

Date: 2 & 3rd March 2020

→ First Meeting

- ↳ Minutes: ≈ 50 mins
 - ↳ Allocated group members
 - ↳ Created Messenger group
 - ↳ Created PDS Document and shared it.
 - ↳ Signed the "Teamwork Protocol" document.
- Next meeting
5/03/2020

- Created a separate document. Wrote up a few ideas for the PDS and in the next meeting, share it with the group and add it to the shared PDS.

Date: 5th March 2020

→ Second Meeting :

- ↳ Minutes ≈ 50 mins
 - ↳ Discussed PDS
 - ↳ Briefly went over Rules
 - ↳ Brought ideas about PDS together and added it to document.
 - ↳ Decided to draw up a Gantt chart to keep track of time.
 - ~~Finish Gantt Chart next meeting~~
- Next meeting
6/03/2020

- Finished up with PDS summarising PDS from bullet points.

Third Meeting : 6th March 2020

- ↳ Meeting min: 40 min
- ↳ Everyone present
- ↳ 2 Submitted PDS
- ↳ Submitted Timeline

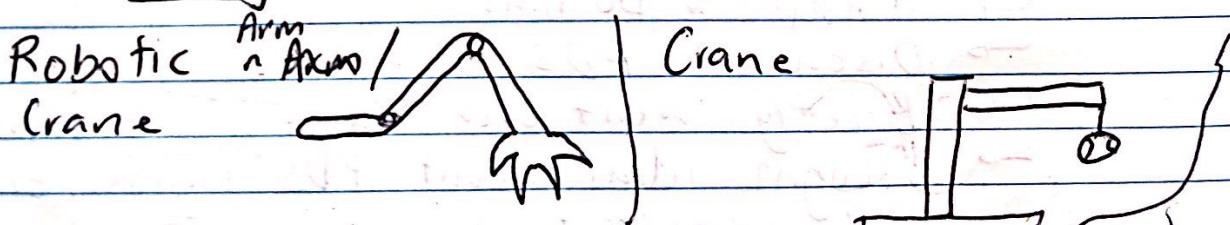
Fourth Meeting : 10 March 2020

- ↳ Meeting min: 55
- ↳ Everyone present
- ↳ Discussed Subproblems
- ↳ Came up with ^{alternative} ideas for sub problems
- ↳ Next meeting: 12/03/2019

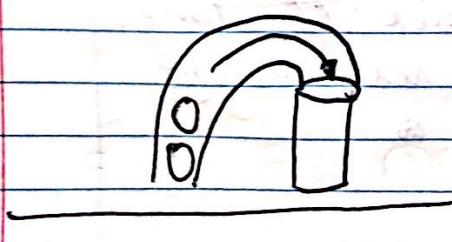
Subproblems:

- Provide Forward Motion ✓
- Provide Power ✓
- Transmit ✓
- Steering
- Depositing payloads ✓
- ~~Stop~~ Initially storing the payloads ✓

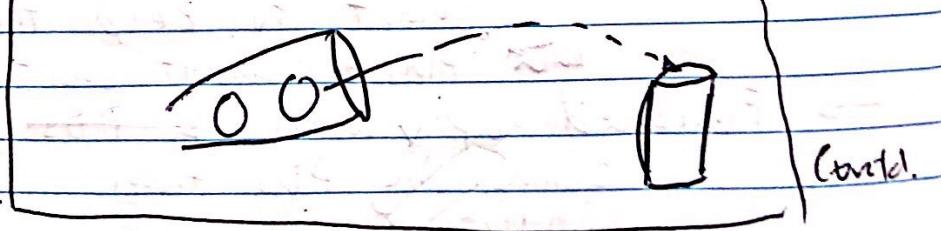
Depositing



Tube

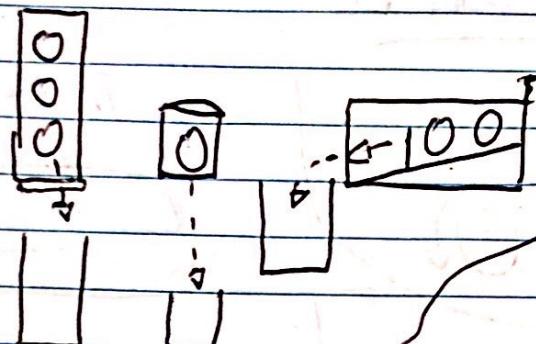


Projectile canon

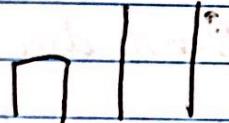
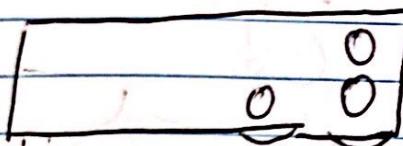


