**GNG2101 Project Deliverable B**

**Universal Mask Fitting**

Client Needs, problem and metrics

Submitted by

GNG 2101-D01, D2

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**Abstract**

This report outlines the needs, problem statement and metrics determined in the client meeting with Mark Templeton on January 19th , 2021 regarding the “Universal Mask Fitting” project. This paper has two the purposes, first of introducing the project and outlining the client's needs. Second, it will develop a problem statement and metrics which are crucial in creating the product.

There are many wants for the product however they were ranked by importance as follows, the product increases viability for mask and glasses wearers and is comfortable, the product is washable/disposable, is affordable, encourages proper wearing of masks and is compatible with all mask types, is easy to use and is appealing to the eyes.

The problem statement was identified to be to create a product to reduce moisture inside glasses and increase peoples’ visibility and improve the overall fit of a cloth or paper mask. This statement was developed from the client's needs and the rankings of their importance.

Matrics were determined based on the client needs. The metrics outlined are comfort, adjustability, level of visibility, safety to style ratio, cost, weight, compatibility washability and versatility. For each metric a scale was determined, an importance and an ideal and reasonable value were set as target specifications.

Benchmarking was also done to determine what products already existed and whether they fit with the client's needs and wants. This report explored three products, foam sealing, plastic moldable nose mask shields, nose plugs and a mask clip.

The findings of this report are that the client wishes to have a product developed that is comfortable and reduces the amount of fogging when wearing a mask with glasses. This was developed from the needs and wants and allowed for metrics and target specifications to be found.

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1. **Introduction**

The team was tasked with the “Universal Mask Fitting” project by the client Mark Templeton. This project was centered on aiding glasses wearers, with a focus on the more dependent demographic, to navigate during the time of the pandemic. This problem is a result of the issue of “fogging” occurring on glasses when wearing a mask, this causes reduced visibility. He said that it is difficult to read labels without removing glasses or masks in stores which increases anxiety and stress of all people in the area. He also raised the point of when driving others while wearing a mask and glasses, where the fogging creates a severe safety issue. After trying many home-made (DIY) solutions he decided that a new solution was the best hope in resolving this newly developed problem during the pandemic.

Determining the problem statement and metrics is a crucial component in developing a solution to satisfy the client. Following the steps of determining the clients needs and wants, finding the problem statement, outlining metrics, benchmarking and choosing target specifications ensures that the product to be developed will be practical, obtainable and can yield good solutions.

1. **Client Needs and Wants**

Identifying the client's needs and wants are crucial in the development process. This will allow the problem to be determined and allow an opportunity for the team members to empathize with the situation. The client statements and needs were determined in the client meeting on Tuesday January 19th, 2021.

**2.1 Direct Client Statements**

Information shared in the first client meeting about what the client is looking for has been summarized below:

* Prevents fogging for those who wear glasses
* Makes sure people who wear glasses do not have to choose between wearing their mask properly and their vison
* Adaptable to all face shapes and sizes
* Easy to use
* Easy to wash (if re-usable)
* Comfortable for the user, therefore, can be worn for longer periods of time
* Aesthetically pleasing to encourage all demographics wear it
* Can be used with any type of mask the user may have
* Does not affect the safety of the mask

The client focused mostly on the need of supplying comfort and increased visibility for mask and glasses wearers. Secondly, he focused on the comfort of the product encouraging people to wear masks properly and having the solution be compatible with all mask types. The product being washable or disposable and affordable were also of the same priority. Thirdly, the product had to be easy to use. Finally, the client stated that he would prefer the solution be appealing to the eye to increase the chances of people wanting to wear it.

**2.2 Translated Client Need and Want Statements**

Based off the client statements collected in the client meeting, the team has come up with a formal list of needs and wants along with the importance of each one. The importance of each need/want was selected according to the prioritization of the client.

