Great Moonstone Oxen of the First and Forsaken Oceans

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Introduction

What is the problem?

It's often easy to forget the many crises occurring throughout the world. This site is designed to gather the data on every crisis, and present in a simple format. We gather details about victims, and information on organizations and people that want to help.

What are the use cases?

With the increasing availability of telecommunication access and this site makes use of this to share news and help victims. This site can be a good source for anyone looking to get informed and help. We can provide contact information for people and organizations involved in helping the victims of crises around the world. People who want to help can look to our site for the best ways to get involved, whether it be donating to the right charities or volunteering at a local site.

DESIGN

XML Schema

Our class has been divided into separate groups for this project, but most groups have agreed upon a shared schema for XML. The schema as of the latest version is printed here, but the latest version can be found with this link.

Updated schema on Github

```xml
 1 <?xml version="1.0" ?>
 2 <!-- XSD for World Crises database -->
 3 <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">
 4     <xsd:element name="WorldCrises">
 5         <xsd:complexType>
 6             <xsd:sequence>
 7                 <xsd:element name="Crisis" type="CrisisType" minOccurs="1" maxOccurs="unbounded"
                        />
 8                 <xsd:element name="Person" type="PersonType" minOccurs="1" maxOccurs="unbounded"
                        />
 9                 <xsd:element name="Organization" type="OrgType" minOccurs="1" maxOccurs="
                        unbounded" />
10             </xsd:sequence>
11         </xsd:complexType>
12
13         <!-- All keys and keyrefs go here -->
14         <xsd:key name="CrisisKey">
15             <xsd:selector xpath="Crisis" />
16             <xsd:field xpath="@ID" />
17         </xsd:key>
18         <xsd:keyref name="CrisisKeyRef_Person" refer="CrisisKey">
19             <xsd:selector xpath="Person/Crises/Crisis" />
20             <xsd:field xpath="@ID" />
21         </xsd:keyref>
22         <xsd:keyref name="CrisisKeyRef_Org" refer="CrisisKey">
23             <xsd:selector xpath="Organization/Crises/Crisis" />
24             <xsd:field xpath="@ID" />
25         </xsd:keyref>
26
27         <xsd:key name="PersonKey">
28             <xsd:selector xpath="Person" />
29             <xsd:field xpath="@ID" />
30         </xsd:key>
31         <xsd:keyref name="PersonKeyRef_Crisis" refer="PersonKey">
32             <xsd:selector xpath="Crisis/People/Person" />
33             <xsd:field xpath="@ID" />
34         </xsd:keyref>
35         <xsd:keyref name="PersonKeyRef_Org" refer="PersonKey">
36             <xsd:selector xpath="Organization/People/Person" />
37             <xsd:field xpath="@ID" />
38         </xsd:keyref>
39
40         <xsd:key name="OrgKey">
41             <xsd:selector xpath="Organization" />
42             <xsd:field xpath="@ID" />
43         </xsd:key>
44         <xsd:keyref name="OrgKeyRef_Crisis" refer="OrgKey">
45             <xsd:selector xpath="Crisis/Organizations/Org" />
46             <xsd:field xpath="@ID" />
47         </xsd:keyref>
48         <xsd:keyref name="OrgKeyRef_Person" refer="OrgKey">
49             <xsd:selector xpath="Person/Organizations/Org" />
50             <xsd:field xpath="@ID" />
51         </xsd:keyref>
52     </xsd:element>
53
54     <xsd:complexType name="CrisisType">
55         <xsd:sequence>
```

```xml
56                    <xsd:element  name=" People"  minOccurs="0"  maxOccurs="1">
57                        <xsd:complexType>
58                            <xsd:sequence>
59                                <xsd:element  name=" Person"  type=" PersonWithID"  minOccurs="1"  maxOccurs="
