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## Towards a Normalized Economic Mechanism Based on E-services

A. V. Ilyin, V. D. Ilyin

Laboratory of Methodological Basics of Information Technology Implementation, Institute of Informatics Problems of the Russian Academy of Sciences, Moscow, Russia

### Abstract

The article describes the conceptual foundations, architecture and main systems of the normalized economic mechanism based on e-services. This mechanism corresponds to the normalized model of the economy, called **NEc-model**. In this model money is treated as an electronic document that proves the cost of goods and property status of economic agents, and money issue is canceled. The model defines rules for e-banking, e-trade, e-investment, cleaner production and other.

### Key words

Normalized economic mechanism, e-service, e-banking, e-trade, e-investment.

### Introduction

#### The mechanism of an economic activity (EM)

– one of the most complex organizational-technical systems invented by human beings. Improvement of EM based on e-services is one of the most urgent scientific and technical problems of economics and informatics (Ilyin, 1996).

Methods of doing business depend on the objectives set. The choice of the main goal of economic activity is not the subject of scientific discussion. In any economic model as in a model of human-machine system it is necessary to state the purpose of the model and formulate the objectives that it will help to solve. In the models offered in the famous works on economics (Fisher, 1922; Keynes, 1936; Friedman, 2005; Krugman, Wells, 2009) the default assumption is that the prioritized goal of economic agents is extraterritorial profit. For those seeking extraterritorial profit the main goal is not the economic development of the country. To achieve their goals corporations hire guest workers (Taran, 2011) and seek locations, which offer cheaper labor, land (Meyfroidt et al., 2013), etc. (e.g. in China and other Asian countries). The result – the population of developed countries loses professional qualifications and switch to activities not related to the production of vital commodities (VC production).

**The conceptual basis of the EM of extraterritorial profit (PM)** is supported by the ideas presented in (Fisher, 1922; Keynes, 1936; Friedman,

2005; Krugman, Wells, 2009). PM is presented as having faults, but having no alternative. The economic troubles inherent in PM are interpreted as the native elements or the unpredictable events like in casinos and racetracks. Not only financial, but also many state leaders, are accustomed to solving their economic problems by reducing the income of producers of real commodities and have a vested interest in the existence of PM.

The inevitable consequences of the use of PM are:

- the growing number of capable people who consume real commodities, but do not produce them;
- an unsustainable pattern in the real economy, including agricultural sector;
- the financial sector dominates the sectors producing real commodities (as money and securities remain highly profitable commodities);
- under the existing rules of the economic activities the state can lose control even over the corporations and farms producing vital commodities (the scheme is well known: enterprises borrow from foreign banks, debts which they are unable to pay back → as a result foreign banks become owners of the property of these enterprises).

Problems of climate change, intensification of pollution, inefficient use of agricultural land

and poorly managed migration of the working population are most obvious harmful consequences of the PM functioning (Taran, 2011; Meyfroidt et al., 2013; Helin, 2013; Skevas, Lansink, 2014; Lwasa et al., 2014). Economists, engineers and environmentalists are looking for approaches to solving the problem of environmentally sound economic growth (Valin, 2014; Lorek, Spangenberg, 2014).

There is also a technological component of the inadequacy of PM: in these days it remains essentially the same as it was before the Internet era. Money is issued and used without legal rules defining any connection with transactions of sale of real commodities. Moreover, different financial instruments (stocks, bonds, etc.) are issued, which are also traded.

The fact that modern banking technologies are provoking fraud proves the professional impropriety of the management of the central banks. Many banks are developing online services as they want to. Surely, the central bank of each technologically advanced country should take the initiative to develop requirements for unified online bank services.

The purpose of this article - to present some results obtained by the authors in studies dedicated to informatization of the economic mechanism (Ilyin, 1996; Ilyin, 2009; Ilyin, 2012; Ilyin, 2013; Ilyin, Ilyin, 2013).

## **Materials and methods**

### **1. The normalized EM (NEM): general description**

The first version of NEM was presented in (Ilyin, 2009), and the latest – in (Ilyin, 2012). A methodology and software for expert resource planning were presented in (Ilyin, 2013) and (Ilyin, Ilyin, 2013).

