

Concept Generation/Selection

TEAM H

COOPER HOLDEN, FAHD ALASKAR

MOHAMMAD ALENEZI, ABDULAZIZ ALKANDARY

EBRAHEEM ALNAFJAN, ABDALRAHMAN ALREFAEI

March 20 , 2017

Overview

- ▶ Initial design ideas with pros/cons
- ▶ Designs that will be pursued further
- ▶ Customer requirements met by designs
- ▶ Updated schedule
- ▶ Updated budget

Project Description

3

Create a dental triturator that does not require a power source to operate as it will be used in areas where central power is not available. A device that can overcome these challenges is needed in order to help dental students provide improved dental hygiene to those who would not otherwise have access to such.

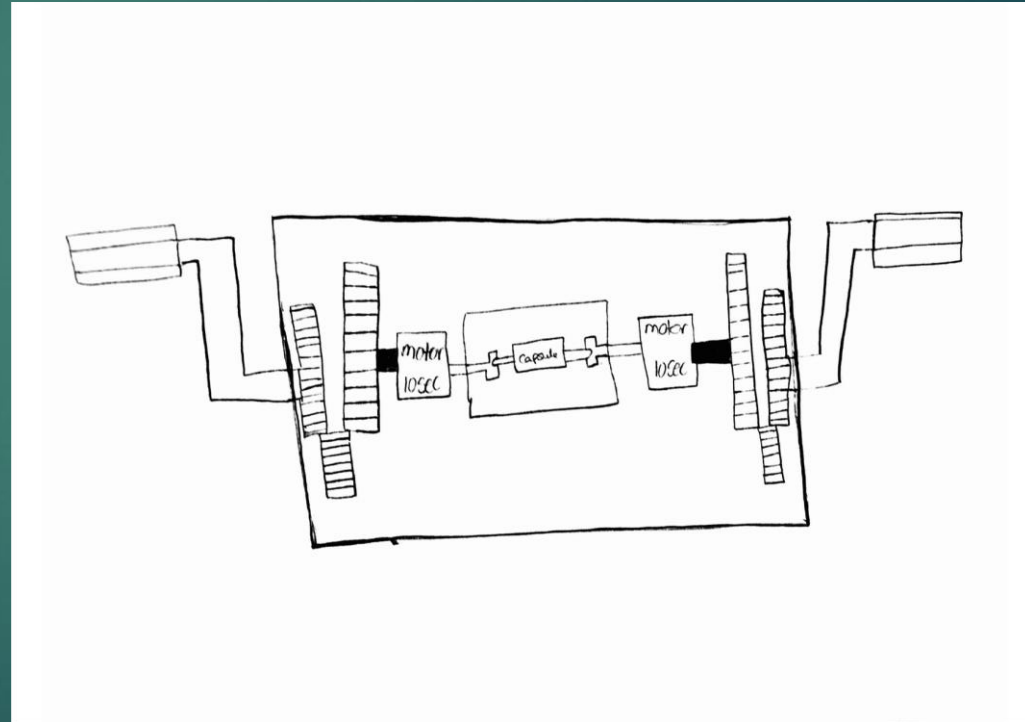
Designs Considered

- ▶ Hand crank + gear box
- ▶ Hand crank + electric motor
- ▶ Compressed air driven piston
- ▶ “Toothbrush” design
- ▶ Rumble motor
- ▶ Spring driven
- ▶ Bicycle driven
- ▶ Jackhammer
- ▶ Fly Wheel

