**GNG1103 Project**

Group A12

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Deliverable E

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Our last deliverable wasn’t completed correctly, and we felt it necessary to clarify what we ended up choosing as our solution. We decided to go with a charging station for Bowie. The basic idea being that it would be primarily made using a durable plastic or metal, with a door that wouldn’t be easily tampered with, so that Bowie could be safely stored overnight.

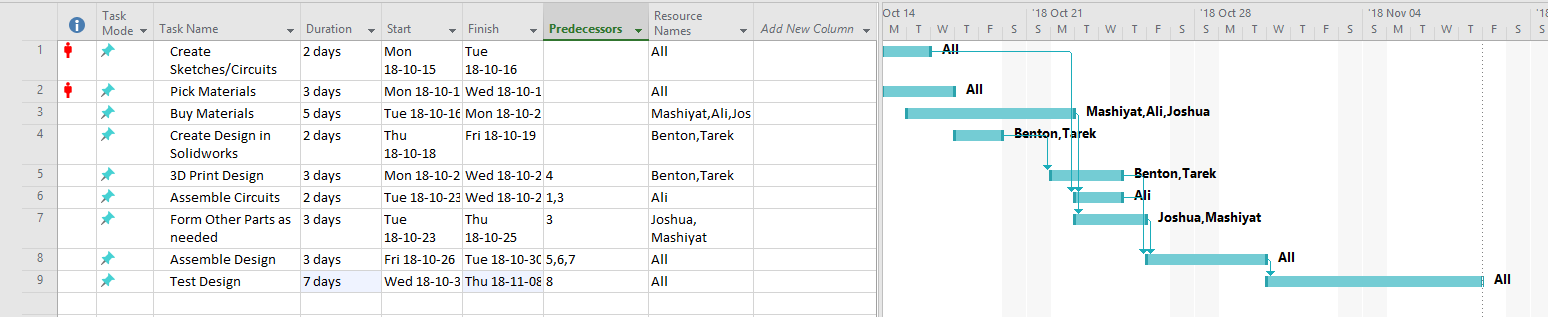
Our design is based off this sketch from our last deliverable. Some changes will have to be made to the design in order for us to stay under budget.



**List of Tasks:**

* Flush out design of station:
  + Pick materials (all; 3 days)
  + Develop circuits for the charging connection and solar panels for the battery within the station (Ali; 2 days)
  + Draw out a more thorough picture of the design
    - Design parts in solidworks as required (Tarek & Benton; 2 days)
    - Ensure every aspect is covered (all members; 1 day)
* Buy/find materials (Mashiyat, Joshua & Ali;5 days)
* Assemble Parts(all members;3 days)
* Test Prototype (all members;7 day)

**Gantt Chart:**

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**Project Risks and Potential Solutions:**

3D Printing

* Not always a perfect object is produced
* May impact quality of final design
* Also very time consuming, so multiple tries may be impossible or difficult to find the time

Material

* Material needs to be resistant to nature (snow, ice, water and UV radiation)
* Material also needs to be durable and tamper-proof
* Rigorous research and testing will be conducted in order to ensure that we find the right material
* Material has to be light as well as strong

Battery

* Needs to be rechargeable by solar panel
* Needs to have high-discharge rate in order to charge Bowie effectively
* Relatively Durable (doesn’t overheat while charging, and won’t be damaged by temperature)
* Needs to be able be able to last long for days with minimal sun
* Battery needs to be guaranteed safe (doesn’t explode)
* Solar panels aren’t cheap
* Finding quality materials that suit our needs might be difficult for our price range
* Budget is small so material quality will take a suffer
* Prototype cannot be built as designed due to lack of financial back up

Power-generation

* Will the electricity provided by the solar panels and/or pelletier modules be sufficient to charge the battery consistently
* What will be the backup source of power when there is no sunlight or heat to generate energy
* Is the amount of energy produced by the solar panel worth the cost.

Tamper Prevention

* How will we stop people from messing with Bowie while he is being stored overnight
* How will we prevent people from causing damage to the charging station itself
* How can we stop Bowie from damaging itself
* How will we prevent Bowie from getting stolen
* How to protect bowie from wildlife attack

**Estimate of Cost:**

|  |  |  |  |
| --- | --- | --- | --- |
| Item/Material | Amount Required(quantity) | Cost per unit ($) | Total Cost($) |
| Solar Panel | 1 | 30 | 30.00 |
| Peltier Modules | 1 | 20 | 20.00 |
| Plastic (Body of House) | 2 m^2 | 5 (m^2) | 10.00 |
| Aluminum (Roof of house) | 0.5 m ^2 | 20 (m^2) | 10.00 |
| Circuit components | 1 | 20 | 20.00 |
| Wiring | 2 m | 5 | 10.00 |
| Battery | 1 | 15 | 15.00 |
| **Total** | --- | --- | 115.00 |

A lot of the items that are listed above will have to be salvaged from other places in order to stay under budget. Our priorities for purchases are the solar panels, peltier modules and the battery, as these components are essential for the primary function of our design. These items would total out to $65.00.