VaTIS: A Travel Information Service for the City of Valletta, Malta

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ABSTRACT

This paper highlights the concepts behind the Valletta Travel Information Service (VaTIS) Project, an intelligent information system capable of harvesting data from a road pricing system using automatic number plate recognition (ANPR) technology and low cost sensors installed throughout the city of Valletta, Malta. In this paper, we describe the different elements of VaTIS and report on the first phase of the system, which has already been implemented using data from the camera system in place in Valletta and secondary data on travel behaviour to the city. Both authors act as observers, having been involved in the design and subsequent operational procedures of the road pricing system. The initial evaluation of phase 1 shows the potential benefits of smart applications and sensors for the management of travel demand and effective use of limited infrastructure and provides opportunity for further development of such applications to include user engagement and potential behaviour change.

KEYWORDS

Beacons, Road Pricing, Travel information, Valletta, VaTIS

INTRODUCTION

In 2002, the European Commissioner for the Environment Margot Wallstrom established Car Free Day as a European initiative for the new millennium. Its aim was to get cities to raise awareness of the environmental issues related to traffic. In so doing, urban centres could be seen through a different perspective by restricting motorised traffic in certain areas and encouraging sustainable modes of transport instead. This concept was eventually extended and became known as European Mobility Week (http://www.mobilityweek.eu). It is held between the 16 and 22 of September and involves hundreds of cities from 40 countries around Europe.

In 2014, the Local Council of Valletta, the capital city of Malta partnered with the Institute for Climate Change and Sustainable Development of the University of Malta and applied for the European Mobility Week Awards organised by Transport Malta, the islands transport regulator. The aim of the awards was to raise awareness of European Mobility Week amongst Local Councils, whilst promoting the concepts and principles of Sustainable Urban Mobility Plans (SUMPs). All the 68 Local Councils were invited to submit a SUMP for their locality and list projects for funding. This national competition provided, for the first time, an opportunity for localities to action sustainable mobility measures, and in the process, contribute to reducing the burden of transport on the environment and public health. The Valletta Local Council submitted an application for the award and managed to place first amongst all the applicants. The application proposed up to 15 measures, which encouraged
sustainable mobility through projects across the City. The Valletta Travel Information Service (VaTIS) Project was created by combining a number of the proposed measures based on the objectives and requirements of the City.

The VaTIS project aims to deliver a reliable, technology driven, crowd sourced information service that would contribute to the alleviation of traffic in and around the City of Valletta. Because of this, the main objectives of the project are:

- Engaging travelers to use and contribute information about their journeys
- Developing software and an app to provide an interface for users to access and provide information
- Developing a website with travel information to encourage and support people in shifting modes of transport
- Using real time information to ensure better simulation and accurate information being relayed to the end user
- Delivering a reliable, technology driven, crowd sourced information service about travel to and from the City

Through the use of monitoring equipment, wireless and mobile technology the project builds on existing data collection infrastructure, used for the operation of a road pricing system in Valletta, and aims to develop a network of Bluetooth sensors to collect further traffic information. Microscopic road traffic simulation software will be used (such as SUMO\(^1\) or AIMSUN\(^2\)) to predict traffic patterns in and around the City to identify high traffic densities in and around the city. Finally, a mobile app will be able to communicate information about traffic in and around Valletta whilst at the same time, collect personal travel information from users (through crowd sourcing) to further improve the information service. Through the app, the system will provide drivers with information about their journey whilst collecting data about the user travel behaviour. This will guide drivers on whether to make the journey by car, or might point them towards a faster, less congested route. The system can scale up to include road closure information and other information, which are relevant and affect drivers and their travel behaviour. A website with travel information will support the project to encourage drivers to use also other means of transport to the City, especially if congestion is high. Real-time road traffic information in the city area will be collected, monitored and provided back to the users in a digitised form.

The project is divided into three main phases:

1. Phase 1 will make use of data from the Valletta road pricing system in order to get real-time information about the number of vehicles entering and exiting the city.
2. Phase 2 will see the deployment of Bluetooth sensors throughout the city, which will provide fine grade information about users.
3. Phase 3 will focus on the deployment of the crowd sourcing platform and website which will help collect and share information.

The paper investigates the potential of sensor and mobile technologies to support sustainable mobility goals for cities. This paper describes the various phases of the VaTIS project and will provide evaluation results of the first phase which has already been implemented and tested in this on-going project.

This paper contributes to the extensive literature on smart applications for city mobility. Even though data has been available for the past decade, it was hardly ever used. This is a pity when considering the potential, which live information can offer to commuters approaching the city. Through this project, we will create the necessary underlying infrastructure in order to deploy smart applications over this network. In the initial phases, we will also provide some basic smart services. This will lead us towards designing higher levels of abstractions using conceptual graphs and logical inferences.
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