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Containers

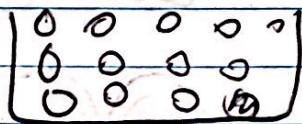


Spring

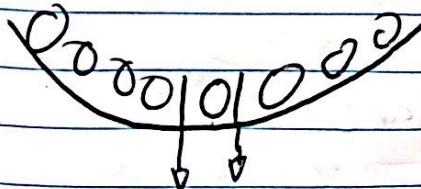


Storage

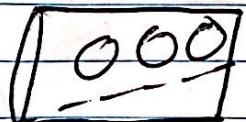
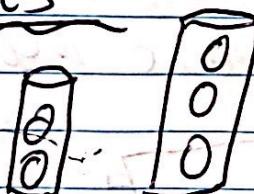
HOPPER



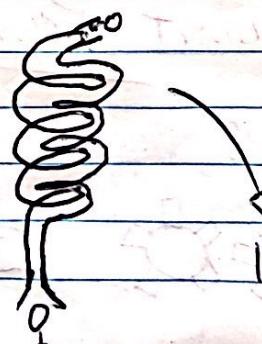
Dispenser



TUBES

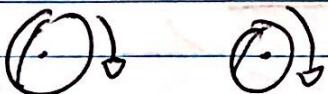


Spiral tube.

