Socially conscious software at scale

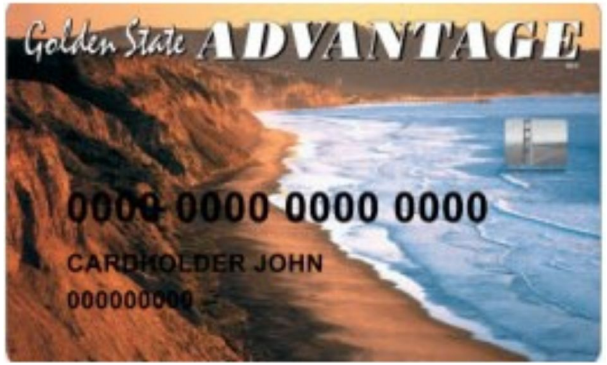
Ram Mehta, CTO Propel Inc

Supplemental Nutrition Assistance Program

- More commonly known as Food Stamps
- 40 million Americans receive SNAP benefits each month*
- Average benefit amount of $125/month*

*https://www.fns.usda.gov/pd/supplemental-nutrition-assistance-program-snap

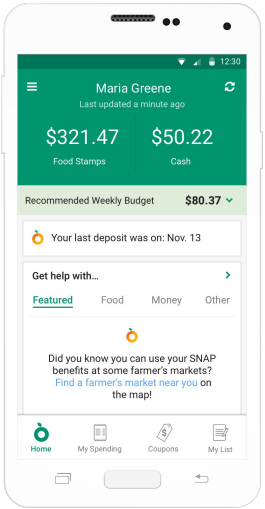
Electronic Benefits Transfer (EBT)



FRESHEBT
BY PROPEL

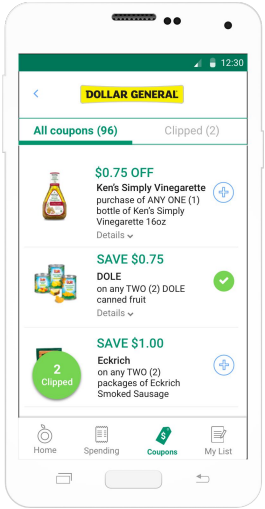
Fresh EBT helps low-income Americans manage their EBT benefits, save money, and earn income

MANAGE



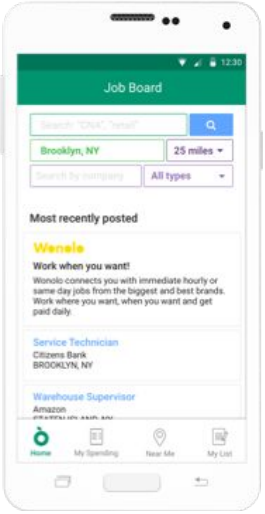
Check balance and see past transactions and deposits

SAVE



Clip coupons and find savings on useful products and services

EARN



Search the job board and discover jobs, gigs, and other ways to earn

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FRESH EBT TODAY

1M+ monthly active users

9 sessions per user per month

IN 2018...

$2.5M saved through in-app coupons

10K new jobs applied for

5 months of human time saved by not calling the IVR

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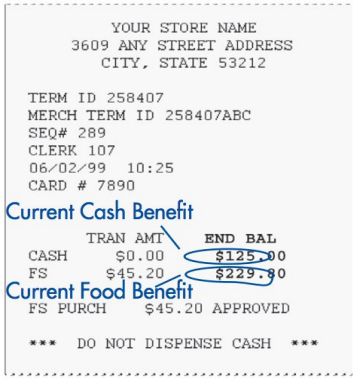
Fresh EBT began with a problem: **EBT cardholders had no easy way to check their balance**

1

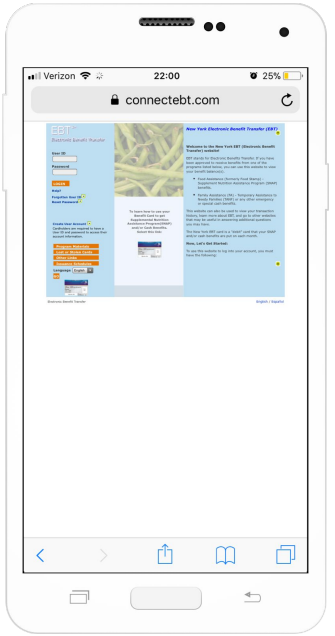
- Most states require entry of full 16-19 digit card number after navigating a phone tree
- Nearly impossible to get transaction history
- Calls take up to a minute, use phone minutes

2



- Have to keep very close track to make sure you have correct balance
- Easy to lose receipts

3



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Early Technical Decisions

- Monolithic codebase with multiple services
- Services run on the same instance using Supervisord
  - Flask python server as a CMS
  - Twisted python server for scraping
- Continuous integration/deployment at day 1
- Next scaling step: bigger box

