International Institute for Applied Knowledge Management

Abstracts Proceedings - KM Conference 2018 – University of Pisa, Italy

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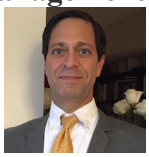

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Communicating knowledge: Can you shoot it?

[Workshop]

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Abstract

Knowledge allows one to take effective action within an organization. However, this knowledge alone is not of much use within an organization unless it is shared. In fact, unless knowledge is communicated within an organization, the benefits provided by that knowledge will eventually be lost. This workshop will allow the participants to engage with a group to achieve a goal. In order to be successful, participants will need to use a variety of communication strategies that will allow them to collaborate and be successful in their task. The workshop will also offer an opportunity for participants to reflect on the success of their group's communication, and then offer ideas for how the communication might be improved.

Keywords: Communication strategies, knowledge sharing within a group, collaboration and teamwork, and reflective analysis.

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Knowledge development and integration among motorsport industries to generate applied innovation

[Panel]

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Giovanni Delfino, Autotecnica, Casalmaggiore, Cremona, Italy

Abstract

The Motorsport Industry has a global yearly turnover of above $ 100 billion spanning in several racing categories spread all over the world. Its value chain involves top-level research and development engineering. Such R&D innovation is often being directly utilized in other sectors, like: aviation, aerospace, automotive, as well as health and wellness. Moreover, such innovation is implemented by the latest applied manufacturing technologies and methods. The Motorsport Industry value chain also spreads knowledge and innovation into the global sport entertainment business in increasingly interactive, data driven ways. What makes the industry unique is the demand for high-level innovation that is developing, accelerates, as well as spreads, among directly and indirectly related industry fields. The majority of Motorsport organizations are Small and Medium Enterprises (SME) operating internationally, leveraging on a high-level of know-how deployed through driven and committed organizational culture, which enables fast-paced joint knowledge development and sharing. The panelists will focus on such dynamics through real-life cases of projects coming directly from the industry, while providing a discussion on how such projects are related to the latest conceptual debates on innovation and knowledge sharing. The panelists will provide time for questions and answers from the audience.

Keywords: Industry innovation, applied knowledge development and sharing, motorsport industry, dynamic knowledge creation, and rapid innovation development.

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Knowledge management, intellectual capital, and their impact on organizational performance: Results from an international benchmarking study

[Keynote]

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Abstract

In the current globalized economy, knowledge has become the key competitive asset. The megatrends of automation, digitalization and globalization have brought about major changes in the bases of value creation, and knowledge has taken the place of land, labor and capital as the key factor of production. Today, knowledge and the ability to generate, share, and apply it to productive purposes lie at the core of organizational performance. Hence, to succeed in the contemporary knowledge-based competition, organizations need to better understand the knowledge-related drivers of performance and to adopt new types of management methods and practices. This presentation will focus on the two key academic discussions addressing knowledge-based value creation in organizations: the Intellectual Capital (IC) and Knowledge Management (KM) approaches. IC concerns the intangible resources that contribute to value creation and applies a more static approach to knowledge, while KM practices take a more dynamic perspective and deals with the intentional and systematic processes, methods and practices that enhance the growth and utilization of IC. This presentation will address the conceptualization and measurement of IC and KM practices based on an international research endeavor spanning over 800 companies in six countries. Specifically, it will be argued that the traditional tripartite categorization of IC elements into human, structural and relational capital could be amplified with specifying relational capital into internal and external relationships, and adding three new types of IC elements: renewal, entrepreneurial and trust capitals. Furthermore, 10 types of KM practices are addressed: Strategic management of knowledge, KM leadership, knowledge protection, knowledge-based recruiting, training, appraisal and rewarding, learning mechanisms, ICT practices and work organizing. Finally, knowledge and its management will be addressed based on a series of cross-cultural empirical studies that examine IC and KM practices in Finland, Russia, China, Italy, Spain and Serbia. It will be demonstrated how IC and KM practices differ between these countries, and what kind of an impact the knowledge-related issues bear on various dimensions of organizational performance.

Keywords: Knowledge-based view of the firm, intellectual capital, knowledge management practices, performance impacts of IC and KM practices, an international perspective on IC and KM.

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The digitization of industry: An inter-disciplinary approach and critical review of research and media

[Keynote]

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Abstract

Arguably, the next several years will engender the great digitization of industry. Lead by consumer demand and powered by new technologies, experts are claiming we are in a period of radical change that is likely to lead to an industrial paradigm shift. The goal of this presentation is to present the core elements of digitization, followed by a critical review of research and media, for the purpose of enhancing inter-disciplinary perspectives on the future of industry digitization. The presentation will start with an overview of the road to digitization, as well as future projections. This will be followed with the results of a critical review of the digital industry ecosystem, including elements and technologies that are contributing to the foreseeable paradigm shift. The presentation will continue by presenting results from a three-part review of research and media in supply chain digitization. Current findings and areas of improvement for research in this topic will be discussed along with potential avenues for interdisciplinary collaboration. Current issues that will be discussed include: intellectual property infringement, cybersecurity and strategic directions on the effective integration of knowledge capital.

Keywords: Industry 4.0, punctuated equilibrium model, cloud computing, cybersecurity, 3D printing.

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Re-fabricating a sustainable digital society: Towards digital responsibility

[Keynote]

Jean-Henry Morin, University of Geneva, Switzerland, jean-henry.morin@unige.ch

Abstract

Our society has now entered a time of continuous digital transition rather than the common understanding of digital revolution. Digitization is a process and a journey requiring a multi-stakeholder approach to address the challenges we are facing today and those of future generations. While Information and Communication Technology (ICT) is a means serving people and not an end in itself, we must leverage ICT to rethink how we learn, teach, do research, stay safe and serve society in a digitally responsible and sustainable way. This presentation will start with an introduction on the challenges our society is facing in this journey. Specific examples in areas of education, safety, information patrimony and sustainability of information as a heritage will be shown. Fabrication and creativity skills are increasingly being discussed and considered in the context of the necessary transition towards digital literacy. The ecosystem relies on equilibrium to be better understood and we argue digital responsibility is the next frontier to be tamed towards this goal.

Keywords: Challenges in the digital transition of society, ecosystem, people-public-private-partnership (4P) approach, digital responsibility, sustainable digital society.

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Theoretical support for knowledge management and information systems research

[Panel]

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Mírian Oliveira, Pontifical Catholic University of Rio Grande do Sul, Brazil, miriano@pucrs.br

Abstract

Knowledge management has been recognized by researchers and users as crucial to the growth and development of organizations. The Information Systems area contributes to research on knowledge management. This panel covers the main theories related to the information systems area that have been used in knowledge management research and are most cited in the literature (2012 & 2017). In this panel, the discussion will focus on providing an overview of the different theories and their contributions to knowledge management research, particularly to knowledge sharing. Moreover, the panelists will highlight the need to sustain quality peer-review research on strong theoretical foundations. The panel will conclude with an open discussion with attendees on the topics covered.

Keywords: Theoretical options, knowledge management, information systems, and journal publications evidence.

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Is human-human spoken interaction manageable? The emergence of the concept: 'Conversation Intelligence'

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Abstract

Currently, via the mediation of audio mining technology and conversational user interfaces, and after years of constant improvements of Automatic Speech Recognition technology, conversation intelligence is an emerging concept, significant to the understanding of human-human communication in its most natural and primitive channel – our voice. This paper introduces the concept of Conversation Intelligence (CI), which is becoming crucial to the study of human-human speech interaction and communication management and is part of the field of speech analytics. CI is demonstrated on two established discourse terms – power relations and convergence. Finally, this paper highlights the importance of visualization for large-scale speech analytics.

Keywords: Conversation Intelligence (CI), speech communication, Interactive Communication Management (ICM), conversational systems, conversation intelligence platform, power relations, and conversation visualization.

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Some design aspects of a cognitive user interface

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Abstract

We report on research conducted as part of the Universal Cognitive User Interface (UCUI) project, which aims at developing a universal, autarkic module for intuitive interaction with technical devices. First, we present an empirical study of image schemas as basic building blocks of human knowledge. Image schemas have been studied extensively in cognitive linguistics, but insufficiently in the context of human-computer-interaction (HCI). Some image schemas are developed early at pre-verbal stages (e.g., up-down) and may, thus, exert greater influence on human knowledge than later developed image schemas (e.g., centre-periphery). To investigate this for HCI contexts, we applied a speech interaction task using a Wizard of Oz paradigm. Our results show that users apply early image schemas more frequently than late image schemas. They should, therefore, be given preference in interface designs. In the second part of this contribution we therefore focus on the appropriate representation and processing of semantics. We introduce novel theoretical work including feature-values-relations and Petri net transducers, and discuss their impact on behaviour control of cognitive systems. In addition, we illustrate some details of the implementation regarding learning strategies and the graphical user interface.

Keywords: Cognitive system, intuitive interaction, image schema theory, feature-values-relation, Petri net transducer, and behaviour control.

