

Barbara E. Hedderich, Michael A. Hedderich,
Michael S.J. Walter (Eds.)

Business Meets Technology 2

Proceedings of the 2nd International Conference
of the University of Applied Sciences
Ansbach 3rd - 4th of July 2020



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Introduction

In its second iteration, the "Business Meets Technology" conference gathered again a collection of scientific works presenting innovative research from a variety of fields. That we were able to offer this conference again was only possible because so many helped: colleagues that organized the workshops, all the participants contributing with their current research and last but not least our directing team and the university foundation who sponsored this act and made it possible to publish our proceedings, which give a testament to the diversity of the work done by colleagues and doctoral students. A special thanks goes also to our participants from partner universities, especially the Technical University of Valencia and a delegation from the Saarland Informatics Campus.

This conference would not have been possible without the technological support of Alexander Beck and Diego Bermudez Echeverry. They enabled us to meet virtually during this sad time of social distancing. Before giving a short overview over what to expect on the following pages a last big thank you to Mona Jantjes, Janine Kowanda, Regina Prutek and Manuela Gesell for preparing the manuscript.

Like last time, workshops were offered about communication and media, technology, and business. As a thematic extension, this year, an additional focus was introduced on business informatics and artificial intelligence under the direction of Wolf Knüpffer and Michael Hedderich.

Business meets Technology, and communication and media connect the two. This is why the section "Communication and Media", hosted by Christian Gebhard, looks at various aspects and different forms of communication and the use of media for communicative purposes. Digitization pushing forward, this integral part of future forms of communication and media represents a core part of the section.

Christian Gebhard exemplifies, how online teaching can be implemented in foreign language courses at university level. In "Some Suggestions for Teaching Foreign Languages Online" he gives five examples and points out how the internet can be used to fulfil the purposes of language instruction. Patrick Gröner, Verena Gerner, Charlotte Kätzel and Armine Fuchs investigate into a digital competence model for the Ansbach University of Applied Sciences and look into digital skills that will be relevant for teaching in the future by means of a survey. They find that security issues are of great concern among teaching staff, professors and companies the

like and that so far there seems to be a gap as to how much the corresponding skills are being applied in teaching. Their contribution is titled "Development of an Interdisciplinary Digital Competence Model at the Ansbach University of Applied Sciences".

Communication with AI is another topic in this section. In his contribution "The Use of Artificial Intelligence in Higher Education Teaching - Social Robots as Assistant Professors", Patrick Gröner is set to find out how students react to a robot assistant professor and analyzes their dynamic interaction. Taking into account affective, cognitive and conative aspects, he gives an account of how attitudes toward humanoid "Pepper" changed over one term.

"From digital innovations to the open museum. New challenges of Street Mural Art" is the title of a study by Virginia Santamarina-Campos, M^a Ángeles Carabal-Montagud and Maria-Victoria Esgueva-Lopez, in which they describe how street art, an artistic heritage, is threatened by extinction. They elaborate on a plan to save mural art so that this form of expression will survive in the European context. Finally, "Portfolios as Performance Records in a Reflective Approach in Teaching Chinese as a Foreign Language" by Christian Gebhard shows once more how digitization reaches the classroom. How to foster autonomous learning making use of metalinguistic techniques on a metacognitive level is part of this contribution.

Michael Walter hosted the workshop on Current Advances in Engineering Research. Its considered challenges span a broad range in several fields of engineering and technology – lasting from complex manufacturing processes to challenges arising in the sustainable and efficient use and supply of energy. Markus Zink and Alexandru Sover introduce a novel procedure on the non-destructive removal of paint layers from polymer substrates by means of laser technology. The authors give deep insights into their studies of the effects of varying process parameters on the achieved level of removal as well as on the intactness of the paint layer.

Astrid von Blumenthal and Anja Bartsch discuss in "District Heating Grids and Renewable Energies" the political ideas that led to the current legislation in German law that calls the use of renewable energies for heating supply as mandatory for new buildings. The authors establish recommendations for a course of action and the determination of possible potential for legislative development of district heating grids. Finally, Marius-

Andrei Boca and Alexandru Sover analyse the influence of the process parameters and plastic material properties on the quality of moulds manufactured by means of a 3D-printer. These moulds are used in a consecutive production step to produce plastic parts by means of thermoforming. Consequently, the geometrical accuracy of the resulting parts depends largely on the appearing deviations of the 3D-printed mould. Therefore, the authors quantify the geometrical accuracy of actual moulds utilizing 3D-scans of the printed moulds. Furthermore, the authors establish design modifications to decrease the appearing deviations of the mould.

Three sessions were organized on business informatics and artificial intelligence covering a wide spectrum of current trends in this area.

