

*WEB TECHNOLOGIES AND SYSTEMS (DEGREE IN COMPUTER SCIENCE)*

# DJANGO WEB 3.0 RDFa TUTORIAL

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## INTRODUCTION

In order to introduce semantic markup, particularly RDFa markup<sup>1</sup>, into a Django application, it is necessary to modify the templates generating the HTML pages for the application. In this tutorial, it is illustrated how to add the necessary markup to the `restaurant_detail.html` template generating the web page with the details for a particular restaurant.

The markup will be based on vocabularies that are widely recognized by the main search engines (Google, Yahoo!, Microsoft Bing,...) and that are available from <http://schema.org>

Particularly, from the `schema.org` vocabularies, the following types and some of their properties and corresponding types are used for the semantic markup:

- <http://schema.org/Restaurant>
- <http://schema.org/Review>

## GENERATING THE RDFa MARKUP FROM A TEMPLATE

The starting point is the restaurant details HTML template:

`myrestaurants/templates/myrestaurants/restaurant_detail.html`

The modified template, as before, continues to extend the base template. It also defines a page title containing the restaurant name by replacing the default “title” block:

```
{% extends "myrestaurants/base.html" %}
{% block title %}MyRestaurants - {{ restaurant.name }}{% endblock %}
{% block content %}
```

Then, we introduce a `<span>` element (not visible) that defines the default vocabulary `schema.org` and a new entity of type `http://schema.org/Restaurant`. We also introduce a property for the restaurant entity, the **name**:

```
<span vocab="http://schema.org/" typeof="Restaurant">
  <h1>
    <span property="name">{{ restaurant.name }}</span>
    {% if user == restaurant.user %}
      (<a href="{% url 'myrestaurants:restaurant_edit' restaurant.id %}">edit</a>)
    {% endif %}
  </h1>
```

The part corresponding to the restaurant address has not been modified, though there are properties and types that might be useful here. There is not any markup for the dishes list either:

```
<h2>Address:</h2>
<p>
```

<sup>1</sup> <http://www.w3.org/TR/xhtml1-rdfa-primer/>

```

    {{ restaurant.street }}, {{ restaurant.number }} <br/>
    {{ restaurant.zipcode }} {{ restaurant.city }} <br/>
    {{ restaurant.stateOrProvince }} ({{ restaurant.country }})
</p>

<h2>
  Dishes
  {% if user.is_authenticated %}
    (<a href="{% url 'myrestaurants:dish_create' restaurant.id %}">add</a>)
  {% endif %}
</h2>
<ul>
  {% for dish in restaurant.dish_set.all %}
    <li>
      <a href="{% url 'myrestaurants:dish_detail' restaurant.id dish.id %}">
        {{ dish.name }}</a>
      </li>
    {% empty %}
      <li>Sorry, no dishes for this restaurant yet.</li>
    {% endfor %}
</ul>

```

The main markup is for the reviews. There is first an aggregate rating with the average rating and the number of reviews. This is a new entity of type **AggregateRating** connected to the restaurant through the **aggregateRating** relation. The **AggregateRating** has two properties, the **ratingValue** and the **reviewCount**:

```

<h2>Reviews</h2>
{% if restaurant.restaurantreview_set.all|length > 0 %}
<span rel="aggregateRating">
  <p typeof="AggregateRating">
    Average rating
    <span property="ratingValue">{{ restaurant.averageRating|stringformat:".1f" }}</span>
    {% with restaurant.restaurantreview_set.all|length as reviewCount %}
      from <span property="reviewCount">{{ reviewCount }}
    </span> review{{ reviewCount|pluralize }}
    {% endwith %}
  </p>
</span>

```

Then, each **Review** entity is connected to the restaurant using the **review** relation. The review has a **Rating**, linked to the **Review** through the **reviewRating** property, a **description**, an **author** and a **publishDate**. The **Rating** has the properties **worstRating** with the minimum possible rating, **bestRating** for the maximum rating and **ratingValue** for the actual rating for the review.

```

<ul rel="review">
  {% for review in restaurant.restaurantreview_set.all %}
    <li typeof="Review">
      <p rel="reviewRating" typeof="Rating">
        <span property="worstRating" content="{{ RATING_CHOICES.0.0 }}"></span>
        <span property="ratingValue">{{ review.rating }}</span>
        star{{ review.rating|pluralize }}
        {% with RATING_CHOICES|last as best %}
          <span property="bestRating" content="{{ best.0 }}"></span>
        {% endwith %}
      </p>
      <p property="description">{{ review.comment }}</p>
      <p>Created by <span property="author">{{ review.user }}</span> on
      <span property="publishDate">{{ review.date }}</span></p>
    </li>
  {% endfor %}
</ul>
</span>
{% endif %}

