

PROJECT REPORT
On
**LIVE STREAMING OF DEVICES/SENSOR DATA USING
CUSTOM WIDGETS WITHIN COGNOS DASHBOARD**



**School of Engineering and Technology
The Assam Kaziranga University**

Submitted by:

**GYANANGKUSH BORGOHAIN – ET16BTHCS038
BHASKAR JYOTI GOGOI – ET16BTHEC014
ADITYA JOARDER – ET16BTHCS039
NIKITA DEY – ET16BTHCS016
SANDIP BURHAGOHAIN – ET16BTHEE010**



**SCHOOL OF ENGINEERING AND TECHNOLOGY
THE ASSAM KAZIRANGA UNIVERSITY
JORHAT-785006 :: ASSAM :: INDIA**

CERTIFICATE

This is to certify that Gyanangkush Borgohain (ET16BTHCS038), Bhaskar Jyoti Gogoi (ET16BTHEC014), Aditya Joarder (ET16BTHCS039), Nikita Dey (ET16BTHSC019), Sandip Burhagohain (ET16BTHEE010) of 7th semester of B. Tech CSE, ECE and EE has successfully completed the project on the topic "**Live Streaming of Devices/Sensor Data Using Custom Widgets Within Cognos Dashboard**" under my guidance.

All help received by us from various sources have been duly acknowledged.

No part of this report has been submitted elsewhere for award of any other degree.

External Mentor

Yogendra Solanki

Jitendra Shremali

Internal Mentor

Manashee Kalita

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INTRODUCTION

Live streaming of device/sensor data is the continuous process where data is generated continuously by thousands of data sources, which typically send in the data records simultaneously, and in small sizes (order of Kilobytes). Streaming data includes a wide variety of data such as log files generated by customers using your mobile or web applications, e-commerce purchases, in-game player activity, information from social networks, financial trading floors, or geospatial services, and telemetry from connected devices or instrumentation in data centers.

Manufacturing companies handle large volume of live streaming data and need to gain insights from anomaly detection and predictive modeling to understand their machine health and working environment. Web-based retail companies, IoT-based industries, Telecommunication and healthcare companies all have uses for streaming data as well. Live data naturally comes as a never-ending stream of events. To do batch processing, we need to store it, stop data collection at some time and processes the data. Then we have to do the next batch and then worry about aggregating across multiple batches. In contrast streaming handles never-ending data streams gracefully and naturally. We can detect patterns, inspect results, look at multiple levels of focus, and also easily look at data from multiple streams simultaneously. In live stream processing process data as they come in hence spread the processing over time. Hence stream processing can work with a lot less hardware.

In this project we have taken static data from JSON spec and generated real time data by random number generator from the JSON spec. In place of static data, the real time data could be generated from live sensor or using simulated sensor from IBM Watson IOT Platform. Then we created a custom widget (In .zip format) and upload it on Cognos dashboard to stream and analyze the live streaming data.

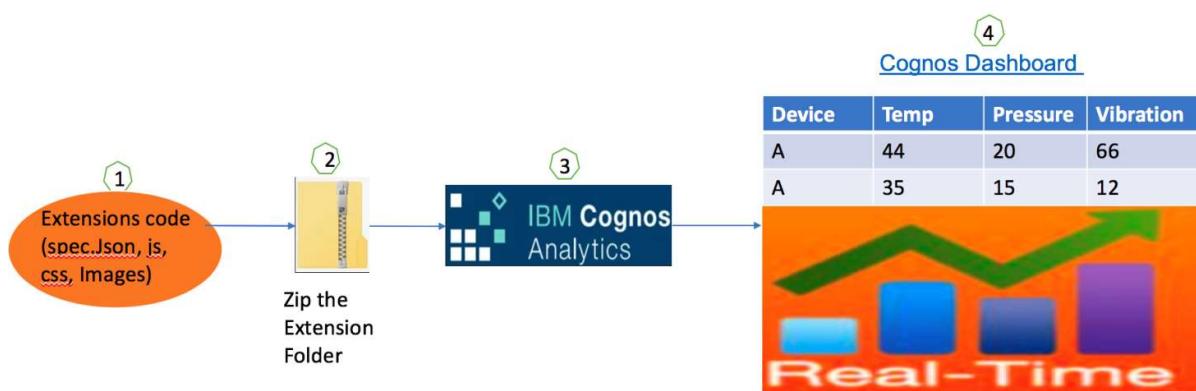


Fig. Flow diagram of the project

INCLUDED COMPONENT DETAILS

IBM Cognos Analytics:

IBM Cognos Analytics is a cloud-based business intelligence and analytics solution that makes it easy to visualize, analyze and share insights about your business.

