A de-risking approach to funding technology

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CDS's Practices

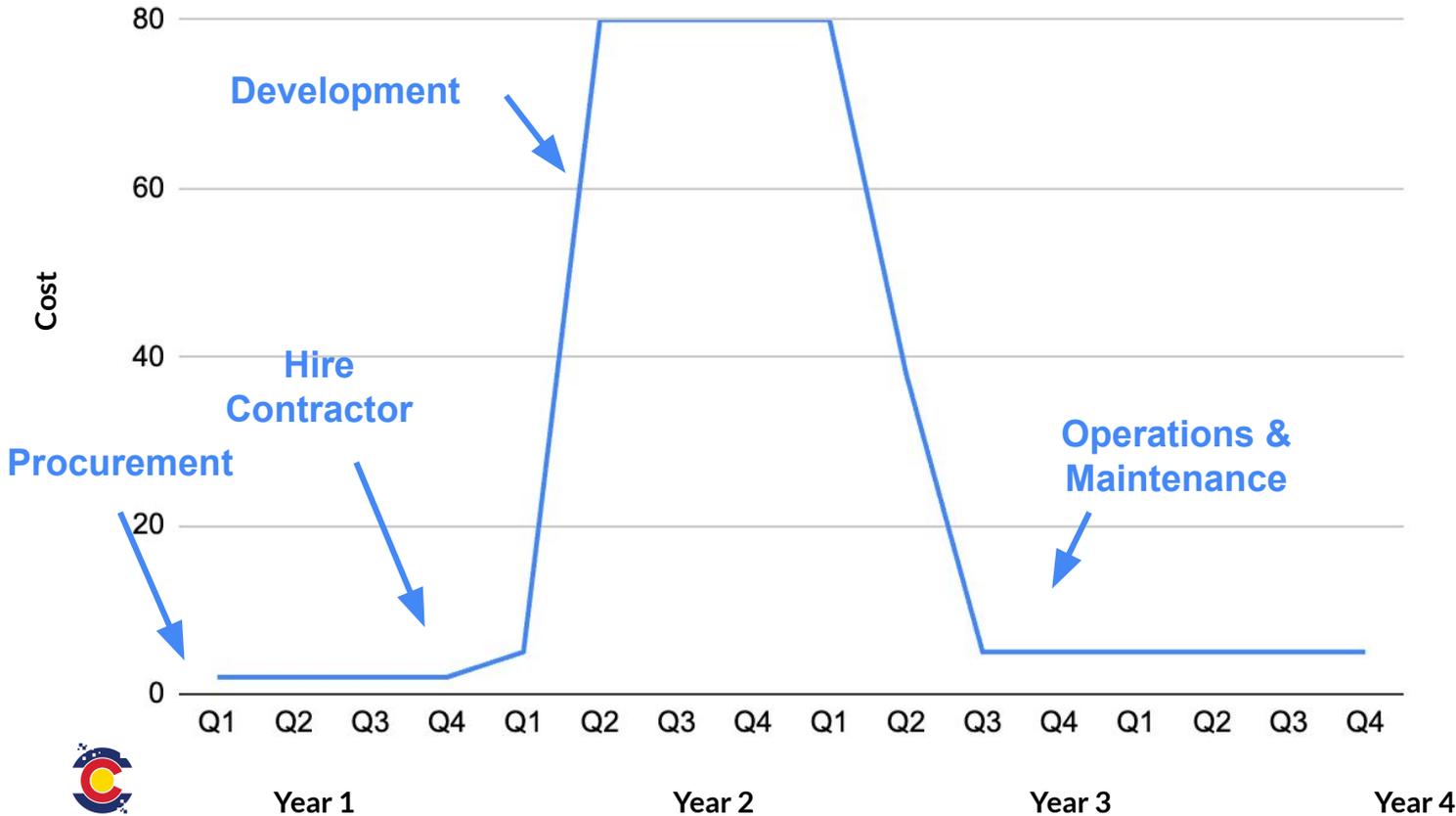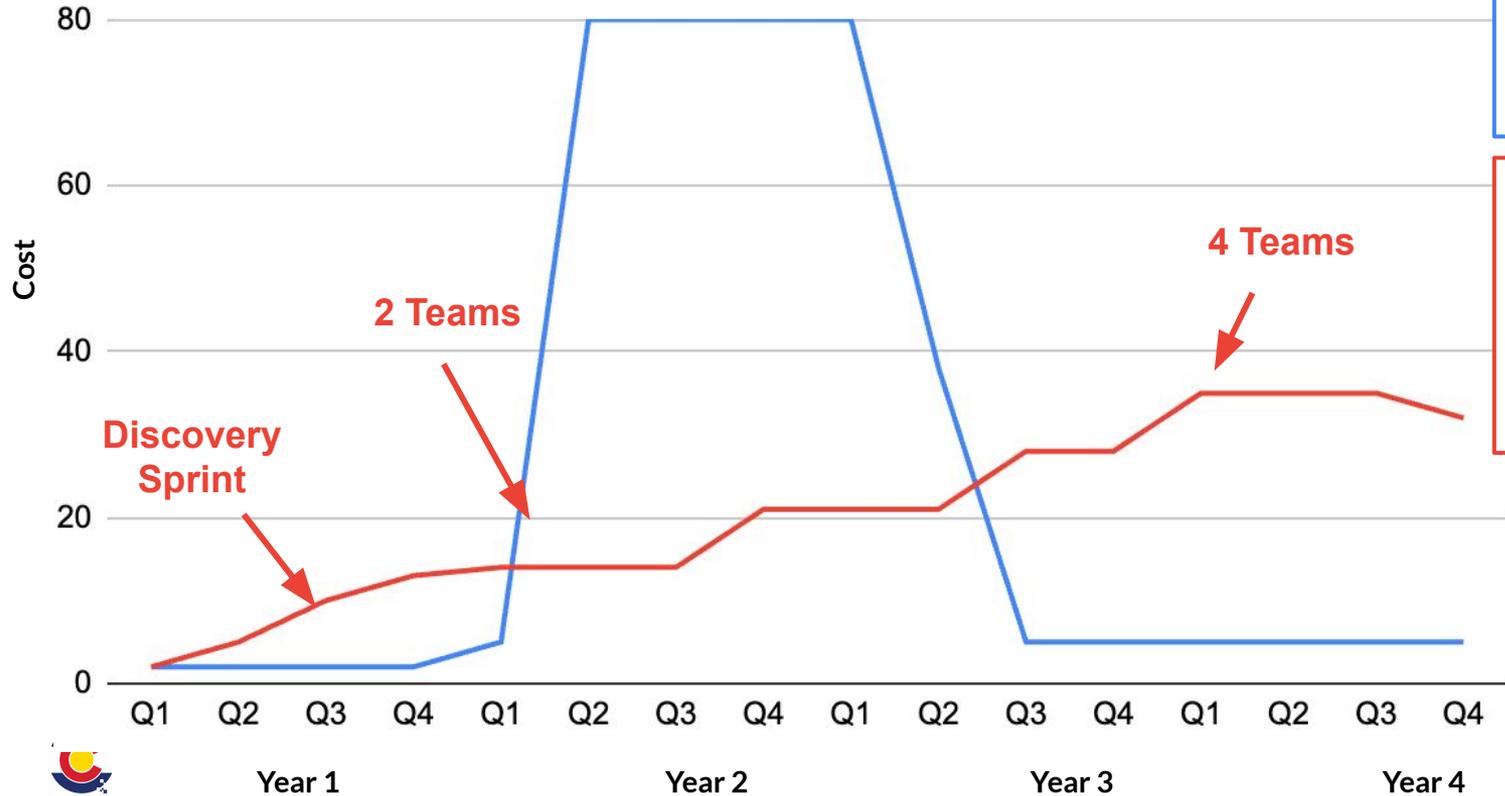|		
Seeking and Solving the Root Problem	**Outcome-oriented Product Management**	**Co-design with Community Members**
Agile Procurement and Modular Contracts	**Iterative, Incremental Development**	**Building Technology that Delivers for the Users**

