
EE/CprE/SE 491 WEEKLY REPORT 4

Due: 3/25/2025

Group number: sddec25-17

Project title: Grid-UI: Developing Advanced Web-Interactive Interfaces for GridAI Power Grid Management Software

Client &/Advisor: Gelli Ravikumar

Team Members__Role/Component:

- | | | |
|---------------------------|-------|---|
| ● Nick McCullough | _____ | Team Manager / Map Box |
| ● Ponciano Ramirez | _____ | Dashboard/Widgets Designer |
| ● Ethan Messmer | _____ | Module Design/Market Dashboard |
| ● Yusef Harb | _____ | Record Keeper/Live Code Editor |
| ● Evan Sivets | _____ | Test Lead / SVG-Diagram Designer |
| ● Tristan Nono | _____ | Dashboard/Widgets Designer |
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Weekly Summary

This week, we met with Dr. Gelli and gained access to the codebase. Nick met with Peeyush and Rolf to gain a more thorough understanding of Map Box. Ethan contacted Justin to better understand the timeline for the Market Dashboard. Ponciano met with Jesus and reviewed possible features to add to the Dashboard/Widgets component. Tristan looked at the current state of the Widgets and planned out features that weren't in there so he could better understand what to work on. Yusef went through previous reports, identified key libraries used in the code editor component, and contacted Peeyush to meet to discuss the component. Evan took a deeper dive into SVGs to strengthen his knowledge of the topic and understand what is needed for the project.

Pending issues

- None currently

Accomplishments/Contributions

Past week accomplishments

- **Nick McCullough:** Met with Peeyush and Rolf, with Dr. Gelli, for a 1.5 hour meeting, gained a deeper understanding of Map Box tech stack, methodologies and components. Learned about IndexedDB (Dexie) which will fetch data from the backend and use the User's CPU hardware for responsiveness to allow for real-time energy data for each node and scrubbing the timeline of historical data. Learned about DeckGL which is used for the nodes/lines/components of the system and React MapGL is used for the map visual only. Learned about NextJS, typescript files, contexts for each component and using Mantine UI for interface development.
- **Ponciano Ramirez:** Met with Jesus to gain a better understanding of what are some possible features that I can implement in the Dashboard/Widgets component. I also emailed Peeyush to set up a meeting to discuss more about the component and what are some possible features to add from his perspective.
- **Ethan Messmer:** Read partially through the US integration of wholesale electricity as well as the UK-AU 2022 report on the subject to get a better understanding of the market. I emailed Justin from 492 to gain a better understanding of the timeline and what will be left for me to develop after he is finished. Made close to a complete markup of a potential DSO market dashboard UI to practice Figma further. I also gained access to the previous team's Figma board to see more of what they have developed in terms of component design and UI.
- **Yusef Harb:** Went through the previous teams reports and found key technologies used in the live code editor. Researched the following technologies that are used: Socket.io, Monaco editor, and React Mosaic.Socket.io is used for the live communication between users, Monaco editor is a web-based vscode, and react mosaic is a tile window manager. All these are key in setting up a code editing environment with live communication ability. Also prepared questions for adviser meetings regarding these components and their uses. Emailed Peeyush to set up a meeting for a more detailed roadmap for the component.
- **Evan Sivets:** Researched real-world use of single-line diagrams in the workplace. Have the diagrams broken down by an Electrical Engineer on how they are integrated.
- **Tristan Nono:** Familiarized myself again with TypeScript and Firebase and started planning out certain features for the widgets that can be added to the project.

Individual contributions

<u>NAME</u>	<u>Contributions</u>	<u>Weekly hrs</u>	<u>HOURS cumulative</u>
Nick McCullough	Met with Peeyush, Rolf, Dr. Gelli 1.5 hours and researched the Map Box component tech stack.	4	20
Ponciano Ramirez	Met with Jesus again to gain more insight into what possible features to add to Dashboard and Widgets Component. Decided on a few to possibly implement during the semester	3	19
Ethan Messmer	I got close to finishing the readings Dr. Gelli provided and reviewed the previous team's Figma markups. I also worked on Figma markups of my own to practice the overall feel that the previous team has elected to go for.	5	23
Yusef Harb	Reviewed all reports from the previous team, taking notes of key technologies used. Made note of challenges Franck faced and any research he did. Contacted Peeyush to schedule a meeting.	3	19
Evan Sivets	Planned on meeting up with 492 individuals to further grow understanding on SVGs and how to contribute that to our project.	3	19
Tristan Nono	Planned out various features for the widgets that weren't added in the application that can improve the quality of the application to get a better understanding on what I'm gonna be working on.	5	16

Plans for the upcoming week

- **Nick McCullough**
 - Further review Map Box code to see how the components work on each page such as the contexts on the left and right side of the Map Box, and think of ways to add a timeline below the Map Box using [MantineUI](#) and JavaScript/CSS.
 - Research [DeckGL](#) on my idea of a 3D elevation of energy usage per node, which Peeyush is open to and is allowing me to experiment with.
 - Review and practice how [DexieJS](#) works with IndexedDB for the responsiveness requirement of data flow for the nodes/energy system.
 - Going to prioritize functionality/responsiveness learning over visuals for the time being, as I want to ensure the code works and is fluid, before improving visuals.

