

# The Phone Drone

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## Project Team Members (Team 7)

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## 1. Executive Summary (Overview)

Do you lose stuff easily? A lot of time can be wasted trying to find things important to you, and one of those things is your phone.

Why waste time finding your phone if your phone could find you?

Introducing: The Phone Drone!

An innovative phone case taking advantage of modern robotics to give your phone the mobility to always find itself for you!

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## 2. Market Research and Need Justification

Phone loss represents a significant and persistent problem in modern society. According to research by [MSPowerUser](#), analyzing data from multiple sources including the Metropolitan Police and FCC reports, phone loss affects millions of users annually. [Ipsos research](#) found that 28% of smartphone users have lost their phone, with 23% experiencing loss and an additional 5% having devices stolen.

The financial impact is substantial. [Allstate Protection Plans' 2024 Mobile Mythconceptions Survey](#) revealed that 78 million Americans damaged their smartphones in 2023, with 8% permanently losing their device and 5% having phones stolen. The survey found that Americans spent USD 8.3 billion on screen repairs alone in 2023, nearly tripling from USD 3.4 billion in 2018.

## Current Market Solutions and Their Critical Limitations

Existing "Find My" Applications:

- Apple's Find My iPhone
- Google's Find My Device
- Samsung's SmartThings Find

Critical Gaps in Current Solutions:

1. Passive Location Only: Current apps can only tell you where your phone is, not retrieve it for you
2. Limited Indoor Accuracy: [GPS accuracy research](#) shows that while GPS can be accurate within a few meters outdoors, indoor accuracy decreases significantly due to signal blockage from buildings and walls
3. Sound-Based Recovery Limitations: [Find My iPhone accuracy studies](#) indicate that audio alerts may be muted, inaudible in noisy environments, or ineffective when phones are buried under objects
4. Manual Search Still Required: Users must still physically search the indicated area, often spending valuable time in close proximity to their device

## Market Opportunity and Target Demographics

Primary Target Market:

- College students and young professionals (ages 18-35) who frequently multitask and misplace devices
- Busy families juggling multiple responsibilities
- Elderly users who may struggle with technology-based location solutions

Market Size and Growth Potential:

The phone case market presents a significant opportunity. According to [Technavio's 2024 market analysis](#), the phone case market is expected to grow by USD 13.9 billion from 2024-2028, driven by rising smartphone penetration. [Research and Markets' U.S. Mobile Accessories Report](#) projects the U.S. mobile accessories market to reach USD 34.22 billion by 2030, expanding at a CAGR of 6.7% from 2024 to 2030.

## Competitive Analysis

Direct Competitors: Currently none exist in the active phone retrieval market  
Indirect Competitors:

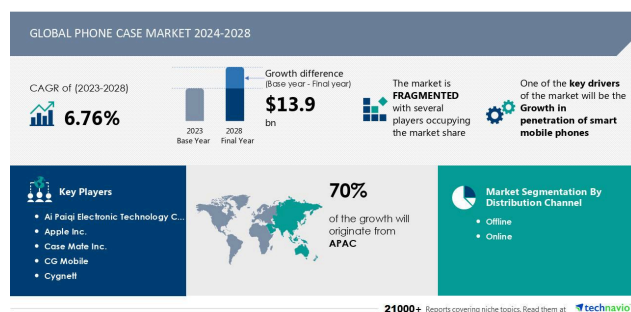
- Tile/AirTag trackers (passive location only)
- Smart home assistants with "find my phone" features

- Traditional phone cases with basic features

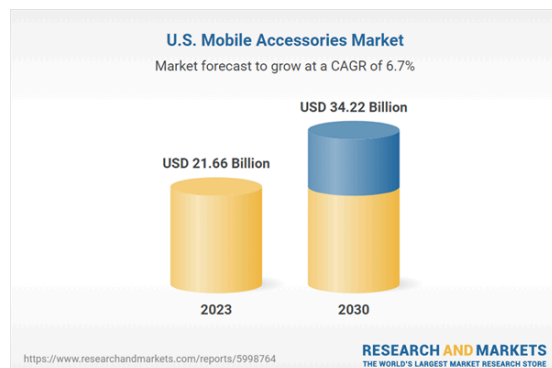
#### Our Competitive Advantage:

- Active retrieval vs. passive location indication
- Multi-terrain mobility (air, ground, water capabilities)
- Autonomous navigation back to user location
- Integration with existing smartphone ecosystem

The Phone Drone addresses a multi-billion dollar problem with an innovative solution that transforms passive phone location into active phone retrieval, representing a blue ocean opportunity in the rapidly growing mobile accessories market.