Day 1

Technology
- Android app
- Python Servers

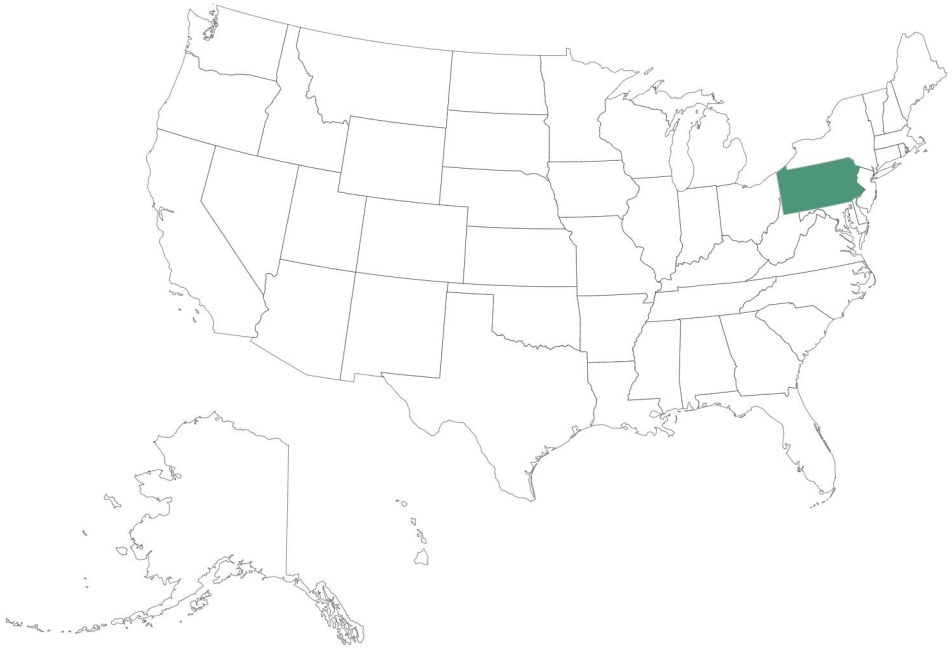
Team
Non Eng: 2
Eng: 1

MAUs: 0
States supported: 1

Development
Vagrant

Infrastructure
1 EC2 instance (Small)

Deployment
Ansible, CI with Jenkins



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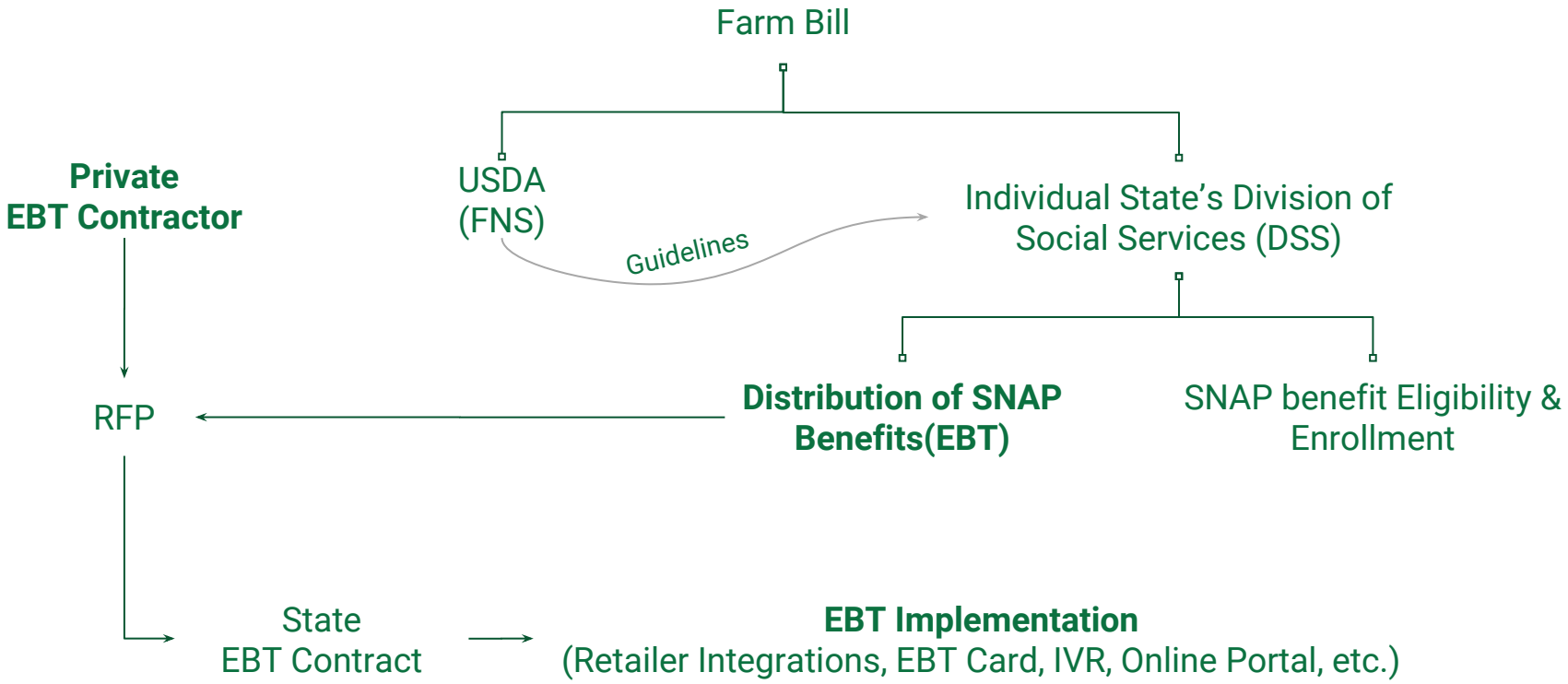
SNAP program at a glance



