Chronos for Loxley Innovation Ltd. – Innovative Energy Solutions

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ABSTRACT

This paper describes the methods used to create an early prototype application for Loxley Innovation Ltd. – a start-up company in the innovative energy solutions sector. The application was developed using the Express Framework for node.js to develop the web portal interface and REST API data stream and the Sprint Boot Framework for Java for data scraping and aggregation. Data from users personal Chronos installation(s) will stream their relevant usage statistics to their corresponding portal account.

Keywords: Energy Solutions, Innovation, Web Portal Application, Java Application

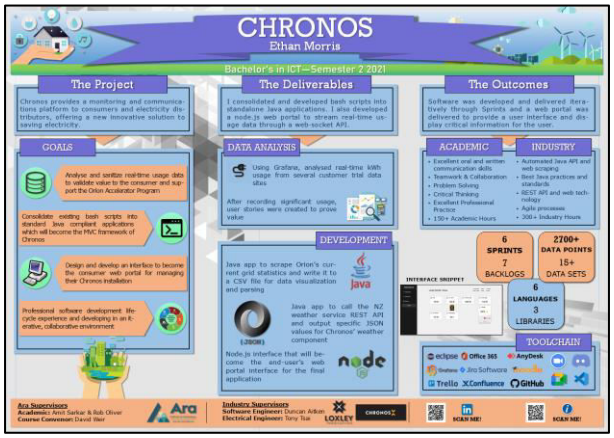
1. INTRODUCTION

The purpose of Chronos is to provide an innovative solution to save consumers money on electricity and to be able to proactively utilize high-energy consumption devices so that they are not operating at full consumption during peak periods.

There is currently a lack of visibility into (near) real-time power usage, both for an end consumer as well as the distribution companies. Additionally, there is a disconnect between generation and consumption resources (leading to peak loading of the network under certain conditions). Chronos aims to alleviate these by providing monitoring and control of both energy consuming devices as well as distributed energy resources (DER).

Chronos has two parts – the communications platform and the optimization platform. The communications platform is the monitoring system – it provides near real-time usage statistics about your current energy installation.

The optimization platform allows proactive energy consumption to lessen peak loads and avoid total energy brown or blackouts, and save users money on their power bills by using more energy during night rate hours, rather than day rate.



2. BACKGROUND

Loxley Innovation Ltd. is an innovative start-up in the energy sector, looking for solutions to optimise the nation's energy usage, for both the consumer and electricity distribution businesses.

Chronos has been designed to offer consumers a way to save electricity and also have a direct effect on other consumers usage. To the EDB's, it provides a detailed tree-node hierarchy view of the nodes that EDB is monitoring. From there they can view specifics by following the hierarchy down to a specific endpoint.

3. PROCESS

After in-depth requirement gathering, designing and developing Chronos began. Firstly, data analysis into customer's usage from nine trial sites. Grafana used this data to generate readable graphs to provide and insight into usage patterns. With usage patterns, 'device signatures' were identified. Device signatures are regular consistent usage spikes of similar usage amount, duration and frequency.

With this data, user stories were created to validate the value of Chronos via money saved on energy. These figures and user stories were used in the Orion Accelerator Program to support the pitch of Chronos.

Following this phase was development. Developing and consolidating existing bash scripts into standalone Spring Boot framework for Java applications and an interface using the Express framework for node.js. The interface will connect to a REST API that stream's usage data to the interface from the logged in user's installation.

4. CONCLUSION

Through the development and culmination of Chronos, I have learned a lot of new technologies and skills and ways to use critical thinking for problem solving and software as solutions. Chronos uses web technologies and traditional software development methodologies, all of which have aided in my learning and understanding of modern software as solutions systems.

Chronos requires more development to build it into a shippable product. However, this project has helped develop the initial prototype and proof of concept for Chronos.

5. REFERENCES

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