



**TSP**  
The Solid Project

**Crystele Dierickx**

**Henry Vu**

**Matthew Affa**

**Victor Zavala**

**Report #2**

**Client: Northrop Grumman**

**California State University San Marcos**

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## EXECUTIVE COMMUNICATION

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

Dear Mr. Usrey,

Thank you for meeting with us a second time on February 19th. Since our last meeting, we have made the appropriate revisions to our previous report. Phase II concludes an updated project requirement list, documentation of the project's projected man hours, and an updated list of tasks and deliverables. During this phase of the project, we have set up a team GitHub repository, revised our project documentation, and successfully compiled and executed last years code. We also met with a team member from Vortek Solutions and discussed technical specifics regarding the code. Our goal for Phase III is to implement administrator mode to the workflow widget.

So far, our project has accrued an approximate cost of \$4,031 with an estimated completion cost of \$14,790.

If you have any questions or concerns regarding the project, please do not hesitate to contact us via email or Slack. We are very excited to work with you and look forward to our next meeting where we will present our prototype.

Sincerely,




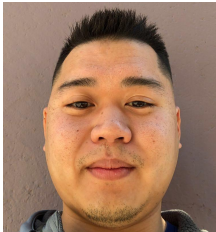

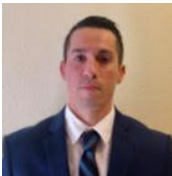
Matthew Affa  
Project Lead  
Solid Project [CSUSM@gmail.com](mailto:CSUSM@gmail.com)

### Stakeholder Approval

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

Client Signature: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

## Team Summary

DEVELOPERS	SUMMARY & SKILLS
 <p><b>Crystele Dierickx</b> Project Manager Developer</p>	<p>I am a senior at Cal State University of San Marcos pursuing a Bachelor's of Science in Computer Information Systems with an interest in Cybersecurity. I currently work for a software firm that uses artificial intelligence, algorithmic science, and machine learning for endpoint security. The Project Management and Coordinating skills I acquired during my internship and current employer will help me manage our project as well as develop.</p>
 <p><b>Henry Vu</b> Software Developer</p>	<p>Senior pursuing a Bachelor's of Science in Computer Information System at Cal State San Marcos. Worked for Asus Computers as a Computer Technician before being promoted to Data Analyst. I moved to Murrieta after transferring to CSUSM. Previously interned for a startup doing quality assurance.</p>
 <p><b>Matthew Affa</b> Project Lead / Developer</p>	<p>Graduating senior at Cal State San Marcos with a Bachelor's of Science in Computer Information Systems with a minor in Business. I am currently employed at a FinTech company called AppTech in Carlsbad that specializes in Payment and Information technology.</p>
 <p><b>Victor Zavala</b> Software Developer</p>	<p>I am a senior student at California State University San Marcos pursuing a Bachelor's degree in Computer Science with a concentration in Information Systems, which I anticipate earning in May of 2018. I am currently working part-time at Fabian Leadership Resources as a full stack web developer.</p>

## Team Norms and Expectations

- Be professional, responsible and punctual.
- All team members are expected to be present at all team meetings.
- Business casual for all meetings with customer.
- Be respectful, honest, and open about team members' issues and concerns.
- Encourage response and feedback.
- Critical decision making should be made by majority vote.
- Clearly articulate the desired outcome.
- Clearly identify constraints and boundaries.
- All costs associated with the project will be split evenly among team members.
- General communication will be made through Slack.
- All tasks are scheduled and managed through Trello.
- All work must be uploaded to Github.
- All work submitted must be on time and has to meet high quality standards.

## Application Development

### Business Context:

Northrop Grumman is an American global aerospace and defense technology company. They develop integrated Communications, Navigation and Identification systems for tactical aircraft, covert communications and tactical radio systems for the Department of Defense and other national security clients. Their product development involves mechanical, electrical, software, and engineering.

### Business Problem:

Northrop Grumman works on multiple projects that vary in size across multiple organizations. As they continue to grow, leaders are required to manage more projects and more people. The company currently uses homegrown workflow applications and data management solutions to manage their processes and need a software solution for collecting, analyzing, controlling data. Northrop Grumman would like to standardize their workflow and bring more interactive visualizations to increase tool efficiency while maintaining the best user experience for workflow, layout, and scheduling ( Gantt).

### Project Proposal:

We propose a Web-based workflow visualization tool using a widget. This widget will be styled using CSS and have the functionalities that include adding multiple workflow objects, altering / adding workflow status , and displaying capabilities within Northrop Grumman’s supported browsers.

