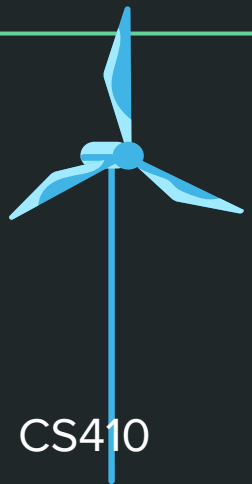
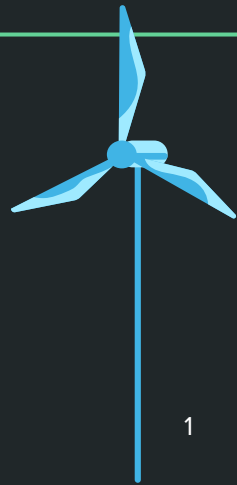
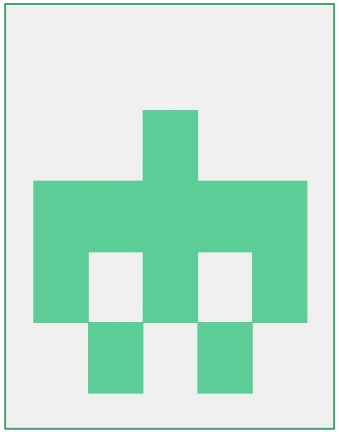
GreenPulse

Design Prototype



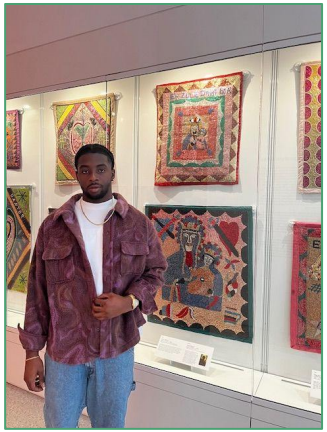


Team Bio



Aria Ashby
(she/her)

Dima Bochkarev



Victory Chuma

Harsh Patel

Holadem Siladin

Elevator Pitch

GreenPulse empowers you to live sustainably, effortlessly. Scan any product anywhere, and GreenPulse unlocks a wealth of up-to-date, reliable information on the product's environmental impact. Make informed choices, reduce your carbon footprint, and join the eco-conscious movement... all with GreenPulse in your pocket!

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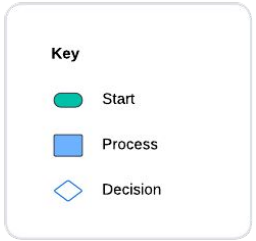
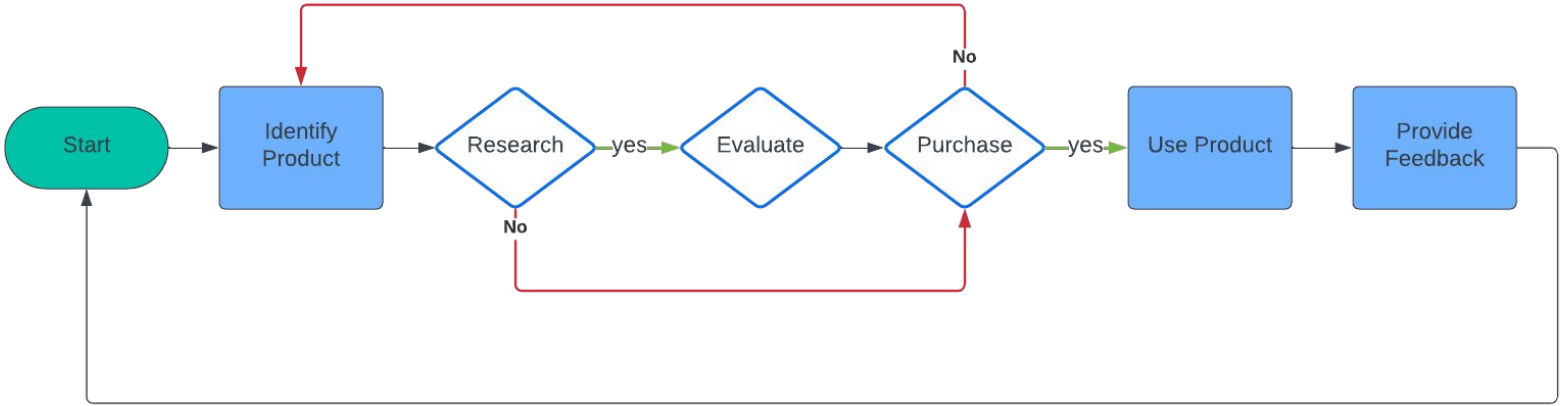
The Societal Problem