                                    unbounded"  />
60                            </ xsd:sequence>
61                        </ xsd:complexType>
62                    </ xsd:element>
63                    <xsd:element  name=" Organizations"  minOccurs="0"  maxOccurs="1">
64                        <xsd:complexType>
65                            <xsd:sequence>
66                                <xsd:element  name=" Org"  type=" OrgWithID"  minOccurs="1"  maxOccurs="
                                    unbounded"  />
67                            </ xsd:sequence>
68                        </ xsd:complexType>
69                    </ xsd:element>
70
71                    <xsd:element  name=" Kind"  type=" xsd:token"  minOccurs="0"  maxOccurs="1"  />
72                    <xsd:element  name=" Date"  type=" xsd:date"  minOccurs="0"  maxOccurs="1"  />
73                    <xsd:element  name=" Time"  type=" xsd:time"  minOccurs="0"  maxOccurs="1"  />
74                    <xsd:element  name=" Locations"  type=" ListType"  minOccurs="0"  maxOccurs="1"  />
75                    <xsd:element  name=" HumanImpact"  type=" ListType"  minOccurs="0"  maxOccurs="1"  />
76                    <xsd:element  name=" EconomicImpact"  type=" ListType"  minOccurs="0"  maxOccurs="1"  />
77                    <xsd:element  name=" ResourcesNeeded"  type=" ListType"  minOccurs="0"  maxOccurs="1"  />
78                    <xsd:element  name=" WaysToHelp"  type=" ListType"  minOccurs="0"  maxOccurs="1"  />
79                    <xsd:element  name=" Common"  type=" CommonType"  minOccurs="0"  maxOccurs="1"  />
80                    <xsd:any  minOccurs="0"  />
81                </ xsd:sequence>
82                <xsd:attribute  name=" ID"  type=" CrisisIDType"  use=" required"  />
83                <xsd:attribute  name=" Name"  type=" xsd:token"  use=" required"  />
84            </ xsd:complexType>
85
86            <xsd:complexType  name=" PersonType">
87                <xsd:sequence>
88                    <xsd:element  name=" Crises"  minOccurs="0"  maxOccurs="1">
89                        <xsd:complexType>
90                            <xsd:sequence>
91                                <xsd:element  name=" Crisis"  type=" CrisisWithID"  minOccurs="1"  maxOccurs="
                                    unbounded"  />
92                            </ xsd:sequence>
93                        </ xsd:complexType>
94                    </ xsd:element>
95                    <xsd:element  name=" Organizations"  minOccurs="0"  maxOccurs="1">
96                        <xsd:complexType>
97                            <xsd:sequence>
98                                <xsd:element  name=" Org"  type=" OrgWithID"  minOccurs="1"  maxOccurs="
                                    unbounded"  />
99                            </ xsd:sequence>
100                       </ xsd:complexType>
101                   </ xsd:element>
102
103                   <xsd:element  name=" Kind"  type=" xsd:token"  minOccurs="0"  maxOccurs="1"  />
104                   <xsd:element  name=" Location"  type=" xsd:token"  minOccurs="0"  maxOccurs="1"  />
105                   <xsd:element  name=" Common"  type=" CommonType"  minOccurs="0"  maxOccurs="1"  />
106                   <xsd:any  minOccurs="0"  />
107               </ xsd:sequence>
108               <xsd:attribute  name=" ID"  type=" PersonIDType"  use=" required"  />
109               <xsd:attribute  name=" Name"  type=" xsd:token"  use=" required"  />
110           </ xsd:complexType>
111
112           <xsd:complexType  name=" OrgType">
113               <xsd:sequence>
114                   <xsd:element  name=" Crises"  minOccurs="0"  maxOccurs="1">
115                       <xsd:complexType>
116                           <xsd:sequence>
117                               <xsd:element  name=" Crisis"  type=" CrisisWithID"  minOccurs="1"  maxOccurs="
                                   unbounded"  />