The first workshop on intelligent systems and AI gives insights into applications in vision and imaging. The developments in recent years have made these technologies more powerful and robust, leading the way to integration in more and more real-life applications. In the subfield of vision, computers are enabled to understand the visual world around them. Guillermo Reyes presents a system to automatically detect and classify hand gestures using state-of-the-art deep neural networks. In his talk, he also highlights challenges and solutions for working with machine learning approaches in a realistic setting with limited training data. The subfield of imaging is well known from cinema and video games but is now also extending to more applications.

Almerich-Chulia and Moreno-Puchalt discuss the opportunities this technology can bring for tourism and architectural heritage and showcase a 3D visualization of the church of St. John in Ansbach. Making visible what is often hidden to the normal visitor, it allows fascinating new views on architectural structures. Combining both vision and imaging, de-Miguel-Molina et al. surveys how museums use immersive technology such as virtual and augmented reality. They present technologies that museums can and already do use but also the issues that can arise in the form of a lack of financing and technological expertise. They also connect their work to the current situation with COVID-19 that triggered challenges and innovative changes for museums.

The second workshop focuses on enabling technologies. With the rising importance of cloud computing, managing cloud services from several providers and integrating them into one's own IT infrastructure becomes an urgent problem. Söldner presents the concept of cloud management

platforms, evaluates existing solutions and explores their current limitations. In an ongoing project, this will be investigated practically in a new laboratory environment at Ansbach University of Applied Sciences. The second work of this session, given by Gomez-Barrero, introduces current developments in security and biometric recognition systems. Bridging to the physical world, the author discusses presentation attacks on fingerprint sensors. Approaching this attack using state-of-the-art machine learning methods, she shows how they can be defeated using both conventional sensors as well as new sensors from the medical domain.

The third workshop covers again intelligent systems and AI, this time with an emphasis on language technology. A limiting factor to the application of machine learning and especially to modern deep learning techniques is the lack of labeled training data for many tasks. Hedderich discusses crowd-sourcing, distant supervision and transfer learning as three possibilities to overcome this limitation. Examples are shown of these techniques applied for entity recognition in text in Estonian and Yorùbá.

Magdalena Kaiser presented in her talk her recent works on conversational question answering. While voice-based assistants like Siri and Alexa have rapidly grown in popularity, they are still often limited to simple questions and direct responses, not allowing for longer, connected conversations. To this end, Kaiser and her colleagues developed CROWN, a system based on passage retrieval and scoring that can take multiple conversation turns into account. To overcome the limitations in labeled training data, an unsupervised word embedding and graph approach was used. The author also presented a web demo that allows to try out the system directly.

In the last work of this session, the authors Santamarina-Campos et al. survey how street art is currently categorized and made accessible online. They find several challenges from the lack of coverage and meta-data to the difficulty in making the content searchable. They present concepts for a platform that could overcome these difficulties supported by intelligent systems.

In the area of business, three sessions were held. The first business workshop, hosted by Markus Skripek covers four papers on business developments: two with a research focus on different sectors, namely automotive and cultural and creative industry; the other two with a research perspective on eco-innovation and on social media developments in B2B.

Skripek and Gröner investigate how social media is used in B2B communication. Based on an online survey of over 800 B2B companies from Germany, Austria and Switzerland, the researchers focus on the relationship of on the one hand company size and on the other hand factors like invested time in social media, responsibility on the activities and plans for the future. The research does also an assessment of the relationship between management level and several success factors in social media. In "Automotive Industry: Sustainability vs. Obsolescence", the authors survey how car manufacturers approach sustainability and durability. They find that life-cycle design is the prevalent aim emphasised by CEOs. In addition, durability is a factor to be considered in sustainability but at the moment, especially in the communication of the automotive industry, it has not yet arrived.

Eco-innovation is a new competitive business model (product, process, organisation, marketing etc) where ecology and social aspects benefit. García-Meseguer and Peiró-Signes study whether there are differences in achieving an eco-innovation result depending on the sector and activities in which the company is competing based on the survey CIS2014. One of their key findings is that manufacturing firms are more successful in achieving eco-innovation results than service firms.

In education, fine arts and computing techniques have historically been completely separated and seldomly worked together. The authors of "Challenges & Business Models for the Cultural and Creative Industries" argue that more multidisciplinary approaches are needed that are also aligned with the needs of the companies. A governance model is proposed to analyse how policies are aligned to meet the digital needs of cultural and creative industries as it interacts with research policymakers, business, civil society and the educational sector taking into account sustainability.

The second session on business was hosted by Ritam Garg, and in total five papers were presented.

