

Studienprojekt oder Bachelorarbeit (Umfang 3 – 6 Monate)

Topic:

The role of information in the field-service delivery processes in the context of AR Remote Maintenance

Project Task:

Augmented Reality (AR) Remote Maintenance is expected to facilitate field-service delivery by enhancing collaboration between physically separated users (remote experts and on-site technicians) via audio/video stream and AR-based communication cues. AR Remote Maintenance might reduce the duration and costs of service interventions by providing necessary information to the on-site technician.

Previous studies showed that availability of information influences field-service delivery performance. Lehtonen et al. (2012) identified the lack of information as a major reason for failure of service interventions while Daeuble et al. (2015) identified information needs of on-site technicians in relation to the different phases of the field-service delivery process. However, the relative importance of specific types of information as well as the influence of AR Remote Maintenance for information provision have not yet been considered.

The aim of this project, therefore, is to collect quantitative empirical data on information needs in field-service delivery processes, and to analyse this data in terms of the relative importance of specific types of information.

The scientific project includes the following activities:

- Familiarisation with the topics of AR Remote Maintenance (Breitkreuz et al., forthcoming) and information needs in the area of field-service delivery (Daeuble et al., 2015; Lehtonen et al., 2012; Lundin & Eriksson, 2018; Metso et al., 2016)
- Submission of a proposal (approx. after 2 weeks) emphasising the object of investigation, research objectives, thesis' structure, and project plan (e.g., Gantt Chart)
- Literature-based development of an appropriate questionnaire for data collection (Bryman & Bell, 2015)
- Reasonable selection of an online survey tool for data collection (incl. strength and weakness analysis of various tools)
- Analysis of survey data collected in IBM SPSS (descriptive and inferential statistics)
- Submission of survey raw data (Excel and SPSS file)
- Submission of statistical analysis (Excel and SPSS file) (Eckstein, 2016; Hatcher, 2013)
- Submission of a written report / thesis in English, including a method section, which meets the standards of scientific work in terms of form, structure, and approach

References

- Breitkreuz, D., Müller, M., Stegelmeyer, D., Mishra, R. (forthcoming): Augmented Reality Remote Maintenance in Industry - A Systematic Literature Review. Submitted for review at XR Salento July 6-8, 2022, 1st International Conference on eXtended Reality, Salento, Italy.
- Bryman, A., & Bell, E. (2015). *Business research methods* (Fourth edition). Oxford University Press.
- Daeuble, G., Oezcan, D., Niemoeller, C., Fellmann, M., Nuettgens, M., & Thomas, O. (2015). Information Needs of the Mobile Technical Customer Service -- A Case Study in the Field of Machinery and Plant Engineering. In T. X. Bui & R. H. Sprague (Eds.), *2015 48th Hawaii International Conference on System Sciences (HICSS 2015): Kauai, Hawaii, USA, 5 - 8 January 2015* (pp. 1018–1027). IEEE. <https://doi.org/10.1109/HICSS.2015.126>
- Eckstein, P. P. (2016). *Angewandte Statistik mit SPSS: Praktische Einführung für Wirtschaftswissenschaftler* (8., überarb. Aufl. 2016). Springer eBook Collection. Springer Gabler. <https://doi.org/10.1007/978-3-658-10918-9>
- Hatcher, L. (2013). *Advanced statistics in research: Reading, understanding, and writing up data analysis results*. ShadowFinch Media LLC.
- Lehtonen, O., Ala-Risku, T., & Holmström, J. (2012). Enhancing field-service delivery: the role of information. *Journal of Quality in Maintenance Engineering*, 18(2), 125–140. <https://doi.org/10.1108/13552511211244175>
- Lundin, J., & Eriksson, Y. (2018). An Investigation of Maintenance Technicians' Information-Seeking Behavior in a Repair Center. *IEEE Transactions on Professional Communication*, 61(3), 257–274. <https://doi.org/10.1109/TPC.2018.2826087>
- Metso, L., Marttonen, S., Thenent, N. E., & Newnes, L. B. (2016). Adapting the SHEL model in investigating industrial maintenance. *Journal of Quality in Maintenance Engineering*, 22(1), 62–80. <https://doi.org/10.1108/JQME-12-2014-0059>