Executive Summary

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Project Name: WATERRA

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Summary:

Water quality and its management play a crucial role in maintaining the well-being of indigenous communities. Indigenous and Secondary Education communities often lack access to real-time water quality data, hindering their ability to make informed decisions about water resources. This *Waterra* project aims to address this issue by providing an accessible and user-friendly platform for visualizing and understanding water quality data from various sources and integrating cultural and historical information related to water features and land areas. The name of our project, *Waterra,* combines the morphemes of both the words ‘water’ and ‘terra’, which can be interpreted as the water of the earth.

The progress of the project can be described in the following steps:

- Requirement Analysis

In this stage, the project team identified the need to address the issue of water quality data access and understanding for Indigenous and Secondary Education communities. The Waterra project was conceptualized as a solution, consisting of two main components: the Water Sensor website sub-project and the *Terrastories* Integration sub-project. The interface requirements, system features of data visualization, and other nonfunctional requirements of the Water Sensor website were defined during this stage.

- Development and Implementation

This stage involved the creation of the Water Sensor website and the integration of water quality data into the *Terrastories* platform. Our team worked closely with the *Ohneganos* program and the *Terrastories* project to ensure seamless integration and collaboration. We made software design specifications of the constraints, system environment, database schema, and overall architecture of the codebase. The Water Sensor website was built separately on the back end and the front end. The back end implemented and extended the Mac Water APIs. The front end was designed and adjusted to apply all APIs from the back end.

- Testing and Quality Assurance

During this stage, extensive testing was carried out on the Water Sensor website to ensure their quality, reliability, and functionality. The testing process was mainly implemented as requirement-based testing, which also included unit tests, integration tests, and system tests on both the back end and the front end. This stage helped identify any issues or bugs that needed to be addressed. We further implemented the multi-axis chart during the testing process in order to prevent the issue of generating incorrect multi-line charts.

- Feedback and Iteration

This was interspersed in every single of the above steps. Feedback from the supervisor and other project developers helped with identifying areas for improvement and potential new features. Our team talked to them, analyzed and implemented suggestions, and integrated them into the existing codebase.

The Water Sensor website enables users to access real-time water quality data, including air temperature, conductivity, dissolved oxygen, humidity, pH, turbidity, and water temperature. The data is displayed on a functional map, allowing users to select and view data from any available water quality sensors located at certain locations. The selected data is transformed into an intuitive line graph for easy understanding. Comparing multiple data is also available by an overlapping line graph on this website. We are looking forward to deploying our project to more end users, gathering user feedback, and monitoring the project's performance.