AUTONOMOUS DRIVING ROBOT

make any vehicle, autonomous

RaghuNath (RaNa)

PROBLEM

* Autonomous vehicle development results in **expensive** product

* Commonly implemented on **vehicles** with high **customizations**

* Trivial vehicle issues cause the **asset** stay **idle**; **loss** of **revenue**

* Autonomy is possible only on a designated vehicle; **no flexibility**

SOLUTION

* An autonomous **driving robot** in the driver seat operates the controls

* **Separate** from the vehicle; Can be **moved** to other vehicles

* Has **contingency modes** to address the technology limitations

MISSION

We turn **any** standard **vehicle** into a **driver-less** vehicle, as autonomous as other expensive commercial solutions

We help to **increase** the **asset utilization**, by quickly shifting our product to any other standard vehicle

WHY NOW?

* **Social distancing** has become the new normal

* Autonomous vehicles help reduce physical contact

* World **economy** is **down**: COVID-19

* Expensive assets go out of commission for unrelated problems

* Business world needs solutions to quickly **redeploy assets**
    * Zoomcar vehicle attachments from owners
    * Paid vehicle pooling and ride sharing with QuickRide
    * AirBnB postings and homestay portals

MARKET SIZE

* Indian passenger vehicle market grew at a CAGR of **6.2%** (2013-19)

* Approximate addition of **3.3 million vehicles a year** in India

* Around **36 million** standard **vehicles** would be available for retro-fitting to autonomous mode in India
    * Assuming an average car usage of 11 years

* A 2% conversion rate with a US$11,000 kit creates a market size of about **US$ 8 billion** in India
    * User base includes businesses looking for better utilization of vehicles and individual owners choosing not to drive
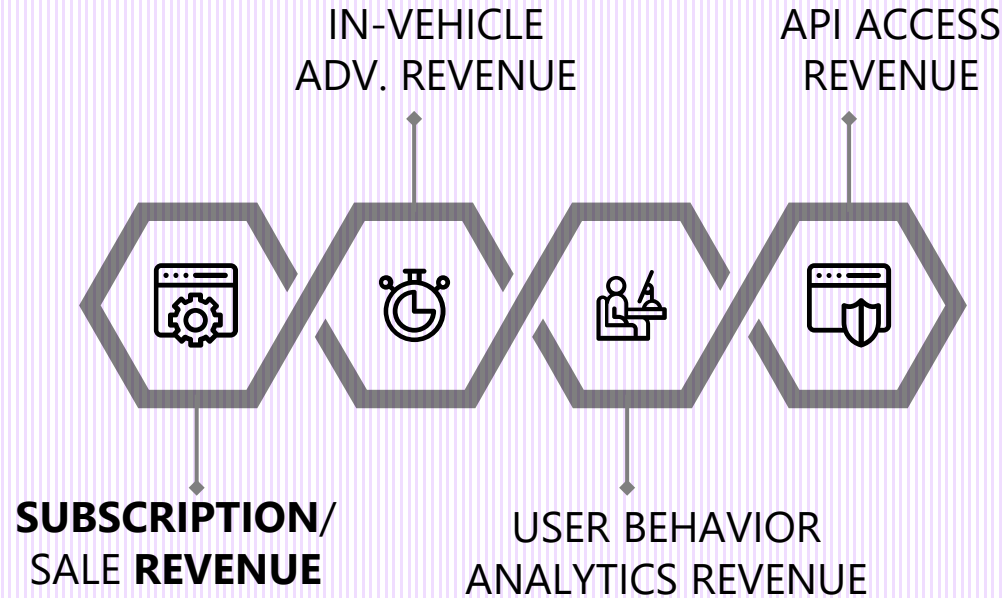
PRODUCT

We will work on an **autonomous robot** placed in the vehicle, that **drives vehicles** using the human operable controls in the vehicle.

The driving robot's actuators will be specially designed to adapt to **any vehicle** of similar weight category. It can be **removed** from the vehicle and **quickly assembled** in a new vehicle.

Customized deep learning models, computational resources, and advanced control systems, backed by remote assistance system will enable the driver-less travel.
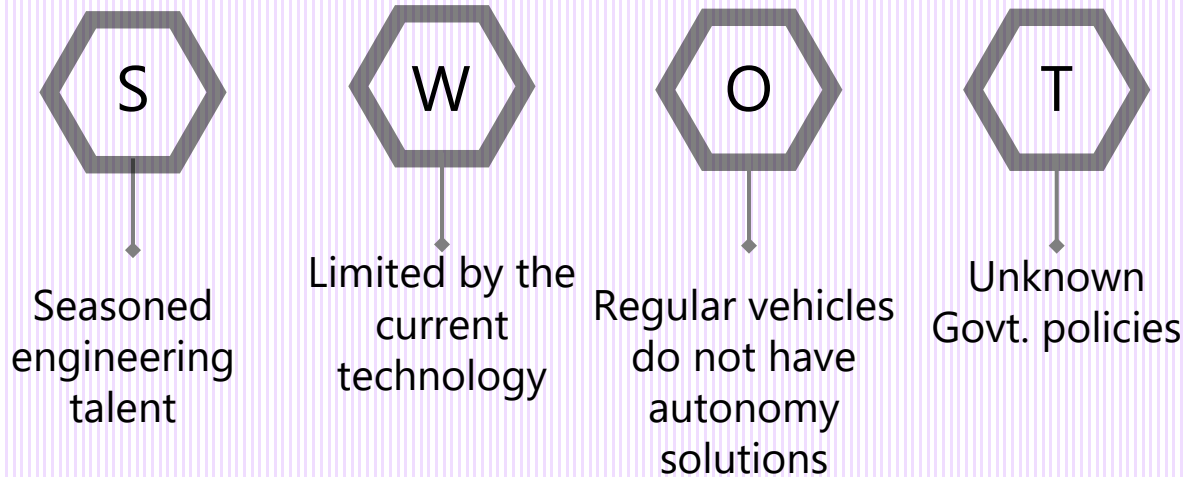
BUSINESS MODEL

IN-VEHICLE
ADV. REVENUE

API ACCESS
REVENUE

SUBSCRIPTION/
SALE **REVENUE**

USER BEHAVIOR
ANALYTICS REVENUE

*Break-even: 33,500 subscribers for 10 years

SWOT ANALYSIS

S	W	O	T
Seasoned engineering talent	Limited by the current technology	Regular vehicles do not have autonomy solutions	Unknown Govt. policies

PROPOSED TEAM

* Selected few AEG Lead Engineers as core members

        * I am an **IITM** B.Tech+M.Tech graduate with **14+** years, **4** granted **patents**, and international conference **presentations** in variety of engineering fields

               * ABS, BMS, Haptic systems, Electric motors, Optimization and Embedded Systems

        * Completed projects related to **self-driving vehicle** technology

               * machine vision

               * deep learning for object classification

               * deep learning for behavioral cloning

* Several long-term and short-term **remote contract** employees

WHY FUND THIS?

* Multi-billion dollar revenue opportunity with **high profit margins**

* **Long-term** business opportunity focused towards **future needs**

* **International** market opportunities; everyone has **equal chance**

* Requires **high** engineering **effort** and **time** for execution

* **Early** starters have clear **advantage**

THANK YOU

RaghuNath (RaNa), AEG/TVSM
ra@ieee.org
raghunath@tvsmotor.com
+91-74110-72448