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Creativity, learning, and knowledge sharing: Engaging people to achieve organizational objectives

[Workshop]

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Abstract

Knowledge Management (KM) is the process of creating, sharing, using and managing the knowledge and information of an organization. As simple as this definition seems, knowledge creation is a complex task that requires collaboration, innovation and a systems approach to thinking. Only when these ingredients are combined, we are able to develop robust KM projects that offer creative solutions to organizational challenges. During this workshop, we will explore a number of action-oriented activities that support creativity, learning, and knowledge sharing. Join John and JoAnn for this interactive session and learn how to enhance the creativity in your organization.

Keywords: Systems thinking, collaborative decision making, team development process, impact of culture on creativity, conducting after action reviews

Effective literature review, plagiarism, self-plagiarism, and reliance on prior research

[Panel]

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Abstract

Peer review process is the cornerstone of academic research and publications. With the increased availability of resources on the Internet and the abundance of journals available via open access, many novice researchers are faced with significant challenges of conducting a valid literature review, while distinguishing the quality of different publications. Furthermore, novice researchers are also challenged to aggregate the information from literature and conduct their own valid synthesis of the research manuscripts they review. At the same time, familiarity with the definition and the rules about plagiarism as well as self-plagiarism aren't known to many novice researchers. In this panel, the discussion will focus on providing tools to develop a valid and effective literature review, the definition and rules of plagiarism, as well as self-plagiarism, will be discussed. Moreover, the panelists will highlight ways in which reliance on quality peer-review research can build a strong foundation for new emerging research. The panel will then discuss issues related to journal publications, quality of journals, predatory journals, indexing, and proper ways to prepare a manuscript for publication. The panel will conclude with an open discussion with attendees on the topics covered.

Keywords: Effective literature review, plagiarism and self-plagiarism, reliance on prior research, journal publications and preparations for publications

Causal configurations of knowledge sharing in SMEs

[Keynote]

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Abstract

The requirements of the knowledge economy demand a change in the human resource management, since individuals and their behaviors contribute more than conventional assets to the organization's success. The value of knowledge is revealed when it is shared, however, promoting knowledge sharing (KS) is a major challenge, since there is a natural tendency to reserve knowledge and look suspiciously at the knowledge provided by others. Considering that the success of the KS process mainly depends on the behavior of employees, organizations should promote a KS environment. The quality of work relationships fosters employees' commitment, thus developing employees' willingness to share knowledge is based on an emotional attachment and identification with organizational values. The use of Qualitative Comparative Analysis identifies causal configurations leading to KS, instead of providing a single estimated solution of the dependent variable like quantitative traditional statistical methods do.

Keywords: Knowledge sharing, human resources management, organizational commitment, qualitative comparative analysis

Knowledge management and engineering information

[Keynote]

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Abstract

This keynote lecture will present the results of two international EUREKA projects focusing on knowledge management in the engineering context. The first project built on state-of-the-art developments in the exploration of principles for engineering knowledge management to incorporate the development of information objects, sources, stakeholders, decisions, and rationale, as well as time dimension into engineering knowledge evolution space, and by doing so extend the state-of-the-art methods and tools. The second project continued the first one and focused on the augmentation of understanding the trends and risks related to the socio-technical perspective of information exchange, knowledge growth, innovation creation, and learning in contemporary organizations that are performing product/systems development. In that, the objective of the project was to apply interactive data capturing methods and tools combined with advanced visualization and analysis approaches in the study of organizational dynamics. The results of the projects indicated that using such approaches to engineering knowledge evolution and performance monitoring, which integrate all the dimensions, generates a framework referring to context and audit trails of engineering knowledge development.

Keywords: Engineering Information, management of engineering information, visualization and analysis of information, content management

Knowledge management for decision support: A data mining and decision modeling approach

[Keynote]

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Abstract

Knowledge Management (KM) is the process of capturing, distributing, and effectively using organizational knowledge, in order to create benefit and competitive advantage. For this purpose, an organization should be able to learn, retrieve, represent, and store its knowledge, as well as to use it for making important decisions. For recurring complex decisions, it is often of a great benefit if the tacit and explicit knowledge are formulated and operationalized in a form of a decision support system (DSS). In this talk, we will investigate the process that leads from the identification of a decision problem to the implementation of a DSS, which involves several KM activities: knowledge acquisition, formulation, representation, verification, and implementation. Specifically, this talk will focus on two approaches, which can be used individually or in combination: (1) Data Mining, which views corporate databases as a historical record of past decisions and develops decision models from them, and (2) Decision Modeling, which proceeds by acquiring and operationalizing decision models from the knowledge of experts. These approaches will be – together with lessons learned – explained and illustrated through real-world case studies in disease management in health care, and food control.

Keywords: Knowledge synthesis for decision support, data mining, decision modeling, operationalization and lessons learned in practice

The trifurcation of the labor markets in the networked, knowledge-driven, global economy and the probable foundations of sustainabilism

[Keynote]

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Abstract

This presentation will start with an introduction to the new, networked, knowledge-driven, global economy. This will be followed with the conjecture that we currently have (or are about to have) three autonomous markets for labor that are driven by different market dynamics and mechanisms. The three markets are identified as: routine labor, skilled labor, and talent. Each one of the markets will be discussed including future trends, issues and remedies. The presentation will continue with describing the dissimilar dynamics of the three labor markets and suggesting that legislating, conducting monetary and fiscal policies that treat them as one labor market could (and probably already does) causes more harm than good. This part will conclude with a possible research framework of the three labor markets. The presentation of the new paradigm will begin with discussing of the premises framing the study of economics and will focus on the role of law in the economy. Afterward, the presentation will suggest the addition of a new model of humans that should serve as the base for the concept of law, the homo sustainabiliticus. Next, an advanced definition of human and other forms of capital using information, energy and entropy will be introduced. Ensuing this discussion and consistent with the newly proposed definition of capital, a proposal for a new currency (“new gold”) will be offered as the building block for the new sustainabilistic economy.

Keywords: New knowledge-driven economy, trifurcation of labor markets, intellectual capital, information, energy, entropy and “new gold”, homo sustainabiliticus and sustainabilism

The endurance test: A virtual project team's lived experience in an online project management course

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Abstract

This case study examines longitudinal data stored in the learning management system (LMS) of an online MBA program's project management course to understand and describe the lived experience of a virtual student team that exhibited difficulty delivering a term project. Testing the constructs of a theoretical model previously proposed in literature, the findings consider whether the model design can be applied in a specific situation and suggests additional case studies are warranted for further understanding. The findings also confirmed two concerns. First, unless students actively contact their instructor to escalate feedback about progress, it is difficult to assess a given student's contribution to virtual team projects. Second, the instructor actively solicited feedback and facilitated closure to compensate for a lack of student accountability, prompting concern about whether requiring an online instructor's constant oversight and engagement is an optimal strategy for effective project delivery on virtual student teams.

