

Collective Intelligence based eBusiness Opportunities in Smart City Environments

Artemis Avgerou
Imperial College, Business School,
London SW7 2AZ, United Kingdom.
artemisavg@gmail.com

Dimitra Nastouli
Dept. of Business Administration, University of Patras,
Rio, Patras 26504, Greece.
nastouli@upatras.gr

Panayiotis Nastou
Dept. of Mathematics, University of the Aegean,
Karlovassi, Samos, Greece.
pnastou@agean.gr

Panos Pardalos
Dept of Industrial and Systems Engineering,
University of Florida, Gainesville, USA.
pardalos@ufl.edu

Yannis Stamatiou
Dept. of Business Administration, University of Patras, and
Computer Technology Institute & Press – “DIOPHANTUS”, Greece
Rio, Patras 26504, Greece.
stamatiau@ceid.upatras.gr

Abstract

The term *collective intelligence* refers to the emergence of actions, data and information through the collaboration of large numbers of individuals equipped with devices with sensing, computational and communications capabilities (e.g. mobile phones and tablets). Collective intelligence applications rely on gathering and processing numerous data streams, such as environmental variables, location coordinates, and on-site conditions from large numbers of individuals residing in dispersed geographical locations. It is this simultaneity and massiveness of data that creates opportunities for new types of applications with unprecedented applicability and usefulness for society. The fundamental idea behind collective intelligence is that massiveness and randomness (e.g. unpredictability in people's positions or local experiences) gives rise to the emergence of structures, information and data which may be impossible to create and/or find otherwise.

Collective Intelligence, in conjunction with the facilities offered by smart cities, appears to offer new opportunities for creating applications and services that go beyond those of today's e-Commerce models. According to these models, an individual connects to and interacts with a service site which contains the information on which the service relies (e.g. ordering tickets, paying electronically, buying goods etc.). Smart cities, on the other hand, are characterized by the existence of Wide Area or Metropolitan wireless networks that connect their citizens, by dispersed data collection sensor/ad-hoc networks that continuously gather environmental or other information and make it available as well as advanced eGovernment connectivity (e.g. civic data). In the proposed work we propose an alternative Business model that offers business opportunities based on the capabilities of smart cities and collective intelligence in creating useful information out of multiple data streams from individuals. In our work, we describe how an entrepreneur may develop services that involve individuals that can interact among themselves and the smart city facilities in order to create alerts and useful information about things of broad interest. For instance, individuals may send on-line to the service the information whether a central parking facility is still relatively empty, if a store has sales and on which products, as well as off-line information about good eCommerce sites. Other individuals may consult this information at any time, even in real-time. Of importance for the success of such a

service is to have a mechanism of reputation management and awards for participating individuals, which we will also discuss in the full paper. The new element in this paradigm is that human intelligence and machines' computational power merge, by means of the Internet, towards creating "collective intelligence" which aims at a concept which is "more than the sum of its parts". Our study will also examine an equally important aspect of this eBusiness model which concerns the privacy of the individuals since the data and information they provide may uncover sensitive and/or identifying information about them.

As we will explain in the full paper, we believe that such a collective intelligence/smart city combination can create new business opportunities at relatively small start-up cost and provide to people added-value services on top of their combined capabilities.