ICTM 8/2022

Book Series Editors:
Jolanta Kowal (Ed.)
Jarosław Klebaniuk (Ed.)
Juho Mäkiö (Ed.)
Ewa Pańka (Ed.)
Piotr Soja (Ed.)
Ralph Sonntag (Ed.)
Paweł Weichbroth (Ed.)

BOOK SERIES: ICT Management in Psycho-social and Economic Research for Human Development (ICTM)

The digital innovation in information systems, virtual management and their impact on sustainable development in crisis conditions

Proceedings of 8th International Conference on ICT Management for Global Competitiveness and Economic Growth in Emerging Economies ICTM 2021

Wroclaw, Poland, October 26-28, 2021

Booklet of Abstracts

University of Wrocław, Poland

Polish Chapter of Association for Information Systems (PLAIS)

The College of Management "Edukacja", Poland

Polish Association of Analytical Psychology (PTPA)

Cracow University of Economics, Poland

University of Applied Sciences Emden / Leer, Germany

Hochschule für Technik und Wirtschaft Dresden, Germany

AIS Special Interest Group on ICT and Global Development (SIG GlobDev), USA

Book series: ICT Management in Psycho-social and Economic Research for Human Development

The digital innovation in information systems, virtual management and their impact on sustainable development in crisis conditions

Proceedings of 8th International Conference on ICT Management for Global Competitiveness and Economic Growth in Emerging Economies ICTM 2021

Wroclaw, Poland, October 26-28, 2021

Booklet of abstracts

For all papers accepted into ICTM 2021 and ICTM 2022, authors of accepted papers will retain copyright.

However, by submitting a paper, authors do agree that ICTM editors can publish and reproduce any accepted papers in the ICTM 2021 and ICTM 2022 monographs or through other publications vehicles.

No further reproduction, copy or transmission may be made without written permission from the individual authors.

Papers have been double-blind peer reviewed before final submission to the monograph.

These ICTM Monograph will be submitted to the Thomson ISI for Indexing.

Further copies of this book can be purchased from: http://ictm2021.edukacja.wroc.pl/

The book series review committee:

Cristina Turcu, University of Suceava, Romania

Cornel Turcu, University of Suceava, Romania

Jaroslaw Wąsiński, College of Management "Edukacja", Poland

Miroslawa Wawrzak-Chodaczek, University of Wrocław, Poland

Krystyna Weglowska-Rzepa, PTPA, IAAP, Poland

Paweł Weichbroth, Gdańsk University of Technology, Poland

Ewa Winkler, The Association of Jungian Analysts in Poland, Poland

Monika Woźniak, University of Gdańsk, Poland

Stanisław Wrycza, Univeristy of Gdańsk, Poland

Monika Ziobrowska, University of Wrocław, Poland

Wiktor Żłobicki, University of Wrocław, Poland

Preface – from the ICTM 2021 Chairs.

The digital innovation in information systems, virtual management and their impact on sustainable development in crisis conditions

This conference aims to broaden our understanding of various aspects of information and communication technologies (ICT) and information systems (IS) in the context of innovations in sustainable development. The primary focus is on emerging age-based digital divides that are also detectable in the labor market, violated – due to broad technology deployment – citizenship empowerment and inclusion, state policies, and action is undertaken to ensure senior citizens support through ICT-based networks. We put much emphasis on systems, models, and methods fostering ICT innovations. The topics of the conference are described below.

The conference focused on the ICT and IS development, virtual management, and their impact on different aspects of sustainable development, possible in crisis circumstances. We understand that sustainable development is a positive socio-economic change that does not undermine ecological and social systems (Rees, 1989, FAO, 2021).

We are especially interested in finding answers to the following questions concerning sustainable development:

1. How can digital innovations in ICT/ IS be oriented towards achieving clear ecological, social, and economic goals in crises?

2. Can the sustainable development policy impose ecological restrictions through the digital innovations in IS on the consumption of materials, promoting quality development at the collective and individual levels in crisis conditions, such as lockdown and pandemics?

3. What kind of virtual government intervention, virtual leadership, and virtual cooperation from the private sector support sustainable development in crisis conditions?

4. Is it possible to integrate and coordinate policies on all spatial scales and between the relevant political jurisdictions under crisis conditions virtually by IS?

5. If and how sustainable development depends on virtual informed, open, and equitable educational, planning, and political processes by digital innovations IS?

6. What methods and techniques of social influence can be applied ethically through ICT or IS to support the pro-ecological activity of different communities?

7. How to measure the virtual digital communications among industrial enterprises in crisis circumstances for sustainable development?

8. What are the virtual aspects of industrial branding using IS for sustainable development?

9. How can we use social media in virtual marketing for sustainable development ethically?

10. What is the impact of social networks and social media on marketing for sustainable development, especially in crisis circumstances?

11. What is the use of mobile media for sustainable development, especially in crises?

12. How can both firm-client relationships and managing the sales force be virtually formed for sustainable development?

13. How to effectively implement management in a virtual company for sustainable development at the level of individual units and globally?

14. What are the barriers to and enablers of virtual management in industrial enterprises?

15. What are the critical competencies required to manage new virtual marketing communications in an industrial setting?

16. What is the psychological impact of a pandemic on society?

17. Can psychological support and online therapy be effective?

We were interested in theoretical and empirical, quantitative and qualitative research, including single and multiple case studies. The authors of the following abstracts answered many of the questions posed above. We invite you to familiarize yourself with them.

Jolanta Kowal

Jarosław Klebaniuk

Juho Mäkiö

Ewa Pańka

Piotr Soja

Paweł Weichbroth

Karolina Dunaj

Is There an Optimal Level of Digitalization?

By

Swen Günther, Hochschule für Technik und Wirtschaft, Dresden, Germany

swen.guenther@htw-dresden.de

ABSTRACT

The topic "Industry 4.0 & Digitalization" spans across almost all company areas and processes today. Manager strive to increase efficiency by implementing related applications and by automating process steps. Therefore, conventional financial instruments are often used in order to calculate the productivity of single digital solutions. For supporting the decisionmaking process, the focus is often (only) on the question of whether the digitalization of a process is economically feasible or not. A comprehensive mathematical model to calculate the cost-efficient portion of digitalized and manual processes within a business process has not yet been developed. Obviously, this would be highly appreciated since many companies worldwide are pursuing a so-called hybrid strategy with partially automated production processes and selective use of digital technologies. The focus of the present paper is on the question, how it is guaranteed that the solution found actually leads to the minimum costs.

Keywords: Digitalization, Process Management, Cost Efficiency, Optimization Model.

Virtual Management in COVID-19 Crisis

by

Ali Reza Afshari, Department of Industrial Engineering, Shirvan Branch, Islamic Azad University, Shirvan, Iran, afshari@mshdiau.ac.ir

Jolanta Kowal, University of Wrocław, Institute of Psychology, Wrocław, Poland

Mahmood Khorsand, Anesthesiology and Critical Care, Faculty of Medicine, Mashhad University of Medical Science, Mashhad, Iran

ABSTRACT

The impacts of COVID-19 on workers and workplaces across the globe have been dramatic. Therefore, this study aims to analyze the influence of virtuality style in innovation organizations to deal with the crisis. This study also identifying issues for future research and insights to inform solutions.

Constructing a research project: what should we pay attention to when applying qualitative methods? Discussion of the proposals of G. King, R. Keohane, S. Verba.

by

Magdalena Kapała, University of Wrocław, Poland, magdalena.kapala@uwr.edu.pl

ABSTRACT: In this article, I will discuss the position of King, Keohane and Verba . Referring directly to the issues of sociology and political science, these authors set the main goal of their considerations to show how to design a research that brings accurate conclusions about social and political life. Many of their comments are applicable to research in other fields of science, including in psychology. Qualitative, and not only quantitative, methods can be very useful in researching the IT environment. Educational organizations can apply the conclusions from studies which connect the qualitative and quantitative methods to assist in the staff development to achieve organizational goals. Also -in process of proper recruitment of leaders in business management or to assist the stuff to raise the performing of professional tasks, even self- development of stuff members should also use the scientific research findings. Hence I consider both – quantitative but also qualitative methods - worth quoting and analyzing.

