**Java Work Sample**

*The Space Agency Data Hub is a work sample for EVERSIS Java developer applicants.*

# Space Agency Data Hub

## *Description*

Space agencies store their satellites images (products) in large data hubs. Product Content Administrator manages satellites missions and products of the data hub. Agency's Customers can search and order products.

Your task is to implement a sample data hub application.

## *Objective*

Assess OO analysis, design and skills with Java frameworks.

## *The Implementation*

Implement REST API and backend services for the satellites and its products management with the product ordering functionalities. This will be integrated with the cash register software which is being developed as a Spring application by a different team. Therefore our team only needs to provide the data access layer, the business logic, and REST API.

**Primary Features** (must be implemented)

- Expose the following REST API and implement functionality to support managing, searching and ordering products.
    - Process a Product Content Administrator mission management: add/edit/remove.
    - Process a Product Content Administrator products management: add /remove.
    - Process the products search by mission name, product type and product acquisition date (lower than, greater than, between two given dates).
    - Process the order of multiple products by the customer. Payment process shall not be implemented.

**Secondary Features** (if time allows)

- Expose the following REST API and implement functionality to support reporting.
    - Get the order history for a customer
    - Get a list of the most ordered products, missions.

**Tertiary Features** (for extra credit)

- Extend products search interface by the coordinates search. API shall return all products covering single point (latitude and longitude) passed as a part of the search query.

## *Data model*

The mission is described by the following properties:

- Unique mission name
- Imagery type – a type of images taken by the mission. Possible types are: Panchromatic, Multispectral, Hyperspectral
- Mission start date (UTC)
- Mission finish date (UTC)

The product is described by the following properties:

- Mission name which took the product image
- Product acquisition date – the date when the image was taken (UTC)
- Product footprint – four coordinates describing the area of the image
- Price – the price of the product
- Product URL – HTTP/FTP address where the product is stored in the external system. URL shall be hidden for the Customer until the order is processed. Assume that the URL is not secured in any way.

## *Interaction*

REST API shall be secured with HTTP Basic Authentication. Two roles shall be defined in the system:

- Content Manager – data hub administrator able to manage missions and products
- Customer – able to search and order products

There is no requirement to implement a registration process and user management. One user for each role shall be predefined, and their credentials shall be delivered with the start-up instruction.

## *Persistence*

Hibernate 4 or later should be used for persistence. This should be backed with an in-memory database for ease of implementation and testing.

## *Technology*

The following must be used:

- Java 8 or later
- IntelliJ IDEA or Eclipse IDE (complete project to be provided as a zipped archive)

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- Spring 4 or later
- Hibernate 4 or later
- Project shall contain the start-up instruction

## *Evaluation Criteria*

These are the main points we are looking at:

- OO design and usage (e.g., separation of concerns, encapsulation)
- Coding practices (e.g., comments, appropriate language constructs, self-documenting names, factored code)
- Unit testing (e.g., testability, proper assertions, edge and error cases)