

Implementing Tourism Service Based on Linked Data with Social Experiments

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Abstract. The purpose of this paper is to implement a web service with Linked Data and evaluating the service. These days, Japanese government sets Open Data as a new strategy and focuses on "Linked Open Data (LOD)". However, experiments to show the effect by consuming Linked Data have not been conducted yet. We implemented a tourism service with Linked Data. Moreover, we conducted social experiments on verification of our tourism service. As a result, the possibilities of Linked Data to respond to various queries easily and to apply for information services were explored.

Keywords: Linked Data, Tourism, Mobile application

1 Introduction

Recently, Japanese government sets Open Data as a new strategy and focuses on "Linked Open Data (LOD)". However, experiments to show the effect by consuming Linked Data have not been conducted yet. The purpose of this study is to develop a web service with Linked Data and to evaluate the service. Therefore we implemented a tourism service which makes users to drop in a tourist spot as a case study. Finally we evaluated the service through verification experiments.

A representative service using Linked Data is "DBpedia Mobile" [1], which is an application to display a map containing information about nearby locations based on the current GPS position. Users can explore background information about locations and can navigate into DBpedia and other interlinked datasets. Conventional applications including DBpedia Mobile, however, are not evaluated their usefulness by appropriate experiments. Okawara [2] implemented a mobility service based on Japa-

nese Linked Data and conducted a verification experiment. He gives details on creating and consuming Japanese Linked Data. However, his experiment does not really evaluate the application because the users are very few in his experiment.

2 Implemented System

Our system can be divided into two sections, creating Japanese Linked Data and Tourism service. Fig 1 shows an overview of system.

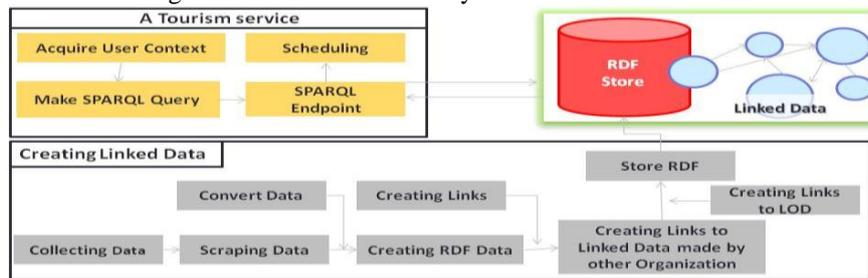


Fig. 1 System Overview

2.1 Creating Linked Data

In this step, we employ the method to create Japanese Linked Data from a conventional system "A Mobility Service based on Japanese Linked Data" [2] and also consume some Linked Data stated in the paper such as Expressway Linked Data and Traffic Regulations Linked Data. We created tourism information Linked Data, coupon information Linked Data and Linked Data of photos on Flickr newly. The links between datasets and an example of their model are shown in Fig2.

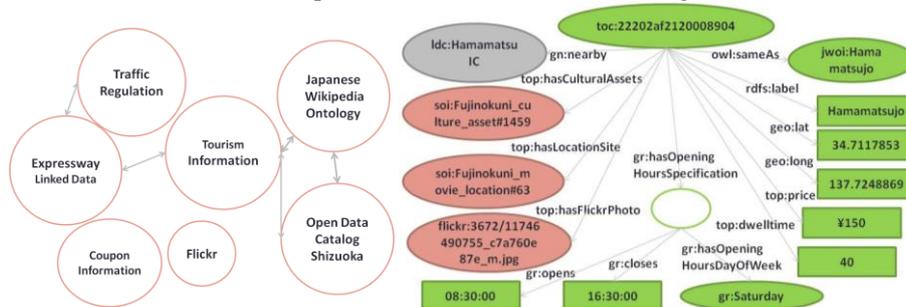


Fig. 2 Links between Datasets and an Example of its Model

Tourism information Linked Data is converted from CSV files created by students of Shizuoka University who are familiar with the area our service provided. It contains information of tourist spots and what tourist can enjoy there. Coupon information Linked Data is a dataset of coupons used at tourist spots. Linked Data of Flickr is dataset of photos taken at tourist spots. Additionally, we link our Linked Data with Open Data Catalog Shizuoka and Japanese Wikipedia Ontology [3]. Open Data Cata-

log Shizuoka is an open dataset composed of various information owned by Shizuoka prefecture. The total number of triples used in our service is 195665. We stored them in a database and set up a SPARQL endpoint.

