

Analysis and Evaluation of Functional and Aesthetic Aspects of Design

The following analysis and evaluation addresses directly to the 'Criteria to Evaluate Success' section (see pages 13 - 15), and is based on the 'Testing of Design Solutions' (see page 43) and 'Target Market Feedback' (see page 73)

Ranking System

Achieved	Partly Achieved	Not Achieved
Green titles indicate that all areas of the criterion for success have been achieved to their full potential.	Orange titles indicate that some areas of the criterion for success have been met.	Red titles indicate that no areas the criterion for success has failed and has not been achieved at all

Retractable Helmet – Functional Aspects

Locking Mechanism



Extended testing and experimentation have led to a functional final locking mechanism that successfully locks each helmet shell in place when opening and closing it. By creating two parts to the helmet's locking mechanism and undergoing appropriate testing, I have proved the effectiveness of its functionality to ensure maximum safety for the individual. The black paint coat on the stop locks allow them to camouflage with the helmet shells. However, the red paint coat of the tension locks adds to the overall helmet's aesthetics and make it stand out from others in the market.

Wireless Bluetooth Connectivity



After undergoing multiple tests with the final wireless earphones throughout the project's development, no major problems or interruptions with its Bluetooth connectivity were encountered. By selecting Bluetooth wireless earphones with the same colour palette as the retractable helmet, its aesthetic appeal has also enhanced its quality and overall attractiveness of the final product.

Buckle and Straps



The use of plastic buckles and nylon straps in the retractable helmet's design has ensured it is safe to use as a result of the durability of the materials. The quick-release mechanism of the buckles has been tested and proved to work effectively every time; locking together when one is inserted into the other, and unlocking when their sides held down. To satisfy the aesthetic criteria and provide a colour connection between the buckle, straps and the helmet, a red and black buckle, and a black strap were obtained. Overall, the application of durable and aesthetically pleasing buckles and straps have added both visual and functional value to the final helmet.

Safety



The retractable helmet's safety was determined by the results obtained during the product's testing stages. By constructing a crash-test model identical to the final retractable helmet and conducting collision-simulations (refer to 'Testing of Design Solutions' in page 43), I could assess its durability, and determine if it is impact resistant. The results showed that the helmet's use of ABS plastic prevented indents from damaging the surface of the helmet and thus, reaching the user's skull. Moreover, the EPP foam liners proved to absorb most of the impact received from the collision, and thus it was concluded that no impact would reach the user's head, thus preventing head injuries. This has confirmed the final retractable helmet meets Australian Standards and is acceptance among the wider demographic. Throughout all stages of the product's design and manufacture, WHS laws and regulations were strictly followed, and as a result has further enhanced the safety of myself and others around me.

Ergonomics and Anthropometrics



By taking into consideration the anthropometrics of the average child/teenager heads, the final retractable helmet was ergonomically designed in an attempt to ensure a near-to-exact fit. This was successfully achieved, with the exception of some slight errors that prevented perfect symmetry across the helmet shells. This causes a few comfortability disturbances to some heads when trialled by various people from the target market. Nevertheless, it can be proven that the shape of the final helmet compliments the ergonomic structure and anthropometrics of some heads of young teenagers within the target market age-bracket. Further improvement, design and development of different sizes, and appropriate measuring tools and techniques in the industry are possible if the product is mass-produced to the market.

Retractable Helmet – Aesthetic Aspects

Colour and Pattern



The final helmet is made up of red, black and white colours. After testing the different combinations (refer to page 44), the selection of a neutral colour palette, with the exception of the vibrant choice of red to provide a wow-factor, has contributed to both the originality of the design and its aesthetic appeal. The bumpy pattern and rough texture of the helmet shells shows attention to detail and provides an interesting feel instead of an ordinary smooth finish. Thus, the unique colour palette, pattern and texture to the final helmet has been successful in setting the product apart from the rest; increasing its degree of difference and overall success in the broader market.

Decals



Decals were applied to both the helmet's shell and the product's packaging box. These included decals of flames which were designed using Adobe Illustrator and applied to either side of one of the helmet's shells. However, due to complexity and a lack of appropriate equipment, decals of the brand's logo could not be printed nor applied to the retractable helmet. Despite this, attempts in fulfilling this criterion has led me to engrave the logo on the surface of one of the helmet's shell, as well as hand-paint it to add a colourful visual effect equivalent to that of a decal. Moreover, stickers featuring highly important information, such as a list of the package's contents, and choking hazard warnings, have been added as an extension from its initial criterion and thus, proved to be vital for the safety of the individual.

Brand Identity – Functional Aspects

Brand Name



The final brand name, ARMA-PROTECT chosen from a variety of names and ideas generated is successful in clearly conveying the purpose of the product. By deciding to include part of the word “armadillo” in the product's brand name, it can clearly convey what the product includes – a retractable feature. Moreover, by including the word “protect” the brand name successfully conveys what the product is – a protective gear. Due to its simplicity, the brand name can be recognised by the target market and guarantee continued success of the brand and products.

Ethical Issues



By following ethical considerations, all the information contained in this MDP portfolio was ethically researched by gathering secondary data from ethically trusted websites, books and industry specialists that is suitable for the target audience. Moreover, to ensure no issues involving ethics are experienced regarding plagiarism and copyright infringement, a Bibliography and Appendix have been constructed, where reference and acknowledgement of outside sources have been clearly identified. Patents, trademark and copyright were also considered and researched in commercial and industrial settings to ensure the ownership of the innovation and prevent theft of intellectual property.

Packaging



By deciding to purchase the product's packaging box by an affordable price instead of self-constructing it, I was able to save a significant amount of time and money which were invested in other more critical aspects of the MDP. Moreover, including protective accessories such as bubble wrap and plastic pouches will ensure the safety of the box's contents.