Keywords: research project, qualitative methods, quantitative methods.

Decision-making system as a service in the computing cloud

by

Piotr Grobelny, College of Management „Edukacja", Wrocław, Poland,

piotr.grobelny@edukacja.wroc.pl

ABSTRACT

Cloud computing presents scientists and engineers with new challenges related to the architecture of information systems and their use. This paper addresses the problem of deployment of decision supporting system in computing cloud. The author of the document presented the application of this approach that lies on intelligent discovery of web services within geographic information systems. Many important aspects of nowadays' IT systems have been considered like the domain of Web GIS, network of agents architecture, semantics and ontology, integration of external knowledge bases, deployment of applications into the cloud. It has been proven that based on them, it is possible to create a software that uses a natural language to submit queries to a system whose operating environment is a PaaS (Platform as a Service) class platform. Another aspect discussed in this article was the approach to build so-called virtual organizations in which data and knowledge exchange takes place via web services. As an example, integration with Google Geocoding API is shown, where the web API provides geographic location based on the location expressed in natural language, e.g. home address, tourist point.

Keywords: decision-making systems, cloud computing, semantic web, geocoding

Using ict for entrepreneurship promotion and support in rural districts: a case of Glubokoye district, Belarus

by

Eduard Pavlysh, Ph.D. in Economics, Associate Professor, Vitebsk State University named after P.M. Masherov, eduard.pavlysh@gmail.com

Yuliya Salakhava, Master of Economic Sc., Vitebsk State University named after P.M.

Masherov, airjs@tut.by

EXTENDED ABSTRACT

In the Republic of Belarus against the backdrop of negative demographic trends and socio-economic difficulties, the problem of effective employment in ensuring sustainable economic growth of the peripheral districts becomes crucial. For Belarus the issues of ensuring equality in the possibilities of realizing the human potential of people, who have less comparative competitive advantages in the labor market (youth, women, people with disabilities, unemployed, low-skilled and low-wage workers, former convicts, refugees, forced migrants) are especially important. Increasing the competitiveness of these groups, the support in entrepreneurial activity and the growth of employment on this basis can become an important factor in reducing social and economic tensions and improving the local business environment.

Basic government policies, aimed at stimulation of entrepreneurial activities within the specific groups of population, by the year 2017 have shown limited efficiency in Glubokoye district. Among the major factors hindering the development of entrepreneurship and innovations in Glubokoye District due to a peripheral location, the most significant were the systematic underdevelopment of the entrepreneurship infrastructure; lack of coordinated state, private and public plans for entrepreneurship development; lack of information on business development opportunities due to a factor of peripheral location of the territory; lack of information on general financial and legal aspects of opening and doing business; lack of educational resources aimed at forming of the professional competencies and motivation of entrepreneurs. The research, carried out by Vitebsk State University in cooperation with Glubokoye District Executive Committee, Glubokoye District Council of Deputies and "Center for Sustainable

Development of the Territory "Country of Lakes" Foundation, led to formulation of three basic issues to be tackled in Glubokoye district to facilitate solving of the socio-economic problems outlined:

- deficit of legal, consultative, informational and media support and promotion of local small and medium business initiatives in Glubokoye district;
- the lack of essential entrepreneurial skills, legal and economic knowledge within the target groups;
- passive attitude towards self-employment and new jobs creation in local community.

The cooperation of the local authorities (Hlybokaye[1] District Executive Committee, Hlybokaye District Council of Deputies), the "Center for Sustainable Development of the Territory " Country of Lakes " Foundation and Vitsebsk State University named after P.M. Masherov was focused on the methodological and practical support of the local development enhancement through elaboration and implementation of specific programs and activities, supporting entrepreneurship and social inclusion in the territory of Hlybokaye district, Vitebsk region.

To tackle the issues outlined, the abovementioned consortium had developed and started the implementation of the action under the Europe Aid programme (project ENI/2017/155272-1/14 "Creation of Centre for Entrepreneurship and Innovations Promotion and Support in Glubokoye District, Vitsebsk Region, Belarus"), aimed at creation of specific conditions for strengthening Glubokoye District entrepreneurial potential. The holistic approach to entrepreneurship and innovation stimulation was implemented via creation and piloting exploitation of the the Hlybokaye District Centre for Entrepreneurship and Innovations Promotion and Support (HD CEIPS), incorporating the Start-up Support office, SME Business Promotion Service office and the educational unit, Hlybokaye district Business, Entrepreneurship and Innovations School (HD BEIS) with courses in various areas: economics, innovation and marketing; law, IT, foreign language, etc., as well as special videoconferencing classes for local's training in village councils of Glubokoye District.

The functioning of Start-up support office was aimed at offering a wide range of support to the individuals, willing to set up their own business. Its main activities concentrated on consultation in the sphere of economy and marketing, assistance in marketing research and working out of business plans, informing on legal procedures and assistance in initial documentation

---

[1] Here and further: Hlybokaye - the transliteration of Glubokoye name in Belarusian language

processing. SME business promotion service functioning included individual cooperation of office specialists and entrepreneurs in preparation and placement of advertisement information for their products or services.

The implementation of the project started in January, 2019 and was designed for 36 months with piloting exploitation of the Center starting from month 13. Despite the positive start, the piloting exploitation of the HD CEIPS was faced with unexpected barriers caused by COVID-19 outbreak, which prevented regular face-to-face events (seminars, consultations, lectures etc.).

To overcome the force majeure, the project team decided to widen the on-line collaboration and to make a broader use of project internet site, initially planned mainly for dissemination and promotion of project results. Within HD BEIS the study courses were taught distantly, the seminars were carried out using zoom. Start-up support and SME business promotion offices used modified working schedule and telecommunication technologies for cooperation with target groups.

The decision to move project activities on-line using ICT ensured reaching the project target indicators. Despite the pandemic, the number of HD BEIS students certified by October 2021 is 310 (target number was 300), and this number can increase before the end of the project due to the fact that a new enrollment of students was carried out in September 2021. The number of people employed in newly created jobs during the project implementation is 459 so far (the target number was 400). The proportion of people employed in the microorganizations, small and medium enterprises, as well as individual entrepreneurs and their employees in total employment in the district's economy reached the level of 25,6% (with target indicator of 25,1%).

The research carried out allows to draw several basic conclusions.

Firstly, collaboration of local authorities, private sector, NGOs and academic sphere had shown significant results in boosting small business initiatives in Glubokoye district.

Secondly, although face-to-face collaboration is undoubtedly more efficient for both teaching-learning processes and consultations, using ICT in general and particularly web-site, messengers and distant learning platforms can be an adequate strategy for tackling the lack of necessary competences and overcoming passive attitude towards entrepreneurial activities within the target groups under the conditions of pandemic, provided that the coordination

mechanisms between the remote structural units personnel is thoroughly planned and. Moreover, the practice of remote interaction and organization of distant learning and on-line events might be a good solution for peripheral district to overcome the lack of educational/consultative infrastructure and lack of local personnel with essential knowledge and skills.

Summing up, we can state that practices described had proven to be efficient instrument of rural areas development and the experience of HD CEIPS can be used by other peripheral territories as a good example.

