ABSTRACT
The work here presented introduces a next generation context-aware architecture for social networking multimedia distribution. It enhances the Multimedia Broadcast Multicast Service (MBMS) and the Evolved MBMS (E-MBMS) systems by adding users’ situation knowledge on their assessments allowing Mobile Operators to offer personalized services delivered over optimized networks. Furthermore, it evolves IP Multimedia Subsystem (IMS) with specific functionalities to control the context information and to manage MBMS and E-MBMS bearers. The proposed framework was tested and the results are here presented. A clever content sharing in mobile communities can be the basis of the famous killer application that Mobile Operators are still looking for.

Keywords: Context, Evolved MBMS (E-MBMS), IP Multimedia Subsystem (IMS), Multimedia Broadcast Multicast Service (MBMS), Procedures, Testing

1. INTRODUCTION
Human socialization tends to be mainly done behind mobile terminals. Users on the move intend to have a ubiquitous access to their mobile services with no limitations. They require communicating between each other while accessing their favourites’ contents. They claim for the very last news while sharing their favourite videos. Mobile Operators need to face the new reality: their clients are already multimedia addicted, always requiring new services, always sharing new contents.

Mobile Operators are still out of the run in what respects to Social Networks and it doesn’t seem it might revert in the near future.
They are just basic bit pipes linking clients to very profitable social networking services. Facebook is clearly the famous and successful example of a social network community permanently sharing multimedia contents (http://www.facebook.com/). Mobile Operators need to pace their developments if they intend to have a major role in this lucrative universe that they are supporting. They need to start offering personalized services efficiently distributed over improved networks.

Mobile Operators can make use of the Multimedia Broadcast Multicast Service (MBMS) and of the Evolved MBMS (E-MBMS) to effectively deliver rich media contents to user groups. These systems were specified by 3rd Generation Partnership Project (3GPP) to provide Multicast and Broadcast connections in the Universal Mobile Telecommunications System (UMTS) and in the Evolved Packet System (EPS) networks allowing saving resources due to the shared channels usage (3GPP TS 23.246 V9.5.0, 2010).

Mobile Operators are already using context information to improve their services. In fact they have services where they deliver the most appropriate content based on their clients’ location. But they can go further; Mobile Operators can gather statistics on the most viewed channels by their customers, the most accessed sites, the use of specific services or even information of their online shopping profile. Moreover, the sensor networks technologies are by now being spread all over the world fostering the Internet of Things vision. The information gathered from these networks is of remarkable value since it can be used to derive the users’ situation. But its importance can be even higher when handling communications’ groups such as the ones targeted by the MBMS and the E-MBMS systems. Context information can be managed by clever services to define groups of users that demand the same content. Furthermore, the knowledge of the mobile clients’ surroundings shall also be employed to perform an effectively multimedia content distribution to mobile communities.

Next Generation Networks (NGN) resorts to IP Multimedia Subsystem (IMS) to assure a global convergence where the service functionalities are agnostics from the access technologies (3GPP TS 23.228 V5.14.0, n.d.). In order to support context-aware MBMS and E-MBMS systems it is required specific enhancements in the standard IMS architecture to enable the context information management while assuring the multimedia content distribution to users’ groups over Unicast, Multicast and Broadcast connections.

This article extends the work presented in Cabral Pinto, Videira, Carapeto, and Dinis (2010) by enhancing the devised framework towards an architecture capable of an effective context-aware multimedia content distribution to users groups, opening the doors to Mobile Operators, allowing them entry in the Social Networks world. It is here defended the association between context, E-MBMS and IMS systems enabling suitable multimedia sharing within mobile communities on Next Generation Networks. The main sequence flow charts are here introduced demonstrating the service and transport management. Finally, several performance and conformance results are shown gathered from a developed testbed.

The rest of this article is as follows: in Section 2 it is described the main motivation for the work carried out; Section 3 focus on the logical framework definition allowing the IMS, E-MBMS and context-awareness integration; in Section 4 it is proposed an architecture to assure an intelligent and effective multimedia content distribution in the social network communities; the main session management procedures allowing the service provisioning to the Mobile Operators’ customers are detailed in Section 5; in Section 6 it is presented the key results of the work performed; finally, Section 7 summarizes the main conclusions.
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