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Algorithm Multivariate Analysis for Ensuring Completeness of Customs Expertise

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***Abstract* – The paper deals with the simulation of the process of customs expertise of goods with the use of information matrices to describe the relationship of the commodity nomenclature of foreign economic activity and permits and algorithm for multi-dimensional analysis to ensure completeness of such expertise in terms of electronic declaration.**

***Keywords* – customs procedures, customs expertise of goods, custom registration, goods customs expertise, information matrixes and system analysis.**

I. Introduction

The practice of international experience suggests that the customs authorities are aimed primarily at the strategic objectives: the protection of the economic sovereignty of the country, ensuring its economic security, combating smuggling and others. The successful solution of problems of fiscal customs authorities largely depends on the correct identification code of foreign trade of goods. To determine the correct code commodities under the nomenclature of foreign economic activity (HS) used methods of customs expertise of goods, including methods of analysis of its chemical composition.

However, with the increase in foreign trade turnover it is becoming increasingly urgent task of automating the process of customs expertise with the use of information technology and specialty 02.00.22- "The classification and certification of products in chemical composition" [1].

In this paper we consider the problem of modeling the process of customs expertise of goods with the use of information matrices and algorithm of multivariate analysis to ensure completeness of such expertise. The technique of the use of information matrices to ensure the completeness of customs expertise in terms of electronic declaration of goods.

II. Information Matrixes Of Connectivity Of Goods Nomenclature In Foreign Economic Relations

It is known that during foreign economic activity every good crossing custom borders is subject for registration and submission to customs bodies.

As a result of this challenge for the purposes of provision of execution of procedure "About electronic registration of goods in customs" of decree of Cabinet of Ministers of the Republic of Uzbekistan the "Electronic declaration" was introduced into practice and with its help the process of distance submission of documents and registration was put into practice. permissions of goods into declaration.

In the annex of above mentioned decree of Cabinet of Ministers of the Republic of Uzbekistan about 20 certificates and permissions such as veterinary certificates, phytosanitary certificate, hygienic certificate, plants quarantine certificate etc. were added.

If take into consideration that with one customs declaration we can clear several types of goods, ths actuality of introduction of electronic systems becomes more important.

It is known that the sign expressing name of each information or its value is called "information variation" [2]. For example:

$$\left.\begin{aligned} X &= (x_1, x_2); \\ x_1 &= goods; \\ x_2 &= mobile\ \ phone \end{aligned}\right\} \quad (1)$$

If in the expression x_1 variation "good" – denotes name of information, x_2 – variation denotes "mobile phone" is variation of that value.

In the Republic of Uzbekistan as a country which has acceded to the International Convention on the Harmonized Commodity Description and Coding System (Brussels, 14 June 1983), apply codes of goods under the nomenclature of foreign economic activity (HS). If the product code on the HS is denoted by xi, name of the product is denoted by yi we obtain the following matrix::

$$Tn = \left\{\begin{aligned} &x_1, y_1 \\ &x_2, y_2 \\ &\cdots\cdots \\ &x_n, y_n \end{aligned}\right\} \quad (2)$$

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It is evident that the matrix elements are given information. Such a matrix, ie, matrix in which all elements of information are called "information array"[2].

This matrix (2) plays important role in analyzing of HS codes. If we take into consideration that there are about 11 thousands of HS code names in the Republic of Uzbekistan, *n*-11000 can be taken.

The same is every x_i HS code goods declaration and take into consideration that certificate or permission is s_i and its submission authority is d_i and every x_i HS code goods declaration is subject to separate requirement of certificate and permission x_i we will

Let's take document permission matrix for goods with HS codes.

$$C_i = \{s_{i1}, d_{i1}, s_{i2}, d_{i2}, \ldots, s_{ik}, d_{ik}\} \quad (3)$$

Here k - x_i are the number of certificates and permission necessary for having foods declared.

