How to Collect and Manage Requirements for Successful GIS Projects

Matt Harman

Craig Venker

Requirements

Provide direction for program success

Why Requirements are Important?

Top Ten factors found in "Failed" projects

1. Incomplete Requirements
2. Lack of user involvement
3. Lack of Resources
4. Unrealistic Expectations
5. Lack of Executive Support
6. Changing Requirements & Specifications
7. Lack of Planning
8. Didn't Need it Any Longer
9. Lack of IT management
10. Technical Illiteracy

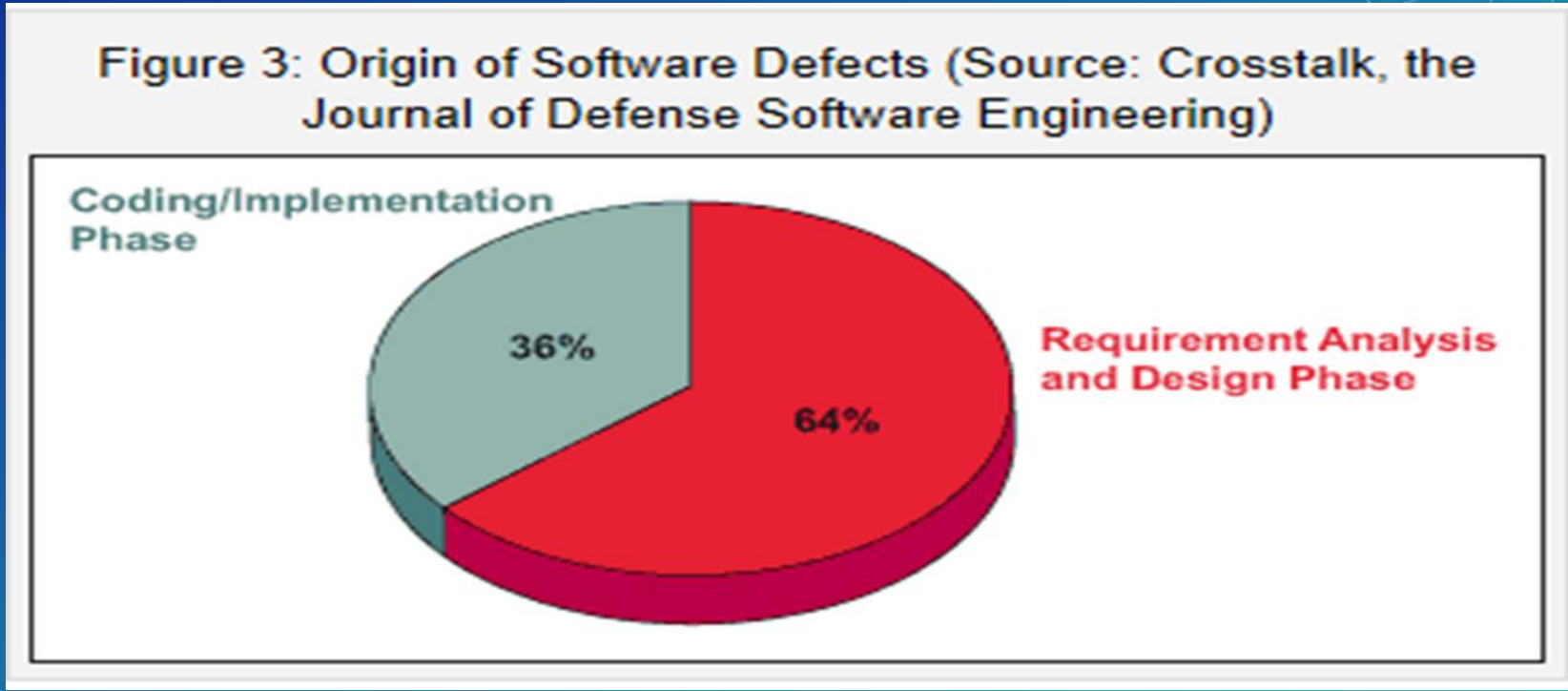
Why Requirements are Important?

“As many as 71% of software projects that fail do so because of poor requirements management, making it the single biggest reason for project failure.”

Christopher Lindquist states in CIO Magazine, “Fixing the Requirements Mess,”

Why Requirements are Important?

Early mistakes lead to costly fixes



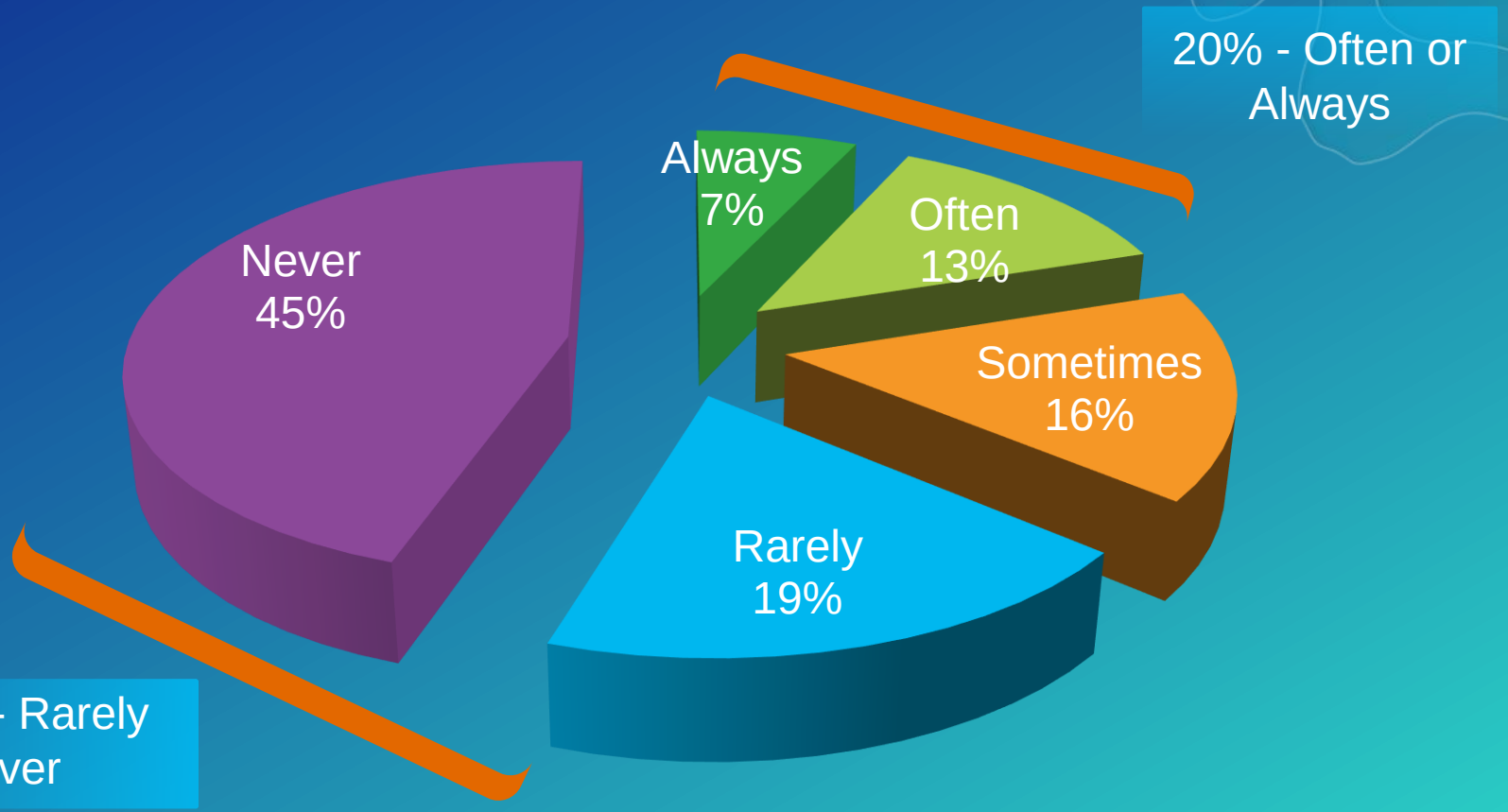
Crosstalk, the Journal of Defense Software Engineering

Why Requirements are Important?

Systems Sciences Institute
Defect prevention reducing costs and enhancing quality
Graphic by Celerity

Why Requirements are Important?