118                           </ xsd:sequence>
119                       </ xsd:complexType>
120                   </ xsd:element>
121                   <xsd:element  name=" People"  minOccurs="0"  maxOccurs="1">
122                       <xsd:complexType>
123                           <xsd:sequence>
124                               <xsd:element  name=" Person"  type=" PersonWithID"  minOccurs="1"  maxOccurs="
                                   unbounded"  />
125                           </ xsd:sequence>
126                       </ xsd:complexType>
```

```
127                  </xsd:element>
128
129                  <xsd:element name="Kind" type="xsd:token" minOccurs="0" maxOccurs="1" />
130                  <xsd:element name="Location" type="xsd:token" minOccurs="0" maxOccurs="1" />
131                  <xsd:element name="History" type="ListType" minOccurs="0" maxOccurs="1" />
132                  <xsd:element name="ContactInfo" type="ListType" minOccurs="0" maxOccurs="1" />
133                  <xsd:element name="Common" type="CommonType" minOccurs="0" maxOccurs="1" />
134                  <xsd:any minOccurs="0" />
135              </xsd:sequence>
136              <xsd:attribute name="ID" type="OrgIDType" use="required"/>
137              <xsd:attribute name="Name" type="xsd:token" use="required" />
138      </xsd:complexType>
139
140      <xsd:complexType name="CommonType">
141          <xsd:sequence>
142              <xsd:element name="Citations" type="ListType" minOccurs="0" maxOccurs="1" />
143              <xsd:element name="ExternalLinks" type="ListType" minOccurs="0" maxOccurs="1" />
144              <xsd:element name="Images" type="ListType" minOccurs="0" maxOccurs="1" />
145              <xsd:element name="Videos" type="ListType" minOccurs="0" maxOccurs="1" />
146              <xsd:element name="Maps" type="ListType" minOccurs="0" maxOccurs="1" />
147              <xsd:element name="Feeds" type="ListType" minOccurs="0" maxOccurs="1" />
148              <xsd:element name="Summary" type="xsd:token" minOccurs="0" maxOccurs="1" />
149          </xsd:sequence>
150      </xsd:complexType>
151
152      <xsd:complexType name="ListType">
153          <xsd:sequence>
154              <xsd:element name="li" minOccurs="1" maxOccurs="unbounded">
155                  <xsd:complexType mixed="true">
156                      <xsd:attribute name="href" type="xsd:token" />
157                      <xsd:attribute name="embed" type="xsd:token" />
158                      <xsd:attribute name="text" type="xsd:token" />
159                  </xsd:complexType>
160              </xsd:element>
161          </xsd:sequence>
162      </xsd:complexType>
163
164      <xsd:complexType name="CrisisWithID">
165          <xsd:attribute name="ID" type="CrisisIDType" use="required" />
166      </xsd:complexType>
167
168      <xsd:complexType name="PersonWithID">
169          <xsd:attribute name="ID" type="PersonIDType" use="required" />
170      </xsd:complexType>
171
172      <xsd:complexType name="OrgWithID">
173          <xsd:attribute name="ID" type="OrgIDType" use="required" />
174      </xsd:complexType>
175
176      <xsd:simpleType name="CrisisIDType">
177          <xsd:restriction base="IDType">
178              <xsd:pattern value="CRI_[A-Z]{6}" />
179          </xsd:restriction>
180      </xsd:simpleType>
181
182      <xsd:simpleType name="PersonIDType">
183          <xsd:restriction base="IDType">
184              <xsd:pattern value="PER_[A-Z]{6}" />
185          </xsd:restriction>
186      </xsd:simpleType>
187
188      <xsd:simpleType name="OrgIDType">
189          <xsd:restriction base="IDType">
190              <xsd:pattern value="ORG_[A-Z]{6}" />
191          </xsd:restriction>
192      </xsd:simpleType>
193
194      <xsd:simpleType name="IDType">
195          <xsd:restriction base="xsd:token">
196              <xsd:length value="10" />
197          </xsd:restriction>
198      </xsd:simpleType>
199 </xsd:schema>
```

