Chapter 7
Social Internet of Vehicles:
A GCC (Gulf Cooperation Council) Perspective

Talal A. Butt
American University in the Emirates, UAE

Razi Iqbal
American University in the Emirates, UAE

Mounir Kehal
Higher Colleges of Technology, UAE

ABSTRACT

Advent of internet of things (IoT) has significantly enriched the opportunities of crafting state-of-the-art applications of smart connected objects. Intelligent transportation systems (ITS) are playing a vital role in the development of smart systems for transportation throughout the world. Based on IoT, the internet of vehicles (IoV) paradigm is emerging to revolutionize the field of ITS. In this paradigm, vehicles leverage the use of internet for socializing with other vehicles, infrastructures, passengers, and drivers. This concept of vehicle socialization is referred to as social internet of vehicles (SIoV). This chapter presents the GCC (Gulf Cooperation Council) perspective of SIoVs by highlighting the latest trends being followed by GCC countries in the broader field ITS. It also provides an insight into opportunities enabled by SIoV applications that can be availed by GCC countries along with the challenges and limitations.

INTRODUCTION

The Internet of Things (IoT) paradigm aims to lead us to a new era of computing where the Internet will expand to include billions of new types of devices. The IoT is based on the idea of integrating everyday smart objects equipped with sensors to the Internet. This way these heterogeneous objects become capable to communicate with each other and to provide ubiquitous services, which opens a new vista of possibilities. All this pervasiveness will be enabled by sensors that range from battery-less Radio Frequency Identification (RFID) to sensor devices equipped with many sensors. These devices sense different physical phenomenon and can actuate different tasks. The Cloud computing will provide the required infrastructure to gather and analyze the data generated by these sensors. This infrastructure will enable different applications by enabling the provision of end-to-end service. The analysis of this data will be important for businesses and governments, and eventually will become a key to create new business models.

The Social Internet of Things (SIoT) concepts envisions to enable consciousness in the IoT by enabling social networking among the IoT devices (Atzori, L., Iera, A., Morabito, G., & Nitti, M. (2012)). These devices will be able to socialize with each other and create social circles based on mutual interests and goals. This application of social networking will re-use the existing social network models and will address the IoT specific issues such as scalability. Furthermore, the IoT devices will build trust-based relationships and will leverage these relationships for service provisioning. SIoT will enable the feasibility of managing the ever-growing number of devices in IoT.

Internet of Vehicles (IoV) is an emerging concept derived from its parent domain, Internet of Things (IoT). The idea of IoV refers to the dynamic mobile communication between vehicles, infrastructure, drivers and the passengers. This communication is sub-divided in to V2V (Vehicle to Vehicle) when vehicles communicate with each other, V2I (Vehicle to Infrastructure) when vehicles communicate with RSUs (Road Side Units) and V2H (Vehicle to Human) when vehicles communicate with drivers or the passengers of the vehicles. The key advantage of IoV is information sharing between different entities that can greatly benefit in improving the traffic on road. IoV promises great commercial interest and wide horizon for research that attracts a lot of researchers and companies (Maglaras et. al, 2016). All time connected environment for vehicles on roads provides enormous opportunities for governmental and non-governmental organizations to connect with the drivers on the roads. For example, Traffic Regulatory Authorities can inform drivers to take an alternate route if there is an accident on the road ahead, or if construction work is in progress. This information can be directly integrated into vehicle navigation systems

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