Learning Report – GENESIS

GLOBAL ENGINEERING ACADEMY

GENSIS

L&T Technology Services

Ver. Rel. No.	Release Date	Prepared. By	Reviewed By	Approved By	Remarks/Revision Details
1.0	03/12/2020	Group 4-Believers	Group1	Srinivas K	
1.1	05/12/2020	Group 4-Believers	Group3	Srinivas K	
1.2	07/12/2020	Group 4-Believers	Group2	Srinivas K	

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Activity and Tasks

Activity 1– System Development

PRODUCT SELECTED: Automatic Wheel Chair

AGEING

- First traditional wheel chair was invented in Germany in 1665
- It required an attendant with the patient all the time.
- Different kinds of automatic wheel chairs were being developed.
- Sip and buff wheelchair, head control wheel chair, Voice activated wheelchair.
- It was still a problem for patients with complete immobility of hands.

COST AND GRADATION

- 8,000-10,000 traditional wheel chair.
- 45,000-50,000 Automatic wheel chair.

DEFINITION OF PRODUCT

Tongue motion controlled automatic wheel chair can be used in patients with severe immobility of hands and legs. It should send signals to the motor driver of the wheel chair to move into the desired direction.

SWOT ANALYSIS

STRENGTHS • Easy to operate and requires minimum effort • System is small in size • Low cost • Disabled people can start being independent and can move to desired location without others help	**WEAKNESSES** • Requires maintenance from time to time • Power supply is needed all the time • Manual support is required when there are steps
OPPORTUNITIES • Can be used in NGO for helping the needful people • Hospital management system becomes more flexible • Most of the works of nurse and ward-boys can be automated	**THREATS** • Maintenance is required from time to time • When the power supply is disabled there is chance of system to collapse

Table 1: SWOT Analysis

REQUIREMENTS

High level requirements:

ID	Description
HL_01	Part of system must be installed inside mouth
HL_02	System inside the mouth must communicate with wheelchair
HL_03	System must be deactivated during eating or sleeping
HL_04	Battery life must be long
HL_05	Motors inside wheelchair must run simultaneously with movement of tongue.

Table 2: High level Requirements

Low level requirements:

ID	Description
LL_01	Permanent magnet and hall effect sensors must be attached inside the mouth
LL_02	Wireless communication must be established between 2 parts of system
LL_03	Sensors must be externally controlled to activate or deactivate
LL_04	Operating voltage must be low
LL_05	Motors with low reaction time must be used

Table 3: low level requirements

TESTING

ID	Description	Precondition	Expected input or State	Expected output or State	Actual output
H_01_L_01_T_01	Hall effect sensors must detect the magnet	Sensors are switched OFF	Magnetic field near hall effect sensor	Sensors are switched ON	
H_02_L_02_T_02	GSM module should detect signals from sensors	GSM is switched OFF	Signals from hall effect sensors	GSM is switched ON	
H_03_L_03_T_03	Microcontroller should detect signals from GSM module	Microcontroller does not receive signal	Signals from GSM module	Microcontroller gets activated and detect signals	
H_04_L_04_T_04	Microcontroller should interpret signals from GSM module	Microcontroller is not processing	Signals from GSM module	Microcontrollers should enable DC motor driver	
H_05_L_05_T_05	DC motor driver should detect signals from Microcontroller	DC motor drivers does not receive signals	Instructions from microcontroller	DC motor driver receives signals	
H_05_L_05_T_06	DC motor driver should start the DC motors	DC motors are not started	Instructions from DC motor driver	DC motors started working	
H_05_L_05_T_07	DC motors should rotate in desired direction	DC motors are not rotating	Signals from DC motor driver	DC motors are rotating	
H_05_L_05_T_08	Deactivate the permanent magnet	Magnet is in active mode	Signal from microcontroller	Magnet is in deactivated mode	

Table 4: Test plan

DIAGRAMS:

Block Diagram

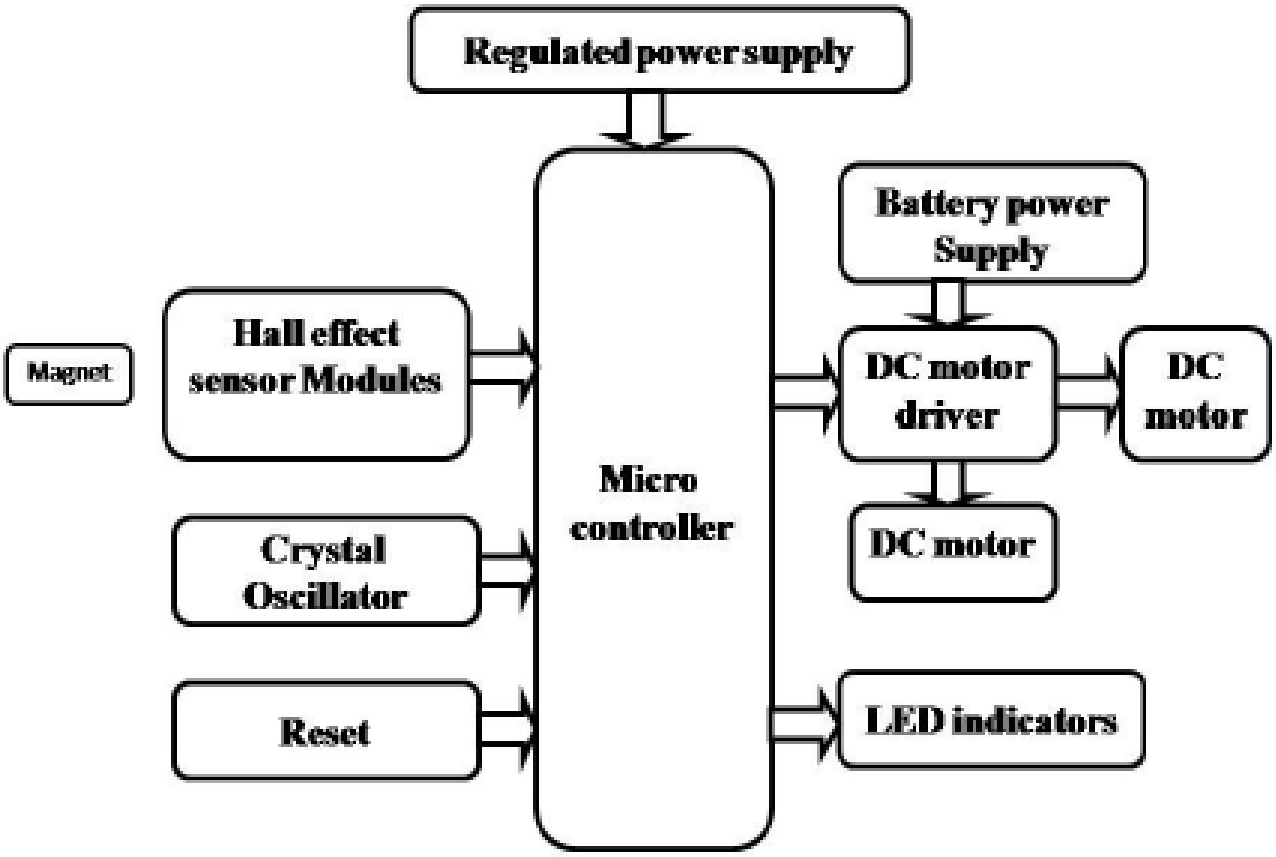


Figure 1: Block Diagram

Behavioral diagram:

