, to bind them closely to the companies, to offer them high-quality training and to enable them to develop an individual profile that matches their talents and predispositions.

The concept as a part-time course enables a flexible integration of the local companies. As a rule, students are at the company three days a week during the lecture period and during the free period, students are present for the entire week. The study phase comprises two days present on site in the extramural learning locations and thus close to the company.

A sheer implementation of teaching only with e-learning methods was deliberately avoided, since the presence phases on site on the one hand reduce the dropout rate in creating grouping and group dynamics, contrary to extremely high dropout rate using pure e-learning offers. In addition, personal contact between students and lecturers is also important in order to realize individual support for individual students, which is also required due to the heterogeneous learning biographies of the learners. The combination of digital teaching creating an individual facility to repeat content, and personal feedback is ideal.

The e-learning phases enables a structured and supervised preparation and postprocession of the presence phases, a deepening of the content or, if necessary, the basic structure using Learning Management Systems (Moodle, JupyterHub), a video conference system and a messaging system (Telegram). In particular, the didactic method of the flipped classroom enables the lecturers to individually address the needs of the students in the exercises that take place on the attendance days. The digital part of the course facilitates the integration of the course into the everyday life of the learners as well as an individualizable process planning and implementation for the lecturers. This allows learners studying parallel to their professional and family life, without leading to excessive stress.

The students are professionally trained by lecturers from the participating universities and intensively accompanied in both online and attendance phases. Mentors from cooperating companies help to maintain contact with the companies involved. Regardless of whether the student studies part-time, integrating a vocational training or with in-depth practice, particular importance is attached to the curricular integration of professional experience. The bridging between theory and practice is achieved through methodical-didactic concepts such as problem-based learning, project method and research-based learning.

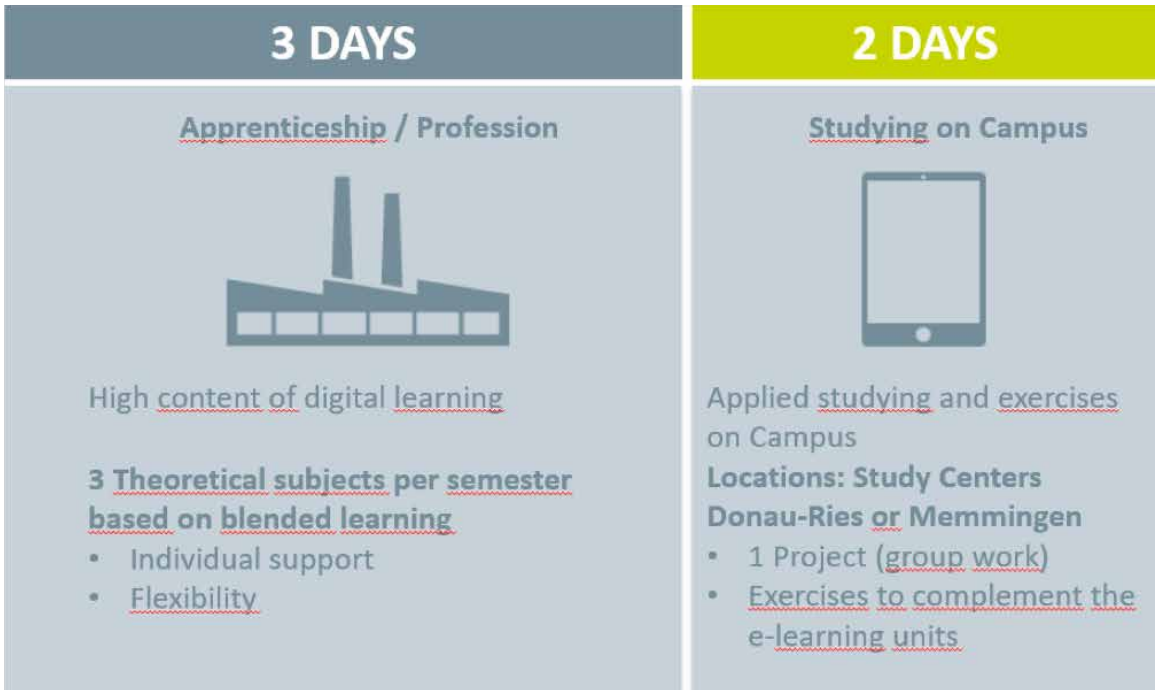

Figure 1. Time allocation per week for students in the Digital and Regional project.

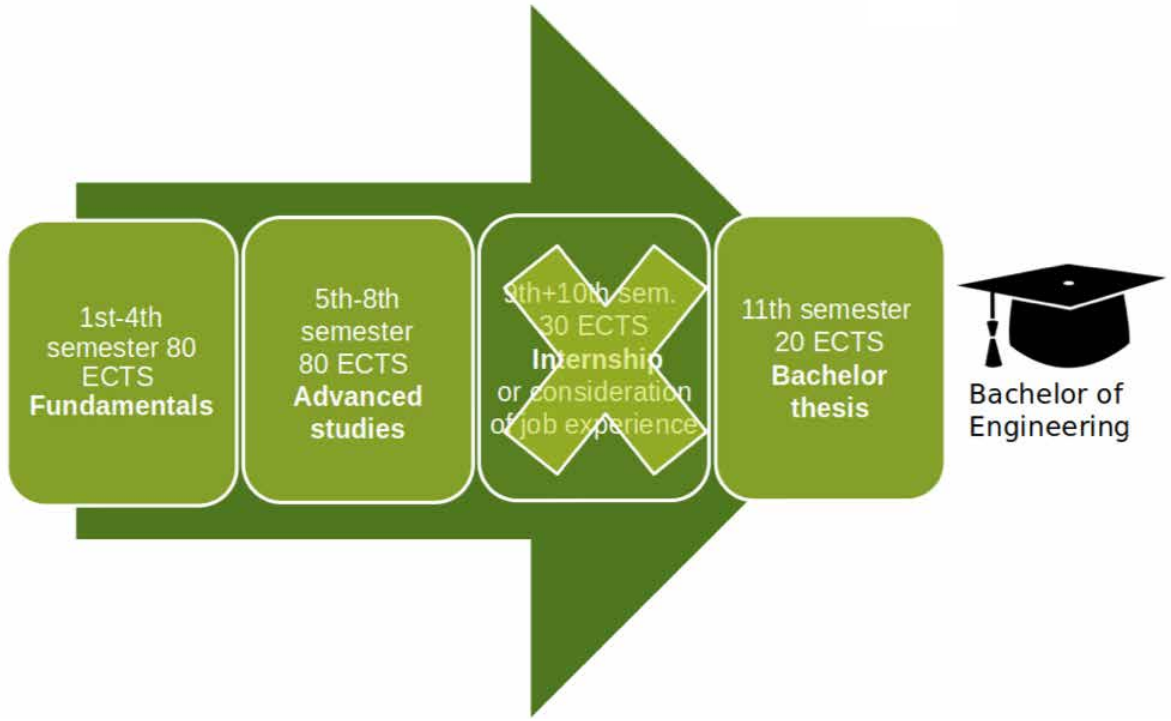

Figure 2. Schedule of the part-time course systems engineering.

3. Degree in Systems Engineering

The content of the course was covered to the needs of industrial companies settled in the regions. The current change in the industry towards digitized production was taken into account: The networking of different actors to optimize processes is a prerequisite for efficient use of increasingly scarce resources and greater individualization of products and people's lives. In terms of content, the course represents a combination of engineering and computer science. The aim is to optimally prepare graduates for the requirements of digitization in industry. On the one hand, you will receive engineering skills, such as mechanics, construction, materials science, electrical engineering, control technique and automation technology, on the other hand, extensive computer science skills such as programming, networks and data communication, secure industrial systems, distributed systems and the basics of Industry 4.0 will be provided. This gives the students the necessary skills to drive the upcoming steps for digitization in the company as specialists and managers and thus securing the future of the company.

The concept consists of the following components:

Orientation Phase

An orientation phase with a broad education in engineering fundamentals and the strengthening of key competencies. The two-year phase is a basic course in the science- and technology- and engineering-oriented domain (Fig. 2). This corresponds to the needs of regional employers and at the same time offers the student target group subject-specific options and specialization options. The orientation phase is characterized by a high presence in the company, individual learning phases with digital teaching and learning offers, intensive personal support in the learning room and personal network building through joint project and exercise work on site.

Consolidation Phase

The orientation phase is followed by a consolidation phase in Industry 4.0. The consolidation phase also includes a high presence in the respective companies, so that the learning content can be applied directly in the company. In contrast to other study models with a high proportion of practice, such as the Baden-Württemberg Cooperative State University or studies with a more in-depth practice in Bavaria, in which the students are only with the company for a blocked period of up to three months, the permanent integration allows the students to be involved in long-term projects with the company.

Three different models are possible for the course:

1. The students complete an apprenticeship as a mechatronics engineer (IHK) in parallel with their studies. The content of the vocational training is coordinated with the IHK Schwaben, as are the days of attendance at the vocational school. After 2.5 years, the student completes his exam as a skilled engineering worker. After that, he is still involved in the company three days a week, gaining further practical knowledge.

2. At the beginning of the course, the students are also involved as interns in a company. This means that they can be continuously integrated into a trainee program in the company and, thanks to the permanent presence in the company, they can also be permanently involved in projects. Due to the considerably more intensive integration into the companies in comparison to conventional study models with an in-depth internship, the student receives a lot of practical know-how in parallel with the study.

3. The student has already completed an apprenticeship as a technician or master and uses the combination of part-time study in conjunction with high digital teaching content as an opportunity for advanced training.

Due to the practical knowledge of the students developed parallel to the course, the practical semester can be recognized, so that the nominal 11 semester normal period can be reduced to 9 semesters.

A project module is integrated into each semester in order to integrate practical content as closely as possible into the course. In these project modules, the contents of the other three theoretical modules of the same semester are combined in one project and worked on together in small teams. The tasks are created as practically as possible and can also be set by the companies from which the participating students come.

4. Accompanying quality assurance

The ongoing quality assurance during the course is of outstanding importance, especially because the students represent a very heterogeneous group. Different tools are used for quality assurance in order to keep control loops as short as possible. Questions and feedback options are integrated in the digital lessons, in order to check to what extent the students have penetrated the offered content during the individual teaching sequences. The direct feedback option provided by the students also gives the teacher quick feedback which of the teaching method used was helpful. If problems of understanding arise, the lecturer can address the problems directly in the following exercise.

