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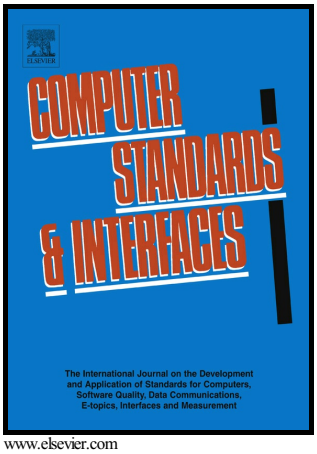

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PII: S0920-5489(17)30021-1
DOI: http://dx.doi.org/10.1016/j.csi.2017.01.004
Reference: CSI3189

To appear in: *Computer Standards & Interfaces*

Received date: 1 April 2016
Revised date: 2 January 2017
Accepted date: 15 January 2017

Cite this article as: Jacky Akoka, Isabelle Comyn-Wattiau and Nabil Laoufi Research on Big Data - A systematic mapping study, *Computer Standards & Interfaces,* http://dx.doi.org/10.1016/j.csi.2017.01.004

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ACCEPTED MANUSCRIPT

Research on Big Data - A systematic mapping study

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Abstract. Big Data has emerged as a significant area of study for both practitioners and researchers. Big Data is a term for massive data sets with large structure. In 2012, Big Data passed the top of the Gartner Hype Cycle, attesting the maturity level of this technology and its applications. The aim of this paper is to examine how do researchers grasp the big data concept? We will answer the following questions: How many research papers are produced? What is the annual trend of publications? What are the hot topics in big data research? What are the most investigated big data topics? Why the research is performed? What are the most frequently obtained research artefacts? What does big data research produces? Who are the active authors? Which journals include papers on Big Data? What are the active disciplines? For this purpose, we provide a framework identifying existing and emerging research areas of Big Data. This framework is based on eight dimensions, including the SMACIT (Social Mobile Analytics Cloud Internet of Things) perspective. Current and past research in Big Data are analyzed using a systematic mapping study of publications based on more than a decade of related academic publications. The results have shown that significant contributions have been made by the research community, attested by a continuous increase in the number of scientific publications that address Big Data. We found that researchers are increasingly involved in research combining Big Data and Analytics, Cloud, Internet of things, mobility or social media. As for quality objectives, besides an interest in performance, other topics as scalability is emerging. Moreover, security and quality aspects become important. Researchers on Big Data provide more algorithms, frameworks, and architectures than other artifacts. Finally, application domains such as earth, energy, medicine, ecology, marketing, and health attract more attention from researchers on big data. A complementary content analysis on a subset of papers sheds some light on the evolving field of big data research.

Keywords: Big Data, systematic mapping study, framework, artefact, usage, analytics.

Accepted manuscript

1. INTRODUCTION

Nowadays, organizations and individuals generate large amounts of data at a very high rate. With an impressing amount of data arriving at an exabyte scale, new insights can be obtained from their contents. The latter will help organizations to gain richer insights and improve their competitive position. Moreover, it is generally accepted that relevant information obtained using Big Data technologies will enhance enterprises efficiency and competitiveness.

International Data Corporation (IDC) found that the created and copied data volume in the world was 1.8 zettabites (ZB). It is estimated that this figure will double every other two years in the near future [1]. [2] asserts that Big Data can improve the potential value of the US medical industry estimated at

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