Traditional Project Model

Traditional Project: High initial cost, limited long term support

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Project vs Product

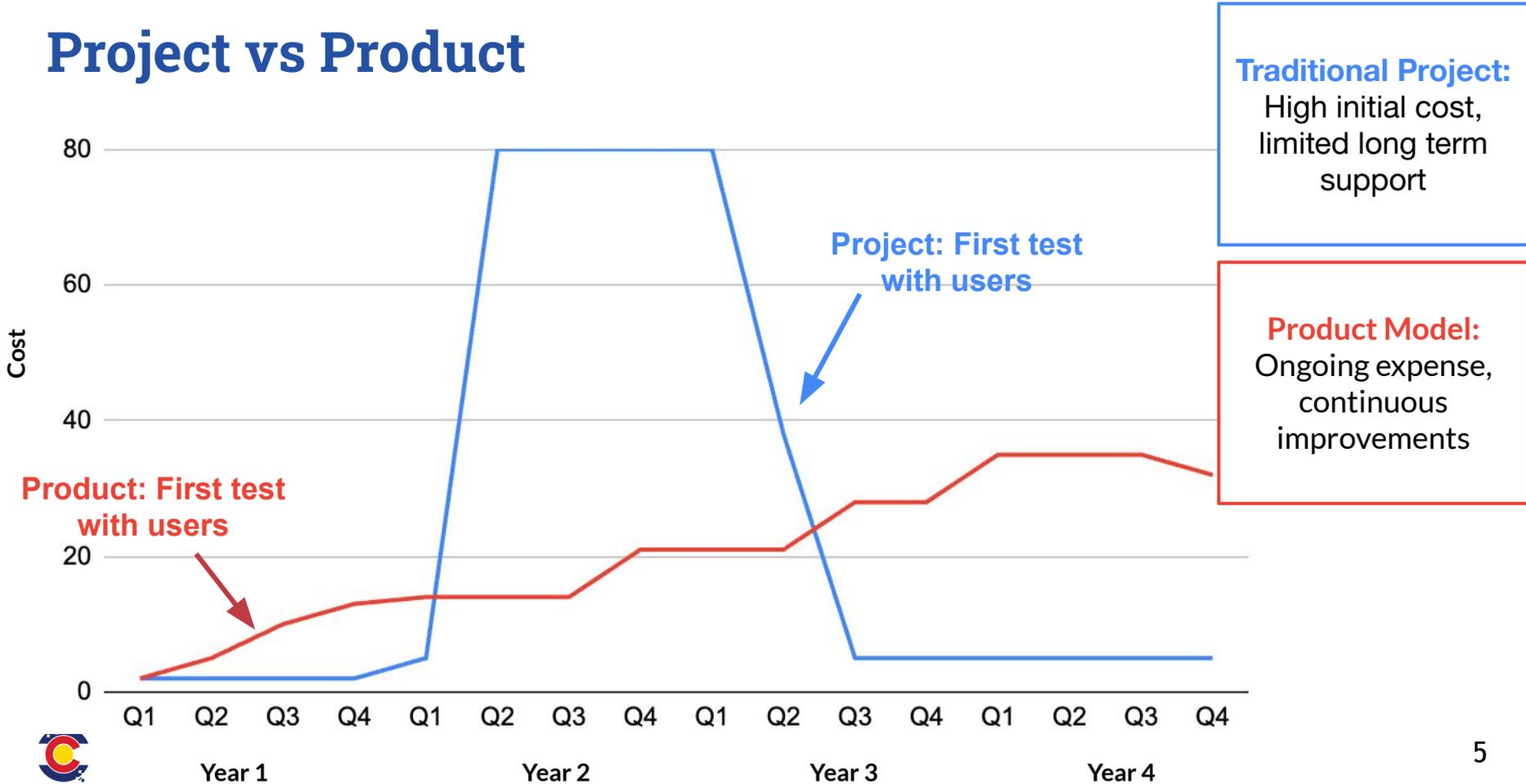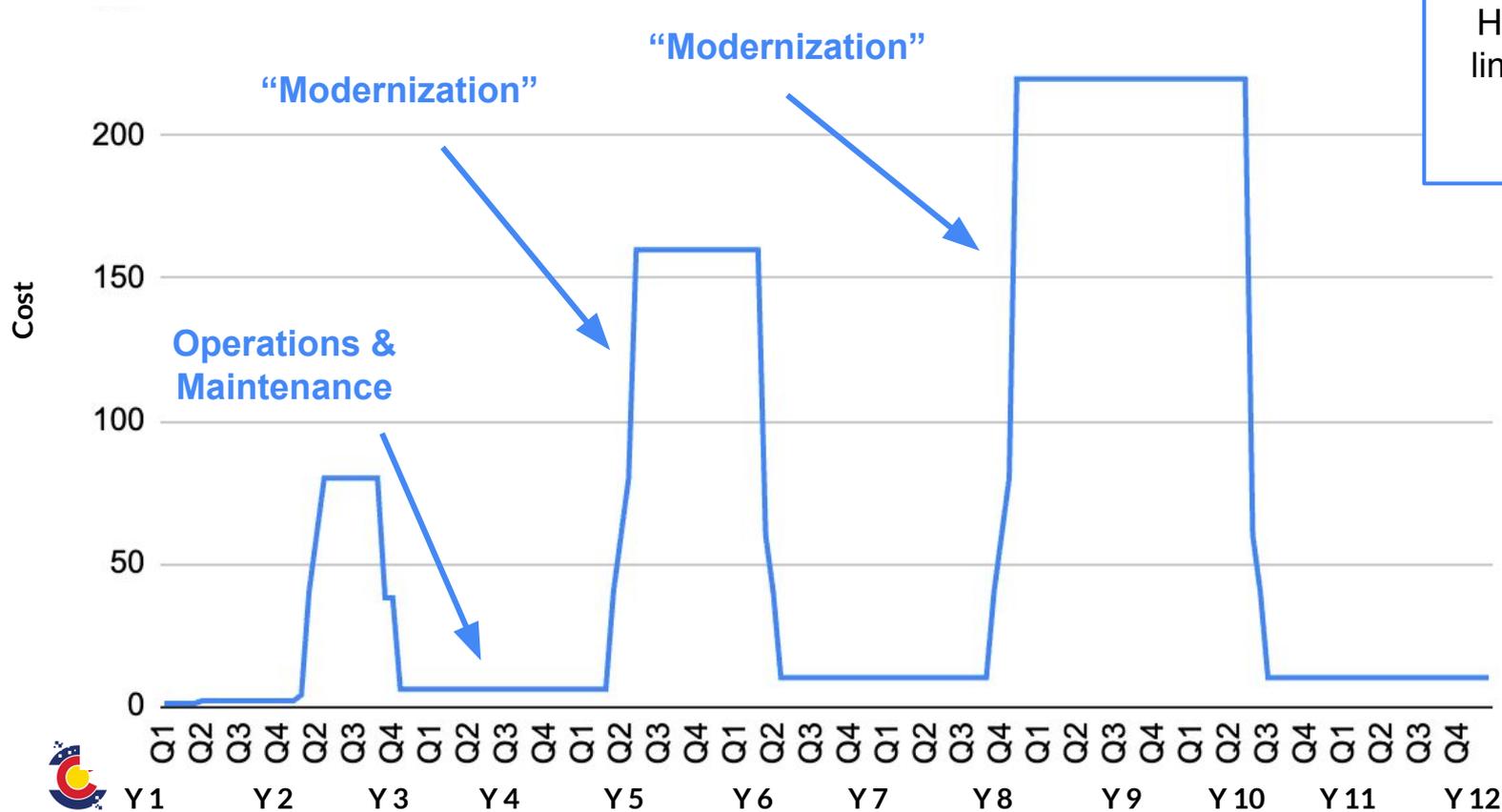**Traditional Project:** High initial cost, limited long term support