- Use case diagram

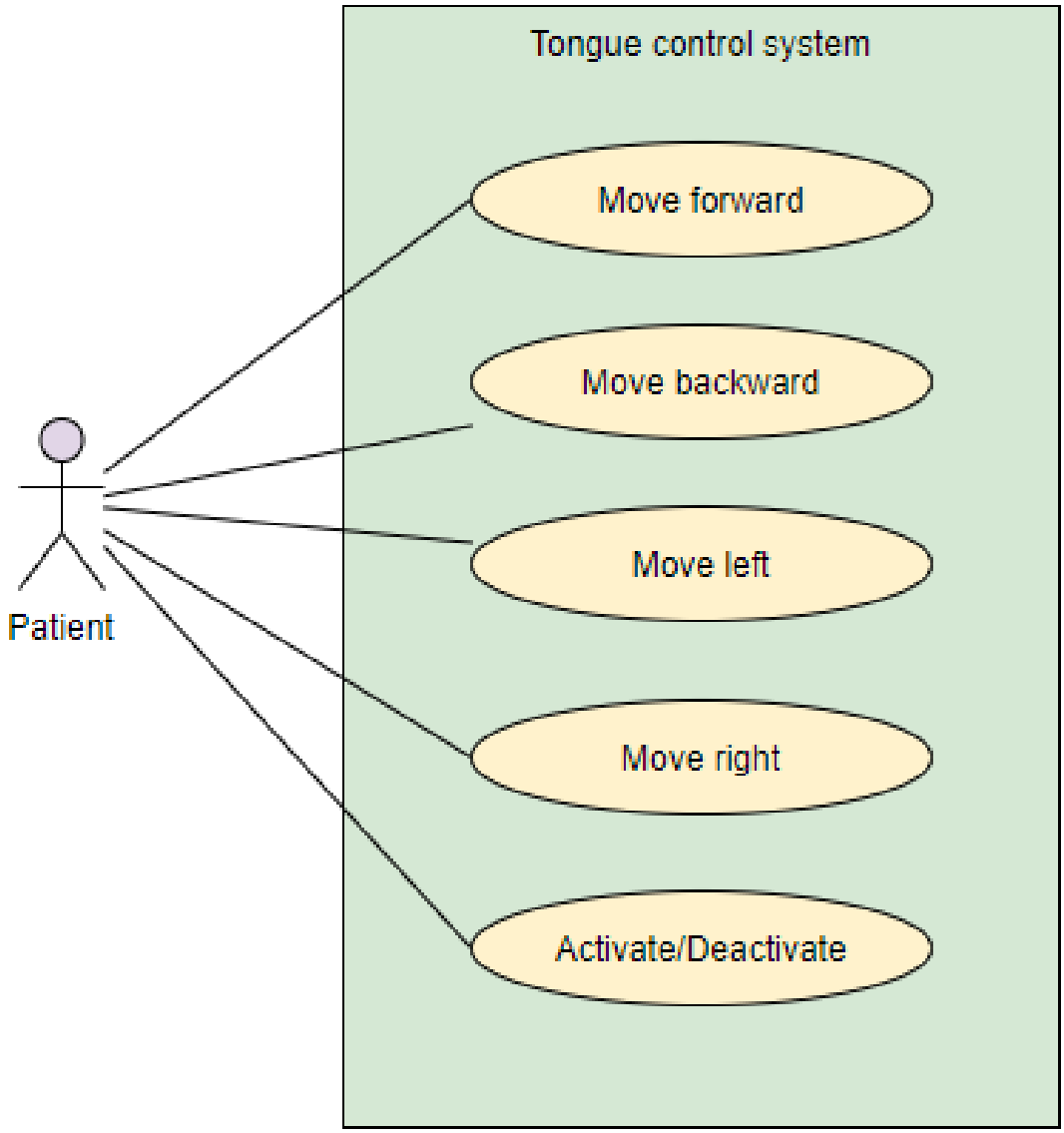


Figure 2: Use Case Diagram

- Activity diagram

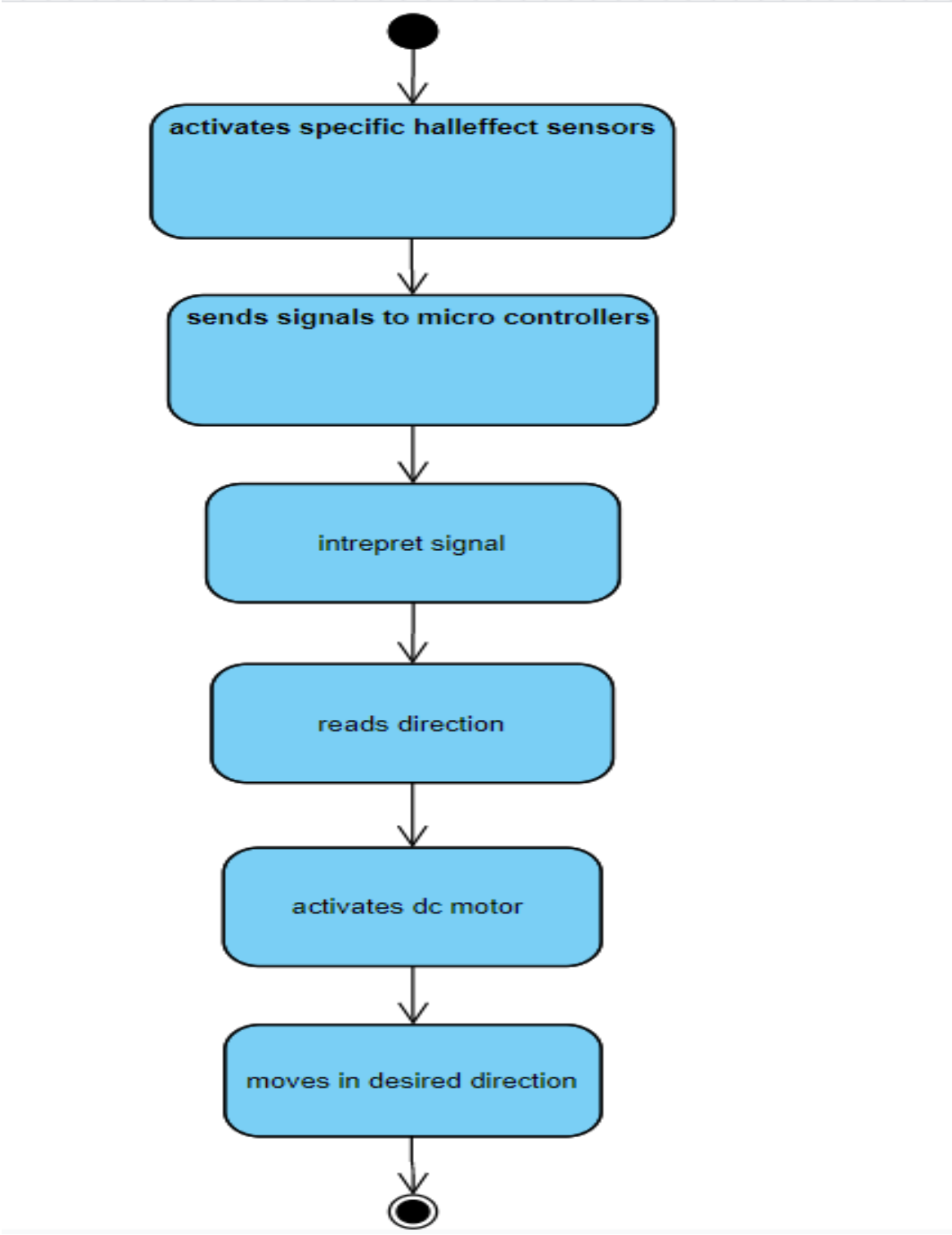


Figure 3: Activity Diagram