```

The rest of the template, which also remains unchanged, contains the form to add reviews and the footer block:

```

<h3>Add Review</h3>
<form action="{% url 'myrestaurants:review_create' restaurant.id %}" method="post">
  {% csrf_token %}
  Message: <textarea name="comment" id="comment" rows="4"></textarea>
  <p>Rating:</p>
<p>

```

```

    {% for rate in RATING_CHOICES %}
      <input type="radio" name="rating" id="rating{{ forloop.counter }}"
        value="{{ rate.1 }}" />
      <label for="choice{{ forloop.counter }}">{{ rate.1 }}
        star{{ rate.0|pluralize }}</label><br />
    {% endfor %}
  </p>
  <input type="submit" value="Review" />
</form>

{% endblock %}

{% block footer %}
  Created by {{ restaurant.user }} on {{ restaurant.date }}
{% endblock %}

```

## GENERATED HTML INCLUDING RDFa MARKUP

```

<!DOCTYPE html>
<html lang="en">
<head>
  ...
  <title>MyRestaurants - La Taberna de la Cuarta Esquina</title>
</head>
<body>
<div id="header">
  <p>User roberto (<a href="/accounts/logout/?next=/myrestaurants/">logout</a>)</p>
</div>
<div id="sidebar">
  <ul><li><a href="/myrestaurants/">Home</a></li></ul>
</div>
<div id="content">
<span vocab="http://schema.org/" typeof="Restaurant">
<h1><span property="name">La Taberna de la Cuarta Esquina</span>
  (<a href="/myrestaurants/restaurants/1/edit/">edit</a>)
</h1>
<h2>Address:</h2>
<p>
  Las Cuatro Esquinas, 16 <br/>
  Calahorra <br/>
  La Rioja (Spain)
</p>
<h2>Dishes (<a href="/myrestaurants/restaurants/1/dishes/create/">add</a>)</h2>
<ul>
  <li><a href="/myrestaurants/restaurants/1/dishes/1/">Parrillada de verduras</a></li>
  <li><a href="/myrestaurants/restaurants/1/dishes/3/">Risotto con bacalao y borraja</a></li>
  <li><a href="/myrestaurants/restaurants/1/dishes/4/">Chuletón</a></li>
</ul>
<h2>Reviews</h2>
<span rel="aggregateRating">
  <p typeof="AggregateRating">
    Average rating <span property="ratingValue">4.5</span>
    from <span property="reviewCount">2</span> reviews
  </p>
</span>
<ul rel="review">
  <li typeof="Review">
    <p rel="reviewRating" typeof="Rating">
      <span property="worstRating" content="1"></span>
      <span property="ratingValue">5</span> stars
      <span property="bestRating" content="5"></span>
    </p>
    <p property="description">La parrillada de verduras es excelente. </p>
    <p>Created by <span property="author">roberto</span> on
      <span property="publishDate">March 31, 2014</span></p>
  </li>
  <li typeof="Review">
    <p rel="reviewRating" typeof="Rating">
      <span property="worstRating" content="1"></span>
      <span property="ratingValue">4</span> stars
      <span property="bestRating" content="5"></span>
    </p>

```

```

        <p property="description">No está mal el chuletón :-)</p>
        <p>Created by <span property="author">roberto</span> on
          <span property="publishDate">May 10, 2014</span></p>
      </li>
</ul>
</span>
<h3>Add Review</h3>
...
</body>
</html>

```

## TESTING THE RDFa MARKUP WITH GOOGLE

In order to test the RDFa markup with the Google Structured Data Testing tool, there is the Google Structured Data Testing tool available from:

<https://search.google.com/structured-data/testing-tool>

You can paste the HTML generated by the template including the schema.org markup. The output shows the recovered data, highlighting warnings and errors if any:

Restaurant		0 ERROR 0 WARNING ^
@type	Restaurant	
name	La Taberna de la Cuarta Esquina	
aggregateRating		
@type	AggregateRating	
ratingValue	4.5	
reviewCount	2	
review		
@type	Review	
description	La parrillada de verduras es excelente.	
datePublished	2014-03-31	
reviewRating		
@type	Rating	
worstRating	1	
ratingValue	5	
bestRating	5	
author		
@type	Thing	
name	roberto	
review		
@type	Review	
description	No está mal el chuletón :-)	
datePublished	2014-05-10	
reviewRating		
@type	Rating	
worstRating	1	
ratingValue	4	
bestRating	5	
author		
@type	Thing	
name	roberto	

Another useful tool to test the generated RDFa, especially its structure, is <http://rdfa.info/play/>

For instance, for the previous RDFa its generates the following visualization that facilitates checking if the markup is the intended one:

