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# MED CHECKER

[medcheckerapp.com](http://medcheckerapp.com)

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Documentation for Agile Delivery BPA  
July 7, 2015

**LongView International Technology Solutions**



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# Background on LongView

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# Background on LongView

LongView is one of the fastest growing companies delivering IT solutions and innovations to the Federal sector. We were #5 in 2014 Washington Technology Fast50 and #384 in 2014 Inc. 500.

## Practice Areas

- Program Management
- Web & Mobile / Software Development
- Cybersecurity / IA
- Cloud / Infrastructure
- Analytics / Decision Support
- Enterprise Solutions

## Investment in Innovation

- In 2014, launched LongView Innovations Center
- Led by former Director of the Garfield Innovation Center for Kaiser Permanente
- Vision is to identify and leverage innovation in IT for the federal sector



- Incorporated in 2005, we are an IT company that is Customer and Solutions focused around our six core practice areas.
- Clients include VA, DHA, DHS, HUD, Navy, Air Force, Intelligence Community
- Prime Contract vehicles include NIH CIO-SP3 SB and SDVOSB (All 10 task areas), GSA IT70, VA T4



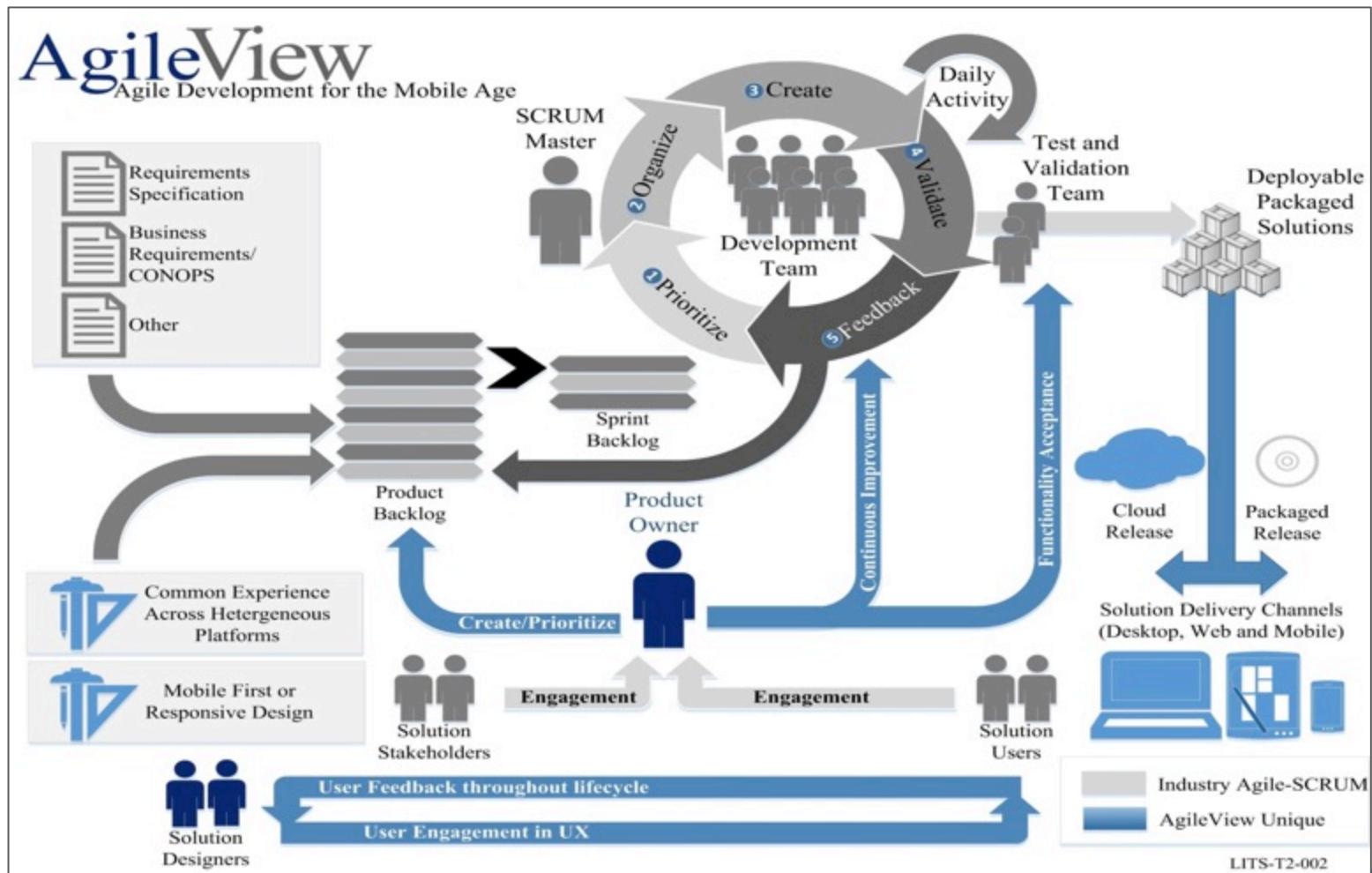
**“** LongView has developed 30 mobile applications for the Federal Government **”**

## Mobile Focus

- Agile SCRUM Methodology
- User-Centered Design
- Responsive Design
- Native & Cross-Platform Development
- Middleware / Web Service / API Design, Development
- Software Quality Assurance
- Section 508 Compliance
- DevOps & Continuous Integration
- Mobile Device Management
- Mobile Security (Secure Code Review, Vulnerability Scans, Federal Compliance)



# Our AgileView Methodology



# Evidence

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## **Criteria A – Assigned one leader, gave that person authority and responsibility, and held that person accountable for the quality of the prototype submitted**

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- Vikram Pant, LongView's Web & Mobile Solutions Practice Director, is the project sponsor
- Mr. Pant worked closely with Margaret Gutermuth, Product Owner, and Melissa Salmeron, Agile Coach.
- Once testing activities are complete, the Product Owner reviews each story to ensure the acceptance criteria is met.
  - Mr. Pant reviews and provides final approval of each application feature and prototype submitted



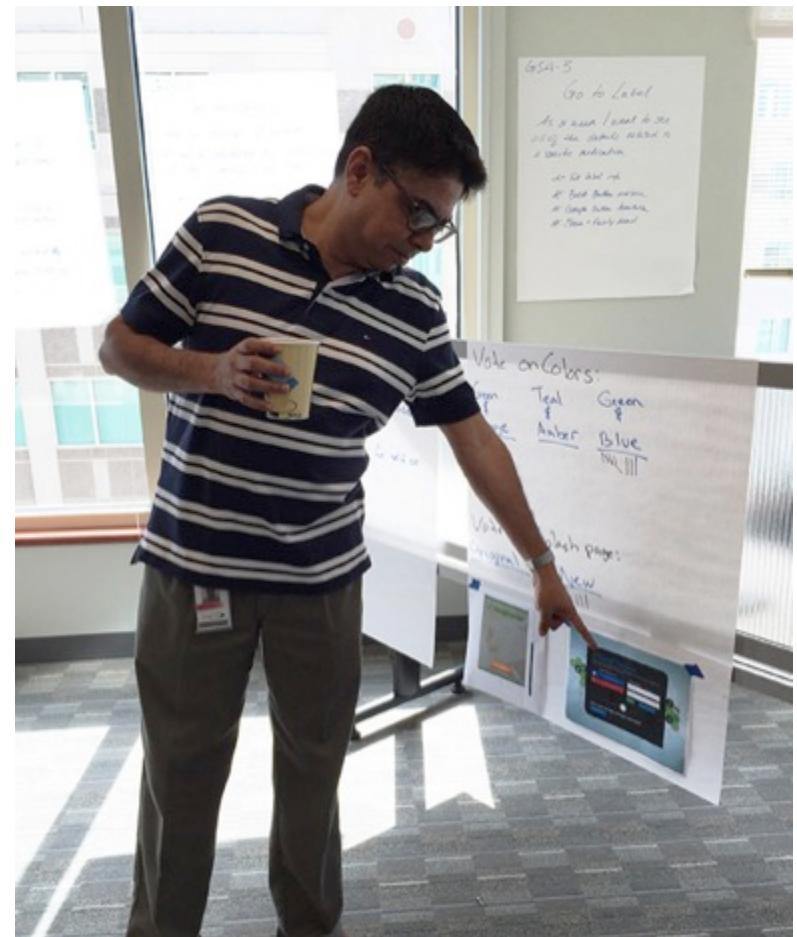
## **Criteria B – Assembled a multidisciplinary and collaborative team including a minimum of 5 LCATs from the Development Pool LCATs to design and develop the process**

