

Smart Cart for Physically Challenged Person

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Abstract

Generally, a person with physical disabilities restricts his movement within a house or building due to his dependence on other people. People with disabilities are not only dependent on others for their movement but also for food. Devices available in the market only allow them to relocate but they have to put efforts which put them under stress.

The purpose of this study is to investigate an alternative to those devices to provide a way of relocation as well as a method of earning for themselves. Designed battery operated vehicle motivates the person to become an entrepreneur and problem of unemployment of disabled section will also be solved simultaneously.

Keywords: Disabilities, unemployment, stress, physically challenged, battery.

1. Introduction

As Person which is unable to interact with world with certain activities either due to body or mind is called as disability. Cennsus report 2011 claims that in India this disability has increased from 2.1% to 2.21% since 2001. Major of this disability fraction is related to movement. Assistive devices has been developed to overcome this suffering from disabilities most commonly wheelchairs are employed for this role. Wheelchair is nothing but a chair with four wheels. Wheelchairs solve problem of relocation but unable to make the person independent for his earning. Also person operating it may feel huge stress. This is why electric wheelchair with attachable rear cart has been designed to solve these problems.

Person may use only wheelchair part for relocation and can ask someone to attach the cart part if he needs to earn this specifies the main objective of the study to make disabled person entrepreneur and independent for his earning.

Batteries can be recharged and durable based on load. So now the person has its own relocating shop he could sell whatever he wants. To make sure that his reach is to the whole cart the seats and the cart part kept is 360 degree movable.

1.1 Problem Statement

Disability covers both physical and mental disorders. Such people are also in the category of unemployed. Also electric vehicles available in market are for earning and hence costly.

Following are problem statements found during study.

- Increase in unemployment
- High Cost of Electric Vehicles
- Forward and backward Movement of Wheelchair.
- Sellers reach to the whole cart

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Idea to solve problem statements.

- A wheelchair with rear cart need to be designed.
- To minimize efforts electric Dc motor need to be employed with proper controlling device
- Cart need to be produced with minimal profit for low cost production.
- 360 rotating seat and cart top required to ensure reach.

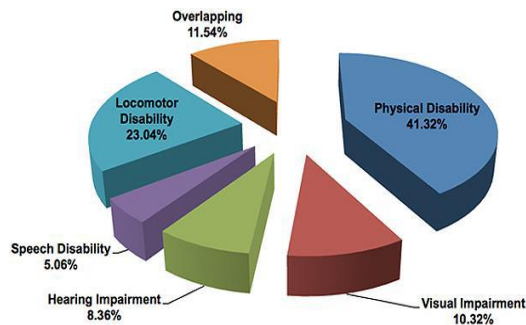


Figure 1. Pie-chart for disabilities in India



Figure 2. Model

2. Methodology

1. After identification of; problem statement literature survey is done.
2. After gaining all requirements and knowledge for the model a sustainable design is created either on paper or on cad software.
3. Now select proper motor, controller and other kit.
4. Assembling then inspection done.

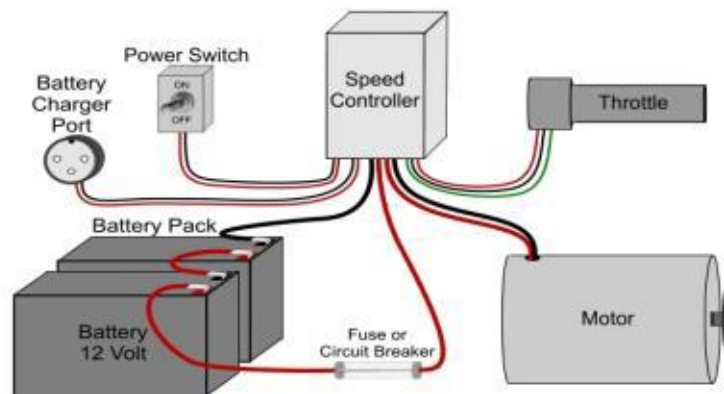


Figure 3. Motor unit and kit Diagram

3. Working

The designed device is multifunctional since one part (The vehicle part or wheelchair),but if needed he or she can attach the rear cart part and become an entrepreneur or can carry loads. This The

The working of device is described here,

1. This wheelchair is an electric dc motor operated device hence can be used n like an e rickshaw or bike.
2. First person need to sit on the seat for which he might need someone help if he is totally unable to move.
3. Connection is competed either by key or ignition kit.

4. Throttle is given at only none handle which perform both front as well as back movement so it is easy to go in either directions.
5. Now if person need to sell something cart can be attached and loaded with items like phone , decorating items, beverage, fruits, vegetables etc.
6. If he wants seat is movable hence he can turn 180 degree towards cart by either side just by removing little constraint.
7. Now the half of part of cart is in reach of sitting person so if needed to other half part he just need to unconstraint the other half cart which rotate 360 degree and now his reach is complete, after this he can again restrict the cart top.

Table 1. Parts to be used

S. No	Item	Quantity	Description
1.	Dc motor	1	650 Rpm (min)
2.	Dc motor controller	1	Motor based
3.	Throttle	1	Bi-directional.
4.	Battery	3	12 V
5.	Rickshaw wheels	3+2=5	Usual no modification
6.	Cycler chain	1	Usual
7.	Set of spocket	2	Welded and machined
8.	Bearings	6	According to shafts
9.	Nut and Bolts	Acc. to use	Multiple sizes
10.	Cycle braking kit	1 set	1 set
11.	Batter wires	6	Inverter Wires
12.	Wood	According to size and strength	10 mm min
13.	Cast iron	According to use	Main body is made by cast iron.



Figure 4. Main components of smart cart

4. Conclusion

- These carts are energy efficient and non-polluting like E-rickshaw.
- Proper implementation Of technology has the potential to address the issues of unemployment and dependency of food of disabled persons.
- A person with disabilities can operate it easily by single hand and setup his own shop in the vehicle.

5. Future Work

1. Designing of vehicles require maintaining safety standards further safety measures can be studied and added.
2. The quality of service associated with safety measure needs to be significantly improved to provide more safe and security from accidents.
3. The vehicle can be equipped with digital gadgets including GPRS and CCTV camera keeping safety in mind.
4. Designing of Charging stations like conventional fuel stations is possible.

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