Vortek Solutions

A **NORTHROP GRUMMAN** Team

Final Report

Members:

Justin Goulet, Chris Larsen, Mikal Callahan, Brock Corbett

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

Dear Mr. Usrey,

Thank you for allowing us to work with you for our Senior Project. We appreciate the time you spent on our meetings and organizing the process with our professor.

The project you tasked us with allowed us to learn a lot about project management and implementation and your mentorship has allowed us to learn what is required to complete a project for a real client. We hope that you, and others, will keep the tradition going to help further students do the same.

For the final phase of the project, we wanted to ensure your requirements were met to the best of our ability. Put briefly, while there were some tasks we could not successfully compete due to time constraints, we were able to complete the vast majority in order to call our project successful.

After the transition of frameworks, we were able to re-implement our working code in an easier to use environment that allowed for your requests. The use of Angular2 and D3 have enabled us to gather a working workflow diagram with expanded detail views.

Do to the constraint of time, we unfortunately had to remove the functionality of expanding and collapsing nodes as the implementation of the detail view rose some unexpected errors. Due to those errors, we were also not able to provide the functionality to expand those of a particular quality.

So far, our project has incurred an approximate cost of $12,000.00 with the hours in the last phase summing 48 hours (breakdown in following pages).

Thank You,
Justin Goulet

Project Manager / Lead
VortekSolutions.CIS@gmail.com   CC: Dr. Shaun-Inn Wu

I _____ (print), approve the current project and accept the work completed by all members of the team to the extent in which was completed to the best of their ability and under the time and knowledge constraints provided. By signing below, also have knowledge of the project's location on GitHub and understand that the repository owner will be transferred directly following the presentation.

Client Signature: _____   Date: ____ /____ /_____

Phase Overview

Summary of Accomplishments:

- In the final phase, we have completed the workflow widget
  - There are two themes to choose from
    - Workflow Tree
    - Simple Tree
  - In the workflow tree, basic information is visible on the states
  - In the simple tree, only the state number is visible on the node
  - State quality is represented by color
  - When hovering over a state, the state's ID and description are visible
  - When a state is clicked on a modal opens displaying all of the state's information
- Development transition
  - Migrated from Angular to Angular 2
  - Migrated from D3 v3 to D3 v4
- 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
    - Not yet implemented
  - The complete replacement of images with SVG elements
    - Done
  - Transition from Angular to Angular2
    - Done
- Development and user manuals in Markdown
  - Transition current documents
    - Done
  - Include code snippets
    - Done
- Workflow can communicate with external form
    - Displays new form when clicked. This form can be modified with simple HTML integration
- Workflow will be zoomable
    - Not implemented, however, does scale based on screen size
- Prepared for large (16 state min) workflow
    - Done