## Statement of Deliverables

- Working widget will be able to take in JSON information and display it in a workflow diagram.
- Widget will be dynamic so user can add (including insert), remove, edit and update existing workflow states.
- Workflow widget will have new features such as admin mode, zoom, node collapse/expansion, and have a new theme with custom options.
- Second working widget will display a visual representation of the Northrop Grumman manufacturing shop floor.
- Will work on IE11+, Firefox 45+, and on Edge.
- Documentation
- Source Code

## What form or medium will your deliveries be in:

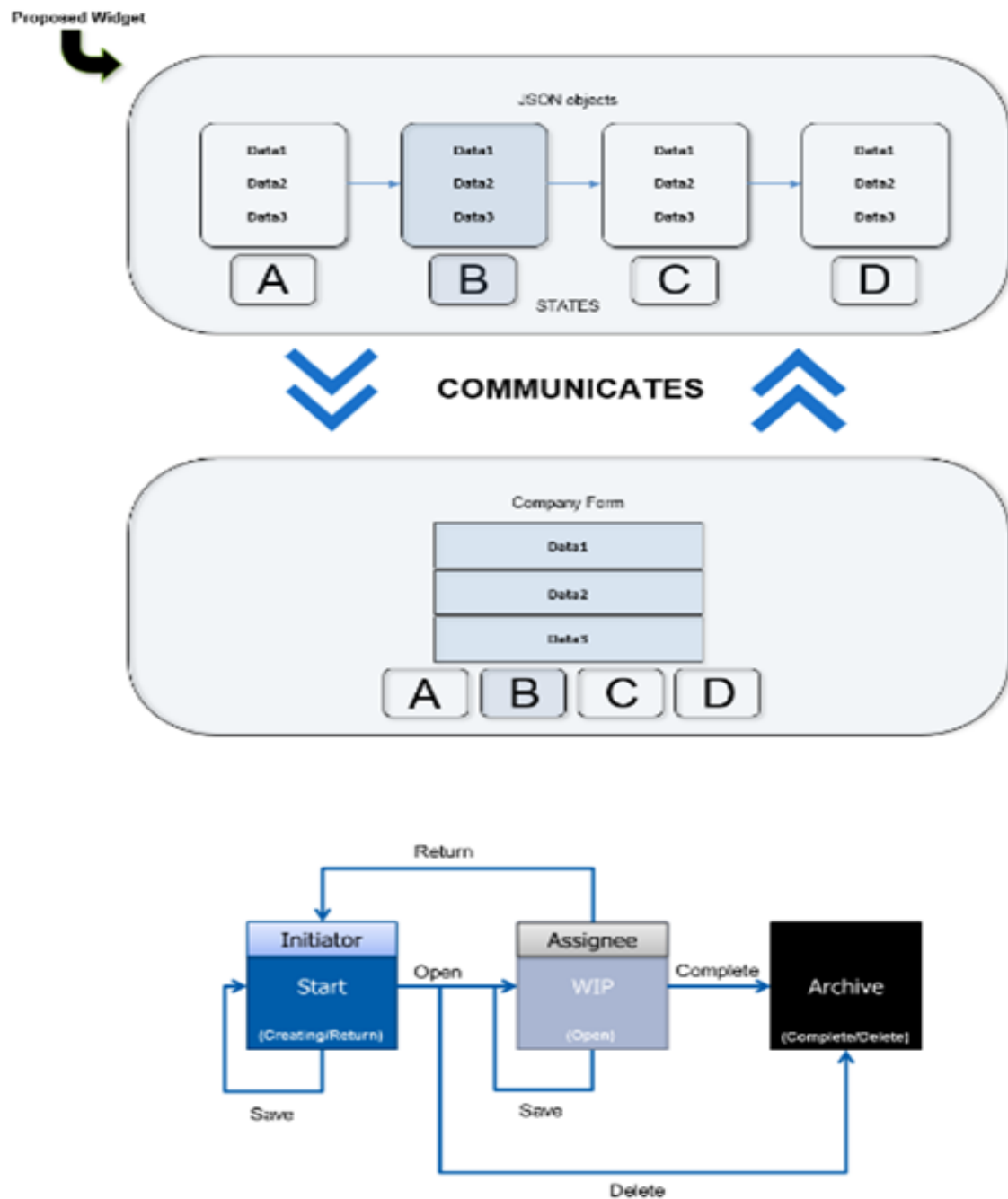
Executable source code customer can run on their local machine via web browser (IE+11, Firefox 45+, and Edge)

