e-minder
Final Presentation

By: purple mango

Presentation Outline

Estimated Time: 30 minutes

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OUR COMPANY

OUR TEAM

CEO

Dylan Rowsell

Software & Embedded
Development

CCO

Adham Sorour

Software & Embedded
Development

CMO

Anika Sheikh

Software & UX
Development

OUR TEAM

CFO

Ramanpreet Kaur

Hardware & Design
Development

CTO

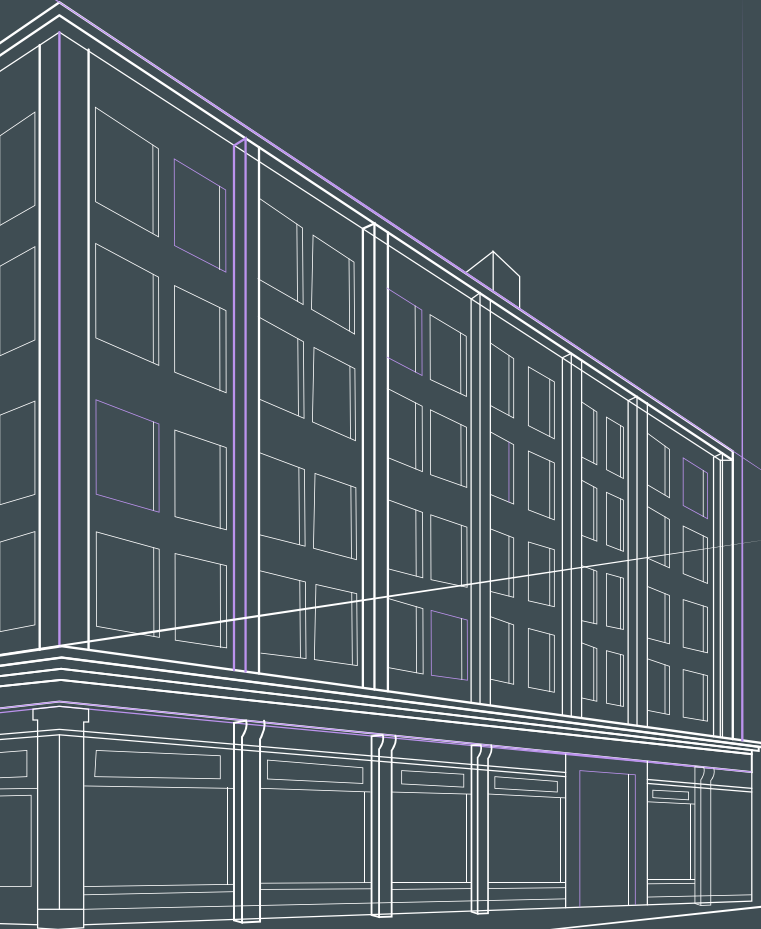### Harley McLachlan

Hardware & Design
Development

CCO

Riku Makita

Hardware & Design
Development

01

Initial Pitch

Elevator Pitch

- Our goal is to sell IoT devices to consumers and commercial care homes

- e-minder is our flagship device

- Tracks user tagged items when passing the device
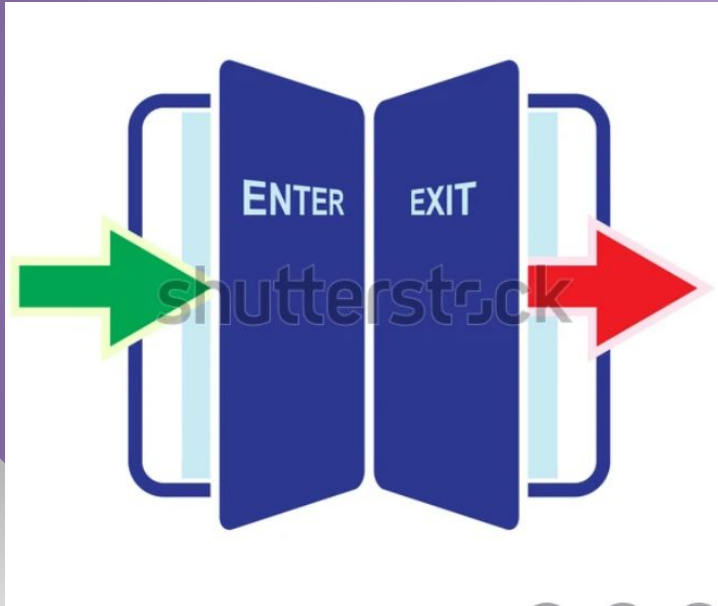
- Helps to remember important items