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Creating gameful experience in the object-oriented programming classroom: A case study

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Abstract

Gamification has become popular in education. However, gamified classroom activity together with assessment activity are not yet much explored. In this study, the gamification was tested by assigning students enrolling in a programming concept class (object-oriented programming using Java) to play a simple card game and contest their programs involving the card game with others. The simple card games are chosen to decrease an instructor's burden. The results of the focus group discussions show that gamified classroom activity could enhance students' problem solving skills, engagement, attention to the course content, enjoyment and friendship, understanding, and creativity. The gamified assessment activity also lets students have more time to solve problems, clearly understanding the problems, increasing their confidence, decrease recitation, and reduce their stress. Intrinsic motivation is the main construct driving students to engage in gamification, supported by students' extrinsic motivation.

Keywords: Gamification, object-oriented programming, education, case study, classroom, and assessment activity.

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Developing program objectives in data analytic field of study using three frameworks

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Abstract

This paper presents a methodology and results in developing program as well as course objectives to be included in curriculum proposals. This study provide a literature review and uses steps of keyword indexing, thematic analysis, as well as the popular Bloom's taxonomy field of text in effort to phrase program objectives that follow standards set for this purpose. A set of program objectives for a program in Data Analytics derived by this methodology is presented in the conclusions.

Keywords: Data analytic, business data analytics, big data analytics, and data science.

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Expert assessment of organizational cybersecurity programs and development of vignettes to measure cybersecurity countermeasures awareness

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Abstract

As organizational reliance on technology increases, cybersecurity attacks become more attractive to attackers and increasingly devastating to organizations. Due to lacking knowledge and skills, humans are often considered the most susceptible threat vector for cyber attacks. Previous studies in information systems (IS) literature have confirmed awareness techniques to be the first step in increasing employee cybersecurity-related knowledge, promoting security-conscious decision-making, and the prevention of naive IS security behaviors. While training initiatives exist within many organizations, there appears to be a limited number of empirical research studies that focus on what security education, training, and awareness (SETA) programs should encompass. This includes topics to be covered, the most valuable method for delivery, and to what degree these factors play a part in the IS security practice of employees. The aim of this study was to use subject-matter experts (SMEs) to validate: 1) the key topics needed for two SETA program types (typical & socio-technical), 2) the measurement criteria for employees' cybersecurity countermeasures awareness (CCA), 3) weights for the three CCA categories (awareness of policy, SETA, & monitoring) in the overall CCA measure, and 4) two SETA programs content with integrated vignette-based assessments for CCA. A Delphi methodology was utilized to gather feedback from 21 SMEs regarding cybersecurity topics for organizational SETA programs, validation of SETA training content, and to develop a vignette-based measure of CCA. Results show that awareness of the organizational cybersecurity policy was the most important category for the overall CCA measure with 41%, followed by awareness of SETA program content, with 34%, while awareness of monitoring was 25%. The paper concludes with discussions and future research agenda.

Keywords: Cybersecurity, cybersecurity skills, cybersecurity countermeasures awareness, security, as well as security education, training, and awareness (SETA).

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The consequences of the use of online sources of information and mobile devices in university classes

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Abstract

The article presents the observation results of the use of different media by students during university computer lab courses. The observation results were supplemented with survey results on general preferences of the students regarding the forms of access to information. The study showed that the students prefer using electronic sources over traditional printed ones, as well as their clear commitment to the use of mobile devices. The students also preferred graphic forms of presentation over in-depth textual analyzes. The observation proved that many students have a problem with assessing the quality of information available on the Internet. The author proposes to use terms alternative knowledge or post-truth knowledge to emphasize the importance of the problem of information source credibility.

Keywords: Information quality, alternative knowledge, pop knowledge, learning, Internet, information sources, and mobile devices.

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Differences in salaries and employment security between tertiary education graduates and their determinants: Evidence from Poland

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Abstract

This article verifies empirically differences in salaries and employment security across 140 thousand graduates of 231 Higher Education Institutions (HEIs) in Poland. HEIs according to the clustering procedure, results were grouped into four clusters: "Underdogs", "Middlers", "Aspirants", and "Winners". Then, a contingency analysis was done, which proved dependence between belongingness to cluster and: localization (weak dependence), profile of HEIs' graduate curricula (medium), as well as ownership type (strong). Discussion of the results and conclusions are presented.

Keywords: Higher education, private monetary benefits of education, salary, and employment security.

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Validation of a vignettes-based, hands-on cybersecurity threats situational assessment tool

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Abstract

Advanced Persistent Threats (APTs) have been growing with social engineering and corporate e-mail compromise reported as the two most penetration vectors to organizational networks. Historically, users (i.e., office assistants, managers, executives) have access to sensitive data and represent up to 95% of cybersecurity threats to organizations. This study addressed the problem of threats to organizational information systems (IS) due to vulnerabilities and breaches caused by employees. While in the past, only selected employees at the organization had access to the computer networks, with the proliferation of mobile devices almost all employees and vendors/contractors have access to the organizational networks. Computer and mobile device users are one of the weakest links in the cybersecurity chain, due to their limited cybersecurity skills (CySs). Over the years, the measures of CySs of computer users were based on self-reported surveys or measure knowledge only. Prior IS and medical research found participants view scenarios as nonintrusive and unintimidating, while providing a realistic way to assess various situations from sexual harassment to chemical hazards. Therefore, this paper discusses the validation stage of a cybersecurity threats situational assessment tool that utilizes vignettes with observable hands-on tasks to measure and quantify CySs. Discussions and future research are also presented.

Keywords: Cybersecurity skills, cybersecurity knowledge, cybersecurity experience, cybersecurity threats situational assessment tool, and advanced persistent threats mitigation.

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A welcomed reversal in computer science enrollments: Analysis of contributing factors and recommendations to sustain the growth

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Abstract

Periodic assessment of enrollment in programs is helpful in different ways. It reveals patterns that may not be immediately clear and it identifies contributing factors that provide insight into sustaining growth. For Information Technology programs, this kind of assessment takes another dimension - the rapid changes of technology may dictate on faculty to continuously study market demand and to reshape their programs in response to the demand. This study assesses the recent trends of enrollment in Computer Science programs. It presents enrollment trends in the years since the turn of the century, analyzes the factors that contributed to the cycles occurring during these years, and provides recommendations for sustaining the most recent trend. This paper sheds light on a program in Computer Science at a university in Western Pennsylvania. It shows how this department continued assessing the trends regularly and how they are responding to the most recent enrollment trends in their program.

Keywords: Enrollment reversal in computer science programs, enrollment trends in computer science programs, attrition in computer science programs, and graduation rates in computer science programs.

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Knowledge generation model based on gamification principles, from the perspective of software processes

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Abstract

Knowledge management is a fundamental and complex process for nowadays organizations. It has deserved attention in literature from different perspectives and disciplines. In practice, the low motivation of people belonging to organizations imposes an interesting challenge to multiple research trends and areas. The approach addressed in this paper for encouraging and facilitating people engaging in such process is termed gamification. Gamification is based on games principles. It is useful for solving engagement issues within organizations and in processes. This paper introduces a gamification-based model allowing knowledge identification, creation, codification and transferring. It is focused on the several processes in a software company business model. A quantitative model evaluation was conducted by a web tool, involving measurements regarding creation, documentation by artifacts, and transferring of knowledge in a specific area of the software company. Model application and obtained results are discussed and analyzed, allowing its repeatability by the reader. It was concluded that results of the presented research-in-progress are promising.

Keywords: Knowledge management, software processes, and gamification.

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Benefits and areas of ICT use by Polish small and medium enterprises

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Abstract

The purpose of this paper was to identify what Information Communication Iechnologies (ICT) tools Polish small and medium enterprises (SMEs) use. Despite the significant contribution that ICT has made to business, many studies indicate that there are a large number of unsuccessful implementations in SMEs and that the use is low. This applies to Polish small and medium enterprises. This research present the ICT tools that Polish SMEs use, as well as the areas where they are being used and benefits these companies perceive. The most popular and most commonly used instrument is the email, which is used by 88% of entities. The emails contain knowledge and information that is not codified in any repository of knowledge. The area of the enterprise in which employees use new technologies is the area of marketing confirmed by 44% of the surveyed entities. Companies recognize that the use of new technologies brings benefits. These benefits translate into an increase in the company's profits, which was confirmed by 59% of the surveyed entities. To stimulate the development of companies from the SME sector in Poland, it is important to support the development of modern ICT tools.

Keywords: ICT tools, ICT use, ICT benefits, and SMEs.

Online Journal of Applied Knowledge Management

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Entropy and the variability of dependence: System of profound knowledge (SPK) and induced entropy copula as a measure of variability for copula density

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Abstract

Deming's System of Profound Knowledge (SPK) is a framework for creating; disseminating and applying knowledge in business, one of its basic principles is the knowledge of variation. SPK is based on a systemic approach in which each part of the system is interconnected, where a system is an interconnected complex of functionally related components that work together to try to accomplish the aim of the system. The system's aim is to be optimized throughout time. Complex systems may vary through time and their variability can easily be measured by its entropy and its interrelatedness. The entropy copula or interrelatedness is interpreted as a measure of reduction of independence measured by the entropy of independent variables. This paper provides the expression of the entropy copula for multivariate t distribution and introduces the concept of induced entropy copula as a measure of variability for copula densities. Moments for the induced entropy copula are obtained as well as the asymptotic sampling distribution for entropy copula for the multivariate t and Cauchy. A test for uncorrelatedness based on the entropy copula is also developed. Tables are provided for testing at different significance levels.

