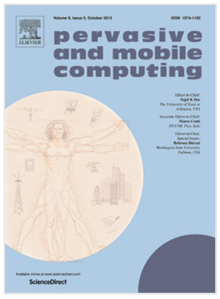
Accepted Manuscript



An empirical analysis of energy consumption of cross-platform frameworks for mobile development

Matteo Ciman, Ombretta Gaggi

PII: S1574-1192(16)30317-0
DOI: http://dx.doi.org/10.1016/j.pmcj.2016.10.004
Reference: PMCJ 777

To appear in: *Pervasive and Mobile Computing*

Received date: 12 July 2016
Revised date: 4 October 2016
Accepted date: 21 October 2016

Please cite this article as: M. Ciman, O. Gaggi, An empirical analysis of energy consumption of cross-platform frameworks for mobile development, *Pervasive and Mobile Computing* (2016), http://dx.doi.org/10.1016/j.pmcj.2016.10.004

An Empirical Analysis of Energy Consumption of Cross-platform Frameworks for Mobile Development

Matteo Ciman[1], Ombretta Gaggi[a]

[a]*Department of Mathematics, University of Padua, Padua, Italy*

Abstract

The increasing fragmentation of mobile devices market has created the problem of supporting all the possible mobile platforms to reach the highest number of potential users. One possible solution is to use cross-platform frameworks, that let develop only one application that is then deployed to all the supported target platforms. Currently available cross-platform frameworks follow different approaches to deploy the final application, and all of them has *pros* and *cons*. In this paper, we evaluate and compare together the current frameworks for cross-platform mobile development considering one of the most important aspect when dealing with mobile devices: energy consumption. Our analysis shows and measure how the adoption of cross-platform frameworks impacts energy consumption with respect to the native mobile development, identifies which are the most consuming tasks, and tries to define a final rank among all the different approaches. Moreover, we highlight future development necessary to improve performances of cross-platform frameworks to reach native development performances.

Keywords: Energy consumption, mobile development, performance measurement, web technologies, cross-platform frameworks

1. Introduction

Smartphones are rapidly becoming more and more present in everyday life of users. Thanks to their increasing computing capabilities and an ample set of different sensors, e.g., accelerometer, barometer, environmental thermometer, etc., smartphones play both the role of mobile workstations and of augmented devices, able to sense the environment and monitor user activities. Smartphones can be used for context awareness [1], user activity recognition [2, 3], health monitoring [4], etc.

*Corresponding author
Email addresses: Matteo.Ciman@unige.ch (Matteo Ciman), gaggi@math.unipd.it (Ombretta Gaggi)