JOAT
Water Energy Efficiency

Hydralytix

AREA OF EXPERTISE

The Hydralytix system will be built to allow one central hub for reporting, communication and monitoring. The system will allow for easy management and allocation of data to users.

The roles system lets users see only the information relative to them. A combination of report and dashboard views will make it much easier to track issues. The commenting functionality will allow easy communication and documentation of an event that will help identify and prevent issues in the future. Born out of necessity to resolve the following headaches:

- Multiple systems for multiple requirements (desktop icon headache)
- (Poor) data communications – limited hardware options
- Disparate data collection
- Making good use of the data – analytics, machine learning, artificial intelligence

Cloud Components

- App Engine
- Cloud function
- VPC network
- VPC connector
- Cloud SQL (Postgres)
- Techstack

The Hydralytix portal will be using the following techstack:

Server: Nuxt vue framework
Databases: Postgres
Front end Framework: Vuetify
Chart Library: Highcharts (include costs in costing section - are all charts available for implementation with the license)

Framework Implementation

The Hydralytix system will use nuxt as its server which will create a rest server that sits on the server. The front end vue/vutify framework will then use axios to communicate with the server using the rest endpoints. Each request must be authenticated using the authentication middleware that sits in the Nuxt server. The authentication in the system will follow the oauth2 guidelines in order to make sure the authentication is to standard. The Nuxt server will handle the sessions on the server and will use postgres database to manage session storage. Each session will last 30 minutes of no input before expiring, at which point the client will need to reauthenticate.

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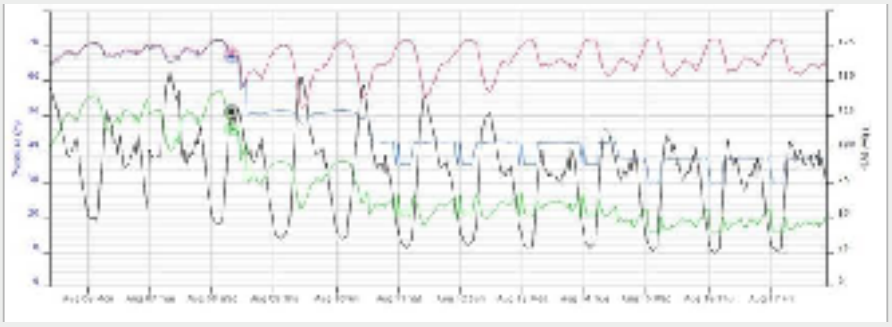
Variable Mapping

The variable mapping module allows users to name and configure variables that can then be used across the system. Variables will be mapped using a page number and parameter number received from the database. Additional information can then be allocated to the variable like Unit (e.g degrees, kiloliters, etc …) and tags for easy identification of the variable. A single parameter can be mapped to multiple variables if needed. The Mapped parameter will use a start date to indicate when a mapping should be used. If a variable is re-mapped at a later stage then the user will have the ability to override all mapping for the current mapping date range or start a new mapping range so only new values will use the new mapping values. Any older date will use the mapping that is found for that date range.

The above layout showcases JOAT Hydralytix smart devices in the field together with user defined colour and icon specifics.

Categories

The Category system will allow neat grouping of variables by using tier categories,which means there are no limitations on how many levels you can add into the structure. Each category can contain variables or other categories. Variables can be allocated to multiple categories which allows summary groups to be created as quick views into parameter types. a category will be used to determine who can access the data within as well as which alerts and reports can be seen by a specific user or role. Each category can be muted if needed so that non critical alerts are not sent. This will be useful when a factory shuts down for maintenance or many other reasons.



The above profile is a example extracted of a system profile abstracted from a Hydralytix gateway deployed on a pressure managed system.

Reports

The reporting screen will allow users to graph and compare data based on multiple filters. Users will have the ability to add multiple graphs to the screen allowing comparison of data as well as add multiple variables to a single graph that will automatically use multiple axes where possible and if the chart library supports multiple axes.

Profiles

Profiles will allow the user to create a fullscreen chart that will extend report functionality but lock to a single report per profile and will always be fullscreen. Profiles will not use a date range but rather a start date and load all data after that with live updates.

Dashboard

The dashboard will allow custom widget built views for roles and users. Admin users will need to build base dashboards that each role will get. Each user can then customise his/her dashboard to suit themselves.

Google Maps

This module will allow users to plot the location of devices, assets and items of interest on the map as well as draw polygons that will allow for grouping and linking of device parameters. When drawing a polygon the user will be able to link parameters to the polygon and also link colour states that will change the polygon state based on the value of the parameter. If the user clicks on a polygon a summary of the variables in the selected area will be shown. If the point itself is clicked the individual parameter's data will be shown.

Users and Roles

The system is built using a user role model that allows very detailed permission allocations. When creating a user on the system a role can be allocated that has been pre-allocated its permissions . This way admin users do not need to allocate each permission to the user.
Users in the Hydralytix system also need a category allocated to them before they can start viewing data from the database. To allocate a category to a user the admin can either allocate it directly to the user or to a role so that anybody with that role can access the category. A user can have one or more roles.

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