Keywords: Online pedagogy, virtual teams, project management, learning management system, LMS, troubled projects, knowledge management, grounded theory, theoretical sampling

Social media sites privacy concerns: Empirical validation of an instrument

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Abstract

This study attempts to empirically validate a social media sites privacy concerns instrument with six constructs (collection, secondary usage, errors, improper access, control, & awareness). Each construct includes three designated items/variables. Data were collected from 157 participants and analyzed using exploratory factor analysis. The results indicated that all six constructs of the instrument were reliable to measure social media sites privacy concerns of users. Recommendations for future research are provided.

Keywords: Social media privacy concerns, collection, secondary usage, errors, improper access, control, awareness, exploratory factor analysis

Strong password? Not with your social network data!

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Abstract

Passwords are the standard means of registration and access to Websites, information systems, online services and various social networks. Databases are increasingly breached and social engineering is employed to obtain usernames and passwords for online fraud, therefore, there is a need to secure existing passwords, and to create ones that will be more crack-resistant. This study addresses the issue of personal data, which users enter on social networks, and incorporate in passwords, as well as how tracking and identifying this data assists hackers in cracking these passwords. The study focuses on Facebook, conducting an online anonymous questionnaire among 195 respondents, and an experiment among a voluntary response sample of 72 participants, in which passwords were tried to be deciphered by a custom dictionary attack. The findings confirm a link between the use of accessible online personal data and success rates of password deciphering. The findings underscore the grave threat to users' information security - not only as a result of their voluntary exposure of personal data on social networks, but also due to the integration of this data into their passwords. The study argues the need to emphasize users' awareness to their password strength, with this vulnerability in mind.

Keywords: Passwords, password guessability, social networks, privacy, personal information in passwords, dictionary attack, cybersecurity.

Uncovering the pathways to e-learning success: A qualitative approach

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Abstract

This paper reports a qualitative study on the effectiveness of an e-learning framework (IPTEACES) for Insurance Broker Training Program Certifications, using a sample of 3,726 trainees from 16 different corporations from insurance and banking industries in Portugal. We've applied fuzzy-set Qualitative Comparative Analysis (fsQCA) technique, which offers improved results when compared to the use of quantitative traditional statistical methods (e.g. regressions, structural equations modeling) that only provide an estimated solution to the dependent variable at stake. Findings suggest higher training success levels are achieved by: older, more educated women trainees attending banking training events covering a large breadth (double course). Concerning lower training success results, evidence shows that those are achieved by: less educated male trainees, attending insurance training events covering a single course. These study results are consistent with previous reported work that followed a quantitative approach.

Keywords: Instructional design framework, e-learning, training success, fuzzy-set Qualitative Comparative Analysis (fsQCA).

Big data and privacy: The study of privacy invasion acceptance in the world of big data

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Abstract

The phenomenon of big data includes technological (new opportunities), business (application), and social aspect. The social aspect applies to the social consequences of the use of big data methods, in particular, those related to the processing of personal and other private data , as well as the danger of privacy violation. In the context of the big data phenomenon, this study presents the results of a survey on the level of acceptance of privacy violation resulting from mass data processing. The different objectives of processing were taken into account, including general, social and commercial. This study helps to draw conclusions concerning commercial and non-commercial use of private data, as well as the legal regulations on personal data processing.

Keywords: Big data, privacy, invasion of privacy, personal data, private data.

Investigating incentives that encouraged and can encourage Polish and UK-based prosumers to engage in knowledge sharing

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Abstract

Prosumers' knowledge is increasingly becoming an integral and important element in business strategy regardless of the country. A major challenge for enterprises involves motivating prosumers to share their knowledge. This problem is addressed by incentives linked to the knowledge sharing activities of prosumers. Previous research showed that prosumers are willing to share knowledge, but only under the condition of obtaining certain benefits, rewards or fulfilling other personal goals in return. The purpose of this paper is to investigate which incentives encouraged and would encourage Polish and UK-based prosumers to engage in knowledge sharing with enterprises. The reported outcomes are the result of a questionnaire survey that yielded responses from 783 Polish and 171 UK-based prosumers. The results indicate there are statistically significant differences between Polish and UK-based prosumers in the particular choice of incentives that encouraged them and would encourage them to engage in knowledge sharing.

Keywords: Consumer, prosumer, presumption, enterprise, knowledge sharing, and incentives.

Challenging the six-minute myth of online video lectures: Can interactivity expand the attention span of learners?

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Abstract

Keeping learners engaged in viewing online video lectures is a challenge, which is considered harder as the length of the video is longer. Although it is a known obstacle, in practice, many videos are lengthy and do not contain interactive elements. This study takes an attention economy perspective, and examines if interactivity may enable effective use of longer online video lectures. Google Analytics data was used to measure average online video lecture viewing completion percentage for two 'long' and 'short' video lecture groups, before and after the addition of interactive components. Preliminary results show that addition of interactivity significantly improved completion percentage as well as average viewing time for both 'long' and 'short' video lecture groups by more than 20%. Furthermore, the average viewing time of the 'long' group grew to over 10 minutes. The contributions of this study are twofold: it demonstrates the potential of learning analytics to identify ways to improve learning processes, and it provides empirical support for the potential of adding interactive elements to the videos to expand the attention span of learners.

Keywords: Online video lectures, interactive video, learner attention span, human computer interaction (HCI), distance learning, learning analytics, attention economy

Application of semantic network visualization as a managerial support instrument in financial analyses

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Abstract

Modern information technology (IT) managerial support systems often utilize visualization as a fundamental form of presenting information. In this context, however, users require easy access and rapid retrieval of not only information, but also knowledge stored by the system. The current trend in research is to identify new methods of graphical presentation that can be used to visualize knowledge. One of the most promising trends in this area is the exploration of the ontological approach to knowledge representation, and the associated semantic network visualization techniques. This paper presents selected aspects of the practical application of semantic network visualization in support of decision-making processes in the narrow context of financial indicators analysis, and in the light of both the rational and the behavioral approach.

Keywords: Visualization, knowledge visualization, semantic network visualization, decision making.

Mapping strategic groups in higher education: Evidence on the Polish technical faculties

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Abstract

According to the New Public Management (NPM) concept, public agencies (in such number universities) have to strive for the efficiency analogous to the private counterparts by among others private sector styles of management practice ('proven' tools). One of the groups of the 'proven' and widely used tools are those connected with the strategic management. Could strategic management tools be helpful for management of public universities? The aims of this paper are twofold: to discuss the potential and usefulness of strategic groups map in the higher education and to test empirically differences of efficiency between mapped groups. This article presents map of strategic groups of faculties of engineering and technology sciences affiliated at public universities in Poland. The investigation was based on the convenient sample of 48 faculties, thus the study should be treated as pilot researches. Following Ward's method four strategic groups of faculties were delineated, namely: "Scientific Entrepreneur", "Authors", "Middlers" & "Teachers". Each of these groups is characterized in this article. Then the differences in performance according to the groups' membership were tested. Based on the chi-square (χ^2) statistics we find differences in efficiency between strategic groups.

