

A Conceptual Study on Suitscape – Asuit for Bikers Safety

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I. INTRODUCTION TO SUITSCAPE



Suitscape is a safety suit that is one of its kind. It is a full body suit that is specifically meant for professional bikers and passionate riders. The suit has airbags which deploy when the biker gets into an accident, which helps in saving the riders lives or from some serious injuries. Let's be honest, only helmet can not save the riders.



Need For Suitscape

As we see in a daily bases that many bike riders get into an accident which leads to a serious injury or even losing lives. So, our aim with this product is to put SAFETY first and reduce deaths and injuries as such.

Working of Suitscape SWOT



Analysis

A string is attached to the suit which should be hooked onto the bike, and any kind of fall or impact will deploy the airbag which thus saves the biker.

- 1) Strengths: light weight, sound quality, affordable, full body suit.
- 2) Weakness: airbag deployment can be used only once.
- 3) Opportunity: first of its safety equipment leads to booming profits.
- 4) Threats: all body safety equipment exists in the on-going market.

STP

- 1) Segmentation: We will segment the market based on people's profession and their interests/passion.

- 2) Targeting: Our target audience is professional bikers/racers as they will get the most amount of benefit from this product.
- 3) Positioning: The suitscape will be positions in the category of safety guard and sports equipment. For all the biking enthusiasts, this product and positioning was a necessity. The SUITSCAPE will be on the top of the market as it is the first of its kind.

Marketing GAP

As suitscape is a first of its kind, we have a large marketing GAP. Many bikers are going to find our product very useful as it is made for their safety, but also, since there already is a full body suit for bikers, our product is going to be more useful for them as it provides much more safety for them.

The Market

With clear demand for safer motorcycling and many companies attempting to solve the problem with various types of airbags, the market seems wide open as there hasn't been any major successful standard airbag. In addition, the problem with most safety gear being designed is that problem of it being built into a jacket. Most motorcycles riders do not want to be burdened by having to carry the same jacket to ride, usually the jacket is not the type they want to wear (e.g., style, comfort, convenience).

The Transportation Research & Injury Prevention Programme Indian Institute of Technology Delhi MAY 2020 had issued its latest findings on motorcycles deaths and related injuries in the INDIA. And all in all, it makes pretty depressing reading. **Need and Relevance (Road crash and traffic injury data) Need for an airbag suit.**

- According to official statistics 1,51,417 persons were killed and 469,418 injured in road traffic crashes in India in 2018. However, this is probably an underestimate for injuries, as not all injuries are reported to the police.
- The number of cars and motorized two-wheelers (MTW) registered in 2016 was 30.2 and 168.9 million respectively. The official registration data over-represent the number of vehicles in actual operation because vehicles that go off the road due to age or other reasons are not removed from the records. The actual number of personal vehicles on the road is estimated to be 50%-60% of those mentioned in the records.

- The extent of underreporting of road traffic deaths in India is not well understood. Global Burden of Diseases, Injuries, and Risk Factors Study, estimated that in 2017, 218,876 deaths (95% UI 201,734 to 231,141) due to road injuries occurred in India. A National Burden Estimates study estimates RTI deaths in 2017 in India to be 275,000. These two estimates are 45% and 82% higher than the MoRTH number.

- Police data should not be used for studying the epidemiology of non-fatal road traffic injuries (RTI) in the country. The official estimate of non-fatal RTI in 2018 was 469,418 which probably underestimates injuries requiring hospitalization by a factor of 5 and all injuries by a factor of 20.

- Over the last two decades the burden of road traffic injuries in India has increased, while the number of those affected by infectious diseases has declined. In 1990, road traffic injuries were the 16th leading cause of health loss, and 10th in 2016.

- Country income level cannot be taken as excuse for inefficient data collection systems and it is possible for countries like India to set up professionally managed data collection systems that give a reasonably accurate estimate of RTI fatalities.

- Lack of finances does not necessarily mean that a society has to have absence of safety on the roads. We cannot depend on growth in national income alone to promote road safety. It will be necessary to put in place

The numbers and proportions of different road users killed and injured as mentioned in MoRTH reports are erroneous and cannot be used for any analysis.

