

# DELIVERABLE II: NEEDS ASSESSMENT

## EML4550C – Senior Design Fall 2015

TEAM 17 - “DOG GROOMING TOOL”

**ETG**  
**ENGINEERING TO GO**



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Submitted To: Dr. Nikhil Gupta

Authors: Jordan Chupp, Roy Mason, Justin Proctor, Dennis Pugh

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## **Abstract**

This is the design report deliverable for the needs assessment of the Dog Grooming Tool project. In this needs assessment report Team 17 introduces what the Dog Grooming Project is pertaining to. Included is also the overall objective of the project concerning the problem and task presented to the team, and the solution that they have been tasked to find. This report also gives a background to the issues with grooming dogs that have matted hair, as well as a summary of research that has been done for current dog grooming products, and any mechanisms that implements similar features to the design ideas of Team 17. The need and goal statements of this project are included in this report, along with objectives voiced by the sponsor and the team as a whole. The initial design constraints were established by the team and are provided, as well as insight to the planned methods that will be implemented to result in a successful design process. The report concludes with a schedule of the completed and future deliverable reports to be submitted by the team, and a conclusion restating the grooming issue and the desired outcomes Team 17 intends to achieve with its design. Going forward, the next steps will be to establish technical specifications of the design, develop a list of plans to progress the development of the design, and lastly, create a schedule to keep the design process organized and timely.

# 1. Introduction

Team 17 has been selected to provide a solution for the unpleasant grooming experiences of dogs and their caregivers, through the design and construction of a tool, which will allow a dog's coat hairs to be detangled and ordered using a process that is non-stressing for the groomer, and pleasant for the dog.

So far in the initially stages of this design project, Team 17 knows and understands that the texture and characteristics of the coat of a dog vary with size and breed. Most dogs require some form of coat and hair maintenance by means of washing, shaving and brushing. One grooming issue that is encountered from the dog caregiver standpoint is that dog coat hairs can get tangled and matted together. It is also understood that matting and tangling of a dog's coat causes brushing and timely maintenance of the dog's hair to be unpleasant for both caregiver and dog. Team 17 has also taken the time to determine the voice of the sponsor. The team has learned and acknowledged the project sponsor's vision behind the solution to this specific dog grooming issue, as well as his long and short term goals and objectives.

Going forward Team 17 will be determining a number of key elements that are essential to having a successful conceptual design and prototype solution. The team will gather voice of the customer, as well as the constraints, and any possible limiting factors that could interfere with or restrict the design process. The voice of the customer will reveal who the target market is, as well as tell what engineering characteristics are needed in this solution, and how they should be prioritized. Team 17 will use the voice of the customer along with the voice of the sponsor to find a balance between meeting the needs and expectations of both sides. Determining the technical constraints and design limiting factors of this project will provide Team 17 with an understanding of the working budget, time scheduling for deadlines, and the type and amount of materials that can be employed. The most important criteria that Team 17 must determine going forward, is in what manner will the grooming tool solution function. As in, what type of operational input will it require from the user and what mechanically operational output will it involve.

## 2. Project Definition

### 2.1. Background Research

After some rigorous researching there are many types of dog grooming tools that are on the market today. For example, there are double-sided dog brushes, which have different types of bristles on each side. There are also dog brushes, which utilize a vacuum pump that sucks up the hair as the groomer brushes the dog. Of all of these different types of dog grooming brushes the most popular type of dog hair detangle that is on the market today is called the FURminator, seen below in Figure 1, which is said to reduce shedding by up to 90%. This tool is widely popular by dog owners and groomers and has established a reputation of being the best solution to any dog coat hair issues



*Figure 1: The FURminator*

Of all of the dog hair grooming brushes that have been researched, none have the specification of the brush that Team 17 is planning to design and produce. Team 17's dog grooming tool solution will look to incorporate some rotary brush head feature, and although this type of tool is found in the human hair grooming market, it has yet to be implemented in the dog grooming market. There are many types of rotary style brushes in the human hair market. For example one of the top rotating brushes on the market is the Infiniti Pro by Conair. This is a multidirectional brush, which uses a motor in order to spin the brush head.

There are a number of things that Team 17 is trying to do that is quite different than any of the current rotational brushes in the market. For example, Team 17 is trying to create a brush that has removable rotating heads in order to groom dogs with different types of hair, whether that be long, short, thick, or thin. The different rotating heads will also have different types of bristles, which can help detangle a wide variety of different dog hair, may it be lightly matted to extremely matted hair.