Hand Crank + Gear Box

5

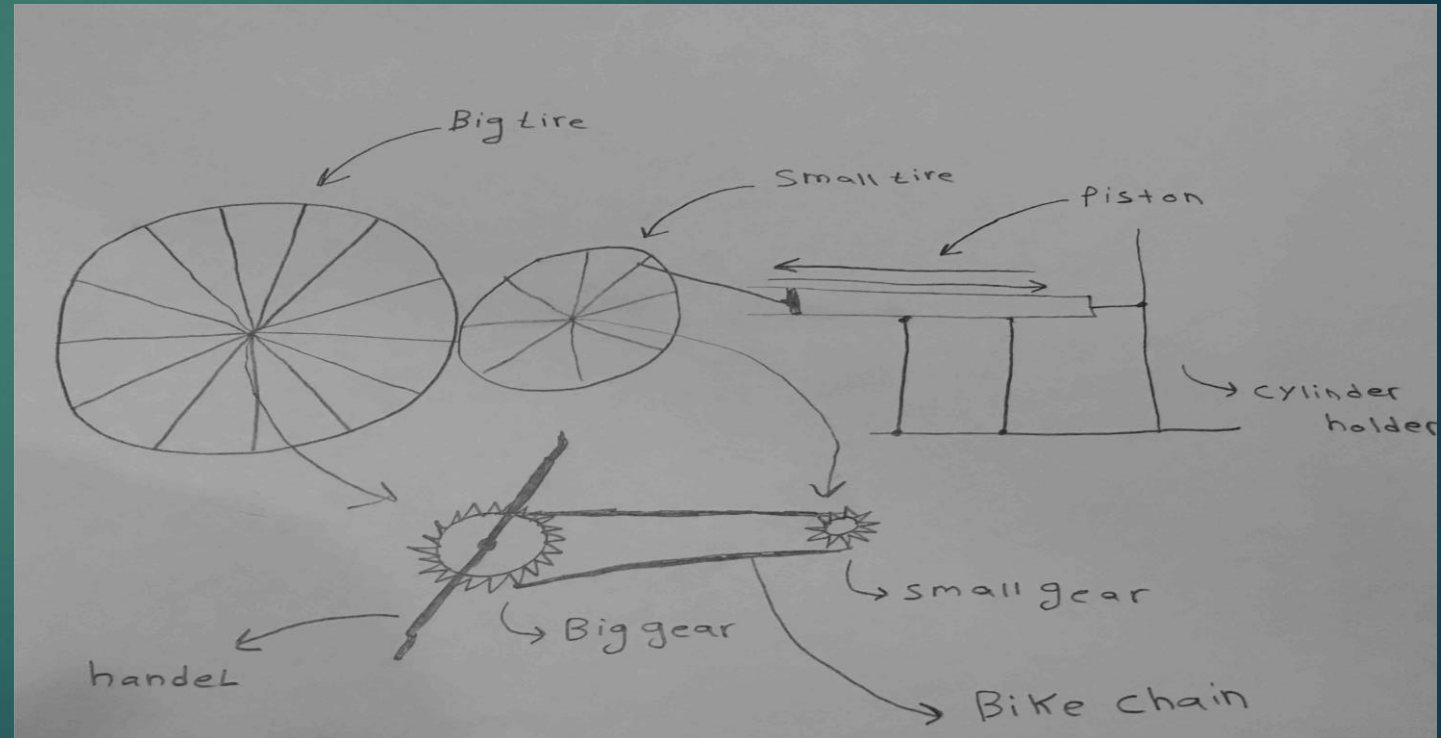
- ▶ Hand crank drives multiplication gear box increasing rpm to required level
- ▶ Requirements met:
 - ▶ Cheap
 - ▶ Easy to use
 - ▶ Human powered
 - ▶ Replaceable parts



Bicycle Driven

6

- ▶ Either a bicycle or arm bike produces power to shake capsule
- ▶ Requirements met:
 - ▶ Easy to use
 - ▶ Human powered
 - ▶ Long life span
 - ▶ Replaceable parts



Fly Wheel

- ▶ A pull chord is used to spin a fly wheel that is attached either a gear box or directly to the capsule, driving the vibration
- ▶ Requirements met:
 - ▶ Easy to use
 - ▶ Cheap
 - ▶ Portable
 - ▶ Lightweight
 - ▶ Replaceable parts
 - ▶ Small



Hand Crank + Electric Motor (Rumble Motor)

- ▶ Hand crank is attached to small generator which directly powers a small electric motor
- ▶ Requirements met:
 - ▶ Easy to use
 - ▶ Small size
 - ▶ Replaceable parts
 - ▶ Shake at constant frequency



Solar Panel

- ▶ A solar panel is used to power any of the electricity-based designs, or to charge a battery for later use
- ▶ Requirements met:
 - ▶ Light weight
 - ▶ Easy to use
 - ▶ Replaceable