## Project Measures of Success Outline

<u>Phase</u>	<u>Details</u>
1	<ul style="list-style-type: none"> <li>● Hold JAD1 meeting on site at. 2/8/18               <ul style="list-style-type: none"> <li>○ Discuss communication method.</li> <li>○ Discuss the customer’s problem.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ Define project scope and requirements.</li> <li>○ Request source code from previous group.</li> <li>● Set up tools for project. <ul style="list-style-type: none"> <li>○ Slack for communication.</li> <li>○ Google Drive for documentation.</li> <li>○ Trello for task management.</li> <li>○ Github for development platform.</li> </ul> </li> </ul>
2	<ul style="list-style-type: none"> <li>● Research &amp; Review Vortek Solutions documents and source code.</li> <li>● Hold JAD2 meeting on site. <ul style="list-style-type: none"> <li>○ Discuss issues and concerns.</li> <li>○ Confirm project requirements.</li> <li>○ Review Report 1.</li> </ul> </li> <li>● Finalize Report 1.</li> </ul>
3	<ul style="list-style-type: none"> <li>● Download and Run Vortek Solutions source code</li> <li>● Implement Admin Interface Prototype.</li> <li>● Finalize Report 2. <ul style="list-style-type: none"> <li>○ Hold Prototype 1 meeting on site.</li> <li>○ Present admin interface prototype.</li> <li>○ Get feedback.</li> <li>○ Discuss briefly next phase of the project.</li> </ul> </li> <li>● Make changes to admin interface prototype if needed.</li> </ul>
4	<ul style="list-style-type: none"> <li>● Implement different themes for workflow diagram.</li> <li>● Finalize Report 3.</li> <li>● Hold Prototype 2 meeting on site. <ul style="list-style-type: none"> <li>○ Present themes for workflow diagram prototype.</li> <li>○ Get feedback.</li> <li>○ Discuss briefly next phase of the project.</li> </ul> </li> <li>● Make changes to workflow diagram prototype if needed.</li> </ul>
5	<ul style="list-style-type: none"> <li>● Implement shop floor visualization.</li> <li>● Thorough testing of all functionalities.</li> <li>● Finalize Report 4.</li> <li>● Present final product.</li> </ul>

## Visual Representation



## Requirements Matrix

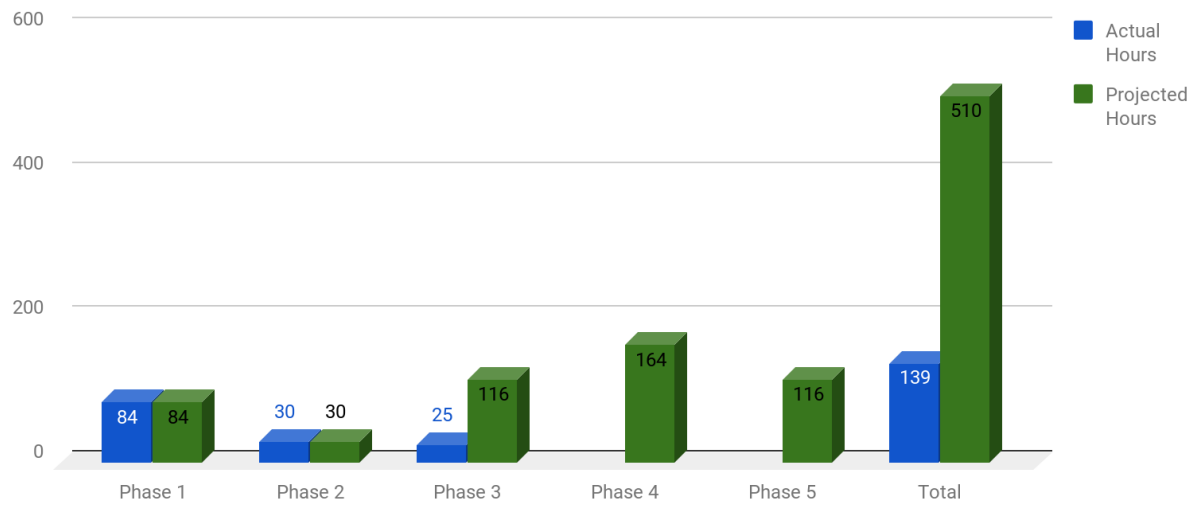


Requirement #	Requirement Description	Task ID	Implemented (Yes/No)
<b>R1</b>	Widgets will run on IE 11+.	49	YES
<b>R2</b>	Widgets will run on Firefox 45+.	49	YES
<b>R3</b>	Widgets will run on Edge.	49	YES
<b>R4</b>	Workflow widget will receive JSON data from source, including incomplete data. Must save in the same format as received.	49	YES
<b>R5</b>	Widget will render data in a workflow diagram.	49	YES
<b>R6</b>	Workflow widget will be interactive to the browser.	62	NO
<b>R7</b>	Widget will display a shop floor visualization.	65	NO
<b>R8</b>	Workflow widget will self contain D3 object.	49	NO
<b>R9</b>	Workflow widget theme can be styled with CSS.	52	NO
<b>R10</b>	Workflow widget will have an admin mode (edit, insert node, add branch)	40	NO
<b>R11</b>	Workflow widget will have zoom feature	54	NO
<b>R12</b>	Workflow widget will have node collapse/expand feature	53	NO