Requirements evolve over time



Standish Group Study Reported at XP2002 by Jim Johnson, Chairman

Requirements, User Stories, Oh my…

A User Story is a requirement expressed from the perspective of an end-user goal.

- **We always start with the card…**
- **That drives the conversation…**
- **The user story becomes the requirement…or really, the understanding**

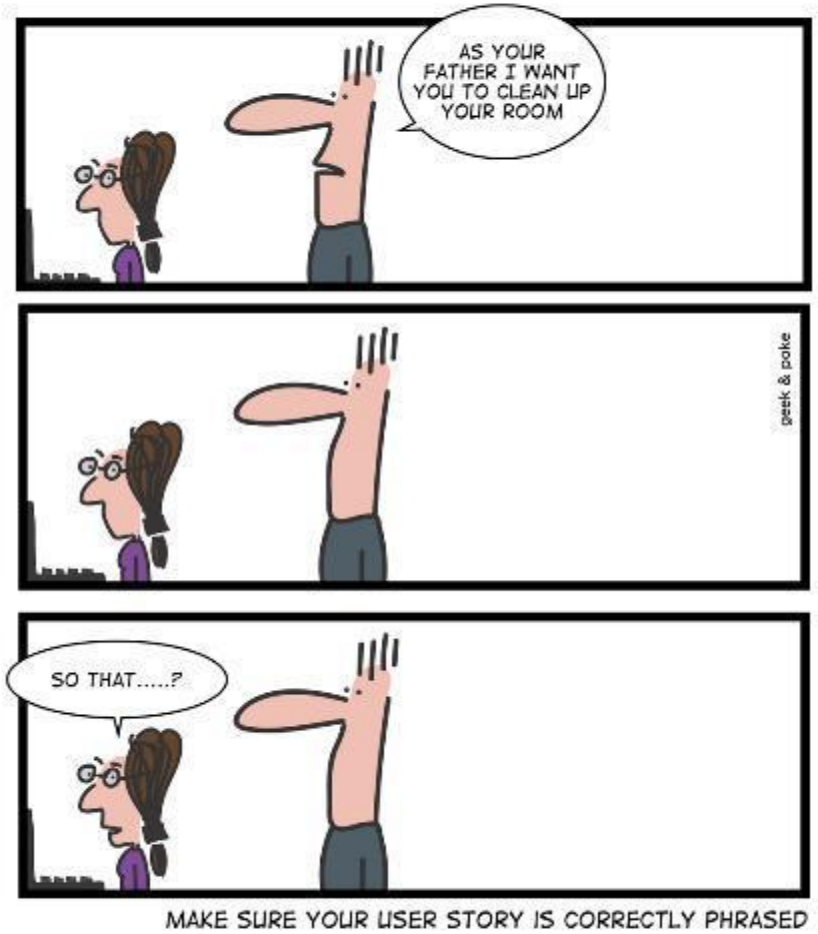
Collect Requirements

User Story

- Simple, brief descriptions of functionality
- Primarily from a user (role) perspective
- Sized for planning
- Testable
- Why?

As a [role], I can [feature] so that [benefit]

AGILE FAMILIES



MAKE SURE YOUR USER STORY IS CORRECTLY PHRASED

Understanding The Four C's

A
Fun
Teacher
Always
Drinks
Coffee

ROY G BIV

HOMES

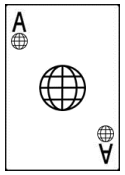
Kings	Play	Chess	On	Fine	Glass	Sets

Let me give you a couple devices to help

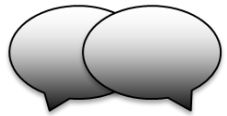
- Three C’s – a gimmick pattern to remind us of the process

- INVEST – a mnemonic to helps us develop good stories

The 3 C’s of User Stories



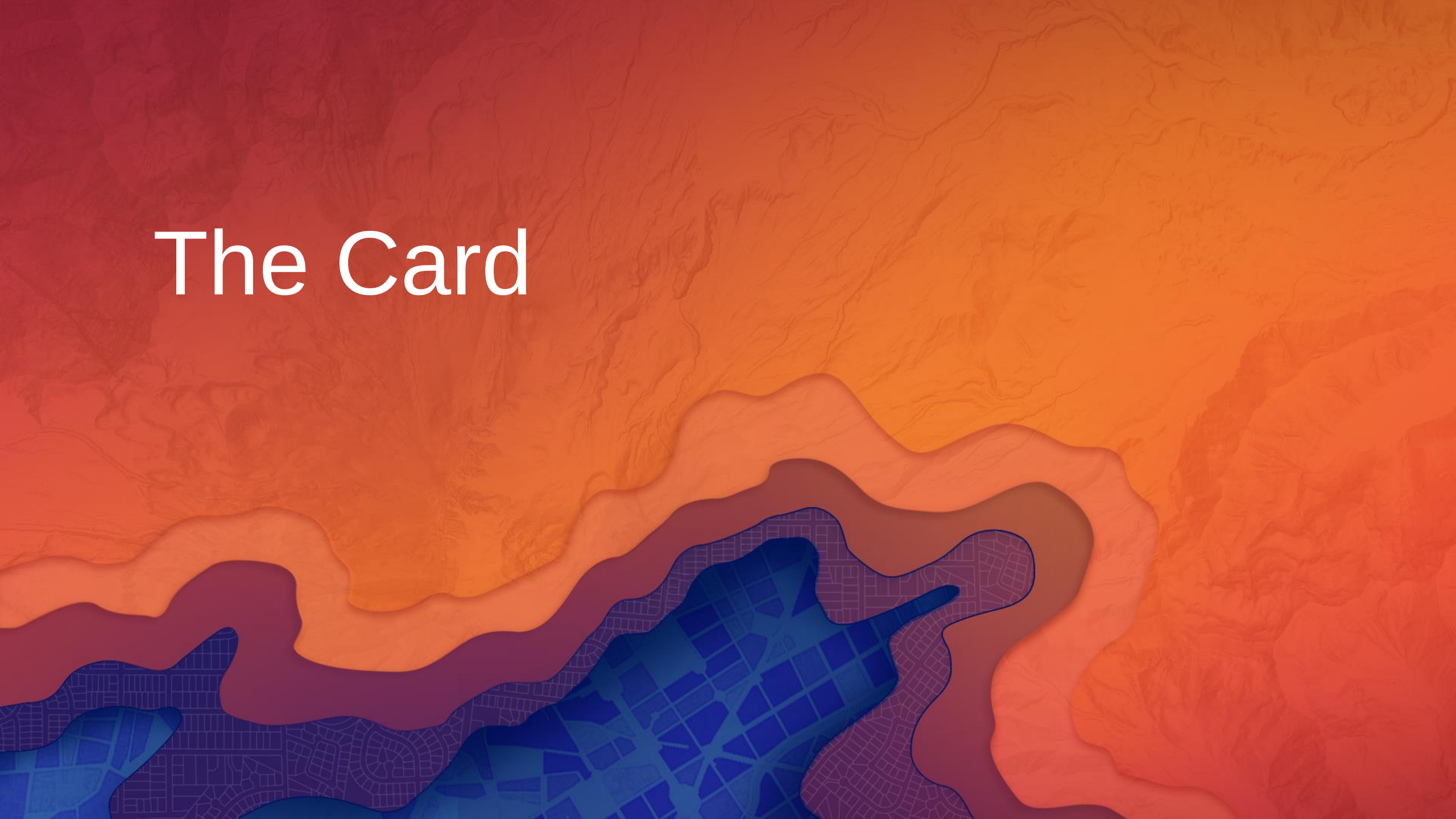
Card



Conversation

Confirmation

The Card



A good user story uses the “INVEST” model:

I ndependent. *Reduced dependencies = easier to plan*

N egotiable. *Details added via collaboration*

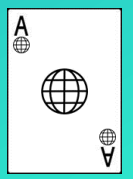
V aluable. *Provides value to the customer*