Using above (2)-(3) determinations, HS codes and their certificates can be helpful for determining their codes and certificates connectivity in expanded manner. Its appearance is as follows:

$$C_{Tn} = \begin{Bmatrix} x_1, y_1, s_{11}, s_{12}, \ldots, s_{1k} \\ x_2, y_2, s_{21}, s_{22}, \ldots, s_{2k} \\ \ldots\ldots \\ x_n, y_n, s_{n1}, s_{n2}, \ldots, s_{nk} \end{Bmatrix} \quad (4)$$

In every row of this matrix there are goods HS code, its name and necessary documents for certificate and permission.

Using expanded HS codes, with the following way we will determine control logic matrix *M* which provides completeness:

$$M = \begin{Bmatrix} m_{11}, m_{12}, \ldots, m_{1k} \\ m_{21}, m_{22}, \ldots, m_{2k} \\ \ldots\ldots\ldots\ldots\ldots\ldots \\ m_{n1}, m_{n2}, \ldots, m_{nk} \end{Bmatrix} \quad (5)$$

Here m_{ij} is variation adopting 0 or 1 values if for declaration of good with HS code x_i certificate or permission s_{ik} is required as 1, otherwise it adopts 0 value. i.e.:

$$m_{ij} = \begin{Bmatrix} 1, if \ Tn \cap C_{Tn} \neq \theta, \\ 0, otherwise \end{Bmatrix} \quad (6)$$

Using shown expressions (5) - (6) the number of x_i certificates and permissions for declarations are determined as:

$$\tau_i = \sum_{j=1}^{k} m_{ij} \quad (7)$$

As an example of logical matrix control the Table.1. shows one part.

Table.1.

x_i	y_i	s_{i1}	s_{i2}	s_{i3}	s_{i4}	s_{i5}	s_{i6}	s_{i7}
3808500000	Insecticides, rodenticides, fungicides, herbicides, anti germination items and plant growth regulators, disinfectants and similar products, put up in forms or packings for retail sale or as preparations or products	1	1	0	1	0	0	1
3808911000	Insecticides, rodenticides, fungicides, herbicides, anti germination itemsand plant growth regulators, disinfectants and similar products, put up in forms or packings for retail sale or as preparations or products	1	0	0	1	0	0	1
3808912000	Insecticides, rodenticides, fungicides, herbicides, anti germination items and plant growth regulators, disinfectants and similar products, put up in forms or packings for retail sale or as preparations or products	1	1	0	1	0	0	1

In Table.1. by s_{i1}, s_{i2} s_{i3},s_{i4}, s_{i5}, s_{i6}. s_{i7} the following certificates are shown:

s_{i1} – conformity certificate,

s_{i2} – permission for ozone destructing products,

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s_{i3} – ecological certificate,
s_{i4} – hygienic certificate,
s_{i5} – plants quarantine certificate,
s_{i6} – phytosanitary certificate,
s_{i7}– veterinary certificate.

It is necessary to state separately the condition (7) is main condition for provision of completeness of goods declared, and if for goods with HS code x_i less number of required documents are submitted, we can easily tell that there are lack of enclosed documents.

In addition, all normative documents if it is determined that goods shall be registered for "import" of "export" modes, there are several modes for registration of such goods. For example, for import operations - "import-40: release for free usage", "import-70: temporary keeping", "import-51: processing in the customs territory and other modes.

Moreover, the regime "import-40: release for free usage" has different procedures such as "Humanitarian goods", "technical provision of goods" and others, so the requirements will vary depending on procedure. I.e., for determining of necessary certificates and permission goods for x_i HS goods it requires to use certain matrix (5) having separate appearance. If we determine goods having x_i HS code as mode r_l the multi value logical matrix will have the following appearance.

$$\mathbf{M} = \begin{pmatrix} m_{1\,1\,1} & m_{1\,2\,1} & \cdots & m_{1\,k\,1} \\ m_{2\,1\,1} & m_{2\,2\,1} & \cdots & m_{2\,k\,1} \\ & \cdots & \cdots & \\ m_{n\,1\,1} & m_{n\,2\,1} & \cdots & m_{n\,k\,1} \end{pmatrix}$$

Here:

$$m_{ijl} = \begin{cases} 1, \text{ if } r_l \text{ for customs} \\ \quad \text{regime is } \mathbf{Tn} \cap \mathbf{C}_{\mathbf{Tn}} \neq \theta, \\ 0, \text{otherwise} \end{cases}$$

i- index conforming to HS code of good;
j- index conforming certificate type;
l- index conforming customs regime and procedure.

