



Vortek Solutions

A **NORTHROP GRUMMAN** Team



Prototype 2 Report (4)

Members:

Justin Goulet, Chris Larsen, Mikal Callahan, Brock Corbett



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Vortek Solutions

333 S. Twin Oaks Valley Rd.
San Marcos, CA 92096

Usrey, Thomas (Ty)
Northrop Grumman
16765 W. Bernardo Dr.
San Diego, CA 92127

Dear Mr. Usrey,

As we progress through our project, our team would like to update you on our current progress.

Thank you for meeting us on-site for our second prototype meeting. We are working hard to ensure our project meets all of your specified requirements and goals that have been stated throughout our project development lifecycle.

In the previous phase, we migrated from using Sencha EXTJS towards Angular2 and hope that this transition will better accommodate your requirements. We have already found this library to be easier to use, contain better documentation and have a faster learning curve to expedite our development. Our previous work has already been transitioned and is on our GitHub repository. Our GitHub Pages site will be updated shortly.

In the next and final phase, we wish to complete the project - per your requirements - as efficiently as possible. The included report includes what tasks we will be working on to ensure this is a reality, a finalized version of all project requirements and a list of references to where related documents may be found.

So far, our project has incurred an approximate cost of \$10,800.00 and an estimated completion cost of \$12,835.00 (breakdown in following pages).

We thank you for allowing us to work with you on this project and will contact you soon regarding our final presentation. We look forward to seeing you there!

Thank You,
Justin Goulet

Project Manager / Lead
VortekSolutions.CIS@gmail.com

CC: Dr. Shaun-Inn Wu

I _____ (print), approve the current project and continuation under the predetermined terms by the Vortek Solutions team, will provide any non-confidential materials that contributes to the overall success of the project and will allow Vortek Solutions to manage all deliverables set by the project sponsor.

Client Signature: _____

Date: ____ / ____ / ____



Phase Overview

Summary of Accomplishments:

- Further defined requirements for both manuals
 - Transform to wiki format
 - Markdown format preferable
 - Page based
- Development transition
 - Migrated from Sencha EXT JS to AngularJS
- Further defined design specs

For Successful Completion of phase:

- We will have a working prototype of the workflow object which includes:
 - The ability to switch between admin and user
 - The complete replacement of images with SVG elements
 - Transition from Angular to Angular2
- Development and user manuals in Markdown
 - Transition current documents
 - Include code snippets
- Workflow can communicate with external form
- Workflow will be zoomable
- Prepared for large (16 state min) workflow



Application Development

Statement of Business Context:

Northrop Grumman has existing systems related to their current manufacturing workflows. These systems run in a web browser showing statistics and information related to specific workflows. Created statistics are visualized in charts, or Visio style diagrams, which are not always easily read (especially on devices of various screen sizes such as the tablets used by upper management). The statistics and other pieces of information related to the workflows are then used in decision making at various levels throughout the organization.

Statement of the Customer's Business Problem:

Northrop Grumman is in need of a versatile widget that would allow them to monitor their current workflow in an easy to process but highly descriptive manner. Currently the employees get this information printed out on a piece of a paper, which makes it inconvenient to deduce more information from. There's a lot more information that would be of use to the employees given that it was more accessible.

Statement of Project Proposal

We propose a widget that will be able to receive multiple workflow objects and render it in the multiple browsers that Northrop Grumman supports. The widget will also be able to be styled using CSS and have the ability to add, update and edit a workflow's state.