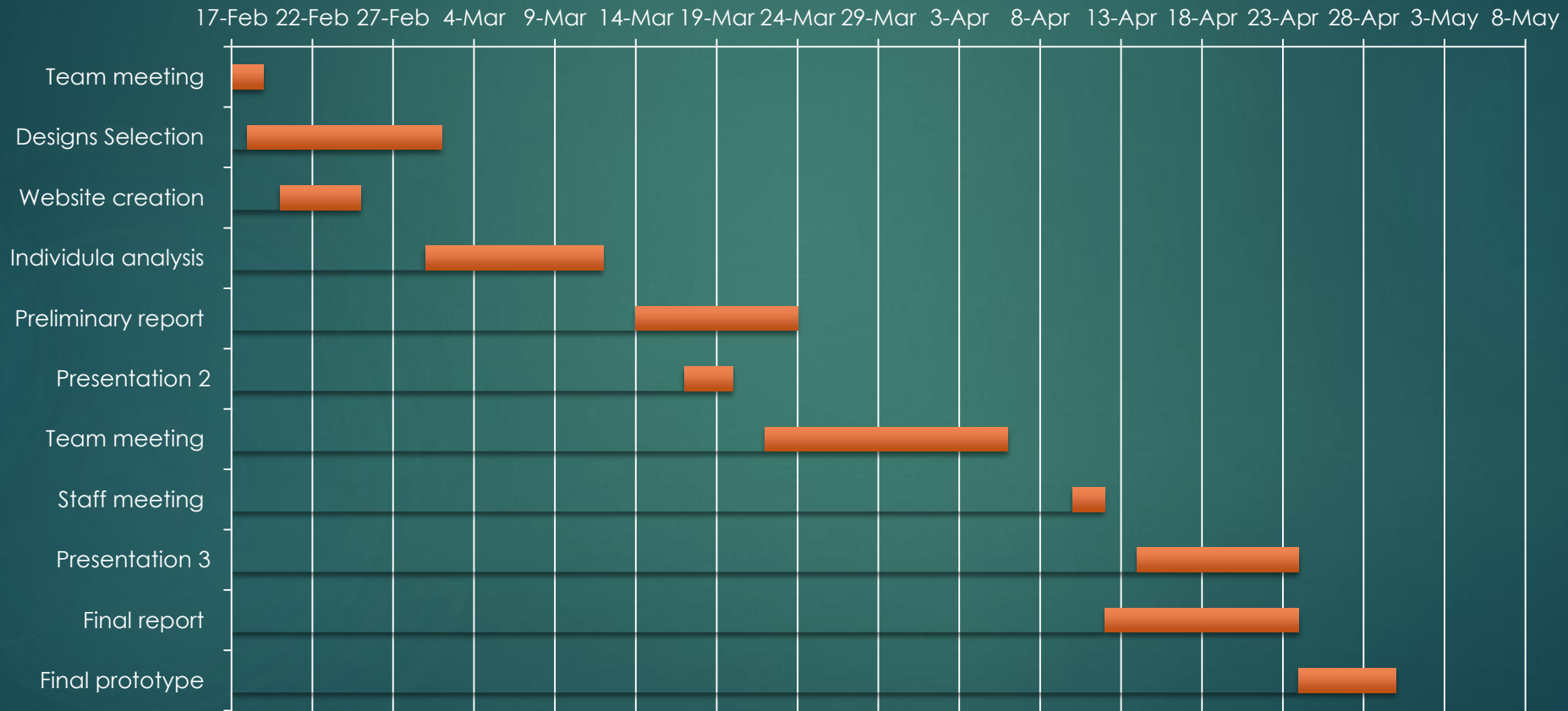
Rechargeable Battery

10

- ▶ In any of the designs where electricity is used, a rechargeable battery can be used to store electricity than can be used multiple times before having to be recharged.
- ▶ Requirements met:
 - ▶ Reliable
 - ▶ Easy to use
 - ▶ Replaceable
 - ▶ Long life span



Updated Schedule



Updated Budget

12

- ▶ Project total budget - \$ 750
- ▶ Final design cost < \$ 400
- ▶ If Solar Panel is used then final design cost > \$ 400
- ▶ Anticipated expenses :
 - ▶ 3D printing
 - ▶ Material cost
 - ▶ Machining cost
- ▶ Actual expenses : \$ 0
- ▶ Resulting Balance : \$ 750

Summary

- ▶ Initial design ideas with pros/cons
- ▶ Designs that will be pursued further
- ▶ Customer requirements met by designs
- ▶ Updated schedule
- ▶ Updated budget

Questions?