AN ANALYSIS AND FORECAST OF SOFTWARE AND SERVICES RESEARCH IN BULGARIA*
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Abstract. In the last 40 years much has been achieved in Software Engineering research and still more is to be done. Although significant progress is being made on several fronts in Service-Oriented Architecture (SOA), there is still no set of clear, central themes to focus research activity on. A task within the EU FP7 Sister project aimed at defining research priorities for the Faculty of Mathematics and Informatics (Sofia University) in the area of Software and Services. A dedicated methodology was proposed and developed, based on various sources of information. The information accumulated was systematised and processed according to this methodology. The final results obtained are described and discussed here.

TECHNOLOGY-ENHANCED LEARNING: REVIEW AND PROSPECTS
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Abstract. Technology-enhanced learning, education, innovation, educational technology, research, computer, media, history.
Abstract. This paper is a reflection on the history and future of technology-enhanced learning. Over the last century various new technologies were introduced in education. Often, educational revolutions were proclaimed. Unfortunately, most of these new technologies failed to meet the high expectations. This paper reviews the rise and fall of various “revolutionary” learning technologies and analyses what went wrong. Three main driving factors are identified that influence the educational system: 1) educational practice, 2) educational research, and 3) educational technology. The role and position of these factors is elaborated and critically reviewed. Today, again many promising new technologies are being put in place for learning: gaming, social web, and mobile technologies, for example. Inevitably, these are once again proclaimed by its supporters to revolutionise teaching and learning. The paper concludes with identifying a number of relevant factors that substantiate a favourable future outlook of technology-enhanced learning.

THE GLOBAL CAMPUS-ICT AND THE FUTURE OF UNIVERSITIES
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Key words: Knowledge society, e-learning, e-infrastructure, e-science, open educational resources, e-library, Web 2.0, virtual organizations, university models, Global Campus Model.

Abstract. This paper analyses the changes which the ICT causes on a global scale. The globalization of higher education triggered by e-Learning, the emergence of e-infrastructure for e-science, the Open Educational Resources movement, e-libraries and the tendency of building global educational alliances are analysed as well. Special emphasis is put on several well-known university models, e.g. Research University, Open University and Entrepreneurial University, as well as on some emerging university models for the Knowledge Society, such as: Global University and Innovation University. The paper puts in focus the influence of the ICTs and the new organizational and business models they bring, such as Virtual University, eCampus, Enterprise 2.0, University 2.0. A new university model is defined—the Global Campus Model. Some arguments that the ultimate result of the ICTs driven transformations could turn the whole world into a Global Campus in the next few decades.

CULTURAL KNOWLEDGE FOR NAMED ENTITY DISAMBIGUATION:
A GRAPH-BASED SEMANTIC RELATEDNESS APPROACH
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Key words: Wikipedia, Named Entity Disambiguation, Semantic Relatedness, Graph.

Abstract. One of the ultimate aims of Natural Language Processing is to automate the analysis of the meaning of text. A fundamental step in that direction consists in enabling effective ways to automatically link textual references to their referents, that is, real world objects. The work presented in this paper addresses the problem of attributing a sense to proper names in a given text, i.e., automatically associating words representing Named Entities with their referents. The method for Named Entity Disambiguation proposed here is based on the concept of semantic relatedness, which in this work is obtained via a graph-based model over Wikipedia. We show that, without building the traditional bag of words representation of the text, but instead only considering named entities within the text, the proposed method achieves results competitive with the state-of-the-art on two different datasets.
SEMANTICALLY ENHANCED SOFTWARE DOCUMENTATION PROCESSES
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Key words: Documentation, Semantics, Software Engineering.

Abstract. High-quality software documentation is a substantial issue for understanding software systems. Shorter
time-to-market software cycles increase the importance of automatism for keeping the documentation up to date.
In this paper, we describe the automatic support of the software documentation process using semantic technolo-
gies. We introduce a software documentation ontology as an underlying knowledge base. The defined ontology
is populated automatically by analysing source code, software documentation and code execution. Through se-
lected results we demonstrate that the use of such semantic systems can support software documentation processes
efficiently.

SMARTBOOK: SEMANTICS INSIDE
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Key words: E-book, Information Search and Filtering, Personalization, Topic Maps, Semantic Web.

Abstract. This paper presents a vision for the future of the e-books which entails further development of
technologies that will facilitate the creation and use of a new generation of ‘smart’ books: e-books that are
evolving, highly interactive, customisable, adaptable, intelligent, and furnished with a rich set of collaborative
authoring and reading support services. The proposed set of tools will be integrated into an intelligent framework
for collaborative book authoring and experiencing called SmartBook. The paper promotes the idea that the
semantic technologies, intensively developed recently in connection with the Semantic Web initiative, can be
incorporated in the book and become the key factor of making it ‘smarter’.

SERVICES FOR CONTENT CREATION AND PRESENTATION
IN AN ICONOGRAPHICAL DIGITAL LIBRARY*
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Key words: Digital libraries, collection, systems issues, user issues, online information services.

* This work is partly funded by Bulgarian NSF under the project D-002-189 SINUS “Semantic Technologies for
Web Services and Technology Enhanced Learning”.

Abstract. Content creation and presentation are key activities in a multimedia digital library (MDL). The
proper design and intelligent implementation of these services provide a stable base for overall MDL function-
ality. This paper presents the framework and the implementation of these services in the latest version of the
“Virtual Encyclopaedia of Bulgarian Iconography” multimedia digital library. For the semantic description of the iconographical objects, a tree-based annotation template is implemented. It provides options for autocompletion, reuse of values, bilingual entering of data, automated media watermarking, resizing, and conversing. The paper describes in detail the algorithm for automated appearance of dependent values for different characteristics of an iconographical object. An algorithm for avoiding duplicate image objects is also included. The service for automated appearance of new objects in a collection after their entering is included as an important part of the content presentation. The paper also presents the overall service-based architecture of the library, covering its main service panels, repositories, and their relationships. The presented vision is based on a long-term observation of the users' preferences, cognitive goals, and needs, aiming to find an optimal functionality solution for the end users.