The paper's application is based on the Deming's Four Principle: The Knowledge of Variation. The knowledge of variation makes a distinction between the variation inherent and predictable to any part of the process components and the variation that it is not predictable in any part of the process components. Process control is the understanding of chance and assignable causes affecting the variability in a process if a process is out of control, steps are taken to diagnose the assignable causes and remove them, thus, its purpose is fault prevention. Statistical process control and control charts are one of the most effective ways to address Deming's fourth principle to determine stability and control in a system. Process control seeks to determine whether a process is in control, meaning whether the distribution of some critical measured variable is stable. A manufacturing example, using multivariate control charts, is analyzed applying the entropy copula approach.

Keywords: Deming, profound knowledge, bodies of knowledge, entropy copula, multivariate t, asymptotic distribution, test for uncorrelatedness.

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Improving success with information technology using an organizational epistemology

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Abstract

There may be a disconnect between technology as-created and as-used that could lie at the foundation of frequent failure in cost, schedule, and/or performance of Information Technology (IT)/Information Systems (IS). This can perhaps be reconciled through a focus on the socially constructed and emergent nature of IT as it enters and is used by an organization. A structured and facilitated dialog technique, by focusing on properly perceiving human felt needs in addition to technological aims, may improve the process of technology realization. The research starts with an analysis of IT/IS failure factors using case studies. Then, a theoretical framework is derived to attempt to address the systemic failure factors. This is then made practical by creating a conceptual decision framework for management to use in framing complex investment decisions including IT/IS. The framework elements achieve an organizational epistemology, or knowledge framework, that can potentially facilitate more accurate acquisition and development of the system-as-created, and perhaps lay the foundation for subsequent transition into a system-as-used that an organization can use in the manner needed and intended. In addition, this epistemology may underlie the process, and products, of successful IT/IS architecture.

Keywords: Information systems, knowledge representation, management decision-making, and organizational epistemology.

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Security policy and data protection awareness of mobile devices in relation to employees' trusting beliefs

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Abstract

This paper builds a research model to examine the impact of security policy awareness and data protection awareness of mobile devices on employees' trust belief. A survey instrument was administered to a sample in various organizations in the United States (US). Collected data were analyzed using Partial Least Squares - Structural Equation Modeling (PLS-SEM). Results using 222 participants showed that the security policy awareness of mobile devices positively and significantly contributes to employees' trusting beliefs. Likewise, the data protection awareness of mobile devices positively and significantly contributes to employees' trusting beliefs. The findings are discussed.

Keywords: Mobile devices, security awareness, security policy, data protection, and trusting beliefs.

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Knowledge donation and knowledge collection patterns in a free software community

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Abstract

This study aims to understand which combinations of tools and activities performed by members of a free software community lead to knowledge sharing. This paper reports a qualitative study developed using data from a worldwide free software community. We have applied Fuzzy Set Qualitative Comparative Analysis (fsQCA) technique, which offers alternatives configurations leading to both the outcomes and their absence. Results show that there is no solution leading to the absence of knowledge collection; there are several and alternative combinations leading to knowledge collection, knowledge donation and both knowledge sharing processes. There are also some combinations leading to the absence of knowledge donation or the absence of both processes.

Keywords: Knowledge donation, knowledge collection, free software community, fuzzy set qualitative comparative analysis (fsQCA).

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An investigation of knowledge brokering during service encounters

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Abstract

Service encounters present excellent opportunities for obtaining and exchanging so called tacit and explicit knowledge between customers and organisations. Recently, the role of frontline employees as knowledge brokers between organisations and their customers has received attention from scholars and practitioners. Despite the significant role played by frontline employees in obtaining knowledge from customers and sharing it during service encounters, there is a lack of research that provides a comprehensive framework intended to explain their role during such engagements. Following an extensive literature review, we developed a research model that identifies: (1) the role of frontline employees as knowledge brokers for customers and organisations and (2) the factors that influence their roles as knowledge brokers during service encounters. In total, 30 semi-structured interviews with different informants (i.e. managers and employees) from three top commercial banks in Jordan (X, Y, Z) were administered through three case studies. We adopted a qualitative 'interpretative' methodological approach to the analysis of the empirical data. Our findings from an evidence-based analysis suggest that the knowledge brokering engaged in by frontline employees during service encounters is affected by four sets of factors (organisational–level, individual-level, technology-level, & knowledge–level).

Keywords: Knowledge brokering, customer knowledge, frontline employees, and service encounters.

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The effects of gamification elements in e-learning platforms

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Abstract

Gamification to perform tedious tasks in an enjoyable way are used in e-learning systems. This study examines in what manner gamification elements affect the e-learning experience in software studies. Two similar e-learning platforms were developed with the aim to teach basic Linux commands, one of them including gaming elements. One group (92 participants) studied using the gamified platform, and another group (47) using a non-gamified platform. The findings show that although the exam grades were not statistically different between the groups, the motivation to learn and continue learning after this experience were higher in the group using a gamified e-learning platform.

Keywords: Gamification, gamified e-learning, badges, points, gamification elements, gamification artifacts, and motivation.

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Open government data: The case of Polish public sector

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Abstract

This paper presents the idea of open government data along with the benefits and threats resulting from using open data. We describe the results of their research on availability of the open data on the example of Poland with particular emphasis on Central Repository for Public Information (CRPI). The comparison of CRPI in Poland and other countries has been discussed. The review of accessible public information has been made with particular focus on data formats. Data formats are important aspect of open data as their facilitate or impede the reuse of data. The insights from our participant observation in the projects of computerization of public administration are also presented. Although the Open Government Data (OGD) movement can provide a number of benefits, while the recent study has shown that in Poland it has not achieved its full potential yet.

Keywords: Open data, open government data, linked data, and central repository for public information.

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Assessing the effectiveness of IPTEACES e-learning framework in higher education: Fundação Dom Cabral - a Brazilian perspective

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Abstract

IPTEACES is an e-learning framework, primarily developed through a pedagogical benchmark, and addresses an assorted social-demography and geographically dispersed variety of attendees. It was originally conceived and designed as an instructional design framework for online corporate learning that could enable an integrated implementation of an appropriate learning strategy for different learners. Fundação Dom Cabral (FDC) is a prestigious Brazilian business school with international standards and procedures. This study reports the application of the IPTEACES Framework in FDC's Executive MBA. An experience has been put into place with a specific new learning module to evaluate (i) how IPTEACES e-Learning framework can promote students' learning; (ii) how to assess its effectiveness and determine specific quality improvement measures' and (iii) how IPTEACES e-Learning framework enhance Organizational learning approach/products. Qualitative and quantitative techniques were utilized to collect the vital data to address these research questions. Results showed that the application of the IPTEACES Framework to this new learning module has reached high effectiveness (0.75).

Keywords: Learning approach, higher education, IPTEACES, EMBA, and learning strategies.

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Prosumers knowledge sharing to develop and manage products

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Abstract

The purpose of the paper is to advance research on prosumers knowledge sharing with enterprises and public organizations by examining and better understanding what knowledge about products prosumers share and would like to share in order to improve products. The paper provides and verifies a new theoretical framework depicting prosumers knowledge about products, which they can share with business and public organizations. The reported outcomes are the result of a questionnaire survey that yielded responses from 783 Polish and 171 UK-based prosumers. The research findings reveal that prosumers mainly share their knowledge about products functionality, ease and intuitiveness of use, as well as a products reliability and durability, whereas they rarely share knowledge related to products design or the packaging of products. It is also found that there are significant differences between knowledge about products that prosumers share and would like to share. In addition, Polish prosumers share and would like to share various kinds of knowledge about products more frequently than UK-based prosumers.

Keywords: Consumer knowledge, prosumer, knowledge sharing, product development, Poland, UK.

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Exploring the effects of expertise and guidelines on small and medium enterprises (SMEs) cybersecurity practices

[Research-in-Progress]

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Abstract

Securing information is a seemingly never-ending task, especially for small- to medium-sized enterprises (SMEs). Despite the abundance of cybersecurity guidelines, SMEs still experience difficulty in implementing and maintaining good cybersecurity practices. Additionally, a lack of cybersecurity expertise may also play a role in a SME's ability to properly secure their information systems. This proposed study will investigate how cybersecurity guidelines and expertise impact the cybersecurity of a SME. Data will be collected from SMEs in the Pacific Northwest of the United States.

Keywords: Cybersecurity guidelines, cybersecurity expertise, small and medium enterprises, and cybersecurity practices.

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Process improvement in a graduate practicum to create a favorable learning environment for knowledge transfer

[Research-in-Progress]

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Abstract

A successful graduate student level practicum in biomedical informatics must not only fulfill academic requirements and student goals, but also the demands of the dynamic and fast-paced healthcare and technology industries. The processes involved preparing, guiding and mentoring students through a practicum experience allowing them to take full advantage of the learning opportunity can be particularly challenging. Academia is in the position to embrace knowledge management principles that create, share, apply and manage information and ultimately knowledge. This project applied selected process management tools to map, develop and provide continuous feedback to improve the Nova Southeastern University, Dr. Kiran C. Patel College of Osteopathic Medicine, Department of Health Informatics, Biomedical Informatics Program student practicum course. Process tools used in this project included: the Supplier Input Process Output Customer Requirements (SIPOC-R), interviews and focus groups, an "As Is" process map and swim lane map, and the study-plan-do-study-act (SPDSA) model, which will be used as the student practicum overall template. The project is now at a stage to begin tracking and collecting data, which will facilitate ongoing continuous feedback and improvement.