Statement of Deliverables

The deliverables will be:

- The final widget which will:
 - Be an executable, locally run widget, which interprets JSON data containing information of a specific workflow
 - Display workflows multiple workflows in a visual manner
 - Run on IE11+, Firefox 45+ and Edge
- IEEE SRS Documentation
- Developer's manual in Microsoft Word format
- User's manual in html
- Source Code

What Medium Will the Product Be Delivered In

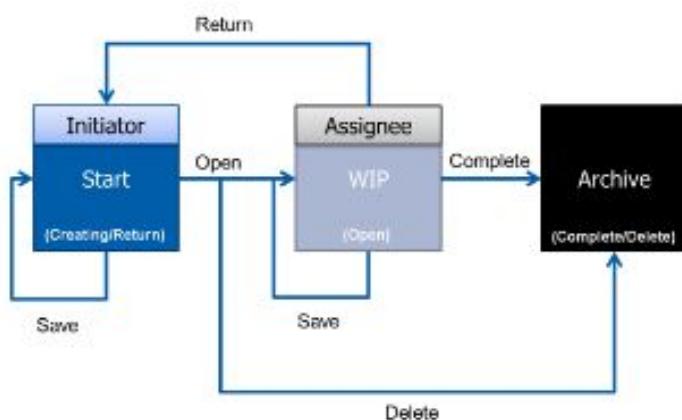
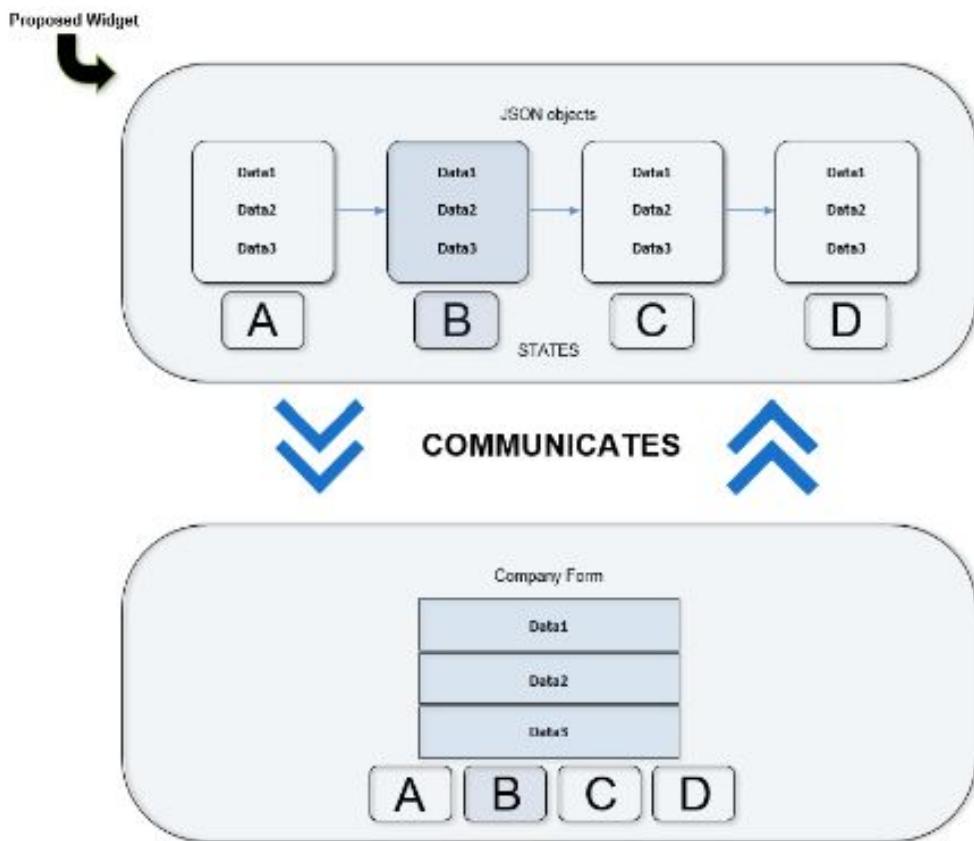
Source code that our clients at Northrop Grumman will be able to compile and run on their local machines via web browser (IE11+, Edge, Firefox 45) through GitHub Repository access.