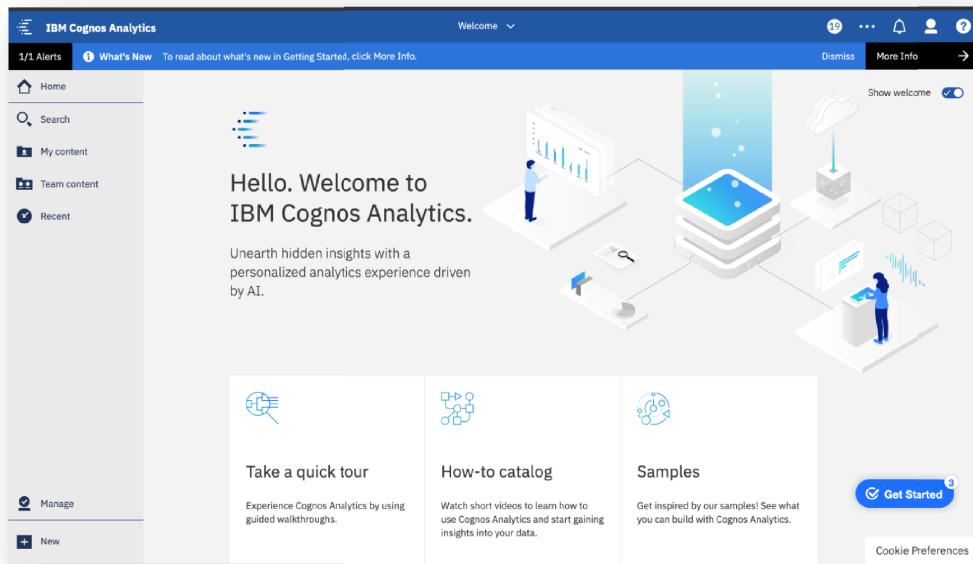


Fig. Screenshot of IBM Cognos Analytics

Atom editor:

Atom is a free and open-source text and source code editor for macOS, Linux, and Microsoft Windows with support for plug-ins written in Node.js, and embedded Git Control, developed by GitHub.

A screenshot of the Atom code editor. It has three tabs open: 'code.js', 'spec.json', and 'dashboard.css'. The 'code.js' tab contains a large block of JSON-like code defining an array of objects with properties like 'id', 'temperature', 'pressure', and 'vibration'. The 'spec.json' tab contains a JSON object with fields like 'name', 'schemaVersion', 'extensions', and a 'perspective' field. The 'dashboard.css' tab contains CSS code for styling a dashboard, including rules for '.titleContainer', '.tableContainer', and 'th' elements.

FEATURED TECHNOLOGIES

CSS: Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language like HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript. CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts.

JSON: JavaScript Object Notation is an open-standard file format that uses human-readable text to transmit data objects consisting of attribute-value pairs and array data types (or any other serializable value). It is a very common data format, with a diverse range of applications, such as serving as replacement for XML in AJAX systems. It was derived from JavaScript.

JS: JavaScript often abbreviated as JS, is a high-level, interpreted scripting language that conforms to the ECMA Script specification. JavaScript has curly-bracket syntax, dynamic typing, prototype-based object-orientation, and first-class functions.