Product Model: Ongoing expense, continuous improvements

Discovery Sprint

2 Teams

4 Teams

Cost

80
60
40
20
0

Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4

Year 1   Year 2   Year 3   Year 4

4

Traditional Project Model

"Modernization"

"Modernization"

Operations & Maintenance

Cost

200

150

100

50

0

Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4

Y 1   Y 2   Y 3   Y 4   Y 5   Y 6   Y 7   Y 8   Y 9   Y 10   Y 11   Y 12

Traditional Project: High initial cost, limited long term support

6

Project vs Product

Ongoing capabilities & working software

7

The purpose of technology is **to solve a user's problem**.

The only measure of success that matters is **what value has been delivered to end users**.

Software is never done. Budget for **continuous value creation**, not one-time completion.

We should **only pay for the value created by the technology**. If it doesn't provide value, we shouldn't buy it.

Vendors build. Government must **own, decide, and validate.**

Dr. Justina
COVID Case Investigation & Contact Tracing

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Success via user research, cross-functional teams, and incremental delivery

Initial User Research

- Built a **service blueprint** based on user research with CDPHE and LPHAs

- Drafted **design principles** and **health equity** artifacts to help drive decision-making

- Aligned focus on delivering **value to the people of Colorado**

- Wrote **user stories** to describe what the system needed to enable for the people using it
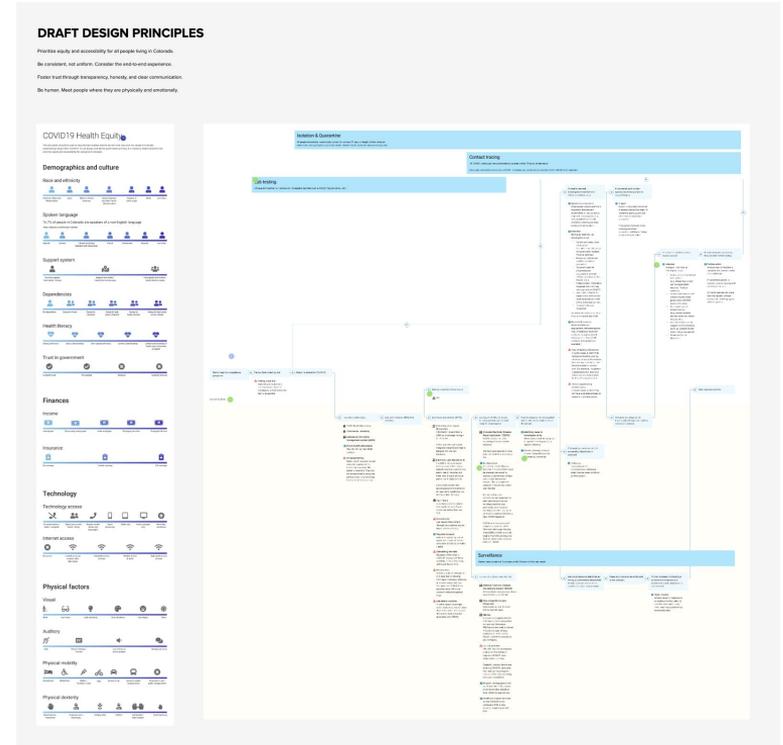
Cross Functional Procurement Team

Internal

- Public Health Executive Sponsor
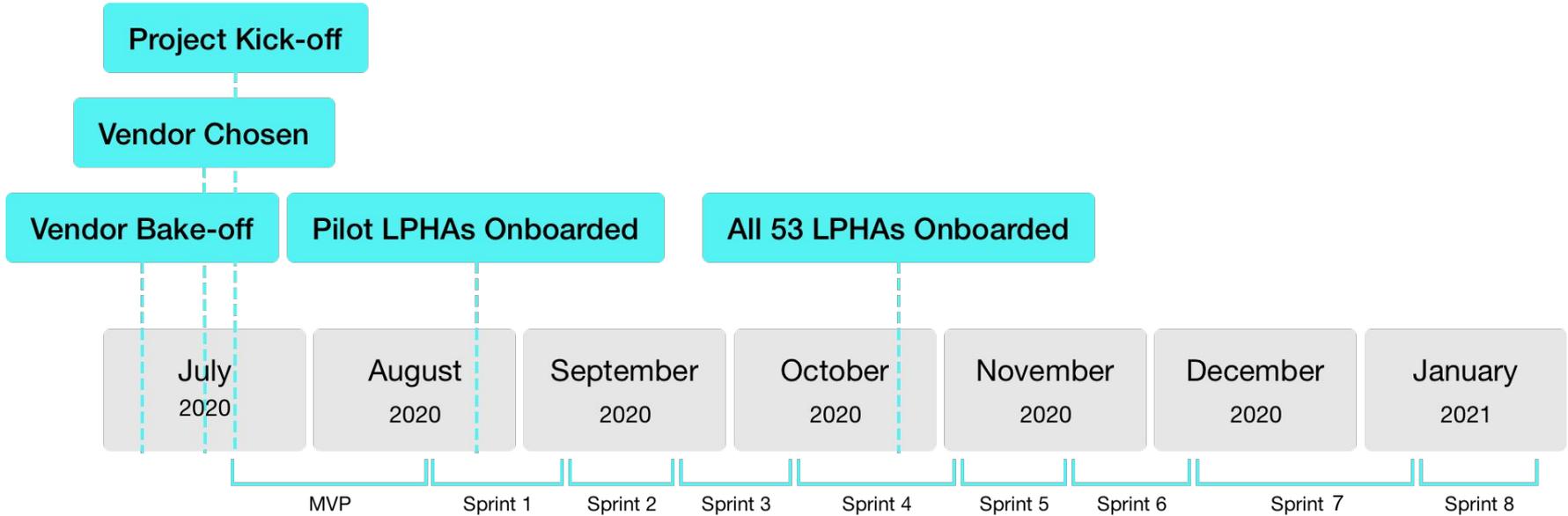- Procurement and Contract Specialist
- CDPHE Contract Manager
- Technical Oversight Coordinator
- User Experience Designer / Researcher
- Product Manager
- Security Engineer
- API Engineer
- Public Health Subject matter expert
- Epidemiologist
- Case investigators, contact tracers, and supervisors

External

- Local Public Health Agencies: Case investigators, contact tracers, and supervisors

Timeline

Project Kick-off							

| Vendor Chosen | | | | | | | |

| Vendor Bake-off | Pilot LPHAs Onboarded | | All 53 LPHAs Onboarded | | | | |

July 2020	August 2020	September 2020	October 2020	November 2020	December 2020	January 2021

MVP · Sprint 1 · Sprint 2 · Sprint 3 · Sprint 4 · Sprint 5 · Sprint 6 · Sprint 7 · Sprint 8

Cross-Functional Execution Team

Internal
- Product Manager
- Tech Lead
- User Experience Designer / Researcher
- Stakeholder / Vendor Manager
- Subject Matter Experts
  (Epis, CI / CT Leads, Health Equity, etc.)
- Data Scientist
- User Manager / Training Lead
- Procurement and Contract Specialist

External (Vendors)
- Project Manager (Dimagi)
- Product Associate (Dimagi)
- Program Director (Dimagi)
- Helpdesk Leads (Microknowledge)
- Training Leads (Abt Associates)
- Data Migration Specialist (Caktus)
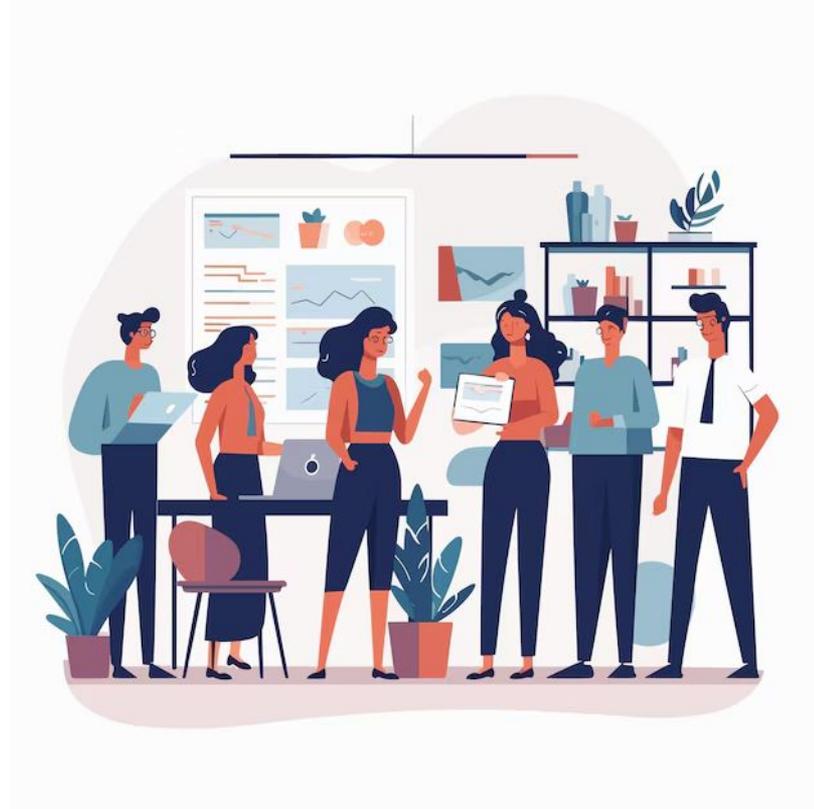
The Bottom Line: $15M Under Budget

Before Dr. Justina

Fragmented ways of tracking

- 53 different ways to track case investigations, contact notifications (some by pen and paper)
- Unknown # of contacts made across state
- Unknown success rate or CI/CT efficiency
- Multiple emails to CDPHE CI/CT to request surge assistance

After Dr. Justina

Centralized approach

- 1 way to track and record case investigations, contact notifications; 53 LPHA-specific project spaces; 1,998 users in a single space
- Coordinated capture and storage of data
- Automated systems populate I/Q dates; SMS and email functionality ensure orders sent
- Tens of thousands of case investigations and contact notifications complete
- Streamline requests for CDPHE CI/CT surge support

KEY WINS

💰 **$15M under budget**
😄 **4.82/5 CSAT**
👥 **1,998 users**

Why it succeeded

🤝 Started with user needs

Not with technology

🔄 Delivered value incrementally

MVP in 6 weeks

📈 Built to evolve iteratively

Not as a waterfall

✨ Cross-functional team

With technology expertise

🌈 Measured success by user outcomes

CDS's questions and considerations for creating value via technology

- Commercial-off-the-shelf vs custom development
- One size does not fit all
- Change take time
- Building capacity across the state

What are the goals of the initiative?

✅ *Right*

❌ *Wrong*

One or more specific user needs are named.

- Help caseworkers <u>spend less time uploading</u> paper documents, so they can spend more time with their clients
- User testing shows that 60% of applications are abandoned because <u>users can't save and return</u> later
- Field staff work in rural areas <u>need offline functionality</u> to do their jobs

Anything technical in nature, instead of focusing on user needs.