Keywords: Strategic groups, higher education, efficiency, performance measurement

Cybersecurity skills: Foundational theory and the cornerstone of advanced persistent threats (APTs) mitigation

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Abstract

Cyber threats have been growing with social engineering and business e-mail compromise reported as the two most rising penetration vectors. Advanced Persistent Threats (APTs) are penetration techniques that combine several approaches to gain access to organizational networks. Organizations need a team of skilled individuals to mitigate or prevent the complexity and seriousness of cyber threats such as APTs. A skill is defined as the combination of ability, knowledge, and experience to do something well. Therefore, cybersecurity skills correspond to individual's ability, knowledge, and experience surrounding the hardware and software required to identify, protect, detect, respond, and recover against damage, unauthorized use, modification, and/or exploitation of cyber infrastructure. Moreover, a strong security posture cannot exist without individuals that possess high level of cybersecurity skills as cyber-attackers prejudice against all nationalities. Therefore, the importance to find individuals that use their cybersecurity skills for good is paramount. This paper presents an-in-depth discussion on the theoretical rationale for cybersecurity skills as the cornerstone of APTs and other cyber threat mitigation.

Keywords: Cybersecurity skills, cybersecurity knowledge, cybersecurity experience, cybersecurity ability, advanced persistent threats mitigation, social engineering mitigation

The role of knowledge management processes on organizational culture

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Abstract

This study sought to investigate which of the four predictor variables (Applying Knowledge, Storing Knowledge, Acquiring Knowledge, & Diffusing Knowledge) are most significant in association with Organizational Culture. The instrument used in this study includes five parts that were used to measure the knowledge management processes (knowledge acquisition, storage, diffusion, & application) and organizational culture. The instrument was administered to 77 employees from two of the largest Georgian cities: Tbilisi and Kutaisi. Collected data were analyzed through multiple regression analysis. The analysis was conducted to determine which of the independent variables (Acquiring Knowledge, Storing Knowledge, Diffusing Knowledge, & Applying Knowledge) is significant in predicting the dependent variable (Organizational Culture). Diffusing Knowledge was found to be the only significant variable associated with the Organizational Culture. The analyses were followed by results, discussion, and implication for future research.

Keywords: Knowledge management, organizational culture, knowledge acquisition, knowledge storage, knowledge diffusion, knowledge application

Multivariate text mining for process improvement using cross-canonical correlation analysis

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Abstract

Text analysis is a useful tool to determine what a company and its customers want in order to improve processes and methodologies of analysis. Searches in databases may have a time series component that determines the importance and sequences of multivariate searches and its structure. This paper presents a methodology to simplify and model multivariate searches in time using the Canonical Correlation approach. The techniques shown provide a robust methodology to simplify the analysis and create predictive models taking into account temporal dependencies.

Keywords: Text analysis, Google correlate, multivariate time series, cross correlation, canonical correlation, Radic matrices and determinant, predictive modelling

Knowledge creation processes in small and medium enterprises: A Polish perspective

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Abstract

The focus of this paper is to analyze small and medium enterprises through a knowledge management perspective. More specifically, the aim of the research is to further the understanding through what processes small and medium enterprises operating in the Polish market to create knowledge. Knowledge creation processes are vital to knowledge management initiatives of companies that operate in a changing environment and depend on innovation to gain the competitive advantage. Such processes significantly differ in small and large firms. Therefore, in the following study, a thorough investigation of knowledge creation processes is presented. This research attempts to fulfill the knowledge creation processes gap between small and medium enterprises in the Polish context where traditionally large firms are mainly investigated.

Keywords: Knowledge creation, small and medium enterprises, implicit and explicit knowledge, knowledge management

The importance of knowledge management systems for service industry companies operating locally and internationally

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Abstract

This article aims to analyze the role of knowledge management systems (KMS) in knowledge processes taking place in particular types of service industry companies operating in Poland and checks the importance of these tools for such firms' competitiveness in the current globalized world. This study distinguishes among companies that operate only locally (in Poland), and those that are on particular levels of internationalization process. This article is based on quantitative research in which 381 service industry firms were examined. The analysis show relatively large differences in the intensity of KMS usage among particular groups of service industry companies. These tools are especially intensively used by information technology (IT) and telecommunication as well as transport companies, and, in turn, less intensively by real estate as well as hotel and restaurant enterprises. Analysis has also shown that intensity of KMS usage among firms on any level of internationalization is considerably higher than among those operating locally. However, the most important finding is that intensive use of KMS in service companies is associated with being more competitive than those using KMS less intensively, and this difference is statistically significant.

Keywords: Knowledge management, knowledge management systems, information technology, IT, service industry, internationalization, competitiveness

Employing the quality function deployment (QFD) method to support knowledge management in innovation process planning

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Abstract

This article proposes the use of Quality Function Deployment (QFD) matrix diagram to one of the stages of the innovation process planning. The purpose of this approach is to support knowledge management, specifically the codification of tacit knowledge. Innovation processes are usually carried out by multidisciplinary teams in which arrangements are often problematic due to communication problems. An example of the choice of an innovative solution in a manufacturing company shows the extent to which the use of the QFD method diagram helps to share knowledge in order to take decisions related to planning the goal of the innovation process. We proposed the modification of QFD matrix to include the scale of risk characterizing each of analyzed solutions.

Keywords: Innovation management, planning, quality function deployment, knowledge management

The measurement of intellectual capital by market capitalization method: Empirical study of Polish listed companies

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Abstract

Intellectual capital has become a fundamental source for enterprises, but its measurement and reporting remain a major challenge for managers and researchers. The aim of this article was to establish the possibilities for using the Market Capitalization method and the particular ratio of the market value to the book value (MV/BV) to report intellectual capital of companies included in the Polish WIG 20 index of the Warsaw Stock Exchange. This study also identified opportunities and limitations rising from its use. The data necessary to perform the calculations in accordance with the MV/PV method came from the financial statements for the period 2010-2014 of Polish companies. The MV/BV method provides the means to measure intellectual capital in a precise and timely calculation and is particularly useful for the companies that are listed on the stock market.

Keywords: Intellectual capital, market capitalization method (MV/BV), WIG20 companies

Knowledge sharing or knowledge protection? The effects of cyber regulations and security policies on firms' market orientation and performance

[Research-in-Progress]

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Abstract

Firms today operate in data-rich environments. Information has become one of the major strategic business assets. Intra- and inter- organizational sharing of information and knowledge offer opportunities for companies to achieve competitive advantage and financial benefits. However, extensive data sharing between organizations also poses concerns about consumer privacy and data security. Scholars have also called on to identify directions for data analytics methods that focus on customers' privacy and data security. The collection of marketing big data, their examination via marketing analytics methods (e.g., examining their applications to structured & unstructured data generated internally or externally), and their potential to support marketing decisions relate to firms' marketing concept is termed market orientation (MO). MO is defined as the generation and dissemination of, and responsiveness to market knowledge. Although marketing research suggest that MO increases firm performance, recent studies argued that certain environmental conditions may moderate the relationship between MO and performance. In this research-in-progress, we propose a model that examines the moderating effects of privacy regulations and information security policies on the relationships between MO and firm's performance. Privacy regulations are external to the organization and are often beyond management control. Information security policies are internal to the organization and may be adjusted to meet organizational strategic goals. Therefore, we expect that privacy regulations will negatively affect all three components of MO's relationships with a firm's profits, while security policies will negatively affect the relationship between knowledge dissemination and responsiveness with a firm's profits.

Keywords: Market orientation, cyber regulations, security policies, and firm performance

Towards empirical exploration of employee's cybersecurity countermeasures awareness and skills: Differences in training delivery method and program type

[Research-in-Progress]

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Abstract

The protection of an organization's information systems and assets from cybersecurity threats is increasingly important in today's world, especially as they become more reliant upon information technology for daily operations. Employees who lack knowledge and skillsets are recognized as the most significant threat vector for cyber-attacks. Therefore, they are being targeted with continually evolving threats, such as social engineering attacks. However, employees cannot be held responsible for cybersecurity practices if they are not provided the security education and training program (SETA) to acquire the knowledge as well as skills, which allow for identification of cybersecurity threats along with the proper course of action. In addition, awareness of the importance of cybersecurity, the responsibility of protecting organizational data, and of emerging cyber threats is quickly becoming essential. This work-in-progress research will be conducted in three phases and will utilize a mixed method approach combining an expert panel, developmental research, in addition to quantitative data collection. This study will empirically assess if there are any significant differences on employees' cybersecurity countermeasures awareness and cybersecurity skills based on the use of two SETA program types (traditional vs. socio-technical) and two SETA delivery methods (face-to-face & online). Recommendations for SETA program type and delivery method as a result of data analysis will be provided.

Keywords: Cybersecurity training; cybersecurity skills; cybersecurity countermeasures awareness; information security; security education, training, and awareness (SETA)

Cognitive data retrieval using a Wizard-of-Oz framework

[Research-in-Progress]

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Abstract

A suitable human-computer interaction plays an increasing role in various applications, such as smart home, learning or autonomous systems. The Universal Cognitive User Interface (UCUI) shall enable the user to handle different applications by intuitive actions via speech, gestures or a virtual keyboard and allows an adaptation to the users' communication style but also to their strategy in problem solving. In the system development, Wizard-of-Oz experiments are used to collect typical user inputs. In further steps, the user behavior is analyzed and integrated into the system model. To support a user-driven construction, a Wizard-of-Oz Framework (WoOF) was designed, which requires adequate methods for knowledge creation and management including the necessary data processing. The article is focused to an innovative WoOF concept, the underlying data structures and the processing methods. Subsequently, results of the first user experiments and test runs are summarized and discussed, followed by a short conclusion and the outlook to further research steps.

Keywords: Human-computer interaction (HCI), knowledge creation, Wizard-of-Oz framework (WoOF), cognitive user interfaces.

Autopoiesis of knowledge management systems supported by software agent societies

[Research-in-Progress]

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Abstract

The structure of autonomous information systems requires reference to the aspect of their possible self-organization and adaptation considered in terms of the system autopoiesis. Self-organization, which is a bottom-up process initiated in a particular system by autonomous individuals, can interact with mechanisms of adaptation initiated from above. An example of such a system is an organization knowledge management system supported by agent technologies. Such systems, equipped with autonomous agents, allow to model their self-organization and adaptability in response to changing environmental conditions. The aim of this paper is to analyze the concept of autopoiesis in knowledge management systems supported by agent systems. The paper will propose a concept of an agent system model which is supported by mechanisms regulating agent behaviour as part of a knowledge management system.

Keywords: Software agent, autopoiesis, agent societies, knowledge management

Assessing university quality ranking system in Kurdistan regional government higher education

[Complete Research]

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Abstract

The purpose of this paper was to assess the work that goes into preparing the university quality ranking report for the Kurdistan Regional Government (KRG) ministry of higher education (MHE). We used the word 'system' to describe this work because preparing the ranking report goes through multiple layers of data gathering, verification, calculation, and reporting. Thus, we deemed that the word 'system' is descriptive of the work involved in producing this report. The KRG-MHE started a system that ranks universities under their jurisdiction according to established criteria. The KRG-MHE issued their first report in 2015 and then a second in 2016. Being it new and after two years of reporting, we determined that it is helpful to assess the mechanism by which the ranking of universities implemented and reported. In this paper, we assess the work of the KRG-MHE that goes into producing the university quality ranking report. It compares the factors used by KRG-MHE in determining quality with similar factors used in established systems of ranking (Like systems in the United States & United Kingdom). The paper at the end submits recommendations to the KRG-MHE to make their system more consistent with the established systems we reviewed in this paper.

Keywords: University ranking, academic ranking, university ranking Kurdistan, academic quality ranking

The use of fuzzy logic to assess the knowledge gap in innovation processes

[Research-in-Progress]

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Abstract

This article discusses the problem of the estimation of the knowledge gap size in innovation processes. This gap is defined as the knowledge that the company must acquire and deploy to implement an innovation process. This parameter allows to characterize the innovation process at the stage of planning. It depends on the novelty and the scope of innovation implementation, but these are usually defined in a descriptive and vague manner. The authors propose a method for assessing the knowledge gap in innovation processes based on fuzzy logic. The article also presents an example of the use of that method to estimate the knowledge gaps in innovation processes.

Keywords: Innovation process, fuzzy logic, knowledge gap, and knowledge management

Cybersecurity vital signs: The role of anomaly detection on insider threat triage

[Research-in-Progress]

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Abstract

Detecting cybersecurity insider threat has become progressively challenging, as an over saturation of data has made it increasingly difficult to parse and consume information. In the past intrusion detection systems (IDS) were used to identify anomalies and potential misuse. However, IDSs do not specialize in the identification of anomalous activities. Thus, the development of anomaly detection systems (ADS) tailored toward the identification of deviations in behaviors is more sufficient. Though the use of anomaly detection systems have grown within cybersecurity, cybersecurity analysts face the problematic task of focusing on the right information in order to identify potentially malicious insider threats. In this paper, we will provide empirical evidence toward the identification and validation of cybersecurity vital signs that will aid cybersecurity analysts with triage for potentially malicious insider threats. A comparison of IDS and anomaly detection systems will be presented to depict the importance of separating anomaly detection from intrusion detection systems. We will also present the development of a prototype focused on effectively visualizing cybersecurity vital signs.

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

Balancing industry professional and researcher: The industry professional perspective

[Research-in-Progress]

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Abstract

The advancement of Ph.D. programs have enabled industry professionals to maintain their jobs while pursuing a doctoral degree. Industry professionals pursue this degree for various reasons that range from a personal achievement to an academic position. However, industry professionals not already in academic positions can be challenged with continuing research upon degree completion. This paper provides an argument for the fact that in order to intensify this motivation, industry professionals must allocate time and become associated with an academic/research association. Moreover, it's argued that connection to an academic/research association will allow the industry professional to meet other scholars and encourage collaboration. Collaboration between the industry professional and academic scholar is essential to the integration of both scientific and practice knowledge towards the creation of new theories and knowledge production. The perspective taken in this paper is from the point of view of an industry professional, which completed a Ph.D. program while working full time, and had been engaged as an active member of an academic/research association. These endeavors were accomplished while balancing the demand from industry, time commitment needed for program completion, and active participation in an academic/research association.