Economic performance depends on architecture of EM, stocks of resources, technological level and productivity of plants and farms, creativity and earning capacity of those involved in economic activity.

We consider expedient such architecture of NEM that would stimulate the citizens of a country

- to produce the required amount of vital commodities of the appropriate quality (including those necessary for defense) and maintain rational production structure;

- to invent and apply advanced technologies and means of their realization;
- to improve the educational system and the system of scientific research;
- to treat with care the human gene pool and natural resources (water, soil, fossils, etc).

Not all countries can manufacture VC independently. The composition of vital commodities varies from country to country. Joint-stock ventures, mutual investments, international trade unite manufacturers of different countries and make them beneficially interdependent.

We assume that economic well-being of a country (as a participant of global status rivalry) is determined, above all, by its ability to provide itself with a sufficient amount of vital commodities of the appropriate quality (including commodities for military defense), the ability to maintain a rational structure of production and the improvement in the qualifications of the work force.

NEM includes the following complexes:

- production of real commodities (**RC-production**);
- e-trade of real commodities (**RC-trade**);
- stockpiling of vital goods (**VG-stockpiling**);
- contractual money e-investment;
- the state budget, reserves, taxes and duties;
- regional budgets and taxes;
- social security funds;
- documenting the results of economic activity (**EA-documentation**);
- management of economic activity (**EA-management**).

NEM functioning is determined by a **system of obligatory and orienting regulations** (Ilyin, Ilyin, 2013). Obligatory regulations include the ones relevant to the country's laws. Regulations that determine the relations of economic coordination between corporations and citizens of different countries should be referred to as orienting regulations.

**RC-production** is the transformation of original resources (labor, equipment, materials, etc.) into real commodities of certain types. Manufacturers of real commodities: the systems of water-, heat- and energy supply; plants producing foodstuffs, clothing and footwear; complexes

constructing buildings, bridges, roads; planning and design offices, institutions for scientific research; education, recreational and healthcare facilities. The complex of RC-trade includes wholesale and retails companies (domestic and international) and means of storage and delivery.

**The division of labor and specialization of manufacturers** have resulted not only in improved products and increased productivity, but also in a number of social problems (including the problems of “single-industry towns”). Job creation for the able-bodied population is one of the goals of EA-management that constantly remains urgent. An acceptable solution to this problem requires a revision of production and distribution technologies.

### **1.1. Modularity, unification, complexation**

The principle of constructing complexes from unified modules does not require an explanation. Modern farms and plants should be built (and those built earlier should be rebuilt) in accordance with this principle. Manufacturing complexes made from unified modules is the key method to solving the problem of unemployment among employable population.

### **1.2. Ordered production**

The higher the cost of a product, the less reasonable it is to produce it without an order and delivery contract. Production to order is an alternative to production “to the warehouse”. This mode of production is technologically provided by the modern electronic services (e-services); in particular, by e-services of information portals of modern corporations and farms.

### **1.3. An alternative to “economic growth”**

Energy saving technologies for light and heat cause the reduction of energy consumption, and transition from paper documents to electronic documents will lead to the reduction of paper consumption. The list of examples of inevitable reduction of consumption that has become a consequence of technological advancements is easy to continue. Useful, functionally flexible, reliable and durable commodities should substitute commodities that do not have such characteristics. The popular cult of “economic growth” that is formulated as the total value of commodities bought (INTERNATIONAL MONETARY FUND, 2014) should be replaced by striving for technological rationalization of production of reliable and durable essential commodities. If production of the commodity is

cleaner and its environmental safety is higher, then sales tax should be lower. Product specification should include data about the level of cleanliness of the production and environmental safety of the product itself.

### **1.4. Economic agents**

In NEM-system, any capable person or entity has an electronic account of economic agent (EA-account) with unique global identifier (detailed in section 2).

Commercial economic agents can be either individual or corporate enterprises. Individual enterprise (I-enterprise) is set up by one capable person. Corporate enterprise (C-enterprise) is set up by more than one capable person. Regulations of the I-enterprise and Articles of Association of the C-enterprise must be endorsed by digital signatures of their founders and should be drawn up according to the electronic templates approved by law. The Articles of Association should include the amount of money and/or property objects invested by each of the founders, division of powers, conditions of withdrawal of the founders and accession of new members. The documentary proof of a state registration is the assignment of unique global identifier to the C-enterprise that is necessary to open its EA-account. References to relevant sections of the C-enterprise’s EA-account are included into private EA-accounts of the founders. At the same time references to private accounts are included into the C-enterprise’s account. Material liability of founders of the C-enterprise for its obligations should not be limited by money and property objects referred to in the Articles of Association.

