

tidbit (about money). Or an excerpt from the article «Little London – Metropolitan growing pains» of the same magazine: «There are many ways to kill the goose that lays the golden eggs. London's economy makes Britain rich. If Britons were to vote on June 23rd to leave the European Union, London would suffer» [5]. The famous expression «to kill the goose that lays the golden eggs» means to destroy something that makes a profit, with your own hands.

The word «money» naturally dominates economic phraseological units: «black money», «dodgy money», «blood money», «white money», «honest money», etc [6].

It should be mentioned that phraseological units with zoonym components are also very often used in the economic sphere. Animals mean economic agents or economic relations of comrades. Such phraseological units are formed in the following way: the name of the animal + an economic term. For example, «bull-market» (a market with a tendency to decrease rates), «dead cat bounce» (a sharp growth of the financial asset price after a period of its decline), «to smell a rat» (someone who has been disloyal to you or deceived you) [6].

Despite the fact that idioms and phraseological units make up a significant part of the modern English vocabulary, they are intrinsically ingrained in all the spheres of life, giving the language a unique colour, beauty and originality.

#### Список використаних джерел

1. Кравцова І. І. Фразеологізми в сучасній англійській мові: визначення, підходи, класифікація / І. І. Кравцова. // Науковий вісник Міжнародного гуманітарного університету. – 2016. – № 20. – С. 29–32.
2. Удяк Г. І. Специфіка вживання англійських фразеологізмів (на прикладі британських електронних ЗМІ). / Г. І. Удяк, Л. І. Петриця. // «Young Scientist». – 2017. – № 4.3 (44.3) – С. 259–263
3. Coming of age – Emerging economies [Електронний ресурс] // The Economist. URL: <http://www.economist.com/node/5411977>
4. Leroyer P. Dealing with phraseology in business dictionaries: focus on dictionary functions – not phrases / Patrick Leroyer. // Linguistik online. – 2006. – № 27. – С. 183–194.
5. Little London – Metropolitan growing pains [Електронний ресурс] // The Economist. URL: <https://www.economist.com/news/leaders/21697851-britains-capital-needs-build-more-its-would-be-mayors-are-short-plans-making>
6. Phraseological terminology in the English economic discourse / [М. Aimenova, А. Ospanova, А. Rakhimova та ін.]. // XLinguae. – 2019. – С. 228–238.

---

**Khropatyi O. M.**, PhD student in the department  
of information and computer systems  
Supervisor - **Kazymyr V. V.**, Doctor of Sciences, Professor  
**Lytvyn S. V.**, PhD, Associate Professor  
*Chernihiv Polytechnic National University (Chernihiv, Ukraine)*

#### CHARACTERISTICS AND OPERATING PRINCIPLES OF THE E-NET MODEL SYSTEM

The distributed modeling system E-net Model System (EMS) [1] allows you to create various distributed models. This is done mainly on the basis of the formal apparatus of hierarchical electronic networks. Such actions are possible within the framework of HLA (High Level Architecture). In defining the concept of HLA, one of the main roles is played by RTI (Run-Time

Infrastructure) [2]. HLA technology usually defines a standard for describing information about objects to be modeled. The RTI, in turn, facilitates the interaction of internal components to coordinate modeling and support inherent synchronization methods.

### **1. EMS architectural features**

EMS has a client-server architecture. EMS generally supports both distributed mode of operation and uniprocessor mode of simulation. This allows the use of the system for debugging models and in the process of modeling not huge tasks.

The system is accessed through a browser. In this case, on the client side, the user does not need to install additional programs. Using the subsystem of the graphical interface, the user can create the corresponding models in the system editor. Actions such as setting up an experiment and starting a simulation run that runs on the web server are also available. Simulation results are presented in the form of tables, diagrams or graphs. The results, along with the models, are stored in a separate database.

In distributed simulation mode, the processes are executed on the appropriate simulation servers. In this case, EMS must be installed on the simulation servers. In addition, it is mandatory to run RTI on the web server. In this case, the user, as in the previous described case, connects through the browser to the graphical interface of the system on the server side and creates models in the graphical editor. Experiment parameters are configured using the experiment subsystem.

