

Use Case Document –Emergency Response for Earthquake – V1.0

Kerala State Disaster Management using IBM Intelligent Operations Center

Presented by:



Registered in India as “Tecnic Integration Technologies Pvt. Ltd”
No.88/86, First Floor, Opposite Patel PU College,
Kariyammana agrahara Bellandur Post, Bangalore – 560103, India

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1. Introduction to User Story

This user story talks about providing emergency response and managing disaster activities caused by earthquake by leveraging the capabilities of IBM Intelligent Operations Center, ESRI Arcgis and TauDEM.

This section of the documents explains the requirement of the user story and what we are trying to achieve from this user story. Below are the details of the user story:

Sno.	What is required?	Why is it required?
1.	See on Geo Map the places where Earthquakes occurred in an area	We can 1. Monitor the area for any emergency situation 2. Keep track of surrounding assets around the affected area 3. Deploy emergency response team to the affected area
2.	Be able to get the details of Earthquake 1. The other necessary data like District name, Taluk name, Richter scale value, Epicenter etc	We can 1. Get appropriate data of the Earthquake event 2. Plan for quick actions at the time of any Earthquake event
3.	Be able to run SOPs for quick response	We can 1. Intimate appropriate departments and officers to take necessary actions 2. Make the response team ready for the rescue operations 3. Aware the public to take safety precautions at the time of emergency situations
4.	See on Geo Map the assets available around the affected areas. For example 1. Colleges/schools 2. Police Stations 3. Hospitals 4. Bus Stations	We can 1. Rehabilitate public to a safe location 2. People who needs medical attention can be sent to nearest hospitals 3. Availability of beds, Occupancy of Schools, Colleges and other assets etc can be determined
5.	Get historic data of Earthquakes occurred in the past	We can 1. Get the historical data of Earthquakes for evaluation 2. Analyze the data for determining the priority areas of interest 3. Get statistics of the events in terms of time, place and event occurrence
6.	Closure of the Event	We can 1. Evaluate event status correctly and determine the management of the event successfully.

1. Objective and Understanding of User Story

The key objective of this user story is to assist and manage any disaster caused due to Earthquakes with actionable intelligence which will aid in taking proactive steps for the management of Earthquakes events with smart decision making and quick response to the event.

The main objective in implementing this user story aims to address the following:

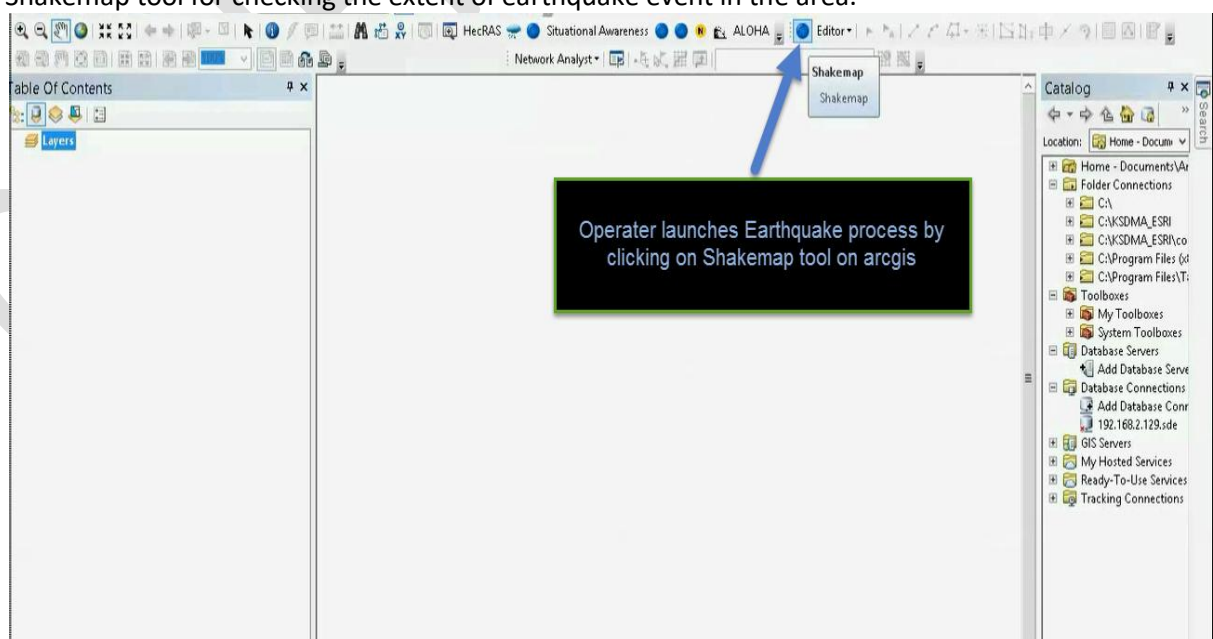
- Effective utilization of available nearby resources like schools, hospitals, police stations, bus stations etc.
- To include response action as a part of Standard Operating procedure, this in turn will help in closure of the event.
- To continuously monitor the status of the Earthquakes event and take necessary actions or dispatch required amenities and resources effectively.
- Improve overall safety and security measures.
- Decrease the number of human loss and loss to the state and improve the quality of living.
- Enable strategy for data sharing within different departments of the state.