Outline of Project Measures of Success

JAD 1 -	Establish Requirements
JAD 2 -	Finalize Requirements
Prototype 1 -	Basic widget implemented to receive JSON data
Prototype 2 -	Static Widget (i.e. can manually update values of Workflow modules, switch between admin and user)
Final Deliverable -	Dynamic Widget (i.e. widget is dynamically changed based on form input)



Workflow Representation:





Cost = Elapsed Hours/Standard Hours

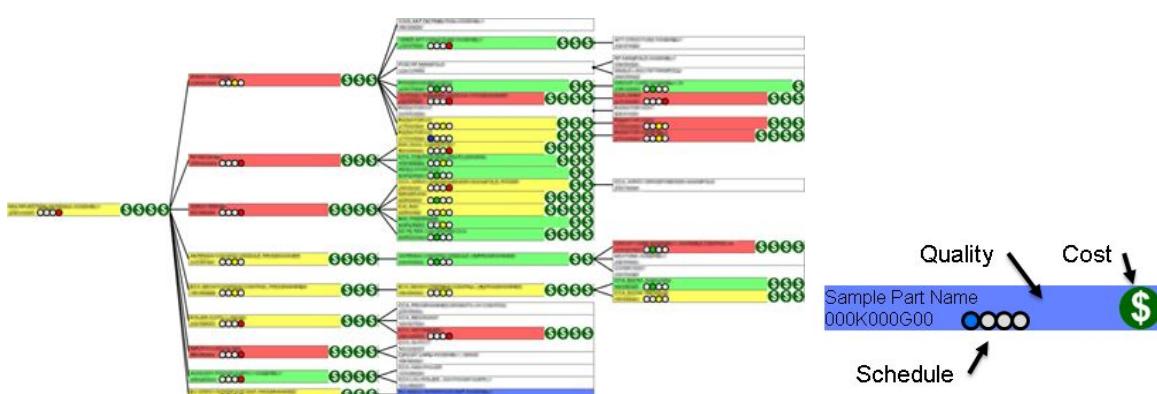
Elapsed hours are less than or equal to standard hours	\$	Perfect: Cost <= 100%
Elapsed hours 1x to 1.5x standard hours	\$\$	Good: 100% < Cost <= 150%
Elapsed hours 1.5x to 2x standard hours	\$\$\$	Good: 150% < Cost <= 200%
Elapsed hours more than 2x standard hours	\$\$\$\$	Bad: Cost > 200%

Quality = WO's with QN/Total WO's

No WO's have a QN against them	Perfect: Quality = 0%
None to 25% of WO's have a QN against them	Good: 0% < Quality <= 25%
25% to 50% of WO's have a QN against them	Good: 25% < Quality <= 50%
More than 50% of WO's have a QN against them	Bad: Quality > 50%

Schedule = Days of QN RW on a WO/Total Open Days of a WO

No days of RW operations related to a QN	Perfect: Schedule = 0%
0% to 10% of WO open days had RW operations	Good: 0% < Schedule <= 10%
10% to 20% of WO open days had RW operations	Good: 10% < Schedule <= 20%
More than 20% of WO open days had RW operations	Bad: Schedule > 20%



John Doe





General Requirements

Detailed on Following Page

Requirements	Description	Task Number
Design	Define requirements for widget and construct basis for further development.	R1
Development	Widget will accept nested JSON inputs, UI will dynamically adjust to tree hierarchy and run on previously defined browsers.	R2
Error Handling	Widget must be able to handle incomplete JSON data.	R3
Documentation	Necessary documentation will be accustomed for future development on widget.	R4

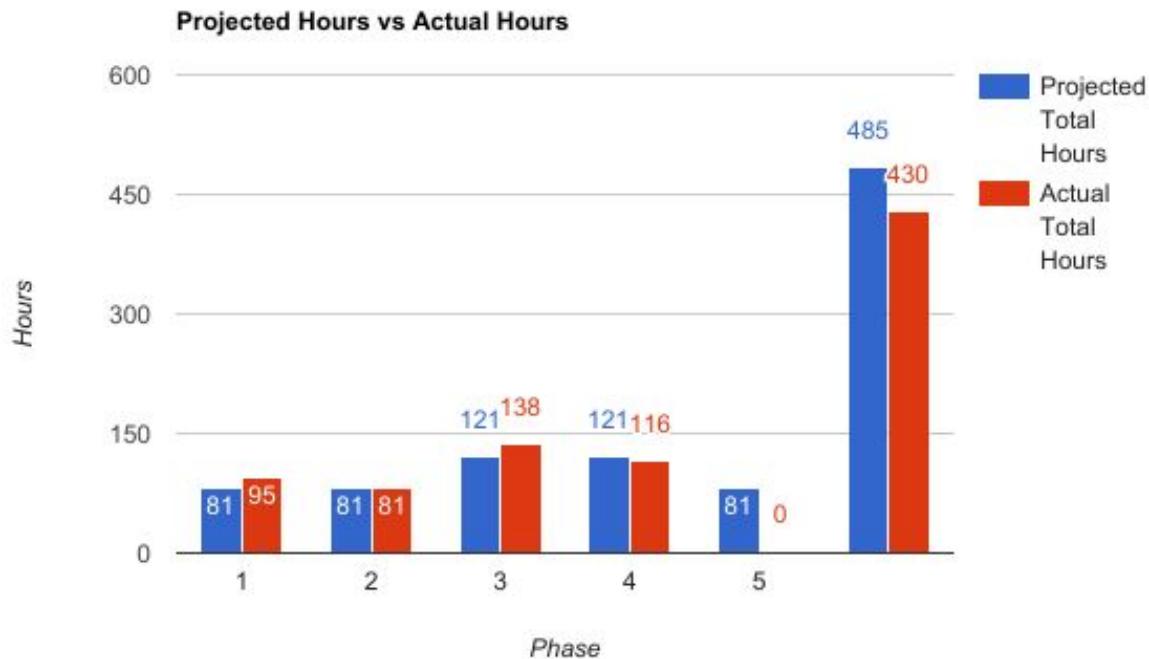


Requirements Matrix

Requirement	Implemented (Y/N)
Widget Design	
Create at least 2 themes for widget using CSS	
Must implement both User and Admin views such that Users are READ-ONLY and Admins may customize available attributes shown	
Must have indicator on parent nodes when child nodes are present	
All images in themes must be type SVG not static images	Y
Development	
The widget shall run on Microsoft Internet Explorer 11+, Edge, and Firefox 45+; with little variation in layout, style, or functionality	
Allow widget to be themed with CSS	Y
Render workflow info (project name, date started, etc)	Y
Widget must be able to handle JSON objects with incomplete data - ID and Name are minimum requirement	Y
Must be able to scale and scroll within view such that the widget does not conquer all available screen space	Y
Must highlight current visible state	
Must be well documented	Y
Final Prototype shall run a 16 leaf tree with little fault	
Developer User Manuals shall be written in Markdown for ease of transfer to existing company wiki	
Deliverables	
Documentation (Manuals), Code and Project Documentation will be submitted by GitHub Repository Access	



Initial Project Cost Tracking Chart





Accrued Cost for Phase:

Total Hours:

116 (1h consultation, 115h labor)

Consultation Fee (\$35/hour):

1 hour * \$35 = \$35

Labor Fee (\$25/hour):

115 hours * 25 = \$2,875

Total = \$2,875+\$35 = \$2,910

\$2,910/4 team members = \$727.50 per employee

Estimated Cost for Phase:

Total Hours:

121 (1h consultation, 120h labor)

Consultation Fee (\$35/hour):

1 hours * \$35 = \$35

Labor Fee (\$25/hour):

120 hours * 25 = \$3,000

Total = \$3,000+\$35 = \$3,035

\$3,035/4 team members = \$758.75 per employee

Accrued Total Cost:

Total Hours:

430 (5h consultation, 425h labor)

Consultation Fee (\$35/hour):

5 hours * \$35 = \$175

Labor Fee (\$25/hour):