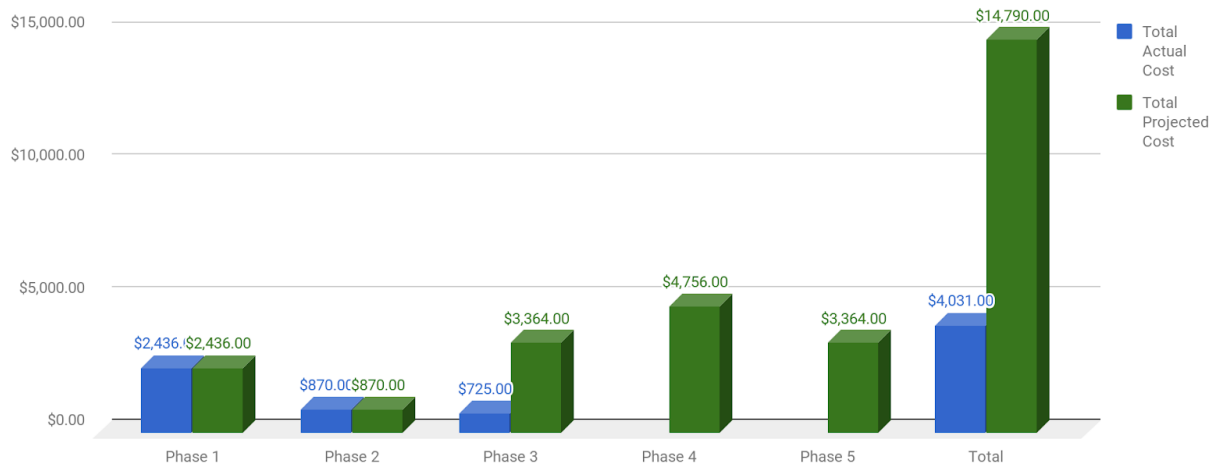
## Project Management

## Initial Project Cost Tracking Chart

Actual & Projected Hours



Actual & Projected Cost



## Schedule for Tasks

ID	TASK NAME	DURATION	START	FINISH	TEAM MEMBER	% COMPLETED
1	<b>Phase 1</b>					
2	Design business logo & prepare business cards/ name tags	2	2/2/2018	2/3/2018	Crystele	100.00%
3	Finalize business cards	1	2/5/2018	2/5/2018	Crystele	100.00%
4	Purchase Avery Printable Template Paper for business cards, name tags, and name tag badges	2	2/6/2018	2/6/2018	Crystele, Henry	100.00%
5	Print business cards & name tags	0.5	2/7/2018	2/7/2018	Crystele	100.00%
6	Collect photos of each team member	0.5	2/6/2018	2/6/2018	Crystele	100.00%
7	Define and appoint team roles to each team member	2	2/1/2018	2/1/2018	All	100.00%
8	Obtain Project Management Software & Create Trello Board	1	2/1/2018	2/1/2018	Crystele	100.00%
9	Download MS Project from CSUSM apps	4	2/1/2018	2/1/2018	All	100.00%
10	Define mission & scope	4	2/5/2018	2/7/2018	All	100.00%
11	Draft possible company mission statement,objective, and team norms	8	2/5/2018	2/7/2018	All	100.00%
12	Schedule Initial meeting to obtain user requirements	1	2/6/2018	2/6/2018	Matt	100.00%
13	Documentation: Prepare JAD1 Meeting Agenda	2	2/6/2018	2/6/2018	Crystele	100.00%
14	JAD1: Think of specific questions for Client	8	2/6/2018	2/7/2018	All	100.00%
15	Meet with Client and Dr. Wu for JAD1	4	2/8/2018	2/8/2018	All	100.00%
16	Finalize JAD1 Agenda Meeting Notes and Email JAD1 Agenda to Client & Dr. Wu	2	2/8/2018	2/8/2018	Matt, Crystele	100.00%
17	Obtain Vortek Solution Source Code & GitHub information and Upload to Team GitHub	2	2/13/2018	2/13/2018	Matt	100.00%
18	Set-Up Slack Communication & Give Team Members Access	1	2/1/2018	2/1/2018	Crystele	100.00%
19	Set-Up Google Drive & Give Team Members Access	1	2/1/2018	2/1/2018	Crystele	100.00%
20	Set-Up & Each Team member has access to the Trello Board to Manage Project	1	2/1/2018	2/1/2018	Crystele	100.00%
21	Set-Up GitHub for Development Platform	1	2/1/2018	2/1/2018	Henry	100.00%
22	Review & Research technologies used in previous project	12	2/13/2018	2/18/2018	All	100.00%