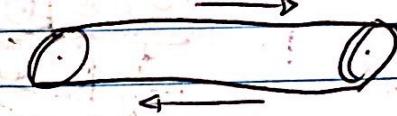


Providing Support

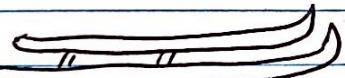
Wheels



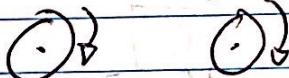
Tracks



Skins



Balloon Tyres



Mecanum Wheels



Omni directional



Power Motors

Electric Motors

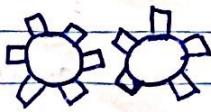


Mechanical

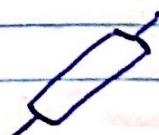


Transmit Power

Gears

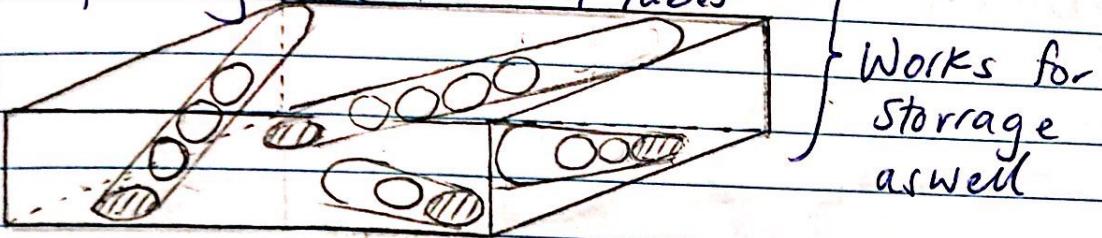


Hydraulic



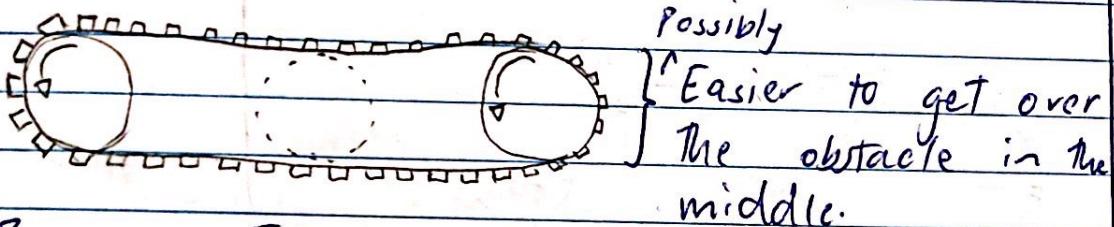
11th March 2020

→ Depositing : Container + Tubes



} Works for
Storage
as well

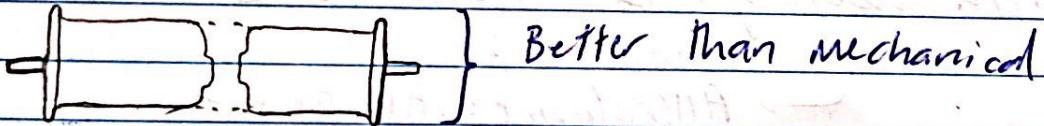
→ Providing support / Forward Motion : Tracks



Possibly

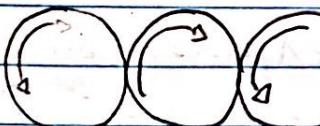
} Easier to get over
The obstacle in the
middle.

→ Power : Electric Motors



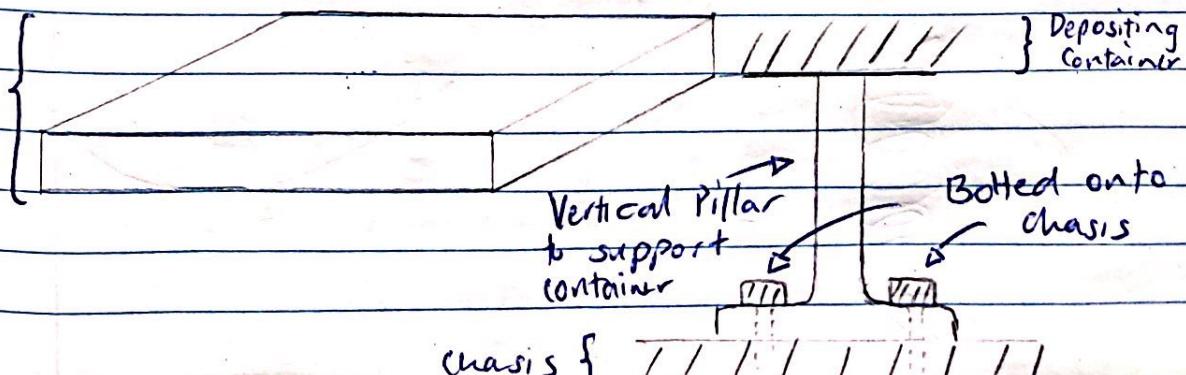
} Better than mechanical

→ Transmission : Gears



} More cost effective than
Hydraulics

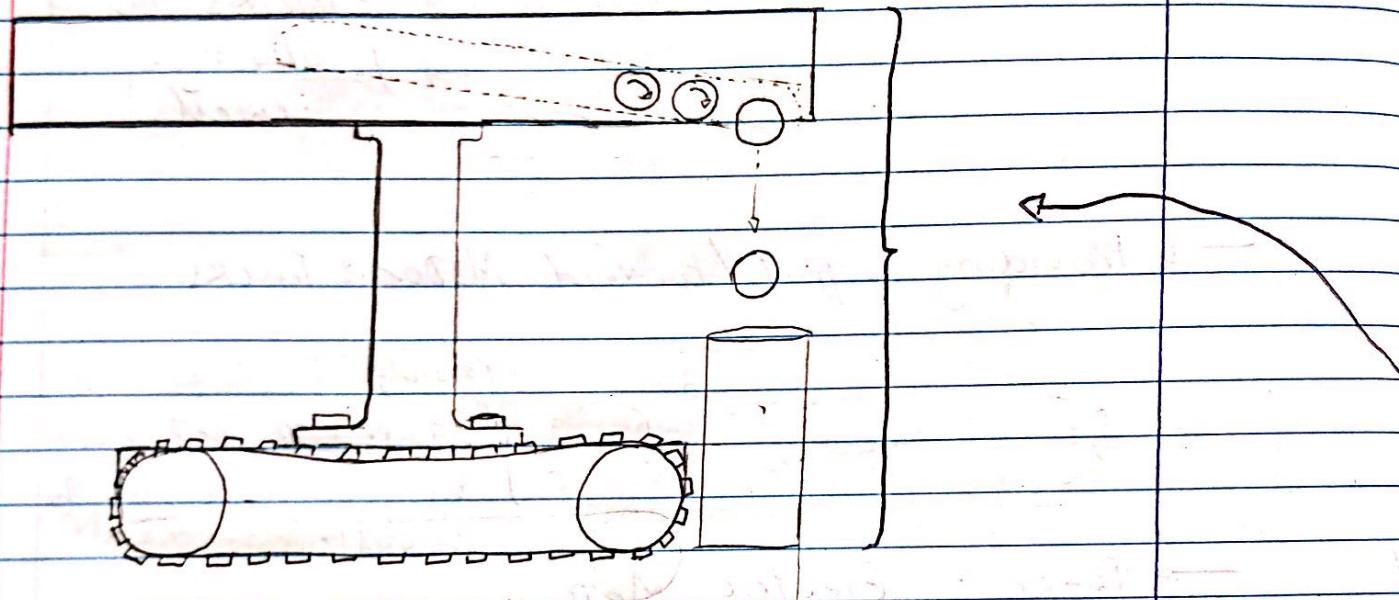
→ Other : Chassis and Connecting pillar



→ Contd.

... Contd.

→ Overall =



Fifth Meeting: 12th March 2020

↳ Minutes:

↳ Attendance: All present

↳ Presented our concept designs

↳ Did the pugh's Model for 93

↳ concepts

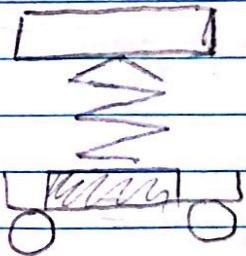
↳ Decided to expand on my concept and start the report over the weekend

Next meeting
17/03/2020

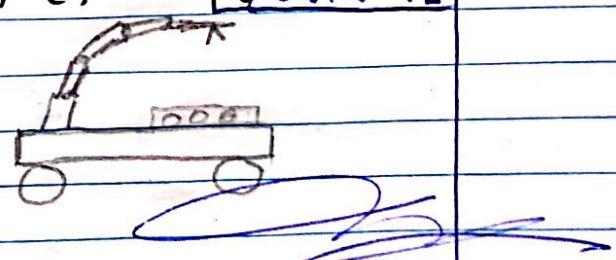
Pugh's Model Base line

	Concept A	Concept B	Concept C
Buildability	Depositing container hard to build N/A	Depositing container hard to build takes quite a few complicated mechanism. -VE	Difficult to programme Robot arm -VE
Cost			
Accuracy	Fixed height * .. Not great. <u>Could make extensible</u> Pillar. N/A	Good Accurate for all found drops.	Very accurate considering the code is done correct +VE
Stability	Only has 1 Pillar. Could & add more. N/A	Scissor Mechanism not stable (centrally) & could make double scissor. -VE	Robot arm could change C.g. OVR: quite stable. +VE
Speed	Tracks would be slower. Would take time in aligning itself. N/A	Would take time to align and open gates, scissor mechanism would take time. =	Relatively fast, deposits quickly, won't take time in aligning, would take time in putting the tubes back. -VE
OVR	Concept A		OVR: -VE

Concept B:



Concept C:

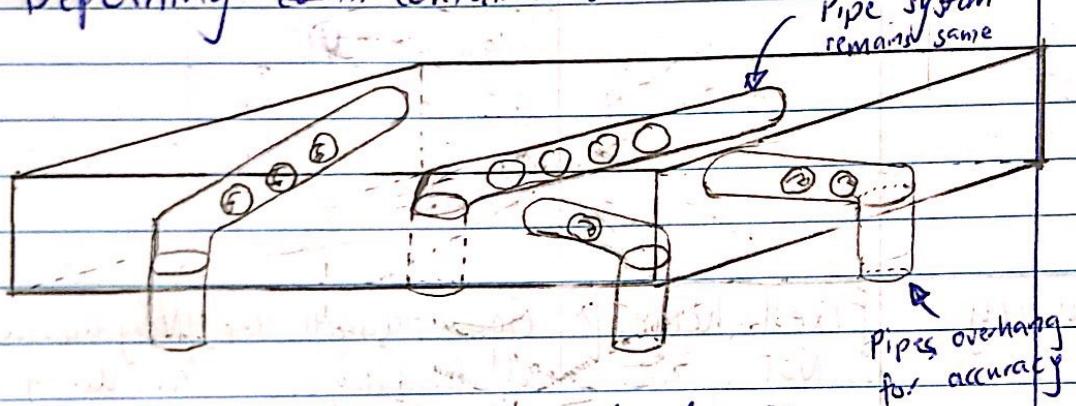


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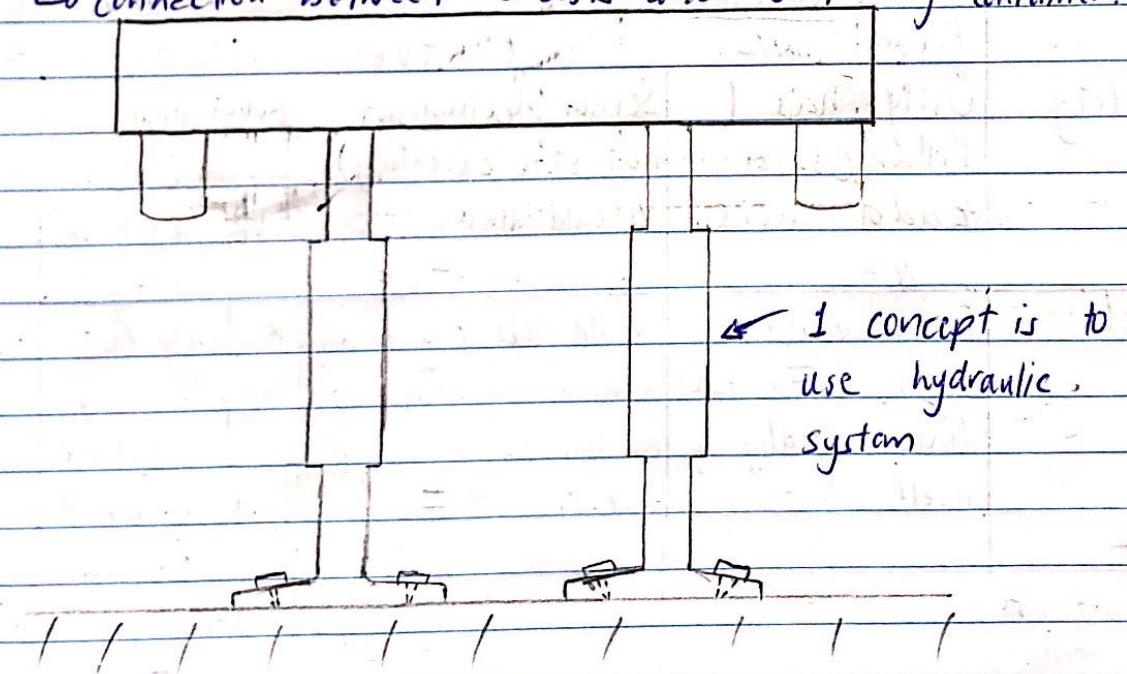
Monday 16th March 2020

→ Expand on concept before re-evaluating Pugh's Model.

↳ Depositing ~~cont~~ container:



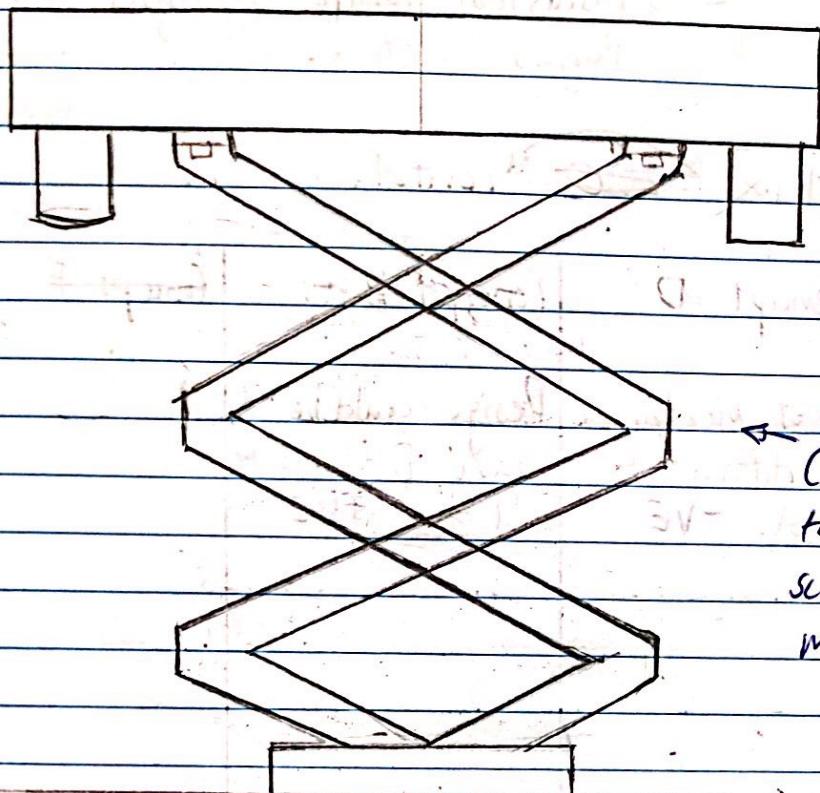
↳ Connection between chassis and depositing container:



Contd...

Contd...

↳ Connection between chassis and depositing container:



Concept #2
SUV to UCC
scissor
mechanism

====

= Triangular SSV linkage

= Three-bar linkage

17th March 2020 :

↳ Minus:

↳ Attendance

↳ Discussed concept designs and radial Pugh's Matrix.

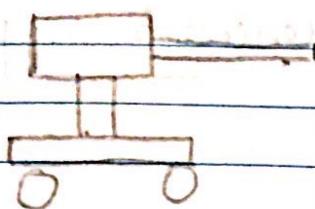
Pugh's Matrix ~~20~~ contd. .

Concept D	Concept D	Concept E	Concept F
Buildability	lots of Mechanical parts, difficult to build. -VE	Design could be heavy, Difficult to build. +VE	
Cost			
Accuracy	Accurate due to the extending arm +VE	Could be accurate depending on alignment. =	
Stability	Stable Cog would change due to extending arm. * -VE	Quite stable due to position of the wheels. +VE	* 1 pillar between chassis and mechanism
Speed	5 motors so should be quick +VE	Would need to slow down due to extra weight =	More unstable

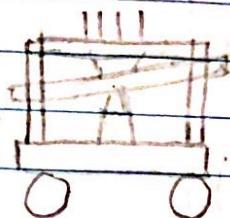
Contd...
~~Contd...~~

Contd... -

Concept D:



Concept E:

~~Concept F~~:

~~Concept F~~: ~~Diagram showing two rectangles connected by a horizontal line. Below each rectangle is a vertical line connecting them to two small circles at the bottom.~~

Concept G:

Box

with red

outline

and blue

outline

and green

outline

and yellow

outline

and orange

outline

and purple

outline

Diagram with

red outline

and blue

outline

and green

outline

and yellow

outline

and orange

outline

and purple

outline

outline

Concept H:

Box

with red

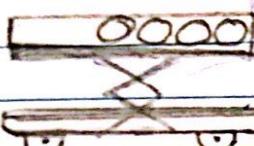
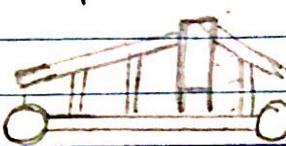
outline