425 hours * \$25/h = \$10,625

Total = \$10,625 + \$175 = \$10,800

\$10,800/4 team members = \$2,700.00 per employee



Work Breakdown Structure

Project Title: JavaScript Workflow Widget

Date Prepared: 04/03/2017

Date Modified: 05/01/2017

Task	Description	Predecessor(s)
1	Initiate Project	N/A
1.1	Establish Business Case	N/A
1.2	Project Charter	N/A
1.3	Initiation Gate with Steering Committee	N/A
2	Plan	1
2.1	Project Management Plan and Subsidiary Plans	1.2
2.2	Project Scope	1.2
2.3	Project Schedule	2.1, 2.2
2.4	Project Budget	2.3
2.5	Project Documents and Templates	2.4
2.6	Identify Risks & Risk Management Plan	2.4
2.7	Project Planning Gate with Steering Committee	2.4
3	Project Kickoff	2.5, 2.6, 2.7
3.1	Internal Project Kickoff	3
3.1.1	Project Team Kickoff Meeting	3
3.1.2	Stakeholders Kickoff Meeting	3.1.1
3.2	Security / Non-Disclosure Agreements	3.1.2
4	Widget Execution	3.1.1, 3.2
4.1	Identify Project Priorities	4
4.2	Identify Use Cases	4



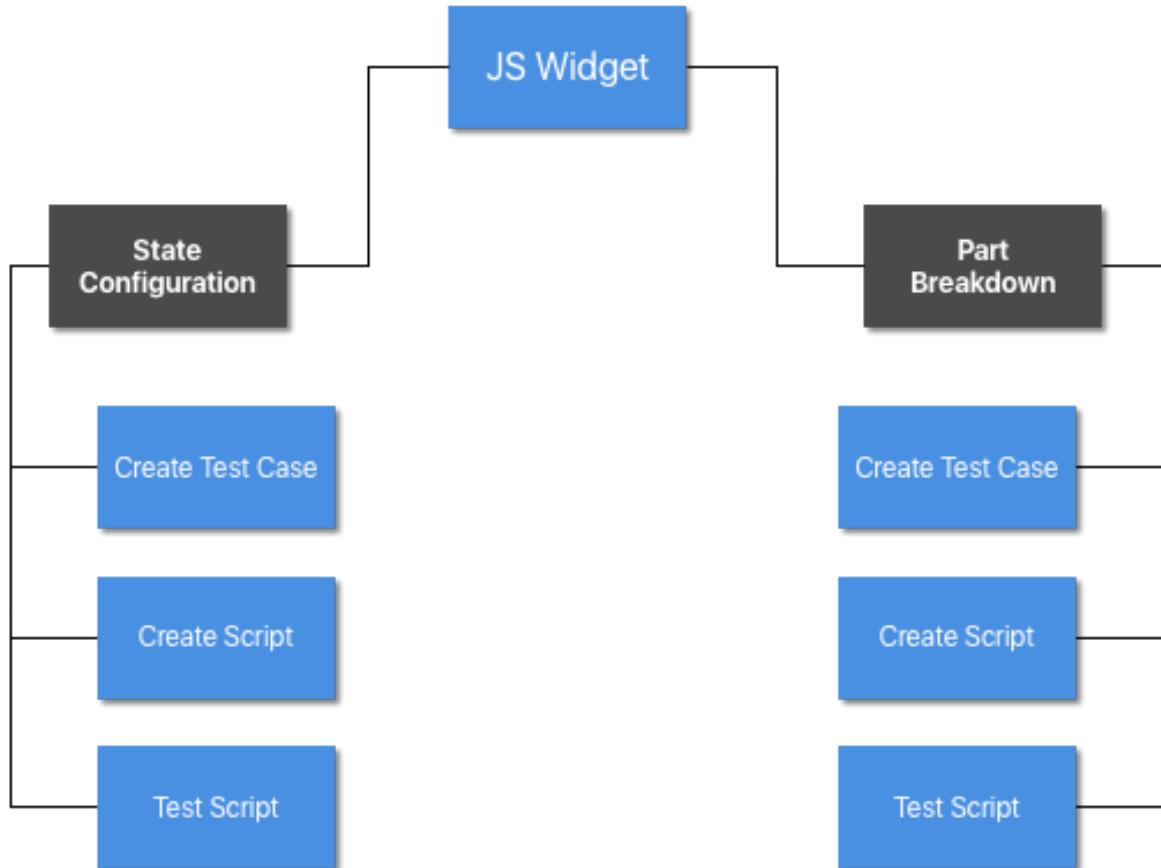
4.3	Data Collection	4
4.3.1	Internal Collection	4
4.3.2	Tour of Manufacturing Floor	4
4.3.3	Third Party Research	4.3.1
4.4	Gap Analysis	4.3.3
4.4.1	Gap Recommendations	4.4
4.4.2	Data & Process Development	4.4
4.4.3	New Data and Process Approval by Project Director	4.4.1, 4.4.2
4.5	Peer Review and Report	4.4.3
5	Widget Development	4.5
5.1	Javascript Widget	5
5.1.1	Widget Management	5
5.1.1.1	Maintain GitHub Repository	5
5.1.1.2	Maintain Proper Documentation	5
5.1.1.3	Maintain Design Requirements	5
5.1.2	Widget Development	5.1.1 - 5.1.1.3
5.1.2.1	Editable State Configurations	5.1.2
5.1.2.2	Render Projected Workflow Steps	5.1.2.1
5.1.2.3	Render Workflow Step Linkages	5.2.2.2
5.1.2.4	Error Management	5.1.2.2, 5.1.2.3
5.2	User Manuals	5.1.2
5.2.1	Develop User-Only Markdown Manual	5.2
5.2.2	Develop Developer-Only Markdown Manual	5.2
6	Monitor Widget Project	5.2.1, 5.2.2



