

Managing a GIS Enabled Web Application from Requirements to Deployment

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Application Architecture

Part of the GeoReadiness Enterprise System (GES)

ArcGIS Server 10.1

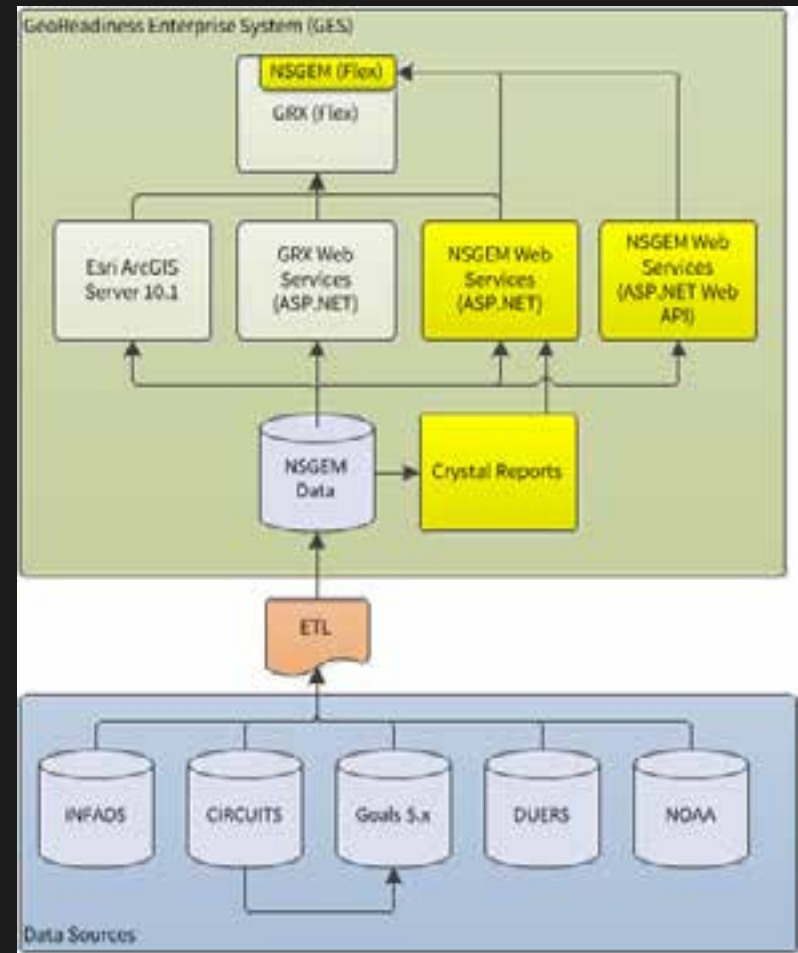
Oracle 11g

ASP.NET & ASP.NET MVC

Apache Flex

Crystal Reports Runtime

Sphinx



Statistics

4th year in development

1 year contracts

1 new version released every month

2,333 task tracking tickets to date

5,950+ commits to source control

≈ 700 code reviews

≈ 1,000 users

Challenges

Capturing & prioritizing requirements

Being responsive to user feedback & needs

Adapting to changing needs and new info

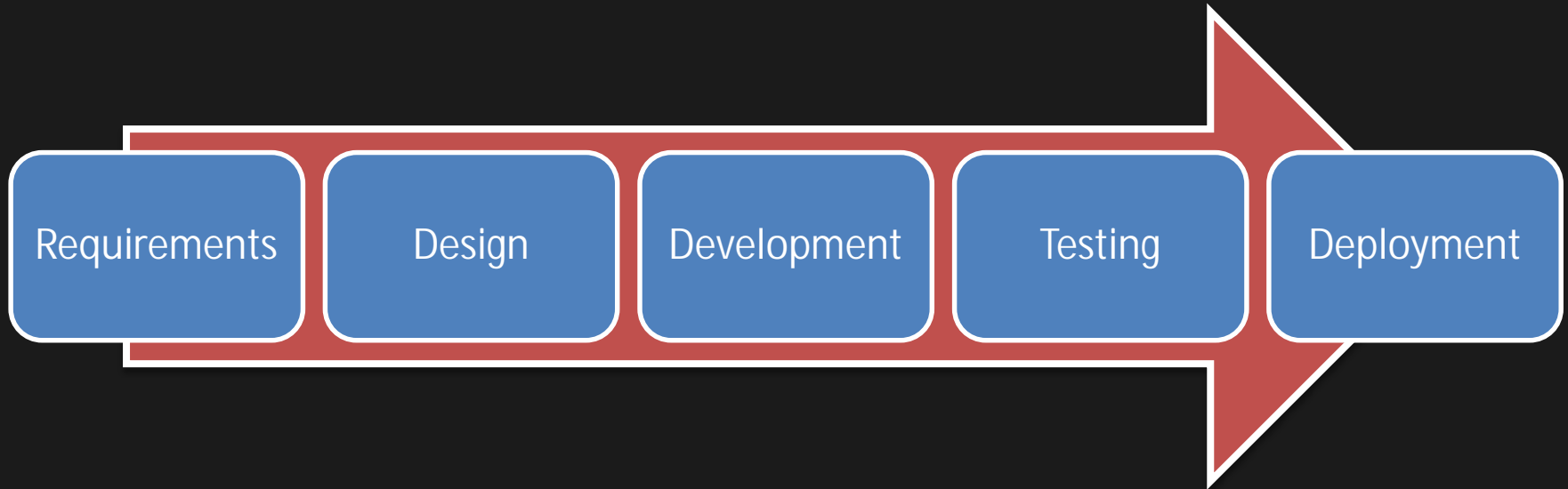
Communicating with stakeholders

Communicating with a distributed team

Understanding status & progress of all things

Our Solution(s)