Keywords: Researcher, work life balance, philosophy doctorate, industry professionals, knowledge sharing, knowledge production, hybrid Ph.D. programs

Do digital natives have knowledge of mobile technology's acceptability to surveillance?

[Complete Research]

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Abstract

This paper first seeks to meaningfully understand how the digital native culture utilizes innovations and mobile technologies to gather, transmit, sustain, or pool knowledge and information. Past scholars, and more recent researchers have continued to suggest digital natives are more sophisticated and understand technologies and innovations such as Smartphones and Internet sharing capabilities. However, a few dissenting voices have concurred that the culture is lacking in meaningful knowledge and abilities. Particularly, the literature lacks research on the culture's knowledge of mobile innovations and security concerns. Therefore, this paper seeks to clarify the culture's knowledge about mobile technologies, knowledge protection, and surveillance. Particularly, the paper seeks to answer the question: Do digital natives utilize mobile (Smartphones) to create knowledge and understand the devices are not secure? The research will shed a new understanding about the culture: digital natives lack awareness about device security.

Keywords: Digital native, higher education, acceptance of IT, mobile computing

How the influential determinants of BI&A use intentions shift to socio-organizational determinants?

[Complete Research]

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Abstract

Research and practice highlight that the use of Business Intelligence and Analytics (BI&A) can create competitive advantages for organizations. However, in order to create value for organizations, users need to accept BI&A and use it effectively. Identifying significant influential determinants of individual's BI&A use intentions is thus of great importance for organizations, since these can be proactively influenced by management action. Studies in the BI&A context have recognized the importance of socio-organizational determinants in explaining BI&A use intentions but a deeper understanding of how the basic acceptance determinants shift to socio-organizational motivations in influencing use intentions is however still missing. In response, we conduct a quantitative survey-based study to examine the relationships between result demonstrability, social influence, compatibility and performance perceptions as what we demonstrate to be significant elements of BI&A use intentions. The model is empirically tested through partial least squares (PLS) approach to structural equation modeling (SEM). We reinforce the importance and significance of socio-organizational considerations by showing that in addition to having strong direct impact on use intentions; these also have interaction effects by positively strengthening the perceived relevance of compatibility in impacting use intentions.

Keywords: Socio-organizational drivers, business intelligence & analytics, use intentions, compatibility, social influence, result demonstrability

Resource creation through equity crowdfunding of knowledge-intensive SMEs: External knowledge and capabilities and their effects on performance

[Research-in-Progress]

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Extended Abstract

The current study examines the contribution of external knowledge to the growth of knowledge-intensive, innovation-driven SMEs. We focus on equity crowdfunding and investigate the non-financial resources that knowledge-intensive SMEs can obtain through crowdfunding activity. While large firms seem to be capable to translate knowledge into enhanced competitive advantage and improved long-term performance, SMEs are still struggling with implementing the necessary steps needed for exploiting knowledge-related benefits mainly due to lack of necessary resources.

Crowdfunding is defined as “efforts by entrepreneurial individuals and groups...to fund their ventures by drawing on relatively small contributions from a relatively large number of individuals using the internet, without standard financial intermediaries.” Equity-based crowdfunding was found to be relevant for knowledge-intensive SMEs. Crowdfunding carries a significant impact on the development of knowledge-related resources as a consequence of the continual interaction between the entrepreneurs, the investors and potential, additional actors. So far, research endeavors mostly focus on the means and ways of evaluating the quality and success rates of the venture, based on the human, and intellectual capital of the entrepreneurs.

The goal here is to identify and investigate knowledge-related resources and social capital obtained via equity crowdfunding. In particular, we aim at analyzing the effects of knowledge on the performance of crowdfunding activities of knowledge-intensive SMEs. The research will add to the emerging literature on crowdfunding by focusing on non-pecuniary aspects in crowdfunding campaigns.

We conducted in-depth face-to-face interviews with entrepreneurs involved in equity crowdfunding. The interview guide consists of three sections: a. Mapping the types of non-financial contributions made by the investors; b. The process information undergoes once offered by the investors; c. Lessons learned and recommendations for future equity crowdfunding stakeholders. The data was analyzed using content analysis based on within-case and cross-case display. Preliminary results will be presented at the conference.

Keywords: equity crowdfunding, social capital, knowledge-based resources, entrepreneurship, SMEs.

Social networks as a knowledge management tool in building safety culture: The case of combined hazards in high-risk enterprises

[Research-in-Progress]

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Extended Abstract

This study addresses the problem of building safety culture to allow proper reaction in combined hazards for high-risk enterprises. The challenge is based on the high complexity of such enterprises, which need a high level of expertise and narrows well-directed specialization, from one side and need of broader understanding of situation when combined hazards happened as of the Fukushima Daiichi nuclear disaster. The proper reaction requires expertise well beyond the one of a single individual who follows rigid procedures. Organizational culture is an essential factor in preventing the impact of hazards in an enterprise. Building a culture oriented toward safety is of critical importance for high-risk enterprises, especially in the case of combined hazards, when no single preliminary develop mitigation plan can work. In such case, a flexible, intelligent behavior (i.e. “organic”) is key for a successful response (Weick, 1987). The relationship between organizational culture and knowledge management in the light of establishing safety culture in a high-risk enterprise is the issue of this research. A mature knowledge management system along with comprehensive and widespread knowledge sharing practices, may serve in preparing the personnel for proper behavior in combined hazards by avoiding narrow department based spread of expertise. One important, but not often discussed, aspect of knowledge management is building a culture of cross-departmental sharing in a way to allow the institution to explore the synergy of diverse expertise, or to react properly to combined hazards. The organization has to establish knowledge management infrastructure to support not only sharing, but also to avoid discriminating and ignoring of not directly relevant knowledge. Within a department, the common sub-culture, values, background, and expertise of employees, supports knowledge sharing, correct interpretation, understanding and also skills to apply good practices, but there are many barriers in the trans-departmental transfer of knowledge. Social networks, as a tool for sharing, is one recently mutually available option for establishing knowledge management infrastructure that may serve for cross-departmental sharing; and establishing a way to transfer the basic knowledge needed to direct behavior in a time of crises. Identifying which are the properties of an enterprise-wide social network, or building a model for knowledge management social network, is essential for transforming a rigid bureaucratic organization into organic, loosely coupled, flexible and responsive one.

Keywords: Safety culture, trans-departmental sharing, social networks, combined hazards

Reference:

Weick, K. E. (1987). Organizational culture as a source of high reliability. *California Management Review*, 29, 112-127.

Gender differences in the motives of drivers using Waze application for shared navigation

[Complete Research]

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Extended Abstract

This study examines the gender differences in the motives of drivers who use a shared navigation via Waze application (Waze.com). The conceptual frameworks of this study were "the wisdom of crowds" principle (Surowiecki, 2004), and the "produsage" concept (Bruns, 2008), which highlights both content consuming and producing by the community members.

