

Where is my Train?

Intelligence is the ability to avoid doing work, yet getting the work done.

- **Linus Torvalds**



Intro

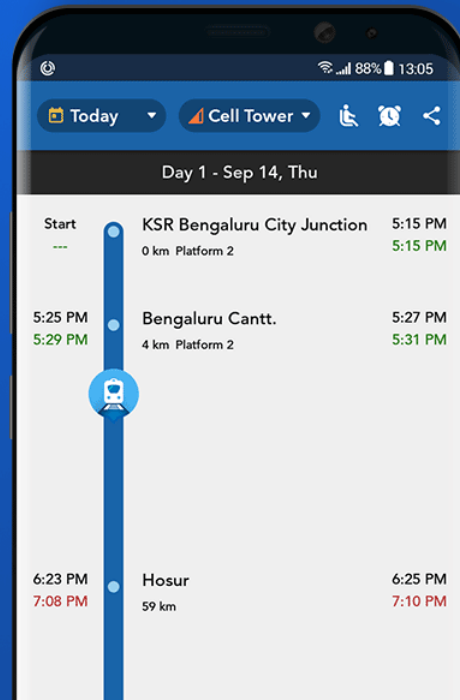
Me: B.E. -> Veveo -> Where is my Train -> Google

Where is my Train

- 100 million+ Downloads (organic growth)
- No. 1 Travel app in Play Store
- Google's first product acquisition in India
- Bootstrapped startup

Train location without internet

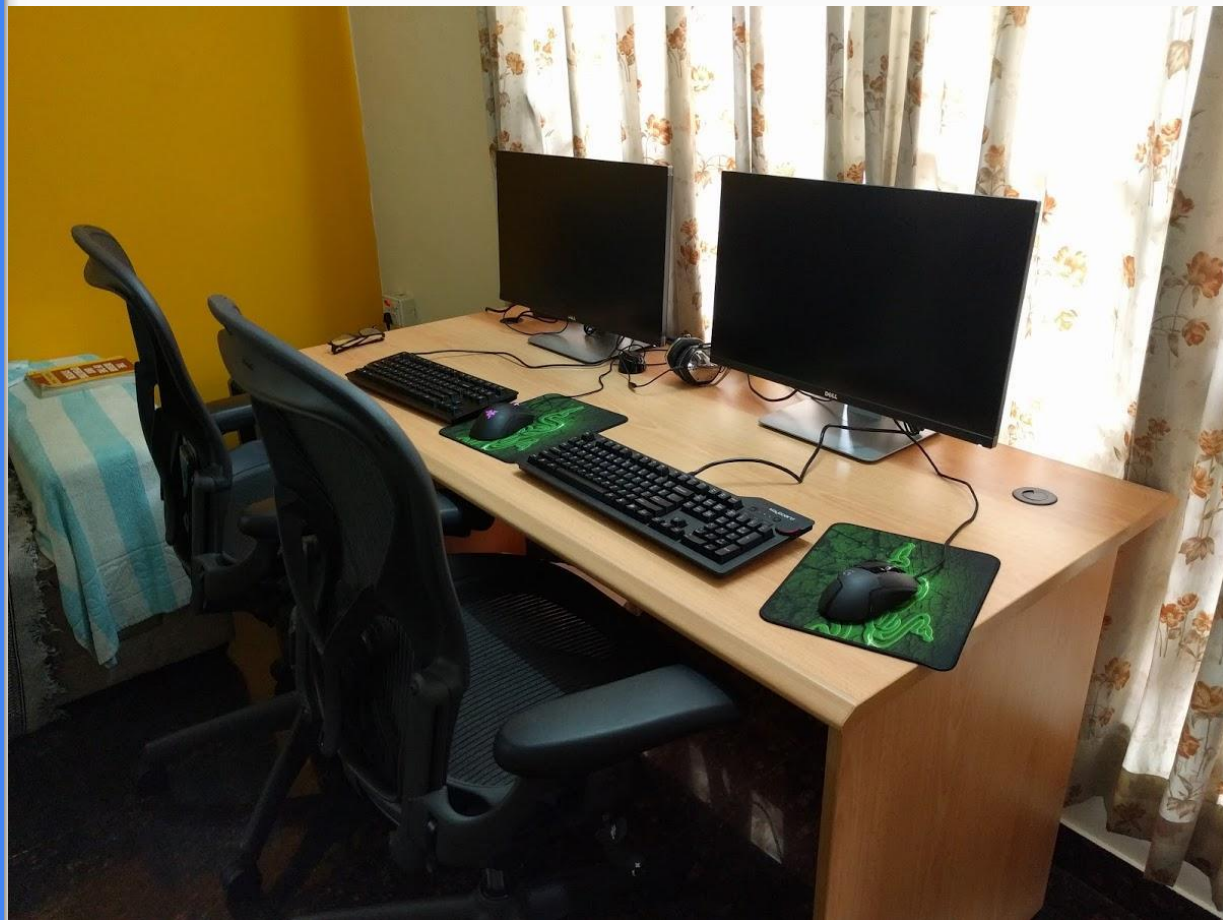
- ✓ Uses cell-towers during your journey
- ✓ Needs internet only outside the train
- ✓ Station based wakeup alarm



