

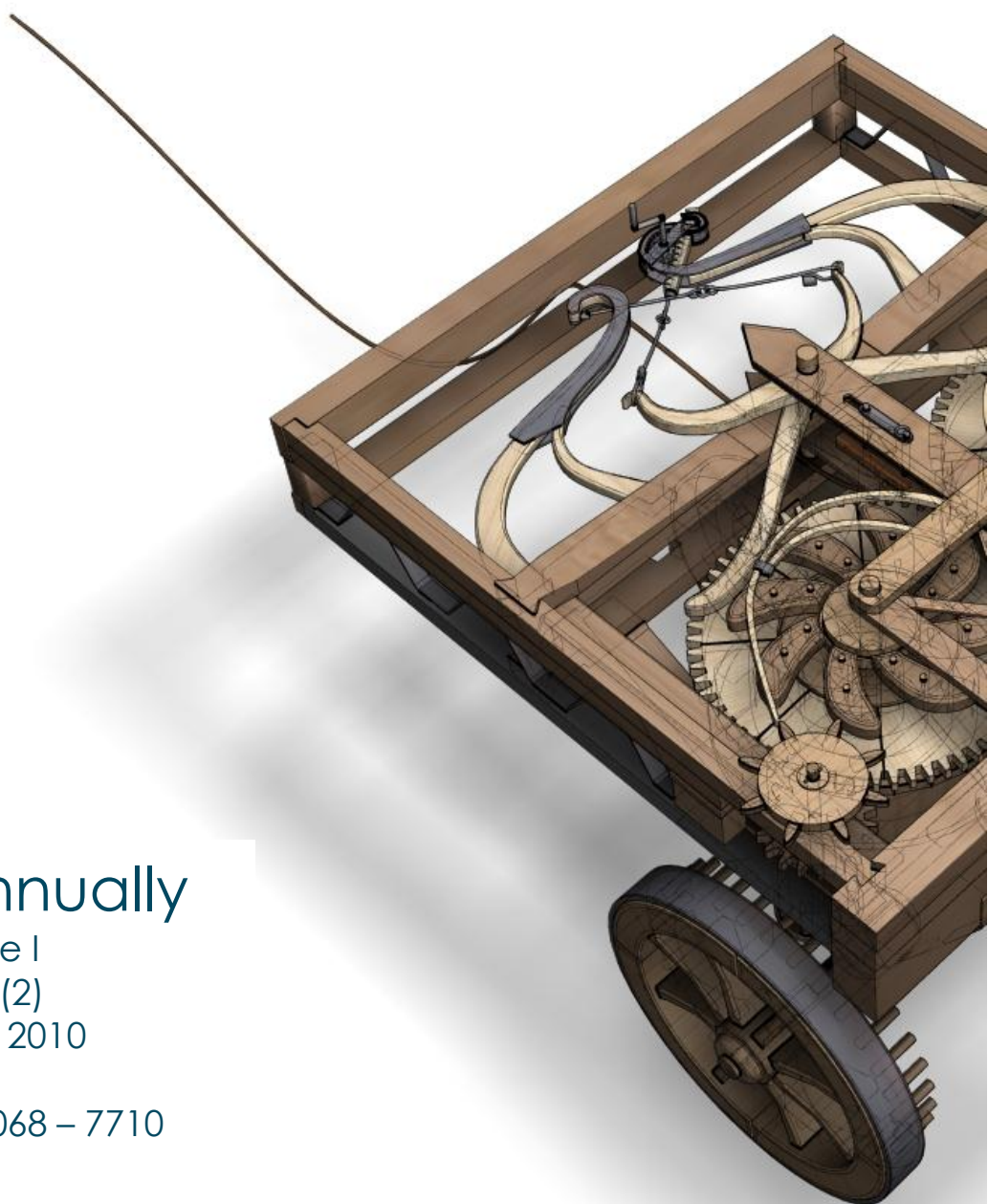
ASERS

Theoretical and Practical Research in Economic Fields

Biannually

Volume I
Issue 2(2)
Winter 2010

ISSN 2068 – 7710



Editor in Chief

Laura Ungureanu
Spiru Haret University, Romania

Editor

Ivan Kitov
Russian Academy of Sciences,
Russia

Editorial Advisory Board

Monal Abdel-Baki
American University in Cairo,
Egypt

Huseyin Arasli
Eastern Mediterranean University,
North Cyprus

Madalina Constantinescu
Spiru Haret University, Romania

Jean-Paul Gaertner
Ecole de Management de
Strasbourg, **France**

Shankar Gargh
Editor in Chief of Advanced in
Management, **India**

Piotr Misztal
Technical University of Radom,
Economic Department, **Poland**

Marco Novarese
University of Piemonte Orientale,
Italy

Rajesh K. Pillania
Management development Institute,
India

Russell Pittman
International Technical Assistance
Economic Analysis Group Antitrust
Division, **USA**