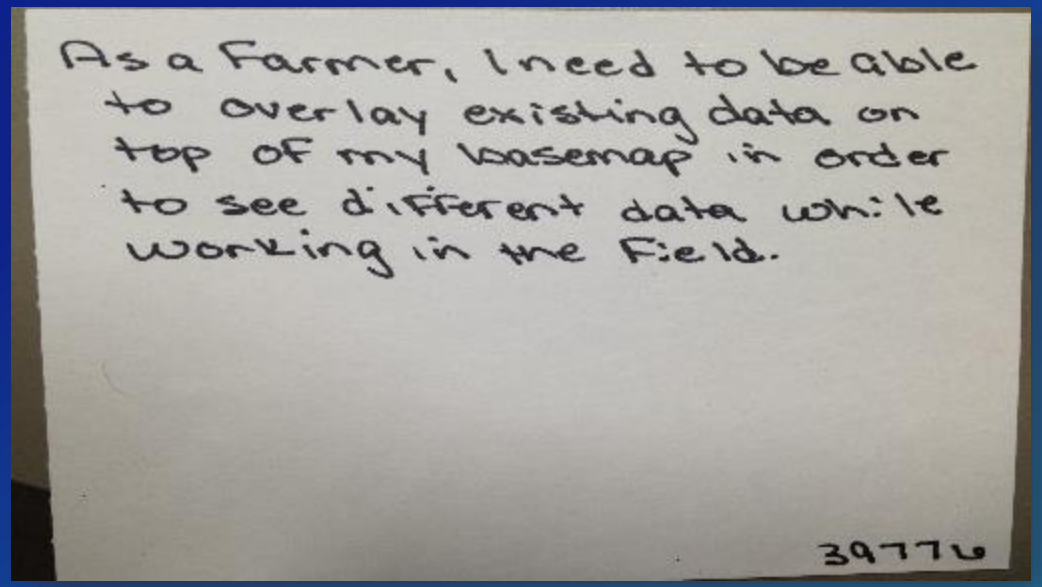
E stimate-able. *Too big or too vague = not estimate-able*

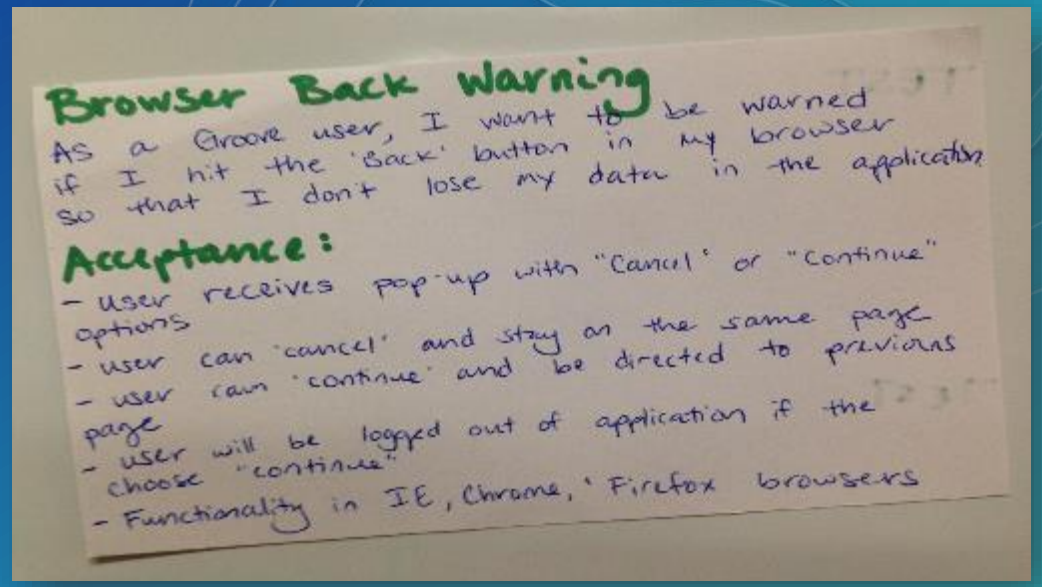
S mall. *Can be done in less* than a week

T estable. *Good acceptance criteria*

As a field representative,
I want to collect information offline
so that data can be collected
in remote locations.



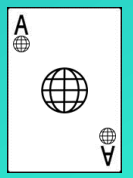




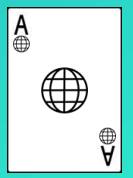
Use **paper cards**

Write out **concise** user stories

Define **acceptance criteria** for each user story

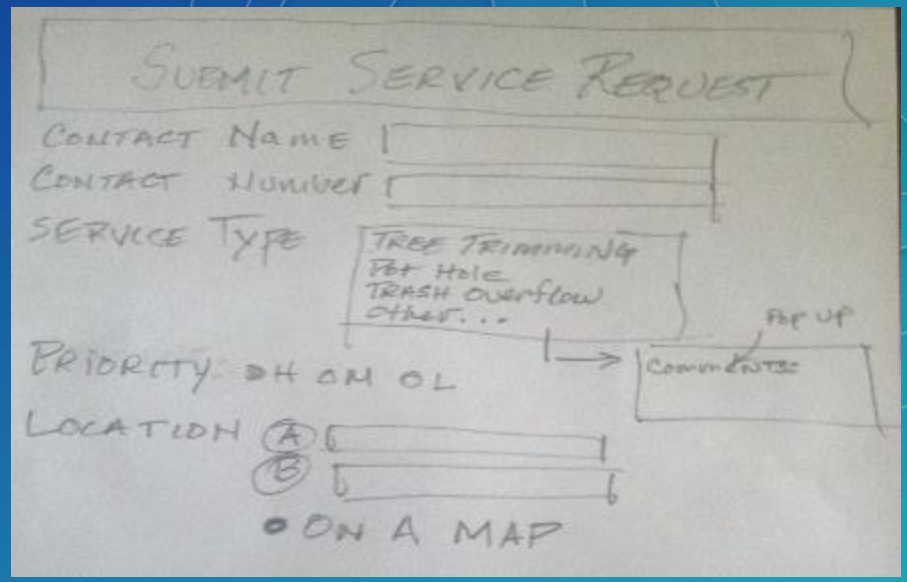


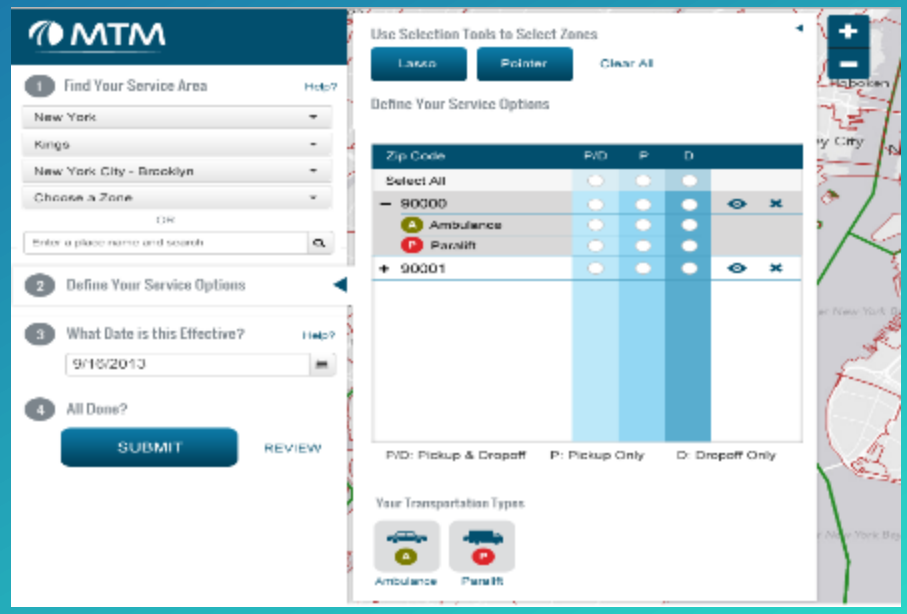
Keep your stories **visible**



Some things are **not about a [user]**

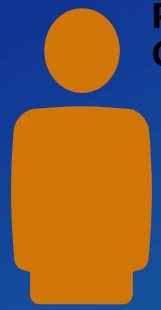
As a user interface, I need to look like the following image so that I can be intuitive to use





The Conversation

User stories facilitate a **conversation** with the team and with the users…



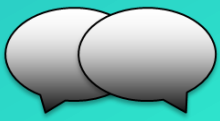
Product Owner

Scrum Master

Hey! Something to look at, talk about, comment on, react to…

Stakeholders

The team



Progressively decompose your stories…

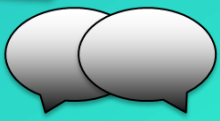
As a real estate manager, I need to interact with a map to explore new locations.

As an analyst, I need the ability to create a map with pop-ups to build easy-use-maps for management.

As a real estate manager, I need to receive information by clicking on potential sites to better understand the property.

As a real estate manager, I need to be able to see a pie chart of surrounding demographics so that I can match consumer demand with product.