PROCEDURE

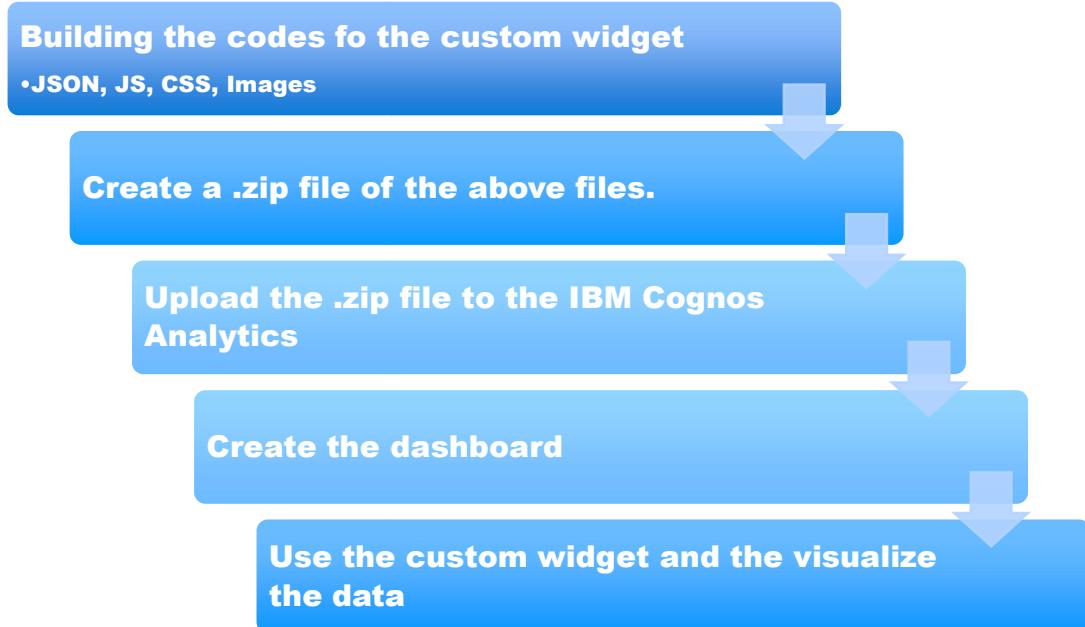
1. Sign in to your IBM account and launch the IBM Cognos Analytics.
2. Click on the Manage option on the left bottom side of the screen.
3. Select the customization option and then select the Extension tab.
4. In the extension tab we can upload the .zip file which contains the files to create the custom widget.
5. After successful upload of the .zip file click on New and select the Dashboard option.
6. Select the dashboard layout and proceed.
7. A new icon/option will appear on the left side menu as Custom Widgets. The uploaded custom widget will appear.
8. Drag and drop the custom widget into the dashboard and resize it to view it properly.
9. Click on any of the attributes on the table and the respective line chart graph which will dynamically display the data in the table.
10. Now save the dashboard.

GitHub repository link:

