Automation of Assessing the Reliability of Operator'S Activities in Contact Centers That Provide Access to Information Resources

Evgeniy Lavrov and Nadiia Pasko

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Evgeniy Lavrov

Sumy State University,
Sumy, Ukraine
prof_lavrov@hotmail.com

Nadiia Pasko

Sumy National Agrarian University
Sumy, Ukraine
senabor64@ukr.net

Abstract. Aautomated systems with many active operators such as contact center of providing internet and television services are researched. To describe the activities the functional structural theory of ergotechnical systems of Prof. A.I. Gubinsky was used. Estimation model of the human-operator reliability were obtained. Computer experiments were conducted. Results will be useful in improving the ergonomic properties of contact-center of providing internet and television services.

Keywords. Contact-center, man-operator, ergonomics, information technology, human factor, human-machine, effectiveness, reliability.

1   Introduction

Progress and strong competition in providing information and computer services for legal entities and individuals in local and global networks exacerbate problems of quality and operational services. Huge efficiency reserves are in the modern arsenal of ergonomics methods [1–6].

2   Problem Statement

In this regard, the purpose of this work is: Based on real system analysis, which provides access to the resources of computer and television networks: - to explore all organizational options of operators activity including serving the applications for the formation of new information services and for the elimination of services quality violations; - to substantiate the method of describing and assessing options of operator activities structures; - to develop a computer program to simulate the activities of

operators; - to demonstrate the possibility of using developed models in providing access to resources of computer networks systems.

3 Approach

3.1 Brief Analysis of the Activities of Contact Center Operators

Research of internet access services and other telecommunication systems (PortaOne, NetCracker, Efsol) revealed: - algorithmic nature of the operators' work; - presence of alternative algorithms in applications execution; - significant influence of operator's skills and their working conditions on the quality of work.

At the same time most often there is no "hint system" of appropriate operators' behavior strategies, based on time calculations and accurateness of the action options.

In modern companies, as a rule, there is keeping of time and error-free records of operators' actions and operations. If we analyze all possible activity structures, their description and statistical quality data, we can estimate the time and the accurateness of incoming applications implementation.

3.2 Operators Activity Modeling

Mathematical Apparatus for Modeling. The most convenient algorithmic activity modeling way is functional-structural theory (FST) of ergotehnical systems (ETS) by prof. A.I. Gubinsky [7]. The description of elementary actions of operators is carried out with the help of standard functional units (TFU). A complete list of TFU is given in [7]. The functional network (FN) that describes the activity of the human-operator is built from these TFU. Mathematical models for accurateness and run-time estimation are obtained for typical functional structures (TFS). These models are used to evaluate the entire FN. The estimation is carried out by the method of folding (reduction) FN [7].

Description and Evaluation of Alternative Implementation Options for the Functional Element of Processing Customer Applications. Operator's activity organization in the sphere of public Internet services is considered. Operator implements the application for "services restoration". This activity can be represented as an algorithm of operation groups: - service application reception; customer's problem analysis; solution; informing the client about the results of the implementation. Formal models are obtained in the form of FN are obtained for the implementation of such activity algorithms: problem 1 - limited Internet access due to the failure to notify about payment; problem 2 - lack of Internet access (due to the client hardware problem); problem 3 - lack of Internet access (due to the company's equipment problem); problem 4 - restricting access to digital television due to the non-payment.

Since working conditions substantially affect the operational quality [1,4,7], we use the correction factors method [7,9–11]. We will use software package [8] for determining these values and evaluation of the functional network of the activity algorithm.

Evaluation of the functional network is based on the technology of functional structures typing and function network folding. The structure of the software is shown in Fig.1.
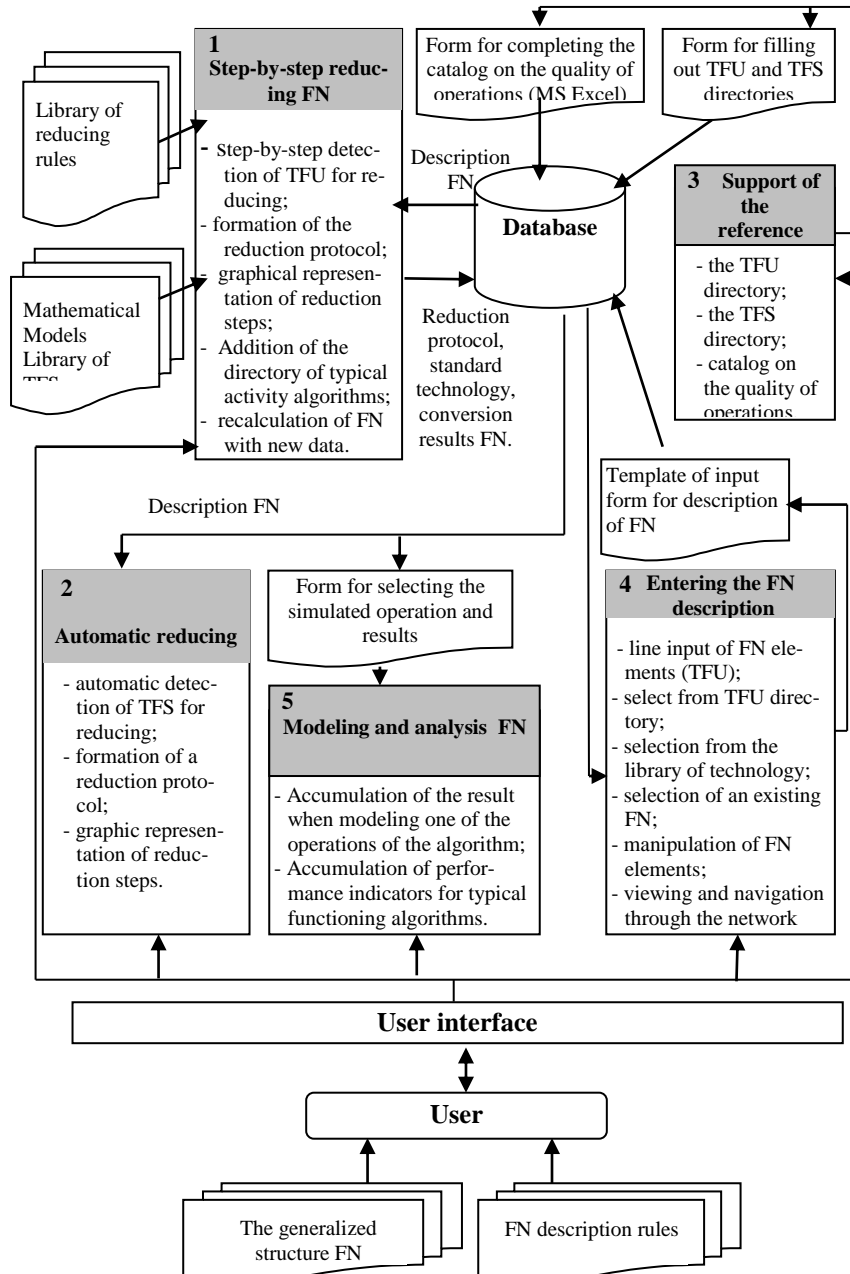

Fig. 1. The functional structure of the FN assessment program

4   Conclusion

The developed approach allows formal describing of the algorithmic operations; also it helps to evaluate a random amount of time and the probability of error-free performance of the operational algorithms in "computer network resources assessing" systems. The advantage of this method is that it makes possible the creation of unambiguous computer-based models and numerical evaluation of various options of operators' activities. The complexity of this method includes the complicated formation of the initial data for the calculation and the necessity of conducting special statistical databases.

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