We conducted a qualitative study using semi-structured interviews, a research paradigm which enables an examination of the personal experiences, perceptions, and insights of users. The participants were experienced Israeli drivers, 20 women and 17 men, aged 22-63, who had used Waze app during driving for at least 6 months. Findings suggest that the participants' motives can be divided into three main categories: (1) Functionality: navigation to destinations and receiving real-time updates. This was the prevalently mentioned category, with no evidences of differences between men and women. (2) Secondary advantages: this group includes motives related to the drivers' wellbeing and financial benefits. The findings indicated that women are motivated to a greater extent than men by these motives. (3) Innovation: this motive was mentioned by the fewest number of participants, and the findings indicated that men were motivated by innovation to a greater extent than women. These findings regarding gender differences in the community of shared navigation characterized by ad hoc participation were only partially consistent with the characteristics of online communities (Blau & Hameiri, 2012) or ubiquitous mobile information sharing in communities (Blau & Hameiri, 2017) based on the wisdom of crowds (Surowiecki, 2004) and with the concept of produsage (Bruns, 2008).

Keywords: Shared digital navigation, Waze application, motives of drivers to adopt innovation, ubiquitous information sharing, gender differences, qualitative research

References:

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Identifying digital literacy research trends in the educational field

[Research-in-Progress]

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Extended Abstract

The wide-scale penetration of teaching and learning technologies challenges instructors and learners alike with the need to master a wide range of competencies, collectively known as 21st Competencies (Eshet, 2012). Following the frequent changes in learning technologies and learning environments, these competencies are modified constantly. This study examines how 21st Century core learning competencies are reflected in academic research over time. The following competencies were examined: Communication, Critical thinking, Collaboration, Problem solving, Creativity, Information literacy, and Socio-emotional skills (Eshet, 2012). In this study, we identified trends of change in these competencies over the past 36 years (1980-2015), as represented by their frequency in the educational academic literature. We based our research on advanced search queries in the Education Resources Information Center (ERIC) database, thus, creating a data set of occurrences of each specific term in peer-reviewed articles. According to the search results, the rate of research interest in each learning competency was calculated, showing the occurrence of relevant words and phrases over the examined period. For each concept, we constructed graphs that visually identify major academic activity periods, their scope, similarity to the other concepts, and interconnectedness between the concepts. The findings show a gradual and consistent academic interest in the term "Technology" over the years, thus this term is used as a pivot to the other terms. We found that Communication was used more than Technology during the years 1980-1998, and since 2000 Communication showed a stable use while Technology is keeping its persistent rising. Regarding the tendencies – Problem Solving was dominant until 2000, and then ERIC shows identical ratios of rising academic interest in both Problem Solving and Collaboration. Critical Thinking and Creativity show a similar tendency of mild rising slope; while Information Literacy and Socio-emotional skills are marginal throughout the years. The contribution of this research lies in revealing specific research trends of digital literacy skills. The methodology utilized in this study for identifying longitudinal research trends may provide scholars with useful indicators of relevant research themes for further research, and of themes that apparently may have been exhaustively studied.

Keywords: Digital literacy, educational research, learning technologies, learning skills, 21st century competencies, search queries, ERIC

Reference:

Eshet, Y. (2012). Thinking in the digital era: A revised model for digital literacy. *Issues in Informing Science and Information Technology*, 9(2), 267-276.

Using security logs for an empirical assessment of employee cyberslacking in corporations: Enhancing information security

[Research-in-Progress]

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Extended Abstract

Internet misuse during work hours is one of the problems that corporations are confronting today. Employees spend time during work hours on non-work related activities including visiting social networking sites, e-commerce Websites, and sending/receiving personal instant messaging. These types of activities in the workplace are known as cyberslacking. Employees need to understand the cybersecurity threats behind this behavior (Hernández, Levy, & Ramim, 2016). Cyberslacking affects employees' productivity, presents legal concerns, and undermines the security of the employer's network (Oswalt, & Elliott-Howard, 2003). At the same time, corporations need to reinforce cybersecurity educational programs for employees and to temper policies of the use and manage of Internet during work hours according to those threats. This research study will analyze the time that employees spend in cyberslacking activities by looking to security logs in a computer network (Hunt, & Hill, 2015). Comparisons of the measures will be conducted to determine which activity the employees spend the most time. The data in this research study will be computer network security logs of employees in two universities. Graphs and tables will be provided as a part of the analysis. Discussions and implications for future research will be provided.

Keywords: Cyberslacking, cybersecurity, information security, employee behavior, Internet, security threats

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Culture as a concept and variable in knowledge management research: A systematic review and critique

[Research-in-Progress]

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Extended Abstract

This paper examines the concept(s) of culture in knowledge management research by systematically reviewing articles from the top three knowledge management journals in terms of their definition of culture, level of analysis, type of variable and research approach. The journals were selected based on the ranking by Serenko and Bontis (2013) as well as by the Journal of Knowledge Management, Journal of Intellectual Capital, and Knowledge Management Research & Practice. Whilst conceptual analyses of organizational culture (Schein, 1990) and reviews of management studies invoking the concept of culture (Smircich, 1983) were conducted, the only systematic review of the role of culture in knowledge management (Jacks, 2012) limited its sample to articles in information systems journals and only considered culture as an independent variable. Dedicated knowledge management journals have not been systematically analysed, while the role of knowledge management in organizational culture change was not considered.

The analysis in this research-in-progress consists of categorizing articles according to whether culture is considered an environmental factor (national culture) or an organizational variable (organizational culture), whether it is treated as an independent, dependent, or intervening variable or a constant, the research method and kinds of evidence invoked. The main themes and trends are identified showing that, although culture is considered an important knowledge management issue, engagement with it in the field has largely been naïve and problematic.

Keywords: Organizational culture, national culture, systematic review, knowledge management

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The selection of modules for the network packet simulator imitating the dynamic properties of the data communication network

[Research-in-Progress]

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Extended Abstract

Analysis of problem of e-governance on big Russian territory fulfilled in previous studying, showed the relevance of the development of the model of Data Communication Network, taking into account the dynamic properties of the network. Such model is considered a versatile tool. It is needed for solving various problems in the research process, connected with transferring and treatment of large amounts of data. Despite the existence of a significant number of diverse models of Data Communication Network (i.e. analytical, computational, & imitation), adequate dynamic model of Data Communication Network in such context does not yet appear to exist. In this work, the idea of discretization of the state space of the network topology in time was proposed to demonstrate the dynamic properties of network. This idea was described in detail in several previous papers of the author. It was implemented in the two software developments and tested in simulation program. So the possibility of studying the Data Communication Network as a dynamic stochastic system was demonstrated on simplified examples. However, for full compliance with the terms of the transfer in modern networks, the model of Data Communication Network needs to be greatly expanded.

The review shows that models of Data Communication Network are successfully functioning in a form of Network Packet Simulator. There are several such developments. Network Packet Simulator NS-2 with modules mostly written in C++ developed at the St. Petersburg Polytechnic University Peter the Great for modeling for analysis of the functioning of digital networks with packet switching. NS-3 simulator is open source software packages. It is used primarily for research and training. Simulators NetSim, Cisco Packet Tracer, OMNeT++, and others help to solve numerous tasks of research and improvement of Data Communication Network. However, they are not designed to simulate dynamic properties of the network.