Keywords: Knowledge, Learning, Practicum, Process Improvement.

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Proposal of evaluation criteria for editors of ontologies created to represent knowledge in information systems

[Research-in-Progress]

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Abstract

One way to represent knowledge of experts in information systems is an ontology. Constructing ontology always denotes analysis and organizing knowledge concerning specific field noted in formalized structure. There can be noticed an increasing interest in using ontology, whose goal is to illustrate the model of a specific field, in information systems. There is an increasing number of both, open source and commercial software, whose aim is to support the process of creating ontology. In this paper, we discuss the suggestion of 11 criteria to evaluate ontology editors. For each of them, we present a rating scale. The proposed list of criteria may be used to conduct research and evaluation of ontology editors with the use of scoring methods.

Keywords: Ontology, ontology editor, multi-criteria evaluation, knowledge representation.

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Definition of a framework for acquiring and acquisition sub-processes in a collective knowledge processing in the integrated management information system

[Research-in-Progress]

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Abstract

Efficient operation of the integrated management information systems (IMIS), especially multi-agent systems, is related to their ability to automatically process collective knowledge. On the basis of this knowledge the decision-making process is realized in the business organizations. This paper presents issues related to framework for acquiring and acquisition sub-processes in a collective knowledge of business organization processing in IMIS. The main novelty of the developed framework is coverage all the areas of the operation of an organization. Additionally, the inter-area knowledge for automatic strategic level decision making has been taken into consideration. The main improvements of this framework are that it allows for processing of the whole collective knowledge of business organization and it can be directly implemented in IMIS.

Keywords: Collective knowledge, business organization, integrated management information systems, and multi-agent systems.

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Antecedents of performance, learning and innovation in exporting operations: A conceptual framework

[Research-in-Progress]

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Abstract

The rapid growth of exporting has focused the attention of marketing researchers on the factors associated with export performance. However, although numerous studies have attempted to identify factors that are correlated with exporting success, much debate still remains as it concerns the organizational learning and innovation. This study examined the internal and external forces as the antecedents of export performance, product innovation performance, and learning consequences. This study suggests also the potential moderating impact of the export marketing strategy. It offers a broad-spectrum view and synthesizes important streams of research to propose a conceptual model of the antecedents of performance, learning and innovation in exporting operations. Methodological suggestions for applying the model and measuring it in substantive research are offered and its importance for practitioners is emphasized.

Keywords: Export performance, organizational innovation, organizational learning.

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Knowledge management in the academic environment in Poland: A pilot study

[Complete Research]

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Abstract

The purpose of this paper was to present an introductory, test analysis on effective ways of obtaining various types of useful knowledge, factors conducive to, and hampering sharing knowledge with academic colleagues. Moreover, the aim was to outline the type of knowledge management strategy that should be implemented in institutions of higher education in Poland. A sample of academic employees' opinions was gathered and analyzed. Results as well as discussion and implications are presented. The main conclusion of this study is that research and teaching staff are eager to acquire and share knowledge, while the main challenge for the academic authorities is to implement the personalization strategy of knowledge management and develop an organizational culture that would focus on cooperation as well as mutual trust and reward knowledge sharing. A further, more comprehensive research into the matter will be worth conducting.

Keywords: Knowledge, knowledge management, knowledge sharing, higher education, personalization strategy.

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Determinants of propensity to establish academic innovative start-ups

[Research-in-Progress]

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Abstract

Many young (and not only) scientists have a very good research results, which are useful for society and the economy, but do not appear to implement them in the form of their own start-up due to fear of failure. In order to make it easier for inventors to assess their own potential, this work presents personality and non-personality factors in the process of making decisions about starting a new business. Knowledge about particular factors may reduce the fear of commercializing the results of their own research. The study made so far, is only a preparation of the theoretical base before the empirical stage of transnational research embarkes, that will be carried out with participation of innovative start-ups representatives. The final publication may contribute in this way to increase interest, especially among young scientists, in launching spin-off companies. Increasing the number of these entities is important from the point of view of accelerating the transfer of new knowledge from the science sector to business practice, and at the same time contributing to the increase of innovativeness of the small and medium-sized enterprises (SME)'s sector.

Keywords: Innovative entrepreneurship, academic entrepreneurship, start-up, spin-off.

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Amelioration of the bibliographical records as a case for knowledge acquisition

[Research-in-Progress]

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Abstract

Information systems operate on bits – digital data – interpreted by specific systems as signs and symbols. These last are subject to operations in formal systems. Computers are syntax machine, therefore, the analysis of the "correctness" is possible only on the syntactic level. The analysis of the semantics or meaning, thus, remains beyond the capabilities of these processing systems and requires the intervention of human factors. The meaning of the words (or constructed sentences) is strictly related to the used natural language. Throughout the history of the dynamic world, languages evolve and the words change their meaning – it is called semantic change (shift). The organizing of the library catalogues is a particular case of knowledge acquisition – like the creating of a semantic network. The bibliographical data are not placed automatically and moreover, it is necessary to accomplish an amelioration (better ordering, refining) of the existing records by librarians. The last one is illustrated with a few cases taken from practice. The main goal of this article is to consider the semantic changes (shifts), the amelioration of the bibliographical records and the role of human factors for this task.

Keywords: Language evolution, semantic changes (shifts), libraries catalogues, MARC, bibliographical records, amelioration of data.

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Teaching creative computing for developing computational thinking in elementary and secondary schools: Comparing instructivist and constructivist strategies of code teachers

[Complete Research]

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Extended Abstract

Creative computing (CC) is one of the prominent ways to develop computational thinking, which is crucial for successful functioning in the digital era and promotes high-order thinking processes. It is important to incorporate CC in the curriculum for young students (Blau & Benolol, 2016; Resnick, 2012). However, the manner in which CC are integrated into learning processes depends on the pedagogic perspectives of teachers. Teachers who hold instructivist perspectives are less likely to utilize CC to promote student-centered pedagogy than teachers with constructivist perspectives. This study examined "*folk pedagogy*" perspectives (Olson & Bruner, 1996) of 89 teachers who integrate technologies in their classroom, which enabled to characterize teachers' pedagogical perspectives as instructivist or constructivist (Blau & Pieterse, 2015). Next, we explored through semi-structured interviews teaching processes of 12 experienced teachers who teach creative computing using *Scratch* platform. The findings demonstrated a good fit of "folk pedagogy" and the pedagogical processes detailed in the interviews. The implementation of constructivist teaching strategies by teachers holding constructivist pedagogical perspectives (75.9%) was significantly higher than among their instructivist colleagues (46.1%, $p<0.001$). Nevertheless, CC can promote constructivist pedagogy among teachers with traditional perspectives, since almost half of the strategies used by the instructivist educators for teaching *Scratch* were constructivist. The findings are discussed in terms of constructionism learning theory and its contemporary application.

Keywords: Creative computing, constructionism, computational thinking, instructivist and constructivist pedagogy, folk psychology and folk pedagogy.

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Which digital literacy skills of elementary school students can be promoted by one-to-one computing with Chromebooks?

[Complete Research]

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Extended Abstract

One of the models for integrating technologies in education is one-to-one computing (1:1) for every student. Studies on 1:1 initiatives reported various positive implications, such as active learning, improved learning motivation and higher achievement (Blau & Peled, 2012; Silvernail, 2011). One of the technologies integrated in 1:1 classrooms is Chromebook - a network laptop, which combines the advantages of the tablet, an economic advantage of low price, learning potential similar to a laptop, and ubiquitous access to information and learning resources stored on the "cloud". We examined the impact of the 1:1 computing through Chromebooks on the development of digital literacy skills. The Digital Literacy model (Eshet-Alkalai, 2012) includes six literacies: Photo-Visual thinking, Reproduction thinking, Information thinking, Branching thinking, Socio-Emotional thinking, and Real-Time thinking. The study took place at an elementary school in northern Israel, which integrates Chromebooks in teaching-learning processes. The digital literacy questionnaire (Blau & Shamir-Inbal, 2014) was administrated among 59 fifth graders at the beginning and the end of the school year. At the same periods, we conducted semi-structured interviews with teachers and focus groups with students. The findings showed that 1:1 computing has implications for teaching methods and classroom management. For students, the findings indicated an improvement of students' digital literacies, mainly Information thinking and Reproduction thinking. The study contributes to understanding of how 1:1 computing affects pedagogical processes and how digital literacies develop over time.

Keywords: one-to-one computing, Chromebook, digital literacy skills.