As a real estate manager, I need interactive map capability on my iPad so that I can travel minimalistic during site visits.



Consider grouping user stories into **themes**

The Confirmation

How do we know when we are done?

Confirmation…the acceptance test

- Given [some context]
- When [some action is carried out]
- Then [something happens]

How do we know when we are done?

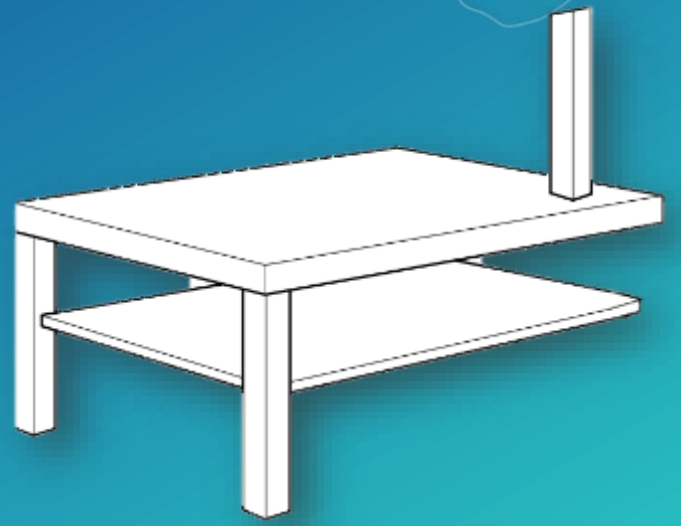
Confirmation…the acceptance test

- **Given** I have enabled offline access on my map
- **When** I click on the map to create a feature
- **Then** the feature will be stored locally until I sync with connectivity.

How do we know when we are done?

Couple of things to note…

- Define acceptance just in time…don’t waste too much time
- Part of the conversation process
- Acceptance consistency (given…when…expect) is helpful, but not necessary



Definition of Done

I don’t do strict…

Examples of practices that might be included in the definition of “done:”

- Acceptance criteria met
- Code is reviewed by another development team member
- Test cases are written
- Unit tests and UI automation tasks are written
- Feature is tested for accessibility
- Feature is tagged for analytics

treehouse
http://blog.teamtreehouse.com/when-is-a-user-story-done-acceptance-criteria-definition-done

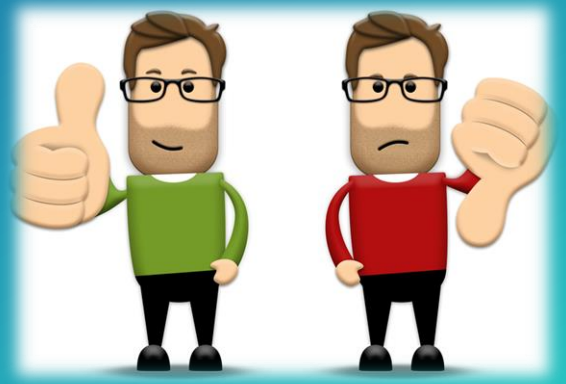
How will I know I’ve done that?

Bob Hartman – Agile for All

As the author of this presentation, I want to put together a slide deck communicating the Esri way of dealing with requirements so that the audience will take away something meaningful.

How will I know I’ve done that?

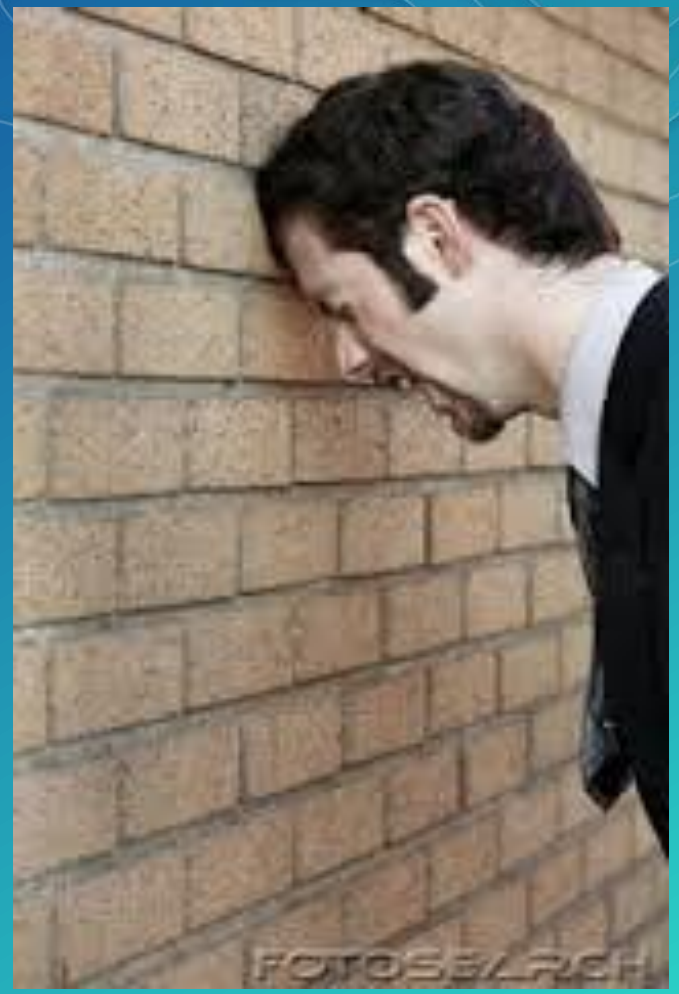
- [x] **Presentation created**
- [x] **Audience in attendance**
- [ ] **Someone learns something**



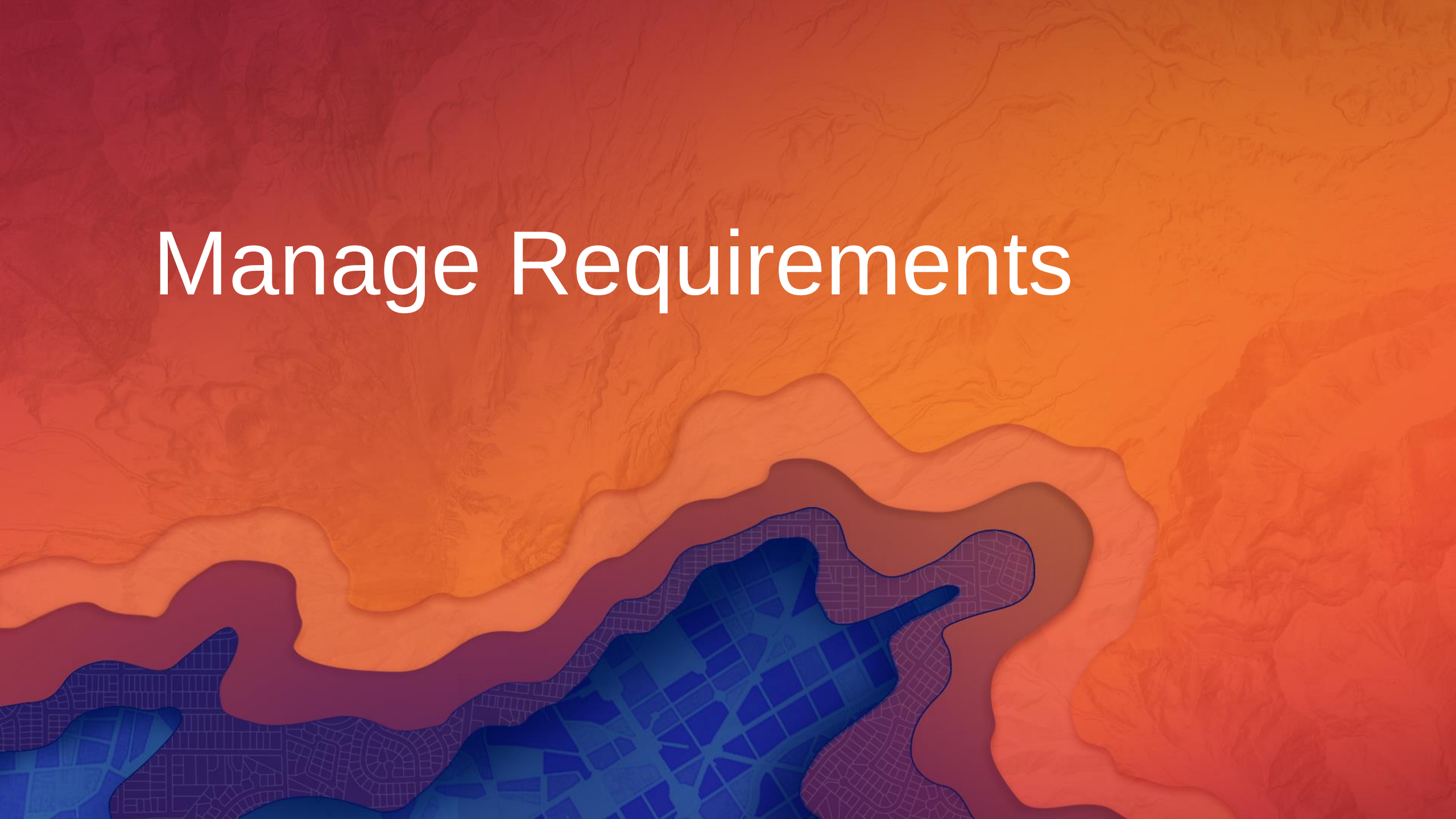
Watch out for the ‘Gotchas’

