Telematics and Informatics 32 (2015) 539–563

Contents lists available at ScienceDirect

Telematics and Informatics

journal homepage: www.elsevier.com/locate/tele

Let's Meet! A participatory-based discovery and rendezvous mobile marketing framework

Lampros Ntalkos [a], Georgios Kambourakis [a], Dimitrios Damopoulos [b,*]

[a] Department of Information and Communication Systems Engineering, University of the Aegean Karlovassi, GR-83200 Samos, Greece
[b] Department of Computer Science, Stevens Institute of Technology, Hoboken, NJ 07030, USA

ARTICLE INFO

Article history:
Received 13 August 2014
Received in revised form 8 December 2014
Accepted 13 December 2014
Available online 13 January 2015

Keywords:
Smartphones
Mobile app
Mobile marketing
Security
Rendezvous system
Privacy

ABSTRACT

Modern mobile devices are nowadays powerful enough and can be used toward defining a new channel of communication with potential consumers. This channel is commonly known as mobile marketing and there is already a number of mobile marketing apps, whose aim is to increase the sales of some product or service. In this context, the Let's Meet! framework presented in this paper is essentially a mobile marketing app. The app groups two or more persons, who basically do not know each other, having as sole criterion their common interest in an offer about a product or a service. Its main objective is to bring them together, so that they can purchase and enjoy an offer, which otherwise could not afford. One of the highlights of our proposal is that all sensitive user data are transmitted in a secure manner, and thus confidentiality is preserved. Users' privacy is also given great consideration. This means for example that the exact geographic locations of the users are never shared with others. For user authentication, Let's Meet! supports both a complete anonymous mode and OAuth 2.0. The framework's main objective, which is to bring the users together, is guaranteed by means of a one-time coupon, generated by the OCRA algorithm, while the final face-to-face user group meeting is achieved through Wi-Fi Direct technology. Moreover, the app implements a smart queueing system for increasing its efficiency. Every possible effort is made to maximize both the number of products being sold and the number of users that eventually enjoy an offer. Finally, a user rating system has been adopted, which rewards any user attitude that helps towards improving the framework's competence. The above qualities make Let's Meet! a novel proposal when considering similar works in the literature so far.

Published by Elsevier Ltd.

1. Introduction

Marketing is defined as any activity carried out in order to promote products or services and to approach potential consumers. It is not a new concept at all but throughout the years the methodology and the techniques used change constantly. Actually, it is the available technology that defines the means used to reach hopefully a great mass of consumers. Lots of years ago, newspapers and magazines were the only available ways to do so. Radio and TV appeared next, followed by the Internet. Nowadays, perhaps the most advanced means of reaching users are mobile devices, which combine the speed and penetration of the Internet with the portability and personalization features of the so-called smartphones. In this

* Corresponding author at: Stevens Institute of Technology, Castle Point on Hudson, Hoboken, NJ 07030, USA. Tel.: +1 2018447079.
E-mail address: ddamopou@stevens.edu (D. Damopoulos).

http://dx.doi.org/10.1016/j.tele.2014.12.002
0736-5853/Published by Elsevier Ltd.

context, according to Kaplan (2012), mobile marketing is any marketing activity which is conducted through a ubiquitous network to which consumers are constantly connected using their personal mobile device. These devices appear to be the most suitable for any marketing approach, since they provide high-speed and constant access to a variety of short or long range wireless data networks, either through Wi-Fi, WiMAX or 3G/4G, and they also tend to be described as personal.

The penetration of mobile devices in our lives is constantly increasing. According to eMarketer.com, by the end of 2014, one out of four people in the world will possess a smartphone. This is equal to 1.75 billion people or 1.75 billion potential consumers, when speaking in terms of marketing. On the other hand, large amount of money is invested in mobile marketing. eMarketer.com also estimates that by the end of 2014, $31,45 billion will have been spent worldwide for placing ads in mobile apps. This amount of money is collected by huge advertising companies, Google and Facebook being the first.

