

## ADAPTABLE TOOLS FOR COMPUTER SOFTWARE INDUSTRY

Dumitru TODOROI<sup>1</sup>  
Nicoleta TODOROI<sup>2</sup>  
Diana MICUȘA<sup>3</sup>

### **Abstract**

*The exploratory paper investigates Adaptability in general and the Adaptable Tools in particular in quality of Engine to develop Computer Software and Software for Artificial Intelligences. The paper aims to open the discussion around the impact that Adaptable Tools might have on Information, Knowledge Based and Consciousness Societies, Human-Robotic Societies of Information Era.*

*Paper employs an exploratory literature review investigating the past and current state of the art in relation to Adaptability as Engine to create Software for Computers and Artificial Intelligences in Information Era. This literature review serves as the starting point of subsequent theorizing.*

*Based on the literature review we theorize that the Adaptability in general and Adaptable Computing Industry in particular achieves horizon of creation Software for different generations of Computers and Artificial Intelligences with creativity, emotions, temperaments, and sentiments. In this process there are developed new Engine – the Robotic Adaptable Tools (RAT). To name just a few uses of RAT, its can help in: supporting definitions of new robotic intelligence entities, its stratification, and its algorithmic presentation; RAT therefore improve robotic skills and competences; RAT generate requirements for new robotic competences and promote collaborative environment among the Actors of Human – Robotic Society.*

*This paper opens the discussion around succession in creation Software for different generations of Computers and Artificial Intelligences using Adaptable Tools and suggests a wide range of areas for further research in the branch of Robotic Industry.*

*In this paper we argue that by looking at Robotic Adaptable Tools as more than just a set of tools for improving robotic intelligences a Robotic Industry can address some pitfalls of a particular type of Artificial intelligences for Consciousness Society.*

*Adaptable Tools have been developed as part of Software for Computer Industry and they have used in creating Computer Systems for different generations of computers. Robotic Adaptable Tools are a new, but increasingly popular approach, which has been shown to be powerful in many areas of Artificial intelligences creation process. This paper is novel in that it initiates a dialogue around the impact that Robotic Adaptable Tools might have on Robotic Industry.*

**Keywords:** Conscience, Artificial intelligence, Creativity, Emotions, Temperaments, Sentiments, Consciousness Society, Human – Robotic Society

**JEL CASSIFICATION:** C81, L86

### **INTRODUCTION**

Adaptable tools represent a set of meta-system methods, models, algorithms and procedures [1-3] used in the process of the software and hardware systems creation and its implementation. They support human-machine interaction processes to be developed by various kind of software and hardware systems at different stages of Information, Knowledge, and Conscience based Societies ascending evolution.

Adaptors as adaptable meta-system tools represent the union of methods, models, algorithms and procedures to be used for adaptable languages and processors creation and application. They are based on definition and usage of new or modified data, operators, statements, and controls. Adaptable tools are represented by the set of adaptors of different types:

Adaptable language	<b>AD</b>	Adaptable processor
New data	<b>AP</b>	New actions (operators, statements,
	<b>T</b>	controls)
Extension definition	<b>OR</b>	Extension call

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<sup>1</sup> Dr.hab., prof. univ., Academia de Studii Economice a Moldovei, Republica Moldova, Chișinău, Bănulescu Bodoni, 61, tel. (+373) 22 41 28, [www.ase.md](http://www.ase.md), e-mai: [todoroi@ase.md](mailto:todoroi@ase.md)

<sup>2</sup> “Gh. Dima” Music Academy, Cluj-Napoca, Romania, [ntodoroi@yahoo.com](mailto:ntodoroi@yahoo.com)

<sup>3</sup> EcoInfoMold NGO, Chisinau, Republic of Moldova, [dianatoroy@yahoo.com](mailto:dianatoroy@yahoo.com)

The adaptor as a meta-system tool supports adaptable software (language and processors) and hardware flexibility (extension and reduction). Language adaptor as part of adaptable language is composed from the pragmatic, syntactic, semantic, environment, and examples of new or modified element's component parts:

**\_BL\_** <element's pragmatics>  
**\_SY\_** <element's syntax>  
**\_SE\_** <element's semantics>  
**\_CO\_** <element's usage context>  
**\_EX\_** <element's examples call>  
**\_EL\_**

Adaptor's component parts support flexibility of languages and of processors as component parts of adaptable systems. Adaptors permit the process of software and hardware adaptation to the home-machine interface needs.

Adaptor is represented by the corresponding extender and reducer. The adaptors permit the Bottom-Up, Top-Down, and Horizontal adaptable (flexible) software's and hardware's development.