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<b>Role</b>	<b>LongView Employee</b>
Product Owner / Manager	Margaret Gutermuth
Technical Architect	Hetal Giri
Interaction Designer	Amanda Dennis
Visual Designer	Amanda Dennis
Front End Developer	Keith Brown, Josh Eagle
Back End Developer	Joseph Hillhouse, Hetal Giri
DevOps Engineer	Stephen Wright
Security Engineer	Nihant Bondugula
Delivery Manager	Vikram Pant
Agile Coach	Melissa Salmeron
Business Analyst	Amanda Dennis
Digital Performance Analyst	Beth Tatum



## Criteria C – Understand what people need, by including people in the prototype development and design process



## Criteria D – Used at least three “human-centered design” techniques or tools

The image displays a web-based user interface for a mobile application. On the left, a browser window shows a sitemap with items like 'Splash Screen', 'Med List' (which is selected), 'Med Label', 'Graph', and 'About'. The main area shows a wireframe of a mobile phone screen titled 'MedChecker'. The screen has a search bar at the top with placeholder text 'Search by brand, generic, or substance name...' and a microphone icon. Below it is a message 'Max of 10 drugs can be added to your list.' followed by a bar chart icon. A list of medicine names is displayed in a scrollable area, each with a checkbox to its left:

- Medicine Name 1
- Medicine Name 2
- Medicine Name 3
- Medicine Name 4
- Medicine Name 5
- Medicine Name 6
- Medicine Name 7

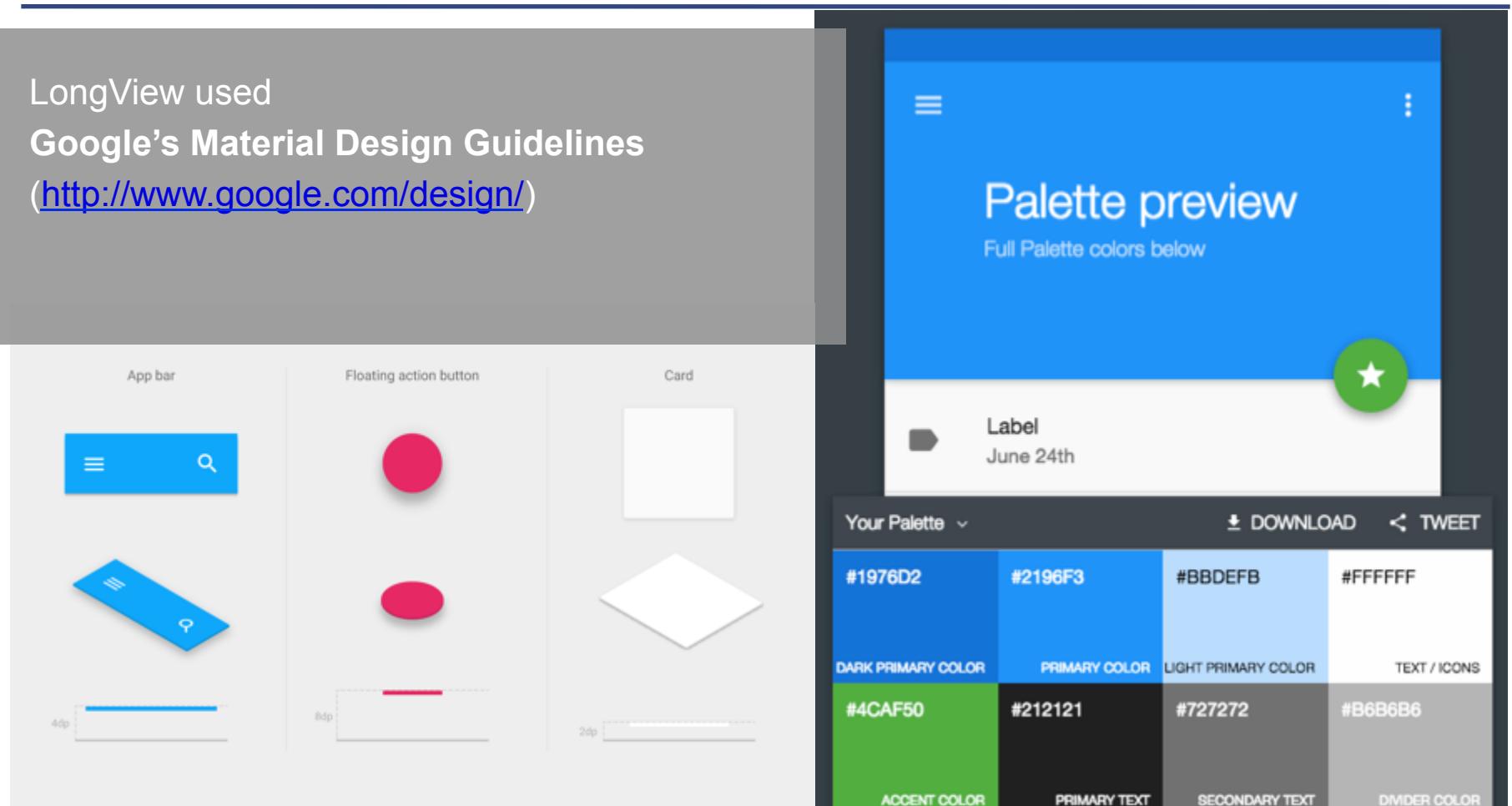
At the bottom of the screen, a blue footer bar indicates 'Logged in: LongLastNamePatient, FirstName'. To the right of the phone wireframe, a dark grey box contains two lists:

- Tools:**
  - Axure (shown)
  - Illustrator
  - Photoshop
- Techniques:**
  - Blind Survey
  - Focus Group

A tooltip on the right side of the phone wireframe says 'No functionality on the iPhone wireframe'.

## Criteria E – Created or used a design style guide and/or pattern library

LongView used  
**Google's Material Design Guidelines**  
(<http://www.google.com/design/>)



## Criteria F – Performed Usability Tests with People



**Focus Group**  
Walking users through the purpose of the app from the splash page, then getting expectations, impressions, and wishes for each screen.