In addition, students are coached intensively through collaborative projects. This also results in complementary support from students with different educational backgrounds. The course includes both experienced skilled workers, technicians and masters who have strong practical experience as well as high school graduates who bring more or more up-to-date theoretical knowledge to the group. Thus, the students can support each other with their respective special knowledge.

The new study model is also supported by the accompanying research project MI³NTENSIV, which is funded by the Bavarian government. This will develop a competency framework for STEM courses, which will support the students' start in the first semester through individual support for skills in the introductory phase and new teaching and learning opportunities such as learning coaching, problem-based learning or project-based learning, thereby significantly reducing the dropout rate. As part of the research project, the course is being closely monitored via evaluation and other QM processes.

An evaluation of the course is planned from the beginning, which will be carried out continuously and in parallel with the process. Essential evaluation criteria are applied at the input, process and output level. These are designed differentiated according to the organizational levels of the project, the degree program, the location parameters of companies and respective universities, and at the event type level. After being used with the help of self-evaluations and external evaluations, these criteria are adjusted. A separate specialist was involved in the project for the accompanying implementation of the accreditation.

The examination concept puts the competence-oriented examination in the foreground. Therefore, the cognitive skills in the theory module and the application-oriented skills in the respective project of the semester are checked. In the programming events, the exams are therefore carried out online with the tools used in the events.

5. Summary

The teaching and learning concept of the Digital and Regional project of the three Swabian universities of Augsburg, Kempten and Neu-Ulm enables very practical training, which through the combination of part-time study, digital learning concepts and intensive learning units in on-site learning groups offers the possibility to realize study concepts adopted to the different needs of the industry. The implementation of this concept for the Systems Engineering course at the learning centers in Memmingen and Nördlingen started successfully in the winter semester 2016/17. The course was awarded the special prize of the VDMA "Best Machine House" in May 2017 (Hochschule Augsburg, 2020), with particular emphasis being placed on the optimal integration of practical activities and the innovative teaching methods. Additionally the project awarded the Price for Outstanding Teaching of the Bavarian State Ministry of Science and Art in April 2018 (Jacob et.al., 2018)

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On the issues of Artificial Intelligence implementation: advantages and constraints

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Abstract

Nowadays intelligent information systems and technologies are evolving actively. These technologies and systems are based largely not on tangible, but on information and communication resources that belong to the class of synergistic resources. At the moment, artificial intelligence (AI) is at the stage of active development, and it has already been successfully used in various companies in many industries and fields of activity. AI techniques include data mining, database, machine learning, pattern recognition and knowledge discovery. But, it is obviously, that there are some significant challenges in the domains of using artificial intelligence. The main goal of this paper is the analysis of areas of AI applications to support the processes in economy and management and identification the key advantages and constraints in these spheres. The problem the author considers with here is: How Can we successfully use the advantages of complex AI systems and what are the main ethical and technological challenges of AI implementation. The research is based on literature review, analysis of large volumes of information, and findings of investigations in this field.

Keywords: artificial intelligence, artificial intelligence technologies, ethical and technological aspects

1. Introduction

At the present time the use of the latest achievements in the field of intelligent information systems and technologies in global economy and management, including contemporary systems of artificial intelligence (AI), is one of the key factors in improving organizational performance and increasing competitiveness. AI systems and technologies can govern the ability of companies to generate sustainable business models in global environment. When solving business problems, AI and intelligent technologies can ensure mutual understanding at all organizational levels and bridge the gap between strategic vision and its implementation. In emerging markets, artificial intelligence and intelligent technologies are in fact an integral part of cutting-edge management systems (Albright et al. 2011; Krichevsky and Serova 2016). They add to globalization of business by providing quick access to employees, customers, and partners worldwide, as well as coordinating global interaction between companies at different stages of value chain. It does not mean that intelligent technologies and systems simply increase efficiency of a company's operations; they can be considered as key intangible asset. But, it is obviously, that there are some significant constraints in the domains of successfully using artificial intelligence. Especially important is the critical approach to the data for social sciences and management. Self-learning systems that work with large data sets, it is oriented on the data, rather than on the basic principles behind

them. Sometimes it gives excellent results, because the machine is able to analyze much more information than a person, and find patterns in it, select the key indicators. But sometimes, using AI may be totally meaningless in case when the coincidences are perceived as an important pattern. For instance, data may be incomplete or bear traces of systematic measurement error.

The main goal of this paper is the analysis of the domains or areas of AI applications to support the processes in economy and management and identification the key advantages and constraints in these spheres. The problem the author considers with here is: How Can we successfully use the advantages of complex AI systems and what are the main ethical and technological challenges of AI implementation. The research is based on literature review, analysis of large volumes of information, and findings of investigations in this field. The research is conceptual and empirical in equal measure, and provides the examination of the next directions of study and use of artificial intelligence systems and technologies:

- Predictive analytics and intellectual data analysis;
- Tools for AI systems creation;
- Data storage;
- Natural language processing;
- Computer vision and pattern recognition;
- Biometrics.

The scientific methodology of the research is system approach and comparative analysis, and comprehensive consideration of the processes of artificial intelligences applications. The paper is structured as follows: Introduction; AI: theoretical fundamentals and the basic concepts; The main domains of AI implementation; Ethical and technological challengies; Conclusion, and List of references.

2. AI: theoretical fundamentals and the basic concepts

The history of artificial intelligence began with Alan Turing's question: "can machines think?". To begin with, to answer this question, it was necessary to give a clear definition of the two fundamental terms of this question: "machines" and "think". Only after these two concepts were defined the work on creating machines that could think like humans has begun. In other words, it was the moment when the era of artificial intelligence began. The main limitation in defining AI as simply "creating intelligent machines" is that it doesn't actually explain what artificial intelligence is? What makes a machine intelligent?

What is interesting is that in English, the phrase artificial intelligence does not have the anthropomorphic coloring that it acquired in the traditional Russian translation: the word intelligence in the context used rather means "the ability to reason intelligently", and not "intelligence" (for which there is an English equivalent of "intellect").

In general, artificial intelligence can be divided into two categories: narrowly focused intelligence and artificial intelligence in the most general sense of the word. A narrow concept involves performing one specific task, the work of artificial intelligence involves analyzing the situation and choosing a solution, however, this process is much more limited than simple human intelligence. Examples of intelligence in the narrow sense of the word are services such as Google and Yandex search engines, as well as built-in image recognition systems; this is the Siri app for IOS; self-driving cars etc.

Artificial intelligence in the broad sense of the word is a much more interesting and exciting phenomenon. These are robots and machines that can apply intelligence to an incredibly wide range of problems, surpassing the ability and speed of thinking of the human brain. However, what is the difference between the artificial intelligence and human intellect? One of the positions about these differences is that artificial intelligence does not have the ability to reflect and motivation. As long as it does not have a certain motivation for action, he will remain an instrument in the hands of a human. Even now, autopilot, implemented, for example, in Tesla, requires a "hands on the wheel" mode. That is, he can drive, but requires constant monitoring by the driver.

In the "Decree of the President of the Russian Federation on the Development of Artificial Intelligence in the Russian Federation" (2019) the following basic concepts were defined:

> a) artificial intelligence – a set of technological solutions that makes it possible to simulate human cognitive functions (including self-learning and seeking solutions without a predetermined algorithm), as well as to obtain results during the performance of specific tasks that are at least comparable to the results of human intellectual activity. This set of technological solutions shall consist of information and communications infrastructure, software (including that in which machine learning techniques are employed), and data-handling procedures and services;
>
> b) artificial intelligence technologies – technologies based on the use of artificial intelligence, including computer vision, natural language

processing, speech recognition and synthesis, intelligent support for decision-making, and prospective artificial intelligence techniques;

c) prospective artificial intelligence techniques – techniques that are aimed at the creation of fundamentally new scientific and technical products, including those that have as their purpose the development of artificial general intelligence, aka strong artificial intelligence (the autonomous solution of various problems, the automatic design of physical objects, automatic machine learning, problem-solving algorithms based on partial data labeling and/or a negligible amount of data, information processing based on new types of computing systems, interpretive data processing, and other techniques).

3. The main domains of AI implementation

According to Lee V. (2019), the artificial intelligence is one of the most perspective tools for improving the productivity of companies. At the moment, artificial intelligence is at the stage of active development, and it has already been successfully used in various companies in many industries and fields of activity. AI techniques include data mining, database, machine learning, pattern recognition and knowledge discovery. Machine learning provides an opportunity for continual assessments of data in order to detect and analyze the anomalies and nuances to improve the precision of models and rules. Computer vision produces numerical or symbolic information from images and high-dimensional data. Image recognition technology is found in healthcare, automobiles, driverless cars, marketing campaigns, etc.

HeadHunter (2019) made the most relevant to the study research. Representatives of Russian companies took part in the study. Of these, 41% are from Moscow, 14% are from St. Petersburg, and 45% are from other regions of the Russian Federation. These were mostly representatives of medium-sized companies (20%) with a population of 100 to 250 people: HR managers (30%), HR Directors (19%) and recruitment managers (13%). General managers (9%) and Department managers (2%) also participated in the survey.

30% of respondents believe that by 2050, half of the professions will be fully robotic. Each sphere has its own risk coefficient. The largest (coefficient more than 6) banking, accounting and Finance, insurance, logistics and production activities are affected. A 50/50 chance for retail (5.1), marketing, advertising and PR (4.8), and law (4.5). Creative professions are least afraid of artificial intelligence: art (1.8), design (2.9), media and journalism (3.2). At the same time, 67% of respondents hope that new technologies will allow them to focus on creative and social activities.

The use of artificial intelligence in the medical sector increases the chances of patients for the earliest diagnosis of diseases, for high-quality treatment and recovery with minimal costs. By use of AI, it is now possible to predict in advance the place where a new disease may break out and predict the course of its further development. One of the example of AI implementation is IBM's Watson platform, embedded in the healthcare industry, can process a large amount of data, including images, in order to detect a particular disease as soon as possible. Watson is already used in clinics in New York and Bangkok. Advantage of this program is that it is able to find even the subtlest symptoms of the disease in a huge volume of information.

Artificial intelligence is also successfully used in the financial sector: it allows to make the most accurate forecasts in the shortest possible time. The use of artificial intelligence systems in the banking sector is actual today. Banks can implement projects related to such expensive high-tech innovation as AI. For instance, in Russia the trend of growing popularity of using artificial intelligence in banking sector is considered. Many of the electronic payment system use a program that calculates the suspicious activity of a user. The artificial intelligence system is also used to analyze the level of taxes and income in order to demonstrate to client what his financial condition will be in the near future, to prompt in which cases it is better to save.