6.1	Maintain Project Management Report	6
6.1.1	Verify Quality and Deliverables	6
6.2	Manage Resources	6
6.2.1	Project Meetings	6
6.2.2	Stakeholder Meetings	6
6.3	Manage Quality	6
6.3.1	Data Quality Meetings	6
6.3.2	Validate Data	6
6.4	Readiness Meeting with Sponsor / Director	6 - 6.3.2
6.4.1	Internal Readiness Check	6.4
6.4.2	Peer Review	6.4.1
6.4.3	Prepare Data and Presentation	6.4.2
7	Close-Out Project	6.4.3
7.1	Steering Committee Meetings	7
7.2	Project Demonstration and Delivery	7.1
7.2.1	Present Data and Final Product	7.1
7.2.2	Deliver Project Assets to Client	7.2.1
7.3	Internal Project Close-Out	7.2.2
7.3.1	Stakeholder Meeting with Project Sponsor / Director	7.3



WBS Diagram

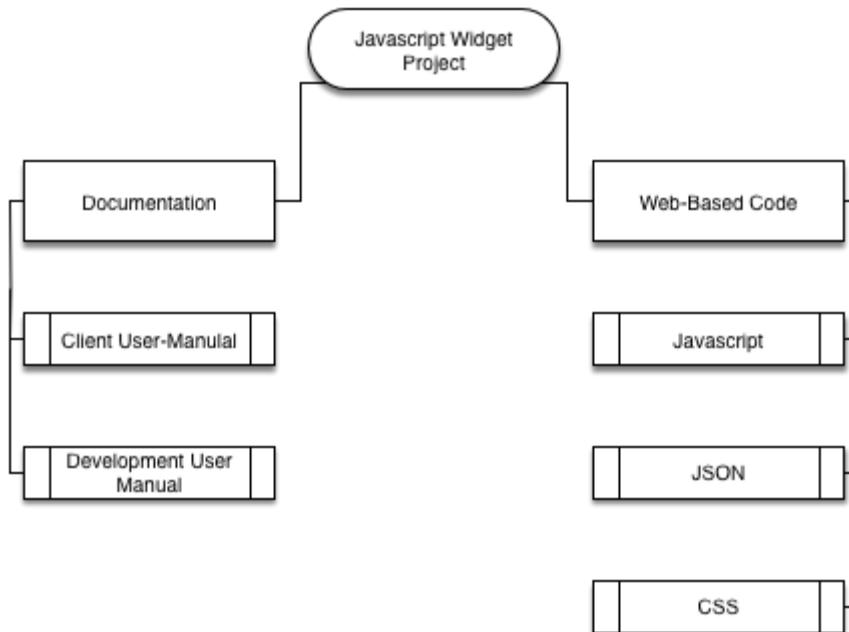




Product Breakdown Structure

Widget

- Documentation
 - Development User Manual (Markdown)
 - Client-Side User Manual (Markdown)
- Web-Based Code
 - JavaScript
 - JSON
 - CSS