<https://github.com/GYANANGKUSH/CognosCustomWidget-LiveDataStream>

STEPS

1. Flow diagram of the project:



2. Screenshots of IBM Cognos Analytics:

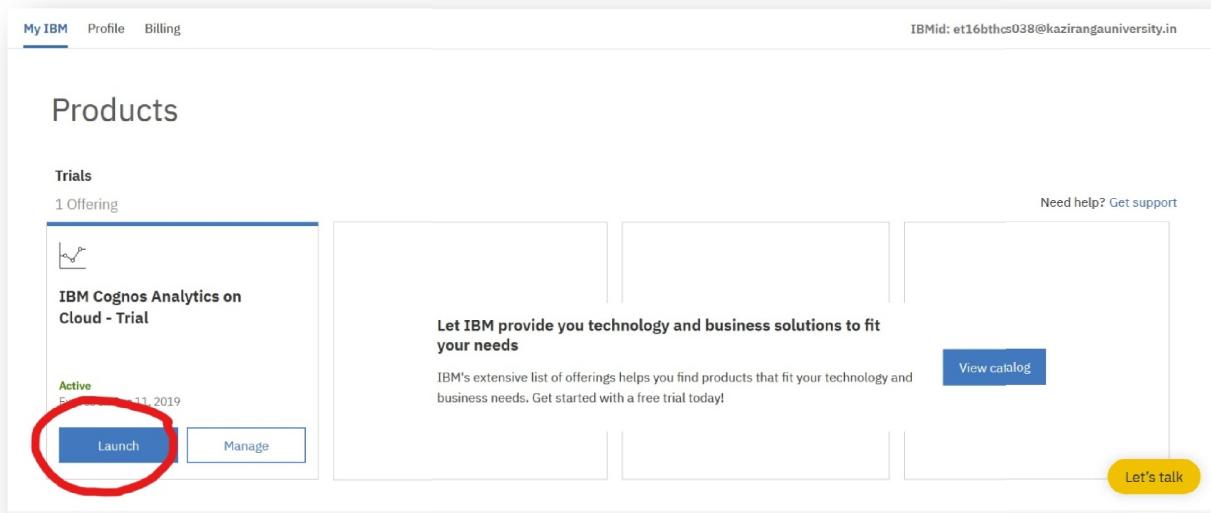


Fig. 1: Launch the IBM Cognos Analytics

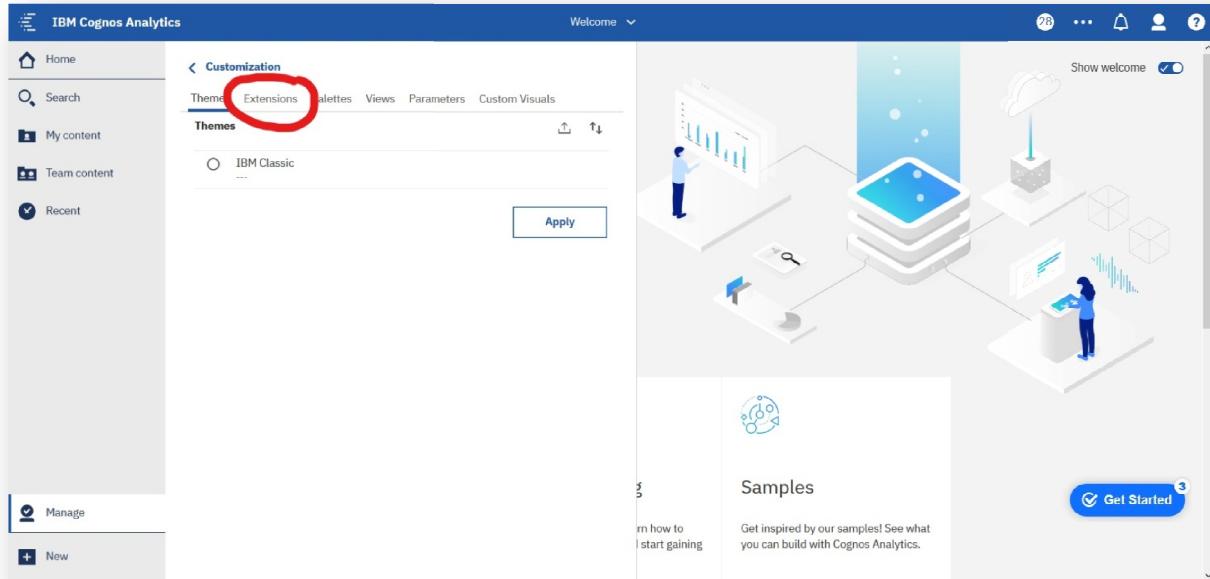


Fig. 2: Click on Manage and select the Customization option and then select the Extensions tab.

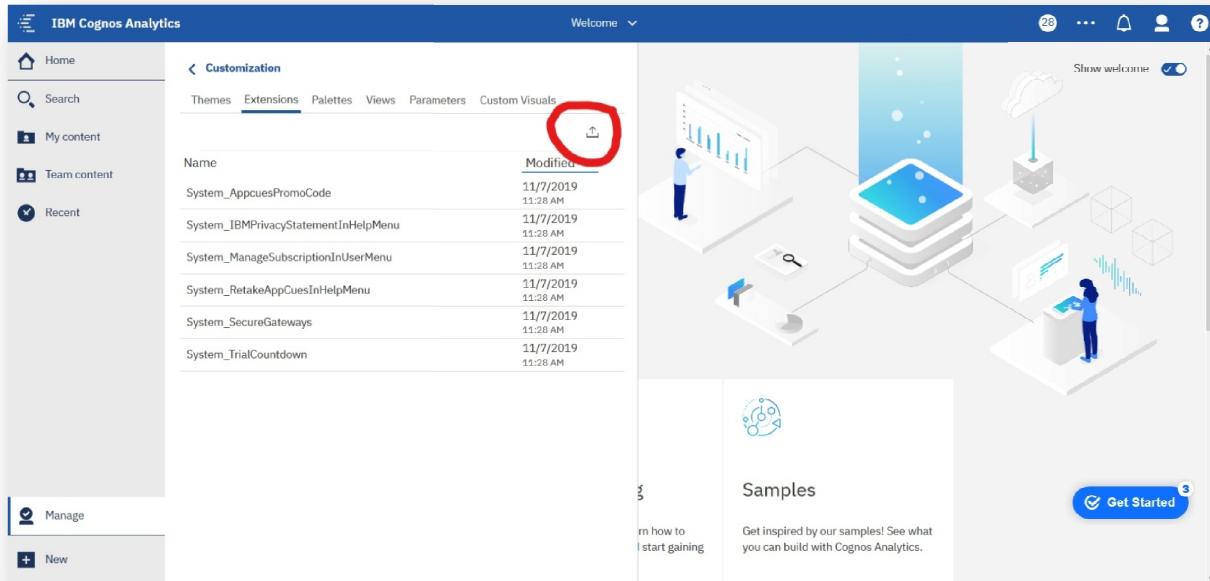


Fig. 3: Upload the .zip file by clicking the icon.

