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GEORGIAN TECHNICAL UNIVERSITY  
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მართვის ავტომატიზებული სისტემები

**TRANSACTIONS**

**AUTOMATED CONTROL SYSTEMS**

**Т Р У Д Ы**

**АВТОМАТИЗИРОВАННЫЕ СИСТЕМЫ УПРАВЛЕНИЯ**

**№ 1**



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**G.G. Chogovadze, V.C. Ctrijevski, N.A. Kvantaliani, V.A. Didmanidze**

**ON THE WAY MASTERING VIRTUALIZATION  
(FROM THE HISTORY OF SCIENTIFIC INVESTIGATION OF TWO RELATED  
DEPARTMENTS AND PERSPECTIVES OF THE FOLLOWING COLLABORATION)**

**Summary**

Virtualization is building of model of the object, process, phenomenon or the world, which perhaps, does not exist in nature, but which by its properties occurs useful. At the present time virtualization in the popular literature very often is understanding like virtual reality or during building of some models of the reality world and understanding this model on the computer desktops.

The present article is devoted to the analyses of the combined understanding by colleagues of the department of „Cybernetics”. Of MIFI and department of MIS GTU of the problems of virtualization one of the main problems of modern investigation. The effort is made to build history of development of opinions on this problem and define the possible directions of its development. The authors make sure that, virtualization will be actual object of investigation for a long time. And the limits of using it will be much more grow in the nearest future. Reciprocal interest of the investigation, tie up with using virtuality in studying and other domains, permits to plan the future, developed relationship between the departments.

**G.Gogichaishvili, S.Sergeev, L.Chkhaidze**

**INTELLECTUAL SYSTEM OF CONSTRUCTION OF THE GEORGIAN LANGUAGE  
SYNTAGMA FORMAL IMAGE SENSE (ON AN EXAMPLE OF THE AUTOMATED  
CODING OF THE CONTENT OF THE CIVIL SUIT)**

**Summary**

At creation of the automated systems of conducting judicial office-work for maintenance of high legal quality documentation, means of integrity support of the documents entering databases are of great value.

One of the main sources of integrity infringement essentially affecting outcome documents of the system is the difference between text image of the claim contents formulation and its formalized code for the classifier of the judicial reporting accepted in Georgia. Owing to the participation of the person responsible for judicial office-work during creation of the formalized document, in the given part of functioning of information system the risk of sense distortion occurrence, which can be caused by the human factor, is inevitable.

In work the architecture of the intellectual system intended for automated construction of possible codes of the contents of the text in natural Georgian language, the claim describing the legal formula is considered. The work considers the architecture of the intellectual system meant for the automated building of the possible codes of the text contents on the natural Georgian language describing judicial formula of the suit.

**G. Gogichaishvili, S. Pochovian**

**AUTOMATION OF HARVEST FORECASTING WITH  
THE AID OF MODIFIED PETRI NET**

**Summary**

In the work is considered the elaborated modified Petri net with parti-colored markers for automation of harvest forecasting. There are given the descriptions of all parameters of modified Petri net in the work.

**V.A. Didmanidze, N.A. Kvantaliani, S.V. Didmanidze, I.S. Malidze**

**PERSPECTIVES OF DEVELOPMENT VIRTUAL STUDING IN GEORGIA**

**Summary**

There are many people with high education in Georgian, which does not correspond to the requirements of modern economics and that is why on the one hand many specialists become not involved (because their knowledge is old or there is no need in it). On the other hand the economics can't develop if there are no specialists. In the present article is suggested to solve the problem by developing virtual form of tuition which allows students to get quality knowledge without interrupting their routine life. Special attention is paid for the technology of studying, based on the virtual world. All the educational literature, including the role games, is created by the author-teachers with the help of the editor, based on standard X3D. The student, after the according registration, is demanding the fragments of content and is using them for studying. The educational literature is transmitted to the student in style X3D-files, which can contain text, graphics, diagrams, role-games and so on. In this process can intervene the teacher, taking over the role game on himself.

**Shonia O., Sherozia T.**

**BASIS OF PROCESSES OF ACCEPTANCE AND MANAGEMENT OF DECISIONS**

**Summary**

Article considers properties and decision making problems. It represents decision making for reduction of negative influence problems factor on possible solutions.

**O. Shonia, K. Odisharia, G. Maisuradze**

**SAFETY OF INFORMATION SYSTEMS**

**Summary**

The article represents us information analysis in details, as the basic resource on a problem for protecting human, society and state. It does give the mainstream for determining these problems as the necessity of creating this information resources for protecting system.

**K.J. Kachiashvili, D.V. Nakani, V.I. Khutchua**

**RESEARCH OF SIGNIFICANT CHANGE IN TIME AND IN SPACE OF  
THE CONTENTS OF NITRATES AND PHOSPHATES IN SOILS OF  
FARMER FIELDS BY METHODS OF THE FACTORIAL ANALYSIS**

**Summary**

In the offered work are considered results of research of character of change of nitrates and phosphates contents in soils of farmer fields by the help of methods of the factorial analysis. In particular is investigated the change of nitrates and phosphates contents in soils in time and in space has a casual character or it is connected with certain not casual factors, for example, with reduction of nitrates and phosphates contents in soils in the autumn due to their consumption by plants, of their wash out from soils by sediments, entering by farmers in soils of different quantities of fertilizers, etc. The research has been carried out by the measurement data of the contents of nitrates and phosphates in soils of sixteen farmer fields placed in six neighbouring villages of region Mangrelia of the western Georgia, where by the financial support of the

World Bank carry out a number of projects on introduction on the farmer economies of advanced agricultural technologies.

**G. Nareshelashvili, O. Gbedava.**

**«ORGANIZATION OF REFERENCE INFORMATION OF FLEXIBLE  
AUTOMATIZED PLATES.»**

**Summary.**

**There are considered the problems of date basis creation for reference information productions of automatized printed plates in the work. In the article is also given conceptual model of object field and it is refection on date logical model.**

**K. Nanobashvili**

**THE METHODOLOGY OF PREPARING VIRTUAL LECTURES ON THE  
EXAMPLE OF TEACHING GRAPH MODELS**

**Summary**

For conducting lectures and laboratory activities in a better way we offer the methodology of active computer use considering essential demands of contemporary pedagogical technologies. Respectively, we describe the methodology of preparing virtual lectures on the example of teaching graphical models in the discipline called "Textual and graphical editors". The work aims at teaching the methodology of preparing virtual lectures to students whose major is automatic systems of management. Methodology is oriented on the example of teaching the ways of defining bicomponents of the graph which will help us to improve in teaching other disciplines as well. Offered methodology considers teaching scanning, preparation of slide shows which is divided into two parts: non dynamic and dynamic (animated), sound effects, etc. The work also concentrates on the essential key components.

**L. Chkhaidze**

**THE EXAMPLES OF PARADOXICAL TEXTS IN THE  
GEORGIAN LANGUAGE AND BUILDING OF NATURAL  
LANGUAGE'S COMPUTER MODELS**

**Summary**

Starting with *L.V.Scherba's* and *N.Chomsky's* classical examples, paradoxical texts in natural language, formally completely satisfying the rules of phonology, morphology and syntax, but having absurd sense or in general deprived of the one, are the important means of studying the mechanism of perception of texts and constructions of the various formalized models of a language.

There is a formal construction given in the text, which carries out known grammar requirements of the Georgian language, the result of which are paradoxical texts made from the lexically non-existent words but which allow non-trivial interpretations of its hypothetically possible sense.

**I. KARTVELISHVILI**

**BASIS MODELS OF ORIGINAL AND UNKNOWN HANDWRITTEN SYMBOLS**

**Resume**

Work describes the creation of basis models for original and unknown handwritten symbols, which represents one of the stages of handwritten symbols decoding.

The processes of model design are established in stages and each of them is described by their functions.

**KARTVELISHVILI I.**

**PROGRAM GROUP OF AUTOMATIC IDENTIFICATION SYSTEM**

**Resume**

Work describes program group of automatic identification system, constructors, procedures and functions. The program codes are worked out for each algorithm method; They are represented schematically and are described by their function.

**G. Janelidze**

**EFFECTIVE CONTROL ALGORITHM OF TOWN WATER SUPPLY**

**Summary**

The effective control algorithm of town water supply is considered. Effective control of water supply process in real systems of water supply is an almost unrealizable problem. The purpose of water distribution mains is to satisfy the increased requirement for water consumption. Therefore, there often arises the problem of effective distribution of water flows in systems. The effective operation of the system depends on various parameters, thus it is quite difficult to obtain a good solution of flow distribution in mains by traditional methods. The consideration of many parameters makes almost impossible the selection of normal regime of water supply systems. The purpose of effective control of water supply process is optimum distribution of water flow in pipe branches in normal as well as emergency regimes. Genetic algorithms are proposed for the solution of optimum distribution of flows.