Project Plan

~~Hold JAD 1 Meeting (2/8/17)~~ Completed

On site

- ~~Discuss communication methods~~
- ~~Define customer requirements~~
- ~~Interpret project priorities~~
- ~~Discuss final product~~

~~Hold JAD 2 Meeting (2/22/17)~~ Completed

On site

- ~~Adjust requirements if needed~~
- ~~Examine possible technologies to implement~~
- ~~Finalize definition of workflow object~~

~~Hold Prototype Meeting 1 (3/22/17)~~

Teleconference

- ~~Discuss and finalize libraries we have chosen~~
- ~~Wireframe for simple workflow in all its states~~
- ~~Get feedback~~
- ~~Widget can accept JSON objects~~
- ~~Widget display implemented~~
- ~~Get feedback~~

~~Hold Prototype Meeting 2 (4/19/17)~~

On-Site

- ~~Widget given more functionality (modify/delete)~~
- ~~CSS-themed~~
- ~~Error handling~~
- ~~Get more feedback for final product~~

Final Presentation

CSUSM - Room TBD

- Final Presentation
- Product Delivery

Statement of the Deliverables

In the next and final phase, we wish to complete the project - per your requirements - as efficiently as possible. The included report includes what tasks we will be working on to ensure this is a reality, a finalized version of all project requirements and a list of references to where related documents may be found.



Estimated Costs - Final Version Due Date: 5/16/17

Task	Hours	Bill Rate	Total Cost
Create additional views for widget	40	\$25.00	\$1,000.00
Improve functionality of widget	40	\$25.00	\$1,000.00
Total Hours:	80	\$25.00	\$2,000.00

Resources Outline

What resources we will need from Northrop Grumman:

- Due to the nature of Northrop Grumman's industry/clientele we understand that we will have no access to Northrop's internal network and production data.
- Ty has provided us with:
 - Sample workflow object data
 - Application style guide
 - List of commercial libraries that Northrop Grumman has access to

What resources we are supplying:

- We will provide a test environment to mimic how the widget will be deployed in production
- Any open source software that is needed for research/development purposes
- Slack channel
- GitHub repository

What resources we will need from the instructor:

- At this time we do not require anything of the instructor.

Gantt Chart / Task List

Please see the attached document for the gantt chart and task breakdown.



Team Norms

Reliability

Vortek Solutions strives to perform all of our tasks carefully and diligently, while still working in a swift manner, providing unparalleled reliability of our products. We take pride in our work, and reliability is of utmost importance.

Commitment

Vortek Solutions is committed to our clients. We put in every effort to ensure all of our client's needs are met, from the most prominent functional features to the smallest subtleties in design.