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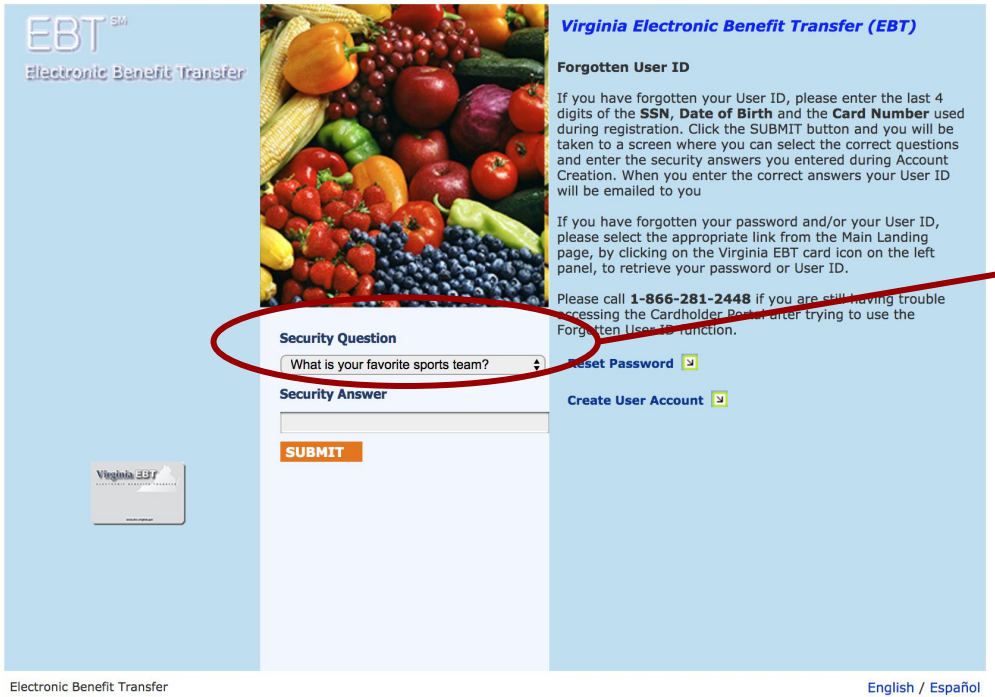
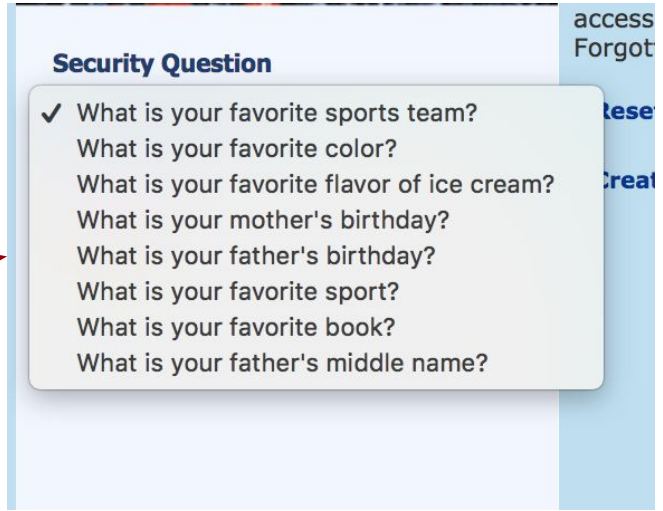
BY PROPEL

Forgot password?





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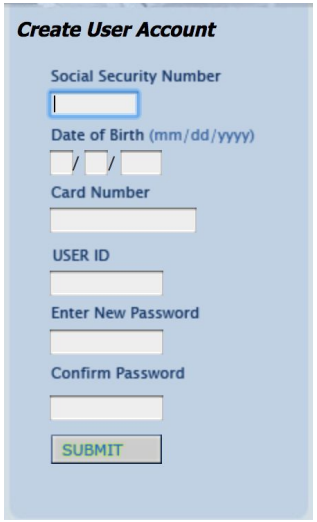
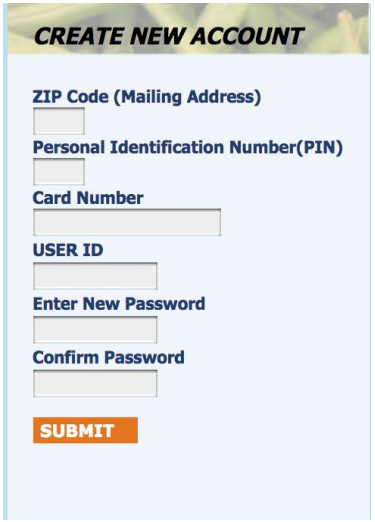
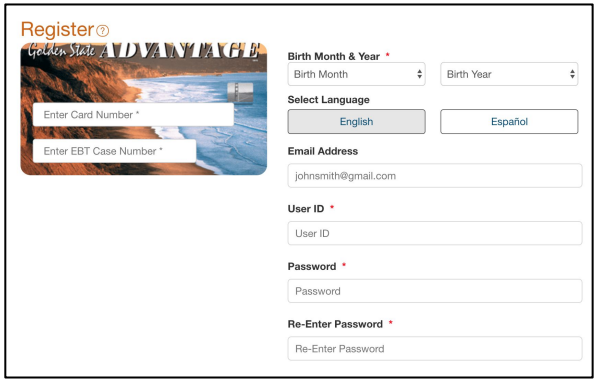
Speaking of registration flows...

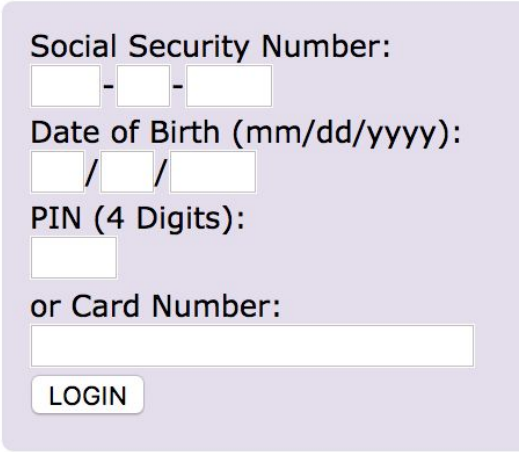






2. Your password must be at least 8 characters long but no more than 12 characters long. You can use any combination of letters or numbers in the password, with at least one capital letter, one lower case letter, and one number.

Your User ID will not change once selected. The password must be at least 6 characters long and no more than 8 and may have any combination of letters or numbers.



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Empower those who do not wish to write code

... by making them maintain configuration instead.

```
98  "CA": {
99    "register": [
100     {"field": "pan", "minlength": 16, "maxlength": 16, "luhn": true, "step": 1},
101     {"field": "dob", "step": 2},
102     {"field": "suid", "minlength": 6, "maxlength": 15, "step": 2},
103     {"field": "login", "minlength": 4, "maxlength": 35, "step": 3},
104     {"field": "password", "minlength": 8, "maxlength": 16, "strong": true, "step": 3}
105   ]
106 },
```