III. The Algorithm Logic Control To Ensure The Completeness Of The Customs Expertise Of Electronic Customs Clearance

The theoretical results allow to develop an algorithm of multivariate analysis and logic control to ensure completeness of customs expertise for customs clearance of foreign trade goods.

As we know that, the customs expertise of goods begins following the analysis of the goods, provided the cargo customs declaration for customs clearance.

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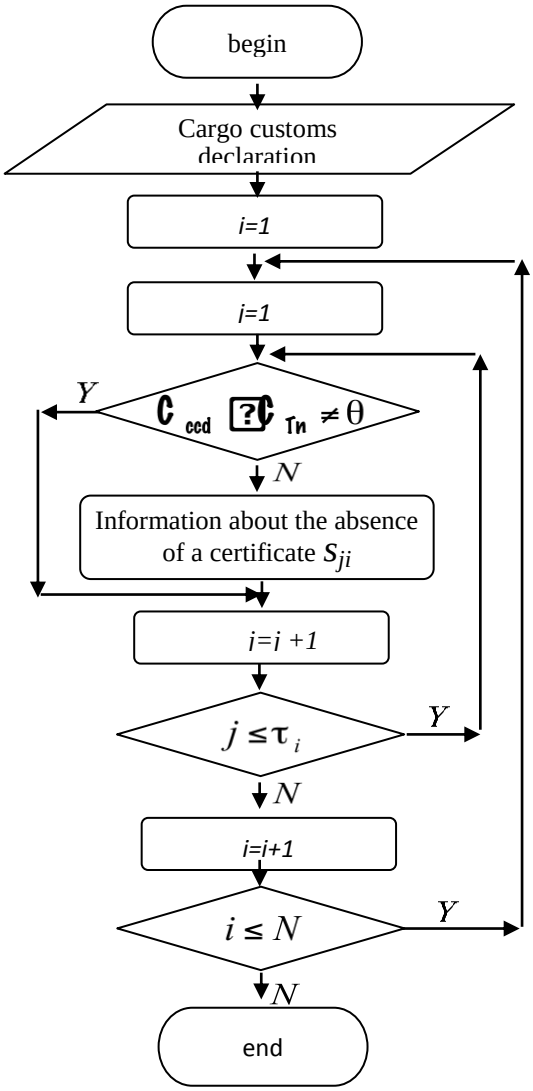

Fig.1. logic control algorithm to ensure the completeness of the customs expertise

For the presentation of the main steps of the algorithm logic control to ensure the completeness of the customs expertise is denoted by ti product code HS presented the cargo customs declaration for customs clearance.

How, one cargo customs declaration can be represented several commodities at the customs clearance, for example N-th number, their set is denoted by:

$$T_{ccd} = \{t_i\}_{i=1}^{N}$$

Then the main stages of the algorithm logic control to ensure completeness of customs expertise can pose as shown in Figure 4.

Here:

$$C_{ccd} = \{s_{ji}, d_{ji}\}_{j=1}^{i}$$

The set of permissive documents for customs clearance of goods from t_i on the HS code on customs r_l mode.

IV. Conclusion

The above logic control algorithm allows to organize the process of customs expertise on the basis of a systematic analysis of the goods.

In addition, it makes it easy customs registration specialists and entrepreneurs to have goods registered and look for necessary normative regulations and documents. When HS code is entered in database the information system will determine necessary permission and documents which have to be applied to authorized bodies.

Moreover, it reduces time of studying of declaration and enclosed documents for officials.

This algorithm is implemented in the automated information system "Single window" customs authorities of the Republic of Uzbekistan, which is implemented with the financial support of the Korean International Cooperation Agency (KOICA) and shown to be effective.

REFERENCES

[1] Abduganiev B. Khakimova F. Information system “Goods customs expertise” – integral part of principle “Single window” of customs bodies. Materials of second international conference on issues of expertise activity, Moscow, October 22-26, 2012, pp 26-29.

[2] Ivanov Yu. Theory of information objects and databases management (Теория информационных объектов и управления базами данных). M. Nauka, 1988.