ChronoWave
PROJECT PLAN
CS 422 - SPRING 2023

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Timeseries analysis is a valuable statistical tool that enables the exploration of data trends over time. Timeseries, forecasting, and error metrics are essential components in fields such as healthcare, transportation, economics, and environmental sciences. These tools allow us to make predictions about the future based on historical data which is critical for effective decision-making.
While forecasting allows organizations to plan ahead and make informed decisions based on predicted trends, error metrics are crucial to evaluate the accuracy of forecasts. Inaccurate forecasts can lead to poor planning and decisions which can result in negative consequences for an organization.
By creating a website that accepts timelines and forecasts and calculates error metrics, we can provide a powerful too that enables any individual or organization to make data-driven decisions based on historical trends and accurate predictions.

Management Plan

The plan for ChronoWave will be based on the Agile project management methodology, using Scrum. The team will consist of the project manager, a web developer, a database developer, and a QA analyst.

Work Breakdown Schedule

Week 1: Planning and Design
- Set up Github, Discord, and Trello
- Design the system architecture and select the system requirements
- Create mock-ups of the website
- Determine the technologies and tools to be used

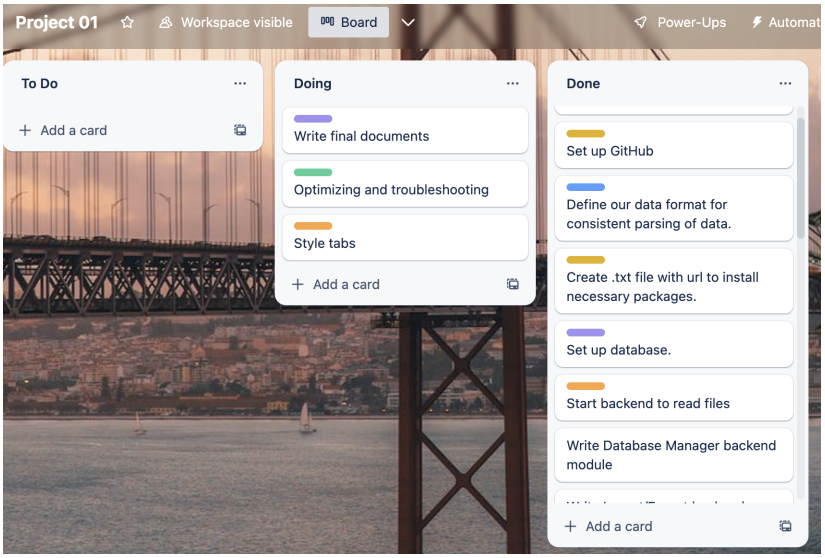
Week 2: Front-end Development
- Set up Flask and Ajax
- Develop the front-end of the website using HTML, CSS, and JavaScript
- Test and debug the front-end

Week 3: Back-end Development
- Set up the MongoDB database
- Develop the back-end of the website using Python and Flask
- Integrate the front-end and back-end
- Test and debug the website

Week 4: Testing, Review, and Optimization
- Test the website for functionality and performance
- Review the website for usability and accessibility
- Optimize the website for speed and responsiveness
- Prepare for final presentation and delivery

ChronoWave is divided into three user roles: admin, contributor, and data analyst. The contributor is responsible for uploading timeseries data to the website in various formats like CSV, JSON, and Excel. The data analyst is responsible for uploading forecasts and retrieving error metrics, which are calculated by ChronoWave's advanced algorithms. The admin has full control over the website and can manipulate or delete data if needed. They are responsible for maintaining the website's database and ensuring the integrity of the data. With this division of roles, the website ensures that each user has specific responsibilities that correspond to their area of expertise, making the website more efficient and effective in its goal of providing accurate time series analysis.

The team used a combination of in-person meetings and digital tools to organize and divide work effectively. They held weekly meetings to discuss progress and any issues that arose, as well as to plan for the upcoming week. These meetings allowed the team to ensure that everyone was on the same page and that tasks were being completed on schedule. They also used an open Discord channel for daily communication and quick updates, which facilitated collaboration and troubleshooting in real-time. Additionally, the team utilized Google Docs to create shared documents and spreadsheets, which allowed for easy access and editing by multiple team members simultaneously. Overall, the team's effective use of both in-person and digital communication tools allowed them to work efficiently and collaboratively towards a successful project completion.



Project Timeline

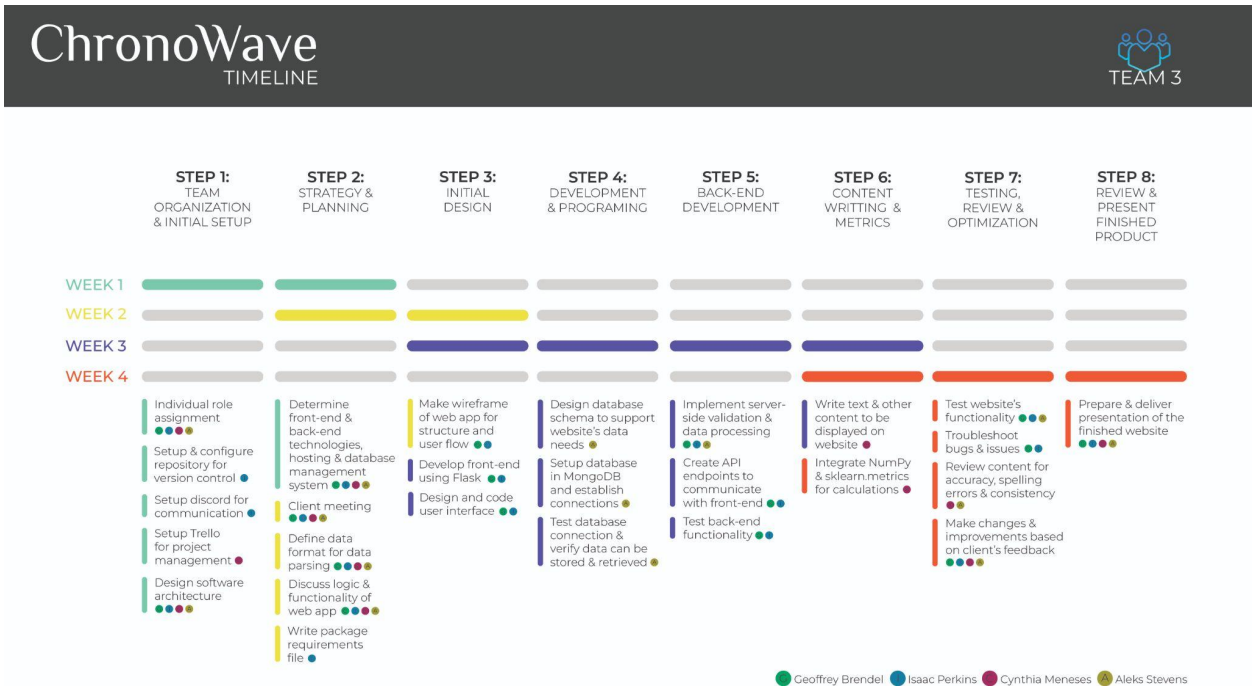
The timeline for ChronoWave will followed these steps:

Step 1: Planning and Design
- Set up Github, Discord, and Trello to facilitate communication and project management
- Design the system architecture and select the system requirements to ensure a clear vision of the project
- Create mock-ups of the website to establish the look and feel of the website
- Determine the technologies and tools to be used to ensure a smooth and efficient development process

Step 2: Front-end Development
- Set up Flask and Ajax to develop the website's front-end
- Develop the front-end of the website using HTML, CSS, and JavaScript to create an engaging user experience
- Test and debug the front-end to ensure functionality and user-friendliness

Step 3: Back-end Development
- Set up the MongoDB database to develop the website's back-end
- Develop the back-end of the website using Python and Flask to handle database operations and other server-side tasks
- Integrate the front-end and back-end to create a cohesive and functional website
- Test and debug the website to ensure functionality and reliability

Step 4: Testing, Review, and Optimization
- Test the website for functionality and performance to ensure a smooth user experience
- Review the website for usability and accessibility to ensure it is user-friendly and meets industry standards
- Optimize the website for speed and responsiveness to ensure a fast and efficient user experience
- Prepare for final presentation and delivery to ensure that the website meets all requirements and is ready for launch



Building Plan

The work was divided into four weeks and each week had specific tasks assigned to each member of the team. During the first week, the team focused on planning and design, which involved setting up communication channels and project management tools, designing the system architecture, creating website mock-ups, and determining the technologies and tools to be used. In the second week, the front-end development was the primary focus, including setting up Flask and Ajax, developing the front-end using Flask, HTML, CSS, and testing and debugging the front-end. During the third week, the back-end development was the focus, which involved setting up the MongoDB database, developing the back-end using Python and Flask, integrating the front-end and back-end, and testing and debugging the website. The fourth week was

focused on testing, review, and optimization, which included testing the website for functionality and performance, reviewing the website for usability and accessibility, optimizing the website for speed and responsiveness, and preparing for the final presentation and delivery. The team kept constant communication with each other through Github, Discord, and Trello, and by doing so, everyone was kept on track with the new developments of the project. By dividing the work into specific tasks for each member of the team and having constant communication, the development of the website was more efficient.

Monitoring and Reporting

The efficient communication and dependability of each team member played a crucial role in the success of the ChronoWave project. By meeting in person on a weekly basis and keeping an open Discord channel, the team was able to stay updated on each other's progress, ask questions, and provide feedback. This ensured that everyone was on track with the project's new developments and goals. Additionally, having a structured timeline helped the team to manage their time effectively and be mindful of deadlines, allowing them to deliver the project in a timely manner. The work breakdown schedule provided a clear set of tasks and a timeline for each stage of development, enabling the team to stay focused and productive.

Rationale

We identified potential challenges related to testing and collaboration while breaking down the system into smaller modules. To overcome these difficulties, we planned to establish frequent communication to address gaps and errors in each program and clarify the logic to avoid merging conflicts, logical errors, and major problems in the future. In the future, we can improve planning by considering the potential challenges and incorporating additional testing and quality assurance processes to ensure the final product meets all requirements. We can also establish more formal review processes and documentation practices to ensure all team members are aware of changes and progress throughout the project.