In his paper on Boundary Spanning, Ritam Garg explains the black box in the dynamic business environment from the perspective of leadership styles in the International Business. He highlights the role of socio-cultural dimensions, and instrumental leadership within the context of boundary spanning, and how it can facilitate synergistic solutions. Inés Díez-Martínez presents a meta-review about ESG (environmental, social, and corporate governance) strategies, and explores how the different perspectives would enable the businesses to integrate these strategies into

the business models. She further explains that by doing so, companies would be able to incorporate socially sustainable practices to improve their economic performance.

The work by Julia Schrandt on Industry 4.0, emphasizes the current predicament of small and medium-sized enterprises to incorporate digitization / digital transformation in their respective businesses. She elaborates that companies need a better understanding of Industry 4.0 in order to comprehend the demands of information technology, and plans to collect data from the industry by conducting interviews to shed more light on this phenomenon. Marleny Gómez-Reyes contributes a paper on the creative industries, and how they can be the engine of economic growth for developing countries. She presents a case of Bogota DC in Columbia. She further illustrates the role of supportive policies that can influence the development of these industries. Lastly, the work of Joaquín Sánchez-Planelles focuses on the issue of sustainability in agricultural and food companies. Presenting his findings from a sample of case studies, he writes about the importance of being proactive and allocating the resources accordingly to meet the needs of being a sustainable business. He further adds that agricultural and food companies have to implement sustainable practices to remain competitive in the market in the long run.

The third session on business, hosted by Carolin Durst, first addresses the topic of tourism. Charlotte Kätzel presents the research project Connected Guest Experience headed by Carolin Durst which aims to increase the length of overnight stays in the tourism region Romantic Franconia. The project is based on a slow travel trend which focuses to attract guests to a region with the help of individualized experiences instead of traditional package holidays. It is shown how a region can be accordingly strengthened in a sustainable manner, also through the networking of (small) local providers. In contrast to providers like Airbnb, who tackle the trend with a top-down approach, Connected Guest Experience follows a bottom-up approach and connects the experiences to a regional hotel.

Navarro and Peiró-Signes then take up the issue of sustainable tourism and present a study that was conducted in order to determine the factors, which allow differentiating tourists who are aware of sustainability in regard of their holiday planning from those who do not consider the environmental aspects. A prediction model was developed and trained via supervised Machine Learning techniques to differentiate between environmentally concern and non-concern tourists. The authors analyze data from the 2016 Preferences of Europeans towards Tourism survey and reveal

that the majority of European tourists do not consider aspects of sustainability when planning and booking their holiday. In the next step, they will dive into qualitative data analysis to gain a better understanding of the results.

Addressing an extremely topical subject, Beatriz García-Ortega, Javier Galán-Cubillo and Blanca de-Miguel-Molina discuss the reaction of Spanish companies in the coronavirus crisis with regard to their corporate philanthropy. Applying a close reading analytical technique they observed four major and solvent companies' internet / social media presences and press notes to figure out if they were displaying their corporate philanthropy to provide help during the crisis. They also investigate whether the companies' corporate philanthropy expenses were proportional to their means and economic resources, or if it was more symbolic and self-promotional as companies often invest in their communities by donations and infrastructures in order to strengthen their reputation and to obtain legitimacy from stakeholders or to get social license to operate. Furthermore, they point out that all of the firms considered had reacted quickly in a positive way but that their efforts had not really been relevant in relation to their capabilities.

Daniel Catalá-Pérez discusses the Demola model as a public policy tool to improve public-private collaboration. He introduces the concept of Open Innovation Platforms and outlines the Demola model which includes multidisciplinary university student teams facing challenges provided by a private, public or third sector organisation in cooperation with the organisation's staff and supervised by lecturers. He analyzes the model in different settings in Finland and Spain in order to reveal which of those were the most successful ones and which factors are decisive for that success.

In his paper, Christian Gebhard introduces a study about the awareness of the Belt and Road Initiative (BRI) – an infrastructure and investment strategy involving more than 80 states including Germany – in small and medium-sized enterprises (SMEs). He gave an overview of the situation of Middle Franconian SMEs and the influence of Chinese interaction in that region. The results showed that most enterprises are still unfamiliar with the BRI, yet half of the participants stated that they want to learn more about the BRI. Gebhard suggested that there might be a market for workshops and courses, including language and economic training measures.

These proceedings conclude with the results from the poster session which was organized by Sibylle Gaisser.

Thanks to all its supporters and participants, the second “Business Meets Technology” conference has again been a platform for highlighting fascinating research in a diverse range of topics. Now we are looking forward to its next iteration, third time’s the charm, that will be organized for the first time by our partner university, the Technical University of Valencia, next year.

Barbara Hedderich

Michael Hedderich

Michael Walter

Ansbach, July 2020

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