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:
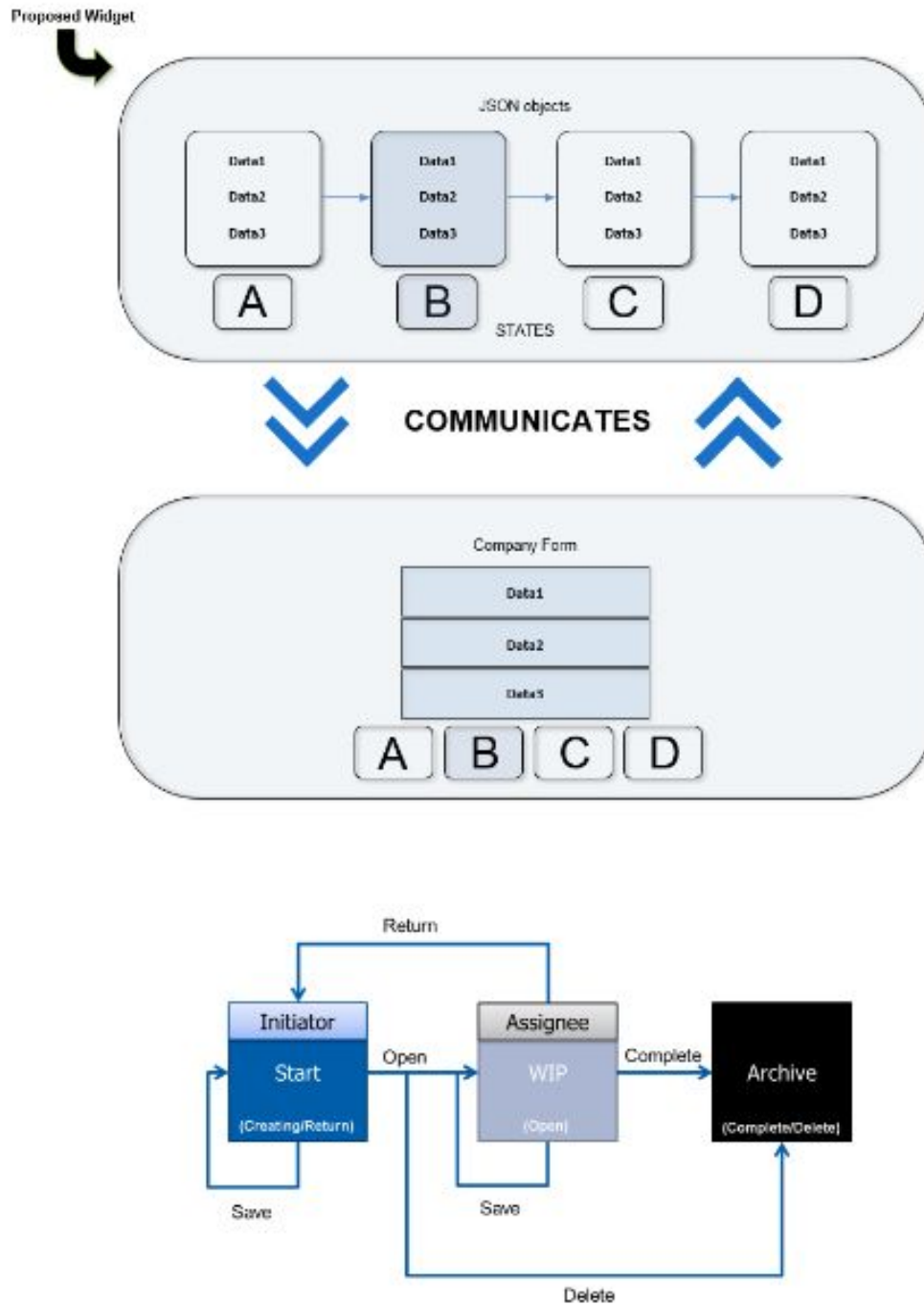
Cost = Elapsed Hours/Standard Hours

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	(blue)	Perfect: Schedule = 0%
0% to 10% of WO open days had RW operations	(green)	Good: 0% < Schedule <= 10%
10% to 20% of WO open days had RW operations	(yellow)	Good: 10% < Schedule <= 20%
More than 20% of WO open days had RW operations	(red)	Bad: Schedule > 20%