ICT technologies in the education of elementary school pupils in the Czech Republic

by

Ivana Polednova, University of Ostrava, Ostrava, Czech Republic, ivana.polednova@osu.cz

Denisa Kuchtova, University of Ostrava, Ostrava, Czech Republic

Zdenka Stranska, Masaryk University, Brno, Czech Republic

Frantisek Baumgartner, University of Ostrava, Ostrava, Czech Republic

ABSTRACT

The paper deals with the the situation of implementation and usage of ICT technologies in the education of elementary school pupils in the Czech Republic. The questionnaire survey was conducted on 103 primary school teachers in several primary schools. The results of the research show the opinions of teachers on the use of ICT technologies in their work and various possibilities of using ICT in individual subjects.

Keywords: ICT technologies, questionnaire survey, education.

About the competence-based approach in modernization of the master's programme "computer engineering"

by

Rudikova L., Karkanitsa A., Bahdzevich A., Yanka Kupala State University of Grodno, Belarus, lada.rudikowa@gmail.com

ABSTRACT

The article deals with the issues related to the modernization of the educational programme "Computer Engineering" for the IT-profile graduates using competence-based approach. The problems of specialists training, ways of modernizing the educational programme are considered. Particular attention is paid to the competence-based approach and the specifics of teaching at Master's level according to the new curriculum.

Keywords: Master's degree programme, computer engineering, modernization, competencies, IT specialist, undergraduate, academic competence, social and personal competence, professional competence, employability improvement, curriculum.

Rhetoric and Academic Writing» Course in the Training of Technical Specialists

by

Zoya Sidorovich, Yanka Kupala State University of Grodno, Belarus

sidorovich_zz@grsu.by

ABSTRACT

The aim of the given article is to present the special course «Rhetoric and Academic Writing» intended for master's students of technical specialties in the Republic of Belarus. The results have demonstrated that the study of the given discipline helps students to adapt to the professional activity, to form an open-minded and competent communicative personality capable of cooperation, speech creation, intercultural interaction, and possessing the most important instrument for achieving social, professional and personal success - effective communication skills. Disciplines of this kind integrate the body of philological knowledge and become fundamental to developing effective communication of graduating students in the present-day world regardless of the acquired profession.

Keywords: rhetoric, public speech, scientific style, communication, competence.

The introduction of soft skills in the study of disciplines of the second stage of higher education at the Sukhoi State Technical University of Gomel

by

Kanstantsin Kurachka, Department of Information Technologies, Sukhoi State Technical University of Gomel, Republic of Belarus, kurochka@gstu.by

Uladzimir Kamrakou, Department of Information Technologies, Sukhoi State Technical University of Gomel, Republic of Belarus, vladivir1977@gstu.by

Vladimir Zakharenko, Department of Information Technologies, Sukhoi state technical university of Gomel, Republic of Belarus, zevs.gomel@gmail.com

ABSTRACT

Professional skills, as opposed to interpersonal skills, are types of skills that students learn in university. These skills are easy to quantify. The proficiency in these skills is easy to verify. Soft skills cannot be measured and tested as simply as professional skills. The authors highlight the most in-demand soft skills among employers.

The article presents the results of several surveys of employers about the important requirements for jobseekers required for employment. Similar surveys were conducted among employers and employees of IT companies in the Republic of Belarus. It is concluded that soft skills are very important both for getting a first job and building a successful career.

However, in the universities of the Republic of Belarus, teaching soft skills is poorly represented. The article shows how the process of teaching students of the second stage of higher education was modernized. Only the IT specialties of five Belarusian universities have undergone modernization. This work was carried out with the support of the international project MACICT. At the same time, the experience of teaching similar disciplines in the universities of the European Union was used.

To assess the effectiveness of students' acquisition of soft skills at the university, a system for assessing the results of the modernization of the learning process was developed.

Questionnaires for teachers, students and employees of IT companies have been developed. A survey of all stakeholders in the results of the international project MACICT was carried out.

The paper provides information on the dissemination of the main approaches for organizing the teaching of IT specialties for teachers of another specialties of the Sukhoi State Technical University of Gomel, as well as for teaching IT disciplines of another universities in the Gomel region.

Application of interactive learning methods

when studyin canc@bstu.byg the ergonomics of human-machine interaction

by

Stanislav S. Derechennik, Brest State Technical University, Brest, Belarus, 1@mail.ru

Dymitriy A. Kostiuk, Brest State Technical University, Brest, Belarus, dmitriykostiuk@gmail.com

A.A. Markina, Brest State Technical University, Brest, Belarus, canc@bstu.by

ABSTRACT

The experience of teaching the ergonomics of the "human-machine" interface for students of computer science and radio electronics is presented. Increased interactivity is achieved through elements embedded in teaching materials through virtualization and experimental biometric approaches to research.

Keywords: ergonomics, interface, interactive elements, virtualization, biometrics.

Psychological Type, Creativity And Innovation Among Polish MIS Managers

by

Jolanta Kowal, University of Wrocław, Poland, jolanta.kowal@uwr.edu.pl

Monika Ziobrowska, MIND Monika Ziobrowska, Poland, psycholog@ziobrowska.pl

Flávio de São Pedro Filho, Federal University of Rondônia (UNIR), Brazil,

flavio1954@gmail.com

ABSTRACT

In this article, we attempt to answer the following research questions:

Q1. Do Polish information systems managers differ in terms of their psychological type (In terms of Carl Gustaw Jung's concept of depth psychology)?

Q2. Does the type of psychological type differentiate their levels of creativity and innovation?

Our methods and research assumptions:

R1. Adaptation of Johnstone's GCI Compass (2018) based on the concept of C.G. Jung as a psychological type IT measurement tool

R2. Adaptation of the questionnaire based on the concept of Filho et al. (2018) as a tool for measuring pro-innovative behavior

We used qualitative and quantitave methods to conduct our research on the basis of collected random sample of 211 management information systems managers (MIS).

Our findings:

The personal and collective unconscious can serve various companies and IS managers. Internal motivation (personal unconscious) and organizational ideals (collective unconscious) play a role in the visionary, dream-driven activity of project managers and the resulting overall creativity of the respective projects (Achiavone, F. & Villasalero, M. (2013). Knowing type

enables you to manage your inner unconscious, which is your intrinsic motivation, chich increases the emotional tone of your visions, dreams and dreams, which in turn contributes to your overall design creativity. A project manager with a stronger inner motivation is an emotional dream who is able to contribute to the creativity of the project with innovative solutions derived from his dreams. Managing the collective unconscious can mean that Project managers organize their project members around certain organizational ideals (hierarchy, group, team and clan) that may drive or hinder the creative outcomes, thus conditioning the use of the collective unconscious.

Our research beneficiaries could be other researchers by answering questions and inspiration for other research; teachers, coaching trainers, psychotherapists, especially those working in IS by supporting the development of individuals. Managers and politicians could use our findings to positively influence the ethical climate in the organization, which in turn will positively affect the way society functions as a whole. People who want to get to know themselves and develop their potential can also use the conclusions.

Keywords: ergonomics, interface, interactive elements, virtualization, biometrics.

Innovation: Online Psychotherapy in Pandemic Era

by

Ewa Winkler, The Association of Jungian Analysts in Poland, winkler@ptpajung pl

ABSTRACT

Digital technologies have developed rapidly, with inevitable and increasingly serious repercussions in our lives. The main objective of this paper is to investigate the impact of that development in two main fields of focus :

1. On-line psychotherapy and how it influenced on the psychotherapy process and framework;
2. The impact of rapid internet development with social media and how it influence therapist identity - evaluation;

Since it has been born in Sigmund Freud consulting room in Vienna more than 100 years ago psychotherapy was strictly bound to personal contact. Two people used to sit in a private atmosphere of the consulting room to share therapeutic experience. Historically, psychotherapy has been intensely private and personal experience. Everything has changed rapidly with the new possibilities opened with extensive development of internet. Not only a patient can „google" some information about his therapist (sometimes very private), who originally should stay as anonymous as a 'blank screen', but also internet communicators opened new possibilities of work in virtual, not real consulting room. Most patients are curious about their therapists. That curiosity can be satisfied rapidly, with no disclosure, and without ever having to enter the consulting room, but using „google" or other social media searching engine. How challenging it can become to an art of psychotherapy. The concept of analytic neutrality, as initially envisioned by Freud, has evolved in a few important ways. Therapists should be able to moderate between their real personality, emotions and beliefs, and their professional attitude. Many years area of psychotherapy has not been influenced by that innovation. In 2020 psychotherapist had to face a new challenge - how to work in pandemic? I will refer to the experience of working on-line and how it affects the psychotherapy process. Some of our clients „does not believe" the COVID-19 pandemic is a real happening. Others are facing regression, fear, or they break up the analytical process. In that circumstances all might happened.