Many universities are already using artificial intelligence technology for educational purposes. Most of them use artificial intelligence to keep track of whether students go to classes and perform the tasks given to them. There are intelligent learning systems that can check the student's answers and level of knowledge, analyze their responses, and make personal educational plans. For example, the AutoTutor system teaches programming language, physics, and critical thinking. Online platforms such as Udacity, EdX, evaluate writing tests and essays. There are also platforms that help with learning foreign languages or improving the knowledge of native language. By analyzing the natural speech of the student, the AI system detects errors in pronunciation and offers correction options.

Artificial intelligence is gradually infused into our daily lives. "Smart houses" and "Smart cities" no longer seem to be something fantastic and incredible. "Smart houses" will be able to become indispensable assistants to a person soon. They will be able to reliably provide the inhabitants of the house with the necessary comfort, and will also predict emergency situations.

AI can use successfully in manufacturing and optimize production and reduce its cost. Industrial AI is a systematic discipline, which focuses on developing,

validating and deploying various machine learning algorithms for industrial applications with sustainable performance. It acts as a systematic methodology and discipline to provide solutions for industrial applications and function as a bridge connecting academic research outcomes in AI to industry practitioners (Lee et al. 2018).

Transport and logistics. Since 2012, Google has been actively testing its self-driving cars on city roads. Google plans to launch them in production by 2020. Such companies as General Motors, Tesla, BMW and Ford are also interested in producing unmanned vehicles. In their opinion, such machines are the future of humanity. The autopilot system will take control, ensuring the safety of the driver throughout the journey, and in critical situations - AI system can transfer the control system to a person.

Public sector. In August 2016, NASA announced that it was working on an intelligent assistant for firefighters "Audrey" (Audrey). This program can monitor a group of firefighters, send useful information to each team member, and give recommendations on how to work together. By observing the firefighters, the assistant can predict the development of the situation in the near future. In May 2016, researchers at the University of Rochester, in collaboration with the New-York attorney General's office, published a study that says that using AI, it possible track down drug traffickers on the social network Instagram. The algorithms embedded in this program analyze the accounts of potential criminals by hashtags, keywords, number of subscribers and "transaction data". This program identifies the perpetrator more accurately than professional experts (Yang & Luo 2016). There are other examples, but anyway such programs should help people, but not replace them.

Service sector. At present in the hotel business a huge number of robots are used: robots-vacuum cleaners, kitchen robots, security robots, robots-butlers and other specialized machines. The widespread use of kitchen robots that can cook a variety of dishes will finally minimize the need for restaurant staff. One of the perspective AI technique implementation is the delivery of food by drones.

4. Ethical and technological challenges

Artificial intelligence can be considered as a tool that allows people to solve certain tasks that do not require the full range of human cognitive abilities. At present, "smart" machines are widely used in various spheres of human activity. The use of such a seemingly extremely harmless AI can lead to some problems in ethical and technological aspects.

On the first place is the problem of unemployment. In reality, the use of AI systems is much cheaper than manual labour. Currently, the automation of production and services with the help of intelligent machines creates more jobs than it eliminates, and leads to the emergence of more highly paid and interesting specialties. The second problem is responsibility. For example, if the doctor listened to the expert system's opinion about the diagnosis, who would be responsible if the machine made a mistake? Modern expert systems cannot directly influence the patient, they influence the opinion of the doctor, and in this sense perform the same function as reference books or medical textbooks. At the present time it is impossible to shift the responsibility from the specialist to the machine.

In general, all technological problems of artificial intelligence relate to its ability to possess and operate on such qualities of human thinking as the ability to reason, understand, generate texts, act according to their motivation, reflect and have free will. All these qualities at the moment do not allow people to call artificial intelligence an original phenomenon, because at the moment it is a machine that acts on the basis of programs embedded in it, analyses past situations, and operates solely based on past experience. Considering the technical aspects of artificial intelligence training, we can name the following methods. Supervised learning, unsupervised learning, and reinforcement learning, each of which is accurately used for specific cases. Mostly today artificial intelligence is represented in controlled applications. Unsupervised learning is a process of combining techniques used without labeled training data — for example, to detect clusters or patterns in a group of existing data. In reinforcement learning, in turn, systems are trained by receiving virtual "rewards" or "punishments". The more the program is being trained, the more accurately it works and proceeds. Technological problems that are currently close to impossible to solve:

a) Ability to reason.

b) Ability to understand.

c) Synthesis, text generation.

d) It is not always possible to introduce a sufficient amount of source data.

Smith et al. (2006) states "Over the years we have learned that having a massive knowledge base isn't enough, nor is a million logical inferences a second. The hard problem in the field of AI is finding a way to teach a machine to think, but in order to articulate 'thought' in a way current computers can understand we must first understand thinking and intelligence ourselves".

5. Conclusion

A huge number of people are currently working on solving issues related to the development of artificial intelligence and ways to teach it to think. By 2030, PwC estimates that artificial intelligence will provide a 14% increase in global GDP, which is about 15.7 trillion dollars, that is, it will become an integral part of the economy. Employees will need to enrich their knowledge with the ability to work with artificial intelligence, and the labor market itself will also be transformed: those who can be easily replaced will leave, but new personnel will be needed from those who will work with the latest technologies, engage in their implementation, training, support. But, it is obviously, that there are some significant constraints in the domains of successfully using artificial intelligence. Especially important is the critical approach to the data for social sciences and management. Self-learning systems that work with large data sets, it is oriented on data, rather than on the basic principles behind them. Sometimes it gives excellent results, because the machine is able to analyze much more information than a person, and find patterns in it, select the key indicators. But sometimes, using AI may be totally meaningless in case when the coincidences are perceived as an important pattern. For instance, data may be incomplete or bear traces of systematic measurement error. The history of artificial intelligence is not finished: moreover, nowadays it goes closer and closer to its pick.

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Kaizen philosophy in the introduction of sustainable behaviours in everyday academic life

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Abstract

Environmental problems that the World is facing nowadays force us, researchers and academic teachers to not only uptake but also promote greener behaviors and digitalization in our work. Kaizen's philosophy, which descends from Japanese culture and is the main pillar of Lean Manufacturing philosophy is an appropriate tool to implement small changes in different fields in the same time, changing the general situation dramatically. This paper presents current processes and actions that appear in academic work-life aiming for a more ecological approach. As organizations such as Universities are rather stiff structures significant changes require loads of time and authorizations, therefore two approaches are presented: the systematic one and bottom-up coming from individual actions.

Keywords: kaizen, sustainability, academic education

1. Kaizen – method of continuous improvement by the small steps

Kaizen philosophy is a Japanese management methodology. It was more widely distributed along with the increase in the popularity of Lean Management. Kaizen is closely associated with Japanese culture, while the moment of instilling this philosophy for management can be indicated the year 1986, in which Masaaki Imai - master and guru of Kaizen published a book of the same title. Kaizen is a long-standing practice at companies such as Toyota, Honda and Sony. The Japanese word Kaizen means constantly improving, developing, perfecting. (Shook & Narusawa 2019)

The basis of Kaizen philosophy is the assumption that the way a person functions as a member of a specific community requires continuous improvement. This rule applies to every area of life. This perfection occurs in small steps that lead to a constant approach to perfection. One of Kaizen most important messages is that no day should go without improvement in some area of the company's operation or life. (Shook & Narusawa 2019)

Kaizen philosophy, in its assumptions, is an excellent approach for implementing changes towards a balanced approach, both in personal and professional behaviour. When dealing with the problems of the modern world, we are aware of the importance of undertaking

changes in our own behaviour and promoting them among colleagues, students, family and friends. As academic teachers, we have greater responsibility because we take a direct part in shaping the attitudes of people who are about to start a family or find their first job. Therefore an increased interest should be appointed to implementing of Kaizen practises in everyday work life, setting behavioural examples to follow or benchmark.

2. Greener research and collaboration

2.1 Digitalization at university

One of the main tools to make research and collaboration greener is digitization. In many of the top factories in the world, as early as the beginning of the 21st century, physical documentation was gradually being abandoned in favour of electronic document circulation. This solution works not only in manufacturing companies, but also at universities. Over the past dozen or so years, paper indexes for students have been abandoned at the Wroclaw University of Science and Technology. Currently, students, lecturers and administrative employees use one IT system, which contains information on various levels of university functioning: from personal data, to student assessments, to inventory, logistics and financial information. The use of an IT system in an organization such as a university resulted in the organization of procedures and their simplification, which is an added value.

2.2 Digitalization in collaboration and research

Digitization is also observed at the level of European institutions that finance development and research projects. By participating in a number of projects over the past dozen or so years, several significant trends can be observed to increase care for the environment. One of such activities is certainly the limitation of paper documentation for electronic reports. In addition, current travel financing lines significantly reduce travel budgets suggesting the organization of teleconferences. In this way, the carbon footprint resulting from foreign travel is reduced in a systemic way. The presentation of results to project partners is also changing. Currently, in a much simpler and more transparent way you can present the results of work on a tablet or smartphone, without having to present printouts.

3. Greener didactics

Green education also includes enhancing students' willingness and ability in using green technology in everyday practice. Computer and information technologies are one of leading, due to their contribution to clean environment in many industrial applications. Therefore introducing online learning within students curriculum is recognised as one of green practises in any education level. Not only this solutions are less time-consuming for participants, but also give them higher flexibility while reaching for knowledge. It is also considered to produce less paper waste, as whole knowledge needed is stored on the platform, students may access lectures, multimedia presentations, extra materials, and make their own notes in unlike profiles as well as the paper assessment is eliminated. The biggest green side of e-education is recognised in lower carbon emission connected with student travels (Prithi Rao 2016). Where the discussion on this topic may appear, whether students have to still travel to other classes, it is only the matter of timetable organisation, allowing one day a week for on-line education without the necessity of appearing at the University estates (Kostyuchenko & Smolennikov 2018)

Recognising all of abovementioned pros of e-education, one of the bottom-up of academic teachers initiative is green didactic approach, such as: on-line courses, webinars, on-line tests or information sharing. Within the Wroclaw University of Science and Technology individual academic staff undertake efforts to systematize this approach, based on previously realised successful single e-courses. Young generation of academic teachers tends to see and understand the advantages and is willing to put a high effort, required at the begining, in order to change higher education practise into more green and modern. While these actions are supported by the University by providing infrastructure and training within this area, the rest sets upon the teachers. There is no systematic solution or rule, when or which course could be transformed, there are no guidelines for formal requirements on the validity of students participation and evaluation. Special request has to be submitted to the Faculty Council and only with its approval the course can be realised in form of e-course, there are also further requirements of legislation matter to be fulfilled. But nevertheless more e-courses appear each semester, and this trend is a sing of slow but constant change.

