FBI CDE
Options for launch

June 9, 2017

18F

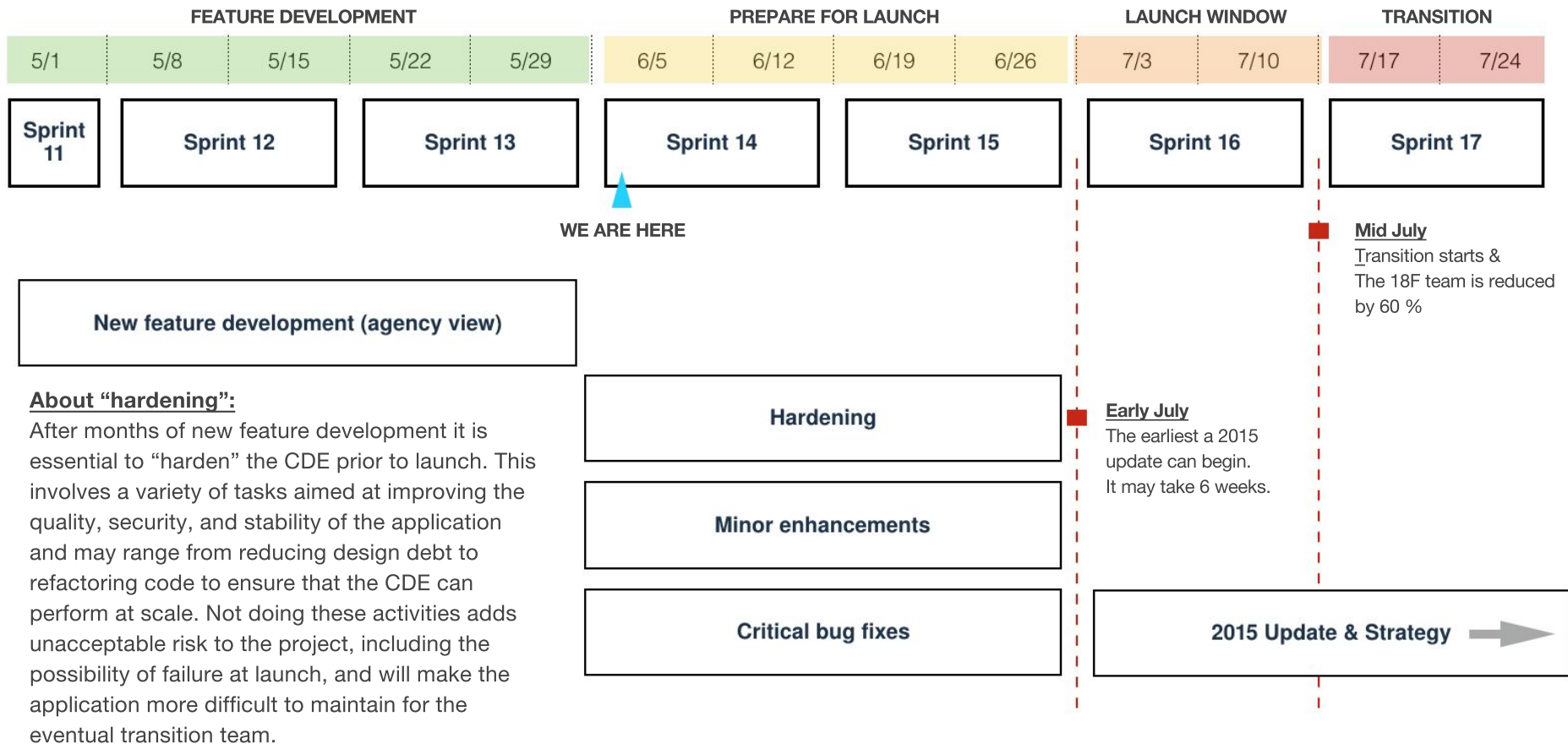This is an agile project, which means if time & budget are fixed, scope must be flexible.

EXECUTIVE SUMMARY

- We believe the CDE can be ready to launch in 4 weeks with the current feature set (2014 data only).

- However, after months of new feature development the CDE requires "hardening" before it can be released to the public. Hardening is a necessary part of software development aimed at improving the security, quality, and stability of an application. These tasks will not only mitigate the risk of downtime or failure at launch, but make the codebase easier to work with and maintain.

- Given the need for hardening, the earliest a full update of 2015 data can begin is mid-July and we estimate (with moderate confidence) that this process will take 6 weeks to complete.

- Currently, updating the CDE requires a manual and labor-intensive process. We believe that future updates could be made in less time by making some aspect "semi-automatic", but ultimately, defining a long-term strategy will require additional consultations with CJIS staff and so it is an ideal focus for the transition phase starting in mid-July.

- **We recommend that the CDE launches as soon as hardening is complete (early July) with either 1) just the 2014 data, or 2) a mixture of 2014 & 2015 estimated data. In either scenario, CJIS would have the full 18F team in place to support the site through launch, but would defer the full update to the transition period.**

LIMITING FACTORS

- The complete 18F team is available for only 6 more weeks. After mid-July, the team is reduced by 60% and their activities are limited to transitioning the product to CJIS in the form of knowledge transfer, documentation, and bug fixes.