2. Proposed solution to User story

By following the best practices and leveraging IBM IOC, will meet the requirements stated in the user story by building solution using IBM IOC and the high level use case that is required for operator to monitor, manage and provide various functionality to manage a Earthquake as well as gives quick response mechanism for emergency situations occurred at the time of Earthquake event.

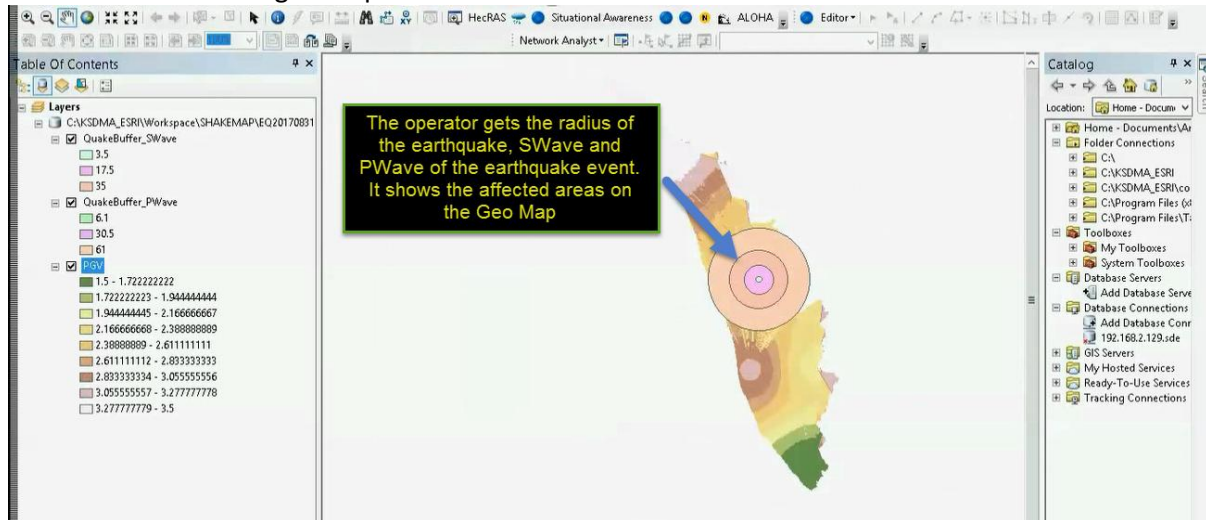
STEP 1: Sinmap tool is launched in ArcGIS:

- ✓ Whenever operator receives reports of Earthquake, He opens ArcGIS Desktop to run Shakemap tool for checking the extent of earthquake event in the area.



STEP 2: ArcGIS generates PWave, SWave and PGV value for the earthquake event:

- ✓ ArcGIS desktop generates buffer area till which the earthquake will affect the area and shows that on geo map.



STEP 3: Earthquake event gets generated on IOC:

- ✓ As soon as Arcgis completes the process, and if there is any chances of earthquake event to occur then the event gets generated on IOC.



STEP 4: To get the full details of the Earthquake event :

- ✓ We can see the full details of an event by clicking on the details tab where it gives operator all the information about the event like place, location, magnitude, epicenter etc.