Things to avoid

- Avoid long lists of acceptance criteria on a single user story
- Prepare for conflicting requirements
- Avoid requirements that are ambiguous
- Avoid requirements that describe HOW
- Requirements must have a “reason”
- Avoid moving forward on development until after the customer has reviewed the design
- Don’t forget to prioritize



Manage Requirements

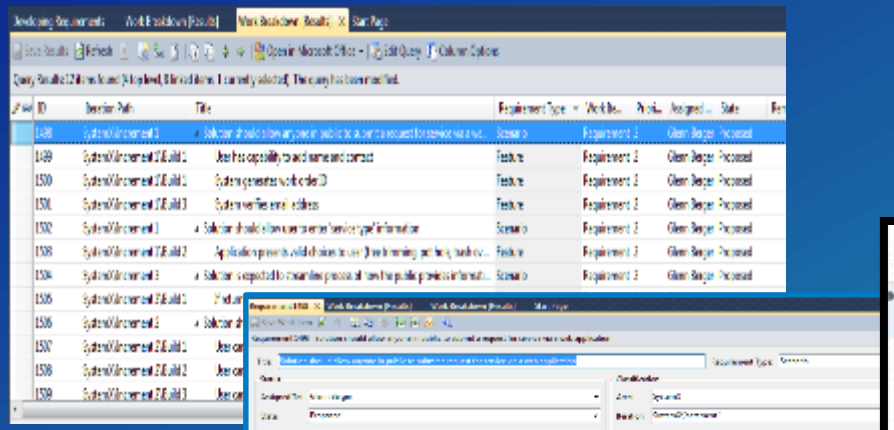


Requirement Management Tools

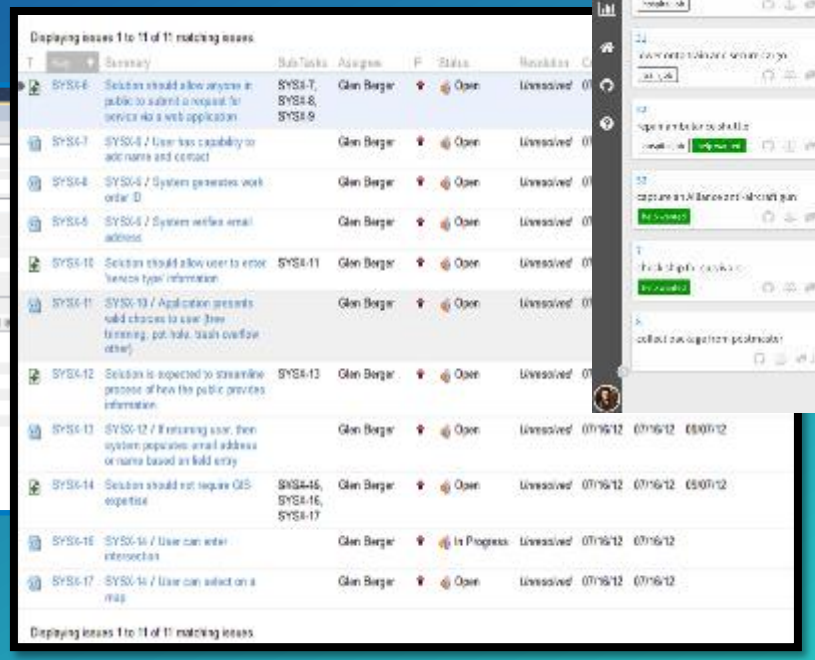
Licensed and Open Source

Compare

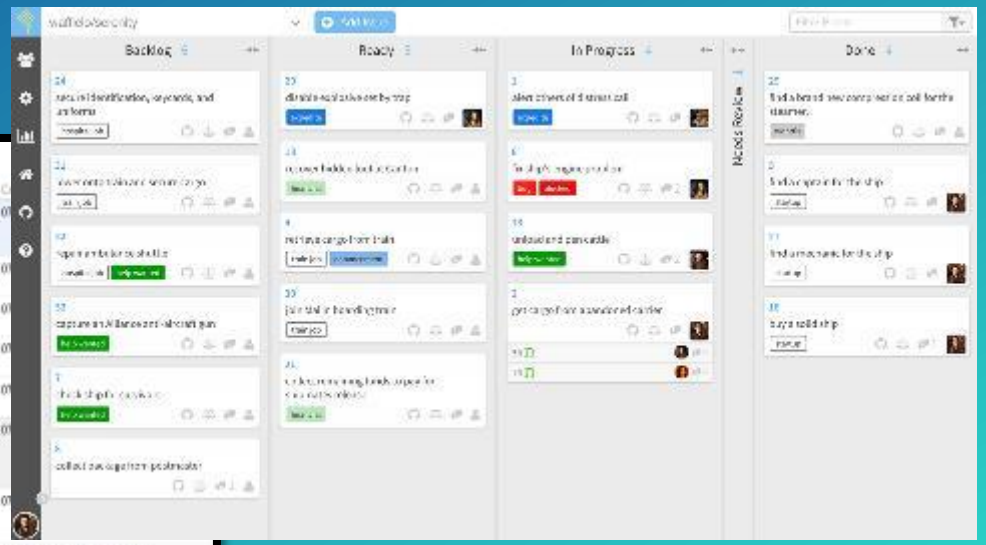
Microsoft Team Foundation Server (TFS)