~~Waterfall Development~~



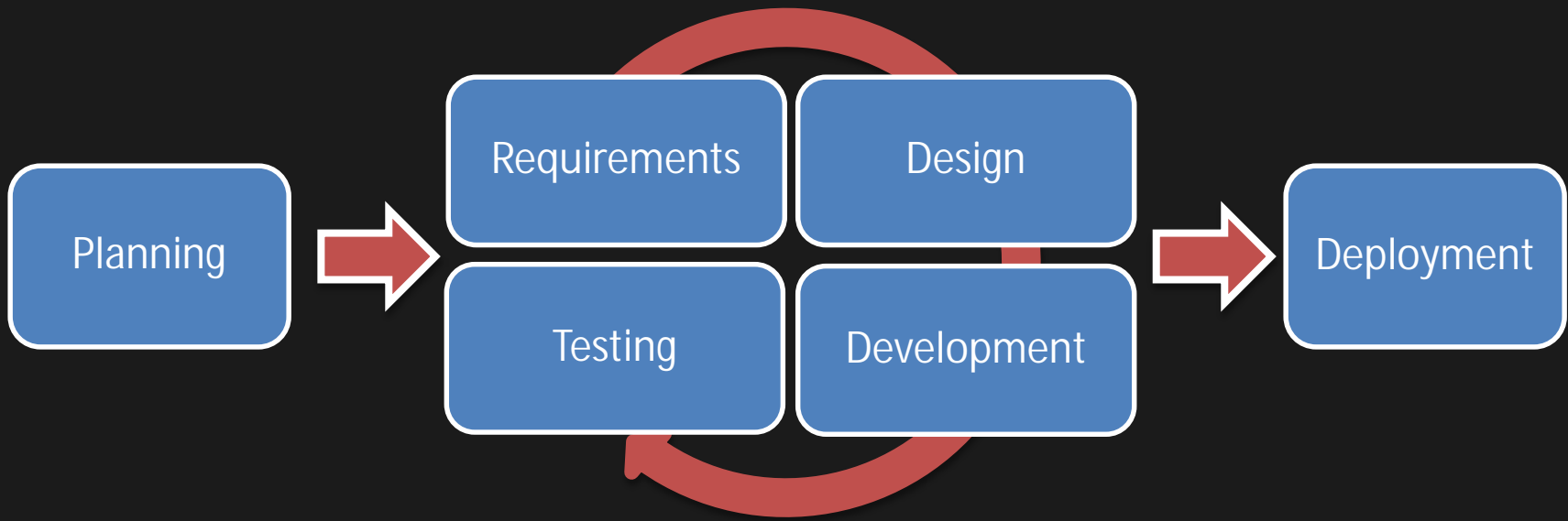
Too many unknowns

Requirements naturally change over time

Long term predictions become difficult

Embrace change rather than manage it away

Iterative Development



- Break development cycle into small sprints
- Reduce requirements to deployment timespan
- Increase feedback frequency from users
- Improve ability to respond to changes