With the climate's current terrible state, making active choices to lessen our effect on the environment is becoming more and more important each day. The lack of knowledge of which options are more eco-friendly to the general population is the issue.

A large amount of society wants to be more eco-conscious. Recent surveys have observed that over 85% of participants have made changes in the last 5 years to their purchase habits. (Global Sustainability Study 2021: Initial insights).

2.3 Current Process Flow





Solution

GreenPulse is a smartphone application designed to facilitate sustainable living effortlessly. By allowing users to scan products and access real-time trustworthy information on their environmental impact, the app empowers individuals to make informed choices, reduce their carbon footprint, and actively participate in the eco-conscious movement.

GreenPulse provides a convenient tool for promoting sustainability in everyday life.

3.1 Solution Characteristics

GreenPulse provides users an instant access to information regarding how eco-friendly a product is and the impacts of said product.

This can be done in multiple different ways, such as searching for a product by name, or scanning in the product to obtain all of the available information that we have about it.

What Will It Do?

1. Product Scanning: Users can scan product barcodes or input product details to retrieve real-time information about the environmental impact of a specific item.

2. Environmental Data: The app provides detailed information on the environmental footprint of products

3. Trustworthy Information: Emphasizing real-time, trustworthy information indicates that GreenPulse relies on accurate and up-to-date data sources to provide users with reliable insights into the sustainability of products.

What Will It Do? Cont.

4. Informed Decision-Making: The primary goal seems to be empowering users to make informed choices by arming them with environmental data.

5. Convenience: The emphasis on "effortlessly" shows that the app aims to make sustainable living easy and convenient for users.

What It Will Not Do

1. Limited Product Coverage: The app's effectiveness will depend on the availability and accuracy of data in its database. It may not cover all products, especially those from smaller or less-known brands, or newly released items.

2. Limited to Scanned Products: May not provide information on broader lifestyle choices or behaviors that contribute to sustainability. It will focus on individual product scans and may not cover aspects such as energy consumption, transportation choices, or overall lifestyle impacts.