## **Criteria G – Used an iterative approach, where feedback informed subsequent work or versions of the prototype**

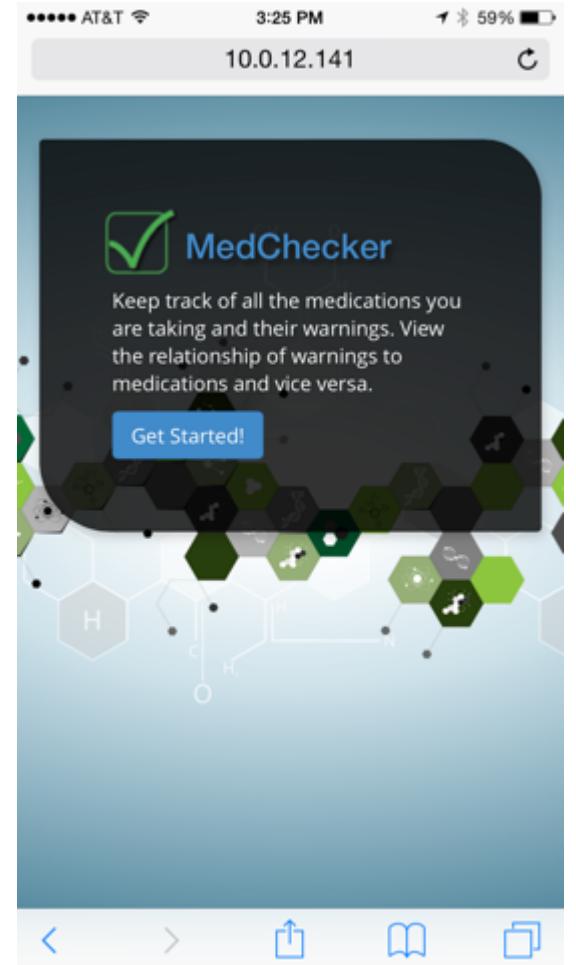
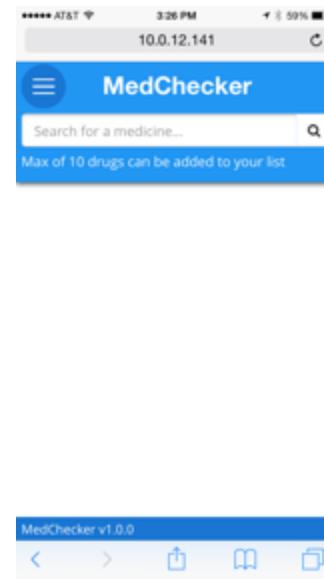
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- **Day 1 (Thurs 6/18)**
  - RFP released with various data sets
  - Brainstorm sessions held
- **Day 2 (Fri 6/19)**
  - Identified potential users, a problem, a proposed solution
  - Captured user stories with acceptance criteria
  - Developed draft wireframes with color scheme
- **Day 3 (Mon 6/22)**
  - Refined user persona
  - Team reviewed the UI design and decided to change the color scheme
- **Day 4 (Tues 6/23)**
  - Received additional input regarding the color scheme
  - Team discovered the APIs did not support the search auto-complete in the design, and adjusted to a complete word search
  - Based on user input, updated diagram to improve readability
- **Day 5 (Wed 6/24)**
  - Team received user feedback and implemented the new color scheme
- **Day 6 (Thurs 6/25)**
  - Finalized application based on user input and PO feedback



## Criteria H – Create a prototype that works on multiple devices, and presents a responsive design

- **MedChecker** (our prototype app using OpenFDA data) works on a smart phone or tablet
  - <http://medcheckerapp.com>
  - Written using responsive design techniques and methods allows it to function on any modern browser



## **Criteria I – Used at least five modern and open-source technologies, regardless of architectural layer (frontend, backend, etc)**

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- LongView Web & Mobile Development Solutions practice **uses a variety of open source frameworks and tools** for all our current projects.
- For MedChecker, our team leveraged the following technologies:
  - Backbone
  - D3
  - Spring
  - MongoDB
  - Bootstrap
  - Gradle
  - Snap.svg
  - Grunt
  - Docker



## Criteria J – Deployed the prototype on an Infrastructure as a Service (IaaS) or Platform as a Service (PaaS) provider and indicated which provider they used

- MedChecker, both front end and back end, are **deployed on Amazon Web Services (IaaS)**

```
[/home/ec2-user] vim /etc/httpd/conf  
conf/          conf.d/          conf.modules.d/  
[/home/ec2-user] vim /etc/httpd/conf/  
httpd.conf    magic  
[/home/ec2-user] vim /etc/httpd/conf.d/  
autoindex.conf proxy.conf      README           userdi  
[/home/ec2-user] vim /etc/httpd/conf.d/proxy.conf  
[/home/ec2-user] vim /etc/httpd/conf.d/virtualhost.conf  
[/home/ec2-user]
```

```
<VirtualHost *:80>  
  ServerName medcheckerapp.com  
  ServerAlias *.medcheckerapp.com  
  RewriteEngine on  
  
  RewriteCond %{REQUEST_URI} !^/med-checker/  
  RewriteCond %{REQUEST_URI} !^/MedCheckerResources  
  RewriteRule ^(.*)$ /med-checker/$1 [L,PT]  
</VirtualHost>
```

## Criteria K – Wrote Unit Tests for their code

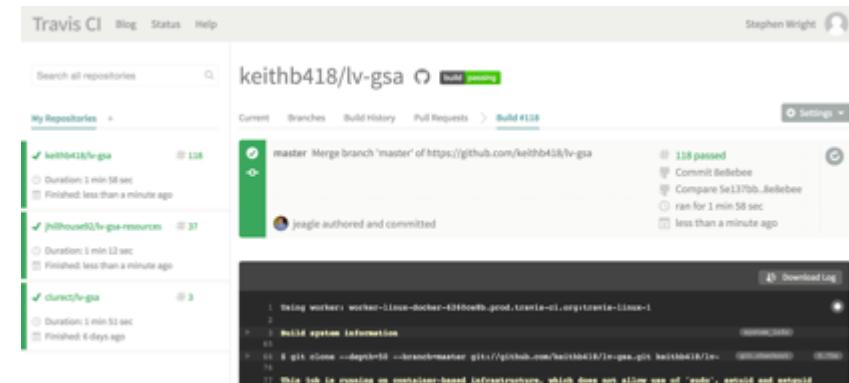
- Our front-end developers, Keith and Josh, use **JasminJS** to run **unit tests** in the terminal and on CI builds
- Our back-end developers, Joseph and Hetal, use **JUnit** to write **unit tests** and resources/ REST service layer unit tests

Pushing a fix to a unit test	
Keith Brown authored 10 days ago	
--	
<a href="#">graphSpec.js</a>	Finished the unit tests for the graph
<a href="#">graphSubheaderSpec.js</a>	Adding the Graph Subheader Spec
<a href="#">headerSpec.js</a>	Added unit test item for the resetBackboneHistory method
<a href="#">mainLayoutSpec.js</a>	Now the search closes when you click outside of it, and the search st...
<a href="#">medListItemSpec.js</a>	Updated the unit tests.
<a href="#">medListSpec.js</a>	Added the tests for the medList and medListItem
<a href="#">medSearchItemSpec.js</a>	Fixed the medSearchItem spec
<a href="#">medSearchSpec.js</a>	Pushing a fix to a unit test
<a href="#">medWarningSpec.js</a>	Added the medWarning spec
<a href="#">welcomeSpec.js</a>	Making some changes to the med list

LINK -  
[https://github.com/keithb418/lv-gsa/tree/master/test/unit\\_tests/specs](https://github.com/keithb418/lv-gsa/tree/master/test/unit_tests/specs)