Communication modules are used for communication between the web server and the simulation servers. This module is needed for a number of operations and functions:

- sending the configuration of items created on the web server
- obtaining simulation results
- work management
- starting, stopping and reloading elements on modeling servers

Thus, the simulation server receives all the necessary settings to run the simulation and the parameters for the experiment. The accumulation of statistical data takes place in the same place. At the end of the simulation, the results are transmitted to the web server in the statistics collection subsystem, where the final report is generated.

### **2. EMS core structure**

The main object of the EMS system core is the model. It stores the model time, as well as other parameters such as the time of the end of the simulation and the list of events. A component called an aggregate is used to store the structure of the model. It can contain positions, transitions, queues, inputs, outputs, and nested system components.

The model contains a reference only to the root aggregate. The objects of this component are needed when starting the model. At its core, a model can also be considered an aggregate and used in other structurally more complex models. The main difference between the model and the aggregate is that the second cannot be launched to conduct experiments and collect statistics.

Variables are usually defined by type, name and value. They can be defined at the root and nested aggregate level. The scope of a variable is determined by the aggregate and the children. In turn, the label is determined by the position in which it is installed. This move allows for the possibility of creating multiple labels in conjunction with a different set of attributes.

### **3. Model description language in EMS**

EMS uses a graphical way to build models [3]. This simplifies the development process. This method does not oblige you to learn any universal programming languages. The model is created

on the basis of a specially designed set of components in the graphical editor of the modeling system. This greatly simplifies the basic processes. Although there are some amendments to this issue. For example, it is necessary to use a specially designed language to define delay functions, transform functions or the decision function of transitions of a hierarchical network.

IEL (IE-net Language) is a developed interpreted language that is used in EMS and allows functionality to be set on IE transitions. It also helps to assign priority functions in IE queues, supports all basic data types and control structures, basic mathematical functions, and comparison operations and functions to generate random variables according to distribution laws.

#### **4. Organization of the experiment**

With the help of the experiment subsystem in EMS, a single or multiple run of the model is carried out during a given simulation time.

EMS provides for the solution of problems of strategic and tactical planning of the experiment. With regard to the strategic planning [4] of the experiment, the system provides for only one-factor experiments. In this case, the parameters of the model are assumed to be constant, and one of them is changed over the entire range of values. If necessary, you can sequentially conduct an experiment for each parameter separately.

Regarding the tactical planning of the experiment, EMS provides two options for carrying out the simulation: first, with a predetermined number of runs to obtain each response point at fixed values of the factor; the second - with the determination of the required number of runs in accordance with the rule of "automatic stop".

#### **References**

1. Kazimir V.V. The Embedded model system EMS / V.V. Kazimir, G.A. Sira, I.I. Musketeer // Bulletin of the Chernigiv State Technological University, Chernigiv - 2011. - No. 3 (51). - S.144-153.
2. High Level Architecture (HLA), Release 3.0, AIOTI WG03 – IoT Standardisation. European Communities, 2017, p. 41.
3. Strassburger S., "On the Role of Simulation and Simulation Standards in Industry 4.0," Simulation Innovation Workshop (SIW), February 11–15, 2019, Florida Hotel & Conference Center at the Florida Mall, Orlando, FL. – Orlando, Fla. : SISO, Simulation Interoperability Standards Organization, p. 12.
4. Feller V. Introduction to simulation and the language of SLAM-II [Text] / V. Feller // M. : Mir, 1987. - 738p.

---

**Chiipesh Natalia**, PhD student

Supervisors – **Maksym Dubyna**, Doctor of Economics, Professor;

**Svitlana Lytvyn**, PhD, Associate Professor.

*National University «Chernihiv Polytechnic»*

### **INNOVATIONS AS A BASIS FOR DEVELOPMENT OF THE CREDIT SERVICES MARKET OF UKRAINE**

The functioning of the credit services market during the years of independence experienced periods of a significant growth, the introduction of new credit services and instruments, and long periods of recession, which were characterized by a significant fall in the national currency rate, high inflation, and a rapid increase in interest rates on credit resources. Such processes have been reflected in the structural and institutional distortions that currently exist in the Ukrainian credit market. It should be emphasized that the introduction of innovations took place mainly during periods of growth, when credit institutions could accumulate appropriate financial resources to finance innovative developments.