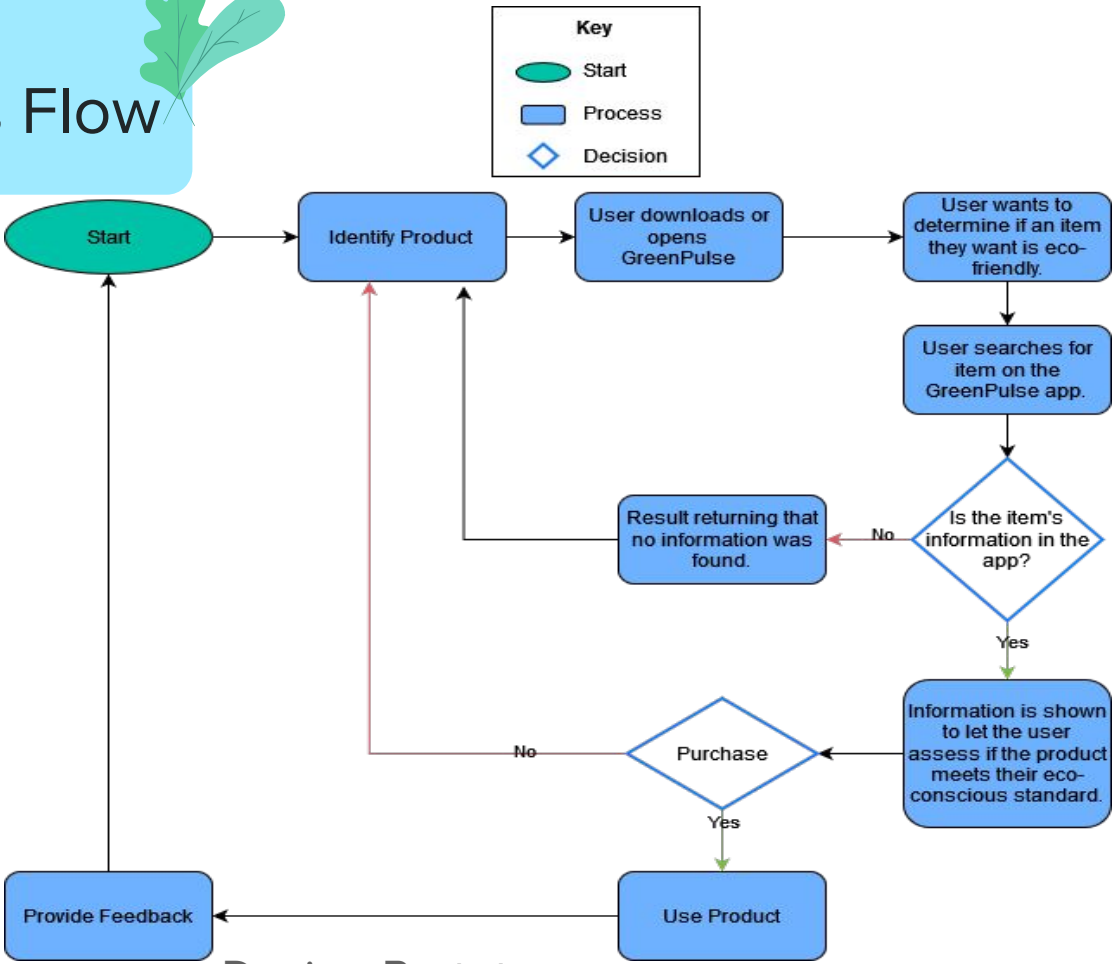
3. Will Not Influence Personal Habits: While the app will provide information, it does not actively influence or change user behavior. The decision to make more sustainable choices will ultimately rest with the user, and the app may not address behavioral or motivational aspects.

What it will not do Cont.

4. Dependent on User Engagement: The app's success relies on users consistently scanning products and actively engaging with the information provided. It may not be effective if users do not regularly use the app or if there is low user engagement.

5. May Not Consider Local Context: Environmental impact can vary based on geographical location and local conditions. GreenPulse may not fully consider regional variations, making it less effective in certain locations or contexts.

Solution Process Flow

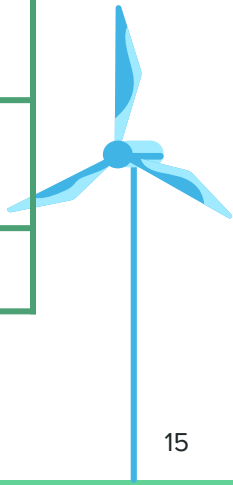


3.5 Competition Matrix

Feature	GreenPulse	GoodGuide	Buycott
Focus	(Environmental impact of products)	(Product sustainability ratings)	(Consumer activism & boycotts)
Barcode Scanning	✔	✔	✔
Searchable Items	✔	✔	✔
Usable on Smartphones	✔	✔	✔

Competition Matrix
Full Green Breakdown:-

Feature	GreenPulse	GoodGuide	Buycott
Ingredient Information	✔	✔	
Manufacturing Information	✔		
Packaging Information	✔		
Social Impact	✔	✔	



Competition Matrix
Reduce Carbon Footprint:-

Feature	GreenPulse	GoodGuide	Buycott
Direct Calculation (estimates footprints per product)	✔		
Products Comparison (side-by-side)	✔		

Development Tools

IDE - VSCode

Version Control - Git (GitHub)

Continuous Integration and Continuous Deployment - GitHub Actions and Workflows

Selected Language

- **Frontend -** JavaScript (ReactJS or React Native)
- **Backend -** JavaScript (Node.js)

Testing Framework(s) - Jest

Documentation - JSDoc

Major Functional Components

Our tech stack:

App Deployment - Docker

Development Framework - ReactJS or React Native

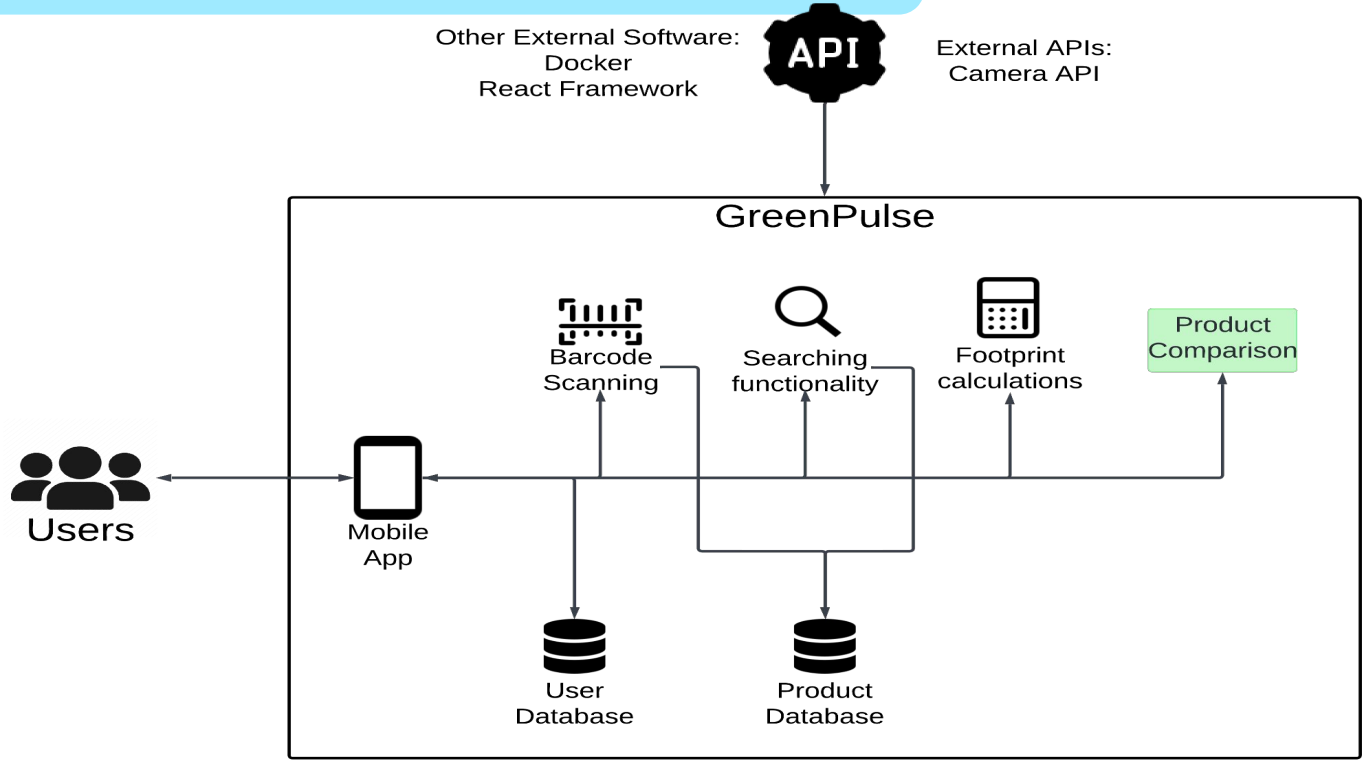
Backend server - Node.js

Database Management System - PostgreSQL

Server side language - JavaScript

Barcode Scanner Integration - ZXing (Zebra Crossing) library

Major Functional Components Diagram



Risks - Customer & End User

Risk: Technical users find the app search parameters and information too limiting.
Probability: 3
Impact: 4

Mitigation: Allow the access for custom boolean search parameters and have user reviews to provide additionally needed information.

Updated Probability: 1
Updated Impact: 3

Risk: Non-technical users do not find the app easy enough to pick up and use.
Probability: 3
Impact: 5

Mitigation: Ensure that the app has an easily navigable interface that shows where information is and how to access it. Another element could be to add a video tutorial example of searching for a specific item in each possible way.