Sprint Logistics

1 sprint = 6 weeks =

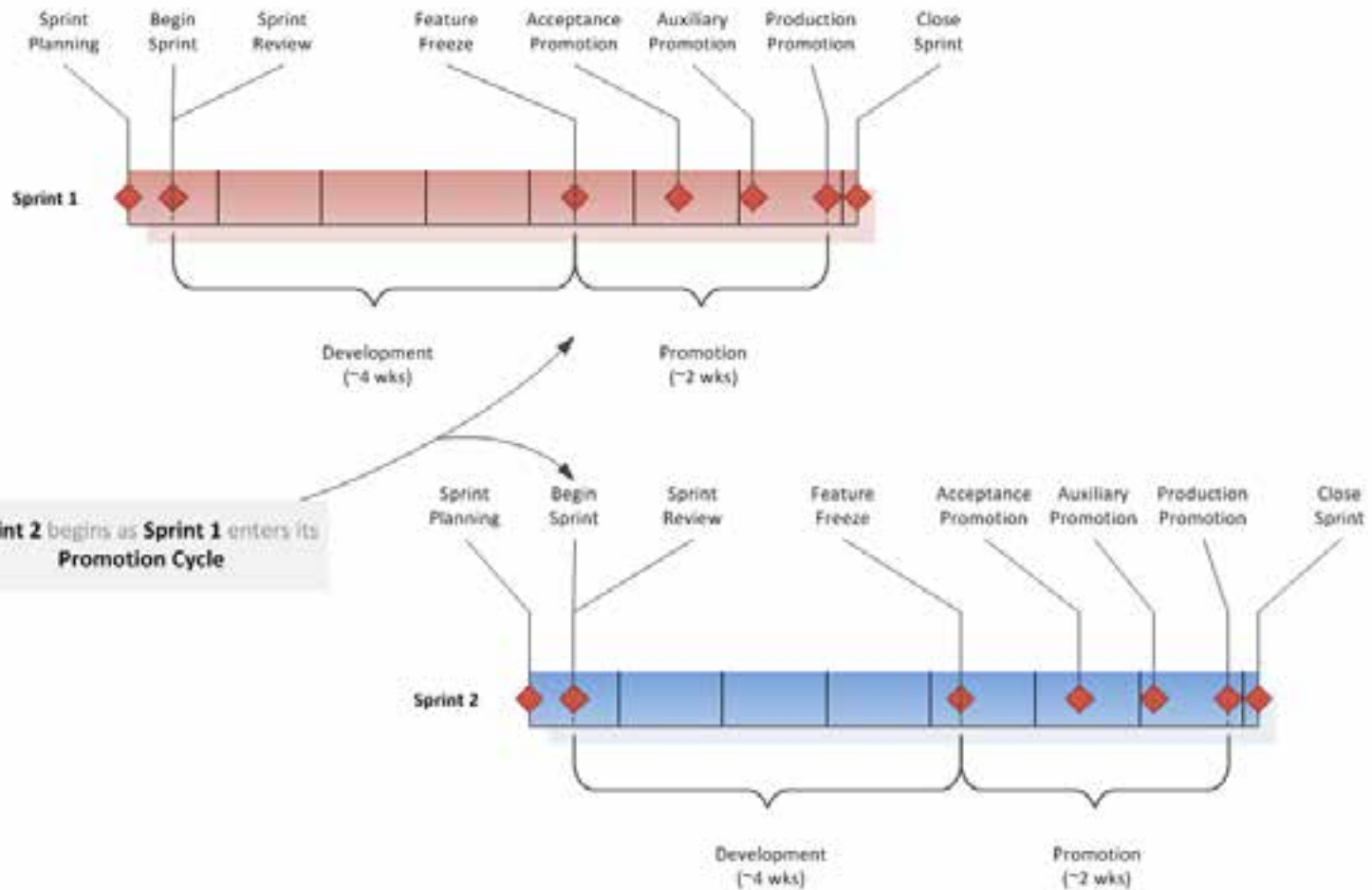
4 weeks development & testing

2 weeks deployment & testing

Prior sprint overlaps next sprint by 2 weeks

New version deployed every 4 weeks (or so)

Sprint Logistics in Graph Form



Sprint Planning

The screenshot displays the JIRA Backlog interface for the project 'NSGEM'. The top navigation bar includes 'JIRA', 'GISi Jira', 'Dashboards', 'Projects', 'Issues', 'More', and a 'Create' button. A search bar is also present. The main header shows 'Backlog' with a 'Board' dropdown and a star icon. Below this, there are 'QUICK FILTERS' for 'Standard Issues Only', 'Promotion Support', 'Only My Issues', and 'Recently Updated', along with a 'Show more' link.

The left sidebar contains a 'VERSIONS' section with a list of versions: 'All issues', '3.2.13', '3.2.14', '3.2.15', and '3.2.16'. The '3.2.15' version is selected and expanded, showing details for the 'July 2015 Release, Feature Freeze' on '06/30/2015'. It includes a 'Details' link and a table of metrics: Start Date (27/May/15), Release Date (18/Jul/15), Issues (19), Completed (2), Unestimated (17), and Estimate (0).

The main content area shows two sprint cards: 'NSGEM - July Sprint 3.2.15' with 74 issues and 'NSGEM - August Sprint 3.2.16' with 14 issues. A 'Start Sprint' button is visible next to the August sprint card. Below these is a 'Backlog' section with 69 issues and a 'Create Sprint' button. The backlog list includes items like 'NSGEM-5254 Reduce pie chart size and make the lists Top 10', 'NSGEM-5130 Add a new layer to the map to display each installation even when con', 'NSGEM-4802 Special Request: Research whether monthly EI against FY03 baseline', 'NSGEM-5226 Add Activity UIC Summary Report - Year Over Year Progress By Regio', 'NSGEM-5053 Steam consumption for WA drops off sharply in MAR 2015', 'NSGEM-5212 Update glossary in help docs', 'NSGEM-4292 Look into Jira Permissions scheme so anyone can add watchers withor', 'NSGEM-4712 DUERS Installation Consumption by Commodity Chart Needs Line Lab', 'NSGEM-3711 Automate "accomplishments this period" section of the monthly status', 'NSGEM-5049 Testing jira filter subscription ability to automatically notify users of issu', and 'NSGEM-4291 Get Ryan's NMCI laptop connected to NITC Test'.

Active Sprint

JIRA GIS Jira Dashboards ▾ Projects ▾ Issues ▾ More ▾ **Create** Search [] [?] [⚙] [👤]

Active sprints: NSGEM - July Sprint 3.2.15

🕒 11 days remaining Complete Sprint Board ▾ [A]

QUICK FILTERS: Standard Issues Only Promotion Support Only My Issues Recently Updated ... Show more

To Do **In Progress** **In Integration** **In Promotion** **Done**

🔍 NSGEM-5016 **CLOSED** 1 sub-task Create canned NSGEM briefing (ppt)

➤ 🔍 NSGEM-5095 **REOPENED** 4 sub-tasks Add Mission Dependency Index (MDI) data as a layer in the map and as attributi: Move to Done

~ Other Issues 50 issues

<p>🔍 NS...-5206 [👤] ↑ Export mapbook reports via Report UX ... Open <i>Unresolved</i> None</p>	<p>🔍 NS...-3849 [B] ↑ Improve automation for final steps In Progress <i>Unresolved</i> None</p>	<p>🔍 NS...-5232 [👤] ↑ The Total # of Projects (EPL) field Passed Integrati... Fixed <i>None</i></p>	<p>🔍 NS...-5432 [👤] ↑ Site score is incorrect in the join Passed Accepta... Fixed <i>None</i></p>	<p>🔍 NS...-4837 [👤] ↑ Add a layer to the map displaying Closed Fixed <i>None</i></p>
<p>🔍 NS...-5205 [👤] ↑ Export static reports via the new Report UX ... Open <i>Unresolved</i> None</p>	<p>🔍 NS...-5033 [👤] ↑ Return available reports and Report UX ... Needs Review Fixed <i>None</i></p>	<p>🔍 NS...-5051 [👤] ↑ The CIRCUITS Installation Ready for Integr... Fixed <i>None</i></p>	<p>🔍 NS...-5276 [👤] ↑ Update MDI layer symbology Ready for Test T... Done <i>None</i></p>	<p>🔍 NS...-4164 [👤] ↓ Create a script that can create Closed Done <i>None</i></p>
	<p>🔍 NS...-4760 [👤] ↓</p>	<p>🔍 NS...-3857 [👤] ↓ Remove the NSGEM</p>		<p>🔍 NS...-4006 [👤] ↑ Review QUEST FAC</p>