Tables dealing with causes of road traffic crashes should not be used for any analysis or policy making.

- This situation can only be improved by MoRTH with a complete revamp of the data collection systems in collaboration with the Ministry of Home Affairs and establishment of a professional data and analysis department.

Analysis of data at national level

- The total number of deaths in 2018 was 10 times greater than in 1970 with an average

annual compound growth rate (AACGR) of 6%, and the fatality rate in 2014 was 5.2 times greater than in 1970 with an AACGR of 3.9%.

- The only way the decline of RTI fatalities can be brought forward in time is to institute evidence-based India-specific road safety policies that are more effective.

The Indian official estimates of pedestrian fatalities are extremely low compared to independent researchers' estimates (~15% vs ~35%), therefore, official estimates for all other modes will also be wrong.

- The error in the official reports regarding types of road users killed probably arises from a wrong coding of the victims' status and the procedure needs to be reviewed carefully and revised.
- It is not known why the involvement rate of children (59 years) in India is lower than that in the USA when a large number of children walk, cycle and travel on overloaded vehicles to school in India. Reasons for these differences need further study.
- Compared with the situation in 2015, the total number of deaths in 2018 decreased by more than 10% in 5 states and union territories, was 10% higher or lower in 16 states, and increased by more than 10% in 11 states.
- Fatality rates per hundred thousand persons in 2018 increased in fifteen states and union territories and reduced in fifteen.
- Since RTI fatality rates in states and union territories do not seem to be influenced strongly by location in the country (culture) it suggests that state RTI fatality rates may be more influenced by infrastructure availability, vehicle modal shares, road design, and enforcement. • Much more attention will have to be given to street and highway designs and enforcement issues that have an influence on vulnerable road user safety than current practice of focusing on motor vehicles as has been the practice up to now. This will require a great deal of research and innovation as designs and policies currently being promoted do not seem to be having the desired effect in improving road safety.

Key Market Trends

- Raising demand for safety will fuel market growth

- The global automotive industry is on rising, and most economies started gaining momentum. By 2025 many developing countries are expected to have a high demand for cars, and improving the economy means more commercial vehicle sales. In 2025, the emerging markets are expected to account for 78 million vehicles, which developed economies will account for 34 million vehicle sales. With government regulations in place and customer demand for vehicle safety, this market is expected to grow.
- Curtain airbags are the fastest-growing segment of the automotive airbag and seatbelt industry. They are mounted on side of seat or the door, usually on the roof above the side window. In the event of a crash, curtain airbags are used to protect the adult's head. It has been proven that curtain airbags reduce the driver fatality risk by 45%. Recently there has been a growing demand for pedestrian airbags. These are automatically deployed when an automobile is about to collide with a pedestrian. Increasing income levels and awareness about safety is expected to drive this market in the coming years. The Transport Ministry of India announced that from 1st July 2019 onwards car manufacturers must install essential safety features. This must include driver airbags, seat belt reminders, speed alerts, and parking systems. Knee airbags would experience fast growth over the forecasted period. It is due to increase in demand of consumers for active leg protection and replacement of bolster seat.

Market Opportunity

The Market opportunity for Airbag for Bike is large as the competitors have not come up with a suitable solution. The typical motorcycle airbag only protects against head on collisions. There are some Swedish and French companies that have designed helmets that inflate upon impact; however, these only protect the skull and neck. Some Japanese companies have made inflatable vests, but these don't protect the whole body either and are bulky and annoying for riders to wear.

Marketing Plan

Our marketing strategy will integrate an up-to-date website, social media, and other digital media to reach customers and clients. The details include:

1. Website – The website will be used to both educate consumers on the technology behind the airbag, its function, its safety record and the way in which it revolutionizes riding without compromising on style or comfort, in addition to facilitating individual orders and wholesale enquiries. To do so a cache of educational content must be developed. That includes videos, safety training and testing guides, riding tips, fitting guides, FAQs and a regularly updated blog. As a first step we need to build trust in our website visitor interactions and an eye-catching video will do that better than most. Equally as important are real life testimonials (video) from real riders. The website should also have separate landing pages and call to actions for free demonstrations which will be coordinated with preferred suppliers and business partners. The website will need to feature a newsletter sign up section and an opt in list for early release information or pre-release waiting lists.
2. Social media – Facebook, Instagram, Twitter and LinkedIn will be used in various ways to attract buyers of the airbag. Facebook is for longer form but colloquial conversations, therefore we can introduce some of the people behind our brand and their contribution to the design and prototype process. Videos of the testing sessions, introductions of the fabrics / materials used and footage from actual riders will be used to make the content easily digestible in addition to generic safety guides for motorcycle riding (titles such as: “Top tips for riding in the wet”, “best new motorcycle jackets”, “what license is required to ride a motorbike (international guide)”). Instagram is purely image and video based; therefore, we’ll need to take high quality images at each stage of the business and product life cycle. Where possible we’ll try and introduce the education and learning element in addition to our product on location in some spectacular places, tracks, roads. LinkedIn is where we can meet new business connections who may be able to help with the project. This includes engineers, suppliers of raw elements, advisors (safety, regulation, financial) and investors. LinkedIn is far more professional and therefore the content distributed and published through the network will be thought leading and industry relevant. Twitter will be used to engage in relevant conversations but only after the product is ready to be marketed.
3. Search / Pay per click – Google Ads (and to a lesser extent, Facebook ads) will play a big role in our overall strategy to attract new customers and maintain existing ones. Using both paid search marketing and remarketing campaigns we will be able to measure the overall success of our keywords, copywriting, landing pages and targeting codes.
4. Partnerships / Associations / Industry Collaborations – In order to gain traction in the most important industry (motorcycle) we need to develop rich relationships with industry associations. Examples include, Motor Vehicle Safety Standards, Consumer Product Safety Organizations, American Motorcyclist Association. Moreover, the partnerships will extend to conventions, exhibitions, race meets, charity ride drives and sponsorships, innovation grants and so on. To nurture these relationships, we will need to put together a marketing team that focuses on both long-term partnerships and short term branding and individual customer acquisition projects. Wholesale opportunities will also exist as will the potential for the airbag to be built in to large motorcycle companies’ bikes.
5. Direct Marketing – In order to get serious about becoming the preferred supplier of airbagsafety devices in motorcycle manufacturing we are going to have to introduce our brand the old-fashioned way. That means, direct messaging and cold calling in order to book demonstration appointments with the key decision makers in bike manufacturing companies. Our product (once modeled) requires a hands-on approach to selling (to this particular market) and therefore a full time sales representative is likely required to gather leads, close sales and account manage.
6. Government - We hope to lobby the government to mandate all motorcycles to be built with our airbag system in it.

Novelty

Novelty is the quality of being new, or following from that, of being striking, original or unusual. Novelty may be the shared experience of a new cultural phenomenon or the subjective perception of an individual.

Model building

The airbag suit consists in a tabular air chamber fitted in an ordinary jacket; the section of

the chamber is variable in order to convey a greater gas volume to protect the most vulnerable body parts. The volume of the chamber is quite smaller than most of airbag actually available on the market (about 15 liters instead capacity that ranges around 20-40 liters), in order to achieve significantly faster inflation times and improve dressing comfort and easiness of use. The device presents the most part of the volume disposed around the neck and along the lumbar spine thus these are the principal body parts it's intended to protect. A strap connects an inertia reel, firmly joined to the motorcycle chassis, with the percussion pin of a cylinder, filled with CO₂. When the strap is pulled over a certain activation force, it disengages from the percussion pin, allowing gas to expand into the chamber and inflating the airbag. The device is characterized by shorter inflation times than others, and after 70ms from the firing it already reaches about half its nominal pressure, that's enough to have a significant effect during an accident.

Novelty in Dressing

Some operations were performed on the model of the airbag, in order to obtain a good dressing on the airbag itself over the dummy's body. As a first step, the airbag model has been folded, to bring it to a shape that is nearer to its real condition when it's worn by the biker. With the airbag subjected to gravity and stiffness of the straps, coming to a very realistic positioning over the chest of the dummy. In the first simulation the arm of the dummy is wide apart, to avoid interferences between arms and airbag, in the second one the dummy is exactly in the same position it assumes on the bike.