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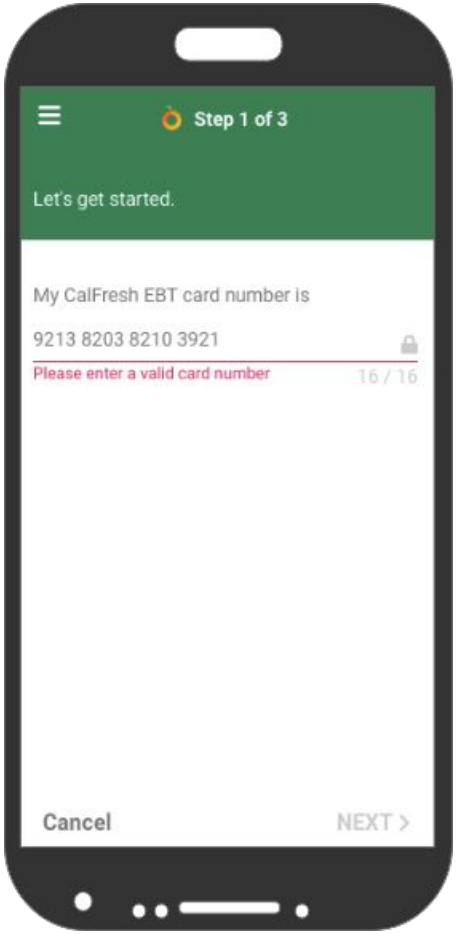
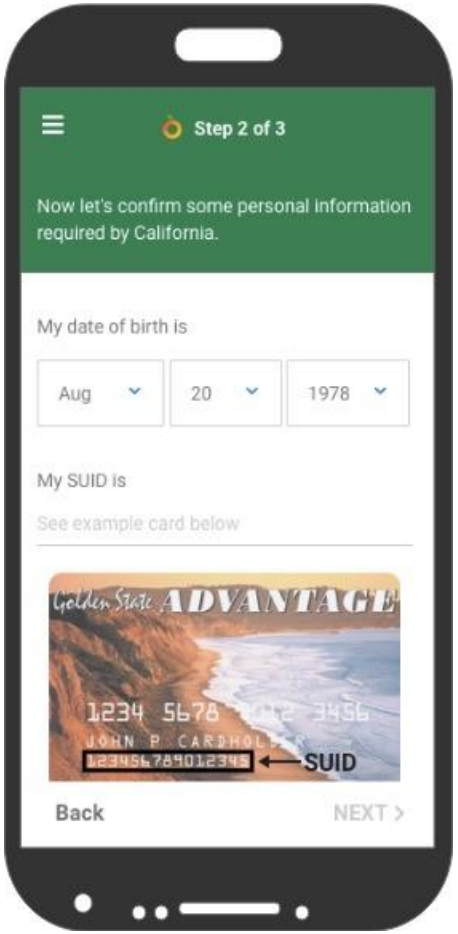
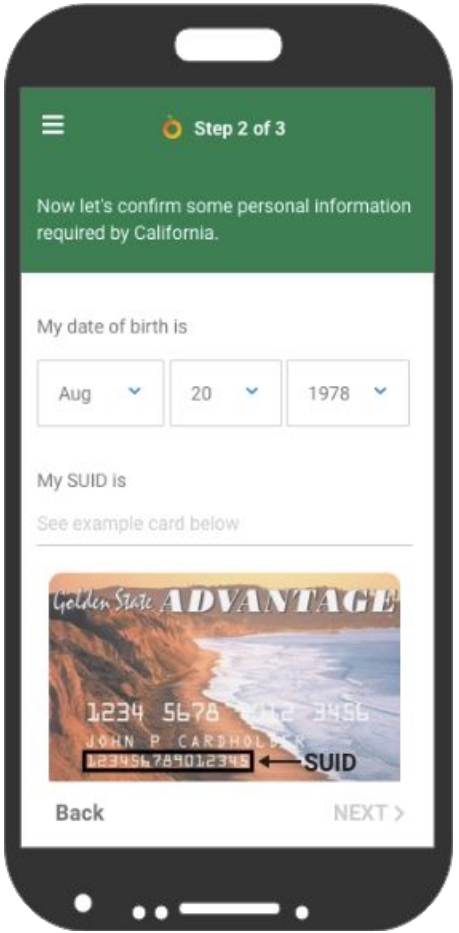
BY PROPEL







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Day 35

Technology
- Android app
- Python Servers
  - Flask & Twisted

\+ Redis, Postgres, nginx

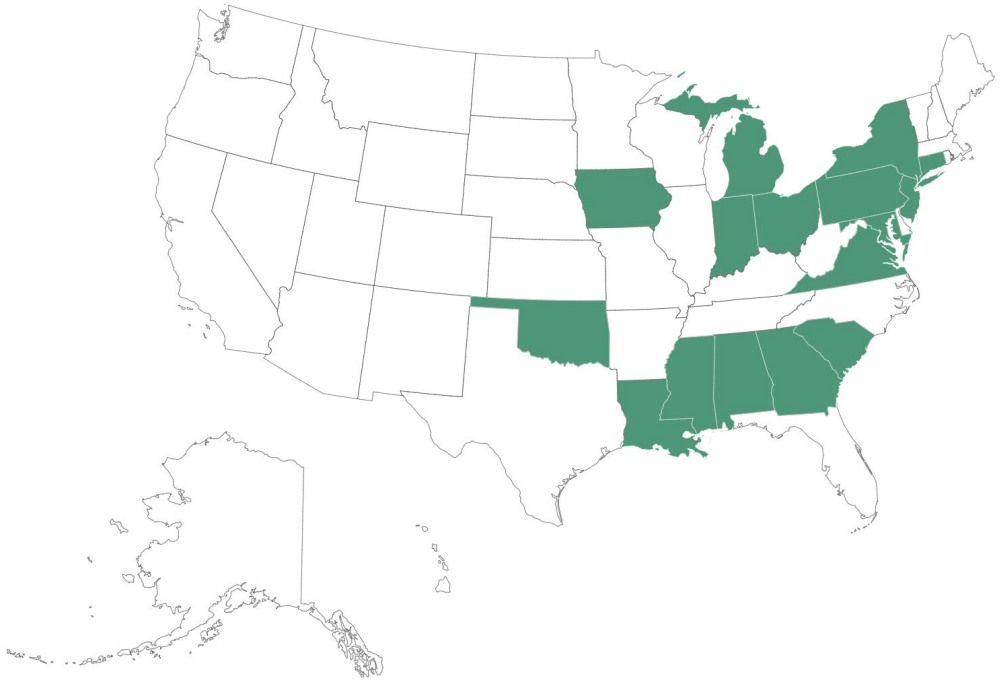
Development
Vagrant

Infrastructure
1 EC2 instance (Medium)