Further, the customization and personalization of mobile ads have proved to be of great importance. Targeted advertisements ensure that the right person receives the right message at the right time (Adam, 2002). To achieve this, user-specific information must be retrieved to generate tailored content. User profiles must be built and include demographics, such as the user's age, gender and occupation, as well as preferences, such as what she likes to eat or drink, what kind of entertainment she enjoys or what kind of places she is used to visit. This is actually long-term information and does not change often. On the other side, the context of the user can also be used to generate content that is most suitable to her. The context is described as short-term and it may be the user's location, the current time or the activity she is engaged into.

Users may identify great value in receiving customized messages, but privacy concerns may also arise when disclosing their personal information. It is therefore up to each user to decide how much information about herself she is willing to disclose and how much valuable the return will be. Privacy is defined as the ability of the individual to control the terms under which personal information is acquired and used (Fraenkel and Westin, 1967; Kambourakis, 2014). When a mobile app user is given the ability to control in detail which information about her is disclosed, then her privacy is being respected and this person feels comfortable to use this app (Loukas et al., 2012). On the contrary, improper handling of user data could result in the discovery of consumer identity and behavior, which may be used for unsolicited marketing or price discrimination (Damopoulos et al., 2013; Kobsa, 2007). Moreover, it is the individuals' own experiences and characteristics that affect their attitude regarding privacy. Any previous privacy invasion experiences, personal innovativeness and coupon proneness play an important role (Xu et al., 2011).

Contribution of this work: We propose a mobile marketing framework, coined Let's Meet!, that puts emphasis on user's privacy. Let's Meet! groups two or more people, who basically do not know each other, having as sole criterion their common interest in an offer about a product or a service. Its main objective is to bring them together, so that they can purchase and enjoy the offer, which otherwise could not afford. So, Let's Meet! collects and publishes offers by different vendors, while the end-users can access them through a mobile app. It thus can be seen as a medium of promoting products or services with the end-users being (almost) constantly connected to this network. The system relies on a client/server architecture, where the server (broker) keeps information about offers and interacts with the users, while the client (a mobile app) enables a user to review the available offers, express her interest in, say, one of them and receive feedback about which other users are also interested in the same offer and which is their approximate location. Eventually, the system makes user groups of appropriate size and guides the group members to a face-to-face contact, so that they can complete the purchase.

A real case scenario would include a published offer, where for every two tickets to a cinema movie, one is given for free. This means that two users are required to purchase one packet of this offer and essentially every user can enjoy a 50% discount. If the movies company decided to give away 10 packets of this offer, then 20 users in total can benefit from this. So, as long as the offer has not expired, a mobile user can find out how many users have claimed it so far and whether the maximum limit of 20 participants has been reached or exceeded. She can then claim the offer herself, and only then she is given access to the approximate geographical locations of the rest of the participants.

The highlights of the proposed framework are:

- User's privacy is well preserved. Among others, the geographical location of a user as seen by peers is relative, no personal data are kept in log files or transmitted elsewhere, all communications are performed over a secure channel. The user can be authenticated by a third party, but she can also stay totally anonymous.
- The system's efficiency is strengthened by implementing a queueing system. A user is encouraged to express her interest in an offer, even when no vacancies exist, and the system will try to include her in a group, if a user of higher priority withdraws her own interest or fails to appear in time at the offer location.
- The system adopts a rating process, based on the users' reliability. Punctual users are rewarded, while misbehaving ones may be penalized in some of their future transactions.
- For an offer to be sold, the group peers need to communicate via Wi-Fi Direct technology (Wi-Fi Alliance, 2013) and reassemble a one-time coupon originally generated by the broker.

Every company that wishes to reach more customers and finally increase its profits could potentially decide to use this framework. In this work, the architecture suggested includes a third-party broker, where offers from all possible producers are collected. So, movies companies, as in the example above, taxi companies, restaurants and cafés, all publish their offers on a single location that a mobile user can browse. But this infrastructure can as well be established in a local area, e.g.,

دریافت فوری ← متن کامل مقاله

ISIArticles
مرجع مقالات تخصصی ایران

✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
✓ امکان دانلود نسخه ترجمه شده مقالات
✓ پذیرش سفارش ترجمه تخصصی
✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
✓ دانلود فوری مقاله پس از پرداخت آنلاین
✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات