## **Chassis**

The following tables and justifications are the basis for the decision making process of selecting a suitable chassis for Roadie.

### **Items Under Consideration**

The following items have been considered for use as a chassis on Roadie. Each item has a unique product ID as well as the vendor and a short description of the product, as depicted in *Table 1*

|  |  |  |  |
| --- | --- | --- | --- |
| Item ID | Item Name | Vendor | Description |
| ROB-12866 | Magician Chassis | Sparkfun |  |
| KIT660 | Build Your First Robot Chassis Kit | Budgetrobotics.com |  |
| 385000034-0 | DG012-Tank | Hobbyking |  |
| Custom | Custom Chassis | N/A |  |

Table 1: Chassis under consideration for Roadie

## **Decision Matrix**

The decision matrix used to select a chassis for Roadie is depicted in Table 2. The decision matrix weighs the. The highlighted row is the chassis selected for use on Roadie.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Factor | Surface Area | Adaptability |  | Availability | Cost | Total |
| Weight |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

Table 2: Decision matrix for chassis

The weighted matrix, or the matrix computed by multiplying the score in each category by its weight is show in Table 3. The total score for each item in the decision matrix (Table 2) is calculated by summing the values for each row in the weighted value matrix.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Factor | Surface Area | Adaptability |  | Availability | Cost |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Table 3: Weighted value matrix. It is comprised of the score for each category multiplied by the weight for the category.

The weightings for the decision matrix were created by using the data in Table 4

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Factor | Surface Area | Adaptability |  | Availability | Cost |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Table 4 Quantitative and qualitative values of the chassiss under consideration that led to the decision matrix.

### **Justifications**

The following section represents the reasoning behind each category and how their weights were determined.

#### **Surface Area**

The surface area of the chassis is how much surface we will have to mount components to Roadie. Since there will be many circuit boards, wires, and other sorts of devices, having an abundance of surface area will be to our advantage. Chassis with a surface area of (**X)** are ranked….

Surface area was given a weight of…

#### **Adaptability**

Adaptability of the chassis pertains to how well the chassis will be able to cope with our design changes. Currently, Roadie is still in the prototyping process. As such, we are not sure how well our system design will function. This means that the chassis of Roadie will need to be able to easily change as our design changes. Chassis that provide the ability to move components around without major modifications received a score of five and a chassis that would essentially require the building or purchase of another received a score of one.

Adaptability was given a weight of…

#### **Ease** **of** **Use**

#### **Availability**

The availability score for each item was obtained by scoring items on hand as a five, and items that need to be purchased as a one.

Availability was given a weight of 10% as it directly relates to the ability to prototype Roadie.

#### **Cost**

The values for cost for the chassis were obtained by giving the most expensive chassis a score of one, and the least expensive chassis a score of five. As there was only one other chassis to consider, and its price was $2 more than the cheapest chassis, a score of 4 was awarded since the price was so close.

Cost was given a weight of 20% as the cost of items are a very important factor in any budget, but not the most important consideration for this item.

<http://www.hobbyking.com/hobbyking/store/__44607__DG012_Tank_SV_Standard_Version_Multi_Chassis_Kit_with_Two_Rubber_Tracks.html>

<http://www.budgetrobotics.com/category/Chassis-Kits-161>

<https://www.sparkfun.com/products/12866>