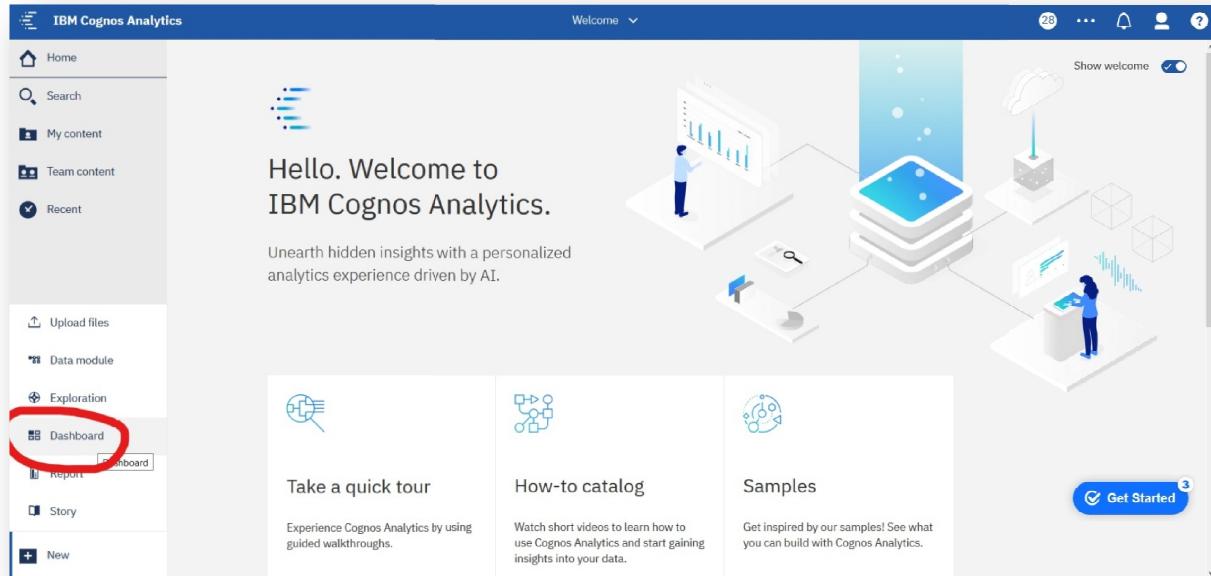


Fig. 4: Click on Dashboard to create one.

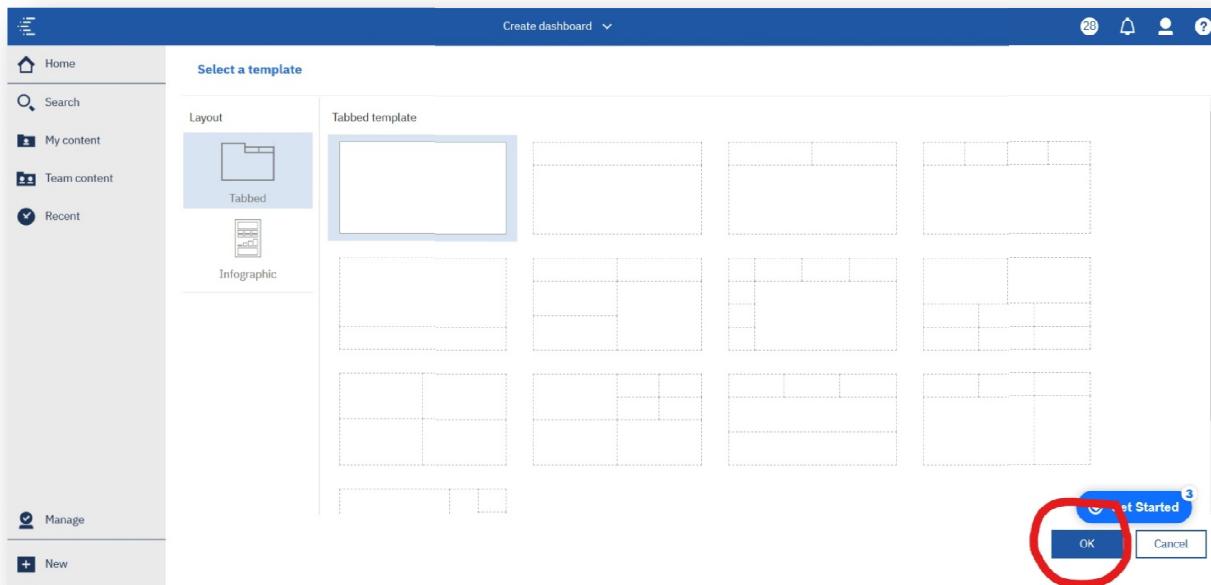


Fig. 5: Select the layout of the dashboard and proceed.