When coming up with this design there were some opposing ideas that we discussed with each other. One of the ideas was that, with this type of brush will dogs with longer hair run the risk of the brush head itself getting twisted and tangled in the hair? We wouldn't want to potentially hurt a dog because the brush got stuck while it was being groomed causing the very issue that the brush is meant to solve.

## 2.2. Needs Statement

For this project we have two sponsors, Todd Hopwood and William M. Billbow. The problem is that dogs with fine hair experience matting and tangling in their coats. This matting makes it tough to groom the dog when trying to complete small tasks, such as brushing a dog's hair. This problem is seen in many different types of dogs with different hair lengths.

**“De-matting a dog's hair can be an unpleasant experience for both the dog and the groomer, especially if the matting has advanced and is deep in the hair or fur. To de-matt or de-tangle, it can be very time consuming and uncomfortable, if not painful.”**

## 2.3. Goal Statement and Objectives

**“Design and develop a grooming tool that untangles matted hair.”**

The objectives of this project are:

- Design a hand held dog grooming tool for use by consumers, groomers, and dog rescues.
- Successfully untangle hair without harming animal
- Develop a hand-held rotary pet groomer that provides for a stress-free experience for both the dog (or other animal) and the groomer

## **2.4. Constraints**

The constraints of this project are:

- The tool must be hand-held and ergonomically friendly
- The tool must have a low RPM to keep quiet
- The tool must be easy to clean and sterilize
- The battery should last 2 hours at 50% duty cycle
- The total weight must be at 1 pound or under

## 2.5. House of Quality

(+) – Positive Correlation  
 (-) – Negative Correlation

◇ - Strong Interrelationship  
 □ - Medium Interrelationship  
 ○ - Weak Interrelationship