### **1.5. VG-stockpiling**

In addition to the state reserves it is desirable to develop a non-government stockpiling of vital goods. Vital goods in the depositary networks of state and non-government VG-stockpiles are a useful trade buffer (both for consumers and producers and for those engaged in wholesaling). The volume of different types of stockpiled vital goods is to be changed depending on the situation in a country, but in any case such a trade buffer contributes to better predictability of vital goods sales and, as a result, to the greater stability of production. Rational management of VG-stockpiling is an important objective, and the results of its decision influence price stability. It is rational to attract private and corporate investments to construction and exploitation

of the depositary network of non-government VG-stockpiles, and also to purchase of vital goods for them.

### 1.6. Technologies of resource allocation

Resource allocation problems belong to the main tasks of economic activity planning in NEM. Technologies for resource allocation are designed for implementation in e-services.

#### Technology of multi-resource allocation

Traditional software for multi-resource allocation does not allow an expert intervention in the search for solution. If given system of constraints is incompatible, programs propose to adjust the input data. To make up for these shortcomings, the authors have proposed the informal statement and method for solving the **general linear problem of resource allocation**, which has been called the **method of target displacement of solution**. This method is implemented in the **technology of interactive resource allocation in accordance with the customizable system of rules**. This technology allows an expert to search for plans in accordance with his knowledge of the applicability and efficiency of the plans. Software implementation of the technology has been developed and tested in a number of applications (Ilyin, 2013).

Expert planner defines rules of resource allocation in the form of requirements on the values of resource functions  $F_i(\bar{x})$  – linear forms, whose values depend on vector of allocation  $\bar{x}$  and numerical coefficients.

In general case, a simple rule can be written in one of three forms:

$$F_i(\bar{x}) = c_i [\leftarrow^{\text{priority}} p_i], F_i(\bar{x}) \leq c_i [\leftarrow^{\text{priority}} p_i], \\ F_i(\bar{x}) \geq c_i [\leftarrow^{\text{priority}} p_i]$$

where  $F_i$  – resource function,  $c_i$  – constant,  $p_i$  – priority of the rule ( $0 < p_i \leq \infty$ ); square brackets denote optionality of priority.

A composite rule is a logical combination of simple rules.

Expert planner performs step-by-step search for solution [in dialogue with specialized software]. At each step he customizes rules that determine the change of solution. (Any rule may remain unchanged during the search).

The rules can be obligatory or orienting. Obligatory

rules have an absolute priority ( $p_i = \infty$ ), that is, they cannot be violated. Orienting rules specify the desired values of resource functions, setting the direction for displacement of solution.

Let  $\bar{x}^0$  be a given vector of allocation, and

$$\{ F_i(\bar{x}) = F_i(\bar{x}^0) + h_i [\leftarrow^{\text{priority}} p_i], h_i \neq 0 \}$$

– a given composite rule: the simple orienting rules, related by conjunction, are enclosed in curly brackets.

Let say that the vector of allocation  $\bar{x}$  satisfies the given orienting rules ( $\bar{x}$  is more efficient than  $\bar{x}^0$ ), if

$$F_i(\bar{x}^0) < F_i(\bar{x}) \leq F_i(\bar{x}^0) + h_i \text{ is true for each } h_i > 0, \text{ and}$$

$$F_i(\bar{x}^0) + h_i \leq F_i(\bar{x}) < F_i(\bar{x}^0) \text{ is true for each } h_i < 0.$$

The informal statement of general linear problem of resource allocation (Ilyin, Ilyin, 2013) is oriented to the computational experiment mode, which involves the possibilities of changing the input data and system of rules, governing the search for solutions. In general case, the expert planner solves a set of particular problems, having the formal statements and algorithms, and performs comparative analysis of solutions.

The developed technology (Ilyin, Ilyin, 2013) significantly extends the traditional arsenal of facilities for solving resource allocation problems (an expert can formulate and try to solve standard optimization problem at any step during the search for solution).

