Developing a Facial Shaving Device for People with Limited Hand Dexterity

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The project is inspired by my late grandfather, who had limited manual dexterity caused by a stroke. He was unable to shave independently, thus requiring continuous care. Consequently, I set out to develop a potential solution to this problem. Initial research investigated current solutions on the market, and their effectiveness. There were no solutions on the market despite the obvious need. The opinions of a number of focus groups were invited regarding desired features of any device. Feedback indicated a need for a device, and that it should incorporate safety, user-friendliness, and minimal maintenance. Feedback also indicated that 100% of affected male users preferred to shave independently. A range of designs were considered and prototypes assembled. Any solution necessitated the need for a programmable 'intelligent' core, gearing systems, motors, electronic control system, sensors, and a practical, portable design. Designs were developed using sketches, CAD and FEA software and 3D printed prototypes to produce a high-quality solution. Software and electronic design was approached similarly, using Arduino to code the device's 'intelligent' core. A mannequin head was used for continuous testing, development and refinement of the design. The final prototype was critiqued by experts, and refinements made. The final prototype involved an innovative mechanical design mediated by a motorised gearing system, and controlled by a specifically designed program. Infrared proximity sensors actuated the control system. In conclusion, a functional prototype was created that fits the needs of the user and is ready for further development to become a market ready product.

Awards Won:

First Award of $5,000