A Ubiquitous Approach for Next Generation Information Systems

Tarek H. El-Basuny

Department of Information and Computer Science,
King Fahd University of Petroleum and Minerals,
Dhahran 31261, Saudi Arabia, Mail Box 413,
Tel: 966-3-860-1967 & Fax: 966-3-860-2174,
Email: helmy@ccse.kfupm.edu.sa

Abstract

Recently, the spread of mobile technologies and communication infrastructures has made
the vision of ubiquitous computing much more realistic and feasible. At the same time,
agent technologies have attracted a lot of interest in both academe and industry as an
emerging programming paradigm. We present the system, which is being developed as a
multi-agent-based approach that lets the users ubiquitously retrieve more relevant
information from the distributed Web portals. In particular, we developed agent-based
framework, where each agent is autonomous, articulate, and social. We reported methods
to embed the autonomous portal agents into the Web portals, to cluster the portal agents
into communities, to exploit and adapt the semantic policies by the Web mining agent and
the attributes of the Web portal by the portal agent adaptively. In order to investigate the
performance of the system, we carried out several experiments and developed a smart
query routing mechanism for routing the user’s query. Through the experiments, the
results ensure that the proposed system promises to achieve more relevant information to
the user's queries.

Keywords: Parallel and distributed systems, Agent self-organization, Clustering,
Routing, Learning and Adaptation.