Sprint Activities

Planning (pre-sprint)

Requirements

Daily huddles

Design

Development

Testing

Deployment

Planning

Big Picture Planning

Start of fiscal year

Review prior year effort

Establish success criteria

ROM for big items

Rough schedule of events

Whole team

Pre-Sprint Planning

Beginning of each sprint

Review backlog for high priority tickets

Populate sprint

Review with whole team

Requirements (continuous)

Captured Via Several Mechanisms

Feedback forums

Steering groups

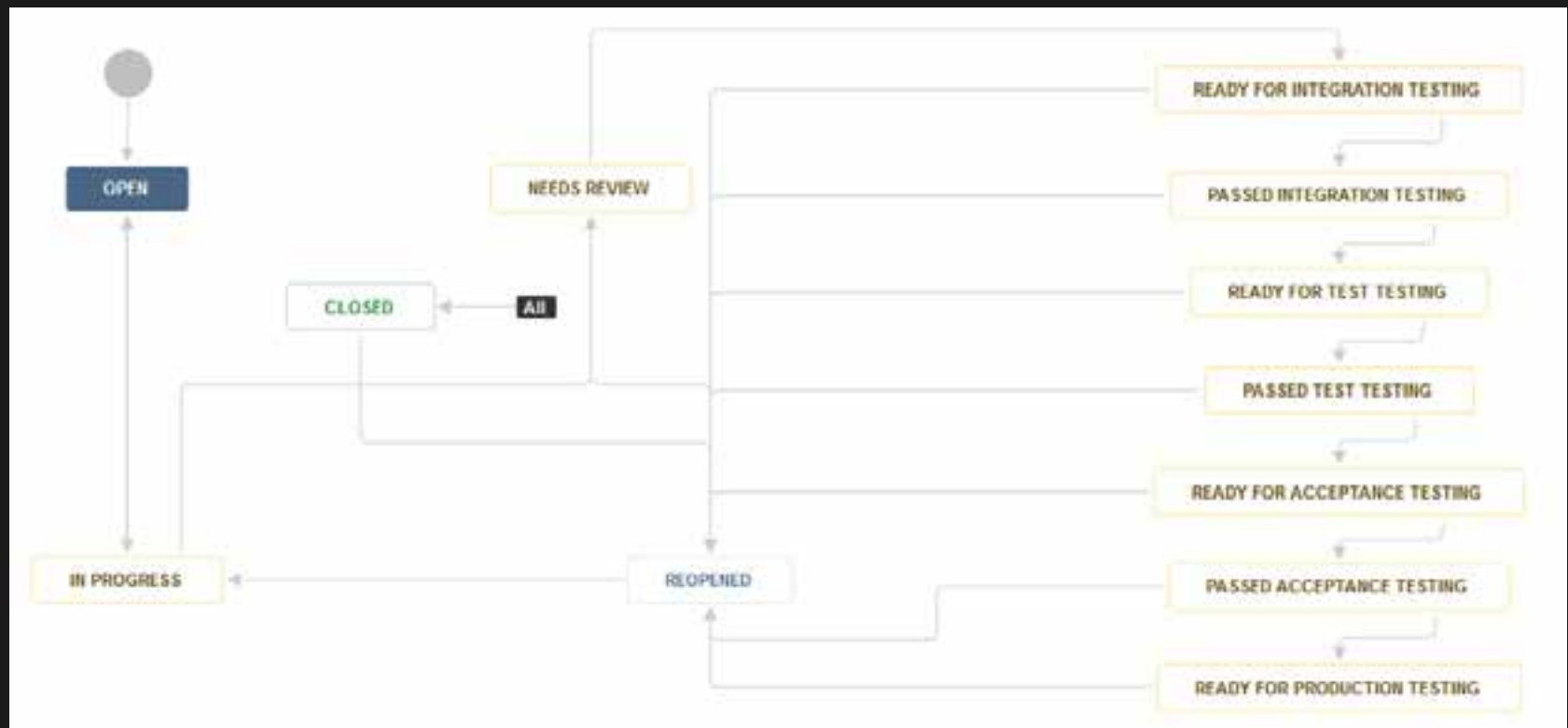
Help desk

Internal suggestions

All requirements become JIRA issues for tracking history, progress, and status

Tracking Requirements

Our workflow tracks status of all features, enhancements, bugs, and tasks



Tracking Requirements

The screenshot shows a JIRA project board for 'NSGEM - July Sprint 3.2.15'. The board is organized into columns representing different stages of the sprint: 'To Do', 'In Progress', 'In Integration', 'In Promotion', and 'Done'. The top navigation bar includes the JIRA logo, project name, and various menu options like 'Dashboards', 'Projects', 'Issues', and 'More'. A 'Create' button and a search bar are also visible. Below the board title, there are quick filters for 'Standard Issues Only', 'Promotion Support', 'Only My Issues', and 'Recently Updated'. The board displays several issues, each with a title, status, and assigned user. For example, in the 'To Do' column, there are issues like 'Export mapbook reports via' and 'Export static reports via the new'. In the 'In Progress' column, there are issues like 'Improve automation for final steps' and 'Return available reports and'. In the 'In Integration' column, there are issues like 'The Total # of Projects (EPL) field' and 'The CIRCUITS Installation'. In the 'In Promotion' column, there are issues like 'Site score is incorrect in the join' and 'Update MDI layer symbology'. In the 'Done' column, there are issues like 'Add a layer to the map displaying' and 'Create a script that can create'. Each issue card includes a 'Report UX' button and a status indicator (e.g., 'Open', 'Unresolved', 'Fixed').