## Criteria L – Set up or used a Continuous Integration System to automate the running of tests and continuously deployed their code to their IaaS/PaaS provider

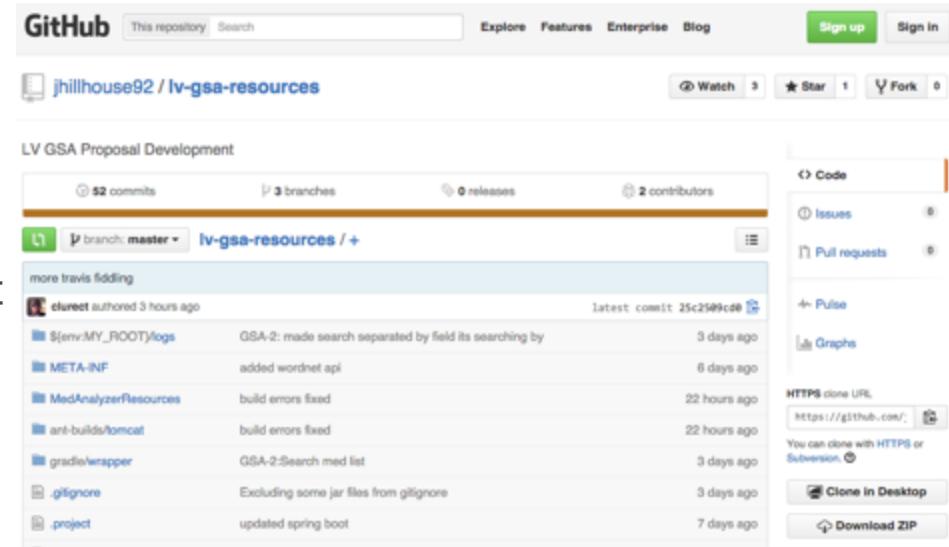
- We use **Continuous Integration** to ensure that the frequent changes to the software are built into a working deliverable
  - For MedChecker prototype development, our team used Travis CI
- We use **automated testing** to ensure that the developed software is high quality and defect free.
  - Our team used Selenium WebDriver with Rspec for MedChecker



Screenshot of Travis CI

## Criteria M - Set up or used Configuration Management

- We used GitHub for the source code repository. **Combined repository** -  
<https://github.com/keithb418/medcheckerapp>
  - Original source code repos available at Front-end -  
[https://github.com/keithb418/lv-gsa/](https://github.com/keithb418/lv-gsa;);
  - Back-end -  
<https://github.com/jhillhouse92/lv-gsa-resources>.
- During the six day prototype effort, our team used a physical board and a virtual board in JIRA to manage their work.
  - **Photos are in Additional Evidence** at end of this slideshow.



Screenshot of MedChecker source code in GitHub

## Criteria N – Set up or used Continuous Monitoring

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- Our team included a **Security Engineer** who spent the brainstorming session with us to discuss potential risks with our initial concept around MedChecker and using OpenFDA data
- The open dialogue allowed for our entire product team to understand the risks and develop mitigation strategies
  - An example was user login, our team discussed using Social Media logins such as Facebook and Google, and then storing a list of user drugs
  - For a prototype, this was not a feasible user story to pursue and we added it to our product backlog for further discussion. Our prototype's mitigation strategy was to use HTML5 local storage.
- LongView's **Cyber and IA Practice** revolves around risk management. We have created a risk management framework tailored to the Federal Government.
  - We have supported dozens of Authorities To Operate (ATOs) for emerging technologies such as cloud and mobile across VA, DHA, DoD and within National Security organizations.



## Criteria O – Deploy their software in a container

- Our team used **Docker** to automate deployments of the software in a container
- Our Docker container is available, <https://registry.hub.docker.com/u/clurect/lv-gsa-app/>

```
Step 17 : COPY docker-conf/tomcat-users.xml $CATALINA_HOME/conf/
--> 8d76e0b6cbd6
Removing intermediate container 4add4ceaa5bc
Step 18 : EXPOSE 8080 27017
--> Running in dfeb597a1525
--> 85b0e359792c
Removing intermediate container dfeb597a1525
Step 19 : RUN chmod +x /$CATALINA_HOME/bin/*.sh
--> Running in 86ac5a62a6a6
--> 47f93b949d18
Removing intermediate container 86ac5a62a6a6
Step 20 : CMD /usr/bin/supervisord
--> Running in 910b075b68a3
--> 8bb6cc404528
Removing intermediate container 910b075b68a3
Successfully built 8bb6cc404528
LV-SWRIGHT@LV-ADMINs-MacBook-Pro-2 ~/code/lv-gsa[master *%]=*
```

ABOVE: Screenshot of Docker ; BELOW: Screenshot of DockerHub



clurect / lv-gsa-app

Pull this repository [docke](#)

Our application submission for our GSA project at LongView

0 0 7

Information	Tags
<p>This is our docker container for our application, MedChecker, submitted for GSA 18F Agile Delivery BPA.</p> <p>To use it after pulling just run <code>docker run -d -p 8080:8080 -p 27017:27017 clurect/lv-gsa-app</code>. To see the application running go to &lt;DOCKER_ADDR&gt;:8080/med-checker in your browser</p>	



## **Criteria P – Provided sufficient documentation to install and run their prototype on another machine**

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- Our team **provided Docker deployment instructions** in the README file located on GitHub
- LongView has **designed, developed and deployed multiple applications** and will develop as necessary lifecycle documentation including, but not limited to,
  - Concept Paper, Business Requirements Document (BRD), System Design Document (SDD), Requirements Traceability Matrix (RTM), Master Test Plan (MTP), Quality Assurance Surveillance Plan (QASP) and others.
  - Our team has **tailored our AgileView methodology to multiple Federal IT system lifecycles** such as VA PMAS/ProPath, HHS EPLC and CMS XLC.



## **Criteria Q – Prototype and underlying platforms used to create and run the prototype are openly licensed and free of charge**

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- Prototype is **deployed to a public**:
  - <http://medcheckerapp.com>
- All source code, APIs are **provided to public under Creative Commons 0 (CC0)**.
  - Copyright waiver is posted at <http://medcheckerapp.com/#about>