#### Technology of cost planning

Income is a variable for millions of individuals and companies. It may depend on the volume of sales, market prices, exchange rates and many other factors. However, even on a state level, expenditures are often planned on the basis of point assumptions about the total income. If such assumptions are wrong, the budget is to be altered. The planning results are also presented by exact value for each expense item, although in practice most of the costs cannot be predicted accurately. To address these shortcomings, authors have proposed formulation of the problem, where expected amount of the resource and requests are given by numerical intervals. The method

for solving this problem (Ilyin, 2013) is implemented in the CP-service (see 5).

### **1.7. Documenting the results of economic activity**

The core of the EA-documentation complex is the **property status system (PS-system)**. Documenting the sale and purchase transactions, e-investments, gifts and donations, and documenting the public dues payments, is done by the **personal electronic banks of economic agents (PEBs)**, where original accounts and other documents of business activity are kept. At the closing of each deal the copies of participating accounts are updated on the servers of **banks-providers** that play the role of certifying centers and depositaries of updatable copies of the EA-accounts and other documents, and the same operations are performed on the servers of central bank once a day (or at another time period set by law). Documenting the corporation's internal operations is carried out using their own resources (on the basis of a form of documents and rules of document flow set by law). All the documenting is carried out in accordance with program-implemented system of rules. Each stage of documenting is done on the basis of advanced information technologies using tested hardware and software of PEBs, the servers of the central bank and the banks-providers. It is rational to implement **e-documenting commodities (EDC)** in the form of **EDC-services**. There should be a specification for every commodity that has a field "Documentation" for hyperlinks to e-documents, which specify all parameters of the commodity.

### **1.8. Property items and their exchange**

**Specified property items of a NEM-system (s-items)** – are means of RC-production, RC-trade, VG-stockpiling, EA-documentation, EA-management belonging to economic agents and consumer items, registered in the NEM-system. Every s-item corresponds to a unified electronic specification that includes its name, purpose and characteristics. If it is a manufactured item, then a manufacturer and a release date and expiry date are recorded. A reference for sales and delivery regulations is indicted for the item to be sold. The s-item specification is an e-document that presents it as a commodity.

**A commodity** is a s-item which can be sold. Categories and types of commodities are to be determined by law. Within their categories (food, clothing, etc.) every type of commodity

(in the category of food: bakeries, dairies, etc.) must have a unified specification that includes the number of this type according to the priority list of the category of commodities, information about customs duties and on the terms of sale within and outside the NEM-system. The type of commodity, within a certain category, determines the level of duties applicable on domestic and overseas sales.

S-items of refundable property exchange include:

- real commodities (including services of state mechanism);
- savings (money savings and non-monetary savings) of economic agents, reflected in their EA-accounts.

Money savings are used in purchase and sale transactions and in contractual **NEM-money** e-investments. Non-monetary savings, reflected in accounts by hyperlinks to specifications of registered property, are used in sales transactions involving credit (as collateralized property of the customer) and in contractual NEM-money e-investments (as collateralized property of the e-investment recipient). Donations (of real commodities and/or NEM-money savings), contributions and etc. relate to free of charge property exchange (the exhaustive list and terms of fulfillment are to be fixed by law).

### **1.9. The complex of EA-management:**

- sets the goals and objectives for the development and improvement of NEM complexes mentioned above;
- directs and stimulates economic activity through taxes, excise, duties and other means of economic regulation;
- coordinates the fulfillment of the objectives and controls the results achieved.

The complex of EA-management includes state institutions (ministries and the central bank) and commercial institutions (boards of directors, etc).

## **Results and discussion**

These days the approaches to the implementation of the PS-system (see 2), e-banking system (see 3) and multicurrency market (see 4) are discussed the most intensively. E-service for cost planning is already being tested (see 5).

## **2. The system of property status (PS-system) and NEM-money**

**The system of property status (PS-system)** is the system of e-documentary representation of monetary and non-monetary components that reflect property status of economic agents. Monetary components are represented in NEM-money amounts that are in the currency sections of **unique unified multicurrency accounts of economic agents (EA-accounts)**. Non-monetary components of PS-system are represented by hyperlinks to e-documents proving ownership of land, houses, etc.