Quality   Cost

Sample Part Name
000K000G00   ○○○○ $

Schedule

John Doe

50%

Start

2/4hrs

Max Powers

Not Started

WIP

--/40hrs

Archive
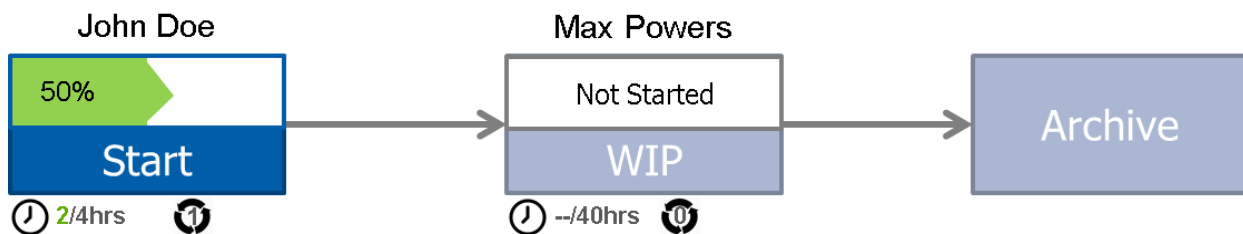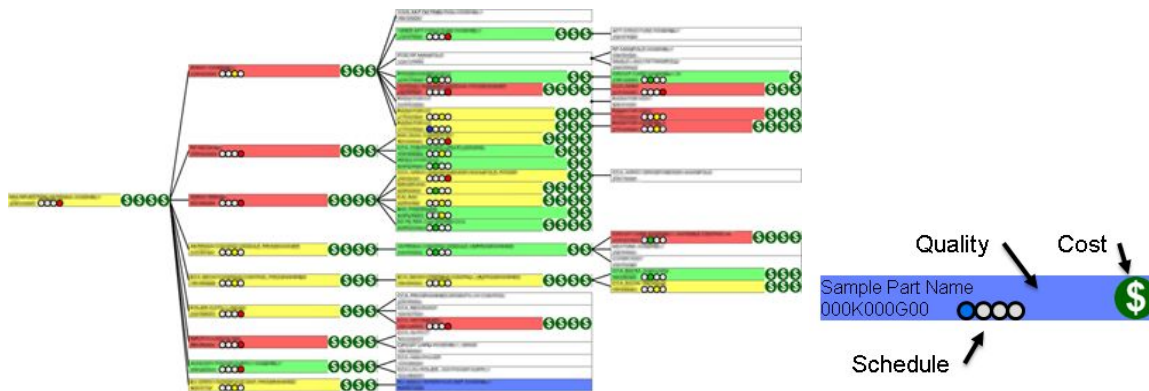
General Requirements

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	Y
Must implement both User and Admin views such that Users are READ-ONLY and Admins may customize available attributes shown	**N**
Must have indicator on parent nodes when child nodes are present	**N**
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	Y
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	Y
Must be well documented	Y
Final Prototype shall run a 16 leaf tree with little fault	Y
Developer User Manuals shall be written in Markdown for ease of transfer to existing company wiki	Y
Deliverables	
Documentation (Manuals), Code and Project Documentation will be submitted by GitHub Repository Access	Y

Vortek Solutions

Initial Project Cost Tracking Chart

Projected Hours vs Actual Hours

■ Projected Total Hours   ■ Actual Total Hours

Projected vs Actual Cost

■ Projected Cost   ■ Actual Cost

Accrued Cost for Phase:

Total Hours:
48 Hours (All Labor)

Labor Fee ($25/hour):
48 hours * 25 = $1,200

Total = $1,200
$1,200/4 team members = $300.00 per member

Accrued Total Cost:

Total Hours:
478 (5h consultation, 473h labor)