Novelty in inflation

Temperature and very high pressure, so it is at liquid state. When the inflation is triggered and the percussor is removed, the cylinder is put the carbon dioxide (CO₂) is stored in the cylinder at ambient in communication with the airbag chamber, so CO₂ suddenly evaporates and flows through the percussor hole in the chamber which is at almost ambient pressure. This sudden pressure reduction leads to a great temperature decrease; the cold CO₂ in the chamber is after quickly warmed again through the contact with the chamber tissue and the ambient, so pressure in the airbag continues to rise even when all the gas in the cylinder already flew in the chamber.

Given the cumulative mass of CO₂, several simulations, acting on the mass flow and gas temperature, were performed to adjust inflation

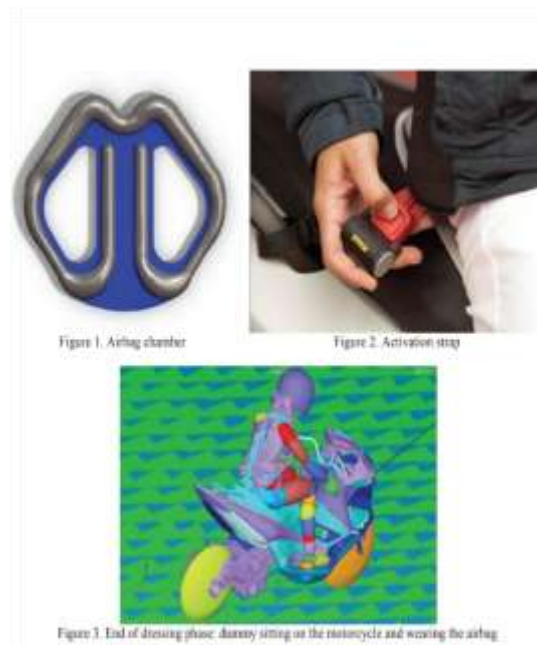
parameters and achieve a good match with experimental inflation data, both on pressure and on time, obtained from three pressure sensors disposed on the device during an inflation.

How air bag system protects the human body parts?

The provision of air bags on motorcycles is more complex than installation in cars, because the dynamics of a motorcycle crash are more difficult to predict. But we discussed the following points on accident. These characteristics leads to act with very short reaction time and fast inflation but only if the motorcycle is involved in the accident. Limitation of this system is that they work properly only under particular conditions, especially the rider must remain on the motorcycle during the accident and the impact dynamics must lead him to hit exactly the part of his vehicle protected by airbags.

Normally, following kinds of bodily harms occur in the accident

- Hand/leg Cracks or fractures
- Head injury
- Bleeding from body parts Getting thrown from bike



OUTCOME

Our product has an idea of safety with look fashionable which attracts others. The outcome is visible to all in market because the accidental rate falls and reason is 'SUITScape'. It

comes with waterproof feature so also acts as a jacket.



Project Title/ Title of the study:

‘SUITSCAPE’ is a safety suit that is specifically meant for professional bikers and passionate riders.

Objectives of the study:

Airbag suit are designed to automatically inflate in the event of a sudden deceleration or impact force that would indicate a collision.

- To understand usage of suitscape for bikers
- To analyse the protection of public after usage
- To understand the risk that a victim go through of the vehicle or object without safety measures.

Statement Research Problem

The main purpose of this study is to research the attributes of airbag:

To reduce injury by cushioning the occupants during a crash and provide protection to their bodies when they strike interior object such as steering interior wheel or window, etc. Thus, the usage of airbag system lowers the number of injuries by reducing the force exerted by steering wheel, windows and dashboard at any point on the body.

Passengers and drivers who were in crashes in which the passenger and driver airbags

deployed were surveyed about their experiences. Overall, passengers and drivers were very positive about their experience, with the overwhelming majority reporting that they felt the airbags protected them from injury. Almost all of them said they would want airbags in their next car. Many respondents about 20% did not remember anything particular about the event, but for those that did, smoke and odour were reported most often and about 15% of passengers and 10% of drivers reported trouble with breathing or coughing after the deployment. There were some differences in the experiences of passengers and drivers that may be related to differences in the way passengers and drivers interact with the airbag

Economic Factor

The development of airbag into a prominent and economically feasible method of satisfying the purposes of the National Traffic and Motor Vehicles Safety Act of 1966 is discussed, and the details are given of a cost benefit analysis of the occupant crash protection standard. The projected economic benefits of the protection system range from \$1.2 billion to \$3.5 billion under the single year approach and from \$6.7 billion to \$19.1 billion under the cumulative approach.