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The evaluation of progress on big data studies: A systematic review

[Complete Research]

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Extended Abstract

The purpose of this paper was to chronicle the progress of big data studies with a view to sparking additional research. We followed an established methodology, modeled after other prior bibliometric projects (Koseoglu, Akdeve, Gedik, & Bertsch, 2015; Ocak, Köseoglu, & Yildiz, 2017). The stages included: determine scope; finalize sampling frame; collect journal articles; complete analysis (content analysis and descriptive statistics); and interpret results. This systematic review of the progress of big data studies over the period 2009 to 2016 yielded a series of interesting finding. Most (71.2%) were published in the last two years of the review (2015 and 2016). Four journals represented more than 50% of the total articles published: Decision Support Systems (19.5%), Information & Management (12.6%), Management Information System Quarterly (12.6%), and Journal of Information Technology (8.0%). Most articles were written by two (28.7%) or three (27.6%) authors. Most (50.6%) papers were Interdisciplinary. Of the 240 unique authors, 16 participated in more than one article. The most common themes were Analytics (28.7%), Framework/Architecture (10.3%), and Strategy (9.2%). Authors from at least 25 countries contributed to articles. American authors lead the production with 42.1%, followed by Chinese at 12.7% and Dutch with 7.9%. In Summary, of the 87 articles analyzed, all from the top information systems or top knowledge management journals, nearly half were published in 2016; more than half were published in just four journals; more than half were written by two or three authors; most were interdisciplinary in nature; and most originated from two countries.

Keywords: Big data, bibliometric analysis, journals, and knowledge management information systems.

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To err is human - what can be learned from errors? Common errors among novices while modeling business processes

[Research in Progress]

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Extended Abstract

Process-oriented information systems (POIS) are designed and implemented primarily to support the organization's business processes. Unlike information systems (IS) that are data-oriented, POIS are characterized by a strict separation between process logic and application code. The process logic must be presented explicitly, usually in terms of **process model**. The process model provides the basis for designing and implementing the system, and clarifies the stretch between current practices and managements' desired ones. Incorrect modeling of business processes can jeopardize the quality of services/products, as well as expose the organization to a variety of risks.

This presentation focuses on errors made by novices, while using a *modeling language* (e.g., EPC, BPMN) to model the processes of an IS, intended to be deployed in an emergency room environment in a hospital. We picked this type of environment because it is highly dynamic, complex and involves multiple actors. Our objectives are: (a) to detect common errors, made by novices, during a modeling task; (b) to classify these errors and identify specific error-combinations; (c) to attempt an explanation of error types and combinations based on demographics, scholarly record, and a measure of self-efficacy.

We recruited 180 participants who recently took the course "IS analysis & design" as part of their IS studies, where they used the UML's *Activity Diagram* (AD) as their process-modeling language. The students were asked to perform the following tasks: (a) at the beginning of the course, they were asked to model a simple task (prepare an omelet) to collect baseline data regarding the students' processual thinking. This was before they were taught any of the modeling languages; (b) in mid-course, the students were given a scenario and were asked to model the relevant process using AD; (c) At the end of the course, they were given a second scenario to model. After each of the modeling tasks, we asked the students to assess the exercise's level of difficulty, and their levels of self-efficacy. The three sets of data allowed us to identify combinations of errors, study their learning curve, and hypothesize as to the relationship between their performance, demographics, and level of self-efficacy. The errors were analyzed using three quality criteria: *completeness*, *correctness* and *lack of redundancy*. Results will be presented in full at the conference.

Keywords: Business process modeling, activity diagram, quality criteria

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To be or not to be an entrepreneur? Entrepreneurial tendencies among students specializing in information systems

[Complete Research]

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Extended Abstract

The growing complexity of technology and information driven business and production environments, mandates an innovative approach to problem solving, also named *mindfulness*. Mindfulness is an awareness that facilitates the construction, discovery, and correction of unexpected events capable of escalation. It is predicted on a nuanced appreciation of context and of alternative ways to deal with it. Hence, creative thinking, improvisation, and a proactive attitude towards problem solving, are key competencies underlying such simultaneous adaptive learning and reliable performance. In response, institutions of higher-education around the world have updated their curriculums to provide their students with the relevant capabilities to access new markets, develop new products, incorporate optimal management practices in enterprises. These capabilities create the backbone of **entrepreneurial** studies.

Though positive in principal, the impact of entrepreneurship education on students' preference for innovation remains relatively inconclusive. We ask what are the forces that drive students to adopt an entrepreneurial perspective? Is it possible to identify the characteristics that define the entrepreneurial personality? The presented study attempts an answer by testing the relationship of four constructs to predict preference for innovation, among third / fourth year students specializing in Information Systems (IS). The four constructs are: nonconformity, proactive disposition, self-efficacy, and achievement motivation. The study is based on an Internet survey answered by 236 students specializing in IS as part of their undergraduate program in Industrial Engineering, and Business management. A multiple liner regression was calculated to predict the level of preference for innovation based on various demographic variables: age, sex, and work experience. We then added to the regression variables such as: personal interests (social, economic), proactive disposition, self-efficacy, and achievement motivation. Our study reveals that the constructs predictive of a preference for innovation are: proactive disposition, a strong interest in economics and a proactive disposition. Contrary to our expectation, despite great variations in our respondents' demographic backgrounds, none of the demographic variables predicted a preference for innovation. The paper identifies the role that entrepreneurship education plays in the development of the engineers' entrepreneurship. We offer recommendations that could increase the effectiveness of actions aimed at promoting entrepreneurial tendencies.

Keywords: Entrepreneurial studies and competencies, innovativeness, innovation preference

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Digitalization and knowledge transfer – necessary disruption?

[Research-in-Progress]

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Extended Abstract

Increased speeds in digitalization and globalization are creating masses of new opportunities for knowledge exchange. Human-to-human is not the only possibility for knowledge transfer; the importance of Artificial Intelligence (AI) in all fields is undisputed and continues to grow. Emerging fields, such as Industry 4.0, are already recognizing the importance of established Knowledge Management (KM) but are criticizing the integration of new participants of AI or about human-machine interaction. A reconsideration of the old, conventional ways of processing and of transferring knowledge is required. Research has shown that, despite the emergence of some new methods, KM in general is still confined within the boundaries of Knowledge Theory (KT) from the 1990s and is practically ignoring the changes which have since taken place in technology and in culture. For big and established national economies/corporations as well for upcoming ones, Information Technology (IT) is not just a key to success, it is the foundation and core of their well-being.. It is essential to overcome the gap in processing knowledge and to identify hidden knowledge as well as preventing loss of knowledge stemming from the leaving or the retirement of employees. At this point, the study analyzes how KT needs to blend into new fields and to merge with IT and if existing models can still be used or how they can be improved. Combining different types of knowledge transmitters with individual knowledge receivers will allow the transfer gap to be made smaller. A main objective is not to replace human employees, but to succeed in getting the right knowledge bearer into a corporation/position and to improving the transfer process between old and new participants. By using quantitative and qualitative models and methods for critical text analysis, my research focuses on the knowledge transfer and the construct of acknowledging AI not only as an intermediary but also as an equal transfer partner, which is the fundamental change that needs to be accepted and further researched. This will enable the use of available knowledge resources to their maximum efficiency. Therefore, it is not sufficient to research corporations alone, research facilities and universities have to take part in this process as well. In a further step of my research, the new models and theory are being deployed and tested in a case study at RWTH Aachen University. An empirical survey, which will be sent to the entire academic staff for teaching and research, will be used. Next to researching which transfer partners are already known, it will analyze which theories and technologies are in use and whether the participants are aware of using KM systems or unconsciously doing it.

Keywords: Knowledge transfer, artificial intelligence, industry 4.0, learning, cultural/ economic/social changes.

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Quality in public administration: A causal configuration analysis

[Complete Research]

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Extended Abstract

This article presents a qualitative study about the influence of Knowledge Management and Intelligence for a greater quality in decision-making and greater efficiency and effectiveness in the execution of the public activity. Data was gathered from the perspectives of 17 public managers from southern Brazil and it was collected using semi-structured interviews. Fuzzy-set Qualitative Comparative Analysis technique was applied to identify the paths leading to quality, efficiency, and efficacy in the public administration.

The identification of alternative pathways leading to higher quality decision-making and to the efficiency and effectiveness in the execution of public activities presents itself as a great contribution to the administrative practice. The Brazilian context is interesting for the development of this study, since the country is facing a turbulent, uncertain and full of surprises scenario, and being able to count on processes of environmental scanning and the compliance with formal processes of Knowledge Management may help reduce the uncertainty in the decision-making of public managers.

Results suggest that Knowledge Management and Intelligence are relevant for the quality of public managers' decision-making, as well as for a greater efficiency and effectiveness in the execution of public activities. Findings also address the combination of these aspects with the support from the senior management and the existence of financial incentives. Additionally, results indicate that the absence of quality in decision-making and in the efficiency and effectiveness of the public activity are related to the absence or reduced use of elements of Knowledge Management and Intelligence in the Public Management.

Finally, it is important to highlight the importance of the joint use of Knowledge Management and Intelligence processes, together with other conditions identified in the paper, in favor of a more effective Public Administration in the development of its activities and in the construction of a cities, states, and countries.

Keywords: Public Management, Knowledge Management, Intelligence, fuzzy-set Qualitative Comparative Analysis (fsQCA)

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How are successful companies executing knowledge management? Best knowledge management practices in Finnish firms

[Completed Research]

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Extended Abstract

The crucial status of knowledge and its management for firm performance is well acknowledged in the academic research community, but the vast majority of organizations struggle to comprehend how and why to implement knowledge management (KM) in practice. The academic KM literature has produced glorious success stories of large knowledge-intensive firms, but a great deal of companies with fewer resources may have struggled to learn from those examples. In addition, practitioners have not been given many chances to share their insights of successful KM practices, as the KM scholarship has focused on replicating and re-using the established conceptual models and methodologies. Hence, research on the up-to-date methods for applying KM in practice is important, as it is likely to generate novel and managerially relevant knowledge and increase knowledge transfer from academia to practice.

This paper presents the key findings of how successful "KM companies" are actually doing KM. We selected the case companies for our study based on two KM surveys in 2013 and 2017 in Finnish companies with at least 100 employees. We classified the companies based on the level of their KM practices and firm performance, and identified 17 companies that were doing better than country average in terms of KM practices and firm performance across both surveys. To study KM-in-action in these shortlisted companies, we managed to interview 3-4 directors in six firms during Autumn 2017 and conducted a content analysis on the interview data.

We provide executable examples of the best KM practices developed in these six firms. The practices vary from the regular involvement of top-directors in operational-level activities, to a stellar example of employee training and development program. In addition, the results show that data-driven decision-making and management are on the rise, and that companies manage to do it without highly complex and expensive technological solutions. In summary, fast-paced and transforming ways of work have set a demand for new KM practices to manage structural and cultural change in the studied case companies.

This paper contributes to the academic discussion on KM by identifying the state-of-the-art KM practices in well-performing companies. For practitioner audiences, the paper provides new ideas of the KM practices that are worth implementing in their organizations. As a limitation, KM practices are culture dependent, which may limit the generalizability of the findings.

Keywords: Knowledge management, knowledge management practices, best practices, case study, Finland

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Knowledge management strategy: Necessary and/or sufficient contingencies for personalization and codification strategies

[Research-in-Progress]

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Extended Abstract

This study examines the configuration of contingencies informing knowledge management strategies. This study proceeds from the well-known distinction between personalization and codification strategies for managing knowledge. Organizations follow a hybrid approach in practice where one strategy is predominant, whilst the other is in a supporting role. Various contingencies could decide which strategy is predominant in an organization. For example, Hansen, Nohria, and Tierney (1999) argued that the nature of the product or services and the nature of the knowledge required were the most important contingencies, whilst Venkitachalam and Willmott (2015) found competition, leadership, organizational politics, culture, and technology to be the factors shaping strategy dynamics. A better understanding of the relative importance of such contingencies can improve the appropriateness of strategic choices.

The current study applies Qualitative Comparative Analysis to find whether any configurations of contingencies from knowledge management theory are necessary or sufficient conditions for a particular predominant strategy. With the help of a domain expert (the convener of the South African Knowledge Management Summit), South African organizations with definable knowledge management strategies were selected and categorized for each contingency variable and the predominant knowledge management strategy outcome. It is expected that management perception of whether tacit or explicit knowledge is required to solve business-related problems will be a sufficient condition for the strategy adopted.

Keywords: Knowledge management strategy, codification, personalization.

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Women's perceptions of ICTs, empowerment and success: A qualitative analysis of seven countries

[Complete Research]

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Extended Abstract

Information and communication technologies (ICTs) are regarded as one of the potential factors in supporting women's participation in the labor force, in enabling the empowerment of women, and in promoting gender equity. Further to that, ICTs are thought of as a mechanism for women, encouraging and facilitating self-expression toward existing social norms and attitudes, especially in developing countries. For women, the key issue of empowerment is increasing their power to take control over decisions that shape their lives. Success is a significant factor in the choices they make both personally and professionally. Considering women's principal concern about relationships and balance in their personal lives, discovering women's perceptions of ICTs, empowerment, and success may present opportunities leading to global participation and economic development by women through the future digital economy.

The purpose of this study was to explore and compare women's perceptions of ICTs, empowerment, and success in seven countries. A convenience sample of 869 (137 from Georgia, 105 from Poland, 130 from Romania, 152 from Slovenia, 102 from Spain, 123 from Taiwan, & 120 from Turkey) participants took part in the research. The general results showed that there are many common factors independently of cultures. For the attitudes toward ICT, the "*easing communication*" and "*accessing or sharing information*" are the most expressed perceptions on the positive side, and the "*lack of privacy*" and "*false information*" are the most stated perceptions on the negative side. For the comments about the impact of ICT on personal success, "*by expanding awareness*" and "*by increasing effective communication*" are the most denoted statements. For the question of "what success looks like to you", the most expressed answers indicate the statements of "*determining and achieving a goal*" and "*being happy/satisfied*". For the comments about how education and technology empower you, the statements of "*by accessing or sharing more information quickly*" and "*technology makes education much easier*" are the most emphasized ones. Lastly, the "*education"* and "*family*" are the most stated factors for empowering women. Because of culture-bound factors, there were also differences in the perceptions of women among seven countries.

Keywords: ICTs, empowerment, success, women, qualitative analysis

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The influence of information production on value creation

[Research-in-Progress]

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Extended Abstract

This study focuses on value creation in the context of information production. Research on value of information focuses on the consumption side of information. However, information systems allow users to become disseminators of knowledge and, thus, producers of information. Our assumption is that value perception changes as a result of production experience. This assumption comes from a recent study which coined the concept "Ikea Effect"- value perception increases when people actively engage in making physical objects (Norton, Mochon, & Ariely, 2012). This study applies the Ikea Effect theory to the digital world, by examining production of information goods. In addition, recent studies reveal that crowdsourcing creates business value for consumers and firms (Wilson, Bhakoo, & Samson, 2017). We observe how the virtual presence of peers affects value perception of produced information. The subjective perception of information value (Raban & Rafaeli, 2006) is measured by willingness-to-pay (WTP) by consumers and willingness-to-accept payment (WTA) by producers. 309 participants took part in a set of information-based tasks about Web accessibility. Consumers read information about Web Accessibility. Producers created the same information. WTP and WTA were measured before and after consumption/production/peer-production. Our results show that the change in value perception in production is larger than in consumption; Post-experience value perception is higher than pre-experience; Value measured before production by a single producer is lower than value perception in a peer production setting. The "Ikea Effect" for information goods shows that production affects value perception. Labor put into production process is translated to perceived value of information. In addition, crowdsourcing is more valued than the labor of individual producers.

Keywords: Information production, information usage, information evaluation, information consumption

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Developing an evaluation framework for knowledge management systems in SMEs

[Complete Research]

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Extended Abstract

This paper develops an evaluation framework for knowledge management systems (KMS) in small and medium-sized enterprises (SMEs). An embedded research approach was used to develop an evaluation framework for KMS in a small, UK-based, information technology (IT) consultancy. This research develops on Nevo, Furneaux, and Wand (2008)'s framework, which builds on the theoretical foundations underpinning organizational knowledge management. The framework is evaluated through its application in the case study company. This paper presents evidence of the effectiveness of the Nevo et al. (2008) framework. First, it provides an overview of knowledge management (KM) activities and a software specification for the KMS. This involved an investigation of existing KM activities within the company's project lifecycle to facilitate the identification of user requirements. The next stage of the evaluation process identified key KMS capabilities required to support the company's project lifecycle KM activities. The four data collection approaches used were: (1) mapping of the essential information used in the company's project lifecycle process, (2) questionnaire, (3) semi-structured interview, and (4) informal discussion. Second, it examines the application of the framework through the case study. This involved evaluating three KMS providers and three KMS already used within the company. A key contribution of this research is building on Nevo et al. (2008)'s framework by assigning relative weights of importance to each of the KMS capabilities. For example, knowledge importation, search and retrieval, and metaknowledge were identified as key KM capabilities. This weighted importance approach potentially improves both the decision-making and evaluation process when undertaking a KM initiative. The approach used builds on an existing framework and through application demonstrates the practical utility of a theory-based evaluation framework.

Keywords: Knowledge management systems, evaluation framework, small and medium-sized enterprises

Reference:

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The future chief knowledge officers: Are they given the right knowledge?

[Research-in-Progress]

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Extended Abstract

In a globalized world, the knowledge workers must know the same everywhere. This is not exactly so, because the different cultural history of the business influences the learning process. Building on the local tradition and monitoring the global world a new type of value system is emerging, namely 'glocal values' of knowledge workers.

The problem is how this value system could be learned. Are Knowledge Management courses geared towards future Chief Knowledge Officers (CKO)? The purpose of this paper is to develop a Knowledge Management course in MOOC context geared towards the future CKOs. The course is designed for the Hungarian speaking communities in Carpathian Basin. This course is offered by the Online Education Center of Óbuda University. The aim of this course is to show the evolution of the value system through the following four perspectives: (1) Knowledge Workers' identity; (2) evolution of expectations; (3) pathfinding; (4) knowledge sharing space. The content of this online course is created by combining a comic strip featuring a business dilemma, a one-minute video lecture, a short reading, a TED talk, and a self-quiz. More than 100 students finished this course by writing a narrative essay. This type of exam is not really usual in spite of the students really enjoy to find relationships between major concepts of the course and their experiences. These essays were added to the course as a new content for future studies. The narrative imagination is the basis of human thinking so it is convinced that we can learn more from these narratives than an impersonal description of a phenomenon. The basis of this study is to pay attention the importance of narratives in CKO' work in organizations. The main objective of this job to create and give space for free knowledge sharing.