Pain Points that e-minder Solves

- The clients in care homes are naturally forgetful

- Having high paid healthcare workers retrieving items is inefficient

- Workers changing shifts can lead to lost information
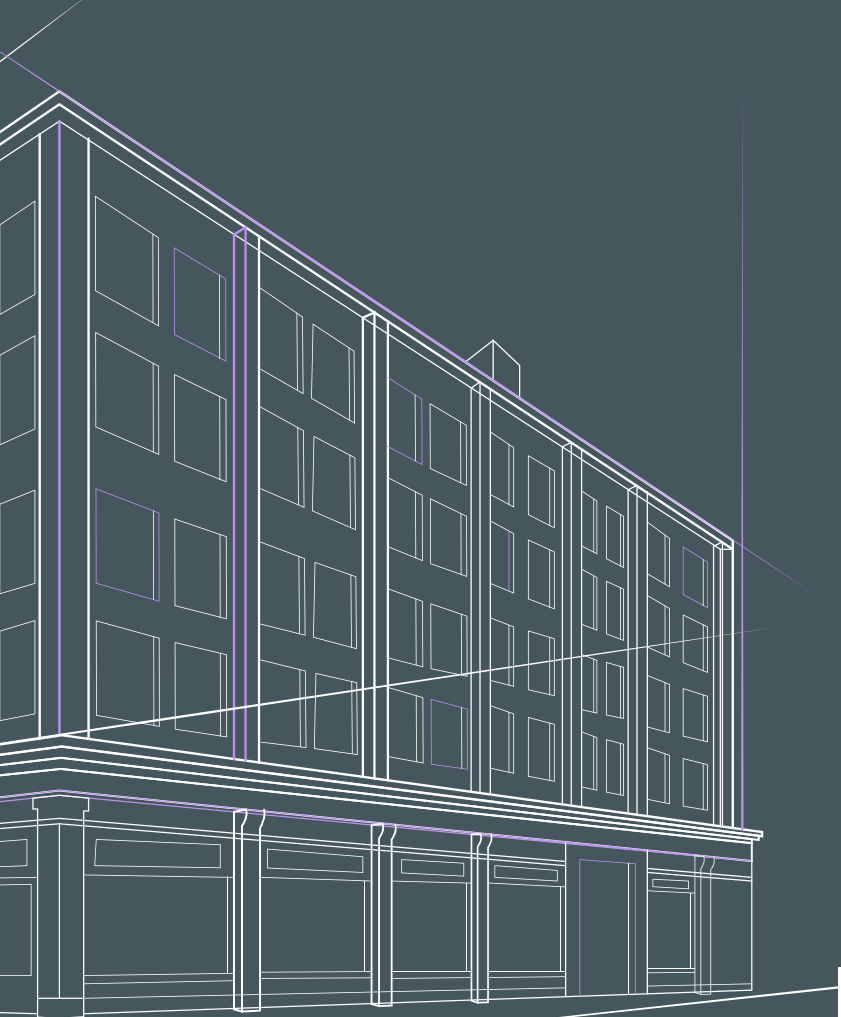
Entrance and Exit Strategy

- Initially need investment for the production of 3000 units

- Extend to market for ADHD and families

- Product could also be useful for commercial inventory tracking
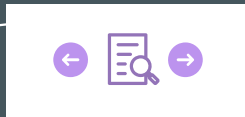
Value Proposition

- Saved time for care home workers

- Remembering medications and aides

02

Product

- Item scanner identifies the person by what their carrying
- Notifies user of any missing items
- Mounted out of the way, at the exit of home with scanners at each side
- Complementary App to manage items, set scheduled reminders,
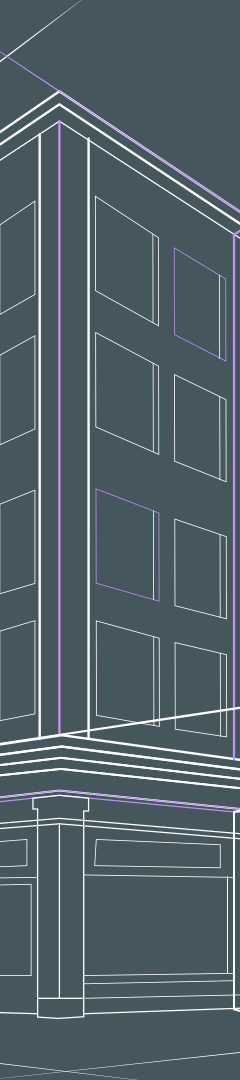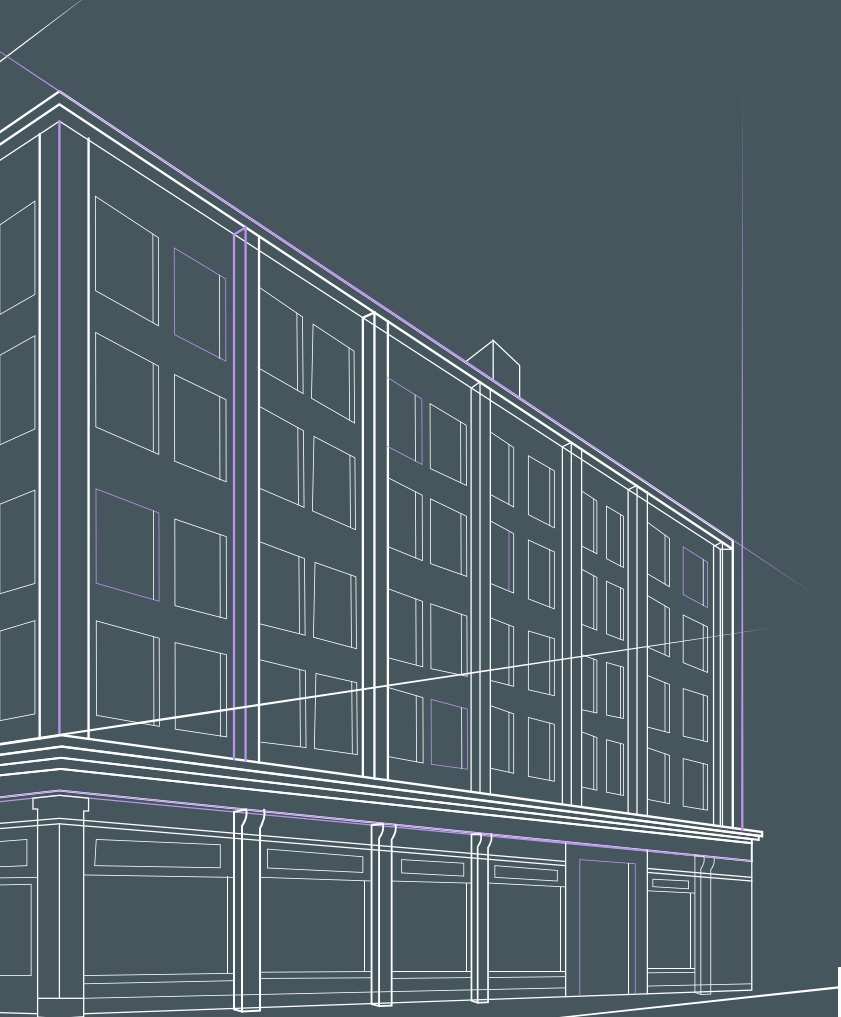
e-minder smart reminder device

Be out of the way

- Scanners are installed around the exit door

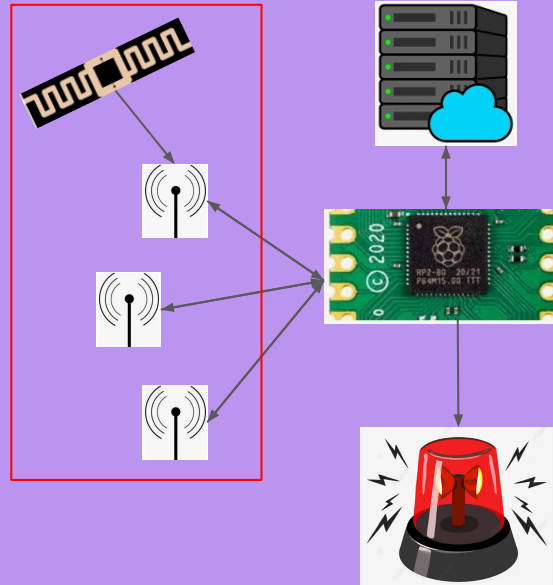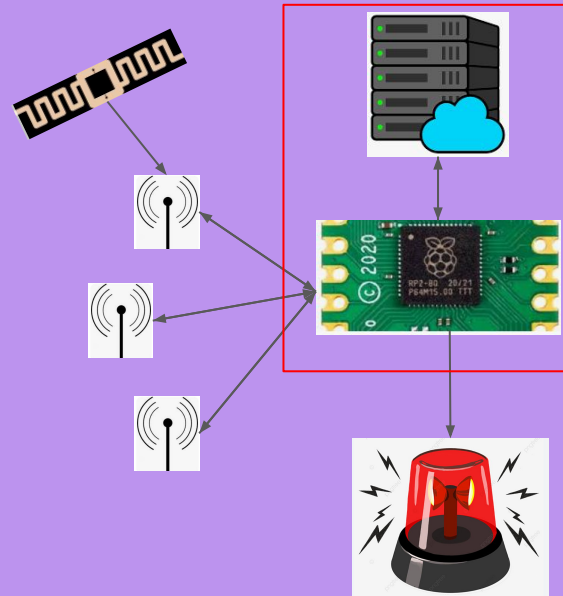- Low profile, quiet

||||

User Has Zero Tags

03
Technical Case

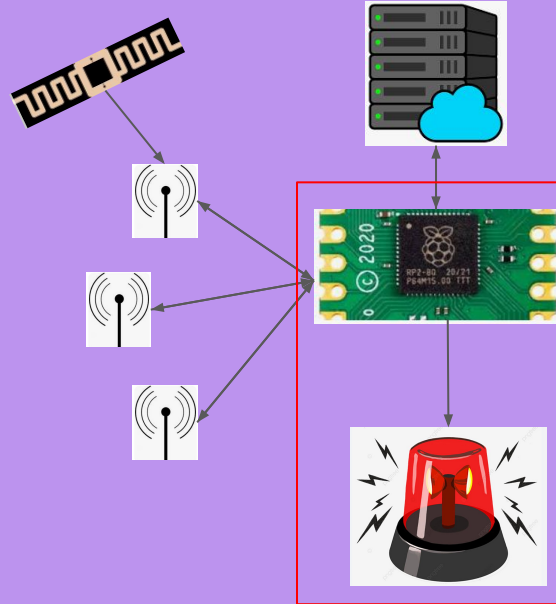- 3 UHF Antennas scan identifies tagged items on the person
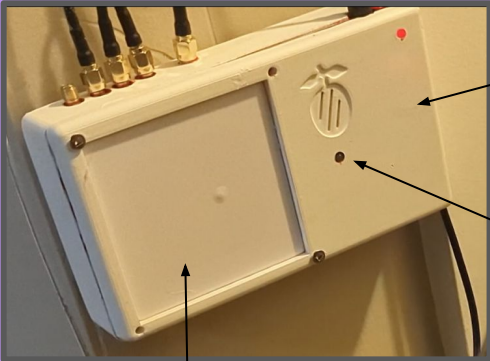
- Controller retrieves user profile from server

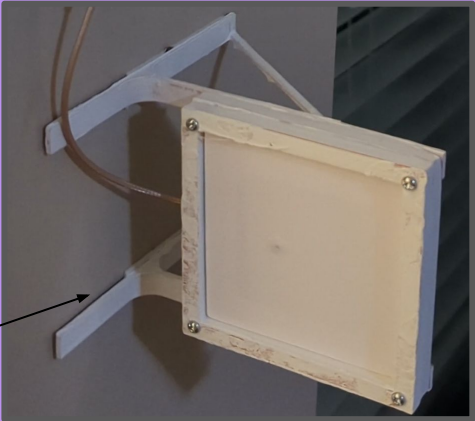- Notifies users of missing items through audio and visual alert