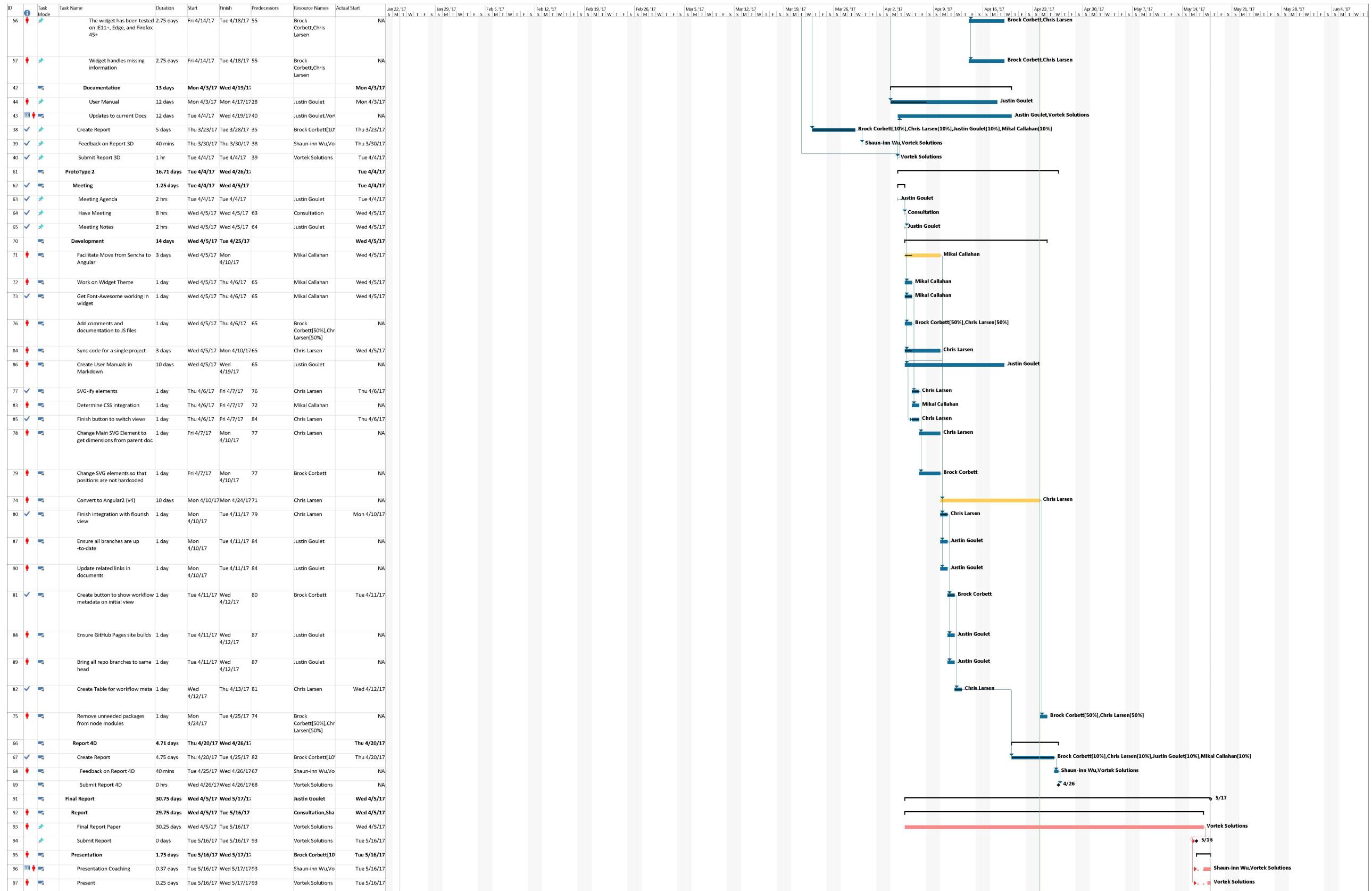
Communication

At Vortek Solutions communication is key. We are in constant contact among each other and always ensure that the individual parts we are working on will amalgamate into one harmonious product. We also keep our clients up to date with our progress and send over updates as they come. We do not hesitate to ask any questions regarding our client's needs and we are always open to questions and comments from our clients.

Common Goal

Vortek Solutions strives to provide a product that is not just functional, but both beautifully built and intelligently designed. The ending result is a well built and carefully crafted product that is sure to leave our clients satisfied.





Project: Northrop JS Widget	Task	Milestone	Split	Project Summary	Inactive Milestone	Inactive Task	Inactive Summary	Manual Task	Manual Summary Rollup	Start-only	Finish-only	External Tasks	External Milestone	Deadline	Path Predecessor Summary Task	Critical	Progress	Manual Progress
Date: Mon 4/24/17	Summary	Summary	Summary	Summary	Inactive Summary	Inactive Summary	Inactive Summary	Duration-only	Manual Summary	Start-only	Finish-only	External Tasks	External Milestone	Deadline	Path Predecessor Milestone Task	Critical	Progress	Manual Progress