Keywords: Content management, e-learning, knowledge sharing, value system

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Feedback and survival on community question - answering sites: The case of stack exchange

[Complete Research]

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Extended Abstract

The survival of open community content platforms depends on continued contributions by their members (Forte & Lampe, 2013). Churn, i.e. the desertion of contributors, is a major concern in many online platforms. The highest churn rate appears after a contributor's single contribution.

Feedback is known to have an effect on contributors' churn and especially on newcomers. In this study, we explore on the role of feedback mechanisms on preserving contributors beyond the first answer in Community Question-Answering (CQA) sites. We focus on the roles of the votes and comments feedback mechanisms. This topic was studied by other scholars and there are some contradicting reports as to the effect of the different mechanisms. One of the main goals of this study was to provide evidence that will shed light on these contradicting findings.

In order to study the feedback effect on contribution survival, over one million posts were harvested from five Stack Exchange communities. Stack Exchange is one of the world's largest and most successful CQA services. In recent years, the ratio of answers to questions on Stack Exchange sites has been decreasing (Srba & Bielikova, 2016), suggesting that the survival challenge is mainly in maintaining answer providers. Hence, in this paper, we examined the effect of the votes and comments feedback mechanisms on the survival of answer providers. We found that feedback in the form of votes and comments provided to the newcomers' first post is strongly correlated with their retention. These findings have implications for the mechanism design of Q&A sites, and for testing the theory of the impact of feedback arrangements on persistence.

Keywords: Community question-answering, feedback, comments, votes, churn, survival, stack exchange

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Whom are we buying from? Sellers' impression management in a C2C creative marketplace

[Research-in-Progress]

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Extended Abstract

For more than 20 years, western countries have witnessed a renaissance of crafts: the number of people practicing crafts is growing and the crafts market is blooming. A majority of crafts makers rely on Internet platforms for marketing and selling their products. In the offline world, three main venues sell crafts: craft galleries, souvenir shops, and craftspeople's workshops. Buyers at souvenir shops show no particular interest in the persona of the craftsmen that made the product they purchase, while buyers at craftspeople workshops make their purchases after getting acquainted with the craftsperson, her/his creative process etc. Buyers of crafts at crafts galleries are reported to view the seller's profile as way of purchase reaffirmation.

Research on digital social networks and e-commerce platforms found a link between personal profiles and desired output (Raban, 2009). The current study focuses on personal profiles of sellers on a Customer-to-Customer (C2C) Internet platform trading crafts as antecedents of sales volume and revenue. Each component of Creative Industries, including crafts, requires "ingenuity, innovation, and imagination" (Howkins, 2001). In addition, crafts have a unique quality of preserving the practical skills necessary to materialize abstract ideas (Dormer, 1997). The research question that drives this study is: Do C2C crafts platforms resemble souvenir shops or workshops in terms of the importance of persona? Analysis of a random sample of 1800 sellers' pages scraped from Etsy.com revealed a statistically significant medium strength effect that personal profiles had on sales volumes. The contribution of this paper is twofold: 1. Studying the relation between impression management and *actual* online purchase transactions; 2. Contributing another perspective to research conducted in Creative Industries.

Keywords: C2C internet platform, personal profile, impression management, crafts, e-commerce

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Evaluation of classifiers on imbalanced data: implications for practical use

[Research-in-Progress]

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Extended Abstract

The use of machine learning is reaching smaller businesses. In many cases consulting companies or "intelligent" products provide solutions for so-called standard business decisions. Thus, the evaluation of different classification models and choosing the right one will become a necessary skill for decision makers in the near future, even in small companies. This study provides orientation for the use and the interpretation of performance measurements for classification models. We focus on imbalanced data within different business scenarios, since the interpretation of these models contains potential pitfalls (Fernández, García, & Herrera, 2011). Many real-world classification tasks involve imbalanced class distributions, including fraud detection in financial applications or customer churn prediction in telecommunication or energy industry. Automatic churn detection is widespread, since the identification of customers who are likely to terminate their contract is an important part of customer relationship management. In research as well as in real-world scenarios single performance measures like classification accuracy are commonly used to evaluate models, because a single number is easy to understand, especially in management, and easy to work with. Nonetheless a high accuracy is not necessarily the best evaluation criteria on imbalanced data. In most cases the interesting class to predict is the minority class. Overtrained models for the majority class may have a high accuracy but they cannot predict the churn probability of a certain customer. Starting with a literature review on the assessment of models for imbalanced class distributions, we discuss several performance measurements and their pros and cons in practical real-world scenarios. We examine possible interpretations on a well-known imbalanced dataset for churn prediction. In conclusion, a practical guideline for the daily work with classification metrics is proposed.

Keywords: Classification, evaluation, imbalanced data

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Modelling knowledge security: Knowledge security as a knowledge management problem

[Research-in-Progress]

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Extended Abstract

The study aims to develop and evaluate a conceptual model framing information security as a knowledge management (KM) problem. This will be done by conceptualising knowledge security as a KM problem. Both information security and KM practices seek to increase an organisation's competitive advantage. In their simplest forms, information security does so by securing key knowledge and information resources. KM does so by sharing key knowledge and information resources. Here in lies the problem. If information security measures are too tight it may inhibit sharing of knowledge and information which could have created innovation. If KM practices are too open, then malicious entities may be able to use this to access key resources. Focusing too much on either element can be a risk to an organisation's competitive advantage, so it is essential to map the way forward in a sustainable manner.

In recent years information security has become a central topic in organisations. Thus, examining how information security may function with KM practices in an organisation should be of interest to conference participants wondering how the two can function optimally together, given their divergent objectives. This study will be based on elements of epistemic interest, critical interest and meta-science. Thus, the research design will follow a path of establishing context through a review of the literature, defining key concepts, using these concepts to develop a model and evaluating that model through an interview process with high-level thinkers in organisations. The primary implication of the study is that it will set the groundwork for how to use information security and KM practices more effectively together in a sustainable manner. This should help organisations improve their KM practices while making sure they are still secure. It should also help organisations better balance these two areas to ensure innovation continues as effectively as possible.

Keywords: Knowledge management, information security, integrated model

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Women in information technology and cybersecurity: Challenges and call for action

[Research-in-Progress]

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Extended Abstract

Even though the massive efforts to promote Science, Technology, Engineering, and Math (STEM) education in high schools and colleges, women represent a small portion in the Information Technology (IT) and cybersecurity workforce, while even a smaller portion in IT executive roles. Government funding programs to support STEM education has gradually increased. In 2017 alone, the Congress passed five legislations to promote and award funding to support women participation in STEM education as well as workforce. As a result, the percentage of bachelor degrees awarded to women in the United States (U.S.) in STEM has increased steadily in the past 30 years, the portion representing computer and information sciences has declined and followed by a long stagnation. Such a low graduation rate of 20% for women in STEM, and IT related programs means a smaller pool of quality women graduates for potential employers to pick from, and less diversity in IT related teams. Hence there are fewer women professionals that can serve as educators and mentors to other women seeking to work in IT jobs. According to the US occupational outlook 2018 employment of computer and IT jobs are forecasted to grow by 13% from 2016 to 2026, more then any other job type. Moreover the demand for professional workers is primarily focused on cloud computing, data storage management, data analytics and information security. Yet, women represent only 26% overall in IT jobs, and only 20% of the three specific IT jobs noted above. Moreover, among decision maker jobs, women participation is represented in 25% of executive and senior managerial jobs, 20% of board seats, and 6% of CEOs. Given the current state of affair and the relevant facts, this work-in-progress study aims to investigate the ongoing challenges that women face in STEM higher education degree programs and STEM jobs in the U.S. workforce. This study employs the methodology of analyzing data collected from social media, personal interviews with women college students, and professionals working in IT jobs. Preliminary results indicate several findings, among them are women's perceptions of 'appropriate professions' related to gender identity, early modeling and encouragement for selecting technology career path, lack of educational preparation in middle and high schools (i.e. mathematics, programming, ethical adversarial thinking), scarce participation in relevant social activities (i.e. boot camps, coding competitions, robotic clubs, hackathons), narrow presence of female faculty as well as availability of female mentors and support groups in IT programs, social isolation in IT courses, lack of knowledge about IT job roles, including the most demanding jobs of cybersecurity, and inability to envision how women can fit. This review explores interventions to improve the graduation and retention of women in STEM, IT, and cybersecurity education in the US.

Keywords: Computer and information science, women in information technology, women in STEM, women in workforce, women in cybersecurity

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Preliminary results of an expert panel elicitation for cybersecurity indicators in the detection of malicious insider threat activity

[Research-in-Progress]

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Extended Abstract

Insider threat refers to those users that have legitimate access to systems and data, which misuse this access for intentional malicious activity, therefore, leading to unexpected security policy violations. Because of the nature of this human-centric type of attack, it is very difficult to detect and mitigate (Nostro, Ceccarelli, Bondavalli, & Brancati, 2014). To assist in the detection of threats and vulnerabilities, many commercial tools employ the use of indicators relevant to the organization. These indicators, once identified as violating a security policy can alert cybersecurity personnel of possible malicious activity. Prompting personnel to take preliminary action, in an attempt to thwart and attack. Phase 1, of this research-in-progress study focuses on the elicitation of industry expert opinions for such cybersecurity indicators through the use of the Delphi technique. Delphi technique expert methodology, as noted by McFadzean, Ezingeard, and Birchall (2011), "ensures that the data collection process is both reliable and valid because it exposes the investigation to differing, and often divergent, opinions and seeks convergence through structured feedback" (p. 108). For the purposes of this study, Delphi rounds were done to 1) identify a set of top cybersecurity indicators, 2) identify the rating of top cybersecurity indicator categories, 3) identify the weights for the selected cybersecurity indicators, and 4) identify the expert panel selected top correlations between cybersecurity indicators. This study will discuss the preliminary results of the expert panel elicitation for cybersecurity indicators in the detection of malicious insider threat activity.