Consultation Fee ($35/hour):
5 hours * $35 = $175

Labor Fee ($25/hour):
473 hours * $25/h = $11,825

Total = $11,825 + $175 = $12,000

$12,000/4 team members = $3,000 per member

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

JS Widget

State Configuration

Part Breakdown

Create Test Case

Create Script

Test Script

Create Test Case

Create Script

Test Script
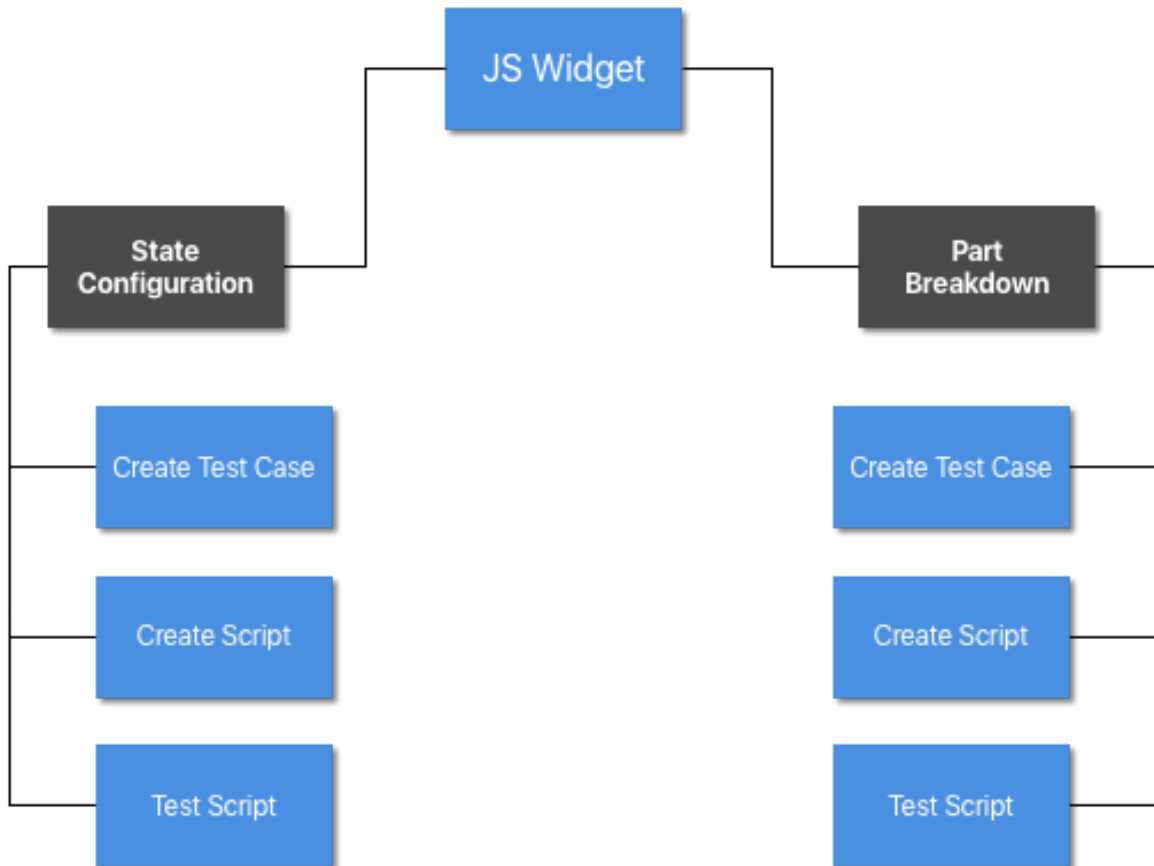
Product Breakdown Structure

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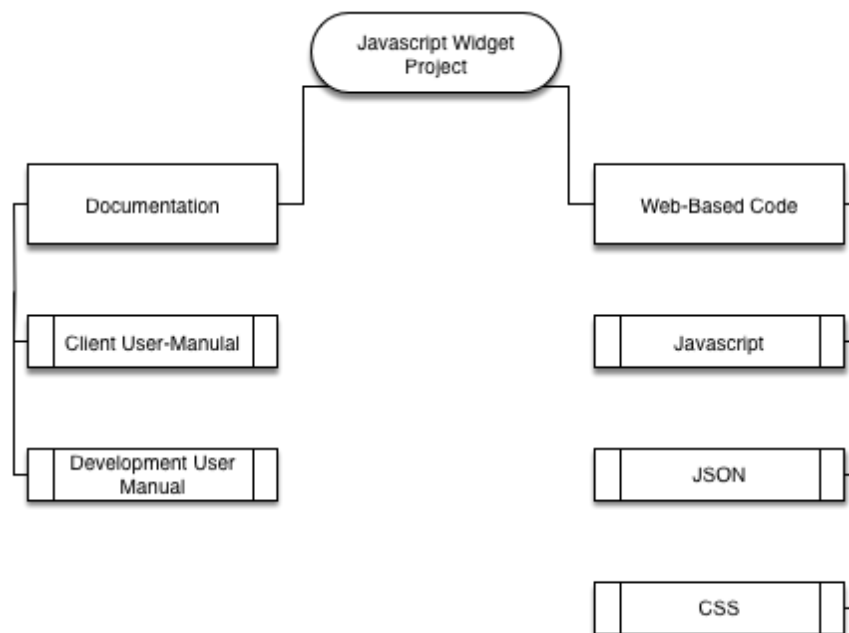
Project Plan