Construction

ABS plastic enclosure available in multiple colours

LED / Audio Feedback

Multiple easy mounting options

Modular Internal components

Software
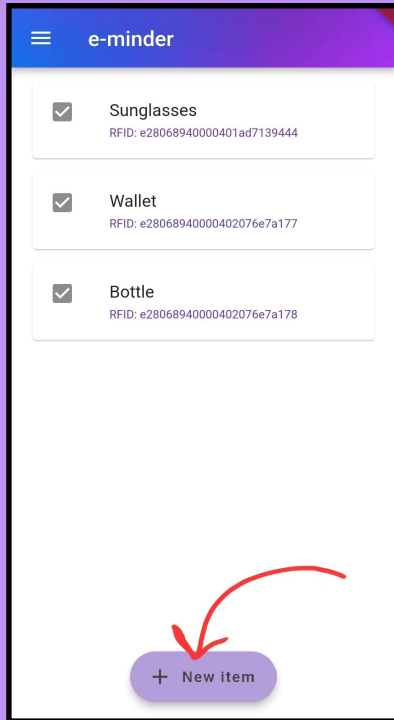
Mobile App that is intuitive and easy to use
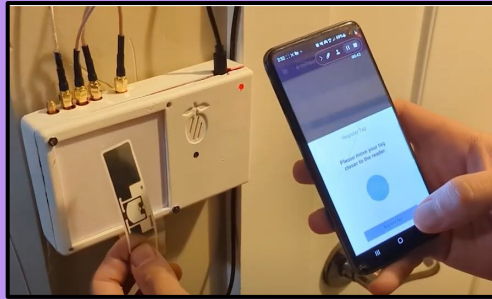
Customizable item schedules
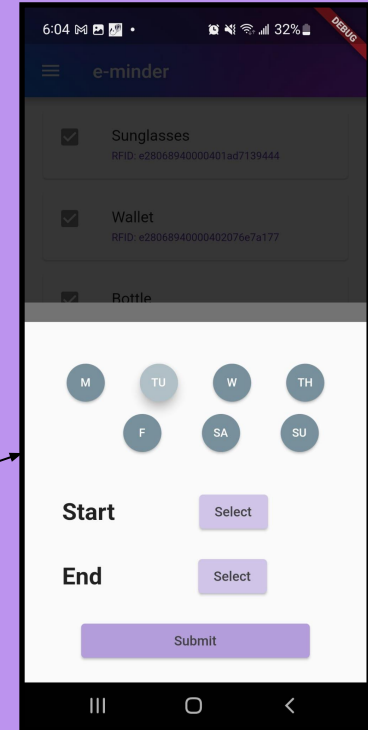
Software
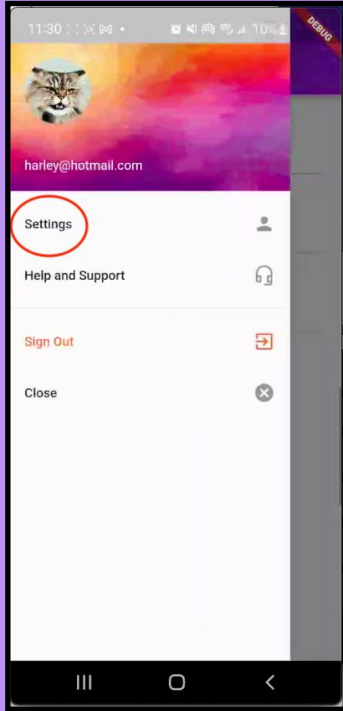
Several settings to allow for a customizable experience
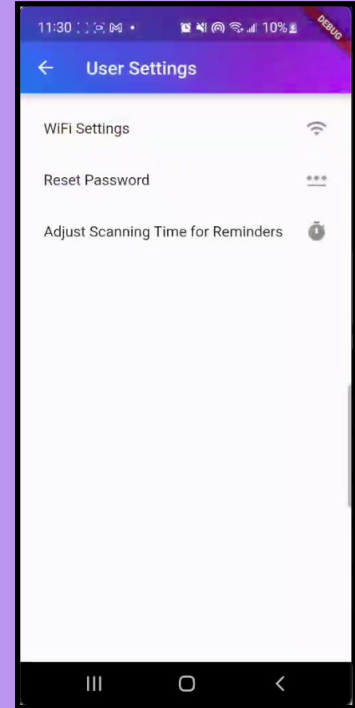
- 1 Scanner -> 3 Scanners
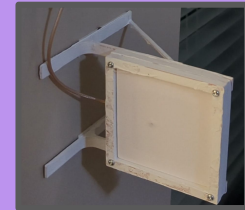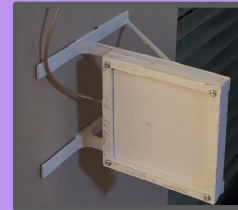
- Volume reduced by 300%

Changes

- PLA -> ABS enclosure

- Lost Recyclability
- Degrability
- (Less) Cradle to Cradle

+ Gained Durability
+ Lifetime
+ Heat/Chemical resistance
+ C2C persists through modularity

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04

Business Case

Target Market

People with ADHD

Elderly (Care Homes)