23	Documentation: Prepare & Draft Report 1	12	2/8/2018	2/13/2018	All	100.00%
24	Meeting with Dr. Wu regarding JAD1 Meeting & Report 1 Draft	4	2/15/2018	2/15/2018	All	100.00%
25	Make Corrections to Report 1	8	2/15/2018	2/20/2018	All	100.00%
26	<b>Phase 2</b>					
27	Research and Review Vortek Solutions Documentation and Source Code	12	2/15/2018	2/20/2018	All	100.00%
28	Organize Trello board w/ due dates, documentation requirements, assigning task cards, etc	2	2/1/2018	5/15/2018	Crystele	100.00%
29	Schedule JAD2 meeting on-site	1	2/15/2018	2/15/2018	Matt	100.00%
30	Documentation : Draft JAD2 Meeting Agenda	4	2/17/2018	2/18/2018	Matt, Crystele	100.00%
31	JAD2: Think of specific questions for Client	1	2/16/2018	2/18/2018	All	100.00%
32	Meet with Client and Dr. Wu for JAD2	4	2/19/2018	2/19/2018	All	100.00%
33	Finalize JAD2 Agenda Meeting notes and Email JAD2 Agenda to Client & Dr. Wu	2	2/19/2018	2/19/2018	Matt, Crystele	100.00%
34	Finalize Report 1 Corrections	4	2/15/2018	2/19/2018	All	100.00%
35	<b>Phase 3</b>					100.00%
36	Download and Run Vortek Solutions source code	3	2/23/2018	2/25/2018	Henry,Matt,Victor	100.00%
37	Meeting with Broc from Vortek Solutions to obtain a better understanding of previous project	4	2/22/2018	2/22/2018	All	100.00%
38	Download all dependencies for source code	1	2/23/2018	2/25/2018	All	100.00%
39	Document any errors and successes in running source code	1	2/23/2018	2/25/2018	All	100.00%
40	Implement Admin Interface Prototype and document any roadblocks,errors, and successes	36	2/26/2018	3/13/2018	All	
41	Changes/Edit Admin Interface Prototype	16	2/26/2018	3/13/2018	All	
42	Documentation: Prepare & Draft Report 2	16	2/23/2018	2/26/2018	All	100.00%
43	Meeting with Dr. Wu regarding JAD2 Meeting & Report 2 Draft	4	3/1/2018	3/1/2018	All	
44	Make corrections to Report 2	8	3/2/2018	3/5/2018	All	
45	Finalize Report 2	4	3/6/2018	3/6/2018	All	
46	Schedule & Confirm manufacturing tour with client	1	2/26/2018	2/26/2018	Matt, Crystele	
47	Schedule & Confirm Prototype I meeting	1	2/26/2018	2/26/2018	Matt, Crystele	
48	Documentation: Prepare & Draft Prototype I Meeting Agenda	16	3/10/2018	3/11/2018	All	
49	Meet with Client and Dr. Wu for Prototype I	4	3/13/2018	3/15/2018	All	

