

## Mixed, Augmented, and Virtual Reality: Services and Applications

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### Abstract

Year 2020 will be remembered for the rapid and large-scale virtualization of services. The process of virtualization has been the fastest in the sectors that could have adopted new working methods already earlier but where work culture and change resistance have been the main reasons for not adopting video conferences or cloud-based sharing of documents. In these cases where the devices and application that have already been widely adopted before the pandemic, the change has been even surprisingly smooth. Many organizations have still focused on ensuring the successful virtualization of the basic functions. During this rapid adaptation, there have been less resources to virtualize the more complex task where the physical presence of personnel is inescapably needed to finish the tasks.

Mixed, augmented and virtual reality technologies diminish the boundaries between physical and virtual worlds. They provide solutions for industries where the physical presence of experts is needed. Even though they were not necessarily in the frontline of the virtualization of services, the need for establishing infrastructure for them has now proven. This means the dissemination of the technologies among both service providers and customers will become a necessity to keep processes running even when there are restrictions in travelling. Preventing the economic damages of eventual new crises will become increasingly important. Those industries that have heavily suffered from the shutdowns because of travel restrictions will be eager to invest in service development that will help in keeping the processes running – such as the ability to educate skills or to guide the customers remotely to do maintenance tasks.

From the papers that were submitted to this minitrack, augmented reality was the technology in

four papers and virtual reality in three papers. Thematically, augmented reality was used in guiding customers in two papers, for marketing purposes in one paper and for skills training in one paper. Virtual reality was used for training and education in two papers and situational imaging in one of the papers. All of the papers had a practical approach and data collected from real use cases was appreciated also by the reviewers. Affordance theory, means-end chain, the diffusion of innovation theory, interaction theory and motivation theories were used as theoretical frameworks.

The first paper in this minitrack integrates the affordance theory and means-end chain perspectives in the context of retail. The approach in this paper is qualitative and videos were used to demonstrate the use cases. On one hand, the approach has certain limits if the users have no previous experience about the technology. On the other hand, mock-up videos could help in labor-intensive data collection when the users understand the technology and service concepts well enough but the technology is not yet widely used. The second paper covers the learning environments in virtual reality and the identification of problem space when developing the applications. In the last paper, augmented reality is used in workplace training. Both qualitative and quantitative data is used in the last paper with a setup where virtual guidance was interestingly implemented in connection with a physical training setup.

For the next year, we encourage everyone in the audience and those who are presenting to submit papers to the session. Interesting research avenues are, for example, user decision-making, customer value and service design. The outcome is hoped to be accelerated, the customer value-guided development of the technologies and consequent innovative business models.

Fields of research that can contribute to the minitrack include computer science, information systems science, e-commerce, decision-making or any scholarly or industry field developing MR, AR and VR applications. We welcome contributions from all contexts and industries. Previously, there has been an emphasis on healthcare, e-commerce, travel, sports, culture, education and industrial solutions, but new areas are welcome as well. We seek empirical and conceptual research papers, methodological papers, quantitative analyses, case studies, reviews and practitioner reports. Contributions to new technologies are also appreciated. In addition to the regular HICSS criteria, the degree of novelty both in the technology employed and the innovativeness of the application is given considerable weight in the evaluation of the papers.

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