Rachel Price-Kreitz
Ecole de Management de
Strasbourg, **France**

Rena Ravinder
Politechnic of Namibia, **Namibia**

Andy Stefanescu
University of Craiova, **Romania**

Laura Stefanescu
Spiru Haret University, Romania

Hans-Jürgen Weißbach, University
of Applied Sciences - Frankfurt am
Main, **Germany**

Contents:

- 1** **Macroeconomic Fundamentals and Stock Return Dynamics: International Evidence from the Global Finance Area**
Ezzeddine Abaoub
University of 7 November at Carthage
Mongi Arfaoui
University El Manar
Hammadi Sliti
University El Manar ... 122
- 2** **Financial Integration in the four Basins: A Quantitative Comparison**
Sergio Alessandrini
University of Modena and Reggio Emilia
Elisa Valeriani
University of Modena and Reggio Emilia ... 147
- 3** **The Law of One Price: Survey of a Failure**
Alessio Emanuele Biondo
University of Catania ... 167
- 4** **The Yield Curve and the Prediction on the Business Cycle: A VAR Analysis for the European Union**
Giuseppe Cinquegrana
ISTAT, Italy
Domenico Sarno
Department of Law and Economics
Second University of Naples ... 182
- 5** **Neuroeconomics and Decision Making Process**
Mădălina Constantinescu
Spiru Haret University ... 209
- 6** **The Evolutionary Dynamics of Tolerance**
Luca Correani
DISTATEQ,
Tuscia University of Viterbo
Fabio Di Dio
University of Rome La Sapienza
Giuseppe Garofalo
DISTATEQ,
Tuscia University of Viterbo ... 218
- 7** **Differential Games in Non-Renewable Resources Extraction**
George E. Halkos
University of Thessaly
George Papageorgiou
University of Thessaly ... 231
- 8** **Consumption in Developed and Emerging Economies**
Peter Kadish
Norvik Alternative Investments ... 243
- 9** **Intelligent Agent Approach for Business Process Management**
Andy Ştefănescu
University of Craiova ... 253

Call for Papers Summer_Issue 2011

Theoretical and Practical Research in Economic Fields

Many economists today are concerned by the proliferation of journals and the concomitant labyrinth of research to be conquered in order to reach the specific information they require. To combat this tendency, **Theoretical and Practical Research in Economic Fields** has been conceived and designed outside the realm of the traditional economics journal. It consists of concise communications that provide a means of rapid and efficient dissemination of new results, models and methods in all fields of economic research.

Theoretical and Practical Research in Economic Fields publishes original articles in all branches of economics – theoretical and empirical, abstract and applied, providing wide-ranging coverage across the subject area.

Journal promotes research that aim at the unification of the theoretical-quantitative and the empirical-quantitative approach to economic problems and that are penetrated by constructive and rigorous thinking. It explores a unique range of topics from the frontier of theoretical developments in many new and important areas, to research on current and applied economic problems, to methodologically innovative, theoretical and applied studies in economics. The interaction between empirical work and economic policy is an important feature of the journal.

Theoretical and Practical Research in Economic Fields, starting with its first issue, it was indexed in **CEEOL**, **IndexCopernicus**, **EBSCO** and **RePEc** databases.

The primary aim of the Journal has been and remains the provision of a forum for the dissemination of a variety of international issues, empirical research and other matters of interest to researchers and practitioners in a diversity of subject areas linked to the broad theme of economic sciences.

All the papers will be first considered by the Editors for general relevance, originality and significance. If accepted for review, papers will then be subject to double blind peer review.

Invited manuscripts will be due till April 25st, 2011, and shall go through the usual, albeit somewhat expedited, refereeing process.

| | |
|--|--|
| Deadline for submission of proposals: | 25 st April 2011 |
| Expected Publication Date: | 15 th June 2011 |
| Web: | www.asers.eu/journals/tpref/ |
| E-mail: | tpref@asers.eu |

To prepare your paper for submission, please see full author guidelines in the following file: [TPREF_Full_Paper_Template.doc](#), then send it via email at tpref@asers.eu.

INTELLIGENT AGENT APPROACH FOR BUSINESS PROCESS MANAGEMENT

Andy ȘTEFĂNESCU

University of Craiova, Romania

andystefanescu@yahoo.com

Abstract

In recent years businesses around the world have been facing the challenges of a rapidly changing environment due to the development of business market and technology. As a result, organizations are paying more attentions to supporting business process management with the ability to adapt to the dynamic environment.

Furthermore, business climate is changing from centralized and closed to distributed and open mainly by virtue of the proliferation of networks.