We had no choice however but to move our practice from the consulting room into on-line experience due to official pandemic-related recommendations. One can see it as an innovation, which cannot be underestimated. It was very important not to leave patients without psychological help even if personal contact was limited to virtual one. We can say, that psychotherapy will never be the same after such a rapid change.

Greencoin information system empowering urban adaptability and eco living choices

by

Hanna Obracht-Prondzyńska, University of Gdańsk, Poland,

hanna.prondzynska@pg.edu.pl

Kacper Radziszewski, Gdańsk University of Technology, Poland,

kacper.radziszewski@pg.edu.pl

Helena Anacka, Gdańsk University of Technology, Poland,

helena.anacka@pg.edu.pl

Kacper Wereszko, Gdańsk University of Technology, Poland,

kacper.wereszko@pg.edu.pl

Paweł Weichbroth, Gdańsk University of Technology, Poland,

pawel.weichbroth@pg.edu.pl

Ewa Duda, The Maria Grzegorzewska University, Warsaw, Poland,

eduda@aps.edu.pl

Jolanta Kowal, The University of Wrocław, Poland,

jolakowal@gmail.com

EXTENDED ABSTRACT

Eco-living choices or urban resilience and adaptation to changing environmental conditions are often emphasized as essential factors of sustainable development (Garcia et al., 2017). The assumption of sustainable development is to meet the basic needs of people, to preserve, protect and restore the health and integrity of the Earth's ecosystem without compromising the ability to meet the needs of future generations as well as long-term ecosystem capacity (Kasztelan, 2017). In addition, changing behaviors to more environmentally friendly is a

necessity in modern economy and society (Demuzere et al., 2014; McKenzie-Mohr et al., 2012).

In the age of digitalization, smart cities should benefit from Information and communications technologies (ICT) and digital tools allowing to response to the negative consequences of climate changes. In order to mitigate the consequences of environmental changes, it is important to find a way to encourage residents to be actively involved in shaping urban adaptability and to enhance eco-living choices. The purpose of Greencoin is to introduce a new eco-currency based on an application to be designed in an interdisciplinary environment in order to engage citizens in pro-ecological activities by shaping climate awareness and inclusion.

There are many gamification projects focused on mitigating climate changes which has been tested or implemented worldwide. However, the gap which remains is the limited number of solutions dedicated for central European countries where the urban polices in terms of climate vulnerability are bounded. On the other hand, cities, when implementing climate-oriented policies, are focused on urban resilience, while the opportunities resulting from social engagement in the process of shaping urban adaptability are not fully explored. Therefore, the research focuses on case studies analysis and defines their functionality, technical solutions and ways to engage urban dwellers.

The aim of the research is to introduce a theoretical framework for Greencoin information system to be designed, as a result of supplementary goals responding to research steps. More specifically, step one is in recognizing existing theoretical framework, tested, implemented or operating digital currencies and apps empowering environmentally friendly behaviors. Step two is in analyzing existing solutions approaching the process of mitigating climate changes, while step three is - in evaluating those solutions. Step four is a critical analysis on both local and worldwide solutions influencing social attitude toward climate changes, while step five is in defining initial framework for Greencoin information system. The methodology is assigned to steps embedded in the approach to information system design on the bases of Burrough et al., (2015) and Wrona (2012).

The research demonstrates a positive impact of digital applications and social currencies-based systems on influencing behavioral changes. The evaluation of social currencies and information systems based on pro-environmental behavior allows us to meet our goals, finding

limitations as well as appropriate solutions to be used in the Greencoin information system (IS). Our suggestion is in applying solutions based on peer-review and verification, which can become a part of the system gamification element.

This research novelty is developing a unique tech solution that uses green currency and gamification techniques to promote pro-environmental behaviors. To the best of our knowledge, such a pro-environmental application based on green-currency and community pro ecological engagement has not been elaborated in Gdansk metropolitan area before, making Greencoin a pioneering solution to the region. Moreover, according to our research, Greencoin could fill in an important niche, so far remained unfilled, with a technological platform solution that connects the local community with pro-ecological opportunities, organizations, initiatives, and actions co-shaped by local authorities, businesses, and citizens themselves.

Limitation of our study is related to the fact that we conducted the research on European community currencies examples. The "test and learn" phase is planned for 2023 and will be conducted in Poland. To address it, the proposed porotype will be available to city councils worldwide to be modified to address ecologically related goals locally. The subsequent phases of the project will cover an analysis of the Gdańsk citizens' attitude towards pro-ecological behavior based on the focus groups and quantitative research. Additionally, the means of technological implementation will be evaluated in the context of local data sources accessibility and potential integration with existing systems, both within the public and private sector.

Keywords: Climate change, eco-living choices, Greencoin, information systems,
urban adaptability, gamification and education

REFERENCES

Burrough, P. A., McDonnell, R. A., McDonnell, R., & Lloyd, C. D. (2015). Principles of geographical information systems. Principles of geographical information systems. Oxford, UK: Oxford university press.

Demuzere, M., Orru, K., Heidrich, O., Olazabal, E., Geneletti, D., Orru, H., ... & Faehnle, M. (2014). Mitigating and adapting to climate change: multi-functional and multi-scale

assessment of green urban infrastructure. *Journal of environmental management*, *146*, 107-115.

Garcia, J., da Silva, S., Carvalho, A., & Andrade Guerra, J. B. (2017). Education for Sustainable Development and Its Role in the Promotion of the Sustainable Development Goals. In J. P. Davim (Ed.), *Curricula for Sustainability in Higher Education* (pp. 1–18).

Kasztelan, A. (2017). Green growth, green economy and sustainable development: Terminological and relational discourse. *Prague Economic Papers*, 26(4), 487–499.

McKenzie-Mohr, D., Lee, N., Schultz, P., & Kotler, P. (2012). Social Marketing to Protect the Environment: What Works. Thousand Oaks, California.

Wrona, A. (2012). Projektowanie i wdrażanie systemów informatycznych w praktyce [Design and implementation of IT systems in practice]. Wrocław: WSZ E.

User experience and user interface (UX/UI) design
of Greencoin mobile application

by

Magdalena Walnik, Gdańsk University of Technology, Faculty of Architecture, Department of Visual Arts Poland,
mwalnik@gmail.com

Kacper Radziszewski, Gdańsk University of Technology, Faculty of Architecture, Deparment of Visual Arts, Poland, kacper.radziszewski@pg.edu.pl

Kacper Wereszko, Gdańsk University of Technology, Faculty of Electronics, Telecommunications and Informatics, Department of Algorithms and System Modeling, Poland, kacper.wereszko@pg.edu.pl

Helena Anacka, Gdańsk University of Technology, Faculty of Management and Economics, Department of Economic Sciences, Poland, helena.anacka@pg.edu.pl

Jolanta Kowal, University of Wrocław, Institute of Psychology, Poland, jolanta.kowal@uwr.edu.pl

Hanna Obracht-Prondzyńska, University of Gdańsk, Department of Spatial Management, Poland, hanna.prondzynska@ug.edu.pl

Paweł Weichbroth, Gdańsk University of Technology, Faculty of Electronics, Telecommunications and Informatics, Department of Software Engineering, Poland, pawel.weichbroth@pg.edu.pl

ABSTRACT

The aim of the Greencoin mobile application is to encourage its users to change their behavior and to act pro-ecologically. The pilot version of the application will operate within the city of Gdańsk. To keep the app's user base as large as possible, the graphical user interface should be attractive to the broadest possible audience, and the application itself should be easy and fun to use. This work is a continuation of studies on Greencoin mobile application prototype performed by K. Radziszewski et al. (2021).