**Parents of kids in
Pre-Elementary School**

Market Analysis

TAM	• 1.265 Billion • CAGR 7%	
SAM	• 39.902 Million • CAGR 7%	
SOM	• 100,000 • Capturing 10% market share	
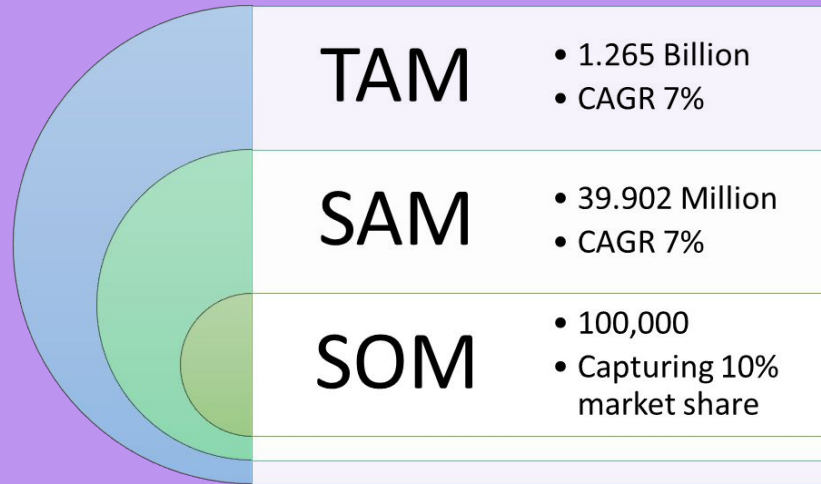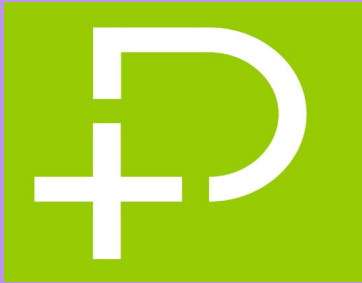
Competitors

- Some systems are already in place - Point Click Care system and Wander guard
- Sienna living - Care home community employs both these systems

Competitive Advantage

THEM

- Subscription based per resident i.e. more cost
- Different devices for different tasks

US

- One time cost and much cheaper
- Easy to install and train carestaff on
- – Better technology

Financials

Table 1

Gamma Prototype Costs	
Item	**Cost ($CAD)**
ABS Material (226g)	3.96
Fabricated PCB	27.14
Speaker	23.05
RFID components	371.00
RFID tags	26.26
Hardware	17.43
5V 2A Power Supply	21.27
ESP32 Integrated Board	25.75
Total	**515.86**

Table 2

Per Mass Prod. Unit Cost	
Item	**Cost ($CAD)**
ABS Material (226g) [4.1]	2.00
Injection molding labor/maintenance [4.1]	1.50
Fabricated PCB	2.80
Speaker	0.54
RFID tags x10	0.98
Multi Port RFID Reader[1]	47.00
Antenna x32	30.6
Antenna cable x3	2.00
5V 2A Power Supply	1.59
Labor[2]	0.78
ESP32 Integrated Board	5.10
Amazon fee[3] [4.2]	20.00
Total (low-end estimate)	**114.89**
Total (middle estimate)	**137.89**

Financials

Fixed Costs	
Item	**Cost ($CAD)**
Mid Volume Injection mold x5 [4.1]	10000
Marketing[4] [4.3]	8250/Yr
Misc. Insurance/Unexpected fees	2000/Yr
Server Fees	Negligible
Total	**20250**

Breakeven Calculation

- Using the more realistic values we need to sell 1780 units over 2 years
- Selling the rest over the third year nets profit
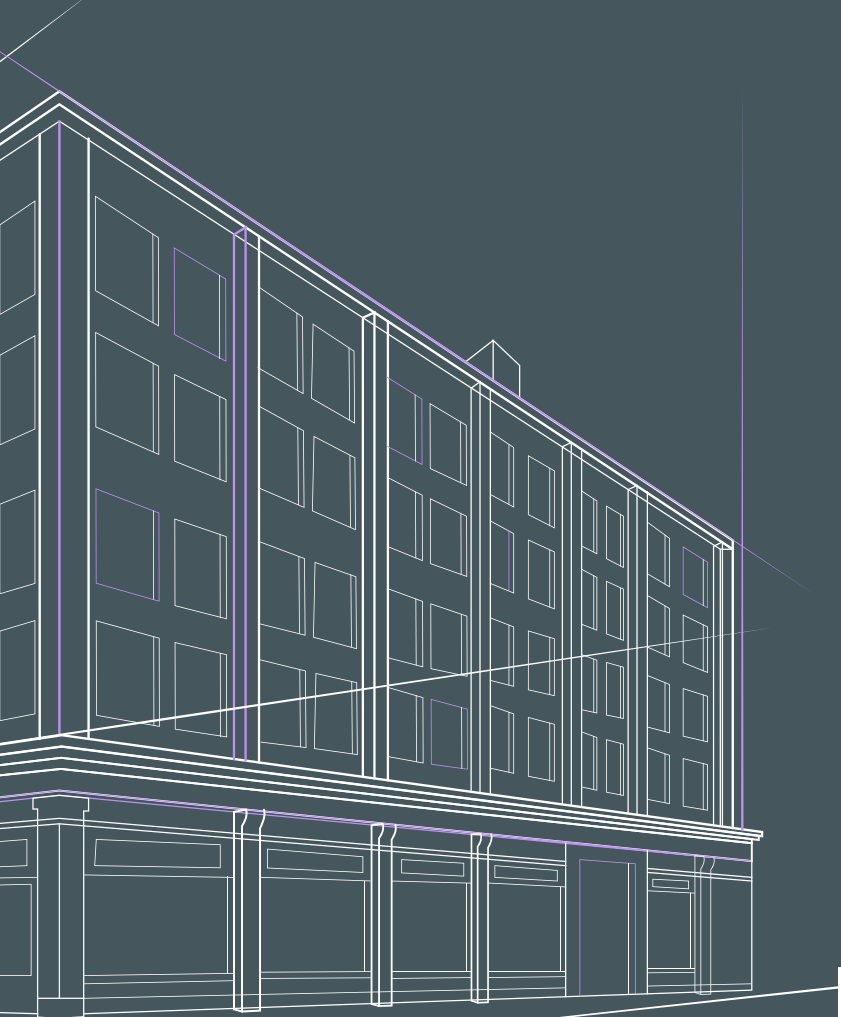
$$Cost = 137.89 * 3000 + (8250 + 2000) * 3 = \$460k$$
$$Gross\ Revenue = 250 * 3000 = \$750k$$
$$Net = \$290k$$

