THE IMPLEMENTATION OF ARTIFICIAL REALITY TOOLS TO VISUALIZE COMPLEX ENGINEERING

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Subject
Designing an advisory report about the implementation of artificial reality tools to visualize complex engineering at Indall.

Background information
Indall is a Dutch startup with as main business visualizing complex engineering. Her focus is on translating complex machines, processes and systems into a 3D film, image or film. In this way, Indall helps companies to make their mechanics understandable, boost their sales and accelerate the conceptualization phase. To be in the front line of technological innovation, the firm wants to investigate the field of artificial reality, such as virtual and augmented reality. However, challenges that arise from this are among others the novelty of, and causal unfamiliarity with, this technology, the prior needed investments into research before implementation, the wide scope of this new technology and the intangible aspect. In addition, according to Indall, many companies research, offer and implement derivatives of artificial reality. Indall considers a tailored artificial reality tool to visualize complex engineering as an untapped market.

Relevance
VR and AR are upcoming technologies in which many companies already invest. Moreover, the importance of this research for Indall is both the enhancement of her knowledge and the potential growth of the firm. By developing a tool which uses artificial reality, Indall does not only broach a new service, but also develops an image of a company which is on the front line of technological innovation. In addition, this research can serve as a groundwork for other research and developments.

Research question
Which conditions are required for Indall to facilitate an optimized visualization tool which fulfils both Indall's as her stakeholders requirements and wishes and visualizes complex engineering by making use of an artificial reality tool?

Approach with intermediate results
This research will be mainly based on a desk part of existing research due to the COVID-19 crisis during which this research needs to be executed. In the first stage, the requirements for this report will be set up, in which both Indall and her partners are considered. These requirements will function as a groundwork for answering the research questions. By improving the knowledge and carrying out the field research with Indall's stakeholders, the list will be dynamic and changing. The thesis will continue with discovering the existing techniques and research, which will be screened, selected, categorized and summarized. Based on the abovementioned steps, as third step a business plan will be investigated and created which both satisfies the researched requirements and is practically feasible. This leads to a report which helps in the translation of complex mechanical engineering into a human centered tool.

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Results
Based on the executed research and the comparative analysis, a recommendation is created in which a framework is offered for the implementation of artificial reality to visualize complex engineering at Indall. It can be concluded that opportunities exist for Indall to offer an artificial reality tool which visualizes complex engineering.

The research about current implementations showed that the use of artificial reality in displaying the technology in order to both explain technology and market the product is of potential. Thus, it is recommended for Indall to focus on the sales and investment stakeholders, in which the tool consists of both a didactic aspect which explains the complex technology as a representative aspect in which the tool has a selling and marketing strategic character.

Practically, Indall should start networking with her current clients to discuss a kick starter case which Indall can use as a first project to carry out without the expectations of much time pressure. Regarding hardware they could decide on investing in for instance a Microsoft Hololens or Oculus Quest during the test phase

It is recommended to use a 3D game engine like Unity for developing tailored virtual reality experiences in which the complex technology is explained. When selecting another software, it is necessary that the software can develop an experience which includes engagement and an appropriate amount of fidelity. The experience should be developed in a way that it creates a journey in which the user can interactively decide on aspects that he or she want to know more about.

Conclusions & Recommendations
During this research, the main research has been answered. The conducted research and the advisory report are research-based, which offers a solid start for the implementation of artificial reality at Indall. The set advice offers a time path with a schematic overview of the tool, so that the execution will lead to a future-proof device which can be easily customized to different clients of Indall.

However, the results are rather descriptive and probably not fully aligned with the ending practices. It is recommended on continuing this research by a field research. In addition, the advisory report is an aspect which could be improved by narrowing down the scope of devices and software which are of potential. Lastly, it is recommended on testing different devices and their usability.

Step 1. Network

Step 2. (optional) Use tablet devices

Step 3. Invest in artificial reality device

Step 4. (optional) Use existing software

Step 5. Deepen knowledge in 3D engine

Step 6. Scale up

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