**NEM-money** is an e-document that serves for

- quantify representation of values of commodities and monetary components of EA-accounts;
- payment for commodities, taxes and duties;
- accumulation of wealth in universal form;
- contractual monetary e-investment;
- monetary gifts and donations.

NEM-money is represented by records in EA-accounts, which certify property rights to a share of the commodity value of the NEM-system and property liabilities in relation to other economic agents. Signed real numbers are used to present the sums in EA-accounts (the minus sign is used for those sums that are to be returned, the plus sign for those sums which have been received in accordance with contracts of closed deals). NEM-money has two states: assigned (e.g. a debt due to a commodity purchase; investment; tax, etc.) and non-assigned (sums in the "I own" sections of EA-accounts). Assigned NEM-money may be used only for a certain purpose [e.g. those received from investors can be used in accordance with the investment contract (purchase of new equipment, etc.)]. Non-assigned NEM-money is used according to the self-determination of the owner of EA-account (in any permissible deal). The NEM-money concept excludes money issue and excludes trade in credits and currencies.

A market value of a commodity is expressed by an amount of NEM-money and is a result of trade-off between a buyer and a seller, which depends on supply and demand. The NEM-money savings of an economic agent are reflected in his EA-account in the form of records of the currency sums in the sections "I own" and in subsections

"I invested" of the sections "Investment". The values in the sections "I own" imply unbound savings [non-assigned NEM-money sums]; investment accumulation is recorded in subsections "I invested" of the sections "Investment" (an assigned sums that can be used only in accordance with e-investment contracts).

### **2.1. Purchasing power (tradable capacity) of NEM-money**

Let us assume that in some region of NEM-system one can purchase  $e[A]$  kilowatt-hours of electric power for  $A$  rubles or  $wa[A]$  liters of fresh water. Amounts  $e[A]$  and  $wa[A]$  represent a regional tradable capacity of NEM-money (e.g. in rubles) for electric power and fresh water. The tradable capacity of NEM-money for similar types of commodities (e.g. electric power) can vary significantly in different regions of the NEM-system. It is rational to use the same amount  $A$  in all the regions within the NEM-system (to make comparisons of the regional tradable capacities for the chosen type of a commodity). Changes over time in the regional tradable capacity of NEM-money (for commodity types) reflect changes in the supply-and-demand situation (for commodities of these types). Data about these changes play an important role for producers and investors. It is efficient to publish changes in regional tradable capacity of NEM-money (for commodity types) on special web-sites of e-trade and bank portals.

The prevailing continuous decrease of the tradable capacity of money in PM-systems, as a rule, is determined by money emission and loan granting not only for purchases of commodities. The decrease of tradable capacity of money occurs also due to the employment of securities as a means of payment for real commodities. Besides, modern banking technologies do not exclude the possibility of using (for some period of time) money on clients accounts (without letting them know about it). Thus the organized decrease in the tradable capacity of money is fraud to take a part of money belonging to those who produce real commodities and selling them.

### **2.2. Unique unified multicurrency account of economic agent (EA-account)**

**EA-account** is a unified e-document consisting of currency sections (which are activated by the central bank), each of which has the following basic items: "I own", "Lending", "Investment",

“Taxes and duties”, “Gifting”, “Donation”.

The section “I own” includes an amount of NEM-money that can be used for any permissible deals (purchases, investments, etc.). The section “Lending” has two subsections – “Granted” (a sum of NEM-money lent) and “Received” (a sum of borrowed NEM-money). The section “Investment” includes the subsections “Invested” (a sum of invested NEM-money) and “Received” (a sum of received investments). There are other subsections in other sections also. Having assigned a time period, one can receive detalization for subsections of any section of the EA-account. The set of permissible operations for amounts recorded to EA-account is determined by subsections to which they belong (e. g. an amount from the “Received” subsection of a section “Lending” cannot be used for granting loans).

As far as an EA-account has a multicurrency structure, it can be applied to record the results of internal and overseas economic activities. The application of EA-accounts assumes that every economic agent has his own unique identifier (a conceptually similar project “National Strategy for Trusted Identities in Cyberspace” was published in the USA (The White House, 2011)).