50	Finalize Prototype I Meeting Agenda Notes and Email Meeting Agenda to Client & Dr. Wu	1	3/13/2018	3/15/2018	Matt, Crystele	
51	<b>Phase 4</b>					
52	Implement different themes for workflow diagram	36	3/16/2018	3/24/2018	All	
53	Implement node collapse/expansion feature	36	3/24/2018	3/29/2018	All	
54	Implement zoom feature	36	3/29/2018	4/3/2018	All	
55	Changes/Edit workflow diagram prototype if needed	16	4/3/2018	4/8/2018	All	
56	Documentation: Prepare & Draft Report 3	16	3/15/2018	3/26/2018	All	
57	Meeting with Dr. Wu regarding Prototype I Meeting and Report 3 Draft Corrections	4	3/29/2018	3/29/2018	All	
58	Make Corrections to Report 3	8	3/29/2018	4/2/2018	All	
59	Finalize Report 3	4	4/2/2018	4/2/2018	All	
60	Schedule & Confirm Prototype II meeting	1	4/3/2018	4/5/2018	Matt, Crystele	
61	Documentation: Prepare & draft Prototype II Meeting Agenda	2	4/7/2018	4/8/2018	Matt, Crystele	
62	Meet with Client and Dr. Wu for Prototype II	4	4/10/2018	4/12/2018	All	
63	Finalize Prototype II Meeting Agenda Notes and Email Meeting Agenda to Client & Dr. Wu	1	4/10/2018	4/12/2018	Matt, Crystele	
64	<b>Phase 5</b>					
65	Implement shop floor visualization	40	4/13/2018	4/20/2018	All	
66	Quality Assurance / Testing Widget	16	4/20/2018	4/23/2018	All	
67	Documentation: Prepare & Draft Report 4	16	4/16/18	4/19/2018	All	
68	Meeting with Dr.Wu regarding Prototype II Meeting Agenda & Report 4 Draft Corrections	4	4/19/2018	4/19/2018	All	
69	Make Corrections to Report 4	8	4/20/2018	4/22/2018	All	
70	Finalize Report 4	4	4/23/2018	4/23/2018	All	
71	Prepare / Draft Final Product Presentation	16	4/26/2018	5/8/2018	All	
72	Change/Edit Final Product Presentation	8	5/9/2018	5/9/2018	All	
73	Present Final Product	4	5/15/2018	5/15/2018	All	
*Durations are in hrs						

## Deliverables

Deliverables	Dates
<b>Report 1</b>	<b>2/20/2018</b>
<b>Report 2</b>	<b>3/6/2018</b>
<b>Prototype 1</b>	<b>3/15/2018</b>
<b>Report 3</b>	<b>4/3/2018</b>
<b>Prototype 2</b>	<b>4/12/2018</b>
<b>Report 4</b>	<b>4/24/2018</b>
<b>Other Deliverables:</b> <ol style="list-style-type: none"> <li><b>SRS</b></li> <li><b>Documented Code</b></li> <li><b>User Documentation</b></li> <li><b>Working Examples</b></li> </ol>	

## Outline of Resources

What resources we will need from Northrop Grumman:

- They have provided us with the following material:
  1. Vortek Solutions Source Code
  2. Project Presentation
- Timely feedback on requirements clarification and approval.
- Northrop Grumman will not provide us with access to their network and production data.

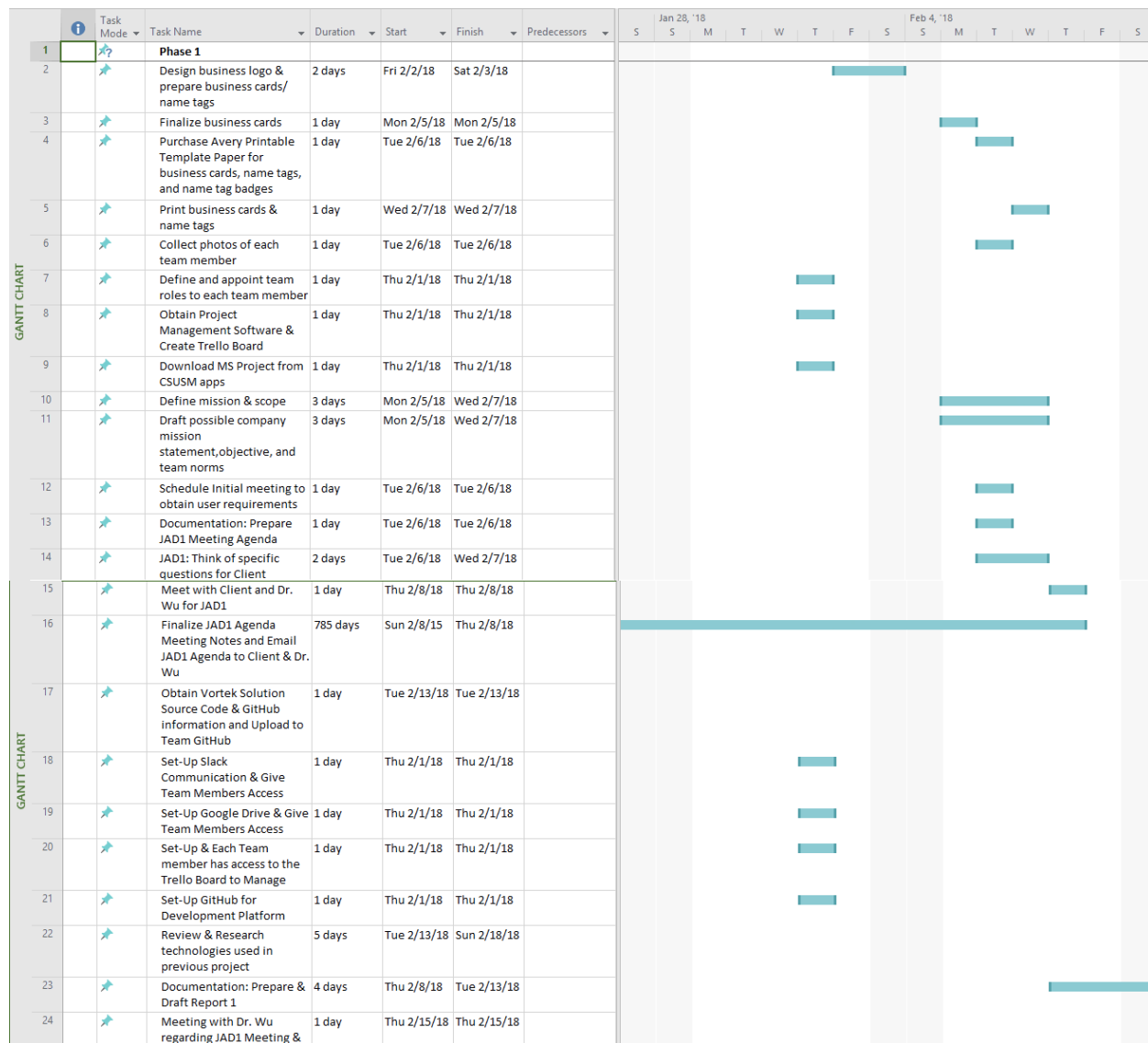
What resources we need from the Instructor:

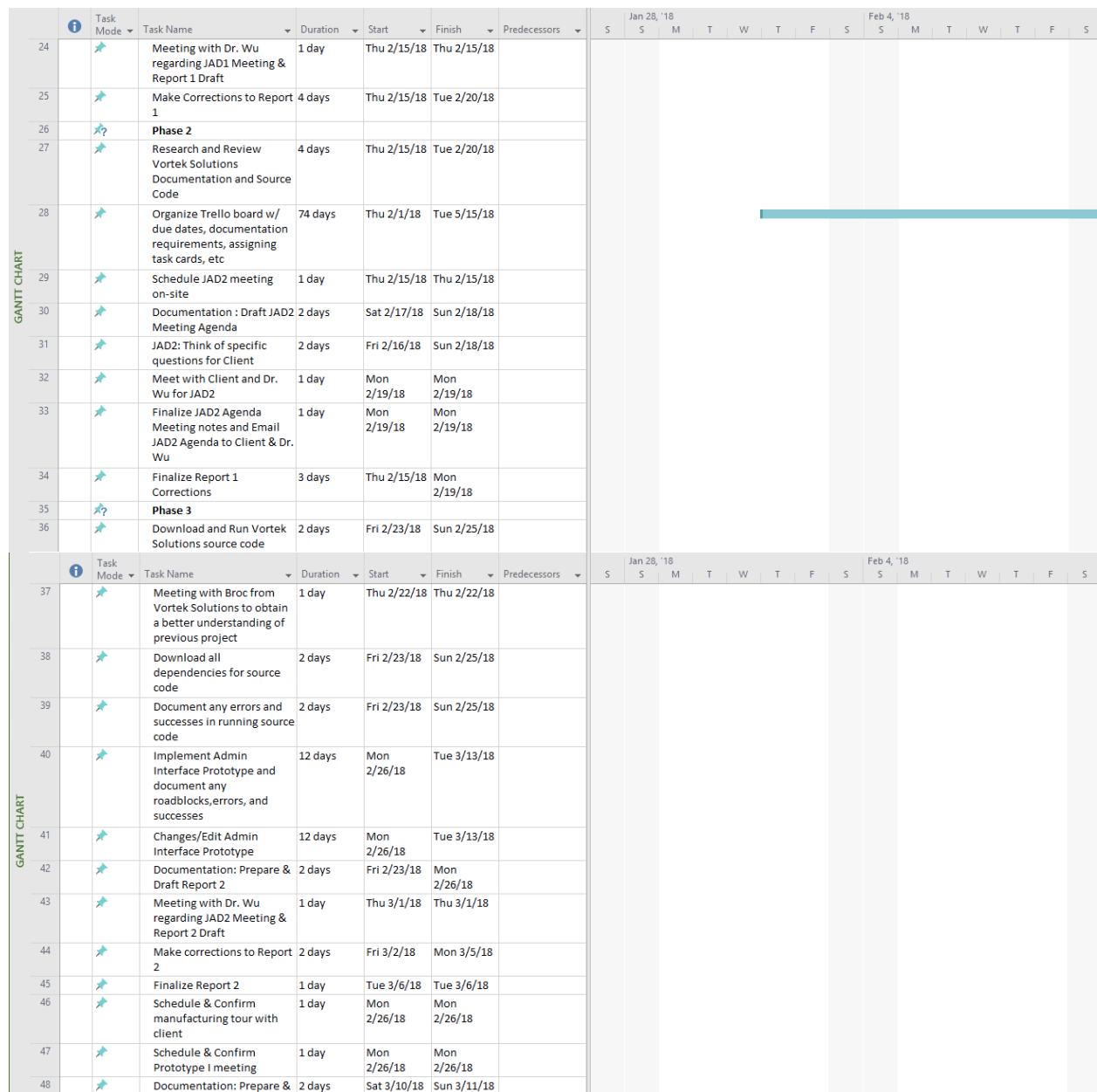
- The instructor needs to give us access to a group server for database, development, and testing.
- Timely response on questions regarding project and guidance.