Active sprints: NSGEM - July Sprint 3.2.15 11 days remaining Complete Sprint Board

QUICK FILTERS: Standard Issues Only Promotion Support Only My Issues Recently Updated Show more

To Do In Progress In Integration In Promotion Done

NSGEM-5016 CLOSED 1 sub-task Create canned NSGEM briefing (ppt)

NSGEM-5095 REOPENED 4 sub-tasks Add Mission Dependency Index (MDI) data as a layer in the map and as attribut: Move to Done

Other Issues 58 issues

NS...-5206 Export mapbook reports via Report UX Open Unresolved None

NS...-5205 Export static reports via the new Report UX Open Unresolved None

NS...-3849 Improve automation for final steps In Progress Unresolved None

NS...-5033 Return available reports and Report UX Needs Review Fixed None

NS...-5232 The Total # of Projects (EPL) field Passed Integrati... Fixed None

NS...-5051 The CIRCUITS Installation Ready for Integr... Fixed None

NS...-3857 Remove the NSGEM

NS...-5132 Site score is incorrect in the join Passed Accepta... Fixed None

NS...-5276 Update MDI layer symbology Ready for Test T... Done None

NS...-4837 Add a layer to the map displaying Closed Fixed None

NS...-4164 Create a script that can create Closed Done None

NS...-4006 Review DUES FAC

Daily Huddles

Foster team collaboration \ communication

What were you working on?

What are you working on today?

What roadblocks do you have?

Tuesday question of the day is fun!

Development (Identifying Tasks)

The screenshot displays a JIRA board for the project 'NSGEM - July Sprint 3.2.15'. The board is organized into columns representing different stages of the sprint: To Do, In Progress, In Integration, In Promotion, and Done. The 'In Progress' column is currently active, showing several task cards. Each card includes a task ID, a description, a 'Report UX' button, and status information such as 'Open', 'In Progress', 'Closed', 'Done', and 'Unresolved'. The top navigation bar includes options for 'Create', 'Search', and 'Board'. The left sidebar contains various navigation icons.

Active sprints: NSGEM - July Sprint 3.2.15 10 days remaining Complete Sprint Board

QUICK FILTERS: Standard Issues Only Promotion Support **Only My Issues** Recently Updated Show more

To Do In Progress In Integration In Promotion Done

> NSGEM-4718 IN PROGRESS 1 sub-task Custom Report Improvements

Other Issues 11 issues

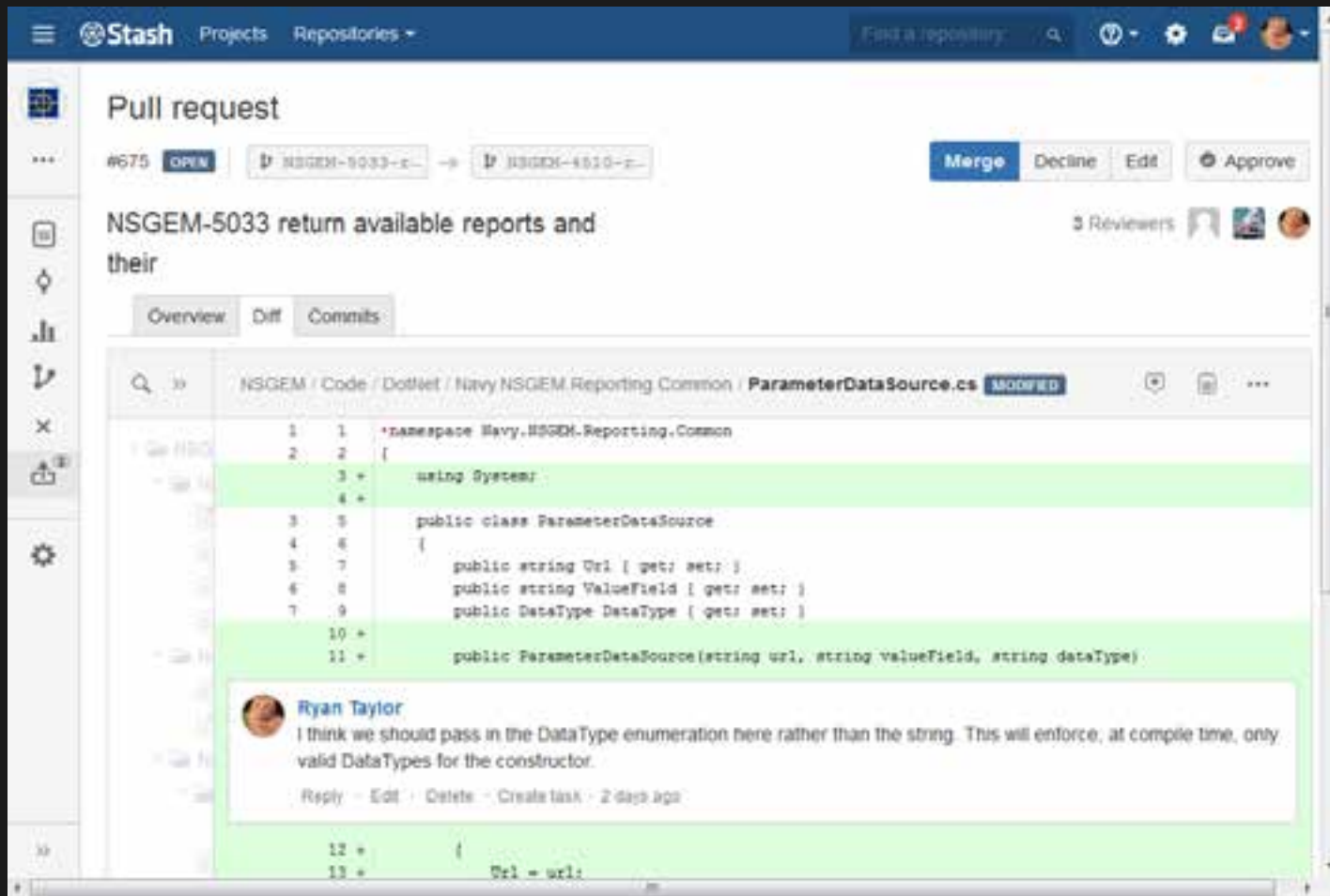
Task ID	Description	Status	Resolution
NS...-5036	Build new report wizard ui to support	Open	Unresolved
NS...-5144	Create new /modules /insgem	In Progress	Unresolved
NS...-5132	Site score is incorrect in the join	Passed Accepta...	Fixed
NS...-4164	Create a script that can create	Closed	Done
NS...-4693	Update build server to accomodate	Open	Unresolved
NS...-5143	Modify flex charts to retrieve their	In Progress	Unresolved
NS...-5307	Setup build server to build the	Closed	Done

