NDB TOUR OPERATOR

Assignment: Modeling of an XML database to store the data of a tour operator.

Author: Nathalie DESCUSSE-BROWN

1. Database building

Filename: NDB_touroperator.xml

Web searching was used to review several tour operators website and see what typical website layout they use and what kind of information is provided on their sites. Based on this research, it was decided the include the following information in the database for each tour:

- Tour name
- Continent: America, Africa, Asia, Europe, Oceania.
- Country
- Tour type: Ecotourism, Wine Tasting, Adventure, Wildlife, Art& Culture, Food, Family, Beach, Cruise, City Break.
- Duration
- For each instance (i.e. occurrence) of that particular tour:
    - Start Date
    - Price
    - Guide
    - Clients booked on that tour
- Whether flights are included
- Whether transfers are included
- Budget: On a shoe string, Comfort, Luxury.
- Rating
- Description

2. Xml schema and associated considerations

Filename: NDB_touroperator.xsd

The schema was chosen with the aim to provide flexibility and long-term manageability. Another consideration was to ensure it enables the application of as many of the class learnings as possible. Hence, the schema makes use of namespace and keys.

```
<?xml version="1.0"?>
<?xml-stylesheet type="text/xsl" href="NDB_touroperator_Clients.xsl"?>
<!-- THIS IS THE DATABASE FOR ALL TOURS OFFERED BY NDBTOUROPERATOR-->
<ndb:TOURS
    xmlns:ndb="http://NDBtouroperator.fr/myvocabulary#"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://NDBtouroperator.fr/myvocabulary#  NDB_touroperator.xsd">
    <ndb:TOUR>
        <ndb:TOURNAME>Darwin to Sydney</ndb:TOURNAME>
        <ndb:DEST_CONTINENT contidref="con5">
            <ndb:DEST_COUNTRY countidref="con51" />
        </ndb:DEST_CONTINENT>
        <ndb:TOUR_TYPE typeidref="t3"/>
        <ndb:DURATION>16 days</ndb:DURATION>
        <ndb:INSTANCES>
            <ndb:INSTANCE>
                <ndb:START_DATE>2022-02-24</ndb:START_DATE>
                <ndb:PRICE>2799</ndb:PRICE>
                <ndb:TOURGUIDE guideref="g1" />
                <ndb:CLIENTS>
                    <ndb:TOURCLIENT clientref="cl1" />
                    <ndb:TOURCLIENT clientref="cl3" />
                </ndb:CLIENTS>
            </ndb:INSTANCE>
            <ndb:INSTANCE>
                <ndb:START_DATE>2022-05-13</ndb:START_DATE>
                <ndb:PRICE>2959</ndb:PRICE>
                <ndb:TOURGUIDE guideref="g2" />
                <ndb:CLIENTS>
                    <ndb:TOURCLIENT clientref="cl2" />
                    <ndb:TOURCLIENT clientref="cl4" />
                </ndb:CLIENTS>
            </ndb:INSTANCE>
        </ndb:INSTANCES>
        <ndb:FLIGHTS>1</ndb:FLIGHTS>
        <ndb:TRANSFERS>1</ndb:TRANSFERS>
        <ndb:TOUR_BUDGET budgidref="b1" />
        <ndb:RATINGS>
            <ndb:RATING>2</ndb:RATING><ndb:RATING>3</ndb:RATING><ndb:RATING>2.5</ndb:RATING>
        </ndb:RATINGS>
        <ndb:DESCRIPTION>This tours the East coast of Australia and will take you from Darwin to S
        </ndb:DESCRIPTION>
```

Figure 2-1: Project xml file structure

Flexibility is provided by adding a number of elements and providing as much information as possible for each tour, which will subsequently enable the developers to slice and dice the data in different ways for reporting purposes. For example, it is possible to extract cost information for all tours, or by type of tour or country.

Manageability is provided via the use of keys, which means that every time a tour will be added to the database, it will be quicker to add the continent/country/type/budget code instead of having to hard-code it, which also remove possibility of typing errors.

The inconvenience of such a schema however is that it may be harder to read by another developer. Also, it may not be easy to sort using elements that are both nested and make use of a key such as start date.

3. Use Case 1: Simple list of all tours available

Filename: NDB_touroperator_all_list.xsl

This use case is aimed at both client users and tour operator staff users.

This use case is about providing a simple list of tours and all associated details. It provide the overall number of tours available and also aggregates all instances of the tour to give available star dates and price range (minimum price and maximum price for that tour, depending on start date). The tour list is sorted alphabetically by tour name.

Output: NDB_touroperator_all_list.html (please note the tabs that display when directly opening the source xml file with IE somehow disappear in the html file so the rendering is not as neat)

4. Use Case 2: Table of all tours available for families

Filename: NDB_touroperator_family_table.xsl

This use case is aimed at client users.

It filters tours of type 'family' and displays it in a table format, ordered by ascending duration, so family can choose which tour to book depending on how long they want to be away from home for.

Output: NDB_touroperator_family_table.html

5. Use Case 3: Average Tour Rating per Continent

Filename: NDB_touroperator_avgrating.xsl

This use case is aimed at tour operator staff users.

It provides the average tour rating for each continent, enabling the tour operator to know whether to modify their offers in some specific continents. If there is no tour planned or no rating given for tour on that continent, a message is displayed instead. Sorting is done by continent name.

A similar approach could be taken to add granularity to the country level.

Output: NDB_touroperator_avgrating.html

6. Use Case 4: List of Guides and Associated Tours

Filename: NDB_touroperator_guide.xsl

This use case is aimed at tour operator staff users.

It modified the xml format to display it as a list of all guides working for the tour operator and lists all tours that are currently assigned to them. It may be useful to do a quicky check of which guides

are overbooked and which ones are underused. We could consider adding more information to this database about the guide in the future if we have this available.

Output: NDB_touroperator_guides.xml

7. Use Case 5: List of Clients and Associated Tours in json

Filenames: NDB_touroperator_clients.xsl and NDB_touroperator_clients_schema.json

This use case is aimed at tour operator staff users.

It modified the xml format to display it in a json format as a list of all clients booked on tours offered by the tour operator and lists all tours that they have currently booked including their start date. It may be useful to do a quicky check of which clients are regular customers and which ones are not, so marketing can be targeted more efficiently. We could consider adding more information to this database about the clients in the future if we have this available, such as address, ratings they have given in the past etc.

The associated jsonschema is also provided.

Output: NDB_touroperator_clients_OUTPUT.json

8. Testing

Testing was performed by first checking against xsd, xsl and json validators referenced in Section 9. The visualizations (Sections 3 to 5) were also directly checked for rendering with Internet Explorer.

9. Tools used

The project was performed in **Windows10** environment and visualizations were validated by viewing the xml file directly with Internet Explorer and the html output file with Firefox.

Most of the editing was performed with **Notepad++** v8.1.9.3 64-bit with xml and json plugins.

A number of online tools were also used for validation purpose:

- xsd validation: Free Online XML Validator Against XSD Schema - FreeFormatter.com
- xsl validation: Free Online XSL Transformer (XSLT) - FreeFormatter.com
- json validation: Json Parser Online
- json schema validation: JSON Schema Validator - Newtonsoft