4. Greener self-behaviours

Going green isn't something that can be done only in our personal time, we can apply the concepts of sustainability to every aspect of life and everywhere we go. Adding up the fact that as academia teachers we stand up for a role model to hundreds of young students, an educational aspect expands also to office life behaviours. There is always something that can be done that makes work environment a little more Earth-friendly, the most important is to continue the

search for new ways and promote them within work environment. Some of the most common things include using less paper for printing, switching off gadgets like laptops and printers when not in use, using energy saving bulbs and many more.

In recent years it is very visible how many employees and students have changed the transportation habits. Instead of private cars, many have started to use public transport, electric car sharing, electric motors scooters, and scooters but the most popular choices are bicycles as well as city bikes (Horwat 2018). In our team most of people every day bring food from home, packed in reusable containers inside of a storage bag that can be reused as well. Besides obvious eco meaning it has social impact as many people have lunch together in common area. This place is also visible for students to the behavioural pattern is set as well for them. The popular practise is also using filtered water to drink instead of plastic bottles. Every employ is equipped with multi use cutlery, glasses and mugs so the one-time use is eliminated.

Setting the good example and explaining why it is important can go a long way, it is also very effective to invite colleagues to challenges or organize completions between departments where goals are set to be more eco-friendly at the end of a week or month in some aspects. These visible changes allow everyone involved as well as the observers to embody and embrace new mission and goals in greener self-behaviours.

5. Summary

Any transformation is a challenge, it is very hard to leave the well-known, comfortable approaches and replace them with something new, unknown and often difficult to implement or learn by its users. But the digital transformation is rather a need than an option. Within universities it starts with creating new education products and transforming existing products into digital ones, by converting offline lectures into video ones, creating digital texts and quizzes. On the operational side of this transformation, a digitalization of all the common operations would be required, such as: students' admission, registration for lectures and courses, examination, facility management, teacher allocation, scheduling, ect. Universities in Poland are also research centers running numerous scientific projects in cooperation with countless partners from all over the World, where digital possibilities of exchanging data, common planning, and distant communication are already well established. Knowing the Kaizen philosophy, it's assumptions perfectly fits to implementing many small changes at different fields at the same time, helping to achieve, big, synergical effects at the end.

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Experimental studies of the strength of nodal joints of geodesic domes made of wood and fiberglass made on a 3D printer for the Arctic and Northern territories

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Abstract

The article provides an overview of existing structural and technological solutions for the construction of geodesic domes made of wood and polymer plastics. The author of the article proposes to consider this task in a combination of experimental research and engineering solutions. Tests of samples and nodal joints made of fiberglass made on a 3D printer for tensile loads were performed.

Keywords: geodesic dome, wood, plastic, 3D print

1. Introduction

When evaluating the current state of the scientific and technical problem to be solved, it is necessary to refer to the history of spatial dome structures on the example of a geodesic dome (Labudin 2006).

Fuller was most famous for his lattice shell structures – geodesic domes, which have been used as parts of military radar stations, civil buildings, environmental protest camps and exhibition attractions. Their construction is based on extending some basic principles to build simple "tensegrity" structures (tetrahedron, octahedron, and the closest packing of spheres), making them lightweight and stable. The geodesic dome was a result of Fuller's exploration of nature's constructing principles to find design solutions (Fuller 1940).

The practical application of fuller's proposed geometry of the building outline is based on the division of space by vectors. The main unit of this division is a tetrahedron, the faces of the sides of which are located at the shortest distance connecting two points on a curved surface (geodesic lines). The above separation allows you to achieve optimal space filling and the most complete use of the structural strength of materials.

The main advantages of geodesic domes are:

- large load-bearing capacity (the larger the size of the dome, the higher it is);
- rapid speed of installation compared to traditional framed and frameless methods of construction of buildings;
- the weight of the dome elements reduces the cost of zero-cycle materials and work;
- structural and technological features of spatial dome structures are the installation of frame elements made of marked rods and nodes, which reduces the construction time;
- dome structures have an ideal aerodynamic shape with high resistance to seismic, wind and hurricane impacts.

The disadvantages of geodesic domes include the fact that the production of modern building materials is aimed primarily at the construction of buildings made of rectangular materials (plywood, glass, rigid insulation mats). Thus, triangular cells of geodesic domes will require additional labor to trim and fit the material to create external enclosing structures with a large overspend, increasing the cost and labor intensity of manufacturing the building as a whole. It should be noted that all existing patent solutions use metal for the manufacture of the node and connections, in the form of bolts, studs with washers and nuts, which has an extremely negative effect on the state of the dome construction structure as a whole in chemically aggressive environments. As a rule, these are warehouses for storing salts, chemical fertilizers, reagents, etc. (Zhivotov & Latuta 2019, 231-237)

In modern construction, dome structures of geodesic domes are not used enough, which is largely due to the lack of validity of design decisions and the regulatory framework.

The main element of the geodesic dome design is a node connector-an element that connects the core elements to each other.

The authors performed a patent search for existing solutions joint domestic and foreign authors on the basis of which conclusions about the presence of imperfect structural and technological solutions of joints that require significant labor and material. We have studied both the design features of the nodes and the design and technological solutions related to the technologies of installation of domed buildings. Figure 1 shows a selection of the most common patented nodes.

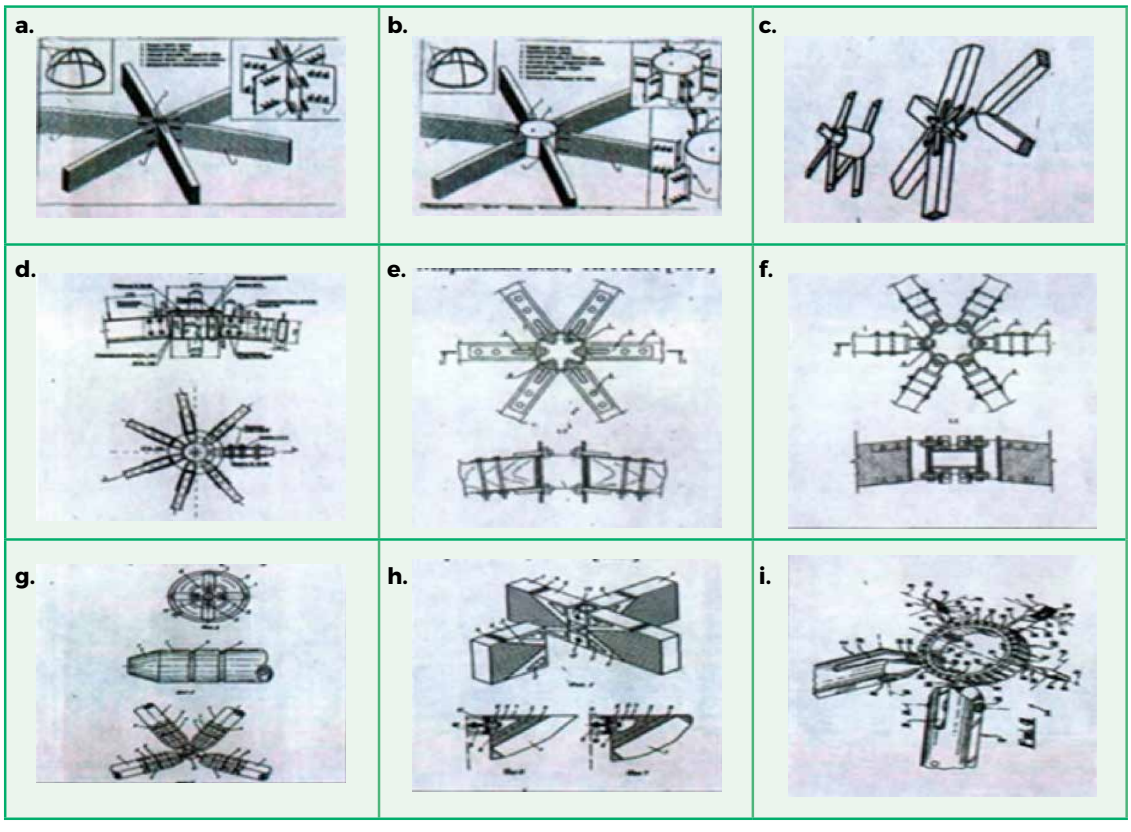

Figure 1. Existing nodal elements of spatial rod systems.
a. (RU Patent 2374 402. 2009) b. (RU Patent 2 570 728. 2015. (Knyazev) c. (RU Patent 154 891 U1. 2015. (Kolesnikov)

The presented diagrams confirm the statement about the complexity of node connectors, their low technological installation, high labor intensity and material intensity of products. Nodal connectors, regardless of the material of the rods, are steel.

The use of a geodesic dome in chemically aggressive environments must include special treatment of metal elements in order to prevent the appearance of corrosion of steel to extend the life of the building structures. Often, concreting of the node is performed, which increases the weight of the building frame, the complexity of installation and, as a result, leads to an increase in the cost of the building as a whole.

Properties of wood and materials based on it are known and specified in the normative literature. However, there are a huge number of types of plastics, all of them differ not only in the initial components, but also in the methods of manufacture, have different physical and mechanical properties and allow us to consider their application in various fields of knowledge.

The authors of the article carry out research on the structural and technological features of the new nodal joint using wood in the form of rods and high-strength fiberglass in the nodal joints (RU Patent 170483 U1. 2017). It is expected to obtain a tangible economic, constructive and technological effect after performing theoretical and experimental research in the field under consideration.

2. Discussion

2.1. Determination of mechanical characteristics of materials for dome units

In the conditions of the Arctic and Northern territories, the issues of speed of installation of buildings, optimization of logistics flows and the use of high-strength materials that can withstand long-term negative environmental temperatures remain important. Such materials, according to the authors of the article, include materials based on wood and plastics.

An empirical study was conducted with experimental tests of samples of heat-resistant fiberglass with the names TOTAL GF-30, TITAN GF-12 and TOTAL GF-30 (N), operating in the declared temperature ranges from + 50 to – 50 degrees.

Production of experimental samples was carried out according to the requirements by printing on a 3D printer (National Standards RU 2016).