### 1. On-Off-Line Adaptable Software

The On-Off-Line adaptable software is composed from adaptable language and from corresponding On-Off-Line adaptable processors. Adaptable language is composed from the adaptable basic language, language's adaptors, and derivative (adaptable) elements (extensions). On-Off-Line adaptable processors are represented by the set of Off-Line, On-Line, and On-Off-Line adaptable processors, which implement adaptable languages. Evolution of On-Off-Line adaptable processors is based on the evolution of Off-line adaptable software [Tod-12].

Adaptable translation methods and models [Tod-08.1, 2] are used to demonstrate Off-Line adaptable processors' automatic creation. The last one is composed from the Off-line adaptable software's Basis and Off-line adaptable software's Levels.

### 2. Adaptable Software's Basis

Adaptable Software's Basis is represented by the adaptable basic language, language's adaptors, and derivative elements in community with the adaptable basic system. The last one is represented by the Definition, Fixation, Calling, and Reduction Adaptable sub-systems. The Definition sub-system implements the extension definition. The Fixation sub-system fixates the extension definition in the Adaptable Software. The Calling sub-system implements the extension call in the Adaptable Software. The Reduction sub-system creates the individual Adaptable Software.

### 3. First level of Adaptable Software

There are distinguished three different types of the first level of Adaptable Software (the first level of translation complexity On-line, Off-line, and On-Off-line adaptable processors). They are based on the next three types of invented Adaptable Software's creation methods: (1) the Extension's Time Implementation Method (E-T-I-M), (2) the Extension's Level Implementation Method (E-L-I-M), and (3) the Processor's Type Implementation Model (P-T-I-M).

With the help of E-T-I-M were created adaptable pre-, inter-, and post-processors. The E-L-I-M was used to create level-level (L-L), level-direct (L-D), and level-level-direct (L-L-D) adaptable processors. Were demonstrated the theorems of automatically creation of adaptable processors by the help of the E-T-I-M and E-L-I-M processor's creation methods.

On-line and Off-On-line first level adaptable processors can be created by the help of the P-T-I-M using Off-line adaptable processors developed on the base of E-T-I-M and E-L-I-M processor's creation methods.

### 4. Second level of Adaptable Software

There are distinguished three different types of the second level of Adaptable Software: the ELIM-PTIM type, the ETIM-PTIM type, and the ELIM-ETIM type. The second level ELIM-PTIM

type of Adaptable Software, for example, is represented by the L-L-Preprocessors, L-D-Preprocessors, and L-L-D-Preprocessors. The second level ELIM-PTIM type of Adaptable Software is created on the base of Extension's Level Implementation and of Processor's Type Implementation Methods.

The second level ETIM-PTIM type of Adaptable Software is created on the base of Extension's Time Implementation and of Processor's Type Implementation Methods.

The second level ELIM-PTIM type of Adaptable Software is created on the base of Extension's Level Implementation and of Processor's Type Implementation Methods. The adaptable processors of the ELIM-ETIM type, for example, is represented by the L-L-Preprocessors, L-D-Preprocessors, and L-L-D-Preprocessors. Was demonstrated the possibility of automatically creation of Off-line adaptable processors of the second level of translation complexity: Off-line Pre-, Off-line Inter-, and Off-line Post-processors and of Off-line: Off-line L-L-, Off-line L-D-, and Off-line L-L-D-processors..

It is demonstrated [Tod-12] the possibility to realize the second level's Adaptable Software on the base of translation interactions of the first level's Adaptable Software.

It is need to demonstrate the process of automatically creation of On-line and On-Off-line adaptable processors of the second level of translation complexity.

### **5. Third level of Adaptable Software**

Third level of Adaptable Software is represented by such types of Off-line Adaptable Software as Off-L-L-pre-processors, Off-L-D-inter-processors and Off-L-L-D-post-processors. They are represented by such types of adaptable processors as Off-line-L-L-Pre-, Off-line-L-L-Inter-, Off-line-L-L-Post-, Off-line-L-D-Pre-, Off-line-L-D-Inter-, Off-line-L-D-Post-, Off-line-L-L-D-Pre-, Off-line-L-L-D-Inter-, and Off-line-L-L-D-Post-processors.

It was demonstrated [Tod-07] the process of automatically creation of these Off-line adaptable processors of the third level of translation complexity. The demonstrations of automatically creation of Adaptable Software of the third level is based on the corresponding demonstrations of automatically creation of the Adaptable Software of the first and of the second levels of translation complexity.

It is need to demonstrate the automatically creation of On-line and On-Off-line Adaptable Software of the third level of translation complexity.

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