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## **IFIP – The International Federation for Information Processing**

IFIP was founded in 1960 under the auspices of UNESCO, following the First World Computer Congress held in Paris the previous year. An umbrella organization for societies working in information processing, IFIP's aim is two-fold: to support information processing within its member countries and to encourage technology transfer to developing nations. As its mission statement clearly states,

*IFIP's mission is to be the leading, truly international, apolitical organization which encourages and assists in the development, exploitation and application of information technology for the benefit of all people.*

IFIP is a non-profitmaking organization, run almost solely by 2500 volunteers. It operates through a number of technical committees, which organize events and publications. IFIP's events range from an international congress to local seminars, but the most important are:

- The IFIP World Computer Congress, held every second year;
- Open conferences;
- Working conferences.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is small and by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is also rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

Any national society whose primary activity is about information processing may apply to become a full member of IFIP, although full membership is restricted to one society per country. Full members are entitled to vote at the annual General Assembly, National societies preferring a less committed involvement may apply for associate or corresponding membership. Associate members enjoy the same benefits as full members, but without voting rights. Corresponding members are not represented in IFIP bodies. Affiliated membership is open to non-national societies, and individual and honorary membership schemes are also offered.

Eunika Mercier-Laurent  
Danielle Boulanger (Eds.)

# Artificial Intelligence for Knowledge Management

First IFIP WG 12.6 International Workshop, AI4KM 2012  
Held in Conjunction with ECAI 2012  
Montpellier, France, August 28, 2012  
Revised Selected Papers



Springer

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# Preface

AI4KM (Artificial Intelligence for Knowledge Management) was the first workshop organized by IFIP (International Federation for Information Processing) group TC12.6 (Knowledge Management) in partnership with ECAI (European Conference on Artificial Intelligence).

TC12 is dedicated to the applications of artificial intelligence (AI) methods and techniques in all fields. The interest of TC12.6 members is in all aspects of knowledge management such as methods, knowledge models, techniques and tools, architecture of knowledge flows, specific solutions for problem solving in complex environments, knowledge acquisition and transfer methods etc.

The AI4KM workshop raised the interest of various research fields. AI is not split into symbolic and computational intelligence; often we need to combine both for the best results.

We would like to thank the members of the Program Committee, who gave up their valuable time to review the papers and helped put together an interesting program at Montpellier. We would also like to thank the invited speaker and authors. Finally, our thanks go out to the local Organizing Committee and all the supporting institutions and organizations.

This volume is a selection of improved papers presented during the workshop. After the workshop, the authors were asked to extend their proposals by highlighting their original thoughts. The selection focused on new contributions to the KM field and innovative aspects. An extended Program Committee then evaluated the last versions of the proposals, leading to these proceedings.

The proceedings begin with one of the invited talks:

“An Overview of AI Research History in URSS and in Ukraine. Up-to-date Just-In-Time Knowledge Concept.”

It is followed by the contribution

“Artificial Intelligence for Knowledge Management with BPMN and Rules,” which combines two approaches: BPMN as procedural knowledge representation and business rules offering specifications of knowledge in a declarative manner.

The next paper, “Validation Model for Discovered Web User Navigation Patterns,” deals with Web usage mining considered as a complex process. It proposes an iterative and hybrid approach to discover user navigation patterns and design of a knowledge validation model as well.

“Kleenks: Linked Data with Applications in Research and Ambient Assisted Living” describes a new approach inspired by the success of Web 2.0 techniques such as wikis, blogs, and social networks, which allows both machines and humans (regular users) to combine efforts for the creation of more and better linked data. The concept of collaborative link “kleenk” contains unstructured data in addition to the classic RDF predicates. A free online platform, [www.kleenk.com](http://www.kleenk.com), implements the concept of kleenk in the scientific research domain.

“The Status Quo of Ontology Learning From Unstructured Knowledge Sources for Knowledge Management,” presents a study of state-of-the-art research of ontology learning from unstructured knowledge sources for knowledge management. Nine approaches are identified based on statistics and natural language processing.

The next paper is titled “Knowledge Management Applied to Electronic Public Procurement.” Electronic procurement aims at reducing the amount of paper, but also at quicker and more knowledgeable processing of proposals and decision taking. Procurement activity is a part of the global organizational knowledge flow. This work goal is to analyze the whole process, to identify the elements of knowledge necessary for successful purchase processing and to study the contribution of AI approaches and techniques to support the above elements. The goal is also to position e-procurement in the organizational knowledge flow.

“Distributed and Collaborative Knowledge Management Using an Ontology-Based System” is the next paper in the volume. The proposed system integrates a database and ontology for storing and inferring knowledge about traffic dangers in a given area. It allows storing of abstract data, shares them across several installations, and manages changes in a centralized way. A loose coupling of the ontology with a relational database allows storage of concrete data about a conceived area in a database, and populates the ontology with data instances during application run-time.

“Collective Intelligence for Evaluating Synergy in Collaborative Innovation” aims to present the *synergy index* as a multiplier of the innovation power of research partners to construct a successful collaboration.

Companies must innovate to be competitive; they are willing to collaborate for the unique product/processes/service only after defining the team with a bigger chance of success. Small and medium companies would like to gratify collaborative innovation with less risk. The paper proposes a new approach to measure synergy for collaboration, which is designed and achieved by using a brand new collective intelligence method.

“How to Understand Digital Studio Outputs: The Case of Digital Music Production” demonstrates how knowledge management principles and techniques could serve digital audio production workflow management, analysis, and preservation.

Knowledge management approaches for digital music production workflows could be of great utility at several time points: in the immediate time for production, in the intermediate time for collection, and in the long term for preservation.

The system combines a trace-based architecture and an ontology-driven knowledge management system, the latter being built on differential semantics theories.

“From Knowledge Transmission to Sign Sharing: Semiotic Web as a New Paradigm for Teaching and Learning in the Future Internet” focuses on the process of creating knowledge by sharing signs and significations (Semiotic Web) more than on knowledge transmission with intelligent object representations (Semantic Web). This way of sharing knowledge is illustrated with two examples

issued from La Reunion Island projects in instrumental e-Learning (called @-MUSE) and biodiversity informatics (called IKBS).

We hope you will enjoy reading these papers.

November 2013

Eunika Mercier-Laurent  
Danielle Boulanger

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