Earthquake

Details of the event

Start Aug 31, 2017 9:32:16 PM

End Aug 31, 2017 9:32:16 PM

Last Update Aug 31, 2017 8:57:30 AM

Place

Epicenter POINT (76.5315450 10.5880574)

Full Properties

DISTRICT_NAME	Pathanamthitta
ID	217
Magnitude	7
REFERENCES	http://192.168.3.37:4567/viewfiles?filePath=smb://192.168.3.37/share/SHAKEMAP/EQ_L_2057/
STATION_CODE	Station Code
STATION_NAME	Station Name
TALUK_NAME	Adoor
VILLAGE_NAME	Village1

Close

STEP 5: To Run Standard Operating Procedures for fast decision making:

- ✓ Operator can run standard SOPs for the earthquake event which enables operator to make fast and reliable decision making and provides necessary steps to be carried out.

Standard Operating Procedure Details

Earthquake_SOP (Earthquake) Edit

Description This is the SOP for Earthquake

Author sysadmin

Started Aug 31, 2017, 11:44:33 AM

Status Started

General Settings Activities are done in order

Operator can run SOP to take necessary steps

Activities Items References Roles Comments Change Log

Add Edit Delete

▶ 1.Activity-1.1: Send email notification to SEOC Complete
Due: Sep 1, 2017, 11:44:33 AM

▶ 2.Activity-1.3: Send SMS notification to SEOC Add Reference
☐ No Due Date

▶ 3.Activity-1: Intimate SEOC for Probable Earthquake Alert Add Reference
☐ No Due Date

STEP 6: To send email notification:

- ✓ Operator can send email notifications to key personnel, city leaders as well as different departments informing them about the earthquake events.

Alert Operator can send email notifications about the event

Alert template: Email Notification template

To: * ashwini.k@elementblue.in

Subject: * test

Message: test

Activity: Activity-1: Intimate SEOC for Probable Earthquake Alert
Description: Activity-1: Intimate SEOC about Heavy rainfall
Owner: sysadmin
Status: ACT_ACTIVE

SOP: Earthquake_SOP (Earthquake)
Description: This is the SOP for Earthquake
Owner: sysadmin
Status: SOP_STARTED

Name: "Earthquake"
Start: "Aug 31, 2017, 9:32:16 PM"
End: "Aug 31, 2017, 9:32:16 PM"
Last Update: "Aug 31, 2017, 8:57:30 AM"

Related to: Event Append

STEP 7: To see the event details in terms of list:

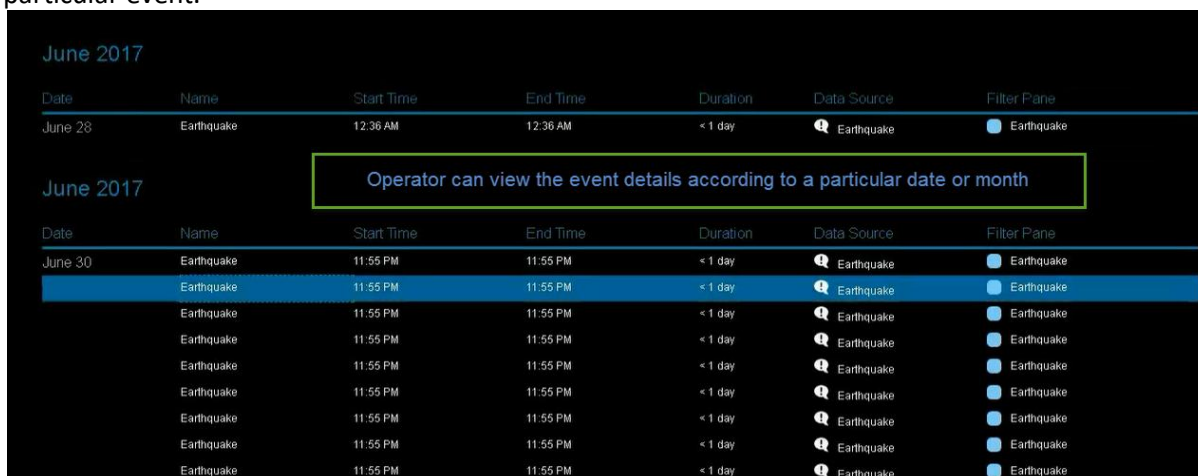
- ✓ Operator can see the event details as a list with its key properties and can select a particular event and view all the details of that event..