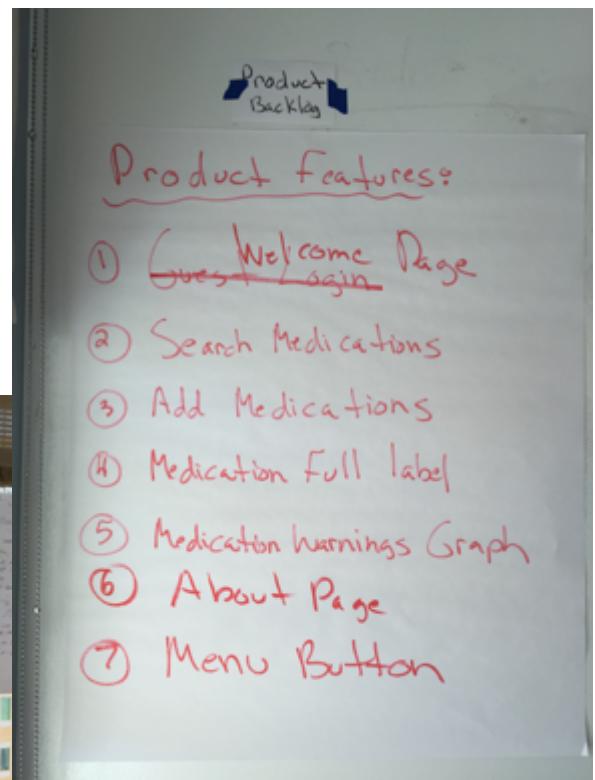
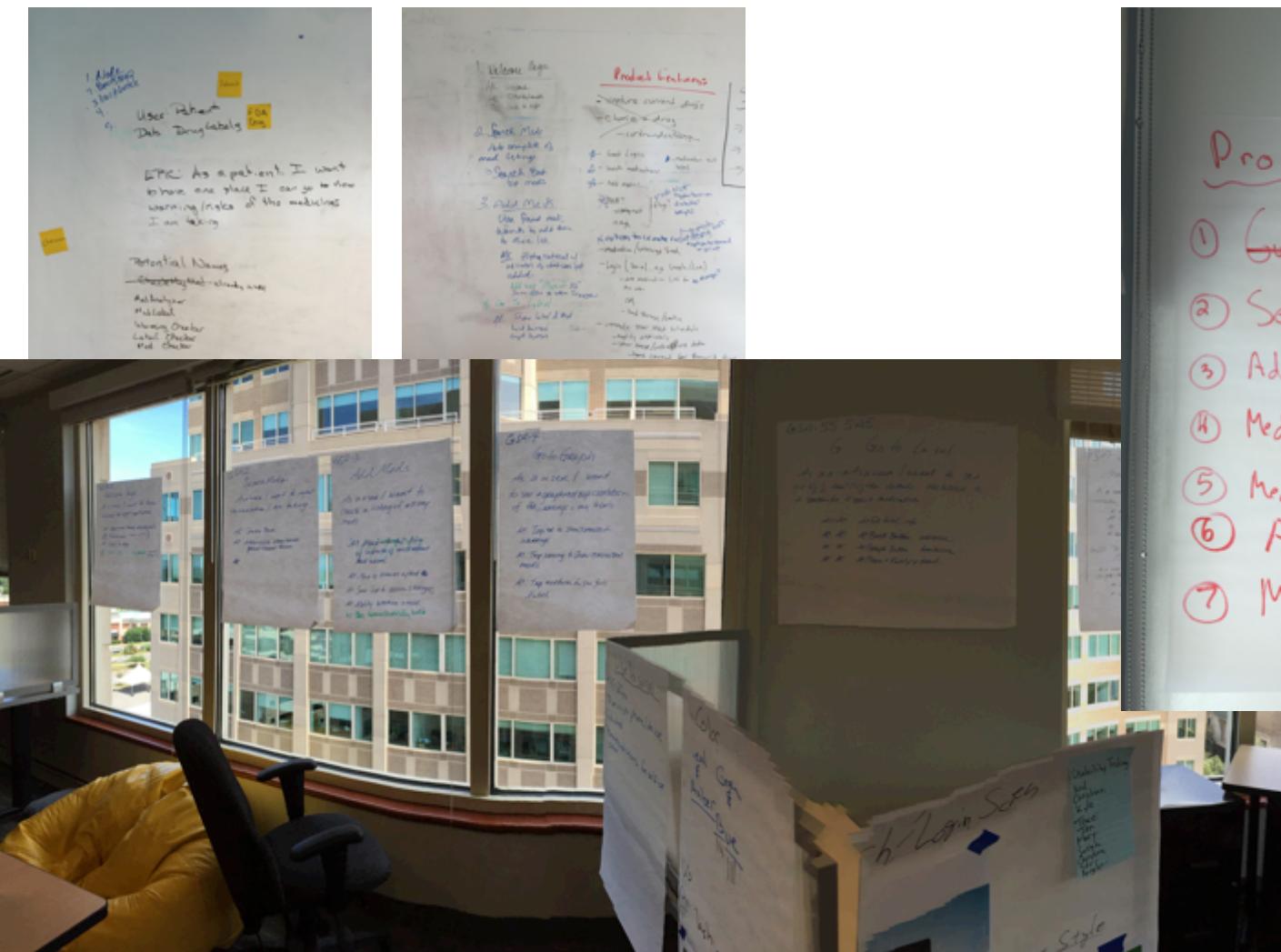
# Additional Evidence - Photos

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- Brainstorming
- Scrum Board
  - Physical
  - Electronic
- Daily Scrum
- Daily Retrospectives
- Usability Testing
- Reaching Consensus
- Scrum Team & Working Area



# **Additional Evidence – Brainstorming**



# Additional Evidence – Scrum Board (Physical)



# Additional Evidence – Scrum Board (Electronic)

The screenshot displays the JIRA Agile interface, specifically the Backlog and a detailed issue view for 'LV-GSA 18F / GSA-1'.

**Backlog:** Shows 10 issues in the backlog, including:

- GSA-1 Welcome Page
- GSA-2 Search Meds
- GSA-3 Add Meds
- GSA-4 Go to Graph
- GSA-5 Go to Label
- GSA-6 Risk: Limited data access of up to 5000 limit in the API
- GSA-7 on iPhone, the welcome screen title falls off the black background
- GSA-8 welcome screen - on phone the black section is not well centered
- GSA-9 About Page
- GSA-10 Menu Button

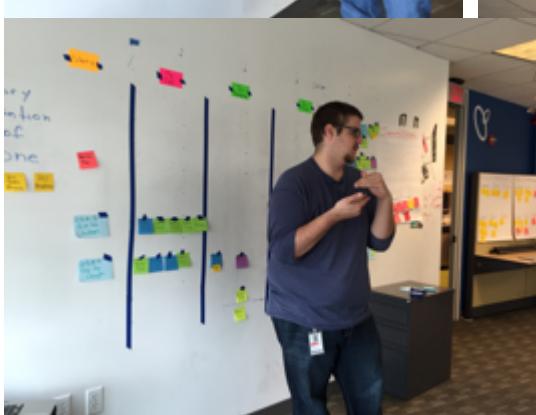
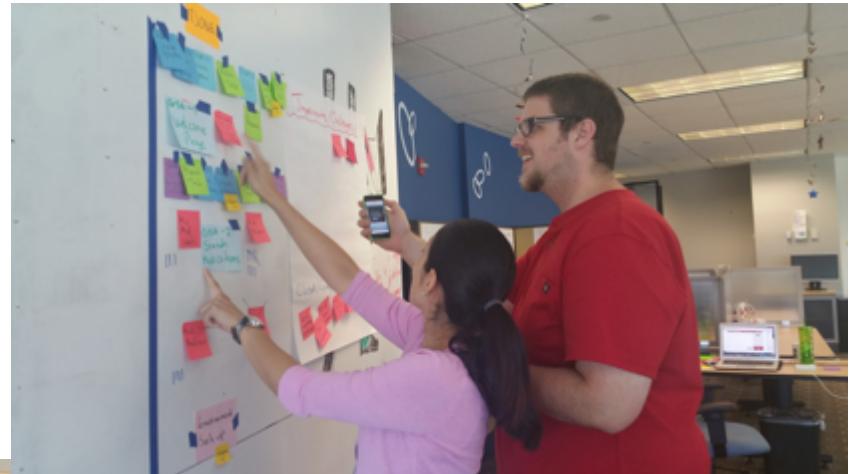
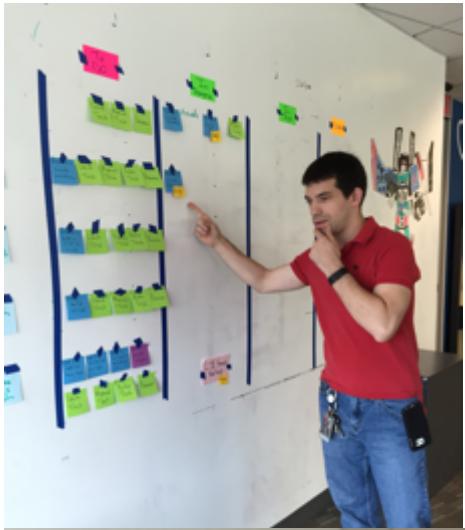
**Issue View (LV-GSA 18F / GSA-1):**

- Summary:** LV-GSA 18F / GSA-1
- Welcome Page**
- Estimate:** Unestimated
- Issue Links:**
  - is blocked by
    - GSA-7 on iPhone, the welcome screen title falls off the black background
    - GSA-8 welcome screen - on phone the black section is not well centered
- Description:** As a user I want to know I reached the right application.