~~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 305 @ 3:05 p.m.
- Final Presentation
- Product Delivery

Statement of the Deliverables

For the final phase, we will be delivering the final product, via GitHub, to Ty Usrey. The deliverables include: The project files, the project documentation / user manuals, and this report.

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

Task	Hours	Bill Rate	Total Cost
Create additional views for widget	20	$25.00	$500.00
Improve functionality of widget	20	$25.00	$500.00
Complete Required Documentation	8	$25.00	$200.00
Total Hours:	48	$25.00	$1,200.00

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 them 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.

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Actual Start
0		Northrop_JS_Widget	81.75 days?	Tue 1/24/17	Wed 5/17/1			Tue 1/24/17
1		Introduction to Course	8.52 days	Tue 1/24/17	Fri 2/3/17			Tue 1/24/17
4		JAD 1	11.75 days	Tue 2/7/17	Wed 2/22/17			Tue 2/7/17
17		JAD 2	10.58 days	Tue 2/21/17	Tue 3/7/17			Tue 2/21/17
18		Meeting	1 day	Tue 2/21/17	Tue 2/21/17			Tue 2/21/17
19		Meeting Agenda	2 hrs	Tue 2/21/17	Tue 2/21/17		Justin Goulet	Tue 2/21/17
20		Have Meeting	1 hr	Wed 2/22/17	Wed 2/22/17		Consultation	Wed 2/22/17
21		Meeting Notes	2 hrs	Thu 2/23/17	Thu 2/23/17		Justin Goulet	Thu 2/23/17
22		Report 2D	8 days	Thu 2/23/17	Tue 3/7/17			Thu 2/23/17
23		Create Report	3 days	Thu 2/23/17	Mon 2/27/17	77,21	Brock Corbett[10%],Chris Larsen[10%],Justin Goulet[10%],Mikal Callahan[10%]	Thu 2/23/17
24		Feedback on Report 2D	40 mins	Tue 2/28/17	Tue 2/28/17	23	Shaun-inn Wu,Vo	Tue 2/28/17
25		Submit Report 2D	1 hr	Tue 3/7/17	Tue 3/7/17	24	Vortek Solutions	Tue 3/7/17
26		Decision Matrix	4 days	Tue 2/21/17	Fri 2/24/17			Tue 2/28/17
27		D3/D4 & Others: Cost/Features	10 hrs	Tue 2/28/17	Wed 3/1/17	24	Vortek Solutions	Tue 2/28/17
28		Live Decision Matrix	4 hrs	Tue 2/28/17	Tue 2/28/17	24	Vortek Solutions	Tue 2/28/17
29		Product Creation	5.58 days	Tue 2/28/17	Tue 3/7/17			Tue 2/28/17