Earthquake Operator can see the event as list with all its key properties

DESCRIPTION	Event_ID	Event_TYPE	NAME	STARTDATETIME	ENDDATETIME	LASTUPDATETIME
Earthquake	EQ_L_1124	Earthquake		Aug 31, 2017, 8:23:44 AM	Aug 31, 2017, 8:23:44 AM	Aug 31, 2017, 8:23:45 AM
Earthquake	EQ_L_1111	Earthquake		Aug 31, 2017, 8:18:21 AM	Aug 31, 2017, 8:18:21 AM	Aug 31, 2017, 8:18:21 AM
Earthquake_Event	EQ_L_1338	Earthquake		Aug 31, 2017, 8:21:22 AM	Aug 31, 2017, 8:21:22 AM	Aug 31, 2017, 8:21:22 AM
Low	EQ_L_1328	Earthquake	Earthquake	Jun 30, 2017, 11:55:17 PM	Jun 30, 2017, 11:55:17 PM	Aug 31, 2017, 7:11:54 AM
Low	EQ_L_2057	Earthquake	Earthquake	Aug 31, 2017, 9:32:16 PM	Aug 31, 2017, 9:32:16 PM	Aug 31, 2017, 8:57:30 AM
Low	EQ_L_1138	Earthquake	Earthquake	Jun 28, 2017, 12:36:10 AM	Jun 28, 2017, 12:36:10 AM	Aug 30, 2017, 1:33:22 PM
Low	EQ_L_1329	Earthquake	Earthquake	Jun 30, 2017, 11:55:17 PM	Jun 30, 2017, 11:55:17 PM	Aug 31, 2017, 7:11:57 AM
Low	EQ_L_1330	Earthquake	Earthquake	Jun 30, 2017, 11:55:17 PM	Jun 30, 2017, 11:55:17 PM	Aug 31, 2017, 7:11:59 AM
Low	EQ_L_1331	Earthquake	Earthquake	Jun 30, 2017, 11:55:17 PM	Jun 30, 2017, 11:55:17 PM	Aug 31, 2017, 7:12:02 AM
Low	EQ_L_1332	Earthquake	Earthquake	Jun 30, 2017, 11:55:17 PM	Jun 30, 2017, 11:55:17 PM	Aug 31, 2017, 7:12:05 AM
Low	EQ_L_1333	Earthquake	Earthquake	Jun 30, 2017, 11:55:17 PM	Jun 30, 2017, 11:55:17 PM	Aug 31, 2017, 7:12:07 AM
Low	EQ_L_1334	Earthquake	Earthquake	Jun 30, 2017, 11:55:17 PM	Jun 30, 2017, 11:55:17 PM	Aug 31, 2017, 7:12:10 AM

STEP 8: To see the event details according to a particular date as well as month:

- ✓ Operator can view the earthquake events according to a date or month where it gives all the key aspects of the event and the operator can view the full details on clicking on the particular event.



Date	Name	Start Time	End Time	Duration	Data Source	Filter Pane
June 28	Earthquake	12:36 AM	12:36 AM	< 1 day	Earthquake	Earthquake
Operator can view the event details according to a particular date or month						
June 30	Earthquake	11:55 PM	11:55 PM	< 1 day	Earthquake	Earthquake
	Earthquake	11:55 PM	11:55 PM	< 1 day	Earthquake	Earthquake
	Earthquake	11:55 PM	11:55 PM	< 1 day	Earthquake	Earthquake
	Earthquake	11:55 PM	11:55 PM	< 1 day	Earthquake	Earthquake
	Earthquake	11:55 PM	11:55 PM	< 1 day	Earthquake	Earthquake
	Earthquake	11:55 PM	11:55 PM	< 1 day	Earthquake	Earthquake
	Earthquake	11:55 PM	11:55 PM	< 1 day	Earthquake	Earthquake
	Earthquake	11:55 PM	11:55 PM	< 1 day	Earthquake	Earthquake
	Earthquake	11:55 PM	11:55 PM	< 1 day	Earthquake	Earthquake

Solution will provide integrated data visualization, real-time collaboration, and deep analytics that can help leaders prepare for problems before they arise and to coordinate and manage problems as they occur, to improve the efficiency of operations.

Solution delivers the following major functions:

- Visual workspace
- Events and incident management
- Resource, response, and activity management
- Status monitoring
- Collaboration, instant notification, and messaging
- Reports
- Semantic model
- Preventive mechanism

This solution makes supervision and coordination of complex sub-systems more effective. The solution helps you evaluate the effectiveness of the decisions and applied procedures and make improvements. The solution helps to:

- Handle events and alerts, in both emergencies and non-emergencies.
- Organize response teams, enabling fast and clear communications between team members.
- Define and provide standard operating procedures for handling the different situations that arise, with the correct assignments, which are based on legal requirements or historical experience.
- Track the progress of the performance of those procedures, including the results of the actions.
- Locate resources with the required capabilities to handle the events.
- Enable the continuous improvement of the organization's services and responses.