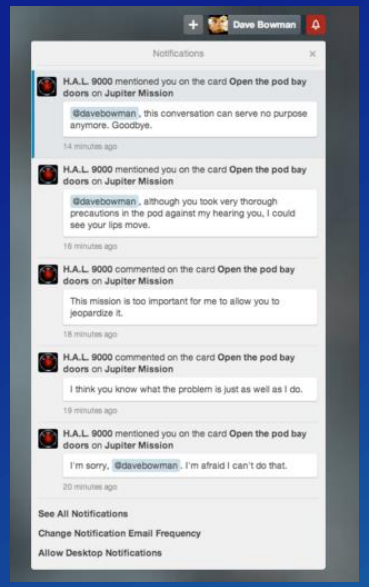
JIRA

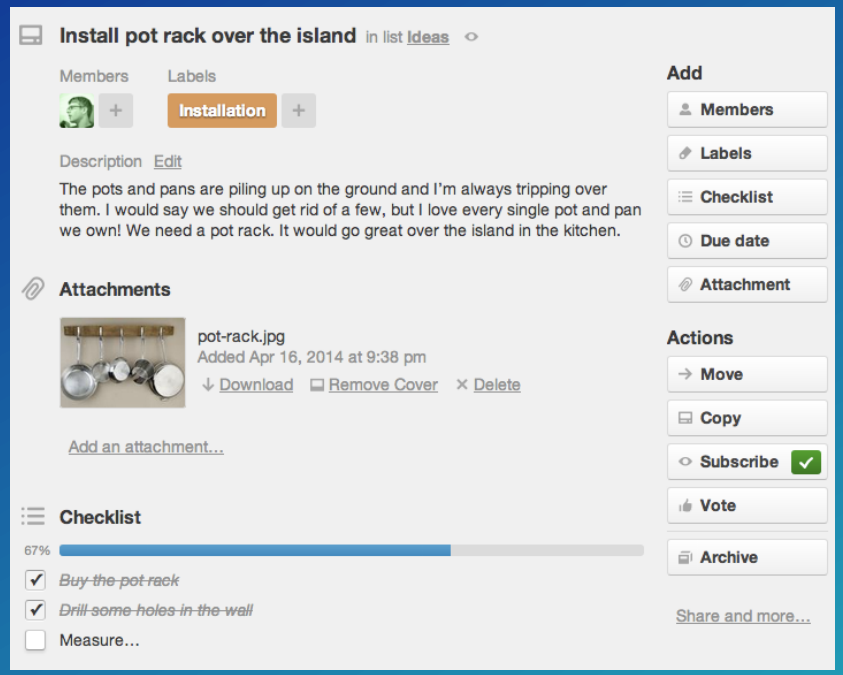


Waffle.io

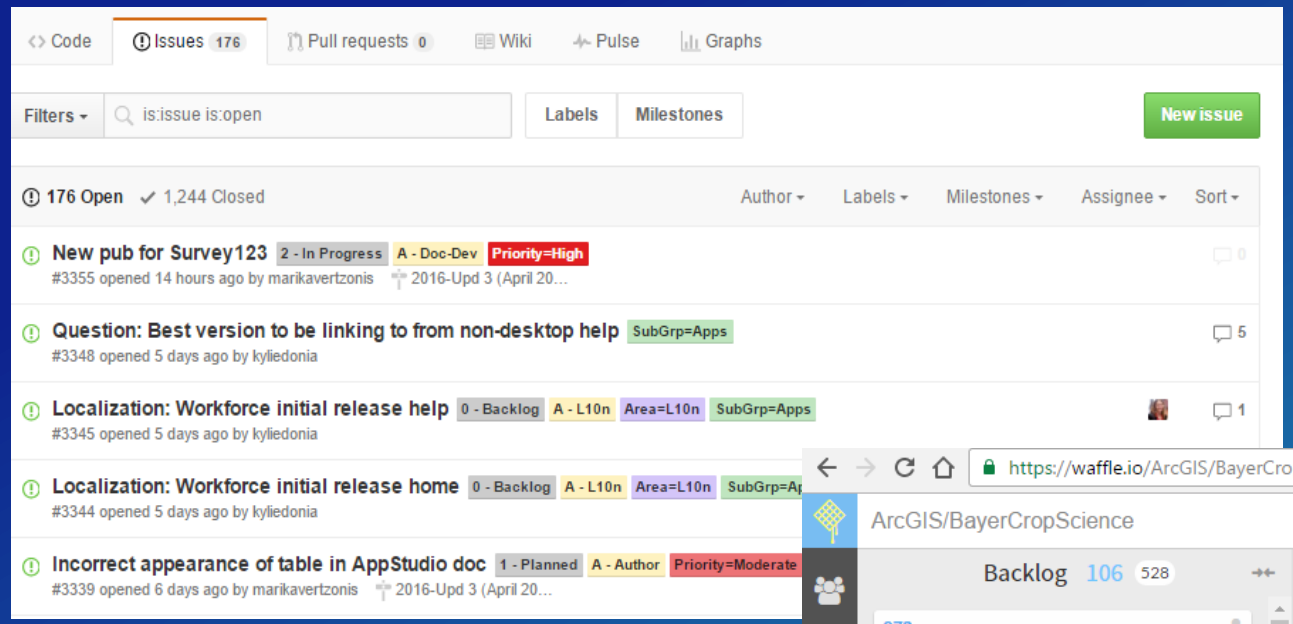


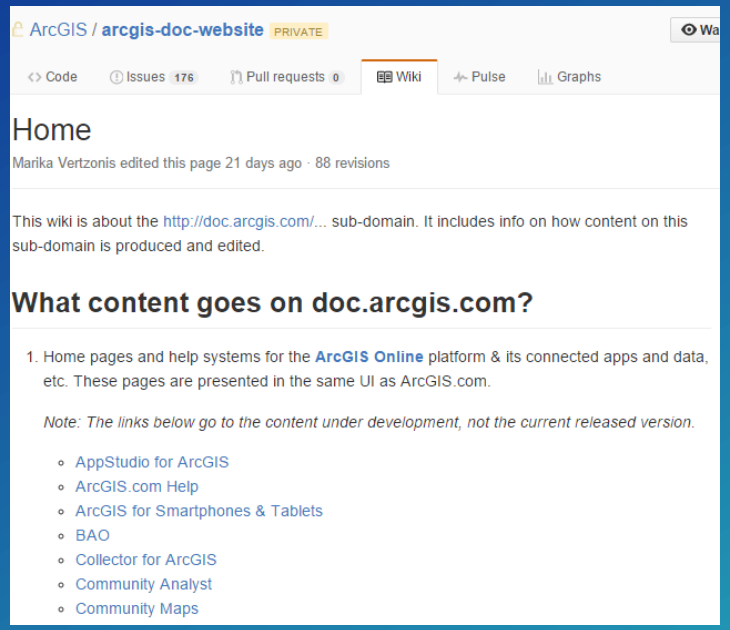
Using Trello

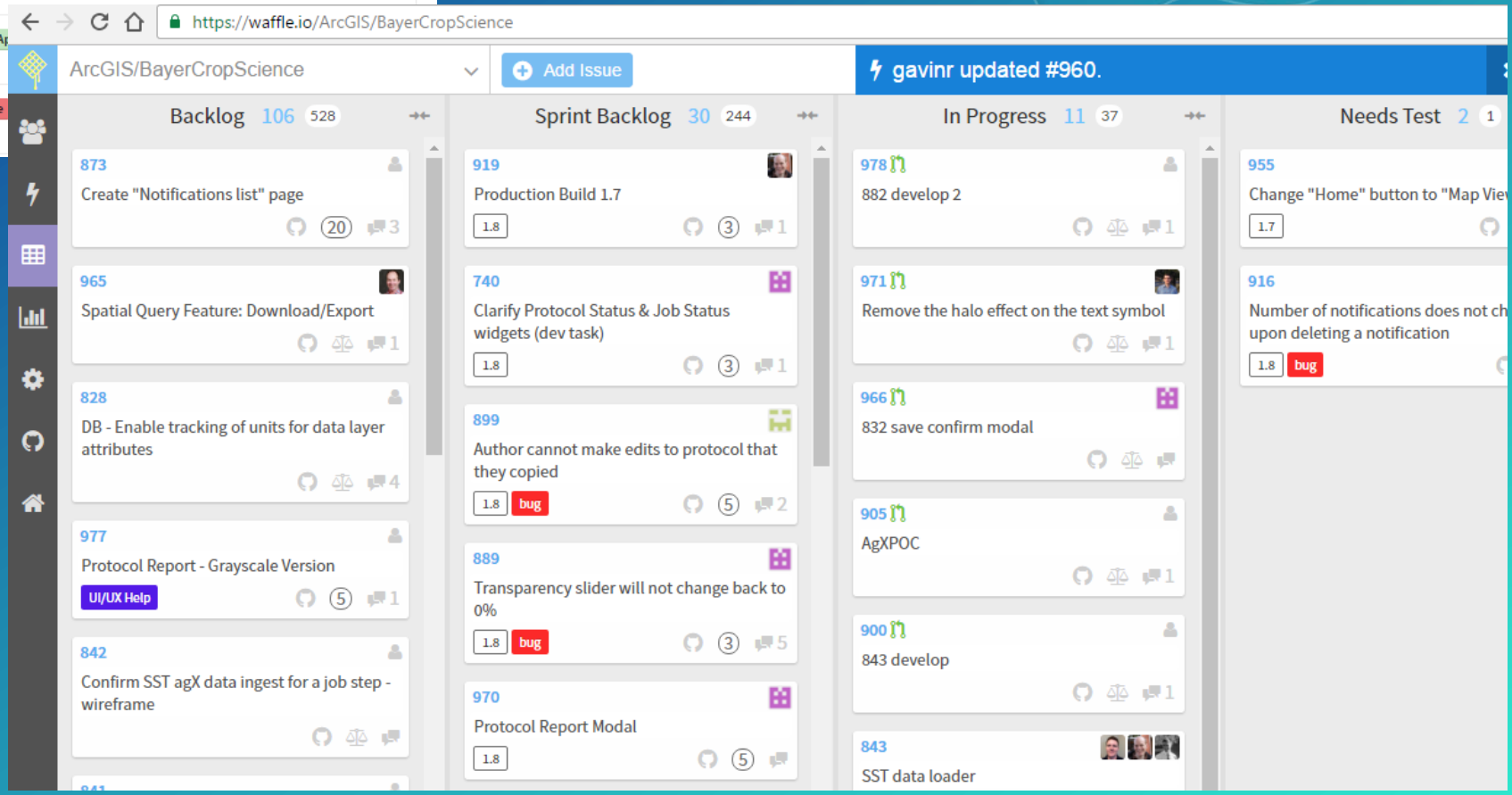




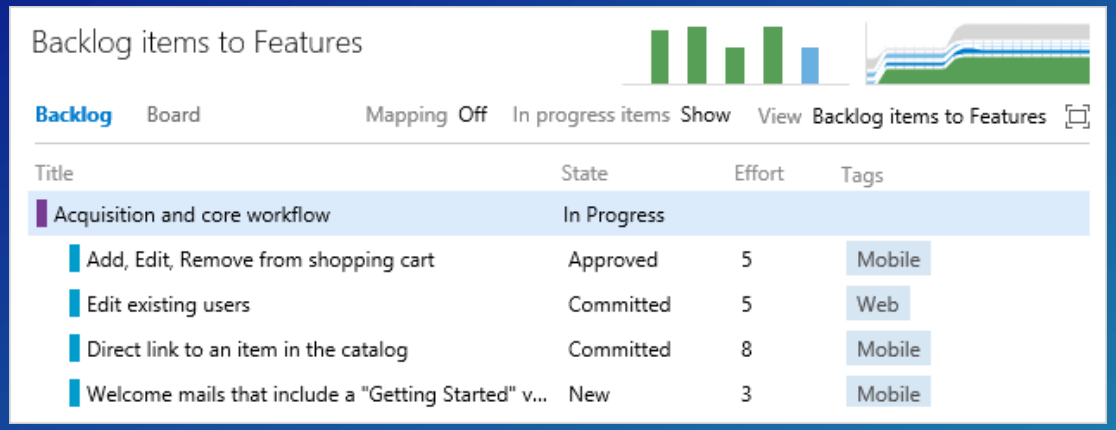
Using GitHub

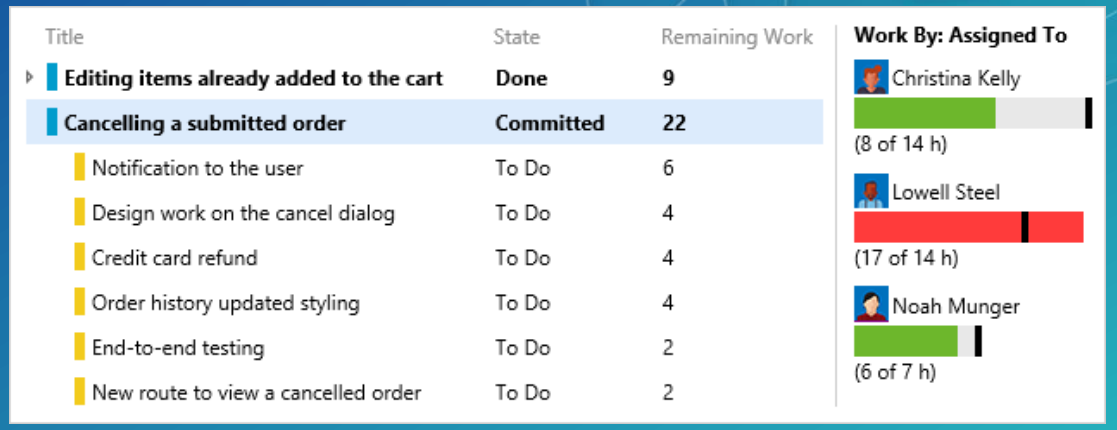


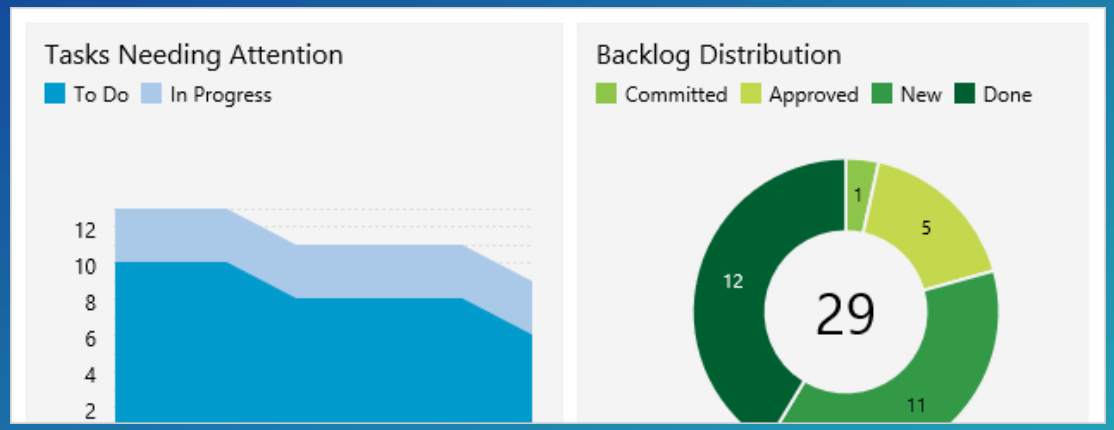


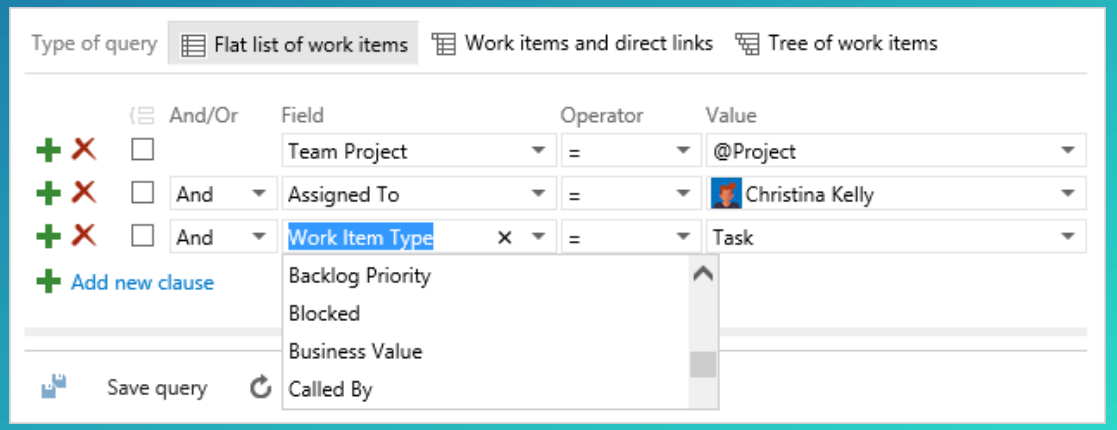


Using TFS


Backlog items to Features
Backlog
Board
Mapping Off
In progress items Show
View Backlog items to Features
Title
State
Effort
Tags
Acquisition and core workflow
In Progress
Add, Edit, Remove from shopping cart
Approved
5
Mobile
Edit existing users
Committed
5
Web
Direct link to an item in the catalog
Committed
8
Mobile
Welcome mails that include a "Getting Started" v...
New
3
Mobile


Title
State
Remaining Work
Editing items already added to the cart
Done
9
Cancelling a submitted order
Committed
22
Notification to the user
To Do
6
Design work on the cancel dialog
To Do
4
Credit card refund
To Do
4
Order history updated styling
To Do
4
End-to-end testing
To Do
2
New route to view a cancelled order
To Do
2
Work By: Assigned To
Christina Kelly
(8 of 14 h)
Lowell Steel
(17 of 14 h)
Noah Munger
(6 of 7 h)