During the experiment, the properties of materials under short-term tensile loads under normal temperatures of 18-22 0C were studied. Preparation for the experiment was carried out directly in the premises of The SPbGASU mechanical laboratory (Figure 2a). Before the test, the thickness and width of the working part of the sample was measured in three places: at the edges and in the middle (National Standards RU 2014). In the test recorded the lowest value of the cross sectional area of the sample Fabricated samples were marked in gripping parts on opposite sides of the transverse axis of symmetry of the sample, the batch number and serial number of the sample in the batch (Table 1).

The experiment was conducted according to the requirements on a 10-ton universal Electromechanical machine Instron 5982 (Figure 2b) with a maximum breaking load of 100 kN. The test machine provided linear movement of the active gripper (traverse) with a given constant loading speed and performed load measurements with an error of no more than ±1% of the measured value.

The test sample was fixed in the gripping devices of the breaking machine in such a way that the load

The number of the sample in order	Name of the material
1	TOTAL GF-30
2	
3	TITAN GF-12
4	
5	TOTAL GF-30 (N)
6	

Table 1. Sample specification.

application and the Central axis of the sample were aligned. Regulatory documents prescribe that experimental studies should be carried out so that destruction occurs in the middle part of the sample without destruction in the clamping area. To determine the axial strain in the middle part of the sample, a mounted strain gauge with a base length of 10 mm was installed.

During the experiment, the mechanical properties of plastics were studied. We studied the behavior of a material under load was investigated by phase deformation and the dependence of these displacements.

The results of the experimental data are shown in Table 2 and in the form of graphical dependencies of strain on load (Figure 3) and displacement on load (Figure 4). A total of 2 samples of each material were tested due to the identity of the data obtained.

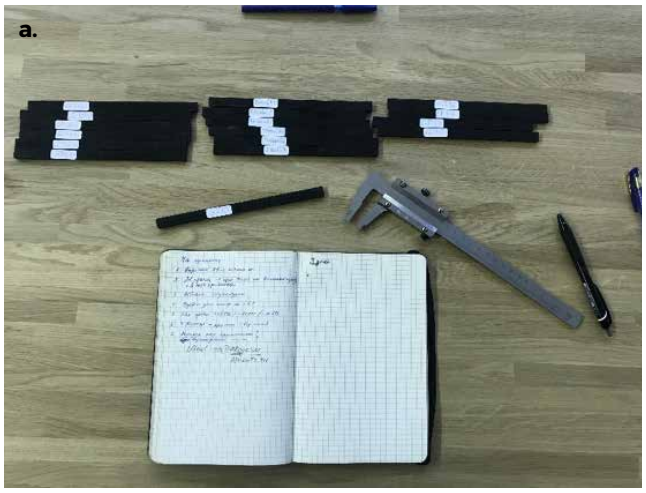

Figure 2. Samples and measuring tools used.
(Photos by Dmitrii Zhivotov)
a. Samples and measuring tools used.
b. The sample in tensile testing machine Instron 5982.

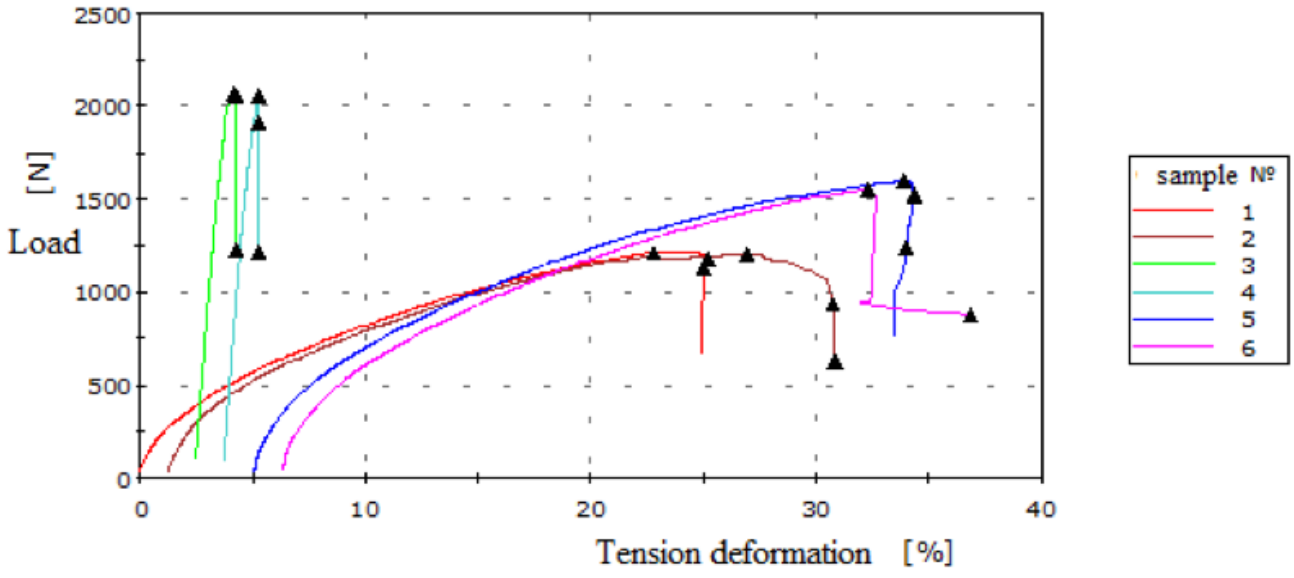

Figure 3. Graph of load dependence on deformations.

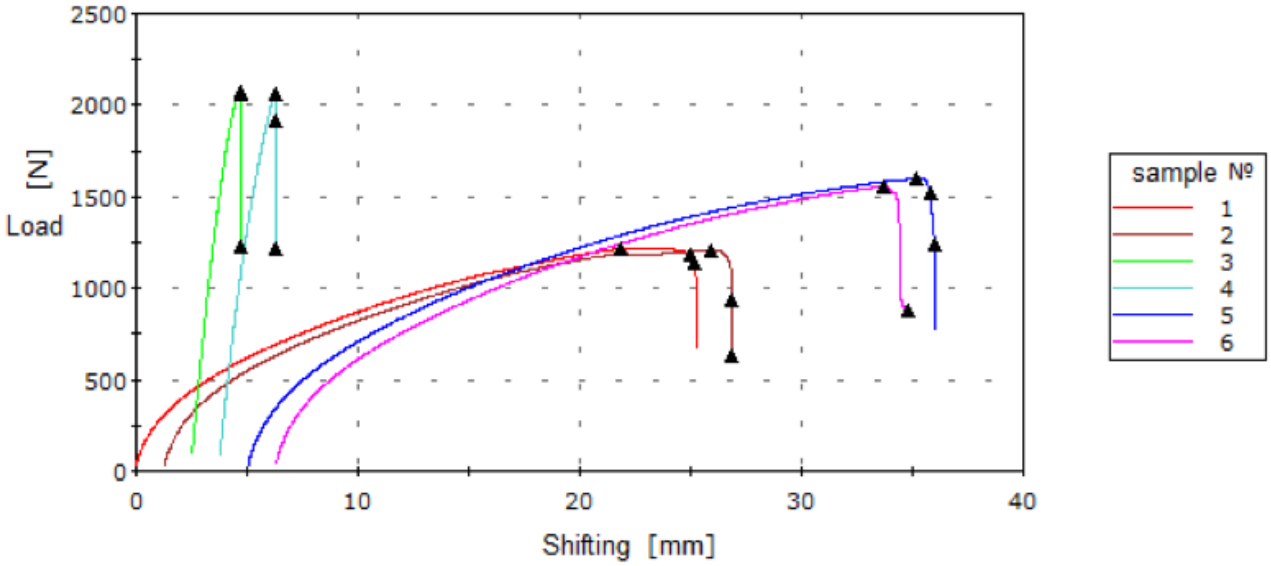

Figure 4. Graph of load dependence on movements.

The results of experimental studies are shown in Table 2.

№	Maxload [kN]	Tensile strength [MPa]	Module [MPa]	Relative elonga-tion [%]	Sample	Section, a*b, мм2
1	1,22	32,41	282,19	25,01	GF30(1)	4x10
2	1,21	32,60	321,30	29,44	GF30(2)	4x10
3	2,08	51,49	4256,21	1,72	TitanGF12(1)	4x10
4	2,06	52,49	4702,36	1,54	TitanGF12(2)	4x10
5	1,60	41,93	313,70	28,97	GF30(N)(1)	4x10
6	1,56	39,14	311,58	30,59	GF30(N)(2)	4x10

Table 2. The results of the experimental data.

The pattern of sample destruction is shown in figures 5 a,b,c,d,e,f.

Figure 5.
a. & b. Destroyed GF30 sample destruction of the material along the fibers.
c. & d. Destroyed sample of Titan GF12 destruction of the material along the fibers;
e. & f. Destroyed sample GF30 (N)destruction of the material along the fibers
(Photos by Dmitrii Zhivotov)

The results of the experiment and the nature of the destruction are combined, indicating the reliability of the data obtained. The graphs and figures show the changes that occur in samples that are typical for brittle materials under the influence of load.

Samples from the GF30 and GF30 (N) material were destroyed gradually, under the influence of the load, the values of deformations gradually increased, moving from the plastic stage to the brittle destruction. The study of the destruction graph shows the identity of the destruction of these plastics with the destruction of wood.

The destruction of samples from the Titan GF12 material was accompanied by a rapid increase in load and brittle destruction with minimal deformations.

2.2. Experimental studies of a joint dome connection for tension in dome structures

Production of the experimental sample was performed in accordance with the requirements of the normative by manufacturing-printing on a 3D printer of elements of the joint (International Standards Office 2014).

The main materials for making a node connection were:

- pine wood of normal humidity for rods;
- total GF-30 (N) plastic for housing, covers, and node connections;

- polyamide d. 12 mm in the form of threaded pins, nuts and washers for assembly of the joint connection;
- steel plates 8 and 10 mm thick for rigging and centering the transmitted tensile forces;
- steel bolts, nuts and washers d. 10 mm for Assembly of the node connection snap-in.

Preparation for the experiment was carried out directly in the premises of The SPbGASU mechanical laboratory.

Preparation for the experiment was carried out in the laboratory premises at a normal temperature of 18-220C. before the experiment, the sample was assembled (Figure 6a).

The experiment was carried out according to the requirements on a 20-ton universal Electromechanical machine Instron 5998 (Figure 6b) with a maximum breaking load of 200 kN.