Further development of the proposed simulation model requires a transition to technology of creation of program package with a modular structure and organization of Network Packet Simulator. This research-in-progress study is devoted to the justification and selection of modules for the Network Packet Simulator imitating the dynamic properties of the network. The presumable composition of the modules for proposed Network Packet Simulator is discussed. Such simulator will allow to fulfill the detailed study and to evaluate characteristics of the Data Communication Network.

Keywords: Simulation, data communication network, algorithm, dynamic systems, stochastic systems

Cybersecurity for group decision support systems

[Research-in-Progress]

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Extended Abstract

Since the 1970's, group decision support systems (GDSS) have been a favored technique for qualitative decision-making involving medium to large groups. Admittedly, advances in computing made GDSS far more effective from the 1990's onwards. GDSS typically involve specialized software over a network, with each decision-maker/influencer at their own workstation. A facilitator collects and organizes the decision components on-the-fly, meaning that the GDSS actually supports a form of brainstorming. In addition to structuring the process, GDSS usually provide for anonymous brainstorming (thereby removing management/social hierarchy effects), distributed participants (not all in one room), and parallelism (participants simultaneously reacting, giving efficiency). These advantages are significant enough that GDSS are now used for strategic processes in corporations, government, and military entities – in short, environments where the outcomes have far-reaching effects. Despite this criticality, GDSS infrastructure typically runs on standard computer networks – a significant and growing cybersecurity risk.

This research-in-progress study extends existing taxonomies of cybersecurity and cyberwarfare risks into the GDSS domain, elaborating on the potential effects. For example, falsification network traffic in a GDSS can directly create brainstorming elements and affect the outcome of a decision-making session. Alternatively, altering a particular user's commentary can lead to deanonymization, compromising the decision process. Whereas cybersecurity risks are usually taxonomized on technical properties, in the context of GDSS, the taxonomy can be redrawn based on effects in the decision process.

As with any information system, cyberdefenses can be applied globally throughout the GDSS to mitigate these risks – though, as mentioned above, this often amounts to the standard corporate cybersecurity infrastructure. We argue, however, that smaller piecemeal defenses can be more appropriate in GDSS. For example, certain types of cryptographic signatures can be used to authenticate a user's GDSS inputs while maintaining anonymization. As a research-in-progress, few direct conclusions can be drawn, however, the impending security implications can be extracted. The taxonomy of threats to GDSS's can be used for risk management, while the recommended architectural changes can already be implemented piecemeal as partial solutions.

Keywords: Group decision support system, GDSS, cybersecurity, security-oriented architecture, risk taxonomy, authentication

The Internet of learning things – QR codes in textbooks

[Research-in-Progress]

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Extended Abstract

Our applied research-in-progress study argues that an Internet of Things (IoT) approach can significantly enhance the design and development of academic textbooks. More specifically, we claim that by connecting between the "analogic world" to the virtual one utilizing Quick Response (QR) codes, we can improve the development cycle of higher education courseware by allowing tracking and evaluation of student learning patterns. Our learning analytics is based on events triggered by activating the QR code that is linking textbooks and study guides to external resources. Within the current research, we developed two identical variations of the same courseware: print and digital. The print version allows students to scan the QR code with a recommended free app that is installed on their mobile device. The digital version allows access to the external resources by clicking the image of the QR code.

In order to capture the activation of each QR code, we have created an internal interim links table to which all the QR codes are directed. The links table refers the users to the external link. By navigating all traffic to the internal links table, we are able to capture analytics about each activation. Additionally, any changes to the target link are managed within the link table and, therefore, do not affect the actual QR code of the print and digital version.

With these research settings, during the second semester of 2017, we will be able to provide some initial findings to the following research questions: a) Based on cognitive fit theory, which version would students prefer? b) What type of external links attracts most traffic: academic references, video lectures, interactive questions or external websites?

We are currently developing the research with our first two courses: the first will evaluate the use of QR codes within a textbook and the other within a study guide. Students of these two courses will be provided with both the print and digital versions. An evaluation of these experiments will be gathered with a dedicated database that will capture time of activation, type of QR code, and the version type of the courseware (print or digital).

Keywords: Cognitive Fit Theory, e-learning, interactive learning, digital courseware, textbooks, Quick Response (QR) Code, learning analytics

Validating psychosocial indicators for precursor identification to malicious cybersecurity insider threat activity

[Research-in-Progress]

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Extended Abstract

Insider threats continue to be one of the most challenging threat vectors for organizations to mitigate. The impact of insider threat attacks can range from companies going out of business, loss of intellectual property, millions of dollars, to the detriment of critical infrastructures such as electrical power grids, communications, or travel infrastructures. Malicious insider refers to current or former employee, partner, vendor, or contractor that misuse their authorized credentials to preform unauthorized activities on the company (Glasser & Lindauer, 2013). Because of the nature of the insider threat, these malicious insiders hide their activities or employ techniques they believe will evade detection, until they have achieved their objective. One of the major challenges in detecting and mitigating the insider threat is that there is a limited agreement on the definition of insider (Bishop & Gates, 2008). This is because insider criminals do not all have the same motivations or characteristics. In many insider threat attacks, perpetrators exhibited observable questionable behavior such as disgruntlement, anger, or unreliability, yet coworkers or supervisors did not report the behavior. Behavior and preference of an individual were found in prior research to be explained by personality traits. These observable events that compose *indicators* refer to actions that can be observed by either people or systems (Claycomb, Legg, & Gollmann, 2013). This research offers a method for the identification of questionable user activity through the development of a monitoring system. This research uses a three-phased approach: (a) Delphi technique to determine the expert validated technical and psychosocial indicators for early detections of insider threats; (b) development of a proof-of-concept prototype, while assessing the indicators against an established a baseline; and (c) analysis of evidence and/or correlations against the baseline, development of correlating hierarchical bundling visualizations, and the overall detection accuracy of predicted malicious events.

Keywords: Insider threat, malicious insider, cybersecurity, cybersecurity experimental research.