- 18F will provide support through August, after which there will only be a bucket of hours remaining for "light consultations" through September, 2017.

- To successfully transition the product 18F will work with CJIS to define a long-term strategy for updating the CDE so they can own this process going forward. The ideal way of facilitating this knowledge transfer and to ensure competency is to update the data together.

- Approximately 4 weeks of hardening is required before the CDE can be launched. Not doing these tasks poses great risk to the reputations of CJIS, the FBI, and 18F and so deferring them is not an option.

- Hardening must come before a 2015 update due to the skillsets required and the project timeline. Some hardening tasks will also make a future update easier.

- Despite the question of when an update can occur, launching the CDE ultimately requires the FBI to secure an Authority to Operate (ATO) and define a new way of assessing risk for open source applications. As of this writing, it is unclear how the FBI will achieve these objectives and what impact, if any, they will have on the launch timeline.
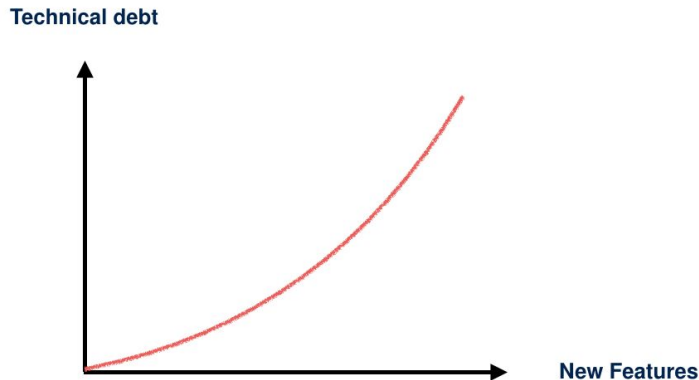
THE EARLIEST A FULL 2015 UPDATE CAN START IS MID-JULY

FEATURE DEVELOPMENT					PREPARE FOR LAUNCH				LAUNCH WINDOW		TRANSITION	
5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24

Sprint 11	Sprint 12	Sprint 13	Sprint 14	Sprint 15	Sprint 16	Sprint 17

WE ARE HERE

Mid July
Transition starts &
The 18F team is reduced
by 60 %

New feature development (agency view)

About "hardening":
After months of new feature development it is essential to "harden" the CDE prior to launch. This involves a variety of tasks aimed at improving the quality, security, and stability of the application and may range from reducing design debt to refactoring code to ensure that the CDE can perform at scale. Not doing these activities adds unacceptable risk to the project, including the possibility of failure at launch, and will make the application more difficult to maintain for the eventual transition team.

Hardening

Early July
The earliest a 2015
update can begin.
It may take 6 weeks.

Minor enhancements

Critical bug fixes

2015 Update & Strategy

What is the cost of sacrificing quality over new features?

(Don't be another healthcare.gov.)

WHY HARDENING: BUILD LESS, BETTER.

Technical debt

New Features

Review the application as a whole for security, accessibility, and other compliance requirements

Address visual design & user experience bugs

General code cleanup & documentation to improve maintainability

Conduct load testing to ensure performance at scale

Add redundancy to API servers to reduce risk of down-time

Validate the integrity of derived data, especially new agency data

Partition derived tables to improve API performance

As we add new features code becomes more complicated. Over time, these changes & bugs accumulate in the form of "technical debt", making the application less performant and more difficult to work with.

Hardening allows us to simplify the codebase to make it run more more efficiently, similar to how an essay would go through multiple revisions before being finalized.
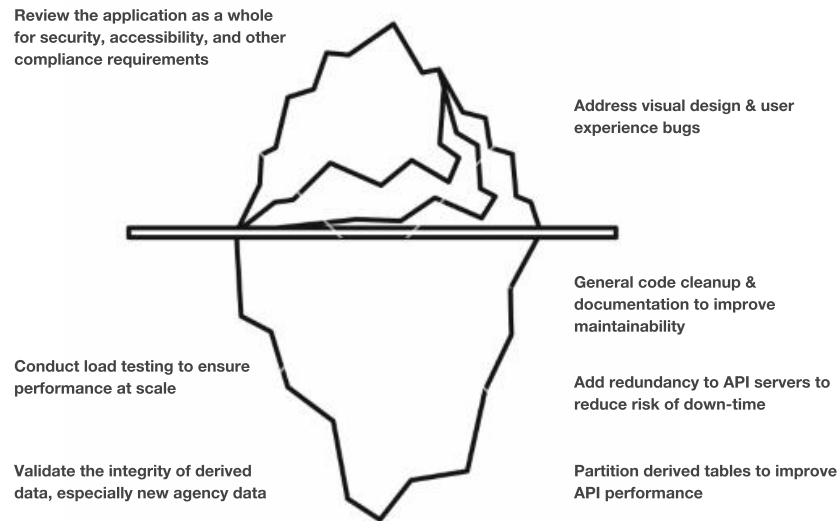
In addition to simplifying the code, hardening allows us to test and optimize the application prior to launch. Examples include ensuring that the CDE meets applicable security requirements, is 508 compliant, behaves as expected, and performs at scale.