**Details View (LV-GSA 18F / GSA-1):**

- Issue Summary:** LV-GSA 18F / GSA-1 Welcome Page
- Type:** Story
- Status:** OPEN (View Workflow)
- Priority:** Medium
- Resolution:** Unresolved
- Labels:** None
- Description:** As a user I want to know I reached the right application.
- Attachments:** Drop files here to upload, or browse.
- People:**
  - Assignee: Unassigned
  - Reporter: Margaret Gutermuth
  - Votes: 0
  - Watchers: 1
- Dates:**
  - Created: 6 days ago
  - Updated: 6 days ago

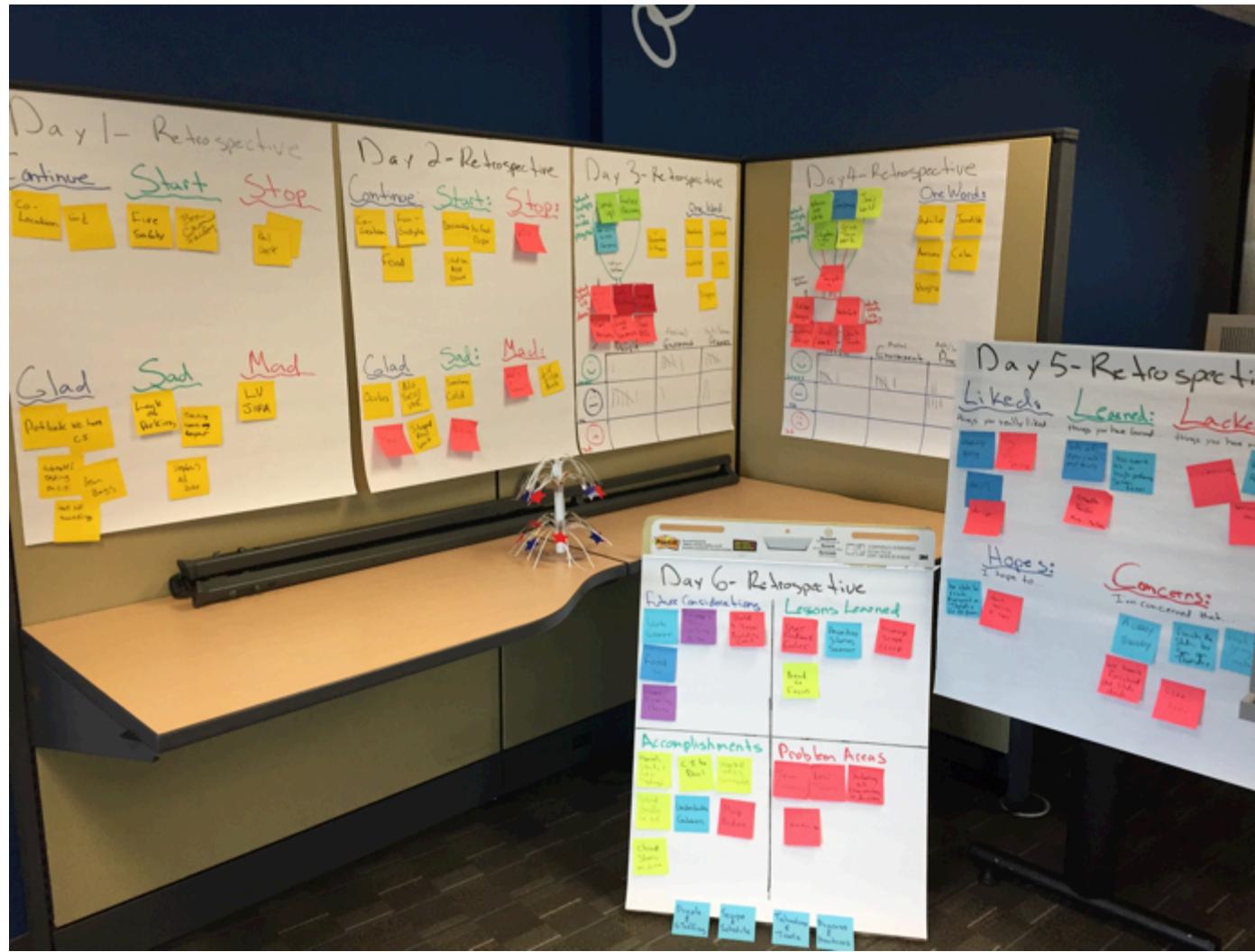
# Additional Evidence – Daily Scrum



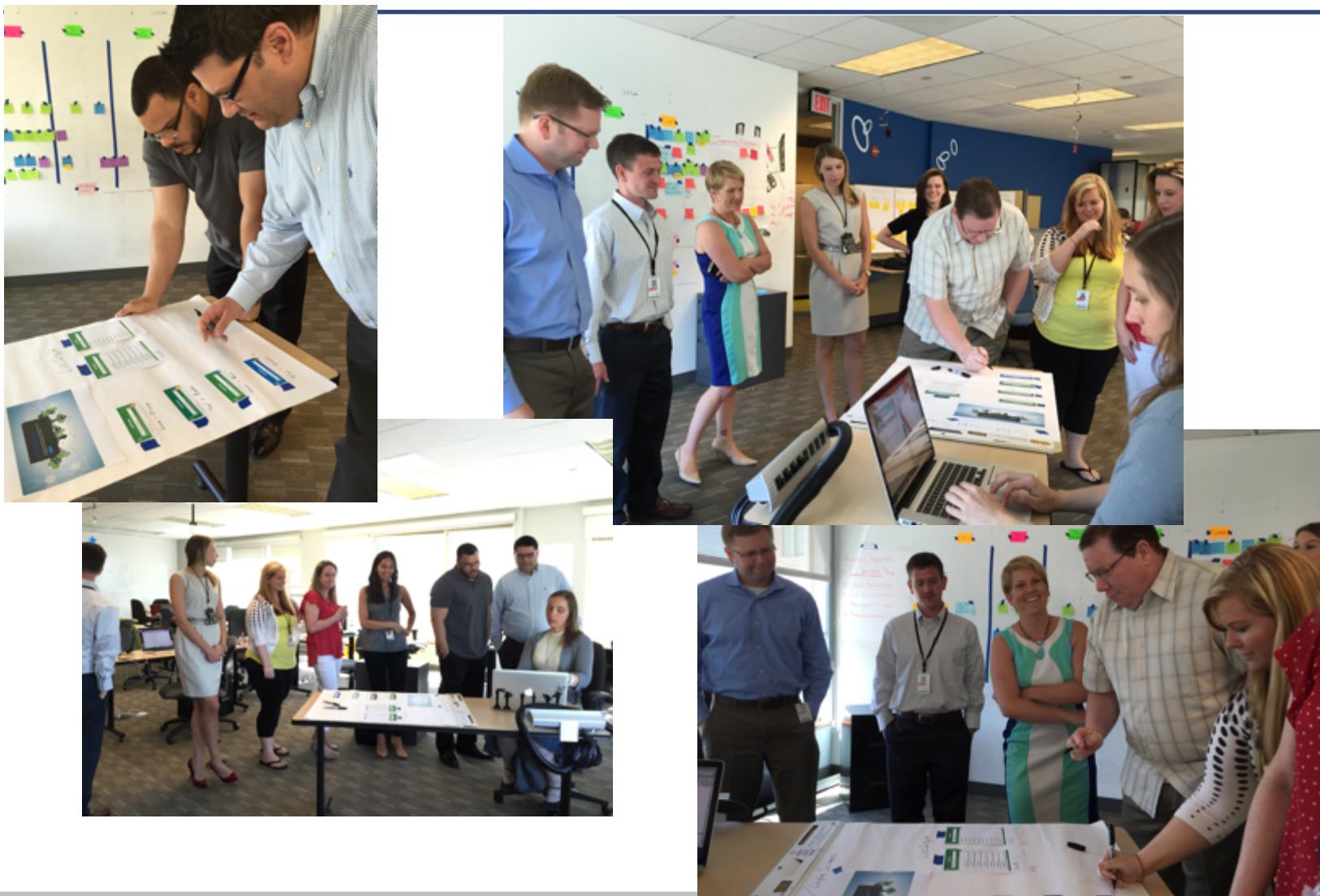
# Additional Evidence – Daily Retrospectives