STRUCTURAL DIAGRAM

- Component diagram

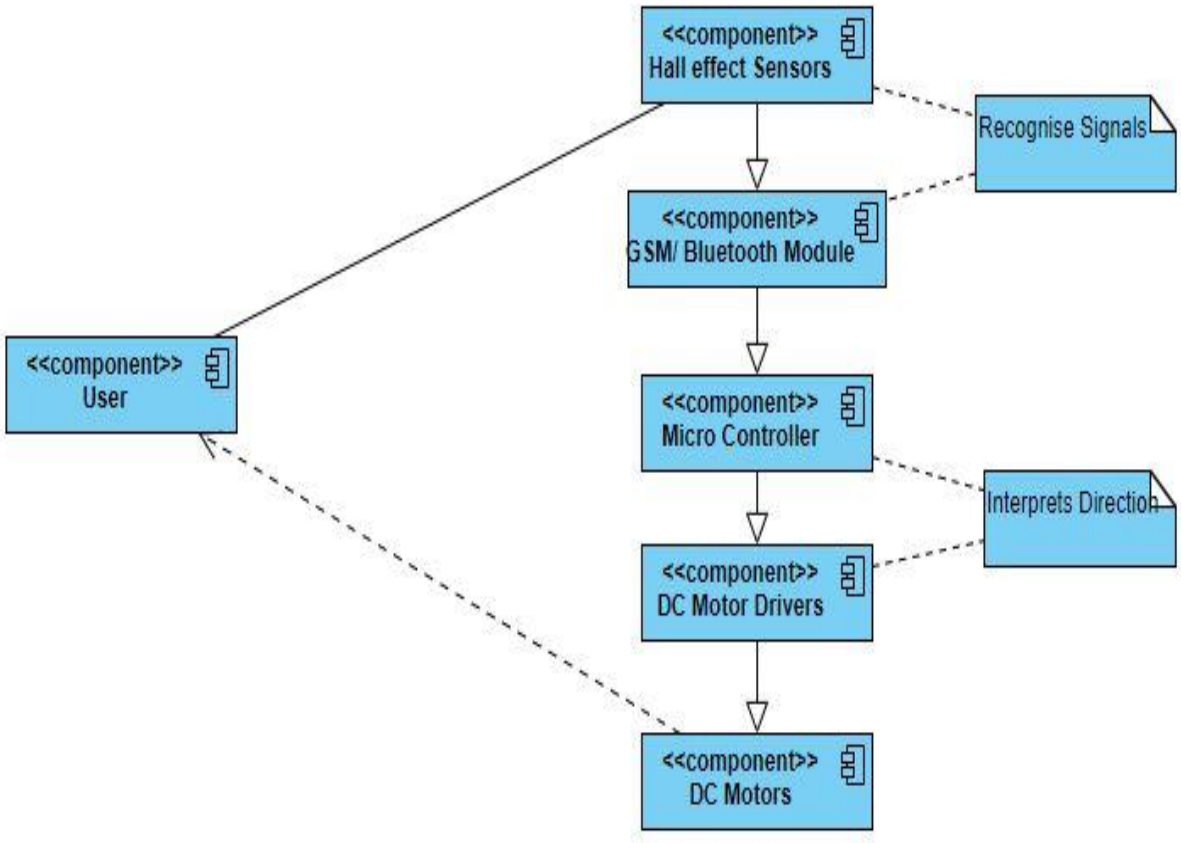


Figure 4: Component Diagram

ACTIVITY 2: Agile aspects

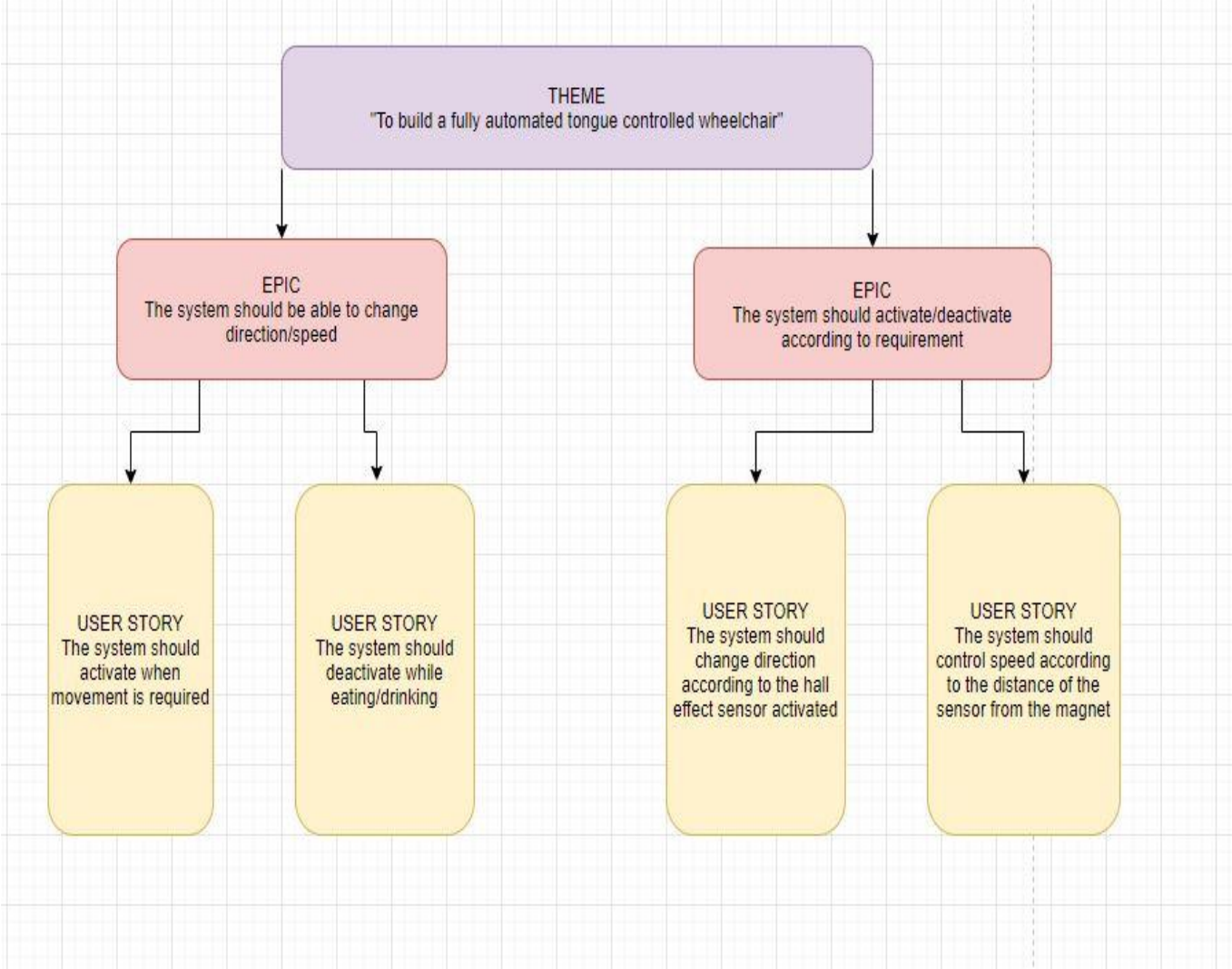


Figure 5: Agile Aspects

REQUIREMENT TRACEABILITY MATRIX:

Requirement No	Requirement Description	Testcase ID		
RN_01	System should change direction	TC_01 TC_07	✓	
RN_02	System should change speed	TC_01 TC_07	✓	
RN_03	System should activate according to requirement	TC_08		✓
RN_04	System should deactivate according to requirement	TC_08		✓

