



A Workforce Development & Management Approach During the COVID-19 Pandemic

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Citywide Immunization Registry (CIR)

Agenda

- Background
- The Challenge
- Organizing the Work
- Recruiting Additional Staff
- Developing the Team
- Results



Subtitle: “How HLN’s CIR Team Navigated through the Pandemic”

Background

Background

- New York City Citywide Immunization Registry (CIR) went live in 1997
- As of May 2023:
 - Population of NYC - 8.5M
 - CIR Patients - 14M
 - CIR Immunizations - 160M
 - HL7 Messages per Month - 22M
- HLN has provided software development and support services to the CIR continuously since 2000
- CIR owns the copyright on all of its source code
- CIR has shared some of its components
 - Immunization Calculation Engine (ICE)
 - IZG Client

The Challenge

Major Disruptors Over the Past 3 Years

- COVID-19 Pandemic
- Mpox
- Modernization of the CIR

New Business Needs (examples)

- Onboarding many new providers
- New vaccine ordering and inventory management processes
- Support increased volume of querying
- Maximize system uptime
- New analytics and reports



The Goals: A Project Manager's Perspective

- Major Functional Enhancements
- Highly Responsive Production Support
- Ongoing Routine Maintenance
- Technical Architecture Transformation
- Organizational Transformation



Key Challenges

- Doing all of the above simultaneously
- Many interdependent applications and services
- Rapidly changing requirements
- Immediate implementation
- Frequent deployments
- Growing the team



Organizing How We Work

Speed
Flexibility
Robustness
Responsiveness

Manifesto for Agile Software Development

<https://agilemanifesto.org/>

We are uncovering better ways of developing software by doing it and helping others do it.

Through this work we have come to value:

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

That is, while there is value in the items on the right, we value the items on the left more.

Kent Beck
Mike Beedle
Arie van Bennekum
Alistair Cockburn
Ward Cunningham
Martin Fowler

James Grenning
Jim Highsmith
Andrew Hunt
Ron Jeffries
Jon Kern
Brian Marick

Robert C. Martin
Steve Mellor
Ken Schwaber
Jeff Sutherland
Dave Thomas

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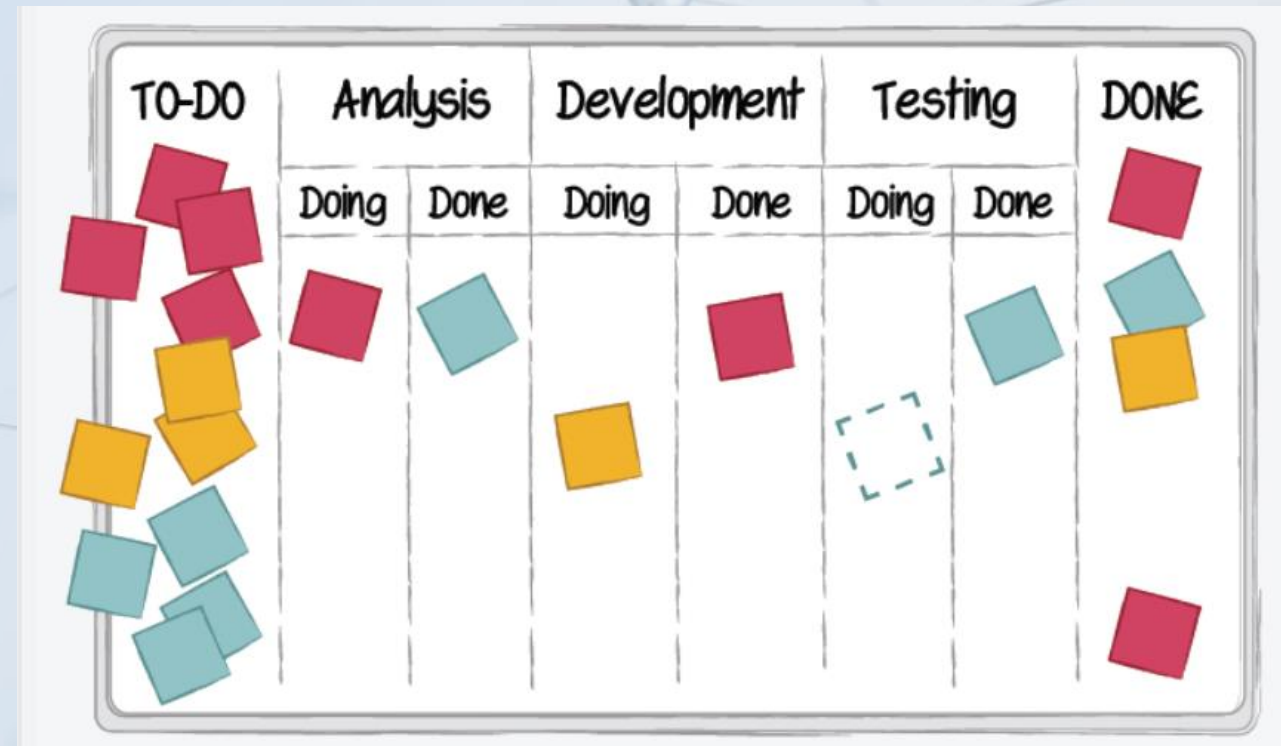
Kanban