First Home Office

Arun

Me



Second Home office

Arun

Me

Sashi

Bala

Arun

Kamakshi

Hepsy



Joined Google

Whole Team



Live status problem

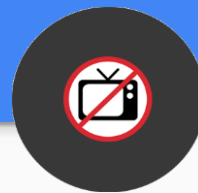


Trains

Long
delays



Stale official
status



No
display

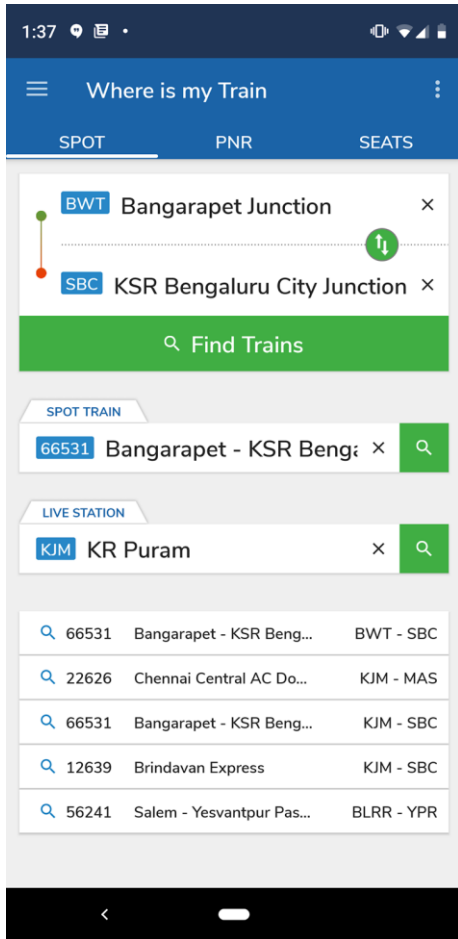


Users

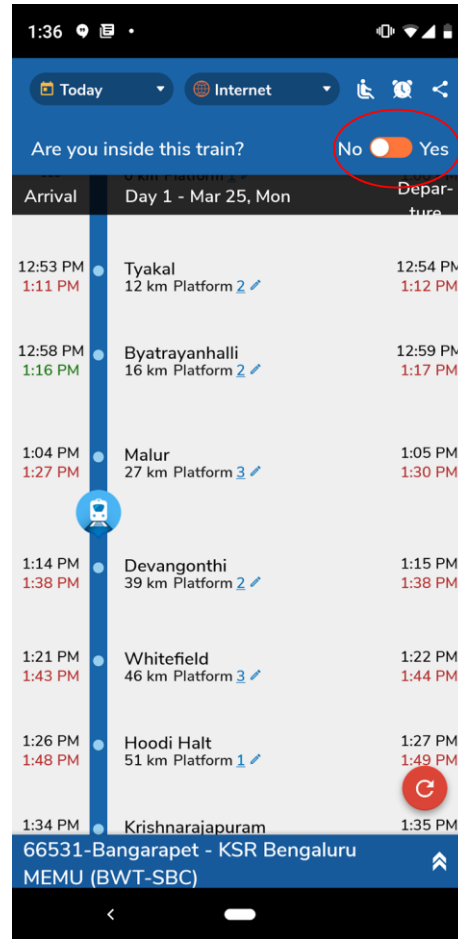
Battery
conscious



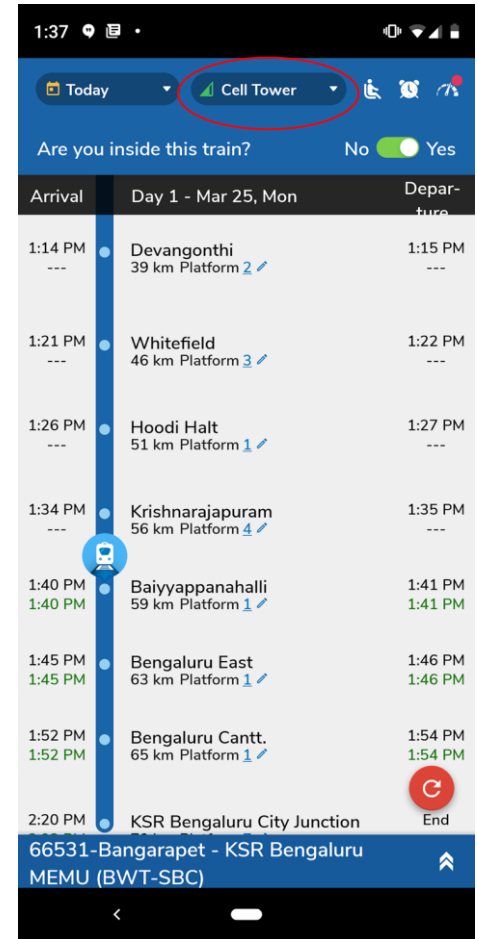
Limited
connectivity

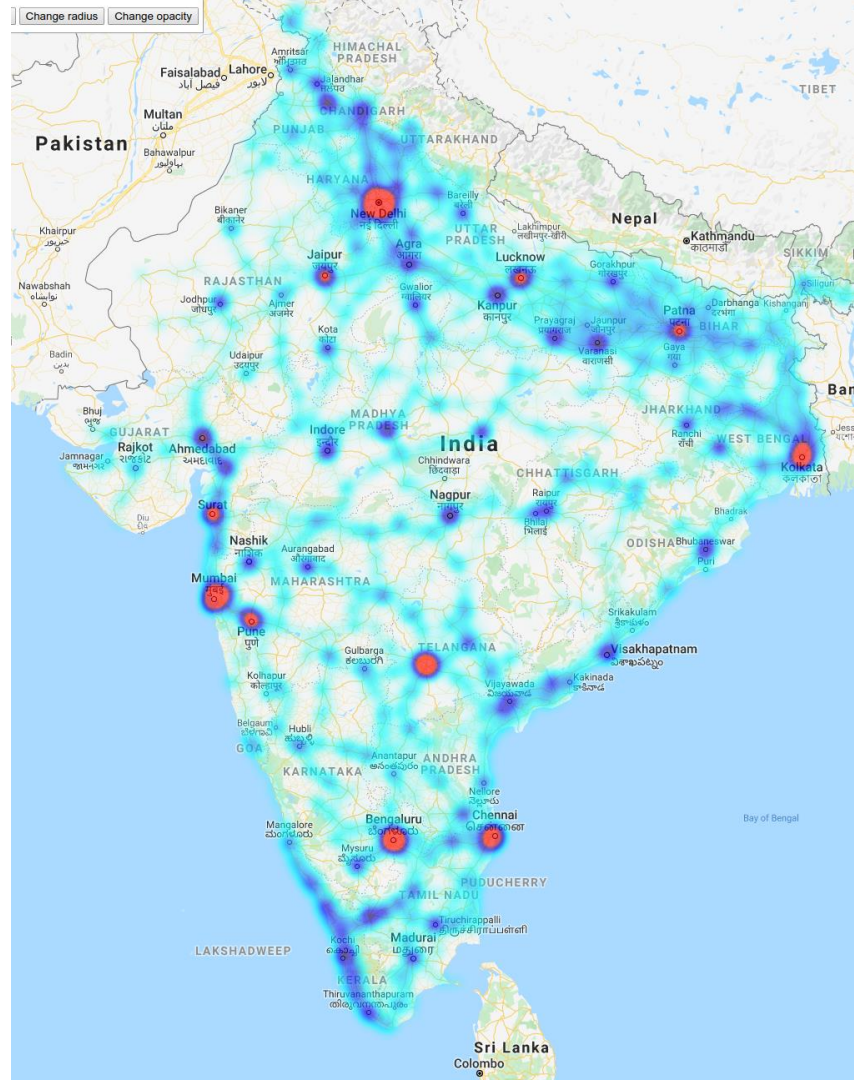


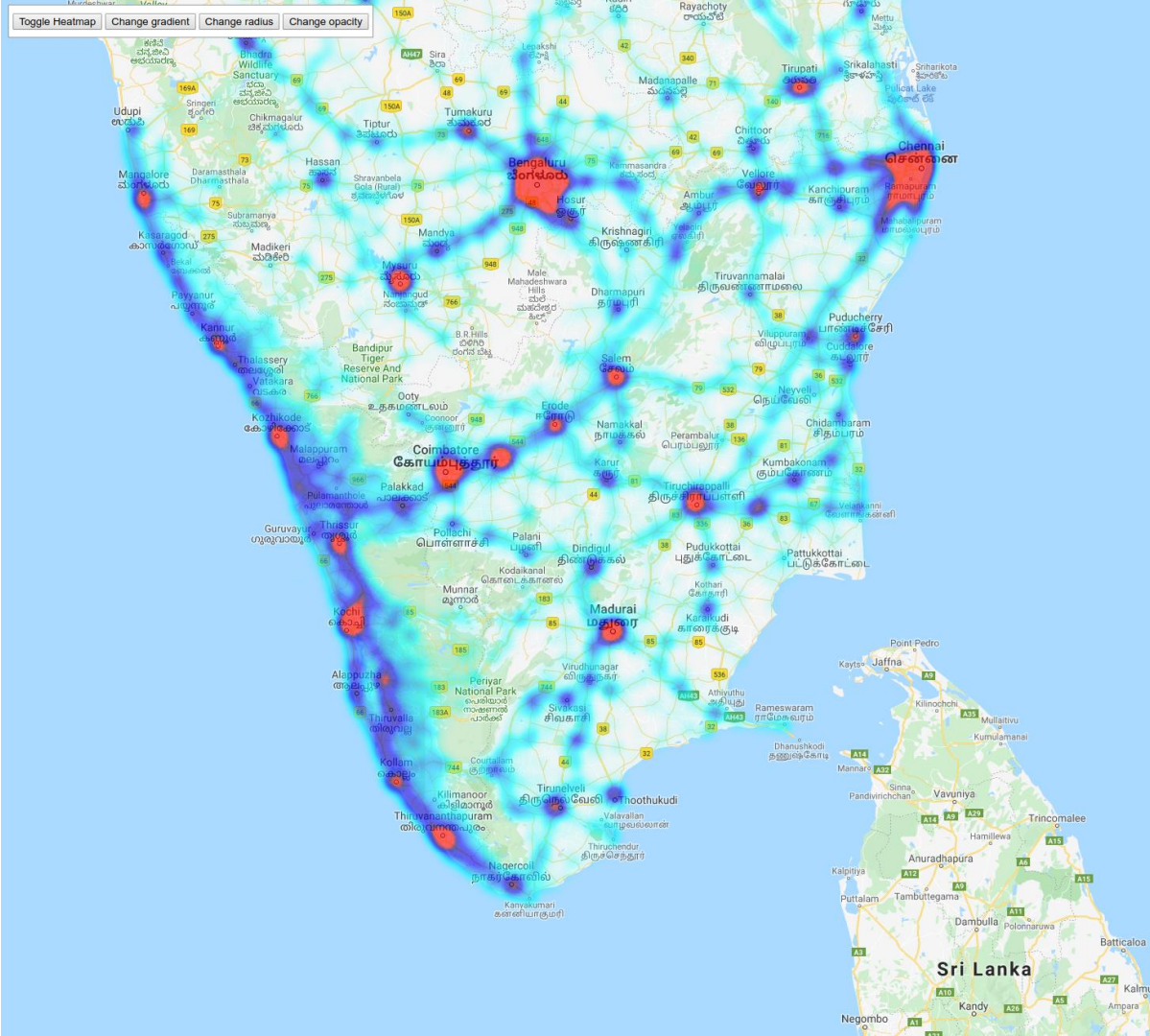
Select a train



Inside Train







Wimt's Solution