Therefore, an agent-based approach is proposed in this research to manage complex business activities. In this approach, business activities are delegated to a number of autonomous agents. These agents may be human beings as well as machines or software applications. Each of them has awareness of situation and can make real-time decisions on activities.

Keywords: business process management, real-time decisions, workflow

JEL Classification: D81, L21, O32, M1

1. Introduction

Management of business process in an organizational setting is commonly referred to the development of business applications that directly follow the execution logic of the underlying business processes. However, traditional workflow approaches model and manage business process based on a predefined logical procedure of activities and from a centralized perspective.

That is, a complete list of all the activities and all the paths are provided, the criteria for following a particular path are specified, and the ordering constraints on the actions are given.

The intelligent agents are strictly linked to the existence of informational and communicational technologies, especially the Internet; outlined as a type of specialized activity, autonomous, very useful for an important part of business. According to the specialists' opinion the intelligent agents represent a new type of logicians, specialized in Franklin, and Graesser (1996), and Wooldridge, and Jennings (1999).

Researching, extracting and treat information automatically for the user in an informational network or in a database is a new way to approach a business process. An agent is a computational system located in an execution environment, capable of autonomous action in that environment in order to achieve the planned objectives (So, and Sonenberg 2004).

Unlike the classical interface ways with the computer, the intelligent agent is autonomous and much more active, representing a hardware or software system which has a series of properties (see Table 1). In Table 1, we are presenting the main characteristics that we also find in Franklin, and Graesser (1996).

Table1. Main characteristics of intelligent agents

| Characteristics | Description |
|-----------------|---|
| Autonomy | Operates without human intervention and has control on its own actions. The agent accepts requests of user but it is the one that decides how and where these requests will be satisfied. |
| Initiative | Collaborates with the user or with other agents to satisfy their requests, being able to propose modifications or ask for further clarifications. |

| Characteristics | Description |
|--------------------------------|--|
| Adaptability | It modifies behavior depending on the acquired knowledge. |
| Rationality | They are able to make inferences. |
| Communication and co-operation | The capacity to accomplish an exchange of information, more or less complex, with other agents, with other servers or human specialists. |
| Mobility | It manifests mobility, in the way that they can surf the web without receiving instructions from user. |

2. Related researches

The challenge of the changing business environment requires managing complex processes in non-procedure paradigms. Non-procedure paradigms do not depend on systems giving exact details to solve problems, but let systems determine how to accomplish tasks. The questions of which task to execute, and when to execute, is more dependent on the current environment and underlying business policies, other than the static process schema.

Landqvist and Pessi (2004) note how the use of intelligent agent-enabled decision support in conjunction with the organizational trends of more dispersed and decentralized organic organized enterprises, enables new practice in the field of Business Intelligence. Their research focuses on empirical data from two business cases and what organizational implications it might have. The behaviors of the applications in the described business cases show us a trend that is very interesting to further investigate.

Research within agent-technologies usually explore different lab related studies regarding how to cope with the vast information overflow, using intelligent agents mainly based on different rules-based mechanism (Liu 1998).

Decision support systems are usually focused on historical data behavior, and analytical approaches. Many researchers discuss the extension of these mart models, to include real-time data (Bolloju 2001). With an extended model on the use of enterprise decision support environments, future business intelligence will be combination of more traditional decision support systems and intelligent agents.

3. Agent supported process management. Study case in financial management

For the potential or operational managers, the intelligent agents represent or will represent an important economic opportunity. Their use in the area of business management can prove to be a very profitable business. Taking into consideration their multiple abilities in progress, we can assert that the intelligent agents will constitute one of the most attractive business opportunities. Concomitant, the intelligent agents can be used to develop the already existing business, increasing their functional and financial performances.

The intelligent agent approach proposed in this paper is characterized by the ability to continuously perceive the business process environment and make real-time decisions tasks based on underlying business logic. In addition to real/time reaction to the process environment, the proposed approach also supports proactive activities, which refer to the exhibition of goal-oriented behaviors by taking initiatives.

For illustration and evaluation of the proposed cognitive approach, a case application of economic activities is presented in this Section. Relevant information of computer system in financial management can be found in Ștefănescu A. (2005, 2006).

The financial services industry is making efforts to achieve the end-to-end automation of financial activities from order to settlement.

According to Ștefănescu A. (2005, 2006), the major activities/tasks and general procedure of financial management are briefly described below in Table 2.

