The 6th International Conference on Ambient Systems, Networks and Technologies (ANT 2015)

From mobile data towards better customer knowledge: proposals for an information framework

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Abstract

Along with the development of internet connected devices, Mobile Marketing is expected to be ubiquitous in the near future. In order to deliver right mobile offers, the need to better know the customer is now crucial. This article develops a theoretical marketing framework to categorise the most relevant information linked to mobile data which complements traditional CRM data models. Three dimensions are identified: context, time line and source of the information. The matching of this framework with the current and future mobile technologies is then analysed.

1. Introduction

Wearable mobile devices like smart phones, smart watches and smart glasses can nowadays be considered as unique sensors of human life. Most people carry one or several of them almost all the time in their everyday life more than other technological devices such as laptops or tablets and they consider them as personal[1]: under normal circumstances, people usually do not share them with their partners or anyone else. At the same time, mobile devices reveal useful information for many research fields: urban planning, epidemiology, sociology, marketing, security,... Some research fields like urban planning consider a community of mobile users as a single unity of focus. Others, like marketing, define the mobile user as the first level of analysis.

For this marketing context, to build a 360° view of the customer is an important task: the more the overview of the customer is complete, the more marketeers will be able to target him or her with custom offers. Researchers in mobile marketing indeed agree on the need for strong relevance of propositions[1,2,3,4,5]: messages have to be targeted to a specific user at a given point of time. For example, taking into account the current location of the user is seen as important. To make offers appropriate, a good understanding of all information available is consequently crucial to avoid the customer's deciding to opt out (that is, asking to get no more offers).

In Customer Relationship Management (CRM) literature, a 360° view of the customer is usually based on a data model designed for a specific business: socio-demographic data of the customer are coupled with transactional data

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and with inbound/outbound interactions between the customer and the company to get an overview of the past and current activity of the customer. To the best of our knowledge, no complete CRM data model including customer mobile data has been published. As mobile marketing is expected to grow in the future, the various information highlighted by such a model would offer a framework to conceive new data mining models. This paper investigates how to structure mobile device data into specific pieces of information about the mobile user for marketing purposes. The proposed theoretical framework organizes mobile data into a complementary view of the mobile user. Then, issues about concrete current and future mobile data are reviewed within this framework from a technical point of view.

The rest of the paper is organized as follows. In section 2, we discuss current research on CRM data models and position our proposal with respect to the state of the art. In section 3, our typology of the different information collected by mobile devices is proposed. Three dimensions are designed: the first two dimensions position the mobile user in his/her context and time; the third dimension is focused on the source of data. In section 4, the typology is compared with the current mobile technology. The sources of the data are discussed. Section 5 assesses the model's robustness to the potential incorporation of future technological developments. The last section concludes our contribution and foresees future work.

2. Background

Let us draw a brief overview of marketing literature to shed some light on the content of customer data with a focus on information coming from mobile data. Then we conclude this section by introducing our proposition of theoretical framework.

In the scientific literature[6,7,8], customer data are recognised as one of the different elements of the CRM data model. These data are however not further highlighted beyond the common sense that customer data include socio-demographic details. For example, Chan[7] proposes an integrated CRM framework where customer data is in the heart of the model and connected to external and internal CRM data sources of the company. This source is however not further described.

Specific CRM Models explicitly including mobile customer data are so far scarce. Starting from the strategic marketing goals of a company, Ghose et al.[9] elaborate a framework identifying some selected research issues linked to the use of mobile devices by their customers. In its agenda overview 2014 of mobile marketing[10], Gartner proposes a data model where the history and the interests of the mobile customer are analysed according to four factors (time, location, context and community) to develop the mobile marketing strategy of the company. These two approaches focus on some parts of mobile data but they do not consider all kinds of mobile data.

Along with the development of mobile commerce, the recommender system literature has recently explored the value of contextual information to make recommendations more appropriate where the context is considered as any supplementary information other than the users'ratings and products'features. Adomavicius et al.[11] define four kinds of context in their review of context aware recommendations systems: physical context, interaction media contexts, social context and modal context.

Our framework extends the approach developed by Adomavicius et al. by extending the scope of the modal context (called personal situation in our proposal), reconsidering the different kinds of interactions and by adding two supplementary dimensions: the time line and source of data. Moreover, our approach focuses on the specific case of mobile devices. Compared to traditional CRM models presented above, this proposal is not a substitute but complements these models: the digital traces left by mobile devices are the opportunity to enrich the customer information part of these models. Our framework, called mobile 3D (M3D) model, is presented in the next section.

3. The mobile 3D model

The M3D model classifies mobile information according to three dimensions. The first dimension represents the mobile user in his/her situation and his/her interactions later referred to as context. The second dimension considers the time line as a major feature to analyse the evolution of the context. The last dimension is a more technical dimension: it indicates if the information is directly obtained from mobile data or inferred from these data.