The Greencoin mobile application mockups, based on early version of the app's documentation, were designed. To evaluate these mockups, the authors organized a series of workshops for researchers and stakeholders engaged in Greencoin project, during which several UX/UI designing techniques was introduced and used, including (but not limited to): empathy maps, personas, "jobs to be done", value proposition canvas.

Feedback from workshops participants has been carefully analyzed. It was crucial for the Greencoin team to plan future versions of the app, which will have some modifications to the user interface suggested by the mockups evaluators, and even the app functionality will be expanded thanks to the comments submitted during workshops.

Little variation in the age of the workshops participants was identified as a limitation of the research performed. Both users under age 25 and elderly users were underrepresented. To answer this issue, an online questionnaire was prepared and sent to potential Greencoin application users of different age groups.

As the future users of the application are a diverse age group (from youth to the elderly people) but living in the same city, their preferences may be specific to a given region. In the process of UX/UI design of the mobile application for this kind of user base, their specific preferences needs to be taken into account (Rogoś-Turek B., Mościchowska I., (2015)).

Keywords: User experience, user interface, mobile app, mobile prototype, smart city.

REFERENCES

Radziszewski K., Anacka H., Obracht-Prondzyńska H., Tomczak D., Wereszko K., Weichbroth P. (2021). *Greencoin: prototype of a mobile application facilitating and evidencing pro-environmental behavior of citizens*. Procedia Computer Science, 192, 2668-2677. doi:10.1016/j.procs.2021.09.037.

Mościchowska I., Rogoś-Turek B. (2015). *Badania jako podstawa projektowania user experience.* PWN

OMG Standards Development Organization (2010). *BPMN – Business Process Model And Notation*. Retrieved from https://www.omg.org/spec/BPMN/2.0/

Nielsen Norman Group (2019). *5 UX Workshops and When to Use Them: A Cheat Sheet*. Retrieved from https://www.nngroup.com/articles/5-ux-workshops/

Nielsen Norman Group (2018). *Empathy Mapping: The First Step in Design Thinking*. Retrieved from https://www.nngroup.com/articles/empathy-mapping/

Fox G. *How To Use The Value Proposition Canvas – 10 Step Guide Plus Free Templates.* Retrieved from https://www.garyfox.co/canvas-models/value-proposition-canvas guide/

Data mining as a service

by

Artsiom Klimets, 2nd year student, post-graduate student

Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus

Scientific Supervisor: Dmitry Pertsau – Associate Professor, pertsev@bsuir.by

ABSTRACT

Data Mining is a relatively young branch of Data Science, which has taken a special place with evolution of the Internet. This method is widely used in the modern world, in particular for analyzing user behavior and identifying their interests, since classical methods of data analysis are rather trivial and do not allow you to quickly respond to changes in user desires. Data Mining is not a specific technology, but a collection of different methods for solving specific problems. A number of tools make data mining easier, opening up the possibility of applying these approaches to people who are not experts in Data Science. This paper presents the concept of a new tool that implements some of the concepts of existing solutions, but provides a more flexible environment for data analysis.

A large amount of traffic generating every day, for example, according to the latest research conducted by Domo [1], Google conducts 5.7 million searches and Instagram users share 65 thousands photos every minute. All created information flows are analyzed, processed and applied in various fields of activity: advertising, forecast of successful campaigns.

Data Mining is a research and discovery of hidden knowledge that was not previously known, non-trivial, practically useful, available for human interpretation in raw data [2]. In this area, both commercial for example, MatLab, Statistica and free for example, Weka, R, etc. specialized tools have been widely developed. However, they have both advantages designed for specific tasks and disadvantages: complicated interface with many parameters, operation only on a personal computer.

Data Mining is not one, but a collection of a large number of different knowledge discovery methods and it is multidisciplinary in nature, since it includes elements of numerical methods, mathematical statistics and probability theory, information theory and mathematical

logic, artificial intelligence and machine learning. The scope of Data Mining is quite wide; however, it is limited, despite the use of a large number of previously created methods of analysis and data processing.

The special features of data mining require the support of a large variety of data analysis methods in tools under development, and the library of these methods needs to be updated over time. Among already existing tools, the concept of visual programming is widely used, that is a very good solution, simplifying the perception and enhancing the user experience. These features are reflected in the tool under development as part of the research work.

The tool provides a simple and user-friendly interface that does not require any program writing skills or prior knowledge of how to interact with the system. It has a wide range of extensibility possibilities through modularity: any library in Python as the main programming language used in projects related to mathematical statistics, machine learning, neural networks, and data analysis can be plugged in.

The system consists of two parts: a server that provides an API to interact with Python libraries and auto generate the final program that will handle the data, and a web interface that can be accessed through the Internet. The interface consists of two areas: the list of available functions to use, presented as a multi-level list, and the area where the order of operations on the data is lined up, presented as separate tabs for each function. One of the first mock-ups provided below (Figure 1).
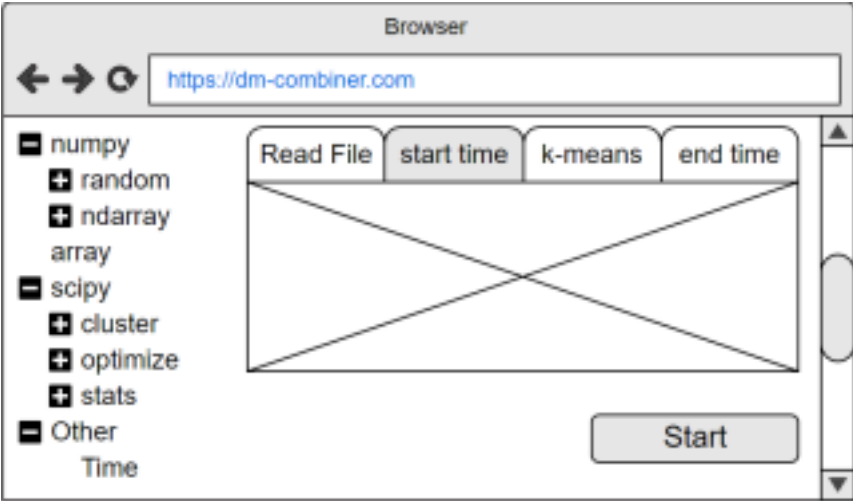
Figure 1. First mock-up of Data Mining tool

REFERENCES:

Data Never Sleeps 9.0. URL: https://www.domo.com/learn/data-never-sleeps-9 (accessed 10 October 2021) 2. Barsegyan A.A., Kupriyanov M.S., Kholod I.I., Tess M.D., Yelizarov S.I. Analiz dannykh i protsessov [Data and process analysis]. Saint-Petersburg, BHV-Petersburg Publ., 2009. 512 p. (in Russian).

