

Deliverable B - Needs Identification and Problem Statement

GNG 1103D

Group #9

January 31, 2021

JAMZ is a drone delivery service that focuses on contactless and automated food delivery in the underdeveloped rural sector. JAMZ was founded in 2020 and is currently based in Ottawa, Ontario. On their LinkedIn page, the company states “JAMZ delivery always [aims] to provide contactless, fast, safe, green, convenient, and accessible deliveries to rural areas.” The first client meeting provided plenty of information about the client’s needs and the importance of the various aspects of the drone. In order to meet JAMZ’s needs, we must create a sensor that is safe, secure and capable of providing reliable data consistently in real time. Prior to writing the deliverable, our group assessed what had been discussed by the client, categorized and ranked this information in order to meet these requirements in an efficient manner.

Using the information we had been provided, our group came to the decision that drone safety had to be a top priority. JAMZ had expressed that the drone could not fall or hit anyone and/or anything and thus needed an emergency beacon to alert pedestrians. Also, the drone should avoid heavily populated areas whenever possible and must have an emergency stop if a malfunction has occurred. If a drone has crashed or made an emergency landing, the operator must be informed immediately via sensor. Furthermore, the emergency must be capable of informing pedestrians that an operator is on the way and to not touch or manipulate the drone. Additionally, pedestrians must be able to contact JAMZ if they spot a drone that is down but this information must be communicated to pedestrians without them needing to approach the drone (to ensure their safety).

In addition to safety concerns, the JAMZ team emphasized the need for consistent data throughout the flight. To satisfy this need, the drone must be capable of providing constant real-time data to the operator in a fashion that is easy to evaluate.

A key point after consistent data is the reliability of information, so the data produced by the drone—such as the speed, location, altitude, weather, battery life and any malfunctioning equipment—must be both precise and accurate. On a review for the FrSky Variometer Sensor Vario-High Precision for RC Drone FPV Racing—a sensor that measures altitude—many users were disappointed with the accuracy of the product. One user wrote, “[Z]eroed out before start, but says 8ft on the same spot

after landing. [D]on't know if I can trust the height it tells me either.¹”The Seek Thermal Compact Imager for Android—a temperature and imaging sensor— also had similar complaints from users. One user wrote, “Temperatures read about 20C more than it really is, the detail/clarity of anything is not very good to the point that it just is of no use to me².” These quotes express similar concerns from JAMZ about the importance of the reliability of data. For JAMZ specifically, the operator should be able to trust that any information the drone is relaying is reliable.

While there are other client needs to be met, the final requirement is the range of uses of the sensor(s) that will be attached to the drone. One or more sensors of different types will be placed on the drone, such as a sensor that will convey visual feedback to the operator to ensure that the package remains secure throughout the flight. This sensor will also be able to record in-flight visuals and if the drone is stolen, it will record the event so this data can be used later by the proper authorities. The drone will also include temperature sensors so it can better adapt to flight conditions and altitude sensors are required as well. JAMZ operators must be made aware if the drone is flying too low using the altitude sensor. The sensors must operate with six degrees of freedom.

In conclusion, our client meet provided us with many of the client's needs such as safety, security and reliability of data and allowed us to understand the problems they are trying to resolve. By empathizing with the client we were able to recognize some key requirements that must be met by our product. Consequently, our group categorized and ranked the client's needs. To satisfy JAMZ' needs, our group must create a sensor that is capable of providing consistent and reliable data to the operator to ensure the safety and security of the general public.

1

<https://www.banggood.com/FrSky-Variometer-Sensor-Vario-High-Precision-for-RC-Drone-FPV-Racing-reviews-p-930779.html>

2

https://www.amazon.ca/Seek-Thermal-Compact-Imager-Android/dp/B00NYWAHHM/ref=asc_df_B00NYWAHHM/?tag=googleshopc0c-20&linkCode=df0&hvadid=292954378022&hvpos=&hvnetw=g&hvrnd=17928742989805679823&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmld=&hvlocint=&hvlocphy=9000661&hvtargid=pla-365069374693&th=1