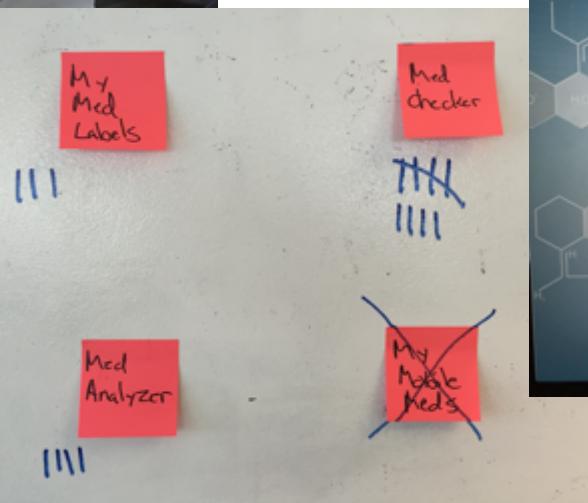
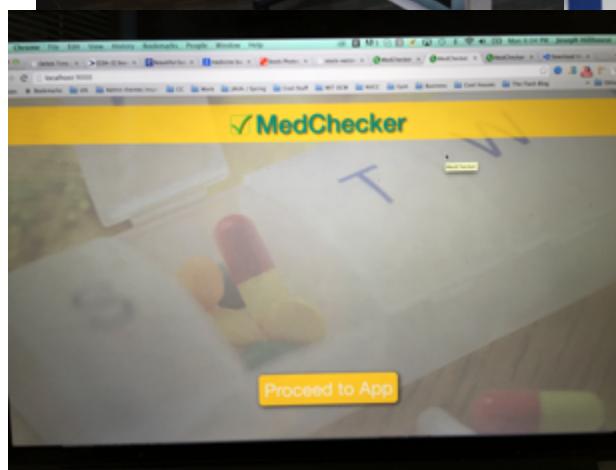
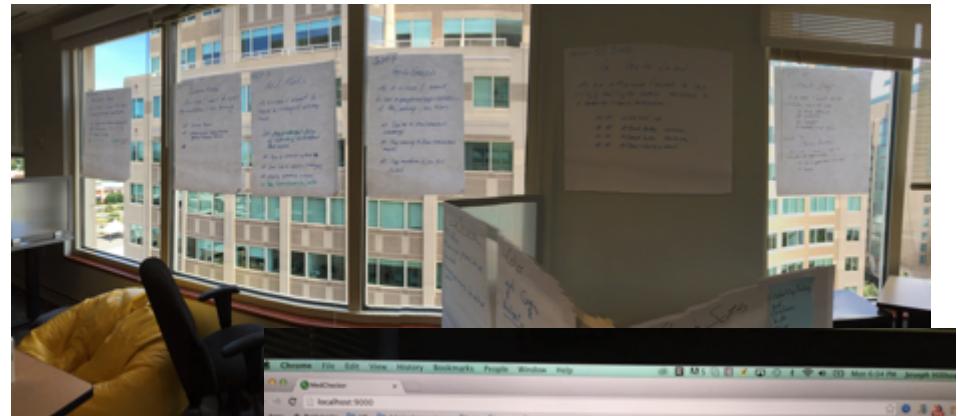
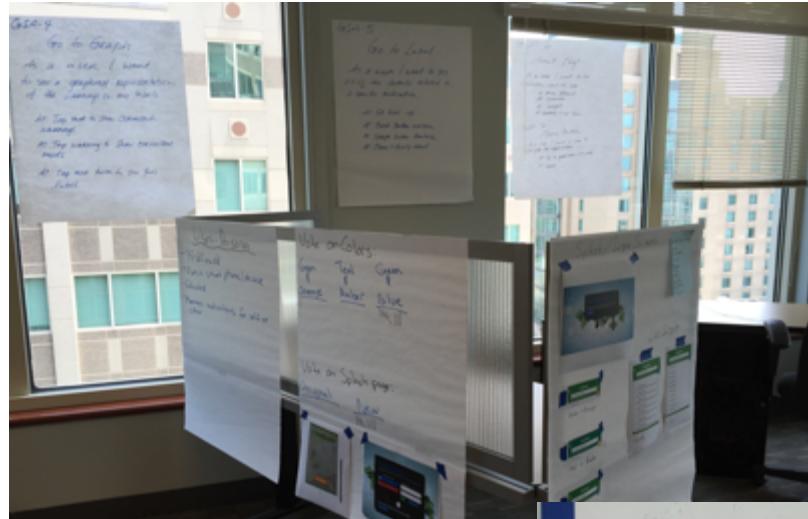
# Additional Evidence – Daily Retrospectives (from all 6 days)