Cybersecurity of digital currencies: a view on the state-of-the-art research and current developments

by

Hanna Obracht-Prondzyńska, Kacper Radziszewski, Helena Anacka, Kacper Wereszko, Paweł Weichbroth, Jolanta Kowal

Hanna Obracht-Prondzyńska, University of Gdańsk, Poland,
hanna.prondzynska@pg.edu.pl

Kacper Radziszewski, Gdańsk University of Technology, Poland,
kacper.radziszewski@pg.edu.pl

Helena Anacka, Gdańsk University of Technology, Poland,
helena.anacka@pg.edu.pl

Kacper Wereszko, Gdańsk University of Technology, Poland,
kacper.wereszko@pg.edu.pl

Paweł Weichbroth, Gdańsk University of Technology, Poland,
pawel.weichbroth@pg.edu.pl

Jolanta Kowal, The University of Wrocław, Poland,
jolakowal@gmail.com

EXTENDED ABSTRACT

Cryptocurrencies revolutionize the money market with a number of advantages, e.g. by facilitating peer-to-peer payments without the oversight of intermediates, and by eliminating the need for identification of information for both parties (Roth, 2015). During the last decade cryptocurrencies surge in popularity, but whether they go mainstream depends on factors like price stability, ease of use and security (Șcheau et al., 2020). Since understanding cybersecurity is no longer optional for businesses and individuals, this study aims at

reviewing and analyzing the state-of-the-art research and current developments. To the best of our knowledge, few attempts have been made so far to undertake the similar study. In particular, our study tackles the ongoing discussion on the crypto cybersecurity by adopting the grounded theory approach developed by Glaser and Strauss (1968), by adapting analytical thinking (Amer, 2005) and sampling strategies (Rapley, 2014).

Taking into account the general notion of cybersecurity, in our view, its multidimensional nature considered in the context of cryptocurrencies, can further be conceptualized within two mainstream areas, namely: technological and human. In particular, the former concerns four interconnected hardware and software domains, spanning from cryptocurrency wallets to security architectures, models, and data transmission methods. The latter considers humans (users) as the last link of the security chain. The notion of a user is a theoretical lens to consider

cybersecurity in terms of social engineering attacks and corresponding countermeasures (Heartfield & Loukas, 2018). A systematic search was performed on Scopus and Google Scholar, using their available online search engines. In formulating search queries, we used the combinations of the keywords, indicating the relationships between them by specifying explicit logical operators such as AND, OR and NOT.

Performed systematic literature review and analysis confirmed an increasing importance of effective cryptocurrencies security architectures, models and measures as a response to a growing number of social-engineering attacks and security compromises. Definitely, the owners of cryptocurrencies have to reckon with cyber-attacks of various types. However, regardless of the type of attack, the victim's detriment may be their trust, naivety, lack of vigilance, lack of knowledge, unbelief in the possibility of an attack, or some thoughtlessness.

Therefore, people often represent the weakest link in the security chain and are systematically responsible for the failure of security systems.

This study limitations, coming from the available and studied literature, are, among, others, a lack of consistency in terms of studied phenomena concepts, selective concentration on certain aspects of cryptocurrencies security, as well as geographical limitations coming from legal regulations and policies applied locally (e.g. China and Egypt cases). These restrictions, however, do not entirely eliminate the issue of security in digital currencies on their territories, but makes them less detectable, and, respectively, more vulnerable to attacks

and further security compromises. Moreover, we detect problems related to inconsistent conceptual intentions or confusing cases, over-generalization, and term misuses (Mashtalyar et al., 2021). These problems can impact understanding and proper analysis of digital currencies security. This research results could be a valuable basis for a future research addressing these limitations and barriers.

The paper is organized as follows. In section two, we discuss the background of the development of cryptocurrencies. In section three, we define and classify crypto wallets. In the section four, we review and analyze security architectures, followed by the description and exemplification of the related models, given in the section five. In section six we recognize and localize data transmission methods, developed for blockchain-based solutions. In section seven, we elaborate on the adopted social engineering attacks and adapted countermeasures for the cryptocurrencies settings. Finally, in section eight, we conclude the paper with the summary of the performed study.

Keywords: Cybersecurity, digital currencies, cryptocurrency wallets, security architectures, security models, data transmission methods, social engineering attacks and countermeasures.

REFERENCES

Amer, A. (2005). Analytical thinking. Pathways to Higher Education.

Glaser, B. G., Strauss, A. L., & Strutzel, E. (1968). The discovery of grounded theory; strategies for qualitative research. Nursing research, 17(4), 364.

Heartfield, R., & Loukas, G. (2018). Detecting semantic social engineering attacks with the weakest link: Implementation and empirical evaluation of a human-as-a-security-sensor framework. Computers & Security, 76, 101-127.

Mashtalyar, N., Ntaganzwa, U. N., Santos, T., Hakak, S., & Ray, S. (2021, July). Social Engineering Attacks: Recent Advances and Challenges. In International Conference on Human Computer Interaction (pp. 417-431). Springer, Cham.

Rapley, T. (2014). Sampling strategies in qualitative research. The SAGE handbook of qualitative data analysis, 49-63.

Roth, N. (2015). An architectural assessment of bitcoin: using the systems modeling language. Procedia Computer Science, 44, 527-536.

Șcheau, M. C., Crăciunescu, S. L., Brici, I., & Achim, M. V. (2020). A Cryptocurrency Spectrum Short Analysis. Journal of Risk and Financial Management, 13(8), 184.

Communicative Skills Development as a Strategy in Building Specialist Model within Master's Programme "Computer Engineering. Programmable Complexes, Systems and Services"

by

Anatol Bahdzevich, Yanka Kupala State University of Grodno, Belarus, bahdziewich04@gmail.com

Sviatlana Horskaya, Yanka Kupala State University of Grodno, Belarus, gorskaya_s_a@mail.ru

ABSTRACT

The purpose of the course "Cross-Cultural, Business and Interpersonal Communication" is to develop the fundamentals of communication theory as well as practical communication skills at different levels of future specialists with a Master's degree including knowledge in the main areas of communication theory and the skills of analyzing different situations for interpersonal, group, mass and intercultural communication, the ways of overcoming conflict situations.

The emphasis was made on practical communicative skills development: the ability to determine the structure of the communicative act, choose strategies and tactics of communication depending on the conditions; use verbal and non-verbal communication means; choose the optimal models of cultural and intercultural communication; analyze conflict situations, and outline ways to resolve them.

Such methods of communicative skills development as teamwork, flipped classroom, situational communicative training were implemented into the teaching and learning process. The lecturer–student cooperation within the independent work was organized using cloud technologies. Interdisciplinary cooperation allowed involving Philological Faculty students into communicative training thus encouraging both groups of students to develop interpersonal communicative skills within the broad range of communicative spheres.

Students' provided their positive feedback by active participation in all the activities and upon the course completion via an anonymous survey. They proposed the academic load redistribution in the favour of laboratory sessions as well as by introducing the course into the curricula of other Master's training programmes which action would enable the lecturers to organize more interdisciplinary communicative activities.

Role of Social Media in Anthropological Qualitative Research: Dreaming in Pandemics

by

Bartosz Samitowski, University of Warsaw, Poland, b.samitowski@gmail.com

ABSTRACT

"The Republic of Dreams" is a qualitative study of social dreaming narratives and the collective unconscious in Poland, initiated during the Covid-19 pandemic, based on the perspective of modern dream anthropology inspired by Jungian analysis and image work. The study uses the method of social dreaming matrix and personal interviews for analysis of dream narration In relation to socio-cultural models and dream storytelling practices. The research is also done on the social networking site Facebook. The presentation will discuss the use of social media In anthropological qualitative research and present examples of dream narratives in relation to social and political situation in Poland in the summer of summer 2020. The value of such research is being shown in how dream realities and social realities intertwine, this offering deeper insight into subtle social processes and narratives.

Keywords: pandemic, social dreaming, social media, ICTM2021, dreams, covid, narratives.

About the Competency-Based Approach for
the Modernization of the «Computer Engineering»
Master Curriculum

by

Lada Rudikova, Yanka Kupala State University of Grodno,
Belarus, lada.rudikowa@gmail.com

Anna Karkanitsa, Yanka Kupala State University of Grodno,Belarus, a.karkanica@grsu.by

ABSTRACT

The paper presents a competency-based approach to the modernization of «Computer Engineering» master curriculum. Developing the curriculum, we were focused on solving two complementary and interrelated tasks. The first is to satisfy students individual needs in acquiring professional knowledge and skills. The second is to satisfy the demands of the Belarusian society and IT-labor market for high-demand specialists. Under the Erasmus+ project MaCICT (Modernization of Master Curriculum in ICT for Enhancing Student Employability) and this the support of the European partners, the structure and content of the «Computer Engineering» master curriculum were significantly revised.