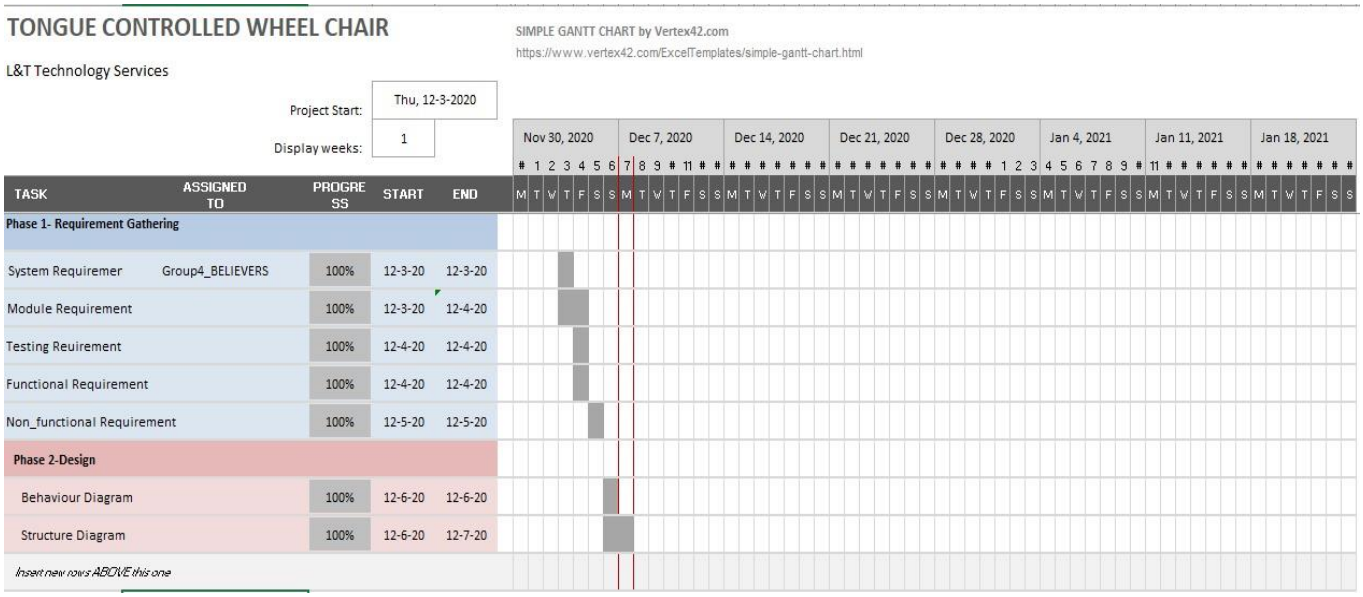
Table 5: Requirement Traceability Matrix

PRODUCT BACKLOG:

ID	Description
B_01	Installation of system inside mouth
B_02	Wireless communication within the system
B_03	Battery operating power
B_04	Reaction time of motor

Table 6: Backlogs

GANTT CHART:



TONGUE CONTROLLED WHEEL CHAIR

L&T Technology Services

SIMPLE GANTT CHART by Vertex42.com

https://www.vertex42.com/ExcelTemplates/simple-gantt-chart.html

Project Start: Thu, 12-3-2020

Display weeks: 1

TASK	ASSIGNED TO	PROGRESS	START	END
Phase 1- Requirement Gathering				
System Requiremer	Group4_BELIEVERS	100%	12-3-20	12-3-20
Module Requirement		100%	12-3-20	12-4-20
Testing Reuirement		100%	12-4-20	12-4-20
Functional Requirement		100%	12-4-20	12-4-20
Non_functional Requirement		100%	12-5-20	12-5-20
Phase 2-Design				
Behaviour Diagram		100%	12-6-20	12-6-20
Structure Diagram		100%	12-6-20	12-7-20
Insert new rows ABOVE this one				

Nov 30, 2020 | Dec 7, 2020 | Dec 14, 2020 | Dec 21, 2020 | Dec 28, 2020 | Jan 4, 2021 | Jan 11, 2021 | Jan 18, 2021

Figure 6: Gantt Chart

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   Authors: D. Ding; R.A. Cooper

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