Cube - Backend Engineer Assignment

Design and implement a Business rules framework on event streams, for operational alerts etc

There is a continuous stream of user activity events generated from multiple users as they use our mobile Cube app. Objective is to implement a server to ingest these events. The server will expose a http end-point to which the events would be posted. Also the server will contain an admin interface to specify business rules, that alert the operator (an engineer in the Cube Ops team) or trigger an action (like sending an alert sms to the end user), when certain criteria is met.

Event schema:

1. userid (integer) [Primary key of the user within Cube system - not null]
2. ts (string e.g 20170315 134850) [Time of the event, generated at source - not null]
3. lat long (string e.g 19.07, 72.87) [Location of event, generated at source]
4. noun [bill] (10 chars) other options could be fdbk [Noun and verb together identify what exactly happened]
5. verb [pay] (10 chars) other options could be post
6. time spent in seconds on that screen (integer) [If a user is on a mobile screen for n seconds(- measured from the time the screen was opened) before the event got generated, then the value n is passed in this field]
7. properties, json object arbitrary payload, key-value , e.g it may contain value of the bill pay transaction. [This varies from event to event, the meta data payload of the particular event]

Example events (these are json strings)

{"noun": "bill", "userid": 178765, "ts": "20170315 134850", "latlong": "19.07,72.87", "verb": "pay", "timespent": 72, "properties": {"bank": "hdfc", "merchantid": 234, "value": 139.5, "mode": "netbank"}}

{"noun": "fdbk", "userid": 178765, "ts": "20170315 145250", "latlong": "19.07,72.87", "verb": "post", "timespent": null, "properties": {"text": "the bank page took too long to load"}}

Rules could be

1. Trigger a push notification on very first bill pay event for the user
2. Alert user if 5 or more bill pay events of total value >= 20000 happen within 5 minutes time window
3. Alert cube operator if bill paid, but did not give feedback within 15 minutes of the bill pay event (bill pay, feedback posted are 2 different events)

The actions above like triggering push notifications etc can be mocked by calling dummy APIs and writing the call to a log file.

You may use any of these backend technologies (like Python, Nodejs, Java) to implement the above framework. For ingesting these events, you are expected to implement a REST API endpoint, that will consume these events that will be sent from a mobile app.

You may choose to store these events in a database of your preference (like MySQL, PostgreSQL or Redis). You will be assessed on simplicity of design, quality of code and attention to scalability and business flexibility concerns, esp in administering rules.

You may package the project as a docker image and send us a link through github with source code, clearly explaining the design and setup instructions to run the project.