To analyze the needs of the Belarusian IT-labor market and to identify in demand professional and personal competencies of undergraduates an online survey was carried out for IT-industry representatives (52 major and regional IT-companies). The survey results allowed us to identify directions for curriculum modernization focusing on the three core aspects of competencies development: professional-substantive aspect - the acquisition of general scientific knowledge that forms professional competencies; professional-activity aspect - the acquisition of practical experience in refraction of the acquired knowledge to solve the assigned tasks; professional-personal aspect - the formation of individual abilities, type of thinking, decision-making style that affect the quality of professional activity.

Following these directions, firstly the structure of the curriculum was rebuilt and currently it   includes compulsory courses (state component), HEI courses, optional courses,

scientific seminars and technological internship. Secondly, the structure of the curriculum has become modular (3-5 courses in each module and 30% of optional courses) which make possible to implement an individual learning. Thirdly, the number of specialized courses emphasized on practical training and developing soft/transferable skills has significantly increased.

Keywords: master curriculum design, computer engineering, IT specialist, competencies, enhancing employability, MaCICT.

Competence-Centered Syllabus Design of IT-courses Following Bloom's Taxonomy

by

Anna Deytseva, Yanka Kupala State University of Grodno, Belarus, a.deytseva@gmail.com

Anna Karkanitsa, Yanka Kupala State University of Grodno, Belarus, a.karkanica@grsu.by

ABSTRACT

In the context of the demand for highly qualified IT specialists, there is a problem of discrepancy between educational programs of higher education and the requirements of regional and global labor markets. The design of educational programs in the field of information technology is often carried out haphazardly, without considering the requirements of employers and the demand for certain competencies.

At present, the model of the educational content of the Republic of Belarus is formed on the basis of a competence system, which includes academic, social-personal and professional competencies. Within the framework of the Erasmus+ project «Modernization of Master Curriculum in ICT for Enhancing Student Employability/MaCICT», when developing IT courses syllabuses, the idea of supplementing the list of competencies with a description of learning outcomes and assessment criteria was proposed. For this, the taxonomy of educational objectives developed by B. Bloom (Bloom's Taxonomy) was applied. Learning outcomes and assessment criteria were correlated with the elements (modules) of the syllabus and were formulated as expected and measurable «components» of competencies (knowledge, practical skills, experience) which student should be able to demonstrate after mastering the course modules. Assessment criteria were formulated focusing on the use of verbs and action words (know, explain, use, evaluate, etc.) and were matched with Bloom's classification of learning objectives: Remember, Understand, Apply, Analyze, Evaluate, Create. It was found that a clear formulation of learning outcomes and assessment criteria adds the clarity to learning processes and contributes to systematic design of course modules.

Significant attention was paid to the application of new didactic approaches and techniques in improving academic courses. The organization of the educational process for hard-skill courses is based on modern methodological techniques in the field of software

development. During the practical classes the team project-based method was actively used, which involves the consistent implementation of practice-oriented projects corresponding to the major modules of the course.

Corruption in The Education System Versus Sustainability in The Amazon

by

Ilton Monteiro Alves, Federal University of Rondônia (UNIR) Denisa, Brazil, ilton.alves@unir.br

Flávio de São Pedro Filho, Federal University of Rondônia (UNIR), Brazil, flavio1954@gmail.com

Jolanta Kowal, University of Wroclaw, Institute of Psychology, Poland, jolakowal@gmail.com

ABSTRACT

Corruption is a social phenomenon that has existed since the beginning in all communities, present in everyday situations, and affects the education system, despite its modern widely based on information and communication technology. We reviewed the various aspects of corruption in the Amazon education system based on domination theory. We looked for factors that facilitate corruption in the education system and harm sustainable development in the Amazon. We have also shown the relationships between domination theory, scientific knowledge degradation, and sustainable development. We have identified some options to fight corruption in the education system to ensure sustainable development in the Amazon. To reach described goals, we have implemented a qualitative research project under the Amazon Graduate Program. Our research methods included critical literature analysis, case study, direct observation, and content analysis to describe the literature review concepts. Through the Ishikawa diagram's graphic representation, we highlighted the causes of traditional domination and corrupt sub-causes that cause the degradation of scientific knowledge and Sustainability in the Amazon. The study concludes that the domination that occurred in the education system is similar to traditional domination. Corrupt actions can be decisive for preventing the construction of knowledge about Sustainability in the Amazon. The scenario warns of a crisis in the education system. Our findings allow us to suggest significant actions for coping with curbing corrupt practices and unethical actions in the system. Our

Amazonian academy findings help reflect the managers and politicians sensitized with this investigative work's reality.

Overcoming Challenges of The Globalised Labour Market with Widened Internationalisation Tools

by

Siarhei Piashkun, Polotsk State University, Belarus, siarhei.piashkun@gmail.com

ABSTRACT

Despite obvious advancements in higher education within the European Higher Education Area (EHEA) in equipping students – future employees – with key competencies that are most demanded by the rapidly evolving globalised market, higher education still lags behind the pace of development of market trends. Although universities endeavour to progress towards meeting those demands, meagre networking and collaboration between universities and between the educational sector and business and industry invest into the gap that has always existed between graduates' knowledge and skills and employers' demands. The paradox of inconsistencies in education-market relations is evident: the closer the academic world approaches the standards and requirements of the globalised economy, it moves further away from higher education. What can really be undertaken by the educational sector at present is enriching, deepening, and widening internationalisation of approaches and methods in practice-based and student-oriented education, enhancing quality and effectively engaging employers.

So far different pedagogical approaches and methods have been invented and used worldwide. Quite separately, international academic exchange has been taking place within the EHEA for decades with sharing best practices and implementing joint research and joint study programmes between universities in different countries. This has produced some but not entirely outstanding effects on the development of certain pedagogical cultures as well as skills of internationalisation. Additionally, over the past thirty years the countries in Europe have become really multicultural and multinational fully recognising the importance of pursuing not only integration of new populations of immigrants but also social, cultural, and educational inclusion. Today, many universities have a tremendously high percentage of international students but the numbers cannot compare with those of the international labour force. What has been achieved in the most recent years is a notable and continuous approach to an enhanced

integration and mutual assimilation of both indigenous and migrant populations in student classrooms.

The paper examines the difference between natural and built types of "internationalisation at home". The first type presupposes more or less natural means of growing mutual respect, understanding and common values among students having different national, cultural, and ethnic backgrounds in one classroom but who reside in the country where they get higher education or have immigrated for a considerable period of time to get a degree from an overseas university. The second stands for a constructed reality within a classroom where integration of students is made for a limited period of time and only for a specific purpose of achieving short-term goals, all of which can be grouped into (1) training intercultural communication and international team-building skills, (2) problem-based or research-based learning, and (3) solving real-world problems taken from international enterprises. The latter was invented as an "A-in-1" method of enhancing the outcomes of "internationalisation at home" and enriching the whole process of internationalisation of education, which for its own success should accelerate to catch up with the pace of internationalisation of the market. It was tested at Polotsk State University and its partners who wanted to expand internationalisation and its effects.

Environmental, Social, and Governance Strategy Execution Model

By

Bartłomiej Gawin, University of Gdansk, Poland, bartlomiej.gawin@ug.edu.pl

and

Bartosz Marcinkowski, University of Gdansk, bartosz.marcinkowski@ug.edu.pl

Digital innovation might be regarded as the establishment of (and the consequent change in) market offerings, business processes, or models that result from the use of digital technology (Nambisan et al., 2017). Innovations within the field of products, services, and business models introduce technological and organizational changes in enterprises. Both new opportunities for digital innovation as well as requirements and problems encountered in the business everyday life are their driving force. Digital innovation usually supports the achievement of financial objectives (financial business goals) but supports analytics, facilitating the estimation of the effectiveness of the company's operations as well.