Updated Probability: 1
Updated Impact: 4

Risks - Technical

Risk: Information is not up-to-date.
Probability: 3
Impact: 4

Mitigation: List a timestamp of when the information is provided. When 2 weeks pass, or a major event affecting the information occurs, check and research to see if new information is available via evaluated sources, then add that information. Also allow user responses to flag when information needs to be updated.

Updated Probability: 1
Updated Impact: 4

Risk: Information provided is inaccurate.
Probability: 3
Impact: 5

Mitigation: Complete routine validation checks (provided by evaluating how a company sources a product) every 2 weeks on the information and allow user responses to flag when something is inaccurate.

Updated Probability: 1
Updated Impact: 5

Risks - Security

Risk: Information being maliciously manipulated.
Probability: 3
Impact: 5

Mitigation: Ensure routine vulnerability checks and implement up-to-date security protocols. Encrypt the database. Do not allow data to be updated by a single user and require it to have more of the team's input.

Updated Probability: 2
Updated Impact: 3

Risks - Legal

Risk: Incorrect information is provided for a company and legal action is threatened. As an example: inaccurate information could give the perception that a company is not eco-friendly.

Probability: 3
Impact: 5

Mitigation: As similar to the technical risks, complete routine validation checks (provided by evaluating how a company sources a product) on the information and allow user responses to flag when something is inaccurate.

Updated Probability: 1
Updated Impact: 5

Algorithms

1. Search Algorithm

   Analyze user input text to provide the most appropriate product information based on their search.

2. Feedback Algorithm

   Analyze user feedback and comments to highlight and prioritize the most beneficial and urgent feedback to help ensure the database's information stays accurate.

Work Breakdown Structure

App Development

- Develop the GreenPulse app to display information for a searched item
- Implement user interface elements for searching and displaying data
- Ensure functionality to retrieve and display relevant information

Database Schema

- Establish a database to store all searchable data
- Define the database schema to organize information efficiently
- Implement data storage and retrieval mechanisms