Services of e-banking and the functioning of the EA-accounts are based on programmable sets of rules fixed by law. Access to the EA-account, reading of its content and recording of something are carried out by certified software that is installed on the PEB-device. Any change is registered, and a copy is automatically sent to a bank-provider that serves this PEB. Only results of transactions that are allowed by law may be recorded in EA-accounts [purchase and sale of real commodities (using lending or free from it), contractual investment, registration of real estate and etc].

### 3. E-banking system

The e-banking system of NEM is the primary means of EA-documentation. It includes **personal electronic banks (PEBs)**, **banks-providers** and **central bank**, which manages all the other banks.

**A central bank** is a state institution that manages the banking system.

The central bank performs the following functions:

- grants and revokes licenses to carry out banking activity (for owners of PEBs and banks-providers);

- activates and deactivates the currency parts of EA-accounts;
- controls implementation of banking activity rules;
- analyses the financial component of the NEM-system’s activity and presents the results of analysis in order set by law;
- develops, modifies and approves tested unified forms of banking documents (including EA-accounts);
- controls the efficiency of monetary state reserve funds and social protection funds allocation, etc.

The central bank possesses a network of servers located on the territory of a country under whose jurisdiction the NEM-system functions.

**Bank-provider** is a commercial institution established by legal entity (or by associations of legal entities and individuals) which deals with RC-production, RC-trade or VG-stockpiling. The bank-provider produces and sells unified e-services to owners of EA-accounts.

These services include:

- processing queries of EA-accounts owners, which are sent by PEBs when the deal is effected (including queries to certify the state of the EA-account, sent upon authorization of its owner);
- storing of the copies of EA-accounts;
- analysis of investment inquiries of clients (prospective investors and investment recipients) (banks-providers can execute orders of investment recipients to consolidate investments in order to accumulate a desired sum);
- registering signed agreements [for permissible transactions] and maintaining the database of such agreements;
- legal support of deals etc.

Legal support of deals is an important component of bank-provider’s services. The bank-provider disposes a consolidated network of servers, designed to process the queries of PEBs owners and to interact with the servers of a central bank.

**Personal electronic bank (PEB)** is a portable electronic device (like tablet PC) with smartphone functions. PEB stores the original EA-account and documents on deals. The mobile banking software (certified by central bank) is the core of PEB applications. The encrypted database



of an EA-account is stored in the memory of the device, and its copy is stored on the memory card. Only EA-account owner can initiate records in the files of EA-account. The copies of EA-account and documents of serviced deals are kept in the bank-provider's databases (for the period of time, set by law of the given NEM-system).

#### **4. Multicurrency market and e-trade technology**

To buy or sell a certain type of commodity any member of multicurrency market may choose a partner from any country with which there is a trade agreement. The choice can be made on e-trade portals where buyers and sellers place their offers. Price of any commodity may be presented in multiple currencies (of the allowed for this type of commodities). Sales tax (in currency that was used in trade deal) goes to the country that issued the license to sell the commodity. Realization of the idea of multicurrency market would reduce the harmful effects of the economic crisis. Krugman (2012) made a similar conclusion when he wrote about the plight of some EU countries.

Market prices are set in deals on twenty-four-hour operating e-trade portals. The beginning of a purchase and sale transaction is the signing of a typical contract (for this type of commodity). Banks-providers of the buyer and seller register the fact of signing the contract (the contract is kept in these banks together with the payment document). The seller does not have any rights to increase the price for this commodity after the moment of the signing (even if there are people who want to buy it at a higher price). The commodity itself does not matter. One of the necessary components of e-trade technology is the legal backing of purchase and sale transactions.

Domestic e-trade is done according to the rules that are set by the laws of the state under whose jurisdiction the NEM-system operates. E-trade deals among economic agents from different NEM-systems should be done following the given obligatory rules:

- the applicable set of currencies is represented by an intersection of the sets of currencies that are activated by central banks of the NEM-systems whose economic agents execute the deal;
- restrictions should be made corresponding to the list of commodities that are allowed for import and export, as defined by law and by international treaties.

Coordinating relations between countries are necessary while developing and implementing of the above rules. Any global regulators that are limiting the freedom of economic choice are not desirable. In particular, WTO rules do not always have a beneficial effect on the processes of competition for markets of agricultural products (Soukup, Brčák, Svoboda, 2014).