Development (Committing Work)

The screenshot displays the Stash web interface for a repository named "NSGEM-5144-new-charts-...". The main content area shows a list of commits with the following columns: Author, Commit, Message, Commit Date, and Issues. A vertical timeline on the left side of the commit list indicates the sequence of commits.

Author	Commit	Message	Commit Date	Issues
Jared Stark	e35c63e0421	NSGEM-5144 Updated charts to use parameter	Yesterday	NSGEM-5144
Jared Stark	ba6d8fab304	NSGEM-5144 Worked on updated charts to use	Yesterday	NSGEM-5144
Jared Stark	e4fb9b4f7d7	NSGEM-5144 Worked on updating the charts in	5 days ago	NSGEM-5144
Ryan Taylor	77a73d24102	Mod ParameterBuilder to support required and	6 days ago	NSGEM-5143
Ryan Taylor	39e5b8534ea	Add Region, Installation, Site, Facility support in	1 week ago	NSGEM-5143
Ryan Taylor	86e2330ea13	Simplify Parameter usage so the caller needn't	1 week ago	NSGEM-5143
Ryan Taylor	9a9240b140d	Configure Navy Das chart to fetch data using n	24 Jun 2015	NSGEM-5143
Ryan Taylor	a7ff6a6a7dc	Modify charts/gateway to send parameters in th	24 Jun 2015	NSGEM-5143
Ryan Taylor	4855e22b8df	Update ParameterBuilder to add BillingMonth fr	24 Jun 2015	NSGEM-5143
Ryan Taylor	2f078d60fe3	Provide a method to convert a date into a YYYY	24 Jun 2015	NSGEM-5143
Ryan Taylor	f1e47e63e4b	Configure disclaimer chart to fetch it's data from	24 Jun 2015	NSGEM-5143
Ryan Taylor	5104d309302	Sending and receiving real json so we do not n	24 Jun 2015	NSGEM-5143

Development (Code Reviews)



The screenshot displays a Stash pull request interface. At the top, the Stash logo and navigation links for 'Projects' and 'Repositories' are visible. The pull request title is '#675 NSGEM-5033 return available reports and their', with a status of 'OPEN'. Action buttons for 'Merge', 'Decline', 'Edit', and 'Approve' are present. Below the title, there are tabs for 'Overview', 'Diff', and 'Commits'. The main content area shows a code diff for 'ParameterDataSource.cs'. The code includes a namespace declaration, a 'using System;' statement, and a 'public class ParameterDataSource' with three properties: 'Url', 'ValueField', and 'DataType'. A comment by Ryan Taylor suggests changing the 'DataType' property from a string to an enumeration for better type safety. The diff shows line numbers and changes, with some lines highlighted in green.

Stash Projects Repositories

Find a repository

Pull request

#675 **OPEN** NSGEM-5033-z... → NSGEM-4010-z...