- Migrate to a cloud-based infrastructure
- Replace our legacy system with modern technology
- Implement a modular, API architecture

What are the specific user needs that this initiative will address? How did you learn about them?

Right

Wrong

The agency determined specific needs based on interviews with end users

- We interviewed 22 case workers who told us they spend an average of 4 hours daily re-entering data across 3 systems
- Allow residents to renew their license in 5 minutes or less
- Enable small business to submit a permit application from their phone

Anything that doesn't name clear needs of end users identified via user research

- Our current system is old and hard to maintain
- We need to comply with new federal regulations
- The existing contract is expiring

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When will users first try working software? And on what subsequent cadence?

Right

Wrong

Within 6 months, then at the end of each sprint

- Users will test a working prototype 6 weeks after kickoff
- We'll deploy the first feature to a pilot group of 50 within 3 months
- Every two weeks, users will see and test new functionality

When it's done or after 12-24 months

- After the 18 month development phase is complete
- During user acceptance testing (UAT)
- After we finish requirements gathering and design
- We'll do a workshop to train the users once it is built

Who on the agency team has technology expertise to own this product?

 Right

 Wrong

Names of specific State employees who are empowered to make decisions and ensure value delivery

- Sarah Clark, the product manager, has 10 years experience building government software and will make daily prioritization decisions
- The team includes a product manager, tech lead, and UX researcher to work directly with the vendor team

Program manager, OIT, the vendor

- The project manager will handle technical decisions
- OIT will do operations and maintenance
- The vendor team includes all the technical expertise we need

What are you buying?

✓ Right

✗ Wrong

Specific people, for specific time periods, at specific rates

- Time and materials, with a cap– $200k per two-week sprint with named team
- Monthly fee of $100K for a defined team (3 developers, 1 designer, 1 product manager)
- We evaluated build vs. buy, and it's truly unmodified COTS with a clear exit strategy. Our contract includes API access to export our data.

Fake units of currency (story points, pool hours, blended rates), any milestone without quality assurance

- The contract is for 10,000 blended hours at $150/hour
- Payments are tied to milestone completion as per gantt chart
- Each quarter we will have 5,000 pool hours from which to do improvements, the vendor will tell us how many hours a feature will take

Who will own the software?

 Right

 Wrong

The State or it will be in the public domain

- We own the code from day 1
- Everything will be in the public domain
- All work product belongs to Colorado and will be published in our Github repository

The vendor

- The vendor retains the intellectual property and ownership over anything they customized
- It's a licensed product we're customizing
- We'll own it after the final payment

When a vendor doesn't perform, what will you do?

Right

Wrong

We'd request a different team. If that doesn't work, we can replace them within 2-3 months. We own the code, use open standards, and have modular contracts

- We'd pull a different vendor from the pool and have them onboarded within 6 weeks
- We're using open standards and APIs, multiple vendors can easily scrub in
- Our contract is structured in 6-month increments and we've identified 3 other qualified vendors

It would be hard to terminate. It would take months/years and set us back significantly.

- We'd gather proof and then talk to our lawyers
- We'd need to start over
- It would require a complete system replacement– 2-3 years
- We've never fired a vendor, so we haven't planned for it
- It would be really expensive

CDS's considerations for de-risking custom technology:

1. What are the goals of the initiative?
2. What are the specific user needs that this initiative will address?
   a. How did you learn about them?
3. When will users first try working software?
   a. And on what subsequent cadence?
4. Who on the agency team has technology expertise to own this product?
5. What are you buying?
6. Who will own the software?
7. If a vendor doesn't perform, what will you do?

5 foundations for technology success

🤝 Start with user needs

Not with technology

🔄 Deliver value early and often

Within 6 months and then at least every month after

💰 Budget continuously

Not as a one time expense

✨ State must have technical capacity

Ability to check vendor work

🌈 Pay for people and outcomes

Not fake units

We're here to help

Colorado Digital Service | colorado.gov/digitalservice | oit_ColoradoDigitalService@state.co.us

Thank you. Questions?