**Table 1**: Needs and Want Statements and importance Rankings

|  |  |  |
| --- | --- | --- |
| Need/Want # | Need/Want | Importance |
| 1 | The product increase visibility for people wearing glasses and masks. | 1 |
| 2 | The product reduces anxiety of people when they are out in public (due to proper mask wearing). | 3 |
| 3 | The product encourages people to wear their masks properly. | 2 |
| 4 | The product is comfortable. | 1 |
| 5 | The product is washable or disposable. | 2 |
| 6 | The product is affordable. | 2 |
| 7 | The product is appealing to the eye as to encourage wearing. | 4 |
| 8 | The product is easy to use. | 3 |
| 9 | The product compatible with all masks (paper and cloth). | 2 |

The needs were ranked by importance to ensure that the needs most wanted by the client were the focus in developing the product.

1. **Problem Statement**

The problem statement expressed by the client and tailored to the situation by identifying his needs was determined to be as follows:

To create a product to reduce moisture inside glasses and increase peoples’ visibility and improve the overall fit of a cloth or paper mask.

1. **Metrics**

Metrics express the client’s needs in the form of measurable attributes.

**Table 2:** Metrics, Units and Importance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Metric # | Need # | Metric Name | Importance | Unit |
| 1 | 2,3,4 | Comfort of product on face | 1 | Qualitative, scale of 1-5 (5 being most comfortable) |
| 2 | 2,3 | Adjustability to all face sizes | 2 | Qualitative, scale of 1-5 (5 being able to fit all face sizes) |
| 3 | 1,2 | Level of visibility | 1 | Qualitative, scale of 1-5 (5 being no fog) |
| 4 | 7 | Safety to style ratio | 4 | Qualitative, ratio scale of 1-5 (5 being best and 1 being worst) |
| 5 | 6 | Cost | 2 | Dollars |
| 6 | 2,3,4 | Weight | 3 | Grams |
| 7 | 5 | Washability | 3 | Qualitative, scale of 1-5 (5 being able to wash with soap and water, 1 being unable to wash) |
| 8 | 9 | Compatible with all mask types | 3 | Binary |

Quantifiable metrics are used to make sure all client needs are met adequately. The metrics put in place will help the team meet technical goals, this allows the team to easily see what needs are being satisfied and which are not. The metrics will also be used to benchmark other products that are similar.

1. **Benchmarking**

The client has been attempting to seal off parts of the mask that are not flush with their face to limit the moisture that accumulates on their glasses. Solutions the client has attempted included taping the top of the mask shut with band-aids and tape, as well as some foam sealing above the nose. However, these temporary solutions did not yield good enough results. Some competitors have created small plastic nose pieces, or larger more expensive masks which seal off the face from the environment completely.

* 1. **Similar products on the market**

Some potential solutions to the client's problem were found during research. However, these solutions do not perfectly fit the client's needs and would require adaptations and improvements.

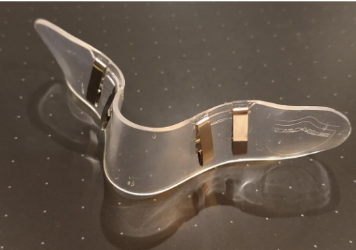
* + 1. **Foam Sealing**  
         
       The foam sealing is inserted in between the nose and the mask in attempts to reduce the amount of fogging.



**Figure 1:** Foam sealing, [1]

Foam sealing can keep some fog from forming on glasses, however the foam may be uncomfortable and may cause allergic reactions or rashes. On the other hand, if no rashes or allergies occur the foam is soft and provides comfort.

* + 1. **Plastic Moldable Nose Mask Sheild**  
         
       The plastic moldable nose mask shield sits in between the mask and wearers nose. It is attached to the mask using small aluminum clips.

  
**Figure 2:** Plastic moldable nose mask shield, [3]

The plastic moldable nose mask shield prevents glasses from fogging; however, they do not quite fit or adhere to every face and could be improved. They are also not very eye appealing.

* + 1. **Nose Plug**

The nose plug is made of plastic, like that or a sporting (synchronized swimming) nose plug and sits on the outside of the mask.

  
**Figure 3:** Nose Plug, [4]

As demonstrated in the figure above the nose plug is effective at reducing the amount of fogging in glasses, although it is unappealing to look at and may cause difficulties in breathing (nostrils may be obstructed). The nose clip may also not fit all nose types and may fall off and be easily misplaced.

