

Modeling of the Data Processing System „Electronic registry of economic transactions” Using Colored Petri Net

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Abstract: This article presents some aspects of data processing system modeling of the electronic evidence for economic transactions. Infological modeling was realized by colored Petri nets, where are presented some of their extensions.

Keywords: data processing system, modeling, Petri net, economic transactions.

1. Introduction

At present, often, traditional means of data processing and data presenting are replaced by certain data processing systems that show a higher efficiency. An important part of the national economy is the accounting evidence, which imply the registration of the business operations and based on their results imply the preparing reports, declarations and statements for the state bodies. Taxpayers record all economic transactions in a database and based on these data develop the necessary reports. State control structures such as the tax inspectorate, the National Statistics Office, National Insurance, etc., record in another database the information submitted by taxpayers according to submitted documents. Thus, each user implements files that are organized differently, even if they use the same data. In such situations there are used files stored data organized differently, which contain common data, which increases data redundancy and inefficiency of data storage memory and low data accuracy [2].

From what was exposed above in this article, a research problem appears to analyze the possibility of development or modeling of a central data processing system for the registration of the economic operations only by the beneficiary in a database and the processing of state control bodies State of the data with the access to only those data depending on skills. Developing such a data processing system provides several stages, where there is mentioned that ensure the success of the entire process of

the development and implementation of a data processing system – modeling [1,2].

2. Infological modeling of the data processing system „Electronic registry of economic transactions”

The infological modeling is the main objective to get in the evidence the informational requirements of the system, which must be done by the future data processing system. In this way there is getting in evidence the usefulness of the data processing system.

The infological model can be realised by Petri-net, which describes the process of the production, and that of the decision thus determine the structure and properties of the software results. The modeling techniques with colored Petri-nets have proved to be well adapted to describing the function of the data processing systems where occur the phenomena of the competition and synchronization of the parallel processes [3,4].

Colored tokens, that consumes or produces at the triggered transition, depends on the coloring function of arcs. If the arc is no color (black), then the produced tokens will have that color that will increase the consumer tokens.

To realize a colored Petri-net of a data processing system must be analyzed and described all the system events and the conditions for achieving them [2,3].

In the data processing system „Electronic registry of the economic transactions” can be realized the following events:

1. user login - if the user exists, namely it is known username and password;
2. creating a new user - if a logged user exists with rights to create user accounts;
3. updating user data - if a logged user exists with rights to update user accounts;
4. deleting a user - if a logged user exists with rights to delete user accounts;
5. introducing an economic transaction in the catalog - if a logged user exists with rights to introduce a new economic transaction in the catalog;
6. updating an economic transaction - if a logged user exists with rights to update the economic transaction from the catalog;
7. deleting an economic transaction - if a logged user exists with rights

to delete of economic transactions from the catalog;

8. introducing a new taxpayer - if a logged user exists with rights to enter a new taxpayer;

9. updating a taxpayer data - if available taxpayers exist;

10. activating a taxpayer - if available taxpayers exist;

11. recording an economic transaction by a taxpayer - if a taxpayer was activated;

12. deleting a recorded economic transaction by a taxpayer - if a taxpayer was activated;

13. disabling a taxpayer - if a taxpayer was activated;

14. creating reports - if the user is logged in with rights to create reports;

15. deleting reports - if the user is logged in with rights to delete reports;

16. including the reports - if the user is logged in with rights to include reports;

17. turn off the system of a logged user - if a user was logged.

Analyzing the events of the data processing „Electronic registry of economic transactions”, and the conditions for achieving them, has been developed a colored Petri-net shown in Figure 1.

3. Conclusion

In the recent years the modeling of data processing systems has become a very important activity in software engineering. New informational opportunities require developing a data processing system of the central evidence for economic transactions made by taxpayers and their processing at the requested level by the user.

Infological modeling was realised through a formalism well known in the software technology, colored Petri-nets, which has an increasingly use in the analysis and modeling data processing systems with an increasingly diverse development of the extensions.

Based on these models it could start developing a central electronic evidence of the data processing system of all economic transactions made by taxpayers.

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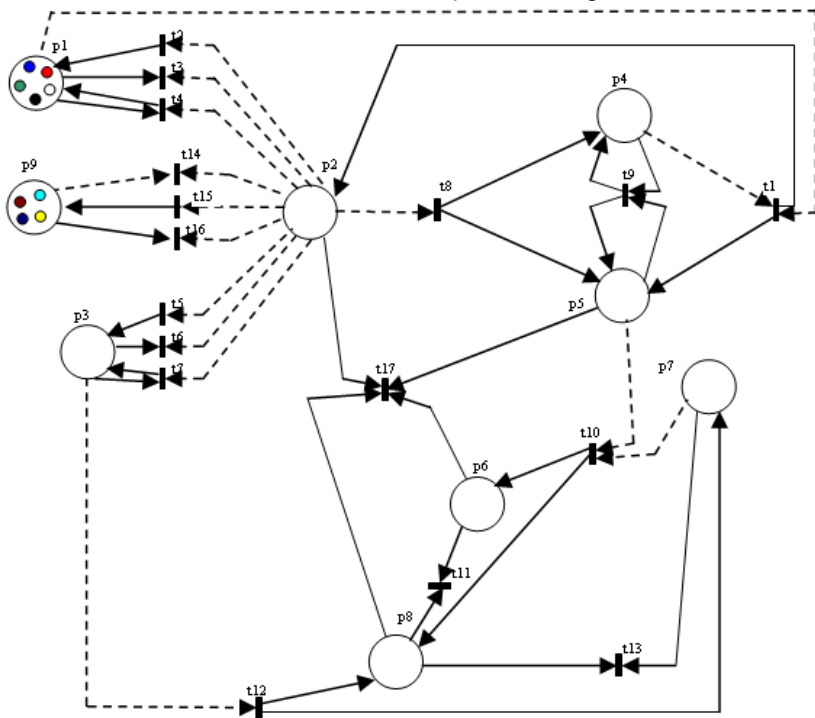


Figure 1. Colored Petri-net model describing the infologic data processing system

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