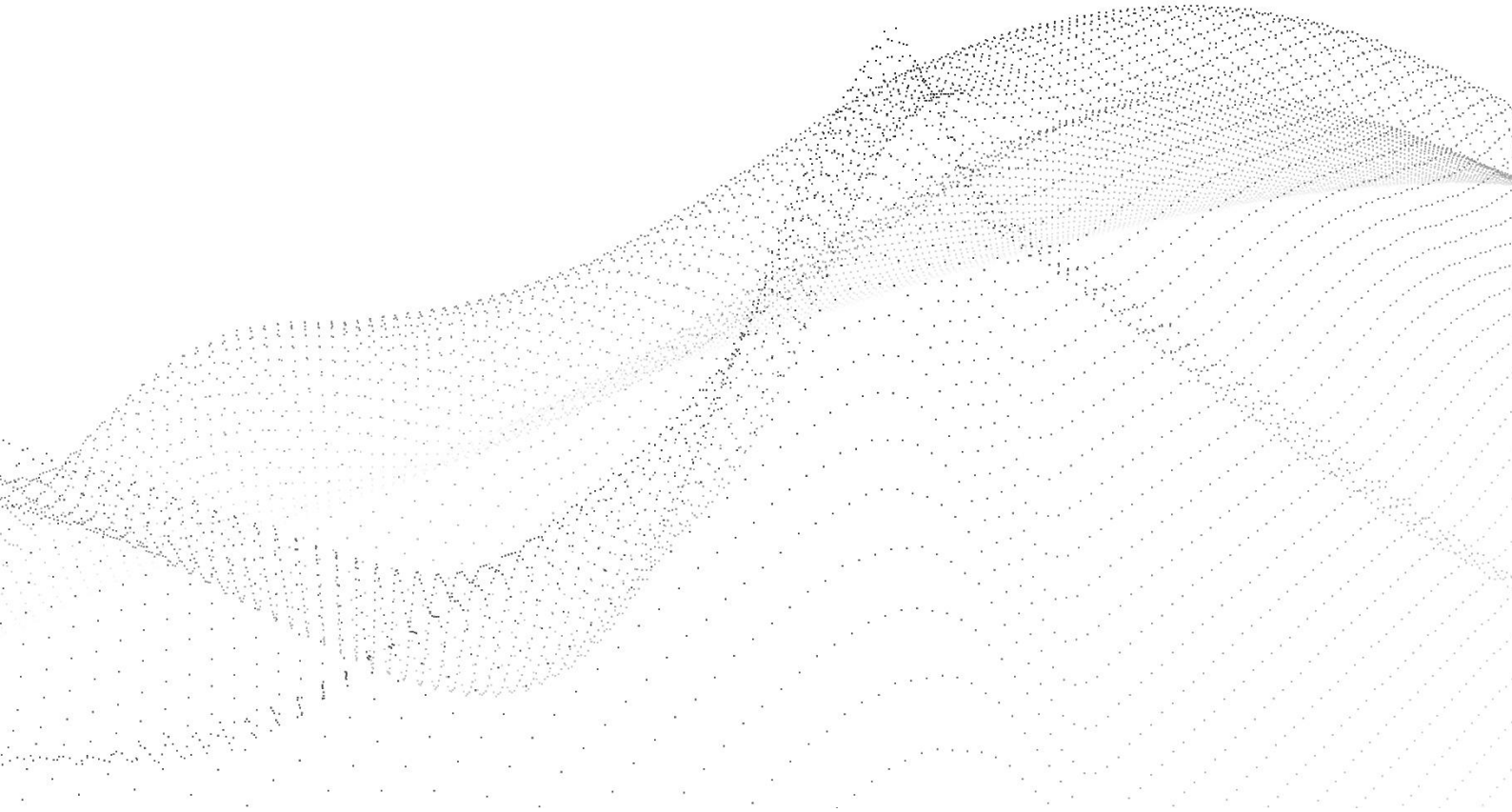
ATSYS



University of Adelaide

2024 Industrial Project

No-Code Solution for InfluxDB

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1.1 Objective

Develop a user-friendly, no-code interface for InfluxDB[1], an open-source time series database. This interface will simplify the process of querying and trending data for users without programming expertise. This tool will also integrate with Grafana[2], enabling users to save and edit displays.

1.1.1 InfluxDB

InfluxDB is a purpose-built time series database designed to handle high write and query loads. It is optimized for storing and analysing large volumes of timestamped data, making it ideal for applications such as DevOps monitoring, IoT sensor data, and real-time analytics.

1.1.2 Grafana

Grafana is a popular open-source platform for data visualization and monitoring. It's widely used to create dashboards that display time series data from various sources, including InfluxDB. Grafana offers a range of customizable charts and graphs, supports multiple data sources, and includes features like alerting and user-friendly dashboard creation.

1.2 Background

InfluxDB's internal language, Flux, presents a significant barrier for non-programmers due to its complexity and dissimilarity to SQL. This barrier also extends into users trying to visualise data in Grafana, alongside the lack to reference of Flux and limited debug functions in Grafana.

The existing InfluxDB web user interface lacks drag-and-drop functionality or block-building features, limiting clients' ability to explore data effectively.

1.3 Requirements and Specification

This project aims to address these limitations by creating an intuitive web interface that allows users to generate queries and visualize trends without writing code, and to provide a connection between InfluxDB and Grafana. This interface is separate from the inbuilt InfluxDB web interface.

The preliminary requirements include:

1. **Single-Page Design**: All functionalities will be available on one page for ease of use and quick access.
2. **Visual Query Builder**:
   - Drag-and-drop selection of bucket, measurements and fields
   - Easy-to-use filters and time range picker
3. **Automatic Code Generation**: Based on user selections, the interface should generate the necessary Flux code in the background, or if the user chooses, display the code.
4. **Data Visualization**: Display the resulting data trends graphically, potentially leveraging Grafana's functionality.
5. **Authentication**: Implement secure authentication at the same level as the existing InfluxDB authentication system.

6. **(Extension) Grafana Integration:**

- Connect to existing Grafana installations
- Allow users to save current displays to Grafana
- Enable editing of existing Grafana displays within the app

Future stretch goals include processing more complicated functionalities such as pivoting or joining fields from multiple measurements.

1.4 Scope Limitations

- The project will focus solely on query building and data visualization. Other InfluxDB functionalities, such as connectors, are out of scope for this interface.
- The project will use InfluxDB OSS version 2.7[3] and Grafana v9.5.3[4].
- The preferred operation system for InfluxDB and Grafana installation is Windows.
- The web application should be developed in JavaScript, but there is no limitation on the server-side architecture or tech stack.

1.5 Deliverables

1. A functional, web-based no-code interface that generates InfluxDB queries, connects to Grafana and has proper authentication.
2. User documentation explaining how to use the interface.
3. Technical documentation detailing the implementation and integration with InfluxDB.

1.6 Reference

[1] InfluxDB Website: https://www.influxdata.com/products/influxdb/

[2] Grana website: https://grafana.com/grafana/

[3] InfluxDB OSS v2 documentation: https://docs.influxdata.com/influxdb/v2/

[4] Grafana v9.5 documentation: https://grafana.com/docs/grafana/v9.5/