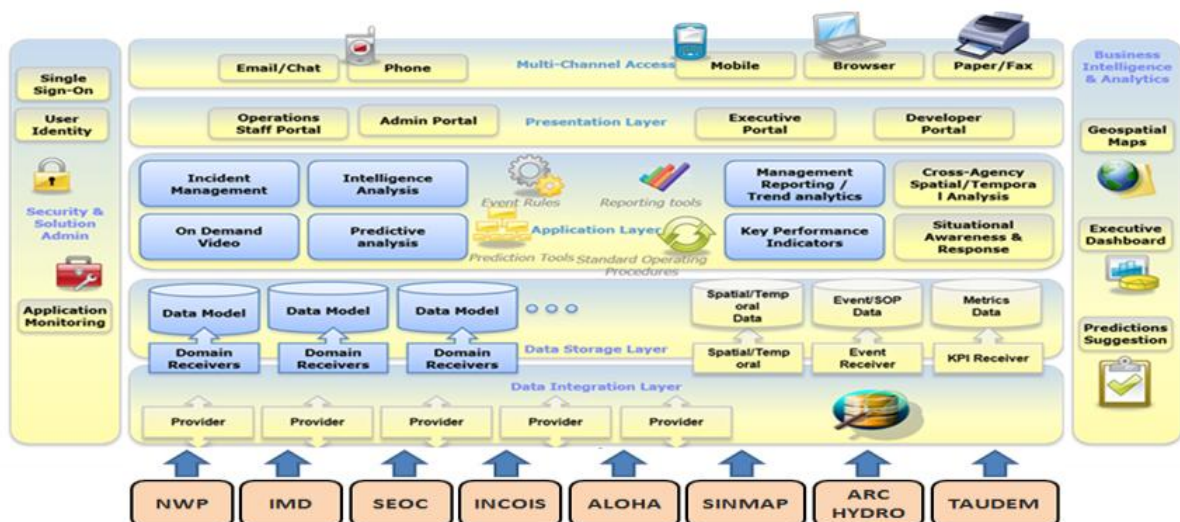
3. Solution Features, Functions and typical use case description

The following steps describe typical flows through the IBM Intelligent Operations Center solution infrastructure:

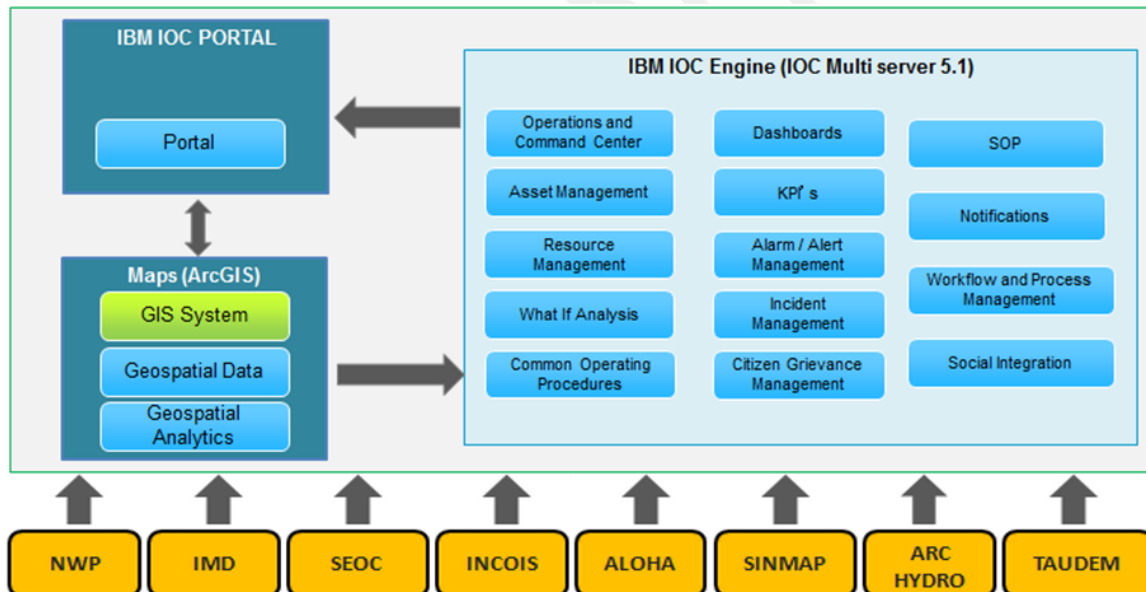
If IBM Intelligent Operations Center receives an event, it performs several actions to mediate or manage the event. Some of the actions include:

- Display the event as an item in the event list.
- Add an entry in the geospatial database and show the event location on the Map on the operator dashboard.
- Check the characteristics of the event against the SOP matrix, which maps event characteristics to specific procedures.
- If the event matches one of the defined SOPs, a new standard operating procedure workflow is initiated and is visible in the IBM Intelligent Operations Center portal My Activities window.
- Correlate events that are received within a specified time and location. For example, trigger a notification whenever two or more events happen within a specific period of time.
- Check the resources and capabilities database, link the event to the appropriate resource, and display the information in the user interface.

4. Solution Architecture



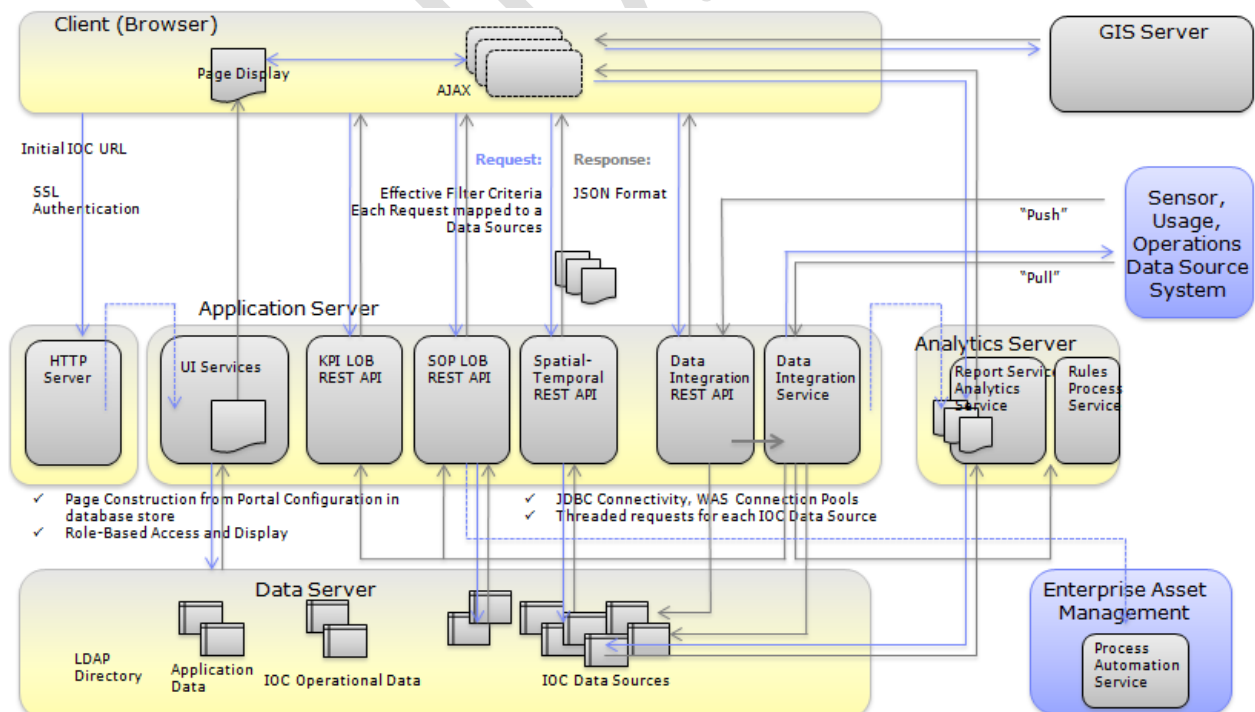
5. Integration Architecture and Approach



Integration approach to this user story is as follows.

1. REST Service based Integration: Alerts / data can be pushed from the subsystem using REST Services exposed by IOC

6. THE IOC 5.1 REQUEST/RESPONSE FLOW ARCHITECTURE



7. Conclusion:

Using this approach, we are able to achieve the following:

- Earthquake has been closed successfully.
- Verifying the details of the Earthquake if there is any event generated.
- Monitoring for emergency situation and providing quick response to the situation.
- Utilization of state resources and assets in an efficient way at the time of Earthquake.
- Analyzing the different types of Earthquakes and giving an insight to emphasize on events which needed to be taken care of.

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