Recently, from stakeholders' perspective, financial accounting is no more sufficient to meet their needs. Some expectations arise regarding disclosing sustainable development and the whole business picture of the way companies organize financial and non-financial elements in order to create value. However, mechanisms to both illustrate sustainable development and to measure the effectiveness of the chosen strategy are still lacking. Per the United Nations Sustainable Stock Exchanges Initiative (2015), listed firms are expected to disclose the impact from their Environmental, Social, and Governance (ESG) practices by 2030. Sustainability reporting acts as a disclosure philosophy that focuses on creating future value related to business policy (Buallay, 2019). ESG-related reports have been developed as a channel for a company to report on how the company's operations impact internal ESG matters and what actions are taken with positive ESG implications. Some studies show that ESG disclosure vastly varies across firms and countries (Ioannou and Serafeim, 2017; Reverte, 2009). This is due to the fact that no standards regarding information content are pursued (ESG information is non-financial disclosure). On top of that, even report formats are used freely by

management boards. Duuren et al. (2015) suggest that European managers view ESG in substantially different ways.

However, organizations tend to declare ESG goals that they are going to achieve without describing in sufficient detail how they want to achieve them. This paper considers the problem of the ESG corporate strategy execution model that integrates both indicators and an operational way of implementing the ESG strategy. Design Science Research was selected as the research methodology. The model has been adopted by an insurance company and is being validated as a 3-year ESG implementation program. The model is both a supplement to knowledge in the field of ESG strategy implementation and a practical guide for an organization that declares the achievement of measurable environmental, social and corporate goals.

REFERENCES

Buallay, A. (2019). Is Sustainability Reporting (ESG) Associated with Performance? Evidence from the European Banking Sector. *Management of Environmental Quality*, *30*, 1, 98-115.

Duuren, E., Plantinga, A., & Scholtens, B. (2016). ESG Integration and the Investment Management Process: Fundamental Investing Reinvented. *Journal of Business Ethics*, *138*, 3, 525-533.

Ioannou, I., & Serafeim, G. (2017). The Consequences of Mandatory Corporate Sustainability Reporting. *Harvard Business School Research Working Paper*, no. 11-100. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1799589

Nambisan, S., Lyytinen, K., Majchrzak, A., & Song, M. (2017). Digital Innovation Management: Reinventing Innovation Management Research in a Digital World. *MIS Quarterly*, *41*, 223-238.

Reverte, C. (2009). Determinants of Corporate Social Responsibility Disclosure Ratings by Spanish Listed Firms. *Journal of Business Ethics*, *88*, 2, 351-366.

Sustainable Stock Exchanges Initiative (2015). *Model Guidance on Reporting ESG Information to Investors*. Retrieved from https://sseinitiative.org/publication/model guidance-on-reporting-esg-information-to-investors-a-voluntary-tool-for-stock exchanges-to-guide-issuers

Presentation-Electric vehicle charging infrastructure: findings from the highway field study in St. Petersburg, Russia

by

Olga Kalchenko, Peter the Great St.Petersburg Polytechnic University, Russia, olga kalchenko_oa@spbstu.ru

Yury Nurulin, Peter the Great St.Petersburg Polytechnic University, Russia, yury.nurulin@gmail.com

Inga Skvortsova, Peter the Great St.Petersburg Polytechnic University, Russia

ABSTRACT

In 2016, the Russian Federation signed and in 2019 adopted the Paris Agreement, within the framework of which, in November 2020, the President of the Russian Federation issued a decree on reducing CO_2 emissions.

To date, 80% of electricity generation is based on low- and carbon-free energy sources: gas nuclear and hydroelectric power plants renewable energy sources.

Russia's energy strategy for the period up to 2035 provides for further diversification of the energy balance with an increase in the share of "green" energy in it.

The issues of sustainable development, circular economy and energy transition are actively discussed at

- St. Petersburg International Economic Forum
- International Forum "Ecology of the Big City"
- Week of the Nordic Countries "Ecology"

- All-Russian Forum "Strategic Planning in the regions and Cities of Russia" (Strategic Forum) Cross-border Forum of Environmental Education "Baltic Forum of Circular Economy"

Organizational Ethics, Moral Fundations and Social Worldviews in The Context of The Pandemic

by

Jarosław Klebaniuk, The University of Wrocław, Institute of Psychology,

Poland jaroslaw.klebaniuk@uwr.edu.pl

Jolanta Kowal, The University of Wrocław, Institute of Psychology,

Poland jolanta.kowal@uwr.edu.pl

ABSTRACT

The difficulties incured by the COVID-19 pandemic affected European population across the board. The ethical attitudes and social worldviews of Information Technology (IT) Knowledge Workers (KW) in regional, cross-border enterprises in Poland were studied before and during the pandemic. The relations between the sets of beliefs are presented in the paper. The beliefs belong to three domains: organizational ethics, moral foundations and worldviews. The Organizational Ethics scale (Vitell and Davis, 1990; Kowal and Roztocki, 2015) consists of three dimentions: Ethical Optimism (ETO), Corporate Social Responsibility (CSR), and Top Management Action (TMA). The five Moral Foundations (MF) measured in the study were: Care, Fairness, Loyalty, Authority, and Sanctity (Graham et al., 2013; Haidt, 2012; Jarmakowski-Kostrzanowski & Kostrzanowska-Jarmakowska, 2016). Among the social worldviews following were assessed: the Social Dominance Orientation (Sidanius and Pratto, 1999), Social Trust, Dangerous World believe, and Competitive Jungle belief (Duckitt et al., 2002; Duckitt and Sibley, 2009).

The results of the quantitative study (N=181) conducted in two waves, the first in June 2019 and the second in January and February 2021, allow for the following conclusions. ETO was predicted positively by Care and negatively by Sanctitude during but not before the Pandemic. Overall, also Social Trust was a weak positive predicator of this dimension of organizational ethics. Although there were no significant predicators of CSR among either moral fundations or social worldviews, a weak positive correlation between this dimension of organizational ethics and Fairness was observed. TMA was predicted by Competitive Jungle belief before but not during the Pandemic. Significant weak positive

correlations between TMA and two moral fundations: Loyalty and Sanctity were also observed, during but not before the Pandemic. Social Trust was negatively predicted by Dangerous World believe, and

– before but not during the Pandemic – positively by Loyalty and negatively by Authority moral foundations. The results are discussed in the context of dinamically changing perspective imposed by the lockdown.

Table of content

ABOUT THIS BOOK…

This conference aims to broaden our understanding of various aspects of information and communication technologies (ICT) and information systems (IS) in the context of innovations in sustainable development. The primary focus is on emerging age-based digital divides that are also detectable in the labor market, violated – due to broad technology deployment – citizenship empowerment and inclusion, state policies, and action is undertaken to ensure senior citizens support through ICT-based networks. We put much emphasis on systems, models, and methods fostering ICT innovations. The conference will focus on the ICT and IS development, virtual management, and their impact on different aspects of sustainable development, possible in crisis circumstances. We understand that sustainable development is a positive socio-economic change that does not undermine ecological and social systems (Rees, 2989, FAO, 2021).

Recent, challenging experiences of people related to the pandemic and lockdown have indicated the need to use and develop information and communication technologies (ICT) and information systems (IS) both in everyday life and in companies (Roztocki, Strzelczyk, and Weistroffer, 2020). There was a need for socio-economic activity in virtual conditions. The pandemic and lockdown hampered socio-economic development (Tisdell, 2020). Hence, how to maintain human development, and maybe accelerate it, considering social and pro-ecological conditions? …