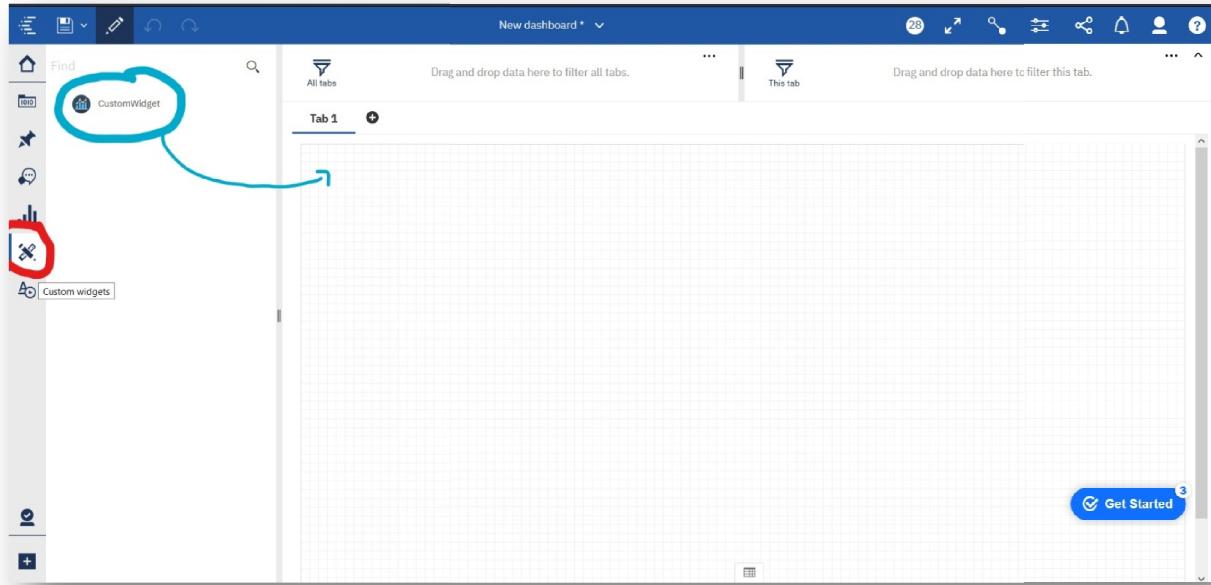


Fig. 6: Drag and drop the created custom widget into the dashboard.

Visualization of Device/Sensor data for the last 24 Hours					
SL. no.	Temperature	Pressure	Vibration	Time	Date
1	90	35	15	1:00	14-11-2019
2	55	40	20	00:00	13-11-2019
3	120	50	45	47:00	13-11-2019
4	135	100	30	46:00	13-11-2019
5	100	80	70	45:00	13-11-2019
6	149	70	65	44:00	13-11-2019
7	170	35	15	43:00	13-11-2019

*Note: Click on any attribute (Pressure/Temperature/Vibration) column to view live streaming.