Rankings are on a scale of 5 to 1 with 5 being the most important

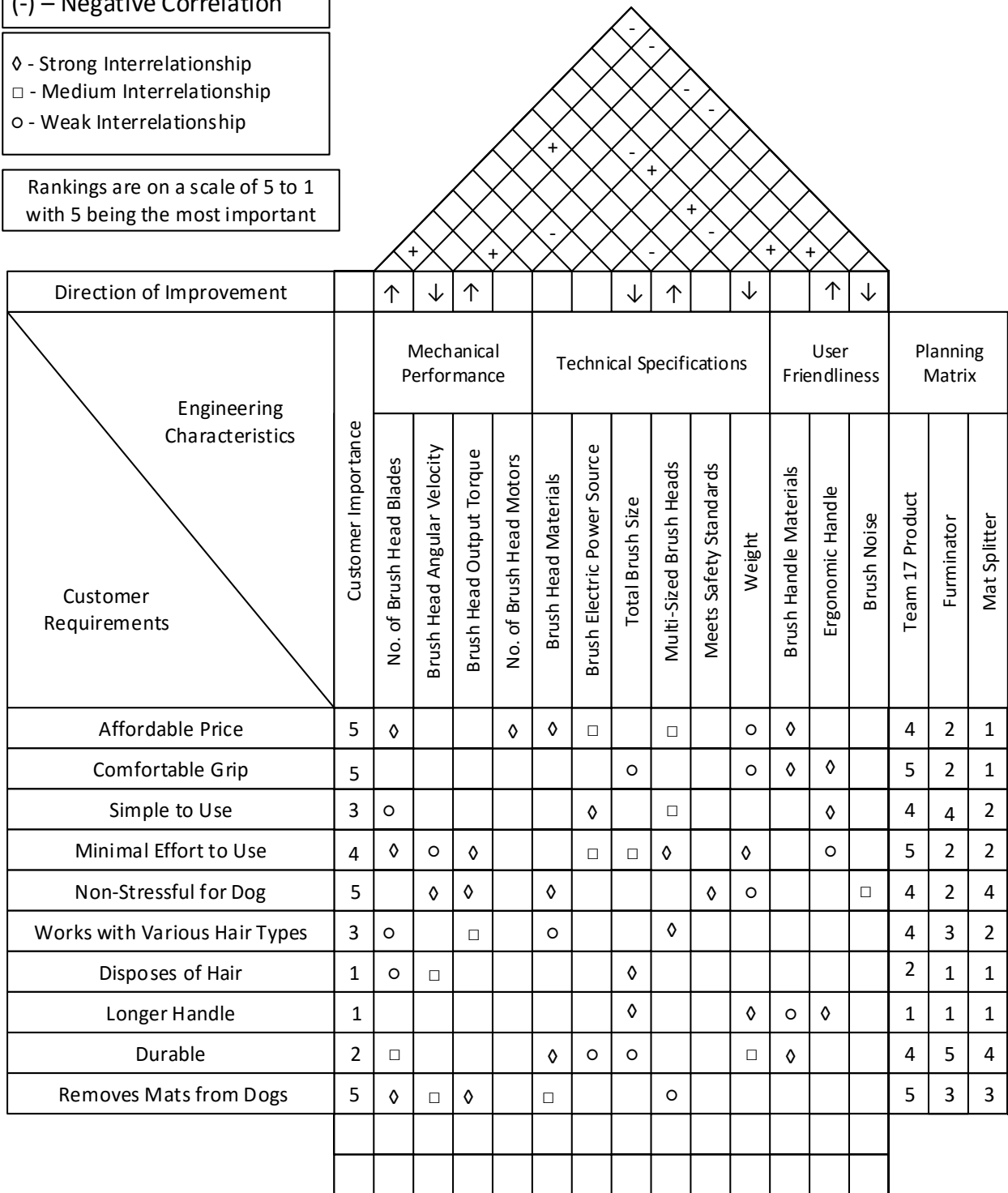


Figure 2: House of Quality



Figure 2 shown above is the House of Quality for Team 17. This diagram was constructed based on results from surveys and questionnaires that were conducted in order to define the voice of the customer. The house of quality was used to form relationships between the desires of the target market and engineering characteristics of the dog grooming tool. The engineering characteristics are grouped under the categories of the tool's mechanical performance, technical specifications, and the user friendliness. All the categories except for the user friendliness are quantitative categories, which require the application of mathematical calculations and engineering principles. The user friendliness is a qualitative measurement and will be in direct relation to the voice of the customer. The roof matrix interrelates the engineering characteristics with each other define those that have strong, medium, and weak correlations. Finally the customer importance ranks the customer requirements on a 1-5 scale, with 5 being most important and 1 being the least. The planning matrix is similar to the customer importance as it likewise ranks the importance of the same customer requirements for team 17 and the designs of the leading competing devices

## **2.6. Methodology**

Throughout the upcoming year, the Team 17 plans to take this project from initial concept all the way to prototype and production phases. The design team plans to accomplish this by following set objectives as closely as possible, and adapting to any setbacks that may arise. The first steps in this process involve gaining an insight into the wants and needs of the consumer. Surveys will be performed on potential customers with questions that will help the team understand what engineering characteristics to focus on when design begins. By obtaining the 'voice of the consumer', the team will better understand what features and characteristics are important to potential buyers. After determining what engineering characteristics will be included in the product, the design phase will begin as the team begins to draft the chosen concept based on the information found from consumers. The tentative goal is to have a final prototype by the end of the fall semester.

## **2.7. Schedule**

A tentative schedule will be included after dates are confirmed. The schedule of our reports can be seen below in Table 1. So far the team has submitted the Code of Conduct and is currently prepping to submit the Needs Assessment Report. Next Team 17 will begin to construct the schedule using the Gantt Chart as well as establishing the plans and product specifications deliverable which is due October 9, 2015.

## **3. Conclusion**

Grooming a severely matted animal can be a long, stressful, and tiring process. This goal of this project is to make the grooming process much more enjoyable for both the pet and groomer. The team plans to examine the current methods used for grooming in order to develop an ideal product for future use. Potential consumers will also be questioned to determine what characteristics make up the ideal pet-grooming tool. Future plans include project timeline, workload delegation, website development, concept generation, modeling ideation, and collaborative analysis.

## 4. References

- <sup>i</sup> *Furminator Deshedding Tool for Medium Dogs*. n.d. September 2015. <<http://www.petco.com/product/112965/FURminator-deShedding-Tool-for-Medium-Dogs.aspx>>.
- <sup>ii</sup> <http://www.furminator.com/>. 2015.
- <sup>iii</sup> *Infiniti Conair Spin Styler* . September 2015. <[http://www.amazon.com/Infiniti-Conair-Spin-Styler-2-Inch/dp/B004INUWX0/ref=zg\\_bs\\_11058221\\_1](http://www.amazon.com/Infiniti-Conair-Spin-Styler-2-Inch/dp/B004INUWX0/ref=zg_bs_11058221_1)>.