In the course of the experiment, the mechanical characteristics of the junction made of wood and plastic were studied. We studied the behavior of a material under load was investigated by phase deformation and the dependence of these displacements (National Standards RU 1999)

The results of the experimental data are shown in the form of graphical dependencies of movements on the load (Figure 7). A total of 1 sample was tested (Figure 8).

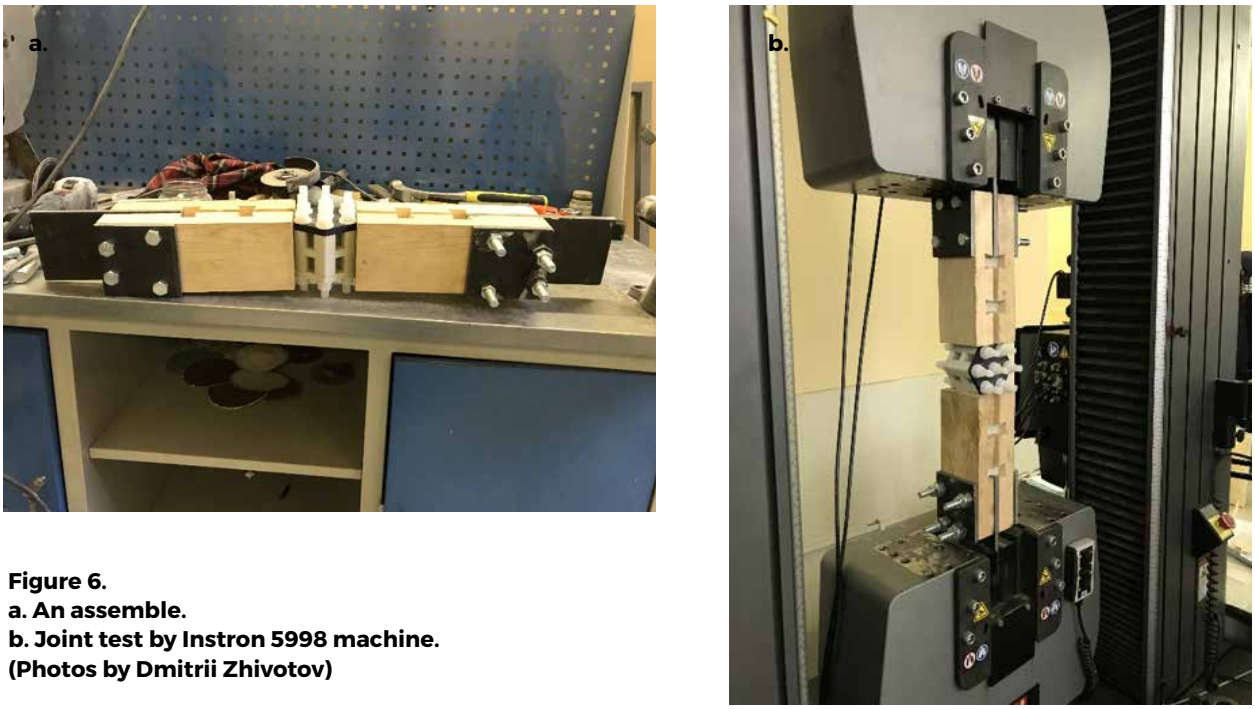

Figure 6.
a. An assemble.
b. Joint test by Instron 5998 machine.
(Photos by Dmitrii Zhivotov)

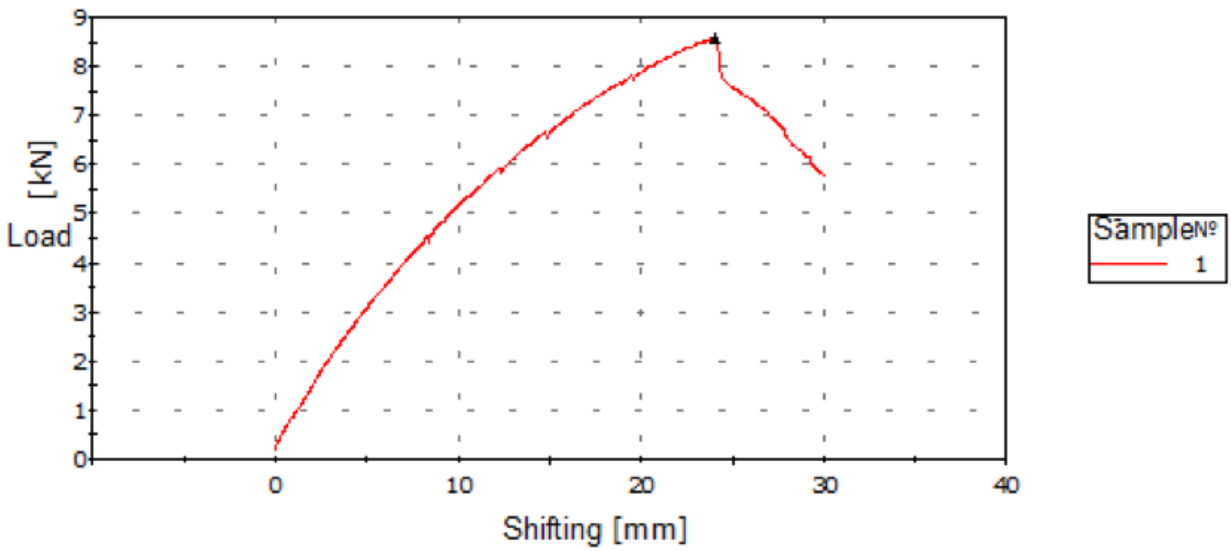

Figure 7. Dependence of movements on the applied load.

Figure 8. The destroyed joint (Photo by Dmitrii Zhivotov)

The destruction of the GF30(N) fibreglass junction body was gradual. under the influence of the load, the values of deformations gradually increased, moving from the stage of plastic deformations to brittle destruction. Comparison of experimental results and mathematical results of calculations confirm their identity.

The destruction occurred by pulling the blade out of the body of the node when it reached 30% of the expected load value of 856 kg, due to the insufficiency of its cross section. It is worth noting that the design of the nodal joint body was calculated based on the characteristics stated by the plastic manufacturer, but the experimental studies of the material properties showed real values of the strength limit.

Printing the body of the nodal joint on a 3-D printer was performed in conjunction with the production of test samples, for this reason it was not possible to change the cross section of the nodal joint according to real strength indicators by manufacturing a new part.

3. Conclusion

1. Various physical and mechanical properties of plastics, which are claimed by manufacturers, require additional study and consideration for use as a load-bearing structural element, in order to find the optimal solution that meets the ratio of cost and properties.

2. The study of the nature of destruction indicates the instability of the properties of samples made from polymer plastics by 3D printing. The technology of production (printing) of samples on a 3D printer significantly affects the strength properties of the material. The main defects that appeared under the action of the destructive force were identified:

2.1. Absence of uniform monolithic sintering of raw materials in the production of samples;

2.2. The presence of surfaces that are not filled with material (shells, micro-holes), which lead to destruction along this cross-section;

2.3. The speed of printing significantly affects the quality of samples.

Thus, the authors decided to continue studying existing on the construction market of polymeric materials made by different manufacturing technology, different from 3D printing, to study them as load-bearing structural elements in building structures spatial domed buildings.

3. Experimental studies of the nodal connection have shown the viability of the proposed design and technological scheme. During the experiment, the behavior of individual elements and the design of the node as a whole was studied. The justification for the need for additional research is the result of testing the node connection with the destruction in the body of the node along the smallest cross section.

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Features of special services for guests from Asia residing at Russian hotels and various country “friendly” programs in Russia

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Abstract

The article shows the experience of organizing special services for tourists from Asia in Russian hotels. The needs of tourists from Asia are very different from the needs of tourists from other regions. The difference is due to cultural characteristics. In order to better serve such tourists, several ”friendly” programs have appeared in Russia.

Keywords: Inbound tourism in Russia, human needs, hospitality, tourism and hospitality industry, China Friendly, India Friendly, Halal Friendly, Kosher Friendly, Japan Friendly

1. Introduction

Russia is a popular destination for inbound tourism. The number of tourists is growing every year. Inbound tourism in Russia in 2019 increased mainly due to tourists from the countries of South-East Asia and countries of the European Union (EU) — Germany, Italy and France. According to the results of the three quarters of 2019, the increase in the number of foreigners, who came to Russia for tourist purposes, amounted to 20%.

China remains the leader in the number of tourists. But in terms of the dynamics of the increase in tourist traffic, it was bypassed by Korea, Germany, Italy, Spain. The number of tourists from the UK and the US is also growing.

There are several reasons for this. The increase in the number of foreign tourists in Russia is due to ”deferred demand” after the world Cup in 2018. The growth of the incoming tourist flow was influenced by the expansion of the geography of Russian tourism. For example, Arctic and other regions of the Russian Federation. The introduction of electronic visas for the regions of Vladivostok, Kaliningrad and St. Petersburg was of great importance for increasing the number of tourists.

According to unofficial data in 2019, during the period from January to September, 19 million 64 thousand trips of foreign tourists were made to Russia, which is almost unchanged compared to last year. Official data on inbound tourism for 2019 has not yet been published.

Since the subject of this article is the specifics of serving certain categories of tourists, the tables below show the sample statistics of 2016-2019, showing the number of entries to Russia from the Asia regions. Tourists from this region are becoming more and more all over the world. Sometimes hospitality companies find it difficult to serve them due to special needs. (Skobeltcyna 2017, 117)

2. Conceptual Definitions

In this article we will talk about countries and regions whose ethno-cultural traditions have a strong influence on the service of enterprises in the hospitality industry.

Some tourists easily adapt to any place, while others experience the inconvenience associated with meeting the basic needs of food, sleep, hygiene, safety, etc. The reason for these inconveniences is due to ethno-cultural traditions, religion, class, profession, etc. Some religions, such as Islam or Judaism, strictly regulate the daily life of believers. Many cultures maintain special food traditions.

Therefore, hospitality companies can offer representatives of different cultures and religions some specific types of service. This is necessary to increase the number of guests and get positive feedback.

However, it is important to separate the daily and recreational needs of a person due to his religious affiliation and the religious aspirations of a person carried out during the pilgrimage. Pilgrimage tourism is carried out by specialized organizations with a different level of requirements, so this segment will be bypassed here.

In this article, we will look at the features of the service for tourists from Asia. For the organization of this service, special "Friendly" programs were created to help Russian hospitality enterprises.

China Friendly

Due to the growing number of tourists from China, the «World without borders» Association initiated the "China Friendly" program in 2014 and later registered it.