Fig. 7: Resize the custom widget

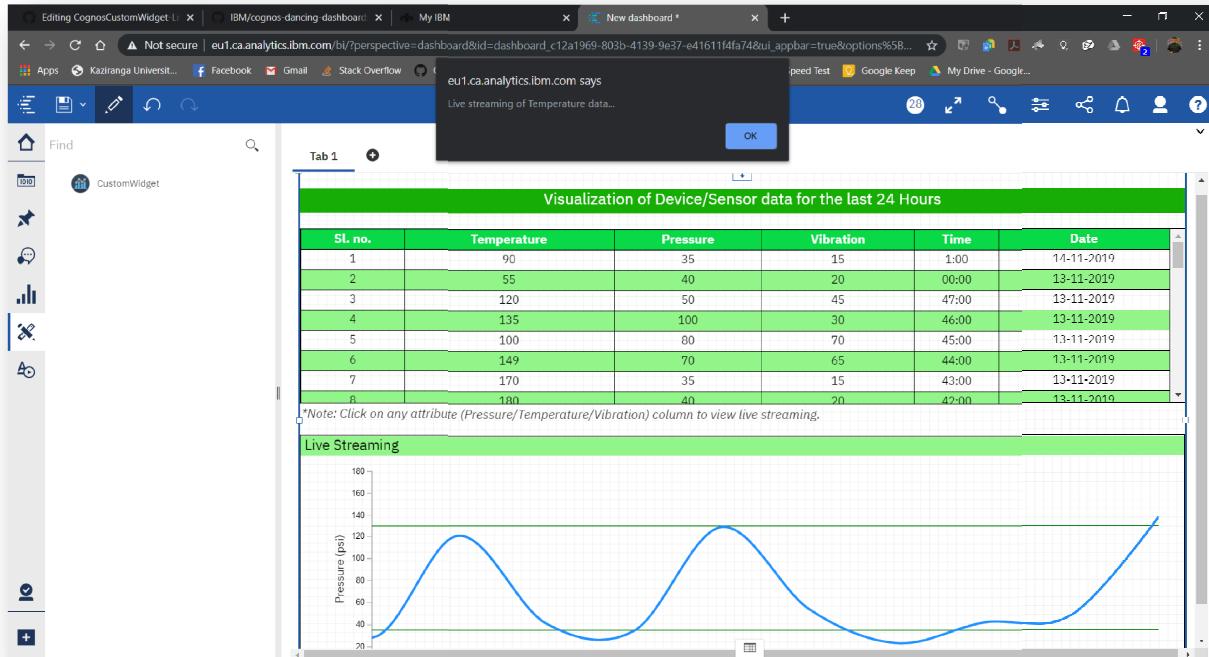


Fig. 8: Click on any of the 3 attributes to display its live line chart graph.

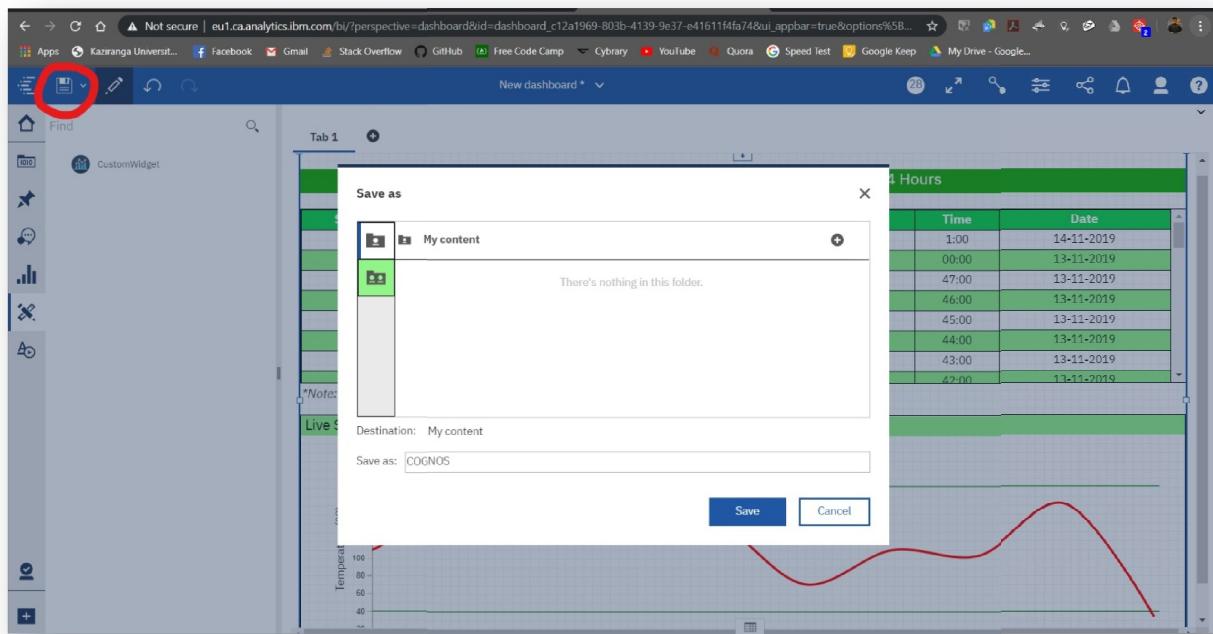


Fig. 9: Save the created dashboard.

TROUBLE SHOOTING

It is found that after the upload of the custom widget to Cognos the new custom widget generated cannot be dragged and dropped into the dashboard. To overcome this problem the browser securities must be disabled and the page should be reloaded.

Following are the few screenshot that can be used to overcome the problem in Chrome, Firefox and Edge browser.

