A CRM Process Model for Agent-Based Simulation

Hichem Benaissa Anouar Badsi, ESI (Ecole Nationale Supérieure d’Informatique), Algiers, Algeria
Abdessamed Rdess Ghomari, ESI (Ecole Nationale Supérieure d’Informatique), Algiers, Algeria
Leila Zemmouchi-Ghomari, University of Sciences and Technology Houari Boumediene (USTHB), Algiers, Algeria

ABSTRACT

To simulate the value generated by information and communication technologies, there is a need to design a suitable model. This article focuses on the little-used technology of ontologies, particularly Business Model Ontologies. Ontologies allow the representation of very abstract concepts, such as Business Models. The concept consists of four pillars, one of which, the “customer interface” is related to Customer Relationship Management (CRM). This paper proposes a modeling approach and a generic CRM model for the simulation of the value generated by information and communication technologies. The model must have a sufficient level of accuracy to achieve meaningful and helpful results, while maintaining a sufficiently generic level of abstraction to allow rapid implementation.

KEYWORDS

Agent-Based Simulation, BPMN, Business Model, Customer Relationship Management (CRM), Generic CRM Model, Ontology

1. INTRODUCTION

Information and communication technologies (ICTs) are undoubtedly useful for businesses. However, testing new ICTs is not always cost effective. Business decision makers can be reluctant to incur the costs (not only financial) generated by the introduction of new ICTs, because even if a technology predicts a capital gain, it is not guaranteed that this will offset the integration and operation costs (Kleis, Chwelos, Ramirez, & Cockburn, 2012; Stratopoulos & Dehning, 2000; Xia, 2015).

On the one hand, this reluctance may deprive companies of useful technologies, whereas on the other hand, it may restrain research into these technologies. The objective of the model presented in this paper is to allow the simulation of the value generated by ICT in companies.

As technologies and business vary considerably, this work focuses on the technology of the Business Model Ontology (BMO) (Andersson et al., 2006) and the business function of Customer Relationship Management (CRM) (Reinartz, Krafft, & Hoyer, 2004).

These are not random choices, as the technology of ontologies is still relatively rare in business. The Business Model is an abstract concept that can particularly benefit from the representational capability of ontologies. According to (Osterwalder, 2004), the Business Model consists of four pillars:

- the management infrastructure
- the product
- the customer interface
- financial aspects

DOI: 10.4018/IJSSMET.2017100104
The “customer interface” corresponds to CRM, and is a necessary component in creating, delivering, and capturing value in companies.

Simulating the impact of using a BMO for CRM requires the use of a model that is as generic as possible. This model must have a sufficient level of detail to achieve significant results when implemented as a simulator.

An extreme level of granularity is not always needed, but the model must be sufficiently detailed to perceive the positive or negative impact of the BMO in a company.

The authors’ hypothesis is that the positive or negative impact of this technology depends on the business type, its environment, and the relevant resources and policies.

The system must be able to represent the different alternatives. For example:

- Business type: a digital service company will have different communication channels to a car manufacturer.
- Environment: latency can be introduced and customers set according to the specific behavior of individuals from different countries.
- Resources: determined by the number of available employees.
- Policies: determined by the distribution of tasks to employees and the allocation of resources.

The following section discusses the prerequisites (background) for this study. Section 3 introduces the approach used to design the model. Sections 4 and 5 describe the model, agents, and system interactions. Section 6 presents application cases with and without BMO. Section 7 briefly discusses some related works, before Section 8 presents a summary and authors conclusions.

2. BACKGROUND

2.1. CRM Definition

CRM is a popular area in the business and marketing literature. Researchers have described the basics of the field as well as its origins, evolution, and impact on business performance, and have studied problems such as the improvement and implementation of CRM strategies (Alhawari, Alryalat, & Hunaiti, 2016).

Zablah (Zablah, Bellenger, & Johnston, 2004) defined CRM as “…an ongoing process that involves the development and leveraging of market intelligence for the purpose of building and maintaining a profit-maximizing portfolio of customer relationships.” (p. 480)

There are three main forms of CRM: Strategic, Analytical, and Operational. A fourth Collaborative form is sometimes distinguished from the Operational (Geib, Reichold, Kolbe, & Brenner, 2005; Iriana & Buttle, 2007; Rababah, Mohd, & Ibrahim, 2011). This distinction is useful to subdivide the model into programmable units (in terms of computing) as autonomous software agents that can interact, communicate, and collaborate in the manner of human agents within a company.

2.2. CRM Related Processes

This work seeks a CRM vision that is as generic as possible. There are numerous reference sources to business processes (Yan, Dijkman, & Grefen, 2012), including the MIT Process Handbook (Malone et al., 1999), that classifies processes depending on the degree of specialization/generalization and the composition of activities. Therefore, it is possible to work at a higher or lower level of detail to locate such processes among a company’s functions and identify similar or equivalent processes.
How IT-Enabled Services Can Help to Change our World: Building Networks for the Energy-Efficient City of Tomorrow
www.igi-global.com/chapter/enabled-services-can-help-change/74999?camid=4v1a