Net revenue over 3 years

05
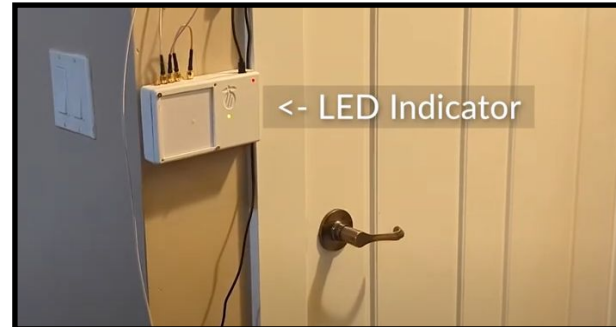# Risk Analysis & Management

Failure to Detect

Issue:

- Reliability to consistently scan all items
  - Tag angle
  - Suboptimal antenna placement
- Technology limitations
  - Phones
  - Liquids
  - Metal

Steps Taken:

- 1 -> 3 scanners to cover all angles
- In-depth guide on scanner installation procedure
- Building off fundamental idea user has their phone

Safety Risks

- Small amounts of research has been done on RFID emission
    - There is research it can be harmful if placed very close to the eyes for a very long period of time
- Typical household application for use in wall plugs
    - Low chance of causing electrical fires from failed outlets
- Walking into RFID scanner may cause cuts or falls

Business Risks

- Changes to initial cost estimation

    - Estimated bulk prices may fluctuate greatly as the numbers were taken through publicly accessible data up to $100 in COGS

- Semi-weak moat & low barrier to entry

    - YES - Intangible asset FUTURE - Low cost production

    - Patents: innovative, useful, non-obvious

BUSINESS
RISK
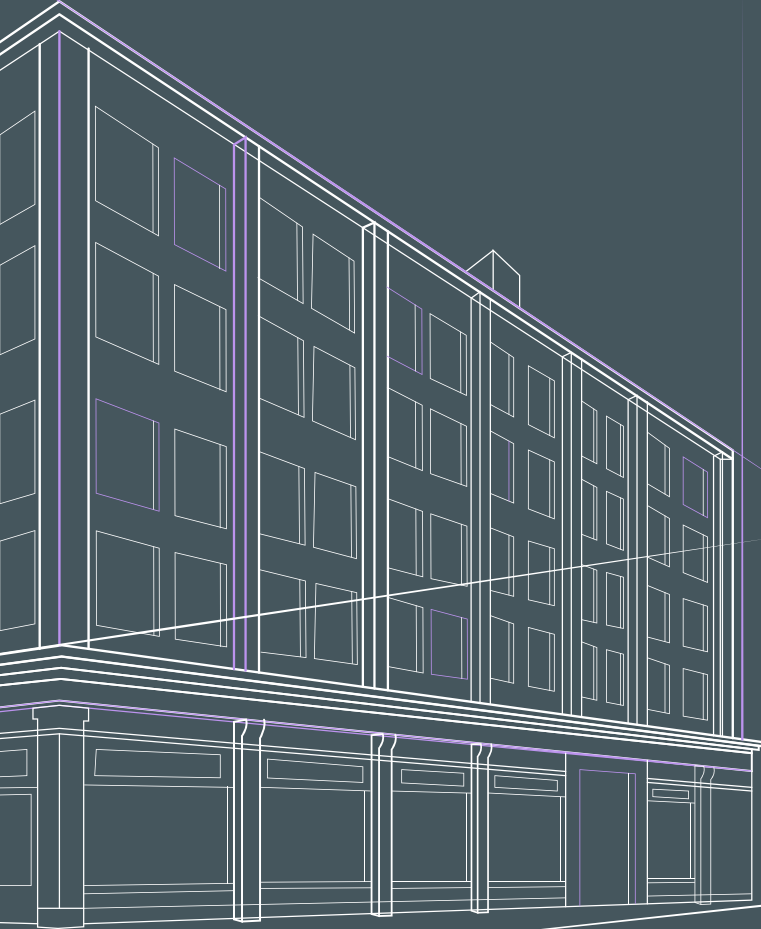
06
Engineering Standards

Engineering Standards

E-minder will cover standards set for RFID usage by ISO, IEC, IEEE and ITU if any

ISO — International Organization fo Standardization

International Telecommunications Union

IEC — INTERNATIONAL ELECTROTECHNICAL COMMISSION

ITU–T K.91

International Telecommunications Union - Guide on Electromagnetic fields and health

- How to assess and monitor human exposure to radio frequency(RF) - Electromagnetic fields (EMF) with radio-communication equipments in the range of 8.3kHz to 300 Ghz
- How to show compliance with exposure limits with reference to existing standards

https://www.drelenaklimenko.com/the-danger-of-emf-exposure-and-the-solutions-to-help-you-and-your-loved-ones-against-an-invisible-killer/