30		Define Requirements	2.75 days	Tue 2/28/17	Wed 3/1/17		Vortek Solutions	Tue 2/28/17
31		Skelaton Product	5 days	Tue 2/28/17	Tue 3/7/17	28	Vortek Solutions	Tue 2/28/17
32		ProtoType 1	31.75 days	Tue 3/14/17	Wed 4/26/17			Tue 3/14/17
33		Meeting	1 day	Tue 3/14/17	Wed 3/15/1			Tue 3/14/17
34		Meeting Agenda	2 hrs	Tue 3/14/17	Tue 3/14/17		Justin Goulet	Tue 3/14/17
35		Have Meeting	1 hr	Wed 3/15/17	Wed 3/15/1	734	Consultation,Shau	Wed 3/15/17
36		Meeting Notes	2 hrs	Wed 3/15/17	Wed 3/15/1	735	Justin Goulet,Vort	Wed 3/15/17
37		Report 3D	3 days	Thu 3/23/17	Fri 3/24/17			Wed 3/22/17
38		Create Report	5 days	Thu 3/23/17	Tue 3/28/17	35	Brock Corbett[10%],Chris Larsen[10%],Justin Goulet[10%],Mikal Callahan[10%]	Thu 3/23/17
39		Feedback on Report 3D	40 mins	Thu 3/30/17	Thu 3/30/17	38	Shaun-inn Wu,Vo	Thu 3/30/17
40		Submit Report 3D	1 hr	Tue 4/4/17	Tue 4/4/17	39	Vortek Solutions	Tue 4/4/17
41		Project	25.75 days	Wed 3/22/17	Wed 4/26/17			Wed 3/22/17
42		Documentation	13 days	Mon 4/3/17	Wed 4/19/17			Mon 4/3/17
43		Updates to current Docs	12 days	Tue 4/4/17	Wed 4/19/1	740	Justin Goulet,Vort	Tue 4/4/17
44		User Manual	12 days	Mon 4/3/17	Mon 4/17/1	728	Justin Goulet	Mon 4/3/17
45		Development	22.75 days	Mon 3/27/17	Wed 4/26/17			Mon 3/27/17
46		Code on Git-Hosted site	2.75 days	Mon 3/27/17	Tue 3/28/17		Brock Corbett,Chr	Mon 3/27/17
47		Admin / User View	4.75 days	Wed 4/5/17	Mon 4/10/17	46	Brock Corbett,Chr	NA
48		Widget works with only name and ID passed	4.75 days	Tue 3/28/17	Tue 4/4/17	46	Brock Corbett,Chris Larsen	Tue 3/28/17
49		Render Projected Workflow steps	7.75 days	Wed 4/5/17	Wed 4/26/17	48	Brock Corbett,Chris Larsen	Wed 4/5/17
50		Render Workflow Info	4.75 days	Tue 4/4/17	Tue 4/11/17	48	Brock Corbett,Chr	Tue 4/4/17
51		Allow workflow's current state to be changed to a different state	4.75 days?	Tue 4/4/17	Tue 4/11/17	50	Brock Corbett,Chris Larsen	NA
52		Render Workflow step linkages	4.75 days	Wed 4/5/17	Mon 4/10/17	50	Brock Corbett,Chris Larsen	Wed 4/5/17