The reasons for the appearance of the program are that the Chinese, due to the difference in cultures and a strong language barrier, have a number of special requirements for tourist service facilities, which are currently not taken into account in Russia by the vast majority of hotels and other tourist facilities.

At the same time, for hotels that meet these requirements, there are almost no channels for bringing information about themselves to the target audience in China.

The goals of the program are is to adapt the service enterprises to the needs of tourists from China. Participants of the program – hotels, restaurants, museums, tour offices, trade enterprises, etc.

	2016	2017	2018	2019 – January-September
China	1289	1478	1690	1594
India	59	71	86	73
Iran	70	80	47	33
Israel	179	182	225	206
Japan	85	102	105	93
South Korea	161	254	361	356

Table 1. Entry to the Russian Federation of foreign tourists from Asia (thousand people) *
*** 2016-2017 - official statistics of the Federal Agency for tourism; 2018-2019 - alternative source (Tourstat 2018, 2019).**

More than 100 million Chinese tourists annually go to travel to different countries of the world, but only 1% of this number still comes to Russia. Russia is the third most visited Chinese country in Europe. Of course, China is a huge market, and Russian business is interested in interacting with it.

Basic requirements for participants of the "China Friendly" program:

- ability to pay with cards of the national payment system of China - Union Pay
- uninterrupted free Wi-Fi
- free hot drinking water in hotels
- adapters for sockets of the Chinese sample
- traditional Chinese food and chopsticks for breakfast at the hotel
- information in Chinese and (or) staff with knowledge of Chinese.

In addition, hotels can offer Chinese press, the usual Chinese hygiene products.

In General – this set of services is not difficult and not particularly expensive for the hotel. China Friendly is already available in 24 regions of Russia and Kyrgyzstan. In Irkutsk, the first China Friendly hotel was the "Cote d'azur – Irkutsk". Lake Baikal and its surroundings are traditionally popular among tourists from China. In Ufa, China Friendly hotels are Hilton Garden Inn Ufa Riverside and "President Hotel". More recently, Murmansk joined the program – the Lights of Murmansk hotel was certified by China Friendly.

A. Sibirkina, head of the "China Friendly" program, noted: "the Adaptation of the service for Chinese tourists is important not only in such popular cities as Moscow and St. Petersburg, because 45% of the "visa-free" tourist flow from China was on regional routes". (Hotelier. Pro 2016b)

Currently, 8 hotels participate in the China Friendly program in Saint Petersburg. 6 shopping centers, seven restaurants, one museum.

The full list of participants is available on the website https://chinafriendly.ru/.

Halal Friendly

Inbound tourism from Muslim countries has a huge potential, since Muslims are about a quarter of the world's population. By 2020, experts predict that the Halal tourism market will reach 150 million people with the possibility of growth in the next 5 years to 200 million tourists. (Association of Tour Operators 2016)

Today, Russia ranks only 49th in the ranking of countries that are convenient for Halal tourism. (Hotelier. Pro 2016a)

Halal is what is allowed in Islam: daily habits, behavior, food, religious rites. It is problematic for Muslims to give up all this on trips.

Halal-friendly hotels are presented on the resource https://ru.halalbooking.com/, which exists in the Russian version.

The international center for standardization and certification "Halal" has developed a standard "Halal Services in hotels and other accommodation facilities". The text of the standard can be obtained by placement companies that have submitted a corresponding application to the standardization Center.

Similar to the classical system of "stars", the Halal classification system is based on the five moons.

Basic requirements for Halal hotels:

- no images of people or animals in the hotel
- providing the schedule of prayers
- the presence of the Koran, prayer mats and a direction sign for Mecca in the rooms
- Halal food in the hotel restaurant or information about nearby Halal catering establishments
- availability of a bathroom in the room with accessories for performing ritual ablution
- selection of male and female areas in the hotel Spa
- availability of multi-room rooms and connecting rooms to accommodate a Muslim family
- prohibition of alcohol
- staff must have appropriate training in the basics of Islam, serve customers in accordance with the rules of Islamic ethics and in compliance with the rules of separate service for men and women
- staff uniforms must meet the Islamic ethics.

Park Inn by Radisson Izmailovo Moscow - 4-star hotel in Moscow, officially certified by the international center for standardization and certification "Halal" with the assignment of category 4 moons. Prayer rooms are available on request, Qibla direction is available in the rooms, and the Koran and prayer Mat are available on request. The hotel's menu includes Halal dishes and ensures that there is no alcohol in the room (if you book a hotel through HalalBooking.com alcoholic beverages will be removed from the rooms). As a bonus, the hotel offer an excursion to the Moscow Cathedral Mosque with a 50% discount.

Currently on the site HalalBooking.com only one Russian Halal hotel is offered – the four-star Gulf Stream Hotel in Kazan, which has been fully adopted under the Halal format: it does not sell alcohol, serves Halal food in restaurants and cafes, and there are also Halal shops in the hotel and nearby. Swimming in the pool is divided into women's and men's time.

However, it is not easy to find its Halal status on the Gulf Stream Hotel website, which sometimes causes bewilderment among guests who were counting on a holiday with alcohol. As a result, some visitors are dissatisfied.

India Friendly

Russia's largest tourism partner could be India – a country with a developing economy and a population of about 1.3 billion, where almost half are middle-class. An important factor contributing to the development of tourism is the friendly relations between the two countries, regular meetings at the highest level, and active economic contacts. All this creates a positive image of Russia in the eyes of Indians, warms their interest in the country, forms a desire to visit it.

The tourist flow from India to Russia is growing every year, although its indicators are still small (Table 1.)

2017 was the year of India in Russia, due to the 70th anniversary of the development of diplomatic relations between the two countries since India gained independence from Great Britain in 1947. Many events were timed to this event, including in tourism.

The program "India Friendly" was officially launched in Russia in 2016, when an Agreement was signed on cooperation in developing Russian-Indian relations in the field of tourism and hospitality between the Russian information center (RIC, Mumbai), Russian Union of travel industry, the Department of hotel and restaurant business of St. Petersburg State Economic University, the national marketing Agency "Visit Russia". The program is also implemented with the support of the Federal Agency for tourism (RUSSIATOURISM) (Skobeltcyna 2019, 101)

The program aims to develop inbound tourism from India to Russia. Interest in our country on the part of Indians appeared in the last five years and continues to grow.

The Russian-Indian Information Center (RIIC) was established in Saint Petersburg to implement the "India Friendly" program. The main tasks of the RIIC are to develop methodological documents of the program, in particular, requirements for hospitality enterprises; training of tourism and hospitality enterprises in the specifics of working with tourists from India; inspection of enterprises for compliance with the program requirements; consulting on the reception of Indian tourists, advertising and marketing.

In March 2017, the first hotels in Moscow, St. Petersburg, Kazan and Sochi were trained. Leading Indologists of Russia were involved for training and subsequent examination. The training program included sections on the modern culture of India, mentality, religious views of Indians, peculiarities of communication, food priorities.

The most difficult point of the "India Friendly" program is Indian food. Indian cuisine has pronounced features, including a commitment to spices, a ban on the use of beef and very often found complete vegetarianism. In addition, there are specific products and dishes, without which the Indian feast cannot do, such as, for example, dal (lentils), basmati rice, chapati cakes, yogurt, pastries without eggs, etc.

Training in Indian cuisine consists of two parts. First, this is a story about the features of Indian food. Second, training cooks to prepare Indian dishes. The first part is necessary for all front office employees to understand the importance of traditional food for Indian tourists.

The basic requirements for India Friendly hotels:

- Meals: breakfast: at least 5 kinds of hot Veg meal, an indication of the tablets vegetarian / non-vegetarian meal, an indication of the presence of beef in the non-vegetarian menu, Indiam meals in some hotels; Indian lunches and dinners for group/FIT in the hotel's restaurant (Veg/Non Veg/ Jain); English Menu
- Communications: English speaking staff
- Equipment: Website, information materials, navigation in English language; Availability to access the English-language press; The ability to make payments by credit cards (Visa, Master Card); Adapters for electrical appliances (Asian standard, to give together with the key)
- Services: Able to accommodate groups of 10 people; Tea, coffee, hot water (cooler in the hallway or kettle in the room); Daily drinking water (free 1/2 liter per person per day in bottles or coolers).

Today, the India friendly program is more than three years old. Participants of the program – 19 hotels in six regions of Russia and Kazakhstan.

The full list of participants can be found on the official website of the program http://www.india-friendly.ru/отели.html

Japan Friendly

The youngest program from similar - Japan Friendly. 2018, was declared the cross year of Russia in Japan and Japan in Russia. In 2019, 250,000 tourists from Japan were expected. Japan Friendly started in 2018, now the program involves 5 regions of Russia, 16 hotels.

It is aimed at attracting Japanese tourists to Russia by providing a level of comfort and service that they are accustomed to. On the official website of the program (japan-friendly.ru) we can find out about its goals:

- to establish a network of businesses catering to Japanese guests that meet their expectations
- to promote Russian national touristic product in the Japanese market
- to extend geography of Japanese tourists' travel in Russia
- to stimulate visits (including repeated visits) from Japan
- to increase average length of stay of Japanese tourists in Russia
- to educate, train and certify Russian businesses working in tourism industry as program participants.

Japan is a country with an ancient culture and distinct features. You need to know this when working with Japanese tourists. At the same time, the Japanese quietly put up with any conditions, but they should know about it in advance.

Here are some preferences of Japanese tourists. In the hotel they prefer twin rooms, bath, not shower – because of a tradition of taking a bath at the end of the day.

When Japanese tourists come to Russia, they, unlike tourists from other Asian countries, are happy to try Russian cuisine. Therefore, the restaurant menu should be with pictures or in Japanese, since most of them do not speak English. And before eating, we recommend giving them wet towels, you can even disposable.

Kosher Friendly

Another religion that extremely strictly regulates the daily life of its supporters is Judaism with the traditions of kashrut (or kosher food). There is no official program with this name in Russia yet. But the hotel industry has recently seen a small but steady increase in the number of hotels for Orthodox Jews. Based on Jewish customs, the hotel room should be quiet, and the interior should be designed in calm colors.

On Shabbat the hotel refuses to use electronic cards to open doors and switches to classic keys, electric photocells are turned off, there is a transition to automatic lighting, hotels have special Shabbat elevators that automatically stop on each floor. Staff must be dressed to special standards. It is desirable that the staff or at least the hotel Manager were Jews.