Not doing these tasks significantly increases the risk of downtime, or failure, at launch.

For now, updating the CDE requires a manual process that could take 6 weeks or more.

CJIS will need to own this process going forward, making it an ideal focus for transition.

TECHNICAL BACKGROUND

- The focus of this engagement is on delivering a first iteration of the CDE that improves access to UCR data and which sets the stage for further modernization. It is not about delivering a "full or complete system."

- The CDE was built around a single data dump from New UCR (provided in November, 2016). As a first iteration, there is no formal connection between the CDE and New UCR, which means that updates currently require a manual process. For the example, at the start of this project, data was literally mailed to 18F via hard disk as a means of transferring the data.

- 18F plans to define a more sustainable strategy for making updates to the CDE as part of the transition phase, but developing this strategy depends on many factors such as: 1) the frequency in which updates can be made by the UCR program, 2) how data will be transferred between systems, 3) how updates will be messaged to users, and 4) how much can be automated to streamline future updates and improve the overall maintainability of the CDE.

- All of this means that while updates to the CDE are costly today, they could be made with less effort in the the future. However, defining this approach will require further consultations with CJIS staff and coordination with the transition team that will eventually own the system.

- For this reason and others, a 2015 update is an ideal activity for the transition phase and will support the broader thinking necessary for defining next steps.

AN UPDATE AFFECTS THE ENTIRE APPLICATION

CDE DATABASE

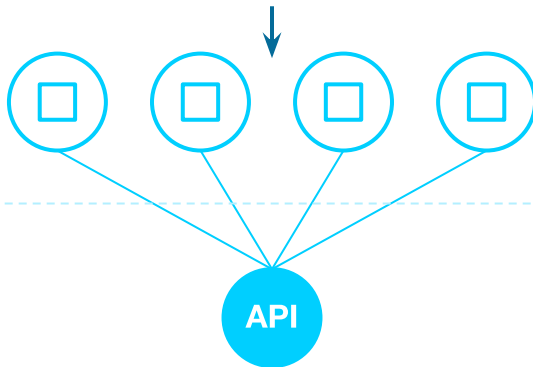The application is built around a single data extract from New UCR.

Create backup database & ingest 2015 data

1 week

DERIVED TABLES

The CDE uses tables derived from the database to make data available to the rest of the application.

Regenerate derived tables. Refactor regeneration scripts as necessary

2-3 weeks

API

API SERVICE

The API reads against the derived tables to enable key experiences & fulfil user requests.

Verify data is being returned correctly & refactor as necessary

1-2 weeks

CDE USER INTERFACE

Data is exposed via the user interface and made available for download.

Perform quality assurance on the application

1 Week

Release early, release often, and listen to your users.

There is much you can learn from a smaller, more limited release.

LAUNCH OPTIONS

- **Option 1 - Stay the course & release iteratively:** Continue with our current plan of adding minor features, like arrest data, but launch as soon as hardening is complete with just 2014 data. In this scenario, CJIS would continue to message that the site is a work in progress and make incremental updates. Many federal entities, like the FEC, have successfully followed this model and it is the option we most recommend.

- **Option 2 - Launch with some 2015 data (national & state estimates only):** While a full update is expensive, adding just 2015 estimated data is more manageable and can be done without impacting the launch timeline. While there are limitations to this approach - only the state and national trends would show 2015 data and all incident data and some downloads would be limited to 2014 - we think it can be done without negatively affecting the user experience. However, this option may come at the expense of some features, such as arrest data, but could safely be done within a sprint.

- **Option 3 - Defer launch until the full 2015 data is available:** This option would involve delaying launch to late July or early August so that a full update can be made. It is the option we least recommend as it unnecessarily prevents CJIS from demonstrating its progress to stakeholders and the public and increases the risk that a dedicated 18F team will not be in place at launch.

LAUNCH SCENARIOS

	June	July	August

1 — Launch when "hardening" is complete in early July and continue making updates to the site thereafter. **This is our recommended approach.**

2014 DATA ONLY

2 — Launch with some 2015 data (national & state estimates and some downloads). This may come at the expense of some new features, like arrest data.

PARTIAL 2015 UPDATE

3 — Delay launch until the full 2015 update can be completed. In addition to delaying launch, this increases the risk that CJIS will be without 18F support once the site goes live.

FULL 2015 UPDATE

ADOPT A "LAUNCH TO LEARN MINDSET"

- The private sector & some federal entities, like the Federal Elections Commission, have adopted an iterative release strategy that values learning over completeness. In this way, firms plan for smaller, more frequent releases to validate core assumptions and guide future development efforts.

- While delaying launch in order to ship a more fully-featured product seems like risk mitigation, it actually increases the likelihood that a product will under-deliver because of a lack of feedback from end users. This results in unnecessarily long and costly development efforts that are essentially "guesses" around what people want.

Change | **Iterative Releases (Agile)** | Change | **Infrequent Releases (Waterfall)**

Time | Time

Smaller updates
More feedback
Less risk

Large and infrequent releases
Less feedback
More risk