ELAI Safety Harness Vest

IDDS 2015 - Chennai, India

Project Abstract

Research has shown that road traffic accidents (RTA) are the second leading cause of death in the 5–12 year age group in India[1]. In addressing this problem, team ELAI aims to improve the safety of motorized two-wheeler (MTW) child passengers in Chennai, Tamil Nadu and throughout India. During our research and community visits in Chennai, our team realized an alarming number of accidents when child passengers fell or were ejected from MTWs owing to non-use/non-availability of proper safety harnesses. Due to these findings ELAI decided to design a fashionable and multifunctional safety harness vest product targeted at Indian children under 12 years olds. The first sketch model and prototype of our idea were presented to and well received by local communities. Our next steps include developing a working prototype and testing the business feasibility of our product.

Context

Background

According to WHO, RTAs are one of the leading causes of child injuries, disabilities and deaths globally, contributing to an annual loss of more than 260,000 lives in the 0–19 year age group[2]. This trend was forecasted to rise dramatically around the world in the coming decades[3]. In India, 20 children under the age of 14 die everyday due to road crashes, of which 25% are accounted for by MTWs[4]. Many of these MTW users are parents who encounter difficulties in finding attractive safety solutions for their children. Hence, project ELAI was launched with the goal of developing an attractive and effective safety solution that will appeal to MTW child passengers and their parents alike.

Community description

Of all Indian states and cities, Tamil Nadu and its capital city Chennai record the top numbers of RTA deaths and injuries. Lying in the southernmost part of the Indian Peninsula, Tamil Nadu is the eleventh largest state and the sixth most populous state in India. In 2014, the state recorded the highest number of RTAs in the country at 67,232, and the second-highest number of RTA deaths at 15,176[5]. Its capital and largest city Chennai, also known as the "Detroit of India" for its bustling automotive industry, is in no better position when it comes to RTAs. As per the National Crime Records Bureau's statistics for 2013, Chennai topped the list of all Indian cities

[1] http://www.sciencedirect.com/science/article/pii/S2090536X1500026X
[2] http://whqlibdoc.who.int/publications/2008/9789241563574_eng.pdf
[3] http://www.who.int/bulletin/volumes/87/5/08-059808/en/
[4] http://sites.ndtv.com/roadsafety/important-feature-to-you-in-your-car/
[5] http://www.thehindu.com/news/cities/chennai/road-safety-chennais-dubious-distinction/article7259598.ece

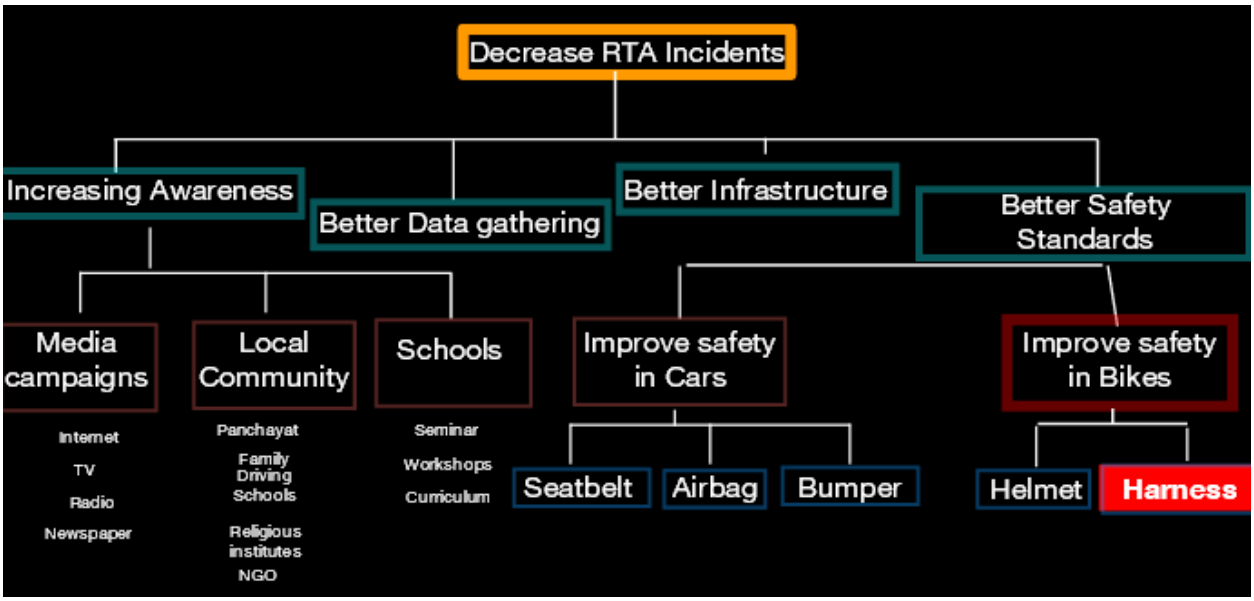
with 9,705 accidents leading to 8,700 injuries and 1,247 deaths[6]. Disheartened by the inordinate number of lives lost due to non-wearing of protective gears, the Madras High Court promulgated compulsory wearing of helmets by MTW drivers and riders in Tamil Nadu from July 1st 2015. Its effectiveness is yet to be proven, but what's downright upsetting is that the new law does not apply to child passengers under 12 years old. MTW protective gears for this age group are at once non-mandatory and non-accessible in Tamil Nadu, rendering those vulnerable children highly prone to tragic RTAs. This presents our project with a design challenge to enhance the safety of MTW child passengers under 12 years old in Chennai, Tamil Nadu.