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Measurable approach for risk justification of explicit and tacit knowledge assessment

[Research-in-Progress]

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Extended Abstract

Society is based on ongoing knowledge creation and the availability thereof. Knowledge management is more and more used in organizations across the globe. As knowledge is an asset, has its value within an organization's processes and related risks. Delak and Damij (2015) proposed a possible approach, but their further development resulted in many complicated and inefficient gatherings of knowledge risk assessment. The aim of this work-in-progress research is to set up and validate the organization's risk assessment approach from the perspective of the knowledge lifecycle. The approach assesses explicit and tacit knowledge within the organization. The knowledge and knowledge management risk assessment are based and aligned with the international standard organization (ISO) risk management. According to this standard, risk assessment answers questions such as: What can happen and why? How to identify the risks? What are the consequences? What is the probability of their future occurrence? Are there any factors that mitigate the consequence of the risk or that reduce the probability of the risk? The approach is based on three phases: 1) risk assessment centered on knowledge, knowledge management threats, and occurrences; 2) knowledge and knowledge management risk exposures by financial evaluations; and 3) measures to increase the resilience of knowledge and knowledge management risk exposures. Risk exposure is the probability of an undesirable outcome and loss due to undesirable outcomes (Benoit et al. 2011). The approach should be used by process owners and top management to assess the status of knowledge and knowledge management within the organization and increase the awareness of these risks. The research is currently in the first phase. The audience will be informed regarding the updated questionnaire for gathering knowledge and knowledge management based on undesirable outcome – threats, related risk matrix and the theoretical assessment of the knowledge maturity assessment within observed organization. The results from two case studies in Slovenia will be presented. The complete research will be presented at the next knowledge management conference.

Keywords: Knowledge management system, knowledge management system risks, knowledge risk assessment, knowledge risk classification

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Knowledge management for group decision making

[Complete Research]

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Extended Abstract

One of the key problems in group decision making are different interests. People are usually differently affected by the decision at hand. There are different views and preferences, but joint decision is the goal. The question is how to manage the group decision making process to leverage different interests? We proposed knowledge management approach in the frame of multi attribute decision making (MADM). In MADM decision knowledge is usually presented by criteria, their values, structures and utility functions. In the context of MADM for groups we use DEX methodology. DEX uses qualitative (verbal) values for criteria and utility functions are expressed as tables of logical rules instead of analytical functions, for example weighted sums. The advantage of the methodology is increased transparency of decision knowledge and weights incorporated in rules need not to be fixed. They can change their values regarding the values of criteria if necessary.

Within the DEX methodology for group decision making we propose that a group primarily agrees with a set of criteria, their value domains and their structure, usually in a tree form. This can be understood as a commonly accepted language of the group. Subgroups or individuals with different interests, then create their separate utility functions. So we get different evaluation models. All alternatives are evaluated by each model. The evaluation results are compared and differences are presented explicitly. The discussion is focused on the differences on evaluation results. With the proposed qualitative approach where utility functions are presented by logical rules we can discuss the origin of differences in final evaluation results. We need not to deal with differences which exists, but do not influence the final decision. Within negotiation process, we can discuss and leverage only influential differences. With the proposed method and its qualitative transparency of decision knowledge the time needed for leveraging different interests can be significantly reduced.

Keywords: decision knowledge management, group decision making, leveraging interests, qualitative hierarchical modelling, DEX methodology

Assessing online system for international researches

[Research-in-Progress]

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Extended Abstract

Teachers can use various tools to measure their students' school achievements. Being the age of omnipresent computers the decision was made to examine the influence of using a computer in primary schools assessment. Since Slovenia is small, there is limited number of possibilities to use in the Slovenians' mother tongue. Therefore, decision for designing a new online system for knowledge assessment was made and system was presented in 2008. Two years later, the system was tested on the subject of chemistry in a country-wide primary school research with 9-graders. The system offered students to solve some variations of multiple-choice questions. Teachers were able to prepare their own online exams or use the questions from the database and administer it to their students. In two-cohort research during 2010, 686 students participated. With students answers in pre-test, test, and post-test, we concluded that students in experimental group (that were able to use the online system) achieved better results than students in control group (without access to the online system). Many useful information were collected with student questionnaire and also from interviews with their teachers. Insights are being used as guidance for further development of the system. Further on, pilot study was conducted in 2014 examining the possibilities of using the system in international knowledge research studies. In that research, we did not intend to drive any conclusion on students' achievements, rather to run a pilot study and evaluate possibilities to develop and use the online system in international knowledge researches studies. The system had built-in options to translate user interface into other languages. First year university students from one country (Slovenia, EU), and one state in the United States (Texas) were invited to participate. Questions were selected from Slovenian and Texas sources. We selected the Texas Education Agency (TEA) and Slovenian National Examinations Centre (RIC) since each of them represents the state organization responsible for evaluating students' knowledge at the end of secondary education (12th grade). Chemistry questions were selected from State of Texas Assessments of Academic Readiness (STAAR) administered in May 2013 in Texas, and General Matura administered in June 2013 in Slovenia. Both sources were in their own state administrated to the final year of secondary school students (grade 12) in Texas and Slovenia in May and June 2013 respectively. Items were selected so that final selection would cover as various topics as possible. After students completed the exam, the system provided with students' responses and various other variables that could be used for further research. On average, students answered correctly on 18 out of 30 questions (60.2 %). No major issues were detected during this pilot study, therefore, we believe this system can serve as a platform to a group of international researchers.

Keywords: Online assessment, knowledge assessment, computer assessment, chemistry education, international research

Initial overview of repeated data breach incidents and the implication of knowledge sharing

[Research-in-Progress]

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Extended Abstract

Bruce Schneier, a well-known cryptographer, once said: ‘Amateurs hack systems, professionals hack people’. A recent report disclosed that overwhelmingly 90% of large United Kingdom organizations have experienced a data breach, and 25% of those experienced repeated data breach incidents at least once a month. Numerous repeated incidents of data breach have been reported in the popular media including various industries such as entertainment companies, financial institutions, and healthcare organizations. Some notable examples of entertainment companies include the 2011 Sony PlayStation Network breach, and later the 2015 Sony data breach. In the financial industry, examples include the 2014 TD Bank and Federal Deposit Insurance Corporation (FDIC) with multiple data breach incidents during 2015 and 2016. Similarly, examples for healthcare include the Lahey Hospital and Medical Center as well as the National Health Services. Moreover, in 2016 a Spanish hospital was documented to have a remarkable data breach volume of one incident per hour, with about 10% repeated breaches. Organizations are fined heavily for repeated data breach incidents. However, it appears that research focused on repeated data breach incidents among large organizations is lacking, while the role of knowledge sharing among security professionals appears to be missing from literature. Thus, this work-in-progress study aims to investigate the implications of knowledge sharing on repeated data breach incidents in mid and large size organizations. This study employs the methodology of analyzing event studies reported in industry, news media, and academic publications while measuring the number of repeated data breach incidents against available techniques for knowledge sharing among employees. Preliminary results demonstrate high level of data breach repeated incidents. The key limitation of this study includes the availability of volume of incidents reported, as a result of organizations’ reluctance to expose breach incidents. The practical implications of this study are the importance of knowledge sharing among information technology (IT) employees within the organization and beyond, the utilization of knowledge sharing tools, and the development of a strategic effort to reduce repeated incidents. Moreover, a potential reduction in repeated breach will reduce irreversible damage to the privacy of the customers. Given the remarkable rate of repeated breach incidents, the economic loss, and effect on society, it is essential to further explore the phenomena of repeated breach incidents, and develop a set of recommendations to reduce the likelihood of future repeated incidents in the same organization. Hence, this study explores the following research question: What are the underlining reasons for limited knowledge sharing amongst cybersecurity professionals in mid and large organizations?

Keywords: Breach incidents, repeated-breaches, cybersecurity professionals, knowledge sharing