(a Lean Workflow Management Methodology)



Kanban (看板)

- Meaning
 - “Sign board” / “Card you can see”
- Principles
 - Visualize the Work
 - Limit the Work in Progress
 - Focus on Flow
 - Continuous Improvement



Sub-Teams

- Organized around business processes and/or applications
- Members
 - **HLN:** Project Manager + Business Analysts + Software Engineers
 - **CIR:** Product Owner + SMEs + Key Users (internal)
- Kanban process
- Weekly cadence
- Issue Tracking - Jira
- Instant Messaging - HLN Slack channel

Sub-Teams / Kanban Workflows

- Vaccine Ordering & Inventory Management
- Data Exchange / Data Quality
- Public Facing Applications
- Provider Dashboard
- Cloud Migration & Operations
- Immunization Forecasting
- Analytics & Reports
- Application Security & Accreditation
- Integration with Environmental Health (Lead, Asthma)

Weekly CIR/HLN Meeting for each Sub-Team

Monday	Tuesday	Wednesday	Thursday	Friday
Management	Vaccine Ordering & Inventory Management Data Exchange / Data Quality	Public Facing Applications Application Accreditation & Security	Provider Dashboard Analytics & Reports Integration with Environmental Health	Immunization Forecasting Management

Collaborative Management

- HLN
 - 3 Project Managers
 - Tech Lead
- New York City
 - Immunization Program Manager
 - CIR Director
 - CIR Senior Research Scientist
 - CIR Interoperability Coordinator
 - CIR Public Facing Applications Product Owner
 - Division of Disease Control Technical Architect
 - Division of Information Technology Project Managers
- HLN/NYC Management Meetings (2 x Week)
- HLN Standup Meetings (Daily -> 2 x Week)