[Link](#)



[Link](#)

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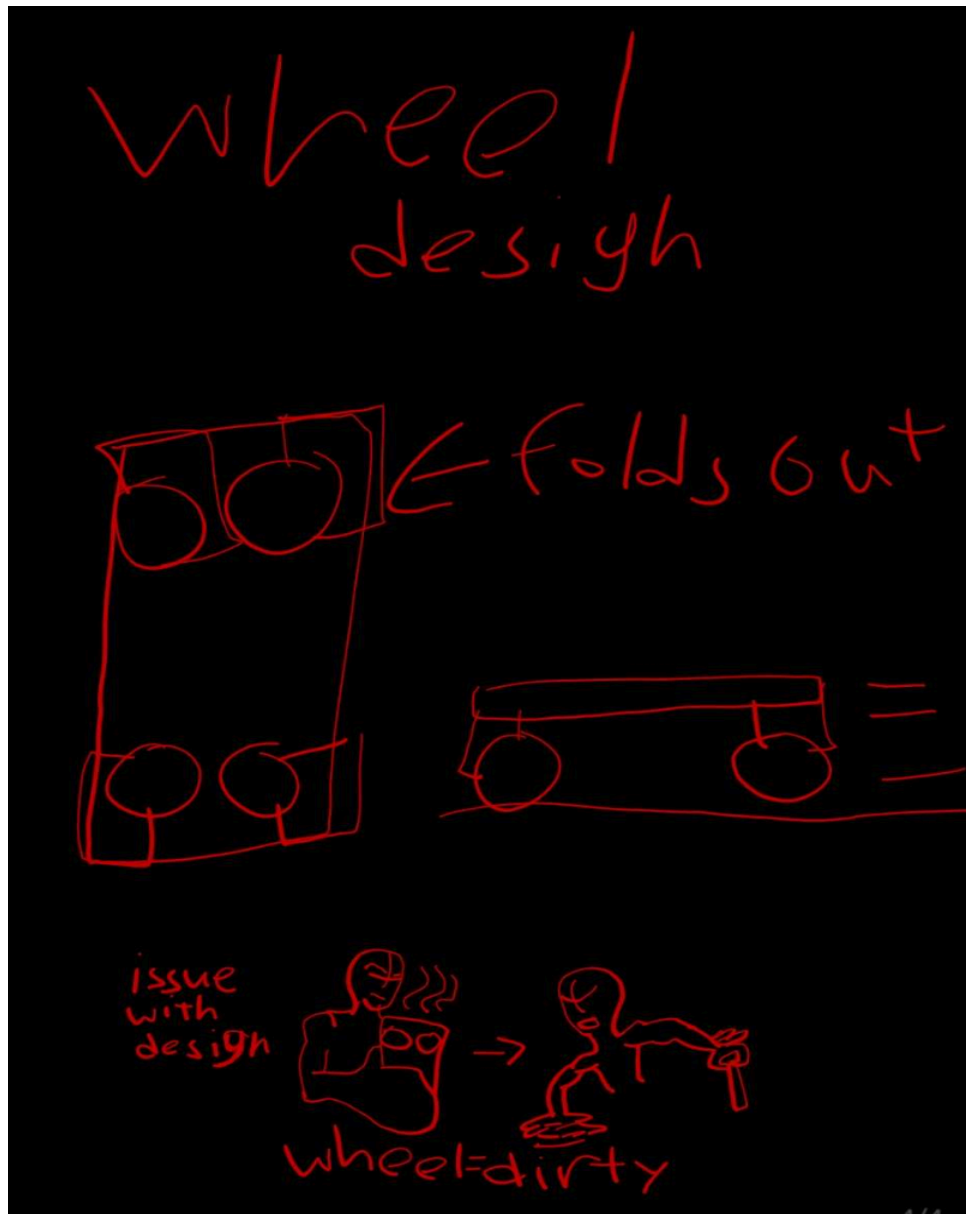
### 3. Product Description