Merge Decline Edit Approve

NSGEM-5033 return available reports and their

3 Reviewers

Overview Diff Commits

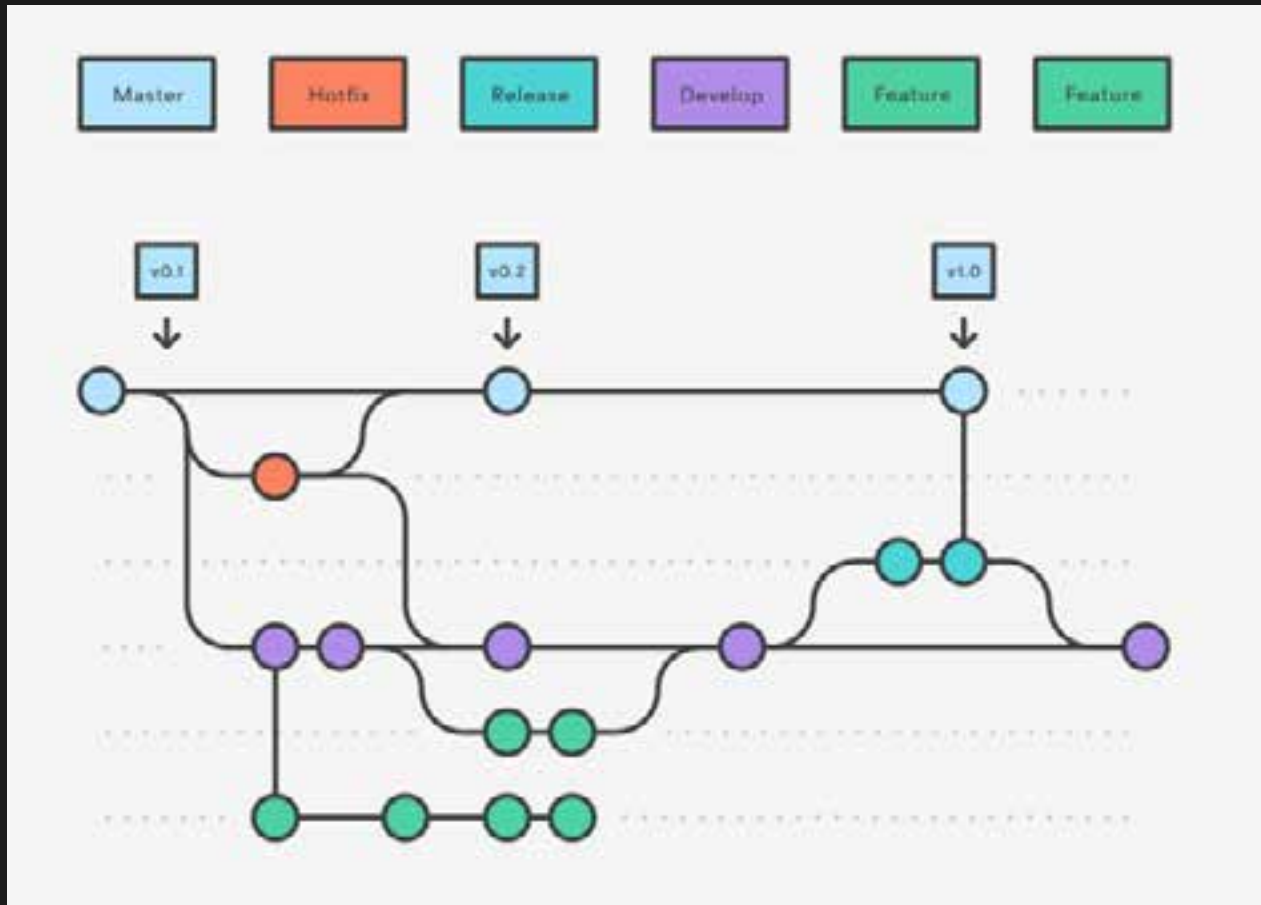
NSGEM / Code / DotNet / Navy NSGEM Reporting Common / ParameterDataSource.cs **MODIFIED**

```
1 1 namespace Navy.NSGEM.Reporting.Common
2 2 {
3 + using System;
4 +
5 3 public class ParameterDataSource
6 4 {
7 5     public string Url { get; set; }
8 6     public string ValueField { get; set; }
9 7     public DataType DataType { get; set; }
10 +
11 +     public ParameterDataSource(string url, string valueField, string dataType)
12 +     {
13 +         Url = url;
```

Ryan Taylor
I think we should pass in the DataType enumeration here rather than the string. This will enforce, at compile time, only valid DataTypes for the constructor.

Reply Edit Delete Create task 2 days ago

Development (Gitflow)



Development (Gitflow)

The screenshot shows the SourceTree application interface. The top menu bar includes File, Edit, View, Repository, Actions, Tools, and Help. Below the menu is a toolbar with icons for Clone/New, Commit, Checkout, Discard, Stash, Add, Remove, Add/Remove, Fetch, Pull, Push, Branch, Merge, Tag, Git Flow, Terminal, and Settings.

The main window displays the repository 'NSGEM'. On the left, there are panels for 'File Status' (Working Copy), 'Branches' (listing develop, NSGEM-4510-report-ux-ii, NSGEM-4713-clear-select, NSGEM-5033-return-avail, NSGEM-5034-export-tele, NSGEM-5144-nw-charts, nsgem-user-docs, and release-3.2.15), and 'Remotes' (listing origin with sub-branches like build-scripts, develop, develop-NRIS, feature-dt-newdalan, etc.).

The central area shows a commit history table with columns for Graph, Description, Date, Author, and Commit. The table lists several commits, including a merge pull request #697 in Git, a modification for GES-3239, and updates to charts using parameters.