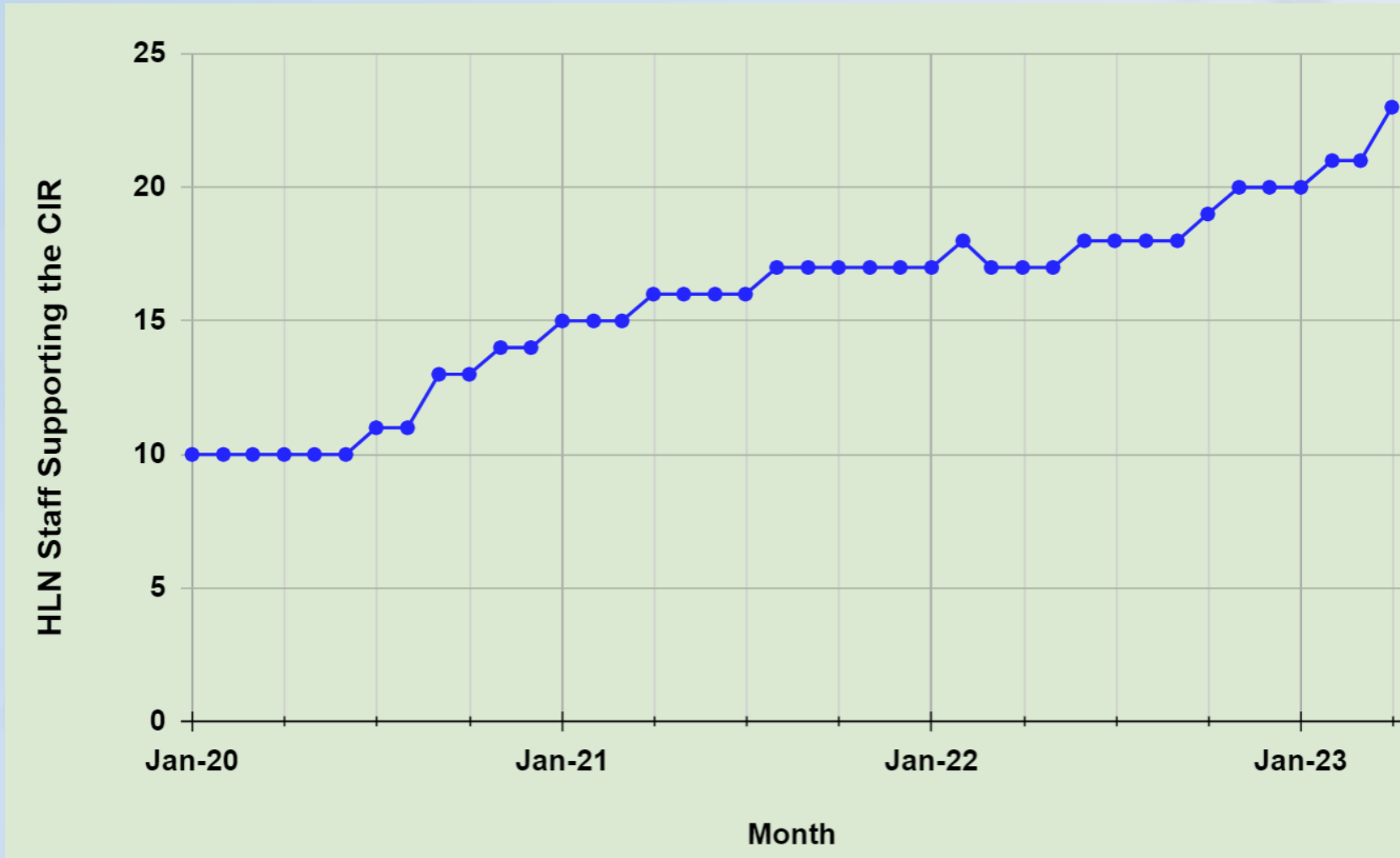


Recruiting Additional Staff

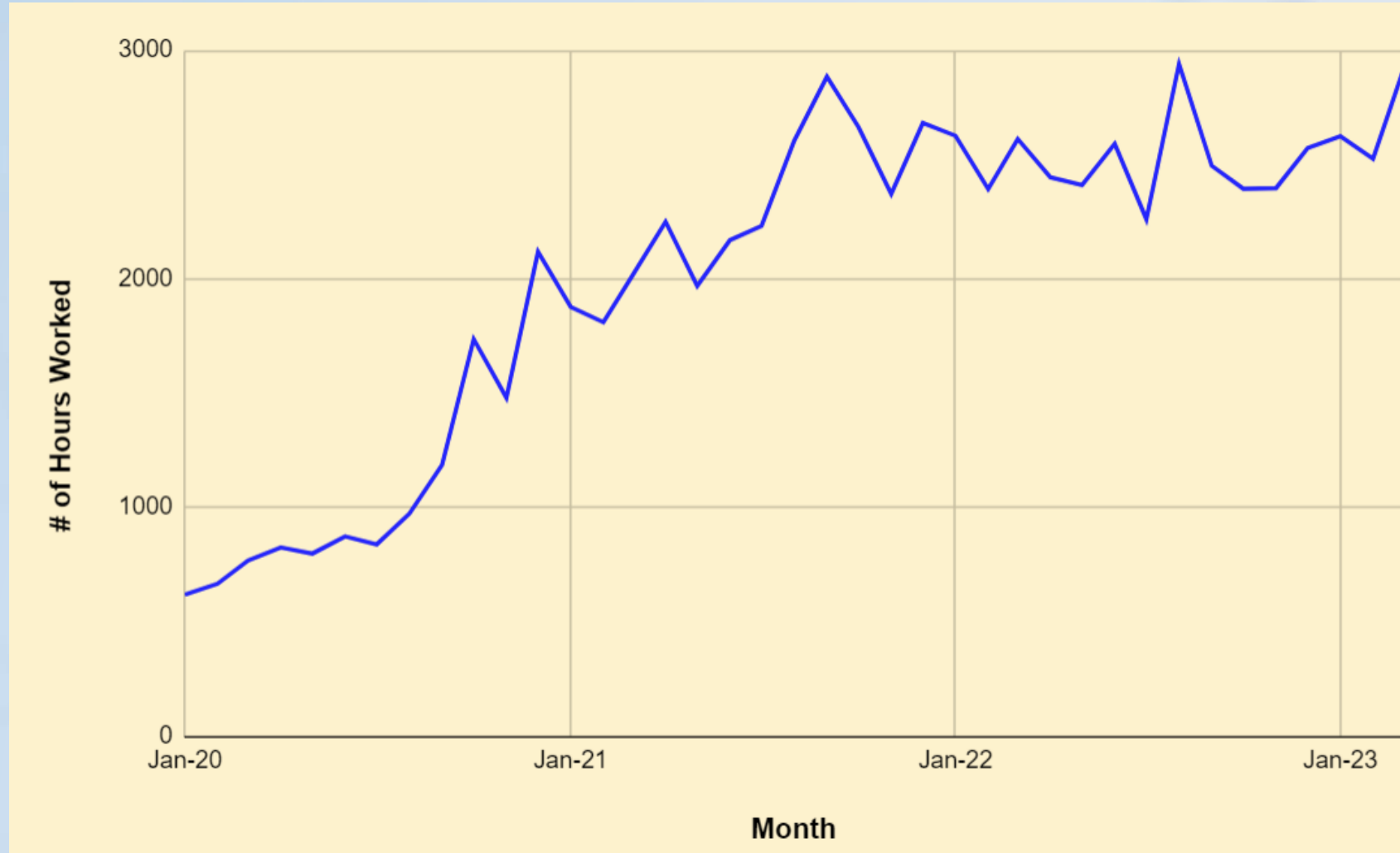


Size of HLN's CIR Team

January 2020 through April 2023



Total Hours Worked by HLN' CIR Team each Month January 2020 through March 2023



Recruitment Process for HLN's CIR Team

1. Candidate is referred to HLN by
 - a. External recruiter
 - b. HLN staff member
2. HLN recruitment team evaluates resume and introduction
3. Non-Technical panel interview with project managers
4. Review candidate's response to the coding challenge (for developer positions)
5. Technical panel interview with future team members (in the same role)
6. Evaluate references provided by candidate
7. HLN's President meets with candidate

Evaluation of Candidate (in 3 areas)

- **Core** skills & experience (*examples*)
 - BAs: Meeting facilitation, requirements analysis, testing
 - Devs: Migrating monolithic architecture to a microservice architecture
- Experience in certain **Settings / Environments** (*examples*):
 - Agile
 - Consulting
 - Simultaneous Development/Support
 - Public Health / Healthcare
- **Other** attributes (*examples*):
 - Shares organization's Core Values
 - Comfortable with multiple/changing roles
 - Highly collaborative
 - Self-starter



Developing the Team



Typical Method for Developing New Business Analysts

- Teach history of IIS community and HLN
- Teach background info about the CIR
- Meet the Team - Coffee Talks
- Developer Brown Bag Lunches
- Assign new hire to sub-team(s)
