

Bachelor Thesis

**„Virtual reality learning software as an alternative to the
previous simulator training“**

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by

Summary

This thesis deals with the topic VR as a learning software in the pilot training, as well as advanced training. It should be worked out whether such a software in connection with VR is at all suitable as a learning software. It should also be about whether such software with VR is a better alternative to the traditional learning methods for pilots. For this the opinion of real pilots was collected and analyzed.

The aim of the present work is to create a cockpit of an Airbus A320 and to make it into a useful training software for pilots in combination with a game engine and VR.

Through this software in conjunction with VR, it is to be possible to practice certain procedures even outside the costly simulator.

By further developing this software, it will be possible to practice recurring procedures, such as preparing an aircraft for the next flight. But also system failures, which are rare in reality and therefore must always be practiced in the simulator.

The construction of the cockpit is kept as realistic as possible. For this, a real simulator of an Airbus A320 is visited, in which such a cockpit is installed. All relevant dimensions are recorded and reference images are produced. The so-called cockpit preparation is implemented in the learning software on the basis of the procedures required to operate an A320.

As soon as the cockpit is finished and the procedure is worked out, this software will be tested by both unexperienced and experienced pilots. These will then provide a detailed questionnaire of their detailed assessment of the software and the possible use of VR in practice. It will be primarily about whether they can imagine that certain modules of a simulator training could also be implemented by the use of VR, in order to even save costs if necessary.

In the basic part, we first looked at the current market situation to provide an overview of what is already present on the market and which learning softwares already existed with VR. This was followed by an explanation of 3D modeling for VR applications, as

they also differ from conventional 3D applications. Afterwards the software development for VR applications was explained, as well as a basic introduction to the previous simulators and learning methods of pilots.

In the methodical part of the work, the methods were used which were used to achieve the research goal. A test phase with a subsequent questionnaire was carried out to reach the research goal. This corresponds to the empirical quantitative research method. In the survey, personal questions are initially asked to define groups of people in retrospect. However, the weighting of the answers remained the same, it is only important that this survey was carried out only with pilots. This is also the potential target group. In addition, each question of the questionnaire was addressed and explained in more detail. Thus their importance for the analysis and the consideration of the questions was described.

In the main section the software was written. This time not in the basics, but something more specific. Here again was exactly explained how the process was and how everything was implemented. The test phase was explained further in the main part. This explains how the contact with Eurowings and / or the pilots arose to be able to carry out the test phase, as well as the exact course of this test phase at the airport.

Finally, the results of the work were collected and analyzed. Here, the survey results were displayed using diagrams and an evaluation was made. It turned out that the test pilots wanted such a software and would put conventional learning methods behind such a software with VR.

The aim of the thesis was to find out whether such a solution can supplement or even partly replace the conventional learning methods of the pilots using a specially developed learning software in conjunction with the new VR technology. The thesis of the work was confirmed by means of the test phase or survey. The results of the survey show, in particular, that there are minor differences of opinion between older and younger pilots, but the majority is very convinced of such a solution in the future. The results vary particularly in the intuition or operation of the software.

It was also clear, however, that the more experienced captains were generally more skeptical than the younger pilots. So also in the questions about the potential later

fields of application. By and large, however, everyone was very much convinced that such a solution would have great potential in aviation in the future. They see behind the idea a method for much more effective learning as well as a cost saving for the airlines. With such a solution according to the test pilots some previous learning methods would already be replaced.

It can be seen clearly that the majority of respondents are enthusiastic about the technology and the possibility of learning in the future. Although it is not possible to replace everything that exists so far. However, parts can be replaced or at least supplemented. In any case, all pilots see a very great potential here and see the future of learning in aviation. Thus, the alleged thesis is confirmed.