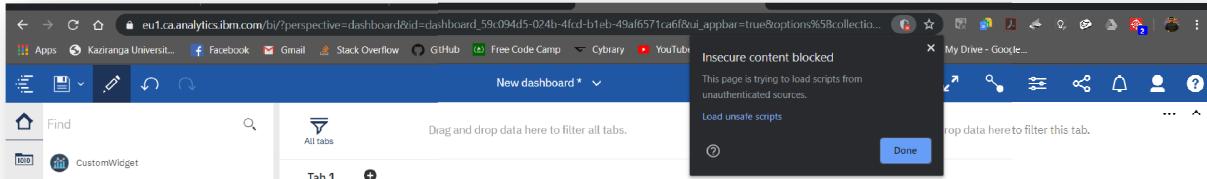


Fig. Chrome

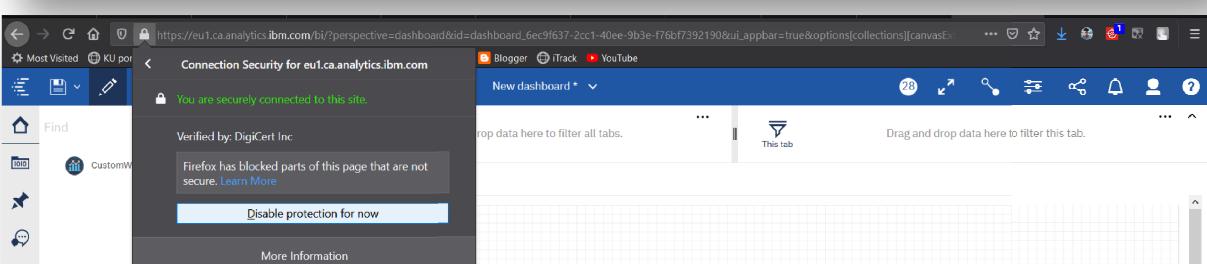
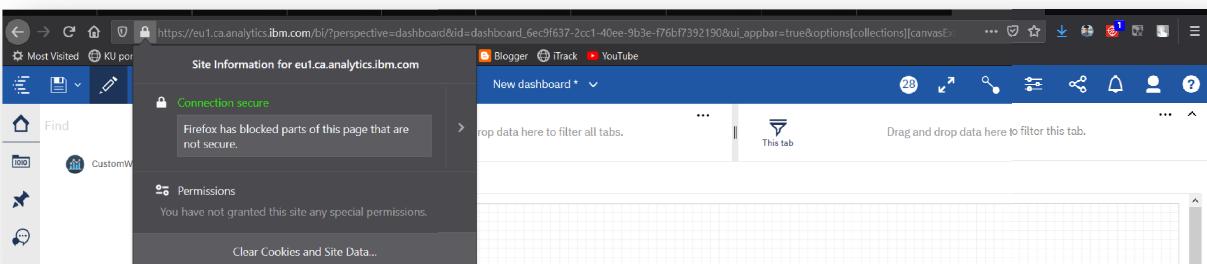


Fig. Firefox

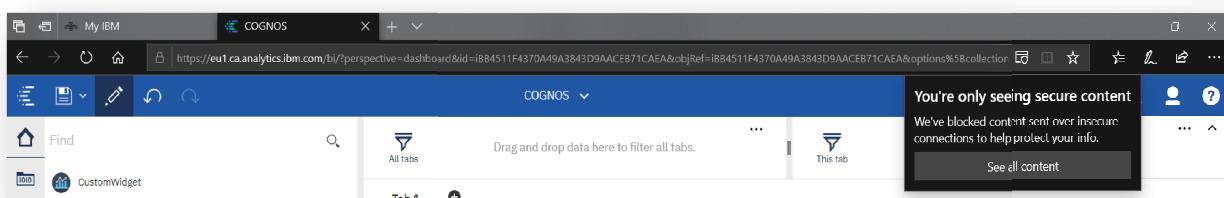


Fig. Edge

SCALABILITY

In this project the data sets used are static and are fetched from the variable present in the code.js file due to lack of resources.

The implementation of this project can scaled to a very large extent where it will be able to handle real time live data generated from different sensors or devices.

For instance real time live data can be fetched from IBM Watson IoT Platform or from real sensors or devices present in a system or environment. To fetch data from IBM Watson IoT Platform we will have to use its API, and to fetch data from real sensors or devices generally Raspberry PI, Arduino boards, etc. can be used.

This project can be implemented in various fields such as maintenance of various devices, systems or environments which are generally very large and not easy for manual maintenance check.

CONCLUSION

- ▶ This project displays a moving line graph that of a volatile data and incrementally updates itself over time.
- ▶ This pattern demonstrates displaying live-insights of the device health metrics within Cognos dashboard.
- ▶ This analytics may also help in understanding the organization data and make effective decisions.

REFERENCE

Source: Secondary source

Link: <https://github.com/IBM/cognos-dancing-dashboard>