Legend:
Task | Summary | Inactive Milestone | Duration-only | Start-only | External Milestone | Path Predecessor Summary Task | Critical Split
Split | Project Summary | Inactive Summary | Manual Summary Rollup | Finish-only | Deadline | Path Predecessor Normal Task | Progress
Milestone | Inactive Task | Manual Task | Manual Summary | External Tasks | Critical | Path Predecessor Milestone Task | Manual Progress

ID		Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Actual Start
53			Allow additonal state(s) to be added to the workflow	4.75 days?	Tue 4/4/17	Tue 4/11/17	50	Brock Corbett,Chris Larsen	NA
54	✓		Allow widget to be themed with CSS	2.75 days	Tue 4/11/17	Thu 4/13/17	53	Brock Corbett,Chris Larsen	Tue 4/11/17
55			Allow states to be deleted	4.75 days?	Fri 4/7/17	Fri 4/14/17	52	Brock Corbett,Chris Larsen	NA
56	✓		The widget has been tested on IE11+, Edge, and Firefox 45+	2.75 days	Fri 4/14/17	Tue 4/18/17	55	Brock Corbett,Chris Larsen	Fri 4/14/17
57	✓		Widget handles missing information	2.75 days	Fri 4/14/17	Tue 4/18/17	55	Brock Corbett,Chris Larsen	Fri 4/14/17
58	✓		**Design**	**22.25 days**	**Wed 3/22/17**	**Fri 4/21/17**			**Wed 3/22/17**
59	✓		Define Requirements for Design Specs	5 days	Wed 3/22/17	Mon 3/27/17	40	Mikal Callahan	Wed 3/22/17
60	✓		Create Additional Theme (1)	5 days	Fri 4/14/17	Fri 4/21/17	55	Mikal Callahan	Fri 4/14/17
61	✓		**ProtoType 2**	**15 days?**	**Tue 4/4/17**	**Tue 4/25/17**			**Tue 4/4/17**
62	✓		**Meeting**	**1 day**	**Tue 4/4/17**	**Wed 4/5/17**			**Tue 4/4/17**
63	✓		Meeting Agenda	2 hrs	Tue 4/4/17	Tue 4/4/17		Justin Goulet	Tue 4/4/17
64	✓		Have Meeting	8 hrs	Wed 4/5/17	Wed 4/5/17	63	Consultation	Wed 4/5/17
65	✓		Meeting Notes	2 hrs	Wed 4/5/17	Wed 4/5/17	64	Justin Goulet	Wed 4/5/17
66	✓		**Report 4D**	**8 days?**	**Thu 4/13/17**	**Tue 4/25/17**			**Thu 4/13/17**
67	✓		Create Report	4.75 days	Thu 4/13/17	Tue 4/18/17	7	Brock Corbett[10%],Chris Larsen[10%],Justin Goulet[10%],Mikal Callahan[10%]	Thu 4/13/17
68	✓		Feedback on Report 4D	40 mins	Thu 4/20/17	Thu 4/20/17		Shaun-inn Wu,Vortek Solutions	Thu 4/20/17
69	✓		Submit Report 4D	0 hrs	Tue 4/25/17	Tue 4/25/17		Vortek Solutions	Tue 4/25/17
70			**Final Report**	**30.75 days**	**Wed 4/5/17**	**Wed 5/17/17**		**Justin Goulet**	**Wed 4/5/17**
71	✓		**Development**	**2 days**	**Fri 4/28/17**	**Mon 5/1/17**			**Fri 4/28/17**
72	✓		Convert Font-Awesome Style to CSS	1 day	Fri 4/28/17	Fri 4/28/17		Mikal Callahan	Fri 4/28/17
73	✓		Add Comments to JS	1 day	Sat 4/29/17	Mon 5/1/17	72	Chris Larsen,Mikal	Sat 4/29/17
74	✓		Convert Images to SVG	1 day	Sat 4/29/17	Mon 5/1/17	72	Chris Larsen	Sat 4/29/17
75			**Report**	**29.75 days**	**Wed 4/5/17**	**Tue 5/16/17**		**Consultation,Shau**	**Wed 4/5/17**
76	✓		Final Report Paper	30.25 days	Wed 4/5/17	Tue 5/16/17		Vortek Solutions	Wed 4/5/17
77			Submit Report	0 days	Tue 5/16/17	Tue 5/16/17	76	Vortek Solutions	Tue 5/16/17
78			**Presentation**	**1.75 days**	**Tue 5/16/17**	**Wed 5/17/17**		**Brock Corbett[10**	**Tue 5/16/17**
79	✓		Presentation Coaching	0.37 days	Tue 5/16/17	Wed 5/17/17	76	Shaun-inn Wu,Vo	Tue 5/16/17
80			Present	0.25 days	Tue 5/16/17	Wed 5/17/17	76	Vortek Solutions	Tue 5/16/17

Project: Northrop_JS_Widget
Date: Mon 5/15/17

Task		Summary		Inactive Milestone	Duration-only	Start-only
Split		Project Summary		Inactive Summary	Manual Summary Rollup	Finish-only
Milestone		Inactive Task		Manual Task	Manual Summary	External Tasks

External Milestone	Path Predecessor Summary Task	Critical Split	
Deadline	Path Predecessor Normal Task	Progress	
Path Predecessor Milestone Task	Critical	Manual Progress	