2.2 A Tourism Service

We implemented our application targeting drivers on an expressway and based on the presupposition that they use our application while taking rest on SA/PA or driving. Therefore, our application is a web application for smart phones. For the sake of helping user to find appropriate tourist spots, our application provides 11 functions. These functions are divided into 2 merger functions, recommendation and search.

Our application recommends tourist spots to users by analyzing contexts of users. The application asks users some question to know the type of group, their interests, available time and money. The application makes a query based on the user context and sends query to get locations matching for the user. Fig3 presents an example of an user context and the SPARQL query based on it.

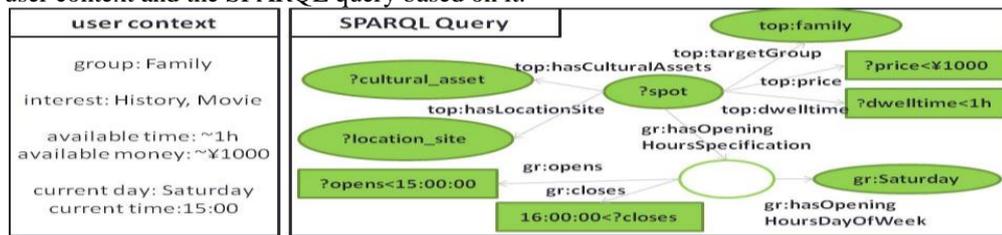


Fig. 3 An Example of User Context and SPARQL Query

Users can also search tourist spots by themselves. We prepare 10 search methods, for example, users can search location of a movie in “Location search”. In this method, application gets a title and description about a movie. Users can refer the casts and detail of the movie from Japanese Wikipedia Ontology.

You can access our application in the following URL. <http://tatiyori.jp>

3 Experiments and Results

If users decide to drop in a tourist spot, it costs much money and time. Therefore we would like to emphasize that it is difficult to make user drop in a tourist spot.

Table 1. Contents of Verification Experiment

	Preparing Experiment	Social Experiment
Period	January 25, 2014 (1day)	June 6, 2014~ July 7, 2014(1month)
SA/PA	Hamanako SA, Hamamatsu SA	Kamigo SA, Makinohara SA, Hamanako SA, Hamamatsu SA

We conducted a social experiment on verification of our tourism service. Before the experiment, we also conducted an experiment for preparing. Table1 shows the contents of these experiments.

3.1 Preparing Experiment

In this experiment, 10 students asked tourists to use our application actively and interviewed to fill questionnaires in the SAs. The number of tourists was 63. 4 tourists dropped in tourist spots and 12 tourists undecided to drop in or not. According to the questionnaires, tourists were prior recommendation to searching. Actually 74% tourists answered that they wanted to visit spots recommended.

3.2 Social Experiment

In this experiment, 10 students passed out leaflets about our experiments in the SAs on Saturday and Sunday. They didn't ask tourists to use our application actively in this experiment differently from the preparing experiment. Not only passing out leaflets, we spread our experiment by news papers, posters and web pages. The number of unique mobile accesses was 554 and 35 tourists showed possibility of dropping in. According to the activity logs, 17 tourists found the spots they dropped in because these spots were affordable compared with their available money. The target tourists have strong constraints because they have to arrive at their goal on time. Our service is helpful for them in looking for appropriate spots rapidly because it can respond their request more flexible than conventional tourism web services thanks to Linked Data and SPARQL.

4 Conclusion and Future Works

In this paper, we implemented a web application consuming Linked Data and conducted social experiments on verification of our tourism service. In these experiments, the possibilities of Linked Data to respond to various queries easily and to apply for information services were explored. For the future work, we improve our recommendation system by applying other semantic web technology such as OWL.

References

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