- Pair new hire with experienced member of same sub-team
- Experienced member trains and mentors new hire
- Watch training videos / Record additional videos as necessary
- Collaborate on same project together
- Incrementally ramp up responsibilities for new hire



Results

Some Noteworthy Accomplishments

- 320+ Production Deployments (March 2021 through April 2023)
- Vaccine Provider Agreement System (VPAS) implemented in 61 days
- Brand new Facility Registration Application
- Timely processing of all COVID-19 vaccine orders
- Support real-time HL7 querying by providers, health plans, and the NYC public school district
- IZG data exchange with 4 other IIS and the Veterans Health Administration



Relevant Presentations at 2023 AIRA National Meeting

- CIR Use in the Mpox Outbreak
 - Session **2E** (Tuesday @2:30pm)
- IIS Client for the Immunization Gateway (Joint Development)
 - Session **3E** (Wednesday 9:15am)
- Analytics Database for COVID-19 Reporting
 - Session **3D** (Wednesday 9:15am)
- Using the CIR to Monitor Storage Unit Compliance
 - Session **5E** (Wednesday @3pm)
- Completing Records via the Immunization Gateway
 - Session **6B** (Thursday @9:15am)

Conclusions

- Agile methodologies are especially good in **dynamic** environments
 - Moving fast
 - Evolving (lots of unknowns and/or changes)
 - Important
- Remember the Agile Principles (see Agile Manifesto)
- Collaborate (including Management & Recruitment)
- Be rigorously thoughtful when recruiting
- Be intentional about developing your team