IEC 61010-1

Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use

- Simple and Safe Installation
- Power dissipated by whole system < 15 Watts
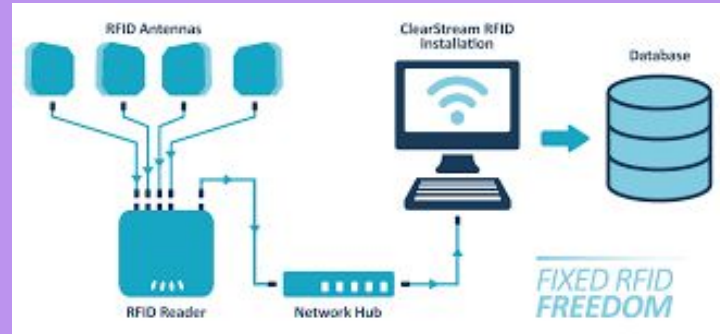- The enclosure will be spacious to have no safety issues

[2]

Information technology - Radio frequency identification for item management - Part 6: Parameters for air interface communications at 860 MHz to 960 MHz General

- Ensure Proper operation of both tags and readers
- Allows for data readability for tags and reader to work to maximum potential

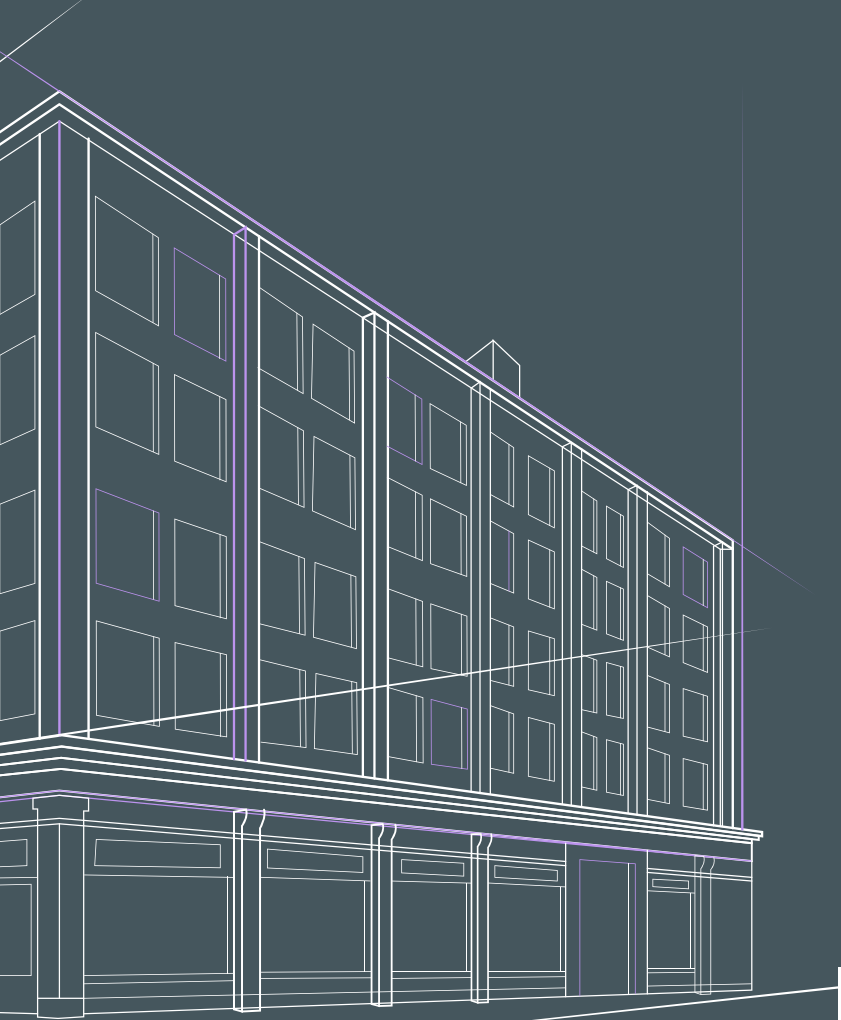https://www.clearstreamrfid.com/images/clearstream_new_diagram.png

IEEE 21451-7:2011

Standard to define data formats to facilitate communications between radio frequency identification and smart RFID tags - Part 7

- Default Parameter: AA AA FF 1B 3F 00 04 0F 00 00 00 01 0B B8 00 05 0B B8 00 05 0B B8 00 05 0B B8 00 05 61 70
- Reader sends 24 characters code unique to each RFID tag
- Example data format:
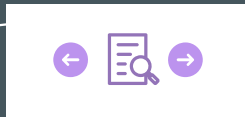 - AA AA FF 18 C1 02 00 C4 30 00 C9 01 0A AA AA 00 00 00 04 30 BF 50 95 C8 00 2B E0

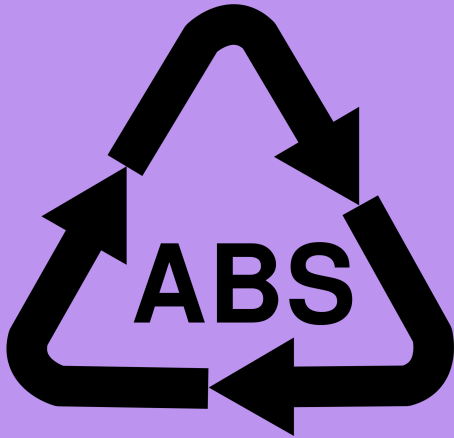https://www.thetechwire.com/wp-content/uploads/2022/03/Binary-code-on-pixellated-screen.jpeg

