THE E-DECISIONAL COMMUNITY: AN INTEGRATED KNOWLEDGE SHARING PLATFORM

By

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STATEMENT OF ORIGINALITY

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I hereby certify that components of the work embodied in this thesis are from published papers of which I am a joint author. My contribution to these papers covers knowledge and experience management, knowledge representation, multi agent system, virtual organisations, and knowledge measurements and warrants inclusion of their parts in the body of my thesis.

Signed (PhD Candidate):__________________________________

Endorsed (Supervisor):___________________________________
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<tr>
<td>ACL</td>
<td>Agent Communication Language</td>
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<tr>
<td>API</td>
<td>Application Programming Interface</td>
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<tr>
<td>CC</td>
<td>Cloud Computing</td>
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<tr>
<td>CML</td>
<td>Collective Management Layer</td>
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<tr>
<td>CoP</td>
<td>Community of Practice</td>
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<tr>
<td>DDNA</td>
<td>Decisional DNA</td>
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<tr>
<td>DF</td>
<td>Derivative Follower</td>
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<tr>
<td>FIPA</td>
<td>Foundation for Intelligent Physical Agents</td>
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<tr>
<td>GA</td>
<td>Group Agent</td>
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<td>GT</td>
<td>Game Theory</td>
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<td>HTTP</td>
<td>Hyper-Text Transfer Protocol</td>
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<tr>
<td>IaaS</td>
<td>Infrastructure as a Service</td>
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<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
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<td>IML</td>
<td>Individual Management Layer</td>
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<tr>
<td>ISO</td>
<td>International Organization for Standardization</td>
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<tr>
<td>KaaS</td>
<td>Knowledge as a Service</td>
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<td>KAL</td>
<td>Knowledge-based Application Layer</td>
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<td>KBVO</td>
<td>Knowledge Based Virtual Organizations</td>
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<td>KE</td>
<td>Knowledge Engineering</td>
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<td>KM</td>
<td>Knowledge Management</td>
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<td>KOS</td>
<td>Knowledge-Oriented Services</td>
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<td>KQML</td>
<td>Knowledge Query and Manipulation Language</td>
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<tr>
<td>MAS</td>
<td>Multi-Agent System</td>
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<tr>
<td>MY</td>
<td>Myoptimal</td>
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<tr>
<td>OWL</td>
<td>Web Ontology Language</td>
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<td>PA</td>
<td>Personal Agent</td>
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<td>PaaS</td>
<td>Platform as a Service</td>
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<td>REST</td>
<td>Representational State Transfer</td>
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<td>RF</td>
<td>Reputation Follower</td>
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<tr>
<td>SaaS</td>
<td>Software as a Service</td>
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<tr>
<td>SKMS</td>
<td>Smart Knowledge Management System</td>
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<tr>
<td>SOA</td>
<td>Service-Oriented Architecture</td>
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<tr>
<td>SOAP</td>
<td>Secure Object Access Protocol</td>
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<tr>
<td>SOE</td>
<td>Set of Experience</td>
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<tr>
<td>SOEKS</td>
<td>Set of Experience Knowledge Structure</td>
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<tr>
<td>SQL</td>
<td>Structured Query Language</td>
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<td>VO</td>
<td>Virtual Organization</td>
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<td>XML</td>
<td>eXtensible Markup Language</td>
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List of Publications During PhD Candidature

Journal Publications


7. Toro, Carlos, Sanchez, Eider, Carrasco, Eduardo, Mancilla-Amaya, Leonardo, Sanín, Cesar, Szczerbicki, Edward, Graña, Manuel, Bonachela,


Conference Publications


Book Chapters


In today’s knowledge oriented economy, the ability to make accurate decisions becomes crucial for any organization or individual for adapting to new demands and conditions in the environment. Additionally, technology allows for ubiquitous access to knowledge and information from different places and devices at any time, which has created a new generation of highly informed customers and enterprises; thus, precise decisions have become more important in order to increase customer fidelity, maintain competitive advantage, and reduce reaction times and costs.

In spite of all the advances in the field of Knowledge Management, and more specifically in the area of Knowledge Sharing, most of the existing solutions for capturing, storing, and reusing knowledge require a high degree of expert intervention; for instance, expert forums or document bases. Moreover, the process of finding an appropriate solution for a given problem becomes complex when the amount of information and knowledge available increase everyday. Furthermore, unlike traditional organizational assets, knowledge has a unique intangible nature and is highly embedded in the workforce and the business processes, making it hard to measure and estimate its actual availability.

The e-Decisional Community aims at proposing a set of guidelines for the development of a large scale platform to share knowledge and experience in order to support decision-making processes in organizations. The main idea behind the platform is that experiential knowledge is gathered from the constant interaction between users and organizations and from the software applications that they use on a daily basis. Knowledge exchange and evaluation is performed in a semi-automatic way by using smart agent technology, a set of indicators that reflect human behaviour, and an automatized knowledge-based market environment. Additionally, the most important contribution of this research is the definition of a semi-automatic way of assessing quantity and quality of knowledge. The e-Decisional Community is able to provide estimated measures of quantity and quality
of knowledge, endowing organizations with a novel set of tools for assessing the knowledge that resides in their workers and business processes.

Several conceptual elements of this thesis have been implemented in a testing prototype, and the experimental results that were obtained show that the platform has a great potential for reducing the workload on experts, as well as response times for providing accurate solutions. Consequently, overall organizational efficiency is increased because workers can focus on their core tasks without worrying about additional management duties for their knowledge-based systems, such as solution classification, or knowledge quality assessment.