Diagram with

red outline

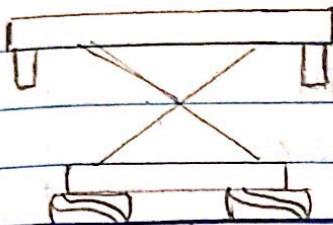
outline

Pugh's Matrix 2.0

Categories	Concept A: Norman	Concept B: Max	Concept C: Ben
Buildability			
Stability	Fairly stable with the double scissor mechanism. Could enlarge wheels, add wheels. Potentially unstable whilst depositing. OVR: N/A	Fairly stable, could enlarge wheels. OVR: -VE	Stable but mass arm could change cog significantly. OVR: -VE
Accuracy	Fairly accurate, as long as it aligns itself varying in height risky for Ben. OVR: N/A	Due to the non-sharpened pipes. OVR: -VE	Accurate due to Robotic arm mechanism. OVR: +VE
Speed	Scissor mechanism would take time otherwise pretty quick and multiple motors OVR: N/A	Quite fast due to the low weight OVR: +VE	Quite fast, but might take time aligning with the pipes. OVR: -VE
Buildability	Easy to build other than the scissor mechanism. OVR: N/A	Not too many parts, should be easy to build. OVR: +VE	Not great, due to the gears on the arm OVR: -VE
Cost	\$\$\$ OVR: N/A	\$\$ OVR: =	\$\$\$\$ OVR: -VE

OVR

Concept D: Jawon



Quite stable due to large wheels

PROS

CONS +VE

Very accurate, due to vertical adjustments

CONS -VE

Rollers are fast, doesn't have to jump over the obstacle

PROS +VE

Difficult to build because of Rollers, Scissors and Box depositing box.

CONS -VE

\$ \$ \$ \$ \$

PROS: -VE

22nd March 2020

→ First ^{design of} look at the CAD model came in. Sent by Benedict.

25th March 2020

→ Layout of Report was decided:

- PDS
- Problem statement
- Morphological Analysis
- Concept designs
- Pugh's matrix
- Iterations
- Final design
- Calculations
- CAD
- Team Eval

Updates
of

Updated
layout
on page
15

→ Worked on the Pugh's Matrix and Morphological Analysis.

→ Second look at the CAD was revealed by Benedict.

30th March 2020

- 3rd Iteration of the CAD model was sent by Max.

31st March 2020

- First Zoom Meeting: Everyone present approx 50 mins
 - ↳ Discussed:
 - Plan of Action for report
 - Updated the layout due to 2nd Pugh's Matrices.

Updated Layout

- PDS
- Problem Statement
- Product Decomposition
- Morphological Analysis
- Concept Designs (1)
- Pugh's Matrix (1)
- Concept Designs (2)
- Pugh's Matrix (2)
- Calculations
- Final Design
- CAD
- Teamwork Eval

1st April 2020

- Worked on finishing All pugni Matrix and Morphological analysis.

2nd April 2020

- Started working on both sections of concept designs.
- Second Zoom Meeting : Everyone present : approx 50 mins
 - ↳ Discussed : -
 - CAD design and how it could be improved.

5th April

- Fixed up the contents page
- Added a table of Figures & tables
- Added a Final design sketch section
- Changed the layout a bit.

Updated layout of report

- Table of Figures
- Table of Tables
- Design Summary
- PDFs
- Problem decomp
- Brainstorm & Research
- Morphological Analysis
- Concept designs
 - ↳ 1, 2, 3, 4, 5

contd...

- Pugh's Matrix 1
- Concept designs 2
↳ 6,7,8,9
- Pugh's Matrix 2
- Final design sketch
- Calculations
- CAD
- Final design.

~~PAR~~

7 April 2020

81 Third Zoom Meeting: Everyone present

: 250 mins

↳ Discussed:

- Updated yet again.
- Final layout of report
 - Updates on the CAD model.
 - A few questions answered by Wilson.

Report layout updated

Everything basically same except: ~~fig~~

- Table of tables / figures pushed into Appendix and put at the end of report. Also added a Table of Links and Equations.

8th APRIL 2020

- Everything is up until Calculations is completed and Formatted. Waiting on final calculations.
- The CAD sections is to be done tomorrow with Max & Benedict. The
- The Final design section is still awaiting Engineering drawings from main parts of the Robot.
- Everyone's Teamwork reflection also remaining

9th April 2020

4th Zoom Meeting : \approx 50 mins

- Run and Edit : Everyone present
- Finishing up The Project and Submitting.
 - Going down to the wire.