* + 1. **Mask Clip**

The mask clip is a plastic (potentially 3D printed) clip that sits on the inside of the mask (on the nose) and attaches with clips to the outside (as seen above).

  
**Figure 4:** Mask clip, [2]

The mask clip reduces fogging with an average effectivity; however, the rigid structure does not allow for much versatility when it comes to different face shapes.

1. **Target Specifications**

The team has been tasked with creating a product that will be used by the public as a result an elevated level of quality will be expected. Ideally the product must improve upon current quality of life for individuals in the pandemic situation. As a result, the qualitative measures were deduced by estimating the ideal situation or quality of life. Metrics such as comfort, adjustability, level of visibility and washability are among the most important metrics and will be of utmost importance as they affect the value of the product.

**Table 3:** List of metrics and target specifications

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Metric #** | **Need #** | **Metric Name** | **Importance** | **Unit** | **Acceptable Value** | **Ideal Value** |
| 1 | 2,3,4 | Comfort of product on face | 1 | Qualitative, scale of 1-5 (5 being most comfortable) | 4 | 5 |
| 2 | 2,3 | Adjustability to all face sizes | 2 | Qualitative, scale of 1-5 (5 being able to fit all face sizes) | 3 | 5 |
| 3 | 1,2 | Level of visibility | 1 | Qualitative, scale of 1-5 (5 being no fog) | 4 | 5 |
| 4 | 7 | Safety to style ratio | 4 | Qualitative, ratio scale of 1-5 (5 being best and 1 being worst) | 4/1 | 4/3 |
| 5 | 6 | Cost | 2 | Dollars | <$15 | <$10 |
| 6 | 2,3,4 | Weight | 3 | Grams | <8g | <5g |
| 7 | 5 | Washability | 3 | Qualitative, scale of 1-5 (5 being able to wash with soap and water, 1 being unable to wash) | 3 | 5 |
| 8 | 9 | Compatible with all mask types | 3 | Binary | yes | yes |

An acceptable qualitative value for these metrics is therefore between levels 3 and 4 while an ideal value would be of level 5 as indicated in Table 3. Furthermore, the client explained that he wished to deliver to the public a product that is very safe and protective yet still stylish enough that people would wear the product daily. We therefore associated an ideal safety to style ratio as 4/3 while an acceptable safety to style ratio would be 4/1. Cost and weight were asked to be minimalized by the client. He expressed that this product could be either a low cost and disposable product or a reusable and washable product that could be at a slightly higher price point. To ensure the purchase of this product by the public, an acceptable retail price was set at $15 while an ideal price would be less than $10. As the product will be worn on a user's face it is necessary that the product weigh as little as possible. Our target will be to make the product less than 8g and preferably around 5g. Finally, it is essential that this product can fit on any mask to maximize potential buyers and to provide an improved quality of life to all product users.

1. **Reflection and Recommendations**

The first meeting with client gives the team and the client an opportunity to get acquainted with each other and lays the foundation for the rest of the professional relationship. In this first meeting the team was able to fully get an understanding of what the client is looking for and why. During the client meeting two members took notes in order to organize the information provided by the client for later use. This gave the group a chance to empathize with the client and understand their point of view. If the challenges that the client would like fixed are well understood, the team will be able to produce a solution with fully realized potential.

1. **Conclusion**

This deliverable focused on the first client meeting where the team empathized with the client in order to understand their needs. The client shared that when people wear a mask with their glasses, the fogging created by the air in the mask can become a safety hazard due to the visual impairment. In order to solve this problem, the amount of warm air coming up from the mask to the glasses must be. After the needs were identified they were prioritized in order to emphasize what the client’s most pressing issues are. The prioritized list of needs was then translated into a list of metrics which allows the team to keep track of how well each of the needs are being met. In order to understand what other products are comparable and already available, the metrics are used to benchmark existing products. Four products were used in this report that claim to prevent the fogging of glasses when wearing a mask. By looking at what is successful and what is not in the benchmarked products, the team is able to apply these ideas to possible solutions. The table of target specifications gives a good idea of what the values for the metrics should resemble. The target specs give the team a sense of sense of what is ideal for the product.

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1. **APPENDICES**

**APPENDIX I: Client meeting notes**