#### **5. E-service for cost planning (CP-service)**

Widest area of the CP-service usage is the budgeting (although the CP-service allows to plan any resource costs). The CP-service is designed for distribution of expected funds between expense items. Service user downloads and installs a client application for his operating system. With it:

- User specifies an interval for expected funds assuming the worst and the best conditions.
- User specifies a table of expense items, and for each row he enters the lowest and the highest expected costs (or exact value) – the requests of the expense items. Priorities of the requests can be specified and optionally used in calculations.
- User can create a table of details for any expense item. Any item in details can also be detailed, etc. Different data precision can be used for different tables.
- User commands "Allocate" from his application. It connects to the CP-service via Internet and sends it a request for resource planning (request contains only numbers).

The CP-service performs calculations and sends results back to the client application, which shows them to user. The results contain values "Give min." and "Give max." for each expense item. Sums of min. and max. values comply the specified minimum and maximum funds respectively. Subsequently, when user receives or spends a part of the funds, or obtains more precise information on the income and expenditure sides of the budget, he adjusts the input data, commands "Allocate" again, and gets refined results. When user specifies the funds exactly (i.e. minimum = maximum), the received values „Give max.“ can be treated as exact decision of the cost planning task.

The CP-service and its client applications are presented at [www.res-plan.com](http://www.res-plan.com).

## Conclusion

The most dangerous trends of the last decades are climate change, intensification of pollution, inefficient land use, poorly managed migration of the working population and the intensive growth of the non-producing but actively consuming part of population (which requires a continuous increase in budgetary expenditure on social assistance). Agricultural sector is most vulnerable to these trends: farms lose not only the necessary human and natural resources, but also a significant part of budget support.

The rules regulating economic activity imposed by the state at each stage should correspond with the objectives of development and protection of the country's potential, and the state regulating impacts (in the spheres of taxation, customs duties, investment and other) should direct activities of economic agents to achievement of these objectives. It should be much more profitable for economic agents to comply with those rules than to break them.

It is advisable to immediately start step-by-step design and implementation of the NEM. Complexes of RC-production, RC-trade and VG-stockpiling have to become highly adaptive to changes in demand for vital goods and to requirements regarding their quality. NEM-money should become a means of e-documenting the results of economic activity. Every economic agent should have unique electronic multicurrency account (EA-account) that reflects monetary and non-monetary components of property. A loan must become a deferred part of payment for purchase, according to a contractual schedule. Contractual e-investment must be targeted at the development of RC-production, VG-stockpiling, RC-trade etc.

The following concepts of the NEM have particular importance for agricultural producers:

- buyer lending by sellers and contractual

investment based on technologies of personal and corporate electronic banks

- multicurrency market
- nets of VG-stockpiling
- state regulation of imports and exports in accordance with systems of obligatory and orienting rules

Implementation of unified technologies for multicurrency e-trade and e-investment is especially important for the agricultural sector because many farms are in need of expanding the market, attracting and making investments (Maart-Noelck, Musshoff, 2013).

Basic NEM principles	
EA-management	<b>RC-production:</b> modularity, unification, complexation; ordered production
	<b>VG-stockpiling:</b> the state reserves and a non-government stockpiling of vital goods
	<b>Multicurrency market:</b> e-trade, e-investment
	<b>EA-documentation</b>
	- PS-system: NEM-money, EA-accounts
	- E-banking system: central bank, banks-providers, personal electronic banks (PEBs)
	<b>The state budget, reserves, taxes and duties</b>
	<b>Regional budgets and taxes</b>
	<b>Social security funds</b>

These days the concept of normalized economic mechanism is being implemented in the framework of research at the Institute of Informatics Problems of the Russian Academy of Sciences. Online services of cost planning and interactive resource allocation according to the customizable rules have been developed (Ilyin, 2013; Ilyin, Ilyin, 2013).

*Corresponding author:*

*Prof. Vladimir Ilyin, DrSc,*

*Laboratory of Methodological Basics of Information Technology Implementation,*

*Institute of Informatics Problems of the Russian Academy of Sciences,*

*44 Bld. 2 Vavilova st., Moscow, 119333, Russia*

*Phone: +79164073332, E-mail: vdilyin@ipiran.ru*

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