Figure 1. The XML schema

Implementation

Source Code

Most of the code, including the *import* and *export* scripts, are done in Python. The website is delivered using Django and the site is designed using Twitter's Bootstrap. The data is stored to a MySQL server on campus. Most of the separate groups have already shared data. Our database already holds data from all of the shared groups, as well as our own.

Folder Structure

The model of the data structure can be seen below. The root folder *must* be named *wcdb*. If downloading from *Github*, it is necessary to rename the cloned folder to *wcdb*. Inside the *wcdb* folder, there are three folders *crises*, *scripts*, and *static*. The *crisis* folder contains the *crisis* application and the standard *Django* files, including *models.py*, which has details about the table structure, and *tests.py*, which contains most of our unit tests.

```
wcdb/
     crises/
     scripts/
     static/
          css/
          html/
          img/
          js/
          templates/
          xml/
```

Figure 2. The Folder Layout

Data Model

The core of our data model starts with the tables *Crisis*, *Organizations*, *Person*. These three tables all have a many to many relation between each other. We have a *Common* table to hold data these three models can all have.

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Crisis, emphOrganizations, and *Person* can have 0 or 1 *Common* objects. We have an abstract model, *AbstractListType*. The database will never write an *AbstractListType*, but abstract types are useful when scripting. The types *CommonListType* and *CrisisListType* both inherit from *AbstractListType*. *CrisisListType* will hold data for *Crisis* objects, and *CommonListType* will hold data for *Common*.

Import

Import is implemented as a Python script, in the root folder of the application. It reads in an XML file as input, parse the information, and stores the applicable data into the database for future viewing. The XML file must conform to the schema in Figure 1. Otherwise, no data will be imported *Import* is password protected, and only site administrators may run this script. Running import is done on the website. There is a link in the navbar that reads *Import*. From this page, an administrator may select a file and upload the information.

Export

Export is implemented as a Python script, in the root folder of the application. It takes the data stored in the database and writes into a new XML file conforming to the schema in Figure 1. *Export* does not require administrator access. Any user may export the data in this database by clicking the *Export* link from the navigation bar.
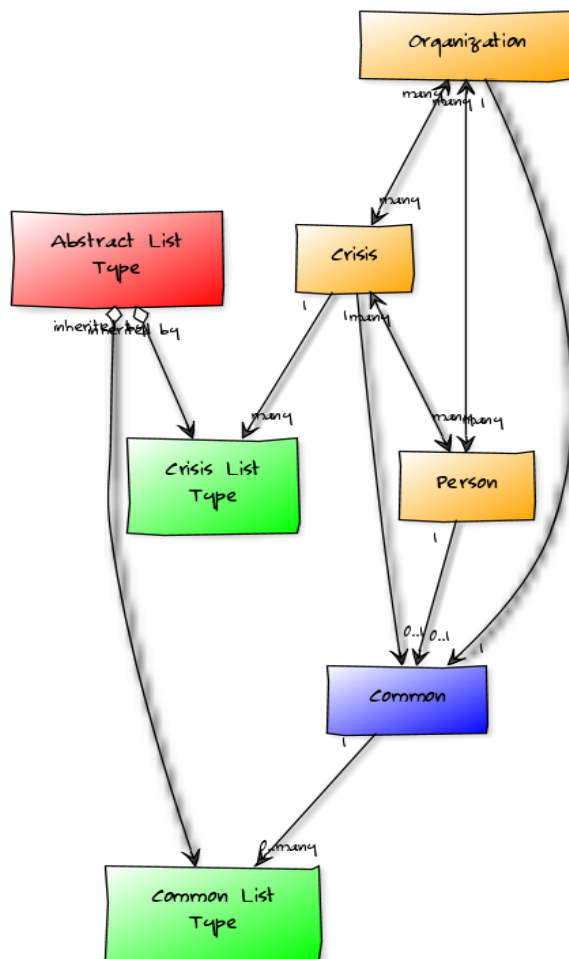
Figure 3. A diagram of our data model

TESTING

Testing is done using tools provided by *Django* and *unittest*. To run the tests, run the command **python manage.py test**. This command will run the unit tests using *SQLite3*. *SQLite3* was used for faster unit testing. *MySQL* will be used for testing in later phases of development to ensure the code is runing properly on our production environment.

unittest

OTHER