- **Ponciano Ramirez**
 - Look over the codebase given to us and get a better understanding of how the dashboard and widgets component will be working
 - Setup a meeting with Peeyush/Rolf to understand more about how the backend is structured and how the frontend pulls data
 - Start to setup environment so that I am able to run code and start to work on some possible features
- **Ethan Messmer**
 - Read more about market standards such as the [FERC order 2222](#)
 - Analyze the previous team's Figma further
 - Make a Figma markup for the DERA market dashboard
 - Dive into the codebase if we receive it, analyzing all the files related to the market dashboard component.
 - Get further clarification on Justin's timeline in order to make sure we aren't both working on the same thing.
 - Look into MantineUI and React
- **Yusef Harb**
 - If we receive the codebase, review all files related to the component, take notes, and prepare questions
 - Meet with Peeyush to get a clear timeline of where the component is at currently and the roadmap for completion
 - Experiment and familiarize self with React Mosaic, Monaco editor, and Socket.io (Key libraries used in code editor component).
- **Evan Sivets**
 - Meet with Skyler on SVGs, and understand more on what I can be doing with them
 - Look over more examples of how to use SVGs in the workplace and how i could use that for the project
 - Practice working on SVGs(ex. make one from an example), break them down and put back together
- **Tristan Nono**
 - Understand the codebase to get a feel and understanding of how the widgets work.
 - Play around with the application code and understand how everything works and interacts with each other.
 - Meet with Peeyush to gain a deeper understanding of the widgets component, how to set up API calls, and know how much will be left to work on so that I can know where to start.
 - Learn more about the other APIs and tools that I will be utilizing such as ThingsBoard Developer and Mantine UI.

Summary of weekly advisor meeting

Week 6 Notes 3/14

- Repository has been provided; be sure to look through it
- Still awaiting individual VMs
- To access VMs, go to <https://git.ece.iastate.edu/sd/sddec25-17>
- Editor access to Firestore and individual accounts coming soon
- After starting VM, follow README in the repository for instructions on installing and initializing the project
- Rolf will email the team soon with more
- For the setup process, watch the video in the teams chat
- Reach out with questions about the codebase to previous team members
- Prepare understanding of the code by the next meeting

Archived Weekly Meeting Notes

Week 1 Notes 2/7

- Student and advisor introductions
- Went over the technologies and progress of GridAI thus far
- Grid AI backend is complete and runs on Go and Python
- Utilizes Deck.gl for managing a large number of nodes and lines
- Three layers are used in Deck.gl (IconsLayer, LineLayer, and HeatMapLayer)
- The professor emphasizes understanding the market through the next few weeks

Week 2 Notes 2/14

- The previous team members gave a presentation
- Gitlab files will be provided to the team in a few weeks
- Showed structure diagrams of how the backend and frontend are built and should be configured
- The professor gave lots of tips for this project:
 - Have branches for just one or two features
 - Use an issue board so everyone is on the same page
 - Keep secrets, like credentials, in repos secret storage
 - Make lots of commits, describe them well, and merge them into master when done

Week 3 Notes 2/21

- Last semester GridAI team presented to us
- Showed structure diagrams of how the backend and frontend are built and should be configured
- 5 main components: SVG diagrams, market dashboard, collaborative code editing, map box, and widgets
- Widgets and main dashboard inspired by Thingsboard

- For naming branches, follow convention ...<yourName>/<feature>
- Have a staging branch when finishing changes and wanting to merge into master branch
- By next week, create a presentation to present our understanding, scope, and questions about the project
- Treat the previous team (currently in 492) as our mentors

Week 4 Notes 2/28

- We presented our understanding of GridAI
- Presented the components each of us want to work on
- We will get access to the codebase and an individual VM in the upcoming 2 weeks
- Figma education license will be provided next week
- He will share documents with more info next week
- Next week, present the responsibilities and requirements of the project
- Also, presents a deeper understanding of the components
- Pose and prepare any questions

Week 5 Notes 3/7

- We presented our understanding of each component along with questions
- Intends to give us a Figma license this week
- Schedule a meeting with Peeyush to figure out Mapbox requirements
- Understand the road map between the code editor and the map box
- Gelli has to talk to 492 to get requirements for us
- Identify key components/key features in terms of logic and aesthetics. Lay it out for each component
- When we get the codebase, dig through it
- The codebase should be done by Monday and shared with us by the end of the week
- Code editor and Mapbox, message Peeyush and cc Rolf and Dr Gelli