07

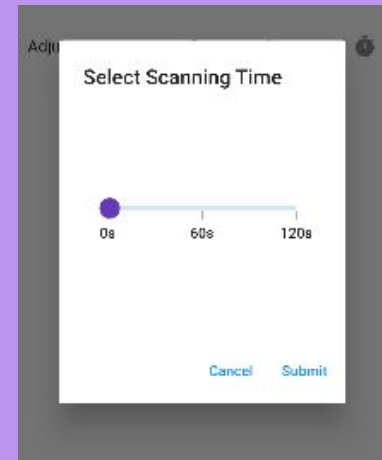Previous Feedback & Improvements
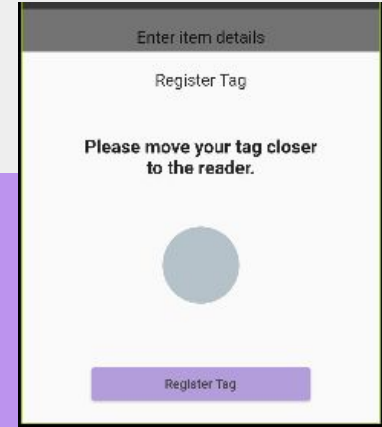
PLA → ABS Plastic

Sent out multiple PCB designs to account for long ship time

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Software Improvements

- Scan tag to register

- Select Scanning time for users to leave through the door
  - Default: ~1 second

- Help and Support available through the app

Looking Back

Challenges Faced

- Inconsistent Scan detected last minute

- Multiple ESP burnt last day of testing

- BLE and App bugs detected when tested on different device

- Long ship times

Lesson Learned

- Test Frequently!!

- Test hardware and software together in all stages of development

- Account for different environments in test plans

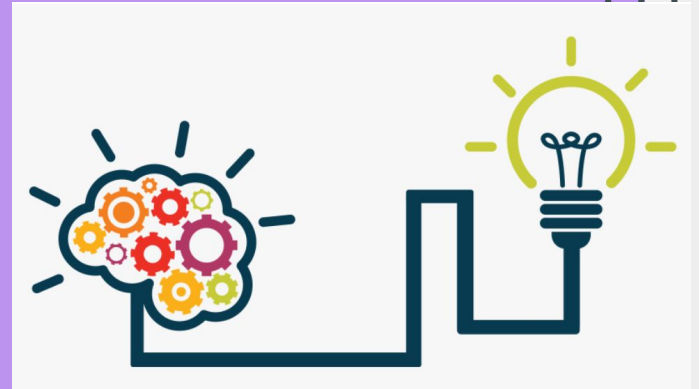- Order products than needed to account for unforeseeable problems
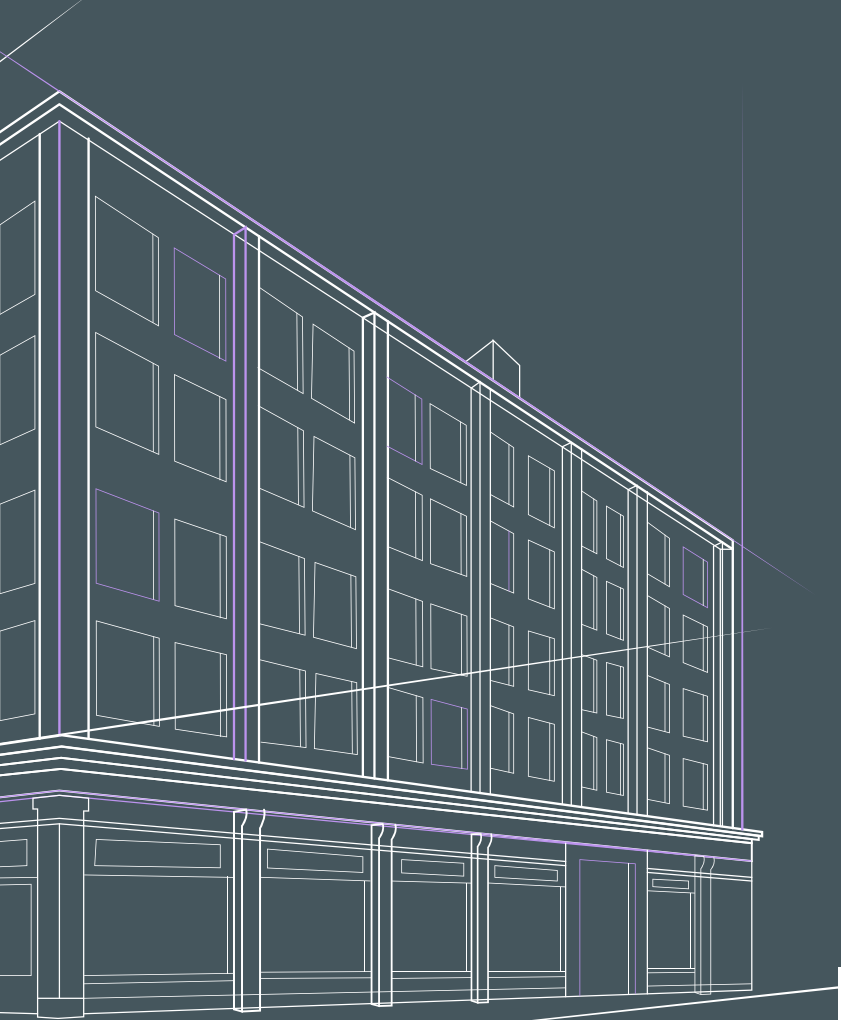
Conclusion & Future Plans

Conclusion

- e-minder: a personalized automated reminder device
- Acknowledgements
  - Craig, Andrew, Mohammed, Eric
  - Nicola Lodge Senior Home

Future Plans

- e-minder was a learning opportunity

Thanks!
Any questions?

Presented by Company 01- Purple Mango