Graph	Description	Date	Author	Commit
[Graph]	origin/NSGEM-5144-new-charts-web-api-using-parameters NSGEM-5144	2 Jul 2015 19:23	Jared St	e35c63c
[Graph]	origin/release-3.2.15 release-3.2.15 Merge pull request #697 in Gi	2 Jul 2015 15:11	Benton	c61ae25
[Graph]	origin/GES-3239-add-ability-to-view-crosswalk-in GES-3239 modification	2 Jul 2015 15:07	Benton	6bd84fd
[Graph]	NSGEM-5144 Worked on updated charts to use parameters.	2 Jul 2015 15:03	Jared St	ba68fa
[Graph]	origin/NSGEM-5033-return-available-reports-and-their Applied more pul	2 Jul 2015 13:21	Will Ho	2f03940
[Graph]	origin/GES-3190-implement-startup-configuration-class Organize imports in	2 Jul 2015 10:15	David F	7f4d26e
[Graph]	Zoom to initial viewer instance extent; clean up max extent code.	2 Jul 2015 10:08	David F	062125
[Graph]	origin/NSGEM-4510-report-ux-improvements Merge pull request #696 in	2 Jul 2015 10:07	Jonah J	0b3a79
[Graph]	origin/nsgem-crystal-reports-improvements NSGEM-5140 NSGEM-5121 F	2 Jul 2015 09:06	Jonah J	a50d1ab
[Graph]	Remove commented out code.	2 Jul 2015 6:58	David F	bf774db
[Graph]	Correct references to Extent util. method to create extent from point.	2 Jul 2015 6:46	David F	5b04555
[Graph]	Rename method.	2 Jul 2015 6:45	David F	06d5370

Below the table, the selected commit details are shown: Commit: e35c63c042421a4857ee331e6197564f79d85207 [e35c63c], Author: Jared Stark, Date: Thursday, July 02, 2015 7:23:01 PM, and Labels: origin/NSGEM-5144-new-charts-web-api-using-parameters. The description of the commit reads: 'NSGEM-5144 updated charts to use parameters. Combined some of the .NET chart query classes to more general to accommodate a single URL for all entity types as we can not longer switch URLs for installation and site selections.'

The bottom right pane shows a file diff for 'NSGEM/Code/DotNet/Navy.NSGEM.Data/ChartQueryMapper.cs', displaying a list of chart query classes like 'Navy.NSGEM.Data.ChartQueryMapper.cs' and 'Navy.NSGEM.Data.CircuitFacilityMonthlyConsumptionQuery.cs'.

Development (Automation)

On Every Commit

New build created & deployed internally

External deployment packages created

JIRA issue statuses updated automatically

Repeatable, predictable, consistent

Saves a lot of time

Testing

JIRA issue describes success criteria

Features / bugs tested as they're completed

Reopen JIRA issue if test fails

History captured as comments in issue

Description

To Test

1. Launch NSGEM
2. Select **CND Washington** from the *Region* lens
3. Select **N33355** from the *Installation* lens
4. Scroll down to the **CIRCUITS Installation/Site Consumption and Reduction by Type Chart**
5. Hover over the slider bar located at the edge of the chart and drag the bottom scroll bar to the x-axis of the chart
6. Generate a custom report containing the **CIRCUITS Installation/Site Consumption and Reduction by Type Chart**
7. Compare the graphs

Expected Result

The custom report and dashboard should display the same number of facility types.

Deployment

Feature Freeze Day

Once per sprint

All features must be complete & tested

Create release branch

Fix remaining issues (if any)

Development team starts working on next version

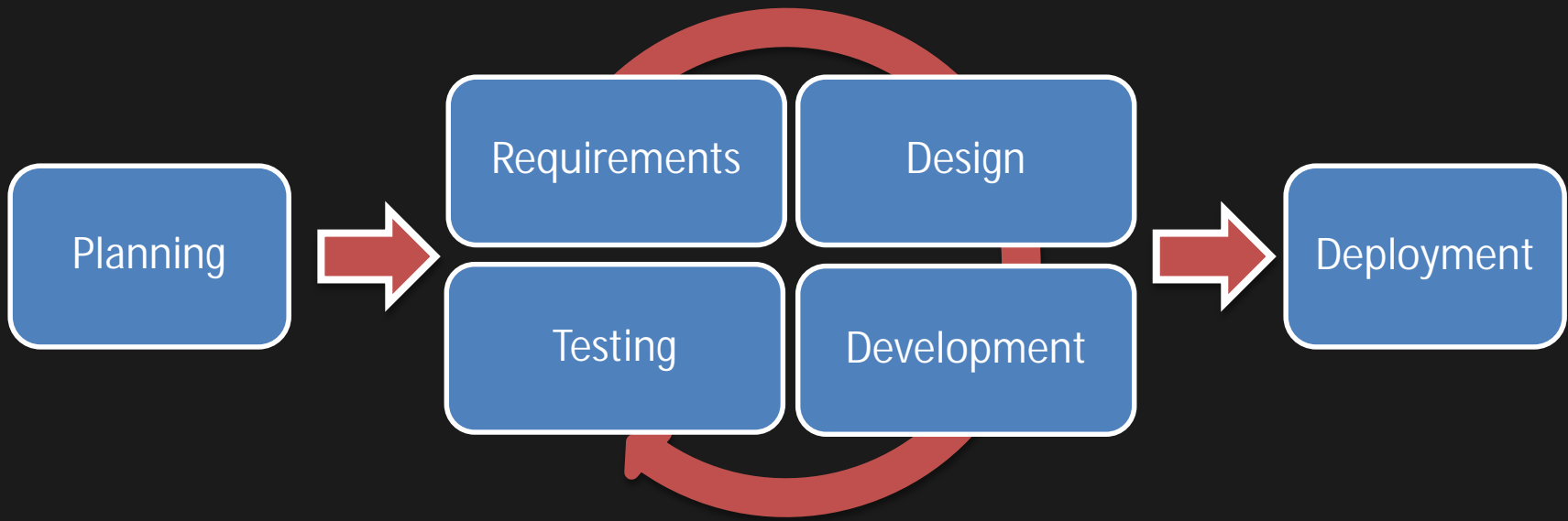
Deployment packages automatically built

Promotion team promotes app through 3 environs

Fully tested in each environment

Release complete when all tickets pass

Iterate



Continuously reflect on your processes and tools in order to improve upon them

For More Info

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