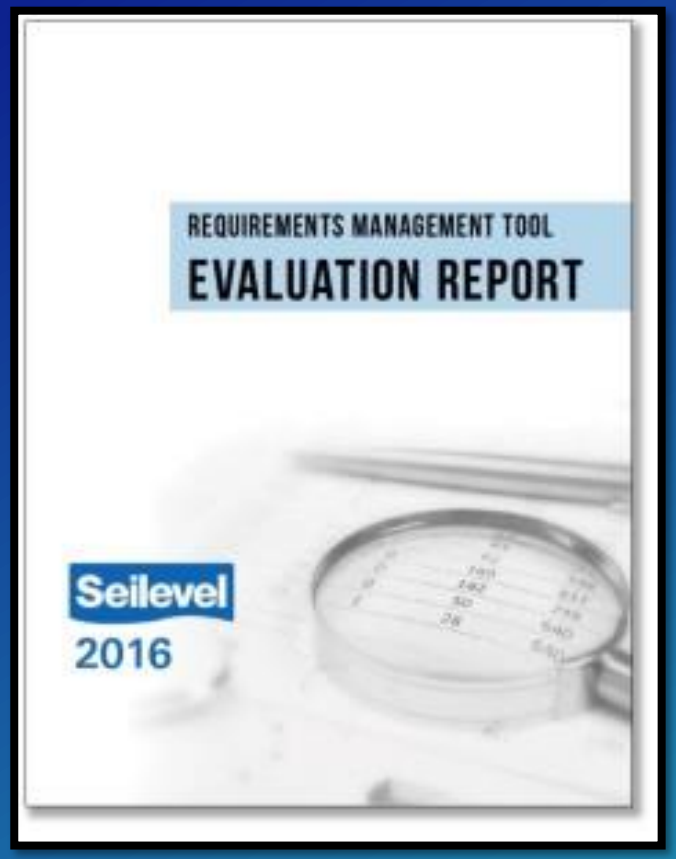

Tasks Needing Attention
To Do
In Progress
12
10
8
6
4
2
Backlog Distribution
Committed
Approved
New
Done
1
5
12
29
11


Type of query
Flat list of work items
Work items and direct links
Tree of work items
And/Or
Field
Operator
Value
Team Project
=
@Project
And
Assigned To
=
Christina Kelly
And
Work Item Type
=
Task
Add new clause
Backlog Priority
Blocked
Business Value
Called By
Save query

Making a Decision

Project Considerations	Trello	GitHub	TFS
Requirements are Proprietary			
Mobile App			
Easy to setup			
Estimation tools			
Scheduling tools			
Automated Burndown chart			
Easily integrated with Visual Studio for Code Repository			
Capacity Planning			
Exports to MPP and Excel			

There is a lot of info out there to help



http://assets.cdnma.com/13314/assets/WebsiteDownloads/2016-Seilevel-RequirementsTool-Evauation-Report-FINAL.pdf

PROJECT MANAGEMENT ZONE

	JIRA X	Pivotal Tracker X	Team Foundation Server X	Trello X
	Bug tracking and project planning tool, available as cloud service and as commercial tool.	Pivotal Tracker is a web-based, lightweight, agile project management tool for software teams.	The Team Foundation Server is a source code management system also offering project management features as part of Microsoft's application lifecycle management solutions. More project management features are accessible via synchronization with Microsoft Project.	Trello is a web-based project management and collaboration tool based on Kanban-like lists.
Category	Project Planning, ranked #2 Issue Management, ranked #1	Project Planning, ranked #13	Project Planning, ranked #10	Project Planning, ranked #4 Project Collaboration, ranked #1
Developer	Atlassian	Pivotal Labs	Microsoft	Trello
Website	atlassian.com/software/jira	pivotaltracker.com	visualstudio.com/tfs	trello.com
Technical documentation	confluence.atlassian.com/jira/jira-documentation-1556.html	pivotaltracker.com/help	visualstudio.com/en-us/docs/-devops-alm-overview	help.trello.com
Social network pages	LinkedIn 17,123 followers Twitter 23,706 followers	Facebook 19,429 likes Google+ 1,492 followers LinkedIn 152 followers Twitter 10,741 followers	Facebook 2,228 likes LinkedIn 666 followers	Facebook 85,396 likes Google+ 33,717 followers LinkedIn 11,440 followers Twitter 146,027 followers

http://project-management.zone/system/jira,pivotal-tracker,team-foundation-server,trello

Free, open source fans?

A few years ago, Accompa put together a list, with pros and cons, of free requirements management tools

http://rmblog.accompa.com/2012/04/free-open-source-requirements-management-tool/

Requirements

THE most important part of a project

- Solid requirements gathering leads to successful projects
- Consider solution, COTS capabilities before collecting additional requirements
- Involve the right people in the process
- Pick a methodology that fits your project
- Focus on the level of detail that is appropriate
- Important to prioritize and allocate
- Invest plenty of time to secure customer approval

References

- *Agile & Iterative Development: A Manager's Guide by Criag Larman, Addison-Wesley ,2003*
- *Software Requirements* (2nd Edition) by Karl Wiegers, Microsoft Press, 2003
- *Use Case Driven Object Modeling with UML* by Doug Rosenberg and Matt Stephens, Apress, 2008
- *Writing Effective User Cases, A Cockburn, Addison-Wesley, 2001*
- *Agile Development with ICONIX Process* by Doug Rosenberg, Matt Stephens, and Mark Collins, Apress, 2005

References

www.agilemanifesto.org

http://alistair.cockburn.us/

http://www.iconixsw.com/

http://www.pmi.org/default.aspx

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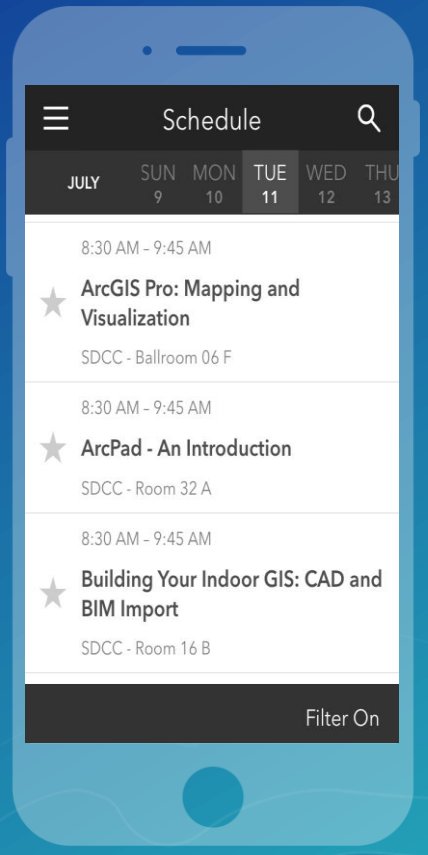
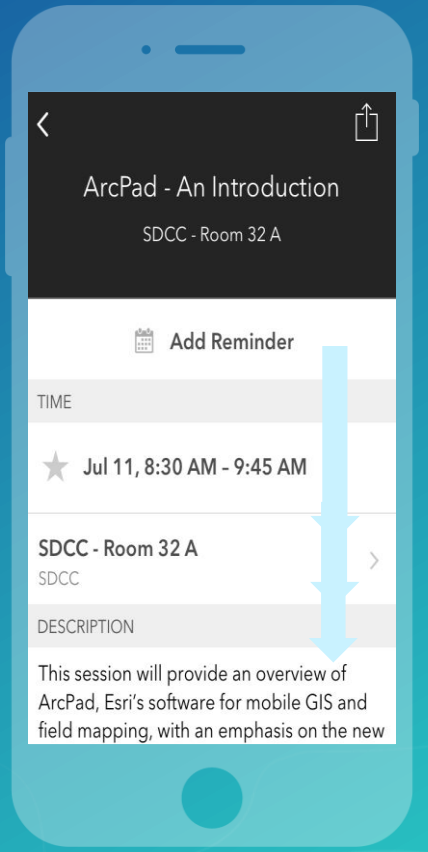
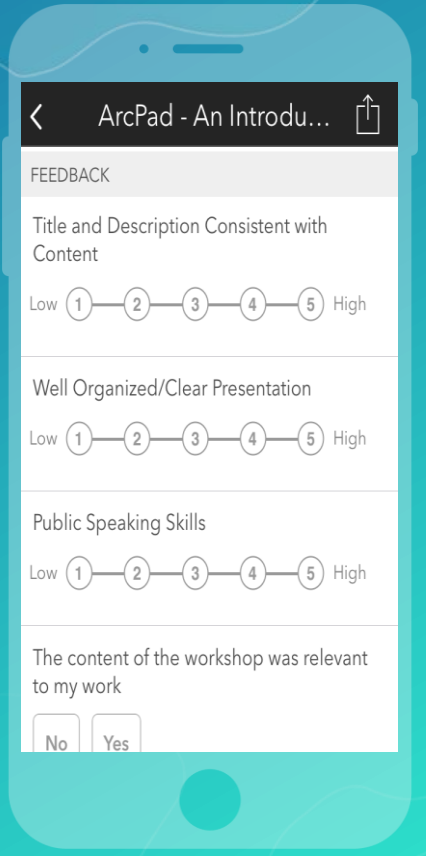
Select the session you attended



Scroll down to find the survey



Complete Answers and Select "Submit"