Deployment
Ansible
CI with Jenkins

Team
Non Eng: 2
Eng: 1

MAUs: 600
States supported: 16



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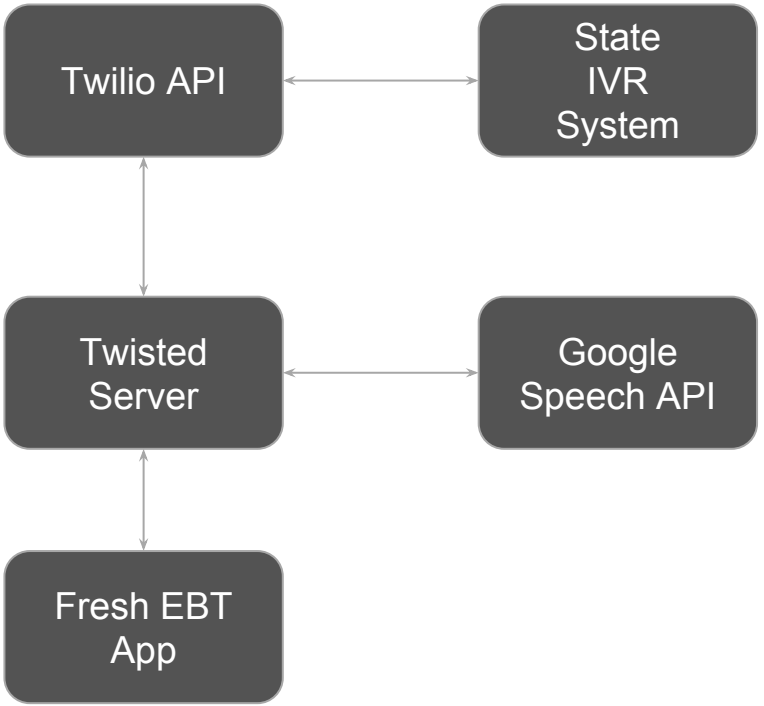
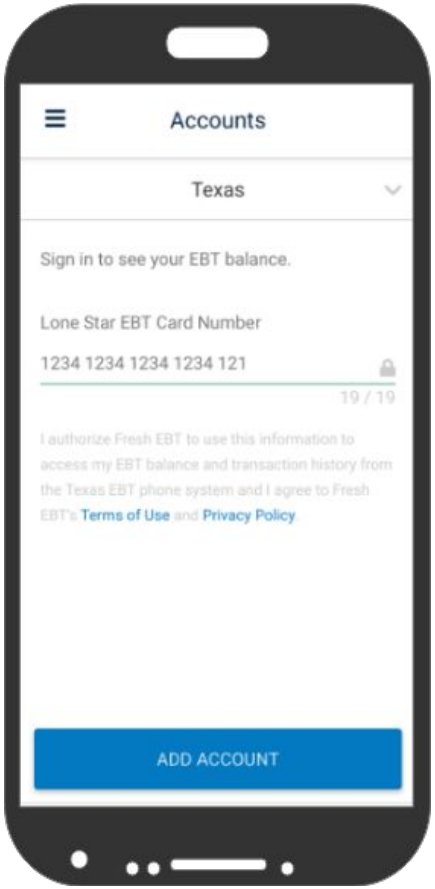
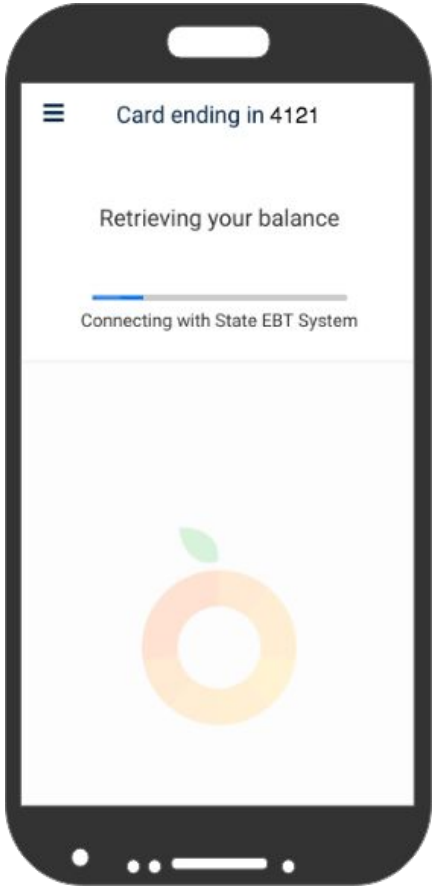
“You have two dollars and twelve cents…”

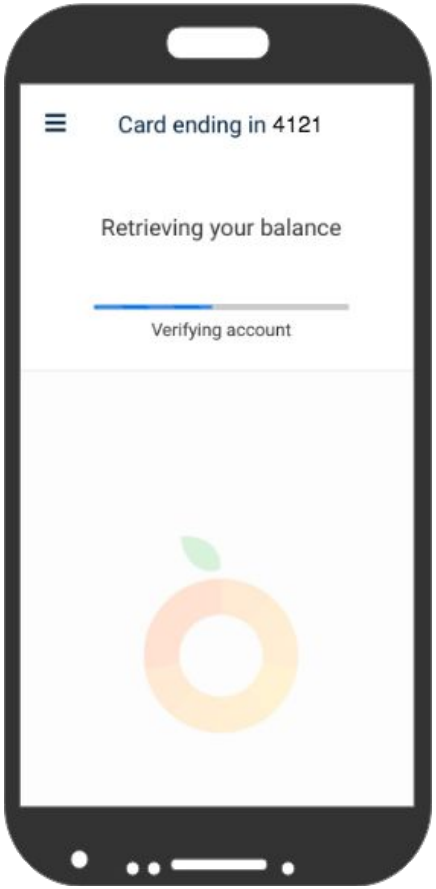
- Texas and Mass. did/do not have an online portal for checking EBT balance
- So we built a phone based system to retrieve the balance for Texans

