OVERVIEW

Scope AR collaborated with one of their large industrial clients to perform a side-by-side comparison of Scope AR's WorkLink software versus using traditional paper-based methods to create manufacturing instructions.

The client chose a complex assembly process for a proprietary spring-loaded hatch. The assembly process contained over thirty steps that involved things such as fitting components at specific angles to ensure proper assembly, screwing down different screw types in correct locations, and grabbing parts that had similar exteriors. The client chose this assembly process because it contained common steps that are frequently used in other processes as well as unique steps that are confusing and if done wrong would cause severe quality issues.

THE GOAL

The purpose of the side-by-side comparison was to measure the time it took for a novice user of WorkLink to create augmented reality (AR) Smart instructions versus using traditional methods to create paper-based instructions.

Once the instructions were created, the client deployed both instruction types to their operators. They wanted to measure the efficacy of both instruction types, measure the speed it took for operators to read and perform the instructions, and measure any quality defects that resulted from using the two different instruction types.

THE FINDINGS

The client chose a competent computer user without any prior coding or 3D modeling knowledge to use WorkLink. After going through Scope AR's standard tutorial and building a couple of sample projects, the user was timed to see how quickly he could create the assembly instructions using both WorkLink and traditional methods. What surprised the client and the Scope AR team was that the time to create the assembly instructions was almost identical! Both teams expected WorkLink to take longer to initially create the instructions and then the client would reap the benefits of the AR Smart instructions once it was deployed. What wasn't accounted for was the ease of conveying instructions for the author when they could manipulate a 3D model and show exactly what they wanted to be done and where.

Using traditional paper-based methods, the author could not directly show what had to be done and this required him to convey external context in addition to the task at hand. An example is when the author wanted an operator to first screw down the second screw from the top left. However, it's only the second screw from the top left when the assembly was placed a certain way. The author had to convey the mounting position relative to other aspects of the assembly versus being able to just show it with WorkLink. Another example is when inserting a bushing, the operator should only insert it from the right side. Instead of being able to drag the bushing in augmented space, the author had to convey and communicate other aspects of the assembly to ensure the bushing was installed correctly. These nuances of conveying instructions using traditional paper-based methods required additional cognitive load for the author. This load slowed down the creation process and allowed instruction creation time between the two methods to be almost the same.

Once the instructions were built and deployed to the operators, the benefits for AR Smart instructions were evident. When operators used the Smart instructions, they were 30% faster than their counterparts who used paper-based instructions. With the Smart instructions overlaid on top of the real-world object that needed to be assembled, operators were able to find the parts faster, they were able to understand the instructions clearer, and they ended up with three times fewer quality errors!