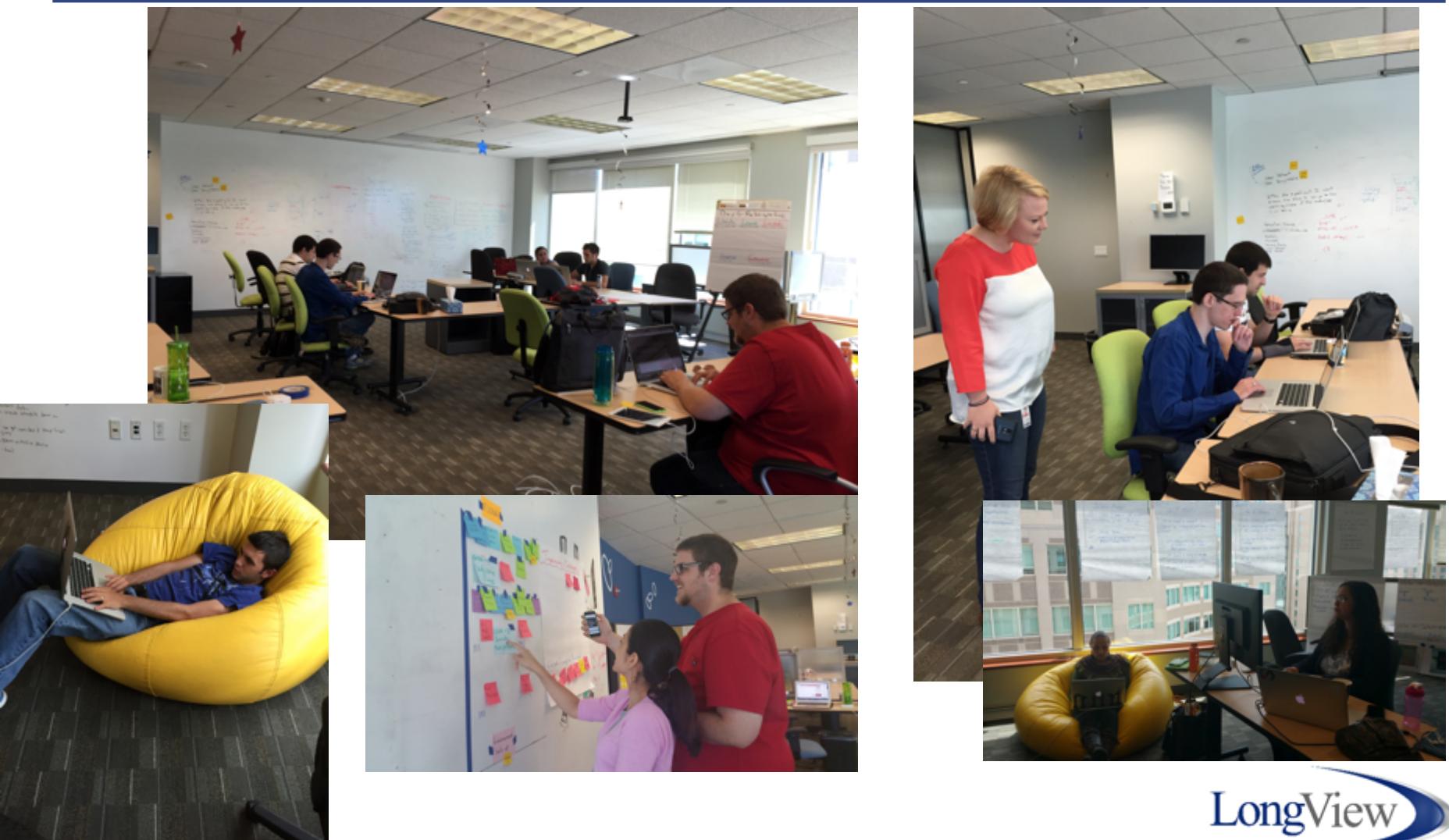
# Additional Evidence – Usability Testing



# Additional Evidence – Reaching Consensus



# Additional Evidence – Scrum Team & Working Area

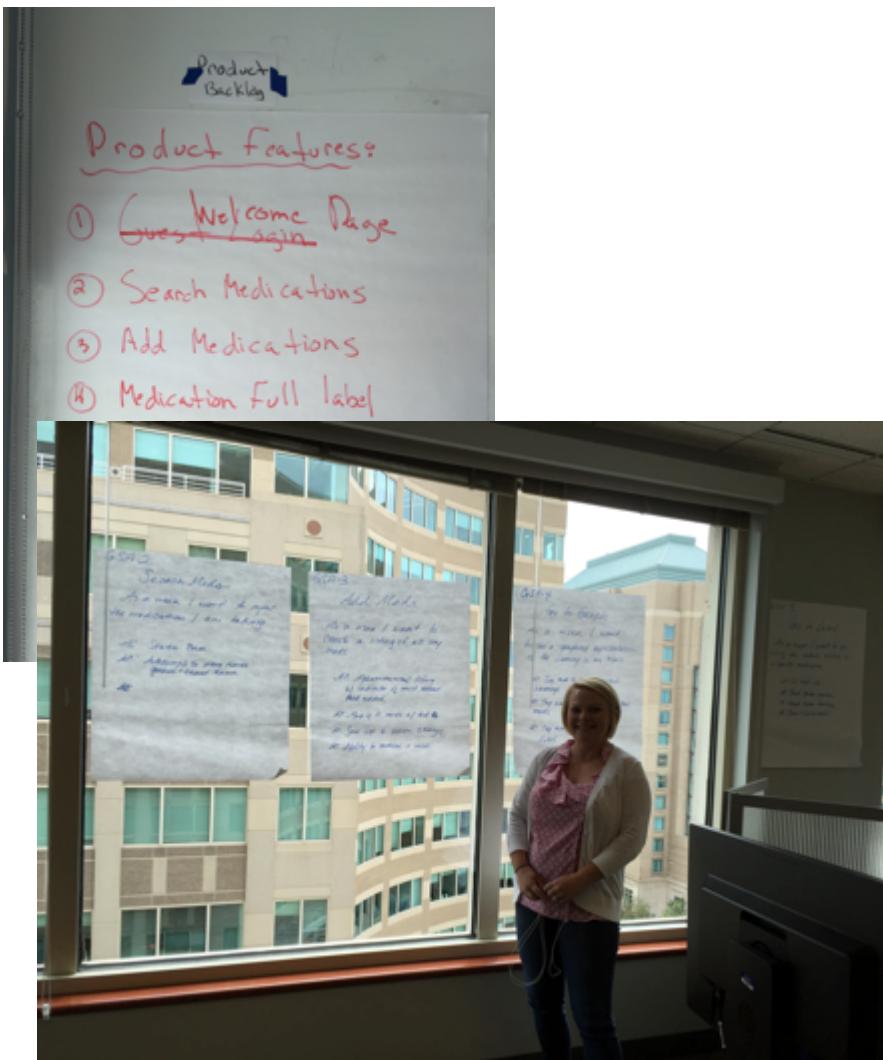


# Closeout

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# MedChecker Product Backlog



## Results from User Studies

- From the graph, users would like to click one of the listed symptoms and be given clarification, definition, or a counter medication to the symptom that is safe
- Users would like to be able to see symptoms in categories
- Users would like to be able to check the boxes from the list to compare those selected, thus giving fewer than the whole list in the graph
- Users would like a drug to be highlighted if any combination of drugs they have listed should never be taken together
- Users would like to be able to take picture of pill and auto-populate drug (integration with NIH Pillbox API)



# Lessons Learned

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- **User Input** - With a 6 day development period, need to elicit user feedback within the 2<sup>nd</sup> or 3<sup>rd</sup> day. This allows for adequate time to implement changes. *Great idea!*
- **Team Building** – When arranging folks to work together as a new team, consider kicking-off with a team building event so that folks can get to know each other better. *Go Team!*
- **Scope Creep** – Developers adding scope to the application ad-hoc. The Product Owner and development team must understand and approve the proposed scope creep. *Beware!*
- **Focus on Goal** – On day 3, the team completed stories when they focused exclusively on the goal for that day. A new team needs time to become self-organizing. *Set daily goals!*
- **Reaching Consensus** – Open voting on decisions helped alleviate team conflicts and disagreements. *Majority rule!*



# The LongView Agile Delivery BPA Team