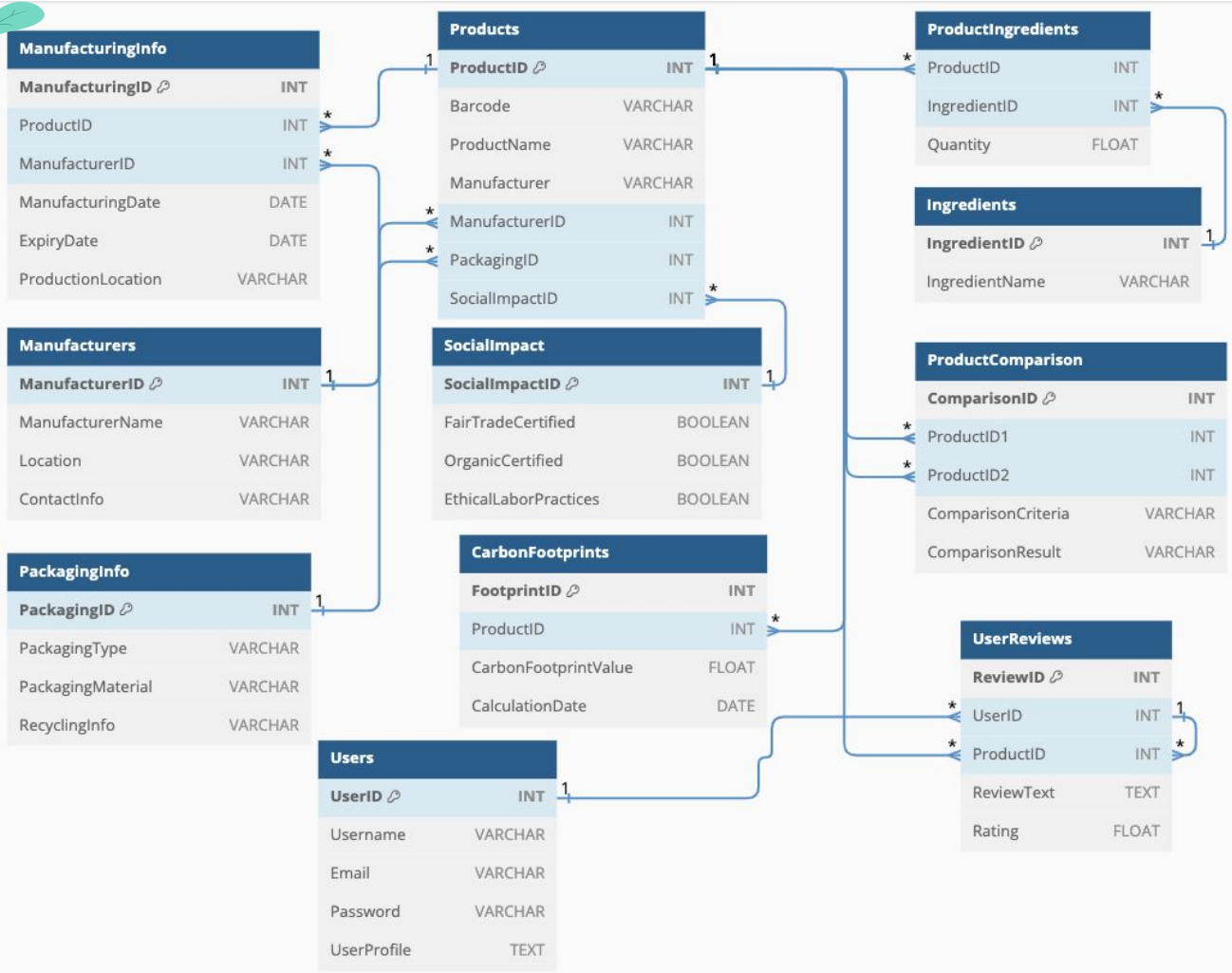
Interface Design

- Design user-friendly interface elements, such as navigation menus and search bars
- Create intuitive layouts and controls to enhance usability
- Ensure accessibility and manageability of the app interface and across device

Testing & Validation

- Conduct thorough testing of the app's search functionality.
- Verify that searched items return relevant products and ecological information.
- Address any issues identified during testing and refine the app as needed.

Database Schema



Real World Product vs Prototype

Features & Functionality	RWP	Prototype	Explanation
Barcode Scanning	**I**	**I**	Basic scanning enabled
Searchable Items (by product name, etc.)	**I**	**I**	Core functionality implemented for user convenience
Usable on Smartphones	**I**	**I**	Fully optimized for smartphone use to reach wider audience
Ingredient Information	**I**	**I**	Empowers user with product ingredients detail
Manufacturing Information	**I**	**PI**	Transparency about production processes (data may be simulated for the prototype)
Packaging Information	**I**	**PI**	Basic packaging info included for user awareness (data may be simulated for the prototype)
Social Impact	**I**	**I**	Crucial for responsible consumption

I = Implemented, **PI** = Partially Implemented, **NI** = Not Implemented

Real World Product vs Prototype

Features & Functionality	RWP	Prototype	Explanation
Product Comparison	**I**	**I**	It's crucial for user decision making and add value
User Reviews	**I**	**PI**	Allow users to leave reviews, but more features like rating and filtering may be missing
Filter by Preference (e.g., vegan, organic)	**I**	**I**	It is a very valuable feature that will help users find even more specific environmentally friendly options.
Discount & Coupon Integration	**I**	**NI**	It requires coordination with external partners and additional development effort
Direct Calculation (carbon footprints)	**I**	**I**	Raises environmental awareness for eco-conscious choices

I = Implemented, **PI** = Partially Implemented, **NI** = Not Implemented

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Testing Framework(s) - Jest

Documentation - JSDoc

Required Libraries, Tools, & Technologies

Libraries - ZXing

Languages - JavaScript

Frameworks - ReactJS or React Native

Other Technologies - Docker, Node.js, and PostgreSQL

Prototype UI Design

Prototype Home Page

Prototype Search Page

Conclusion

With the climate's rapidly declining state being a present constant pressure on nearly everyone's mind, GreenPulse's main objective is to allow any user to commit to and maintain making eco-conscious choices in their daily purchasing lives.

We all have to and can make an impact together!

By seeing the eco-friendly rating and information of a company, any user will be able to make the best environmental choice!

Appendix

The ZXing library, primarily known for its barcode scanning capabilities, got its name from the concept of "zebra crossing," reflecting the pattern of alternating black and white stripes found in barcodes.

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