

# Augmented Reality in Industrial Service & After-Sales

## Testing, Evaluating and Implementing AR Use Cases

### Graduate



Carlos Joel Bessa Cunha

**Introduction:** This study focuses on evaluating and validating the applicability and value addition of augmented reality (AR) technology in enhancing Tecan's service department. The investigation delves into three distinct use cases: design reviews targeting serviceability enhancement, the implementation of guided workflows aiding field service engineers (FSE) in the field, and remote assistance for expedited troubleshooting processes in the field. Test scenarios, aligned with Tecan's expectations and stakeholder needs, were conceptualized to explore the AR technological possibilities using the AR software Sphere.

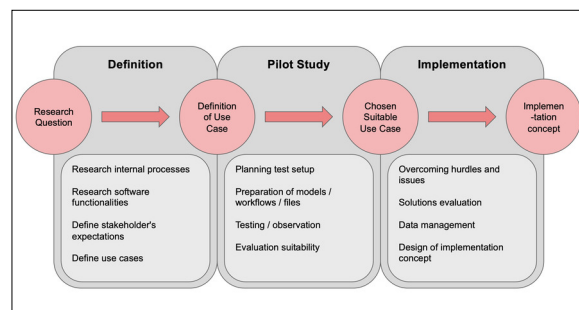
**Result:** The results highlight the design review as exhibiting the highest potential in terms of user adoption, visual quality, and increased efficiency, with considerable AR relevance for the designated task. The integration of near-reality and life-sized models during design reviews significantly contributed to the success of this use case. Moreover, benefit and cost estimations revealed lower investment costs in equipment and labor, along with substantial savings through reduced travel expenses and time. Consequently, Tecan opted to further investigate the implementation of design reviews in the company's workflows. However, pending issues such as file compatibilities, data structure and metadata, and data management required further exploration, with conceptualized solutions being imperative. A process analysis indicated the necessity for separate design reviews, specifically focusing on serviceability. A feedback evaluation process was also devised.

**Conclusion:** In conclusion, unlocking the full potential of AR in design reviews requires addressing specific challenges. This involves adopting a file format that includes essential metadata as outlined by Sphere,

while considering Tecan's current formats used in R&D. Additionally, establishing new procedural steps for the necessary service design review and providing training for personnel in AR for these updated processes is vital. By effectively overcoming these identified obstacles, the successful utilization of AR in design reviews for the service can be achieved.

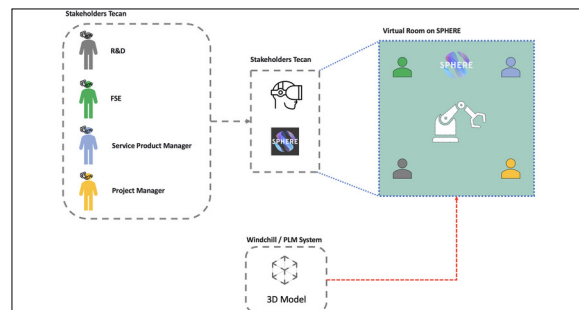
### Methodology

Own presentation



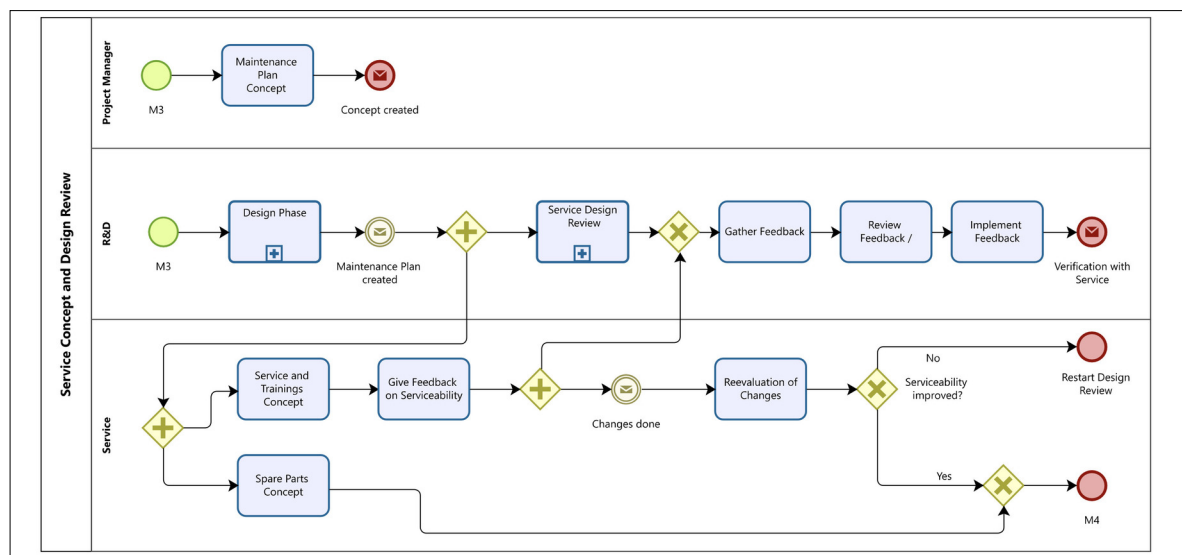
### Use Case Design Review Scenario

Own presentation



### Service Design Review Implementation in Internal Procedures

Own presentation



### Advisor

Prof. Dr. Daniel Patrick Politze

### Co-Examiner

Dr. Noëlle Jufer

### Subject Area

Technology Management

### Project Partner

Tecan Trading AG, Männedorf, Zürich