AN MODEL OF SUITSCAPE

airbag systems can save your life and reduce the possibility of serious impact-related injuries.

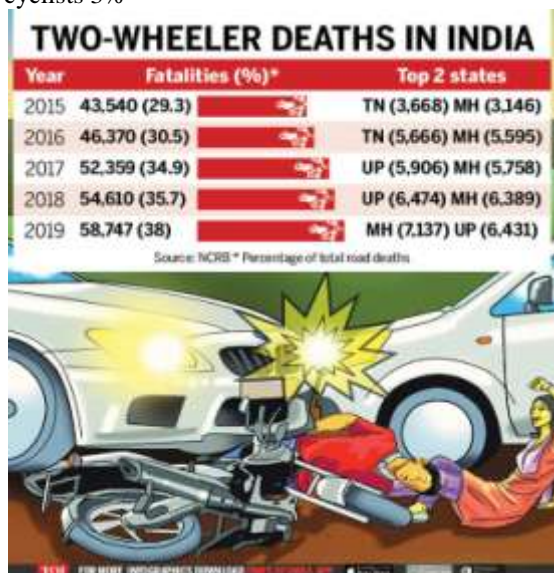


FINDINGS

- It was found that all body safety equipment exists in the product of suitscape
- Accident occurrence have various outcomes which has 60 – 80 percent harmful cases for the public
- Usage of suitscape will be beneficial for travellers
- The product is comfortable for the users usage
- The product is cost effective

A total of 151,113 people were killed in 480,652 road accidents across India in 2019, average of **414 a day** or 17 an hour, according to a report by the transport research wing of the ministry of road transport and highways.

Road accidents have been a major cause for concern across the Indian subcontinent. In 2019 alone, the country reported over **151 thousand** fatalities due to road accidents. Each year, about three to five percent of the country's GDP was invested in road accidents. Together, two-wheelers and pedestrians account for **54%** of accident-related deaths in India and are the most vulnerable category in line with global trends, according to the ministry report. While 37% road accident deaths (56,136) --or six every hour, on average--involved two-wheelers, pedestrians made up 17% and cyclists 3%



II. SUGGESTION

Suitscape airbag jacket for several reasons:

Safety: Riding a motorcycle is inherently risky and accidents can result in serious injury or even death. Suitscape's Airbag jacket is designed to protect the occupant's body and vital organs from impact in the

event of a collision. The airbag inflates quickly in the event of a crash and creates a cushion between the occupant and the ground, which can significantly reduce the risk of injury.

Cost-effective: While the cost of purchasing an airbag cover may seem high, it is important to consider the long-term savings that can result from preventing serious injuries in a crash. Hospital and medical bills can add up quickly and be financially devastating for many families. By investing in an airbag jacket, riders can save themselves these financial hardships.

Comfort: Suitscape Airbag jackets are designed for comfort and ease of use. They are made of lightweight materials and are designed to fit well without restricting movement. Riders can wear them over their usual riding gear, making them an easy addition to their riding routine.

Weather Resistant: India has varied weather conditions and riders need to be prepared for all kinds of weather conditions. The Suitscape Airbag Jacket is designed to be weatherproof, meaning it can be worn in all conditions, from hot and humid to cold and rainy.

Overall, the use of a Suitscape airbag jacket can significantly reduce the risk of serious injury or death to cyclists in India. It's an investment in safety and peace of mind that can potentially save lives and prevent long-term financial consequences.

III. CONCLUSION

So, after the product launch in market, we are sure that the product will have a great impact proving its worth and reducing the number of accidental rates.



WE TARGET THIS AS THE GRAPH OF ACCIDENTAL RATE FALLING AFTER SUITSCAPE IN USE.

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