- Appendages (function as legs and to help it get uncovered/ untangled since a phone reasonably would be lost under stuff a lot)
- Legs double as propellers so that way it can navigate off high surfaces!!!
- Comes with a device/application that the drone's brain would use as its "destination"
- Camera to detect obstruction to destination, and then move perpendicular to destination until obstruction is passed, checks to see if route is clear on set intervals
- Device activates through click of a button on either the app or keychain remote and using features mentioned above, navigates towards the user to return phone

*"People frequently lose their phones. I know this because I'm one of those people and frequently have trouble with that too!"*

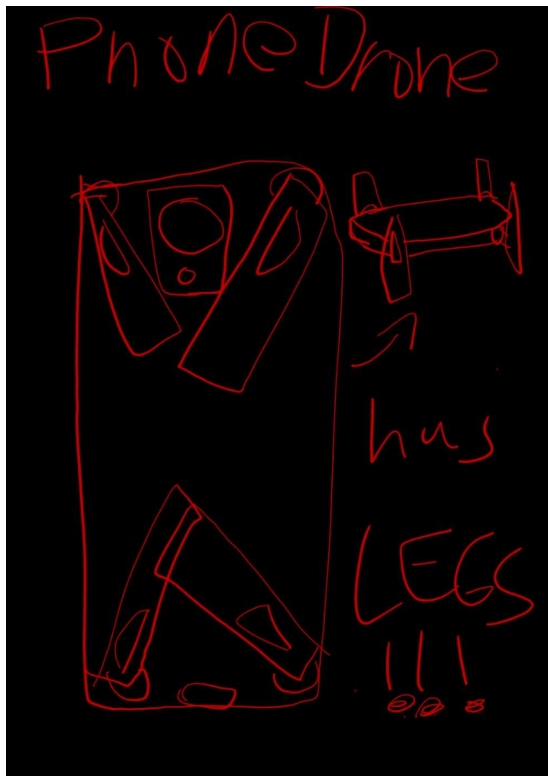
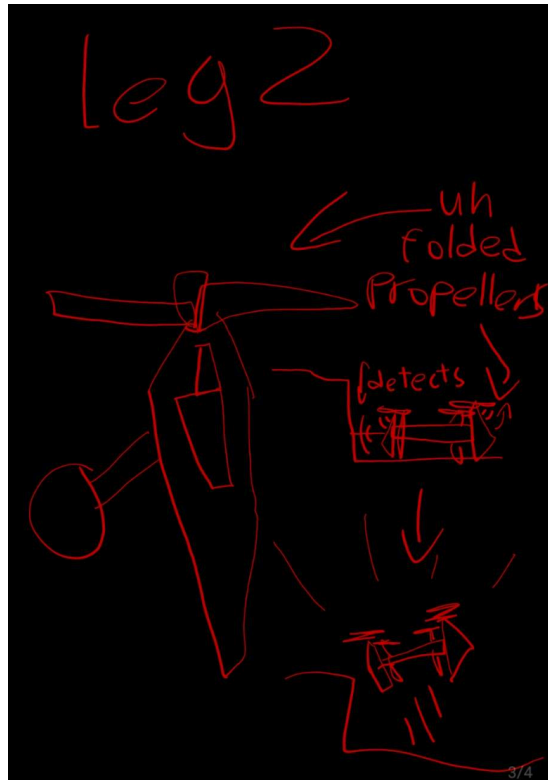
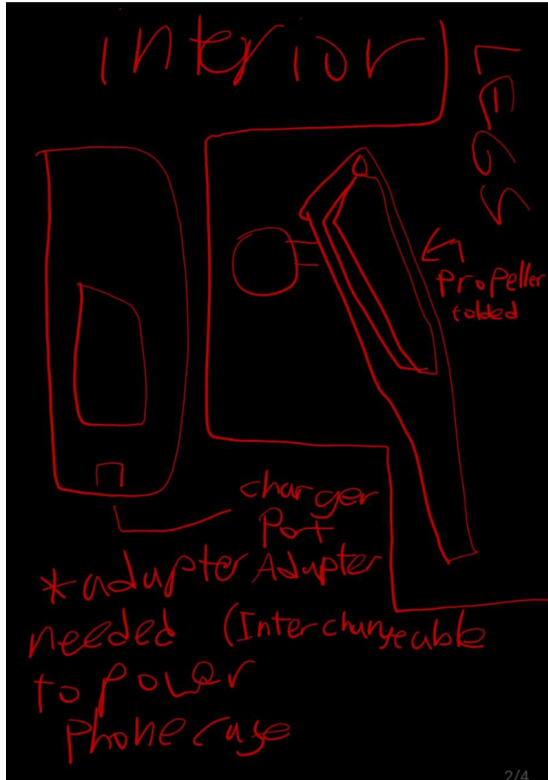
- *Brian Teruya*

I've taken some of our various designs into consideration. One of our ideas was to have wheels on the case.