Problem framing statement

Protective gears for MTW child passengers under 12 years old in Tamil Nadu are at once non-mandatory and non-accessible, rendering this vulnerable age group highly prone to tragic RTAs. Team ELAI aims to deal with this problem by developing an effective safety solution that will appeal to MTW child passengers and their parents alike.

Design Process

Problem framing tree



Value proposition

For two-wheeler parent drivers who are dissatisfied with the scarce, unattractive or expensive child safety accessories in Tamil Nadu, ELAI jacket is an affordable, fashionable and effective safety solution that will appeal to the parent drivers and their child passengers alike.

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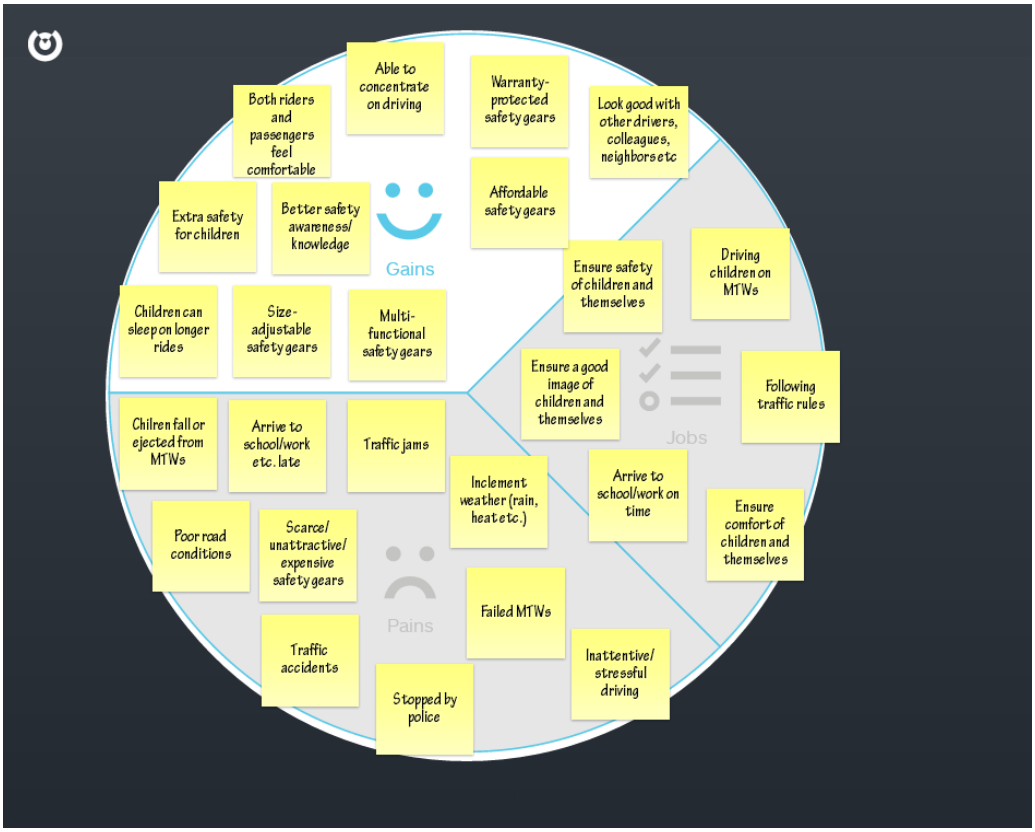
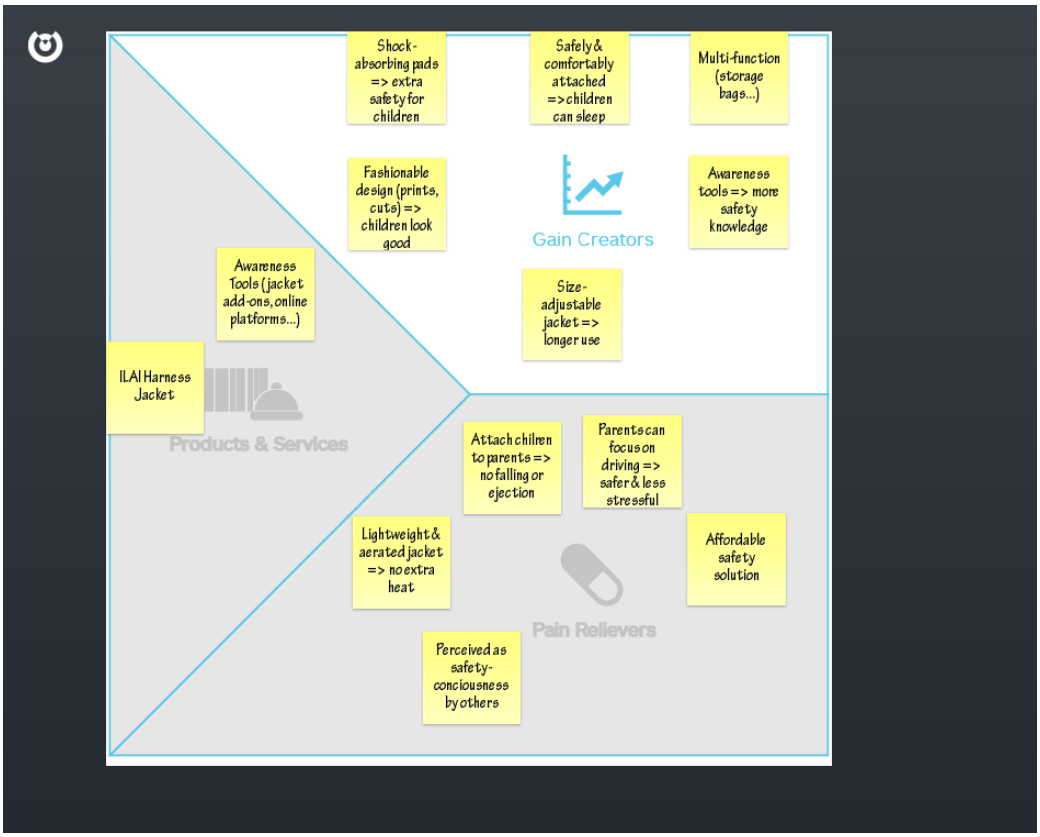
[6] http://www.thehindu.com/news/cities/chennai/road-safety-chennais-dubious-distinction/article7259598.ece