Mostly, kosher hotels open either in or near historic Jewish neighborhoods. For example, in London, the famous "Kosher Hotel Croft Court" is located in Golders green, where Jews traditionally settled. The Venetian hotel «Giardino Del Ghetto» - on the territory of the New ghetto.

In ordinary Russian hotels, it is hardly possible to organize a full set of these services for Jews. More often hotels offer Orthodox Jews, for example, kosher food. While in St. Petersburg, where kosher food is personally controlled by the chief Rabbi Menachem-Mendel Pevsner, the only official kosher restaurant is "Lehaim", located on the territory of the Great choral synagogue and has rooms for 30, 100 and 200 people. There is also a "GoldenCafe / Golden cafe", and several Jewish restaurants.

The Synagogue has a Kosher store, where you can buy kosher products, Souvenirs and literature. The Great choral Synagogue of St. Petersburg, which regularly receives Jewish delegations from different countries, deals with special services for Jews. Hotels located near the Synagogue ("Premiere", "Alexander house") offer special service to guests who profess Judaism (for example, kosher food, standard keys to rooms on Shabbat, etc.).

As for specialized kosher hotels, until recently they were not in St. Petersburg. Only in 2016, a guest house was opened at the synagogue, which was certified as a kosher mini-hotel "Malon" with 6 rooms, accommodating only 14 guests.

3. Conclusions

We have considered examples of organizing special services for tourists with bright ethno-cultural and religious features of everyday life in Russian hotels. This service belongs to the category of "client-oriented technologies" in the hotel. It is necessary to increase the competitiveness of hotels, to attract new customers, to get good reviews. (Skobeltcyna 2018)

Special service is easiest to do in small hotels. In large hotels, narrow specialization is not possible, but it is possible to allocate part of the hotel for a special service. For example, in the Moscow hotel "VEGA" part of

the floors and rooms were specially adapted for the needs of tourists from India.

In large hotels, you can do something that does not require a lot of money, for example:

- teach staff the specifics of service of visitors with specific ethno-cultural characteristics, or invite for service staff who speak the language and are familiar with the cultural traditions of specific guests
- buy specialized equipment, allocate and equip premises for special needs (prayer rooms, separate kitchen areas, separate areas for men and women)
- pass certification (China, India, Halal or kosher)
- arrange a separate entrance or passage for placing Muslims near prayer rooms in a separate block of rooms from other visitors
- provide the possibility of dividing the restaurant hall with sliding walls to prevent Halal food in the same room with visitors who drink alcohol or wear immodest from the point of view of believers clothing.

Large hotels can combine resources to maximize their use.

In conclusion, it can be noted that the world is extremely diverse and will never be one. Competition in the modern hotel business is very high, so it is very important for the hotel to meet the needs of each guest as much as possible.

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The influence of state regulation on the formation of a barrier-free environment at hotel enterprises in Russia

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Abstract

Nowadays the existing infrastructure at hotel enterprises for people with limited mobility is not always properly adapted. This circumstance indicates the lack of effectiveness of the national state in relation to people with limited mobility. However, the development of such a destination as a couple of tourism leads to an increase in guests with disabilities. Most hotel companies do not focus on creating this infrastructure for various reasons. Therefore, the relevance of this study is determined by the fact that the availability of state support in the development of an accessible environment for people with limited mobility is essential for their integration into society, including in the field of tourism and hospitality.

Key words: barrier-free environment, employment, people with disabilities, barriers, people with limited mobility

1. Introduction

Currently, tourism is becoming more accessible for people with limited mobility. Creating a barrier-free environment for hotel enterprises also plays an important role in attracting guests and can become a serious competitive advantage. Attention to the special needs of tourists helps to increase the tourist attractiveness of the region as a whole and becomes a priority every year in the hotel industry.

In this regard, the state as the main participant in the development of society is developing a set of measures for the correction and establishment of various processes in the country. On the issue of creating a barrier-free environment, the state can use several methods of influence. Fundamental are state target programs and fiscal policy.

2. State Program of the Russian Federation "Accessible Environment"

The main document regulating the development of a barrier-free environment for people with limited mobility in Russia is the state program "Accessible Environment", approved by Decree of the Government of

the Russian Federation No. 363 of March 29, 2019 "Approving the State Program of the Russian Federation" Accessible Environment ".

The state program is a strategic planning document that contains a set of planned activities that are interlinked by tasks, deadlines, implementers and resources, and public policy instruments that ensure, within the framework of the implementation of key state functions, the achievement of priorities and goals of state policy in the field of socio-economic development and national security of the Russian Federation. (Portal of state programs of the Russian Federation)

The responsible executor of the accessible environment program is the Ministry of Labor and Social Protection of the Russian Federation. The fundamental goal of this program is to create legal, economic and institutional conditions conducive to the integration of persons with disabilities in society and to raising their living standards.

The state program "Accessible Environment" includes 3 subprograms:

1. Ensuring conditions for the accessibility of priority facilities and services in priority areas of life of people with disabilities and other low-mobile groups of the population;

2. Improving the system of comprehensive rehabilitation and abilitation of persons with disabilities;

3. Improving the state system of medical and social expertise.

This program is designed to be implemented by 2025 and is divided into 5 stages:

Stage I - 2011 - 2012

Stage II - 2013 - 2015

Stage III - 2016 - 2018

Stage IV - 2019 - 2020

Stage V - 2021 - 2025.

The total amount of budgetary appropriations of the federal budget and the budgets of state extra-budgetary funds is 702,312,949 thousand rubles.

According to the report of the Ministry of Labor on the implementation of the state program of the Russian Federation "Accessible Environment" for 2011-2025 in 2018, the implementation of the state program is recognized as effective (Ministry of Labor and Social Protection). In addition, according to official data for 2015, 48 514 602.4 thousand rubbles were spent on the state program "Accessible Environment". This suggests that the proposed activities are carried out in accordance with the plan and are considered effective.

3. Other regulations governing barrier-free environments

Moreover, in addition to the state program for the development of an accessible environment, there are certain documents regulating the functioning of a barrier-free environment, such as (SP 136.13330.2012):

1. Federal law dated 30.12.2009 N 384 "Technical regulation on the safety of buildings and structures"

2. Federal Law dated 24.11.1995 N 181 "On the Social Protection of Persons with Disabilities in the Russian Federation"

3. SP 137.13330.2012 Living environment with planning elements accessible to people with disabilities. Design rules

4. SP 139.13330.2012 Buildings and premises with work places for disabled people. Design rules

5. GOST R 52131-2003 Means of displaying information are iconic for the disabled. Technical requirements

6. GOST R 55641-2013 Lifting platforms for the disabled and other MGN. Dispatch control. General technical requirements

7. GOST R 55956-2014 Lifts. Special safety requirements for elevators used for the evacuation of disabled people and other people with limited mobility

As for hotel enterprises, it can be said that organizing services for guests with disabilities involves the creation of an appropriate hotel infrastructure, which is based on the principles of universal design. Universal design - the design of objects, environments, programs and services, designed to make them as much as possible suitable for use for all people without the need for adaptation. (SP 59.13330.2016) These principles of universal design are governed by the following document: SP 59.13330.2016 "Accessibility of buildings and structures for people with limited mobility".

Analyzing this document, we can distinguish several important elements of the infrastructure of the barrier-free environment at the hotel enterprise, shown in Table 1:

Element	Characteristics	№
Affordable restroom cabin	There should be free space in the cockpit for turning the wheelchair. It should be provided that space should be provided next to the toilet for the placement of a wheelchair, as well as hooks for clothes, crutches and other accessories, the installation of stationary and folding support handrails, swivel or folding seats.	p. 6.3.3
Wireless help call button	Closed spaces of buildings (accessible rooms for various functional purposes: restrooms, elevators, changing rooms, etc.), where the disabled person can be alone, as well as elevator halls adapted for safe areas and safe areas must be equipped with a two-way system communication with the dispatcher or the duty officer.	p. 6.5.8
Means of informing	In places where there are elements of the building inaccessible to people with disabilities (entrances / exits, stairs, elevators, etc.), direction signs are set that indicate the path to the nearest accessible element.	p. 6.5.1
Contrast marking	To facilitate identification by visually impaired people and people with cognitive disabilities, use contrasting color combinations in the equipment used (door - wall, handle; sanitary device - floor, wall; wall - switches, visual media, etc.)	p. 6.4.1
Tactile tablets using embossed signs and symbols, as well as braille	Must be located next to the door on the side of the door handle for people with visual impairment: before entering the building, before entering the interior.	p. 6.5.9
Mnemonic diagram	For a preliminary study of the space of the room in order to independently move in the room without an accompanying person.	p. 8.1.6

Table 1. Elements of a barrier-free environment at a hotel enterprise.

Speaking about the fiscal policy of the state in relation to enterprises in order to create an accessible environment, it is important to note that until 2015, the Federal Law dated 24.07.2009 No. 212 was in force, according to which for employers making payments and other remuneration to individuals who are disabled I, II or Group III, in 2012-2014 reduced premium rates were in effect. However, in 2015, this federal law ceased to operate due to the end of the transition period when the system for calculating social payments changed.

At the moment, insurance premiums at enterprises with limited mobility are carried out under general conditions. In this regard, enterprises have no interest in creating jobs for people with limited mobility, and, accordingly, creating a barrier-free environment.

Nevertheless, the evolution of the attitude of society towards people with limited mobility has become noticeable and leads to the need to introduce changes in the urban infrastructure and in hotel enterprises in particular. For hotel enterprises, the issue of adapting infrastructure for the needs of people with disabilities is as relevant as it is for medical centers, cultural, entertainment, sports and educational institutions.

The strategic goal of social protection of people with disabilities, proclaimed by the state, should be achieved by combining the provision of various types of social security with measures to rationally form tourism opportunities and create adequate living conditions for people with limited mobility.

This relationship of social security and tourism development is an argument that determines the need for joint development of legal regulation of these areas of activity.

4. Conclusion

In conclusion, it is important to note that at this stage, hotel companies and society as a whole are moving towards creating a comfortable accessible environment for people with limited mobility, as evidenced by the introduction of the state program "Accessible Environment" and the development of other legal acts. However, today it is difficult to assess the effectiveness of the implementation of planned activities, since the number of traveling people with limited mobility still does not match the number of people who want to make tourist trips. In this regard, the state needs to develop a more effective set of measures that will help regulate not only the technical minimum at the enterprise but will also contribute to the development of socially oriented business in the country. Creation of preferential tax rates. Thus, by increasing the number of enterprises with the necessary infrastructure, the number of low-mobility guests and employees will increase.

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