*Image of the wheeled phone case concept art*

However we zeroed in on the idea that the phone case would operate similar to a spider, or a quadruped mechanized object. We had also envisioned propellers at the knee of each leg to conquer higher elevations.



concept images of final design

Here we can also see that the phone case is powered by the phone. I took device accessibility into consideration and made sure that charger port adapters are necessary for the functionality of this contraption. We even added our own camera to the case. The phone connects to that camera and the mechanical legs and propellers through the adapter. Operation is done through a remote signal. A locator is installed on the remote and on the phone case.

(note: it does take more power to activate and use the propellers and legs. I would like to recommend a powerbank installed onto the phone case. It would make sense, especially if we can fit a camera...)

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## 4. Possible Issues and Counterarguments

- Damage Control (parts may weaken or be rendered defunct due to wear and tear or possible rusting).
  - In such a case, use long term materials for the products as well as advise the consumer to take care of the product to ensure long product lifespan
- Cramped spaces
  - Thinking about this with my current proposed design, phones often get stuck under pillows/blankets, inside couch cushions, ect. I can easily see the current design getting itself tangled and being unable to move in these scenarios
  - Appendages help scurry the phone though cramped spaces or remove blockers on top of it.
- How do we recall the phone?
  - If it is a physical recall button, consumers may find it irritating to carry it around or may leave it somewhere and when they need to use it they now need to find the recall device to then recall the phone, which can be redundant.
  - If it is an app, that would rely on the user to have another device available, such as a smart watch, which can severely limit the consumer base.
  - Maybe automatic or voice activated return, but voice activated can have issues with range and automatic has issues with when exactly it should return.
  - We offer both a button that is portable and can attach to your keychain to recall the phone as well as have an app that can be downloaded and connected to case to recall phone
- Different phone models
  - With different phones come different sizes and shapes, which would require a different design for each phone that we decide to include in the available models, which could be expensive. This is due to the electronic components, it makes it

much harder to just translate the design. Plus dif strengths needed for the propellers or other transporting parts

- Start on newer devices as people that have newer devices are more attached to them and likely have more reason to buy a device to make sure they don't lose it. If it takes off, we can move to more phones.
  - Signal strength/battery. How far away from the phone would you need to be for this to activate?
    - I mean this is more to find its specific location since finding its general location is already very feasible so the use case for this is sorta fine if its activation range is limited but still.
  - Find my iPhone already does this, right?
    - Find my iPhone certainly can help find the general location of a phone, but it's not perfect at all. A phone can run out of battery, get hidden under something you don't expect, or end up in a hard-to-read place! The phone drone streamlines the process of finding that phone and makes it much more efficient to get it back in your hands.
  - What about if you break the case, would you have to buy a whole new phone case?
    - Understandable! This is an advanced, innovative piece of technology, we understand the risk of having it broken. As such, we offer a warranty for a fraction of the cost of a new case, providing free repairs and replacements to our users that accidentally break their case, as well as offering repairs in general, for a small fee, to fix components that get damaged. We also offer tech support for smaller questions the user may have about our product or smaller issues they could fix themselves.
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## 5. Conclusion and Recommendations

To reiterate, we want to prevent permanently losing your phone somewhere in your house or on the go. We believe our product is the next iteration of that solution using modern day technology.

Our product allows the phone to traverse its way back to you through a remote signal, and make it much easier to pinpoint its precise location, alleviating the time spent searching that room all over for the phone. It allows you to not be reliant on someone else's phone, owning an apple watch, or even the phone itself needing battery, since the case operates independently.

It makes retrieving your phone a stressless process that you will never have to worry about again! That's why we wish to move forward with the development of this product, and we hope to have your support too.



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## 6. Appendix

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Graph 1

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Graph 2

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Mockups: Brian Teruya / Henry Watson