Table2. Major tasks of financial activity

| Activity | Characteristic complex processes | Elementary Processes |
|------------------------|---|---|
| Economical Operations | Opening the work session | <ul style="list-style-type: none"> ▪ confirmation of the possibility of system use; ▪ specification of password and username; ▪ giving the access level. |
| | Processing dates from accounts | <ul style="list-style-type: none"> ▪ introduction of data in the required working files of the Checking Balance; ▪ processing the clearance scales: debtor/creditor to make the Balance of Accounts; ▪ processing the net hauling time to accomplish the Profit and Loss Account. |
| Activity Analysis | The structural analysis of the patrimonies | <ul style="list-style-type: none"> ▪ data taking over from the Balance of Accounts and obtaining the Financial Balance-Sheet; ▪ elements processing from the Financial Balance-Sheet for 2 consecutive years and obtaining the cumulative Financial Balance. |
| | Analysis of the results formation | <ul style="list-style-type: none"> ▪ obtaining a set of indicators to quantify the activity; ▪ checking the levels obtained; ▪ interpretation of results economically and financially. |
| Financial Diagnosis | Profitableness diagnosis | <ul style="list-style-type: none"> ▪ obtaining the profitableness indicators; ▪ results interpretation. |
| | Risk diagnosis | <ul style="list-style-type: none"> ▪ determination of the position indicators I% and comparison with the known criteria to determine the relative value of the exploitation and financial risk; ▪ determination of a set of indicators; ▪ models of evaluating the bankruptcy risk. |
| Financial Anticipation | Elaboration of the financial anticipation documents | <ul style="list-style-type: none"> - estimations for the indicator level the turnover taking into account the level of the estimated availability; - identification of position from Financial Balance, the Profit and Loss Account which modifies together with the estimated Turnover; - determination of the necessary of the external financing; - specification of the financing ways. |

However, the process in real-world situations is more complex than this. Followed are some possible situations that are not covered in the general process:

- information contained in an error report is not enough to make resolution advice, and additional data are required for diagnosis;
- the resolution advice on a problem detected is not produced within a normal time frame due to lack of information or other reasons;
- diagnostic experts need to make some adjustment on advised resolutions;
- the chief manager is not available to validate the resolution advice;
- emergent errors are required to be reported to the chief manager directly for instant actions.

4. Acknowledgement

The presented work has been conducted in the context of the GRANT-PCE-II-2008-2-IDEAS-450 'The Management of Knowledge for the Virtual Organization. Possibilities to Support Management using Systems Based on Knowledge' funded by The National University Research Council from Romania, under the contract no 954/2009.

5. Conclusions

Compared with traditional system approaches focusing on specifying the execution order of activities beforehand, this approaches attempts to declare rules for autonomous agent to manage their activities via perceiving and interacting with the environment.

Also, in this work has made efforts on investing how to employ intelligent agent's technology into business process and financial management, especially from the flexible task management, which is a basis for building intelligent agents to perform rational activities in process management.

References

- [1] Bolloju N. 2001. *Extended Role of Knowledge Discovery Techniques in Enterprise Decision Support Environments*, Conference on System Sciences.
- [2] Franklin S., and Graesser A. 1996. *Is it an Agent, or just a Program?: A Taxonomy for Autonomous Agents*, Proceedings of The Third International Workshop on Agent Theories, Architectures and Languages, Springer-Verlang.
- [3] Landqvist F., and Pessi K. 2004. *Agent Action: Business Cases with Individualized information Services in a Business Intelligence Context*, Proceedings of the 37th annual Hawaii International Conference on System Sciences.
- [4] Liu S. 1998. *Strategic Scanning and Interpretation Revisiting: Foundations for a Software Agent Support System – Part 2: Scanning the business environment with software*, Industrial Management & Data Systems, 362-372
- [5] So R., and Sonenberg L. 2004. *Situation Awareness in Intelligent Agents: Foundations for a Theory of Proactive Agent Behavior*, International Conference on Intelligent Agent Technology.
- [6] Ștefănescu A. 2006. *Computer System in Financial Management*, Conference on Intelligent Systems 2006, Institute Jozef Stefan, Ljubljana, Slovenia, 9-13 October.
- [7] Ștefănescu, A. 2005. *A Data Processing Model for Financial Management of Economic Agents*, in Economic Computation and Economic Cybernetics Studies and Research, volume 39, 1-4/2005, 199-204.
- [8] Ștefănescu L. 2006. *Intelligent agents to support transacting decisions*, International Conference on Intelligent Systems, Institute Stephan Josef, 9-13 Oct, Ljubljana, Slovenia.
- [9] Wang M., and Wang H. 2004. *Agents and Web-services Supported Business Exception Management*, Proceedings of International Conference on Artificial Intelligence, New Zealand.
- [10] Wooldridge M., and Jennings N. 1999. *Intelligent Agents*, Communications of the ACM, Berlin, Springer Verlag.

ASERS Publishing
ASERS

ASERS Publishing
Web: www.asers.eu
URL: <http://www.asers.eu/asers-publishing>
ISSN 2068 – 7710