Chapter 53

A Service–Based Framework to Model Mobile Enterprise Architectures

José Delgado
Instituto Superior Técnico, Portugal

ABSTRACT

Mobility is a relatively recent topic in the enterprise arena, but thanks to the widespread use of cell phones it has already changed much of the business landscape. It should be integrated in enterprise architectures (EAs) as an intrinsic feature and not as an add-on or as an afterthought transition.

Current EA frameworks were not designed with mobility in mind and are usually based on the process paradigm, emphasizing functionality. Although the issue of establishing a systematized migration path from a non-mobile EA to a mobile one has already been tackled, the need for mobile-native EA modeling frameworks is still felt.

This chapter presents and discusses a resource-based and service-oriented metamodel and EA framework, in which mobility is introduced naturally from scratch, constituting the basis for some guidelines on which EA resources should be mobilized. Several simple scenarios are presented in the light of this metamodel and framework.

INTRODUCTION

When we think of "mobility", the image that usually springs to mind is that of a travelling person, equipped with a mobile device integrating a significant set of functionalities, such as cell phone, PDA, data communications and browsing, video camera, GPS and, more recently, NFC (Near field communication) and strong security mechanisms to support applications requiring strong authentication and encryption, such as mobile payments (Ondrus & Pigneur, 2009).

The usual approach to mobility and ubiquity in the enterprise context is thus bottom-up and technology driven (in particular, computer-based).

Given the fact that we have all these functionalities in a single device, what can we do with them, how can we integrate them into existing systems, and which functional and non-functional limitations are we imposed upon by them? Although these are fundamental issues, this chapter tackles a complementary, top-down approach. How can mobility be integrated in an enterprise architecture? Which components can and/or should be mobilized and under which requirements? We contend that it is the union of these approaches that produces the best results, and any method of designing mobile enterprise architectures should contemplate both.

We start by noting that mobility is a much more encompassing concept than a person with a mobile device and doesn't even have to take place in the physical world. For example:

- A home-delivery pizza company has a highly mobile architecture (a good part of its resources are on the streets);
- A daily commuter has mobility problems to solve, which can vary significantly if the employer moves its headquarters;
- Logistics companies live out of mobility, trying to optimize the movements of its resources;
- Companies such as IKEA impose upon costumers a careful planned route at their shops, thereby restraining the mobility model;
- Trucks, ships and planes are highly complex mobile systems and can act as carriers of smaller but also mobile resources, such as people;
- Human roles can move from one person to another, which is also a form of mobility that raises its own problems;
- Programs can move from one computer to another, as scripts, agents or deployed applications in a datacenter or cloud computing platform;
- Even the Earth itself is mobile. It has a translation and rotation mobility relatively to the sun (which is not fixed, either), responsible for seasonal products and services and for incompatible meeting schedules in global companies.

Mobility is a form of the pervasive change problem that plagues all EAs (enterprise architectures) and is present whenever there is a change in location (in the 3-D physical space or some other space, physical or virtual) and does not have necessarily to be associated with wireless technology, data, business or even people. We feel the need to have a broader view on mobility and a framework that allow us to deal with it in a more general way.

The main objectives of this chapter are:

- To claim the usefulness of the service paradigm as the basis to support the modeling of mobile enterprise architectures;
- To systematize the notion of resource, identifying common characteristics between various types of resources;
- To establish a model and a framework to model mobile enterprise architectures;
- To discuss mobility of physical and virtual resources in the light of costs and benefits, establishing some guidelines to help in deciding which are the best resources to be mobile.

BACKGROUND

Enterprises are the backbone of economy. Agility and competitiveness (Alexopoulou, Kanellis, Nikolaidou & Martakos, 2009) are fundamental issues for enterprise survival. Enterprise architectures have long been recognized as a basic tool in enterprise organization and structure (Chen, Doumeingts & Vernadat, 2008). Mobility is a much more recent area, but already with a strong impact on business models (Basole, 2007).

16 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/service-based-framework-model-mobile/50628

Related Content

Problems and Pitfalls in the Evaluation of Adaptive Systems
Stephan Weibelzahl (2005). *Adaptable and Adaptive Hypermedia Systems (pp. 285-299).*
www.irma-international.org/chapter/problems-pitfalls-evaluation-adaptive-systems/4190

Digital Storytelling and Digital Literacy: Advanced Issues and Prospects
Kijpokin Kasemsap (2018). *Digital Multimedia: Concepts, Methodologies, Tools, and Applications (pp. 873-893).*
www.irma-international.org/chapter/digital-storytelling-and-digital-literacy/189508

Service Provision Evolution in Self-Managed Future Internet Environments
Apostolos Kousaridas, Panagis Madgalinosand Nancy Alonistioti (2012). *Advancements in Distributed Computing and Internet Technologies: Trends and Issues (pp. 112-140).*
www.irma-international.org/chapter/service-provision-evolution-self-managed/59680

Digital Rights Management for Streaming Media
Deepali Brahmbhattand Mark Stamp (2009). *Handbook of Research on Secure Multimedia Distribution (pp. 22-38).*
www.irma-international.org/chapter/digital-rights-management-streaming-media/21305

Board Game Supporting Learning Prim's Algorithm and Dijkstra's Algorithm
Wen-Chih Chang, Te-Hua Wangand Yan-Da Chiu (2012). *Methods and Innovations for Multimedia Database Content Management (pp. 256-270).*
www.irma-international.org/chapter/board-game-supporting-learning-prim/66698