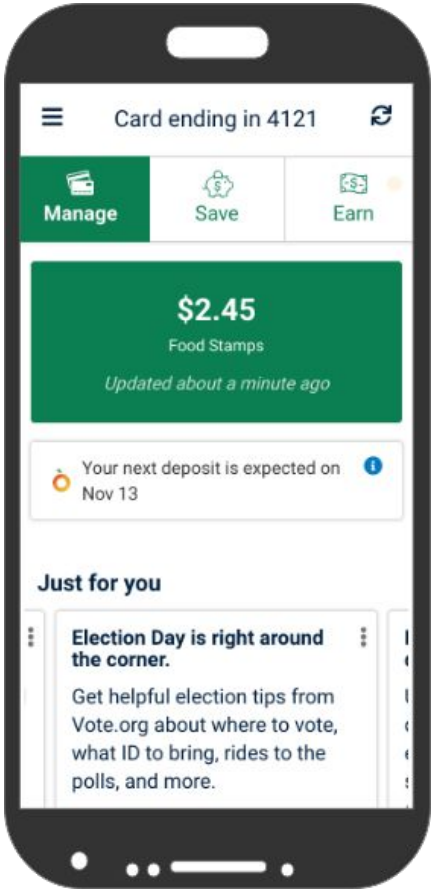


FRESHEBT BY PROPEL









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Day 90

Technology

- Android + iOS
- Spanish Translation
- Python Servers
  - Flask & Twisted

\+ Redis, Postgres, nginx

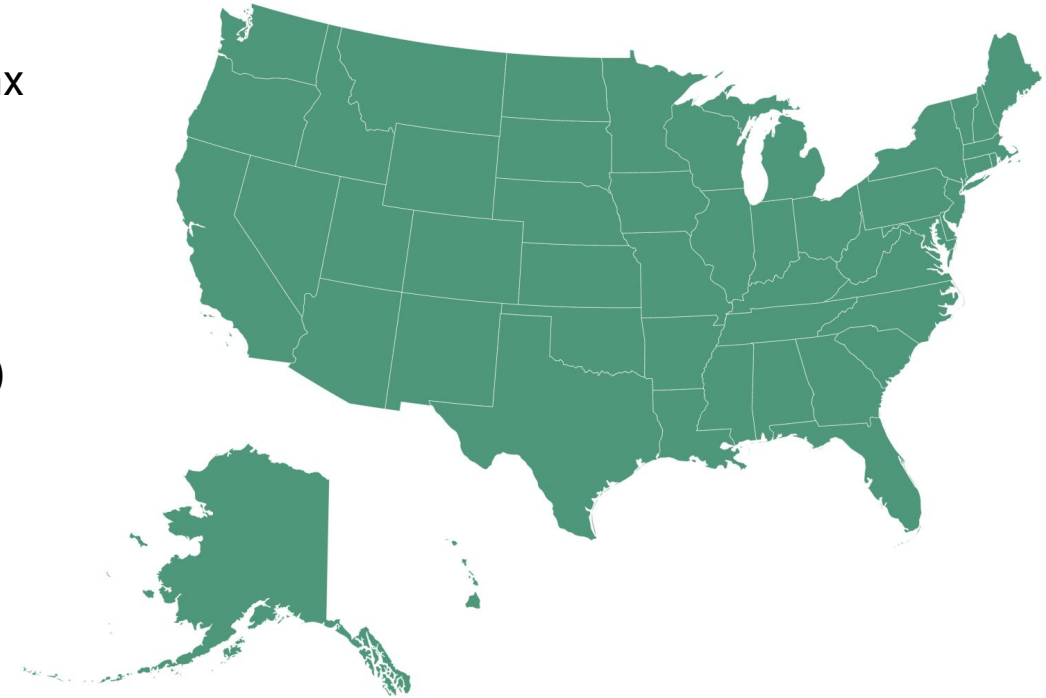
Development
Vagrant

Infrastructure
1 EC2 instance (Medium)

Deployment
Ansible
CI with Jenkins

Team
Non Eng: 3
Eng: 1

MAUs: 7,000
States supported: 52



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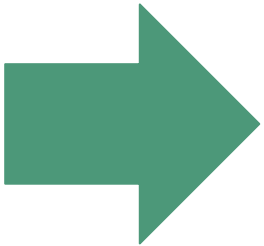
Serving low-income consumers requires understanding specific needs and constraints

Our approach to user research:

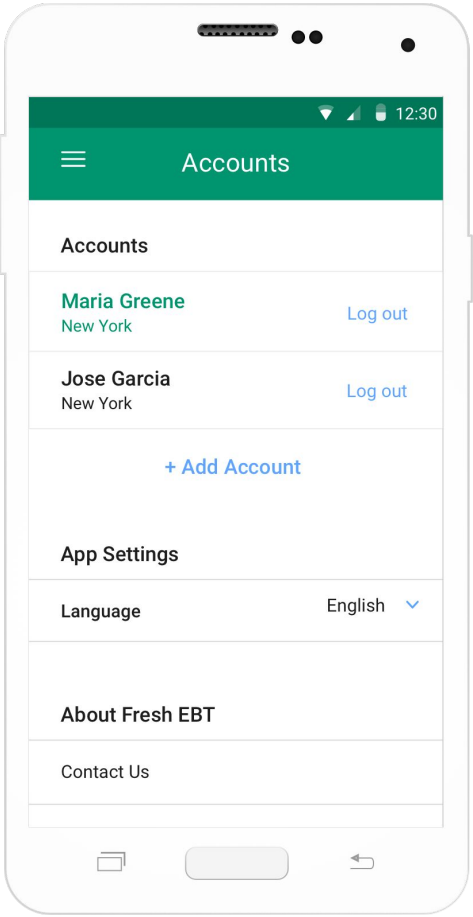
- Meet people where the product is relevant
- Avoid NYC (or local) bias
- Include the whole team



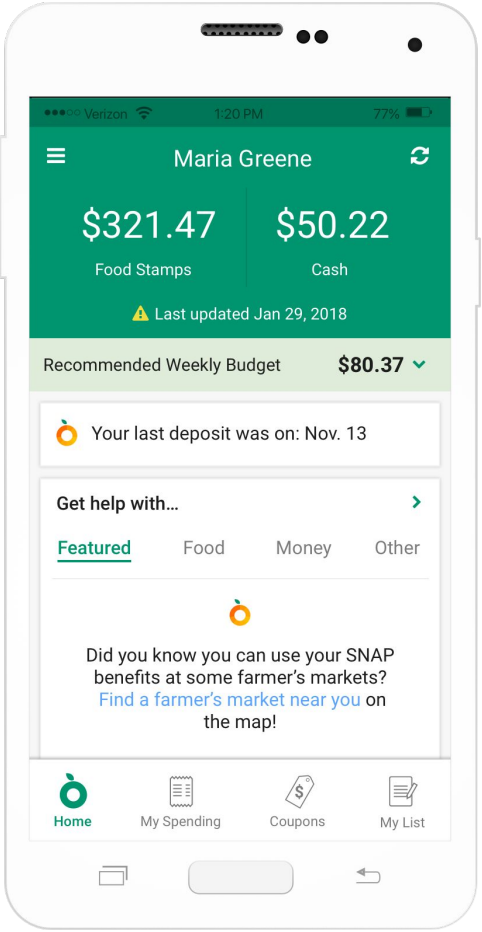
Problems we heard:

- *“I share a smartphone with my roommate”*
- *“I often run out of data”*
- *“I shop very conservatively so I don’t go over my balance at checkout”*

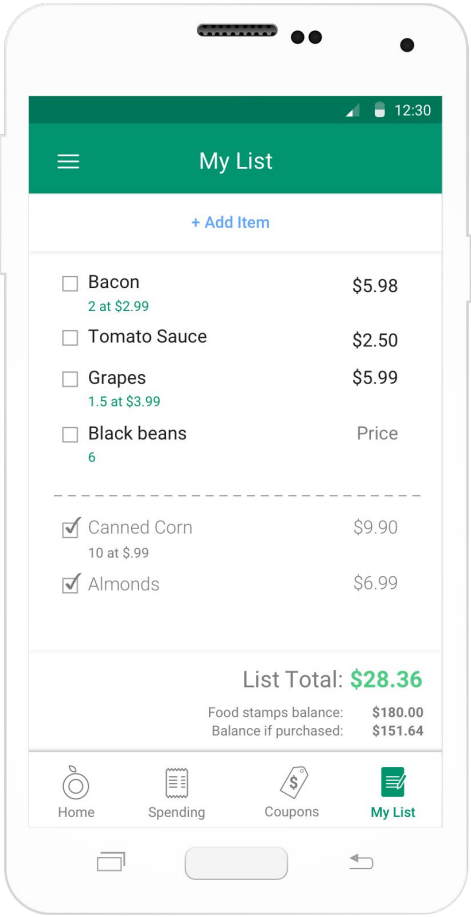
“I share a smartphone with my roommate”



“I often run out of data”



“I shop very conservatively so I don’t go over my balance at checkout”



Month 9: Preparing to Scale

Technology
- Python Servers
  - Flask & Twisted
- Android + iOS
- Spanish Translation

\+ Redis, Postgres, nginx

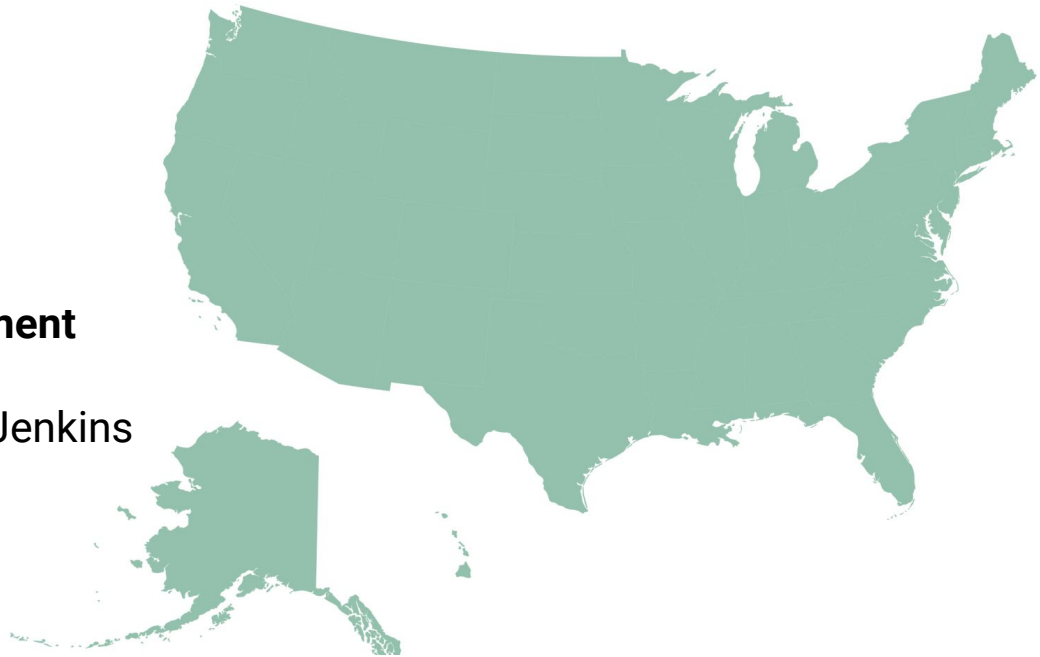
Development
Vagrant

Infrastructure
1 EC2 instance
AWS RDS postgres
AWS ElastiCache

Deployment
Ansible
CI with Jenkins

Team
Non Eng: 5
Eng: 2

MAUs: ~150k
States supported: 53



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Infrastructure vs Product

- Scaling Technology vs Scaling number of features
- Be prepared for you next scaling step.
- Operationalize features by making them configurable and empowering the team to manage the configurations
- Use infrastructure automation tools like terraform and ansible early.

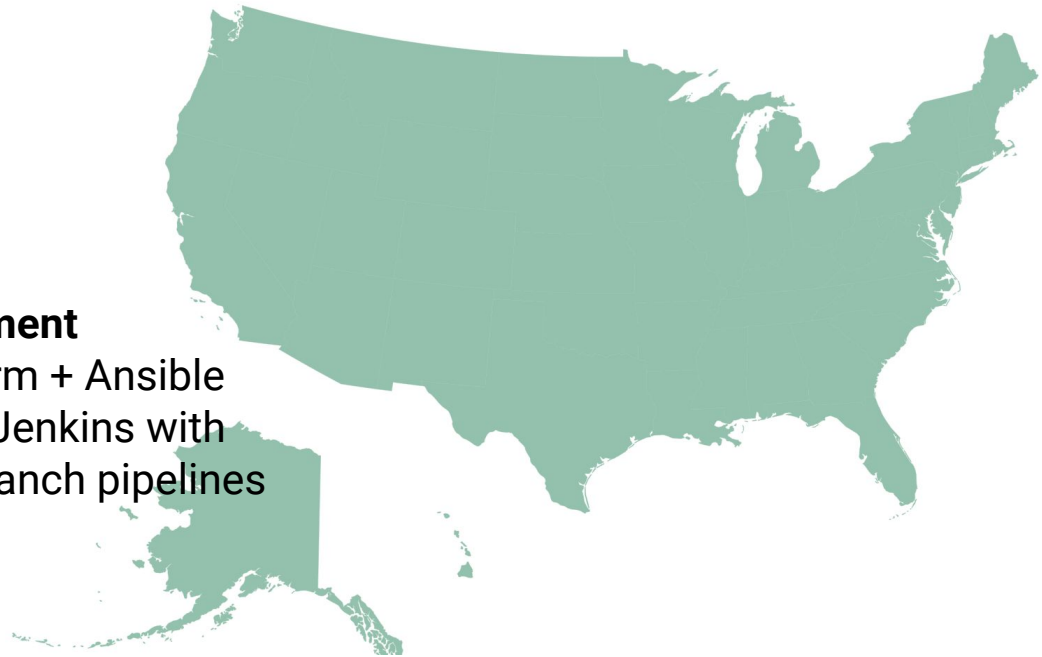
Year 2: Monolith + Microservices

Technology
- Python Servers
  - Flask & Twisted
- Android + iOS
- Spanish Translation

\+ Redis, Postgres, nginx

Team
Non Eng: 7
Eng: 3

MAUs: ~350k-1M
States supported: 53



Development
Docker-Compose

Infrastructure
ECS
RDS
ElastiCache
ELK*

Deployment
Terraform + Ansible
CI with Jenkins with multi-branch pipelines

FRESHEBT BY PROPEL

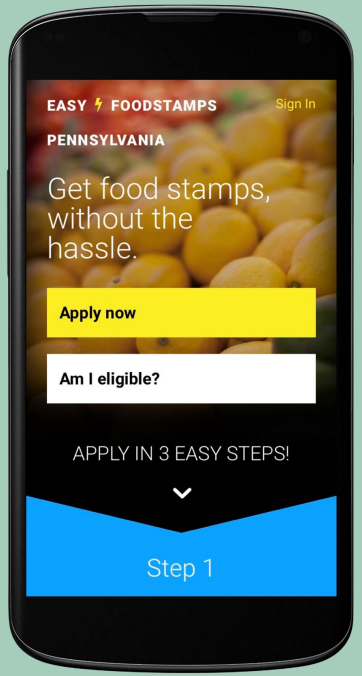
Scaling with a small team

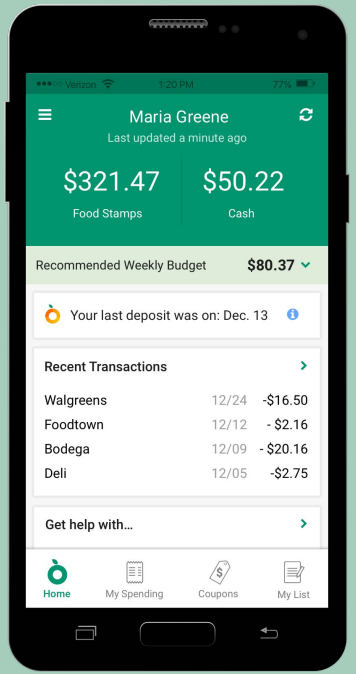
Empower team members that do not code

Invest in continuous integration and deployment early

Be prepared for the next scaling step

Solve real problems





Find opportunities that scale...

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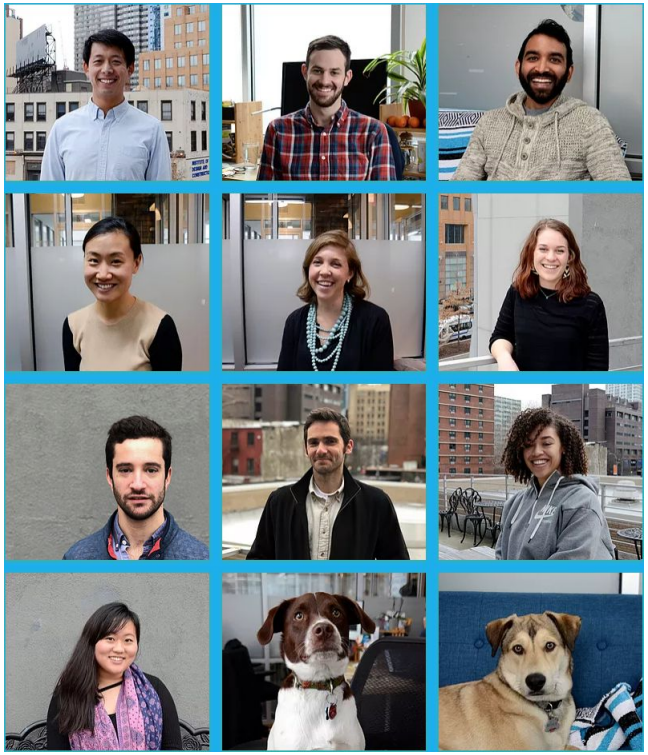
The Propel Team Today



FRESHEBT BY PROPEL

https://www.joinpropel.com

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BY PROPEL

Thank you! Questions?