What resources will TSP: The Solid Project supply:

- Open source software that is needed for development and research purposes
- Github Repository
- Testing environment to show the widget in production
- All research and developed material will be given to Northrop Grumman

## Gantt Chart of Major Phases





							Jan 28, '18							Feb 4, '18							
							S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
GANIT CHART	49		Task Mode ▾	Task Name	Duration ▾	Start ▾	Finish ▾														
				Meet with Client and Dr. Wu for Prototype I	3 days	Tue 3/13/18	Thu 3/15/18														
	50			Finalize Prototype I Meeting Agenda Notes and Email Meeting Agenda to Client & Dr. Wu	3 days	Tue 3/13/18	Thu 3/15/18														
	51			Phase 4																	
	52			Implement different themes for workflow diagram	7 days	Fri 3/16/18	Sat 3/24/18														
	53			Implement node collapse/expansion feature	5 days	Sat 3/24/18	Thu 3/29/18														
	54			Implement zoom feature	4 days	Thu 3/29/18	Tue 4/3/18														
	55			Changes/Edit workflow diagram prototype if needed	5 days	Tue 4/3/18	Sun 4/8/18														
	56			Documentation: Prepare & Draft Report 3	8 days	Thu 3/15/18	Mon 3/26/18														
	57			Meeting with Dr. Wu regarding Prototype I Meeting and Report 3 Draft Corrections	1 day	Thu 3/29/18	Thu 3/29/18														
	58			Make Corrections to Report 3	3 days	Thu 3/29/18	Mon 4/2/18														
59			Finalize Report 3	1 day	Mon 4/2/18	Mon 4/2/18															
60			Schedule & Confirm Prototype II meeting	3 days	Tue 4/3/18	Thu 4/5/18															
61			Documentation: Prepare & Draft Prototype II Meeting Agenda	2 days	Sat 4/7/18	Sun 4/8/18															
GANIT CHART			Task Mode ▾	Task Name ▾	Duration ▾	Start ▾	Finish ▾														
	62			Meet with Client and Dr. Wu for Prototype II	3 days	Tue 4/10/18	Thu 4/12/18														
	63			Finalize Prototype II Meeting Agenda Notes and Email Meeting Agenda to Client & Dr. Wu	3 days	Tue 4/10/18	Thu 4/12/18														
	64			Phase 5																	
	65			Implement shop floor visualization	6 days	Fri 4/13/18	Fri 4/20/18														
	66			Quality Assurance / Testing Widget	2 days	Fri 4/20/18	Mon 4/23/18														
	67			Documentation: Prepare & Draft Report 4	4 days	Mon 4/16/18	Thu 4/19/18														
	68			Meeting with Dr. Wu regarding Prototype II Meeting Agenda & Report 4 Draft Corrections	1 day	Thu 4/19/18	Thu 4/19/18														
	69			Make Corrections to Report 4	2 days	Fri 4/20/18	Sun 4/22/18														
	70			Finalize Report 4	1 day	Mon 4/23/18	Mon 4/23/18														
	71			Prepare / Draft Final Product Presentation	9 days	Thu 4/26/18	Tue 5/8/18														
	72			Change/Edit Final Product Presentation	1 day	Wed 5/9/18	Wed 5/9/18														
	73			Present Final Product	1 day	Tue 5/15/18	Tue 5/15/18														