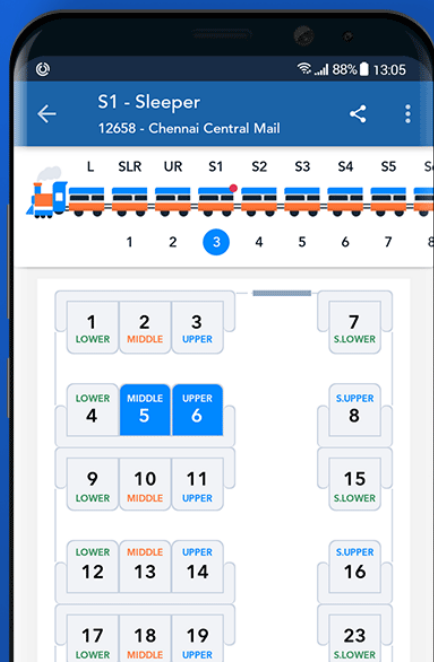
- **Cell-Tower based tracking for users inside train - without internet or gps**
 - Offline Schedules for all the 12K trains
 - Packing cell-tower locations within app (4M+)
 - Created critical mass of users inside train
- **Crowdsource user locations to create most live status**
 - Most trains within 1-2 minutes staleness
 - Official source is 20-30 mins stale on average
 - Became the de-facto app for tracking trains
 - Not just passengers but also rail officials, chai-wala's

Challenges solved so far

- **Offline Schedules**