Keywords: Cybersecurity, insider threat, cybersecurity indicators, Delphi technique

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Buyer's remorse of cybersecurity

[Research-in-Progress]

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Extended Abstract

As consumers of products and services, we love new technology. We crave it. We have been spoilt by it, and whenever possible, we demand better, faster, newer capabilities from manufacturers. Prior to the launch of a product, consumers line up overnight to be the first few to buy, unbox, and use it. In order to get these new products out to market so quickly, companies follow strict timelines.

During the design, test, and manufacturing stages, company staff members are under lockdown and are subject to possible job loss when information leaks occur at their hands. For both hardware and software, companies are pressured to release new products annually, for all kinds of reasons, including maintaining market share, showing constant growth in financial statements, and being first to market, just to name a few. These quick to market products and services tend to suffer from inferior quality testing, commonly relying on early buyers to work out and find issues.

As consumers, we lean more toward ease-of-use versus security. As owners, when a security breach occurs, we behave as though the company has failed us. We become hypocrites, pointing fingers and demanding that the companies repair and sometimes reimburse us for the lack of security in their solutions.

Are companies to shoulder the blame for the lack of cybersecurity or are we as consumers also responsible? Will the pendulum shift from our desire to have highly capable technology over to a focus on cybersecurity? This position paper discusses the possibility that consumers and consumerism are also responsible for the lack of corporate attention to cybersecurity. This paper will categorize the problems and propose solutions that may offer companies to work within, to moderate the competing forces of consumer desires versus cyber risk.

Keywords: Cybersecurity, corporate responsibility, security by design, consumerism, data protection, intellectual property

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Activating hybrid knowledge creation spirals in the logistics sector: Evidence from an EU project

[Research-in-Progress]

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Extended Abstract

In this paper, we propose research activities aimed at investigating and identifying knowledge creation processes oriented to systemically improve the development of competencies and skills in the logistics and supply chain management field in Europe. Recent studies evidenced the presence of "a serious skills shortage" in all logistic levels (staff, supervisors, managers) and across all competence categories (knowledge, personal, technical, etc.) including in international level. While Europe is the leading continent for the performance of logistic activities (with seven nations in the first eight positions of the 2016 Logistic Performance Index), the situation is geographically heterogeneous, with a high concentration of best-practices in the north part of the Continent. The focus of this study is on the "Knowledge Triangle", a collaboration framework of key stakeholders: high education institutions (HEIs), research institutions, and private companies. Our methodology includes mixed qualitative and quantitative approaches. We did a survey of about 100 organizations working in the European Knowledge Triangle, and performed a multiple case study analysis of 13 selected good practices and some brainstorming activities with experts. Researchers developed in this context the EU Project "FRAMELOG - European framework for 'Knowledge Triangle' in the logistics sector". Using the Nonaka and Konno's frameworks of SECI models and Ba as main theoretical foundations, while shifting their application from the organizational to the inter-organizational level, we pointed out some high-impact knowledge applied solutions and actions that are able to constantly enhance the quality of the knowledge creation processes within the Triangle, especially through some hybridising mechanisms capable of activating the spiral of knowledge creation among the key actors. We found that as the logistics areas are constantly evolving, an efficient and "knowledge creation-oriented" framework of interactions among the three key actors would enable the definition of a didactic offer increasingly aligned to business' requirements, the creation of an effective recruiting system to connect students, workers, and companies, and lay the foundations for joint research activities and scientific production for its proactive improvement. In this way, it would be possible to stimulate a process of continuous labour market-oriented generation of skills and competences in the field. Our proposed solutions need to be validated with extensive testing activities for stakeholder in the development of the project.

Keywords: Knowledge triangle, supply chain management, knowledge creation, logistics

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How the dependency on foreign technology by developing countries makes it difficult for countries such as South Africa to be secured

[Research-in-Progress]

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Extended Abstract

The study looks at the implications and impact of foreign technology dependence on the cyber security capability development process of developing countries, especially African countries – and more specifically South Africa.

There seems to be a blanket approach to what needs to be done in the development of cyber security capabilities. Cyber (security) has become a very important aspect of how countries develop and compete. Because of the long-standing dependence of African countries on the developed countries for issues such as food security, something similar can happen regarding foreign technology – to the detriment of Africa. Countries differ tremendously even though they may be grouped together when it comes to whether they are (under)developed. It is therefore difficult to develop any cyber capability without first looking at the country specific context. Even though the study looks at South Africa specifically based on the World Banks classification, the outcomes of this research *may* not be applicable to all the countries in the same category as South Africa.

Organizations such as the International Telecommunication Union (ITU), part of the United Nations (UN) have gone as far as writing guidelines that are to be followed by the developing countries in their development of their cyber security capability. Given the challenges that are brought about by the use of foreign technology, countries have difficulty succeeding at developing a cyber secure environment without the risks that come with such technology dependency. South Africa like many other African countries probably ranks very high when it comes to the consumption of foreign technologies. With some of the leading imports originating from developed countries that may not necessarily be seen as friendly, it is important for countries to consider the risks involved in their cyber security capability development process. It is impossible to stop using foreign technologies, but countries must work on developing their own capability. The challenge is not only in the tangible technologies that are imported, but also in how we follow the prescribed guidelines from developed countries

This paper will look at the possible approaches that may be adopted by countries like South Africa. We will look at the risks associated with the over reliance on the technologies, and what this means, as well as look at some of the available guidelines that are meant to assist developing countries as they endeavour to develop cyber security capabilities.

Keywords: Digital divide, foreign technology, developing countries, dependence

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Lifelong learning skills for survival in the gig economy

[Research-in-Progress]

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Extended Abstract

Unemployment is one of the major global challenges of the 21st century. More and more jobs are being performed by machines, and services are being digitized. Therefore, the need for clerks, salespersons, human agents, operators and workers, is diminishing. Today, earning a living concerns both younger and older people. As life expectancy is getting longer some people do not have enough resources to support themselves and their families. Young adults are also having a harder time finding a job (Eurostat, 2018).

Gig Economy concerns alternative work arrangements, such as temporary help, on-call workers, independent contract workers or freelancers (Katz & Krueger, 2016). A narrower definition of the term relates it only to work interactions that involve using digital platforms, such as the one used by the occasional drivers of Uber.com (Sargeant, 2017). Gig economy has emerged as a research topic during 2016-2017, mainly in the fields of labor studies, law, and economics, as observed by analysis of Google Scholar search results. Organizations increasingly prefer a flexible mode of employment, via outsourcing, crowdsourcing, and other arrangements, which intensifies the demand for freelancers, and hence the gig economy trend. The purpose of this conceptual study is to examine the issue of acquiring the skills required for survival in the gig economy. This study uses multiple perspectives, such as the roles of governments, educational institutes, other organizations, and the individual person. The lifelong learning aspect is emphasized because this training continues throughout a person's working years. This study concerns the skills required to successfully adapt in the gig economy. It does not concern specific skills needed for performing a particular job. The expected contribution of this study is both theoretical and practical, since the gig economy had not been extensively studied yet. Practical implications may be used by governments and organizations to improve well-being worldwide.

Keywords: Gig economy, skills, lifelong learning, employment modes, training

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Workplace satisfaction: A vital variable for the mitigation of malicious insider cyber threats

[Research-in-Progress]

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Extended Abstract

Insider threat mitigation is a growing challenge faced by many organizations. The development of a novel alert visualization dashboard for the identification of potentially malicious cyber insider threats was identified as necessary to alleviate this challenge. This research study aims to develop a cyber insider threat dashboard visualization prototype for detecting potentially malicious cyber insider activities. Based on the data collection performed using subject matter experts (SMEs) and applying the Delphi method to identify the most critical cyber visualization variables and ranking. This paper will provide the results of a survey based experimental research study that identified the critical cybersecurity variables also referred to as *cybersecurity vital signs*. The identified vital signs may aid cybersecurity analysts with triage for potentially malicious insider threats.

From a total of 45 analytic variables assessed by cybersecurity SMEs the top six variables have been identified using the Delphi method. Though many insider threat detection applications are primarily capturing system generated log data, the results of this study indicated that workplace satisfaction is one of the top six critical cyber visualization variables that should be measured when detecting potentially malicious cyber insider threat activities. Using a comprehensive data collection process incorporating 42 cybersecurity SMEs. Identified in rank order the critical cyber visualization variables that should be displayed to cyber analysts when using applications to detect potentially malicious insider cyber threats are: workplace satisfaction, change in violation patterns, audit log modification, changes in data access patterns, data exfiltration, and privilege change. The result of this data collection process to identify and rank critical cyber visualization variables is detailed within this paper and forms the foundation for the prototype development, which is the next phase of this on-going research project.

Keywords: Anomaly detection, cybersecurity, vital signs, intrusion detection, insider threat, visualization