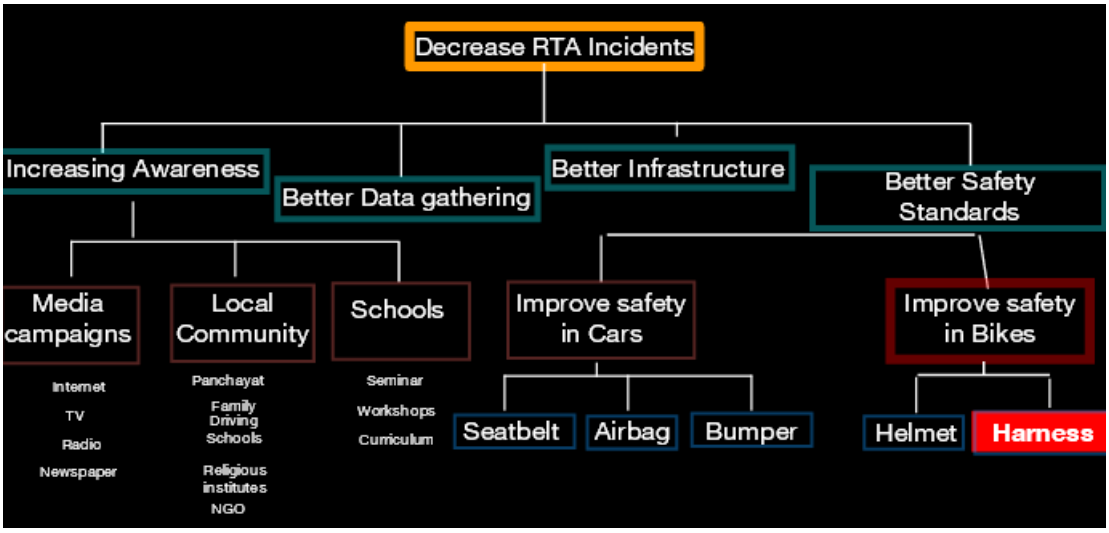

Able to concentrate on driving
Warranty-protected safety gears
Look good with other drivers, colleagues, neighbors etc
Both riders and passengers feel comfortable
Affordable safety gears
Extra safety for children
Better safety awareness/ knowledge
Gains
Ensure safety of children and themselves
Driving children on MTWs
Children can sleep on longer rides
Size-adjustable safety gears
Multi-functional safety gears
Ensure a good image of children and themselves
Following traffic rules
Jobs
Chilren fall or ejected from MTWs
Arrive to school/work etc. late
Traffic jams
Inclement weather (rain, heat etc.)
Arrive to school/work on time
Ensure comfort of children and themselves
Poor road conditions
Scarce/ unattractive/ expensive safety gears
Pains
Failed MTWs
Traffic accidents
Inattentive/ stressful driving
Stopped by police


Shock-absorbing pads => extra safety for children
Safely & comfortably attached => children can sleep
Multi-function (storage bags...)
Fashionable design (prints, cuts) => children look good
Awareness tools => more safety knowledge
Gain Creators
Awareness Tools (jacket add-ons, online platforms...)
Size-adjustable jacket => longer use
ILAI Harness Jacket
Products & Services
Attach chilren to parents => no falling or ejection
Parents can focus on driving => safer & less stressful
Lightweight & aerated jacket => no extra heat
Affordable safety solution
Pain Relievers
Perceived as safety-conciousness by others

Summary of design process

1. First community visit to Kuthambakkam village: engage and gather information from our stakeholders about road traffic issues.

2. Problem framing tree: the whole framing tree for the problem of road traffic accidents was mapped out to identify the main issues and determine our direction.



3. Observe-Ask-Try (OAT): after defining MTW safety gears for children as our design challenge, we conducted OAT on the streets to better understand the problem.


4. Brainstorming and Concept development: with the knowledge gained from OAT, we conducted a couple of brainstorming sessions to build ideas for our design solution.


5. First sketch model and prototype: after defining the concept, we quickly built the first sketch model and prototype to present to the community.

6. First feedback: the community agreed with the identified issues and provide useful feedbacks on our first prototype

7. Second prototype: with the feedbacks gained, we developed the second prototype to present to students and faculty at B.S. Abdur Rahman University.

Technology/Final Prototype

Design requirements

How does it work?

Performance

Bill of materials

Lessons Learned

Community engagement

User feedback

Troubleshooting

Next steps/Project future

Reflection on project viability and other design opportunities

Continuity/dissemination model

6-month plan and team engagement (roles and responsibilities)

Anticipated risks and challenges

Stakeholders

Contact Information

Community partners
NONE

Team members
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