 - 1Mb for packing 12K schedules
 - Stores routes as graphs - heuristics for finding intermediate stations
 - Handles slip trains, renamed trains, optimizing local trains (store offset only)
- **Packing 5-10M cell-tower locations in mobiles**
 - Uses logical patterns in 2G/3G towers from different operators
 - Splits into ~20 files for each region
- **Crowd-source - Spotting trains from users**
 - Geometric algorithms to determine if user is inside or outside - overlap/bootstrap
- **Real-time ETA predictions based on past trips**
 - Information on how much train can catchup in every segment if delayed
 - Minimum time train stops in each station (even if delayed)
 - Used in crowd-source to avoid errors due to early departures

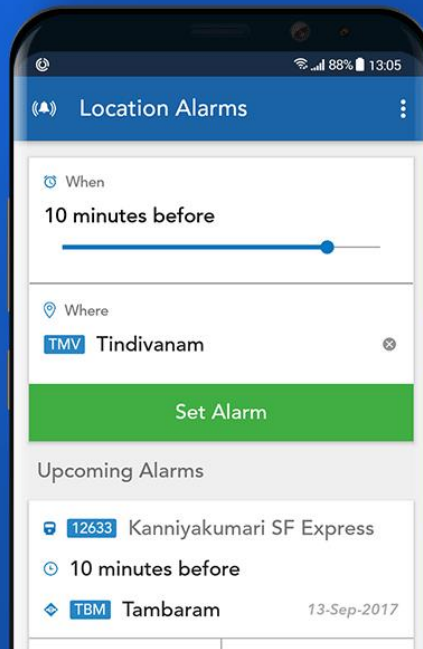
Coach & Seat Arrangement

- ✓ Get seat positions from PNR
- ✓ Coach position of trains



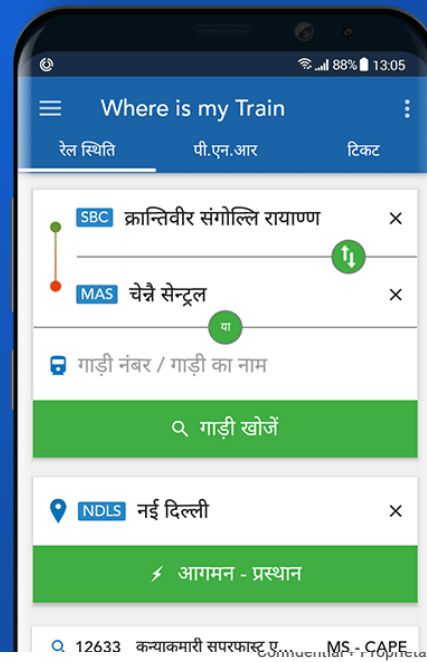
Location alarm without GPS

- ✓ Most battery-efficient location alarm
- ✓ Sleep peacefully even in delayed trains



8 languages

- ✓ English
- ✓ हिंदी
- ✓ తెలుగు
- ✓ বাংলা
- ✓ मराठी
- ✓ தமிழ்
- ✓ ಕನ್ನಡ
- ✓ മലയാളം



Thank you

Q & A