

# Concept of Smart Backpack

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**Abstract— A Smart Backpack, which comprises of an inbuilt power bank in the bag. The bag consists of a high capacity power bank or battery, with which, laptop, mobiles, tablets can be charged anywhere, any place and at any time. The power banks or the batteries can be used to charge fully a smart phone 2-3 times a day, so that the user should not have any problem in using their mobiles. The bag helps people who travel a lot and also for those who work with their laptops a lot. The production of these kinds of smart bags will help people, in getting multiple facilities in one bag. This bag also includes some electric circuits, which are carefully placed in between the high quality mesh provided in the bag. These mesh's that are used actually take up the stresses applied on the bag. And the fabric used is, a water resistant high quality fabric, which protects the electric circuits that are placed inside and has a high durability rate.**

**Keyword:** Multiple facilities, water resistant, electric circuits.

## I. Introduction:

Bags are one of the basic products that is been used, from carrying groceries to shipping products. In ancient times, the backpack was used as a means to carry the hunter's larger game and other types of prey and as a way of easier transport for other materials. In the cases of larger hunts, the hunters would dismember their prey and distribute the pieces of the animal around, each one packing the meat into many wrappings and then into bags which they placed on to their backs. The bag itself would be made up of animal hide and skin and sewn together by animal intestines, which would be woven together tightly, to make a sturdy thread-like material.

[1]

In this modern era a high quality polymer with coated fabric, which are water resistant a produced and used to develop a backpack. These fabrics will undergo various tests such as load test, wear and tear test. These test results helps in selection of the right fabric for the design development of the bag. [2].

Most of the customer's will check the battery backup when they purchase any electronic devices like mobiles, laptops, tablets. But they also face a huge problem while they have forgotten to charge there device or over use of it leading the device to turn off. And then they look for a power bank which they have to carry it with them in their pockets. The charge of the power bank can only help charging one's smartphone and

not a laptop. So this smart bag helps a technical professional or any other user who uses their electronic devices, comes in handy. This smart bag will also have an in-built sensor in the electronics of the bag, which helps one to know the charge remaining in the battery, and also a proximity sensor will be installed and can be connected to their smartphone by creating an application for the smart bag. The application shows all the required information of the battery. This proximity sensor senses the presence of the phone; if it is out of range then a notification is sent to one's smartphone. [3].



Fig.a Conceptual design of bag

## II. Problem definition:

Most of the times a person using a smartphone, tablet, laptop will face a situation, where there battery is drained and will look for some current source. They need to carry it with them and look for a place to connect it them. And if they don't find any place to charge there devices, they might lose some valuable time and information, which gets aborted in the middle of a conversation.

The usage of backpacks has become one of the basic requirements in one's life. Most of the technical professionals will carry their laptops, tablets for their work. And they face little issue with their bags that is the space in the compartments is not enough to fill in.

So this smart bag, which has a built-in power bank/battery, might help in reducing the draining of batteries of their devices, and also the space consumed by the chargers and reduces time in searching for a power source.

### III. Conceptual design of Smart Backpack:

The parts are as explained below:

#### A. Base:

The design of the entire bag is first developed in the software and the pattern is prepared. Then the cutting of the fabric takes place. The base of the bag will be provided with a nice cushioning of air mesh, and with a high quality bottom pad on the side where the inner lining is provided, the bag will be good enough to keep things straightly inside. And the outer part in the base of the bag can be provided with a shock absorber that helps in keeping things inside the bag undamaged if it is accidentally fallen from certain distance. So that impact reduces.

#### B. Back Panel:

The cutting of the back panel of the bag contains an air mesh of good quality, the main fabric and inside lining are cut and the back panel is stitched. If necessary an option of providing a pocket on the back panel can be done, this depends on the customer requirement. This panel contains the electronic circuits placed which are placed carefully and provided with a quality load absorber.

#### C. Front Panel:

The front panel is also taken from the cuttings of the bag. The design of this depends on the customer or also on the size of the bag. The front panel is made of with a high quality fabric which is water resistant; this panel also might contain some pockets at the front. This is also provided with a good lining inside and a quality air mesh between main fabric and lining. The front panel also contains a small display device which displays the charge remaining inside the battery.

#### D. Shoulder Strap:

The shoulder straps are also taken from the cuttings of the design. It uses the main fabric, air mesh and a lining cloth which helps in load distribution, equally on the two shoulders. The shoulder strap may also be provided with a small pocket to place mobile, while charging.

#### E. Compartments:

The bag can be provided with one or two compartments, this depends on the design of the product. One of the compartments will have the inbuilt battery integrated with the panel and is stitched. In each compartment or pockets provided in the bag contains a charging port. So that many devices can be connected at once.

#### F. Accessories:

Some of the accessories used are zippers, Velcro, runner, adjuster, elastic, puller, webbing tape, binding tape and reflectors. Contrast fabric (if needed).

### IV. Material selection:

The materials can be chosen based on the customer requirement and also it depends on the pricing of the bag during the preparation of BOM.

### v. Conceptual Production Drawings:

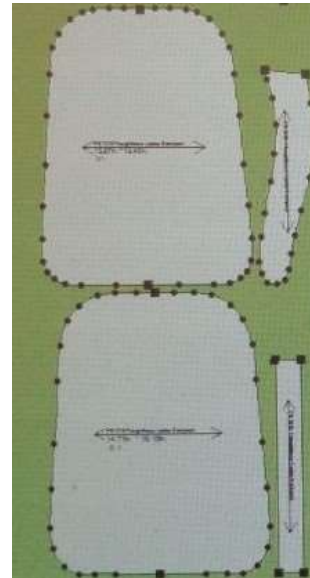


Fig.1 Back panel and Front panel

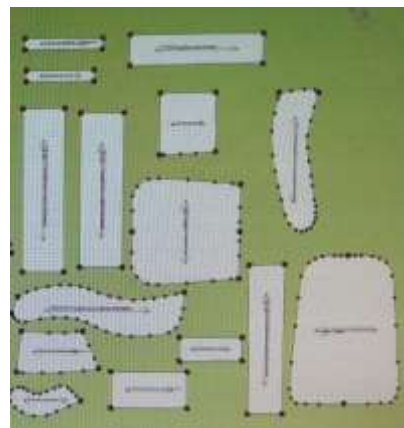


Fig.2 Compartments pattern



Fig.3 Shoulder strap and Power-Bank

## VI. Results and Conclusions:

These kinds of bags can be used by most of them to make sure that they won't run out of their batteries and also carry their bag with them and make use of the technology installed in the bag. People who travel a lot can make use of this. And the bag would be economical in the mass production. This integration of power banks will help startups that manufacture these kinds of batteries or power banks in building their business, which indirectly helps in the economic growth of the country and help in reach of utilizing the technology developed. The in-built battery is to be charged at once every night, if the battery is used.

## VII. Future scope:

The design can be improved based on the user inputs. Different materials for the bag may be used. The cost of production may be brought down by using cheaper, yet durable materials, and mass production. The bags can also be made at a much larger scale, enabling longer battery life. The current charging mode of battery can be replaced by providing a solar panel on it; this would save the consumption of power.

## VIII. References:

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