**G. Janelidze**

**MATHEMATICAL MODELS OF TOWN WATER SUPPLY**

**Summary**

Mathematical models of water supply of the town are presented. Control object is characterized with great size of mains topology, technological complicity and also with quite high time lag. System functioning is complicated with frequent emergency situations, their elimination requiring effectiveness of control. Standard values of hydromains, reservoirs, pump-houses, pipe-lines, valves, manometers and other components are given a priori. The dynamics of 24 hour demand makes necessary the effective control of town water supply process that represents the great size, multicriterial and multiparameter problem based on modeling of different processes proceeding in the system. With the view of control, all systems developed in the work are the common model supply of the system.

**O. Gbedava, T. Sherozia, G. Nareshelashvili, S. Makarov**

**MANIPULATOR MODEL CONTROL FOR ANODIC PLATES PRODUCTION.**

**Summary**

In this work is given construction of manipulator model control for anodic plates production and search of purposeful decisions by means of construction of different quantity generalization of hierarchic systems. Here is processed the structure of functional model control, by means of which occurs the realization of multistage choice and forming control strategy. Here is considered semantic net for knowledge presentation of problem environment. Here is constructed control strategy of model control. Here is accepted the beginning of problem environment for current situation and intellectual generalized algorithm obtained by means of comparison of generalized rules on Meta level. Here is also considered notion of cell as net unit.

**O. Gbedava, T. Sherozia, G. Nareshelashvili, Sh. Makarov.**

**TECHNOLOGICAL MODULE CONTROL IN FLEXIBLE AUTOMATIZED PRODUCTION.**

**Summary**

In this work the principles of technological module control is considered in flexible automatized production as a matter of fact by example of machine processing of manufactured article. The division of the whole system into modulus in the flexible automatized production. The structure of dual stage system control. There is also defined the role of personal computers on the high and low layers of hierarchy. There is given a functional scheme of manipulator group control. Electronic commutator is considered and processed as well as the apparatus programmed provision of system control.



**O. Gabedava, T. Sherozia, G. Nareshelashvili, Sh. Makarov**  
**PERSONAL COMPUTERS IN MANIPULATOR CONTROL SYSTEMS  
IN TECHNICAL VISION.**

**Summary**

In this work it is considered the possibility of use of modern personal computers to solve special problem, in particular information processing in manipulator control system in technical vision. Here is described the algorithm received by information processing from manipulator control system by means of technical vision. The structure scheme of control system is received, in which technical vision is used to measure coordinates. The control program is processed to process received information by means of technical vision.

**T. Sukhiashvili**

**THE AUTOMATIZATION OF DISTRIBUTED SYSTEMS OF ORGANIZATIONAL-  
ADMINISTRATIVE CONTROL**

**Summary**

On the basis of court system, technology of automatization of distributed systems of organizational-administrative control is given. Enlarged variant of model (pentaedral model) defined by UML methodology is considered, in which on the basis of five views, steps for constructing program systems are given. The given approach includes the creating of integrated research mechanism, with which the author of the system can on the basis of constructed models conduct computer-based analysis of processes and make quantitative evaluation of variants in order to select an optimal one.

**Sukhiashvili T.**

**THE ANALYSIS OF DYNAMIC PROCESSES IN THE DISTRIBUTED SYSTEMS  
OF ORGANIZATIONAL-ADMINISTRATIVE CONTROL**

**Summary**

Consideration of distributed systems of organizational-administrative control modelling by statechart diagrams. On the example of civil law-making, the living cycle model of object - "civil case", its transformation into Petra network and ability of certain analysis is brought.

**Sukhiashvili T., Kashibadze M.**

**THE SIMULATION AND ANALYSIS OF WORKING PROCESSES IN THE  
DISTRIBUTED SYSTEMS OF CONTROL**

**Summary**

Consideration of dynamic process modelling and grapho-analytical systems usage in the distributed systems of organizational-administrative control. Working process modelling by the work diagram, represents a good methodological instrument. However, due to multivariation, the process of projecting and realization is entirely dependant on a project-maker specialist. Therefore, it is important for the definition of best model, to portray and explore work processes and operations by Petra network graphs.

**Sukhiashvili T.**

**SIMULATION OF DISTRIBUTED SYSTEMS ACCORDING TO  
VIEW OF PROCESSES**

**Summary**

In the distributed systems of management, we meet several streams of management. Unless we are careful, the streams may except each other, which will lead to incorrect change of object conditions. Therefore, while simulating such systems, it is necessary to take into consideration its presentation by the view of processes, in which the main attention is paid to communications among objects and to mechanisms of synchronization of common resources. Simulation of communications and of synchronization mechanisms

between active and passive objects is discussed in the work on the example of distribution management of court system, by using Petra networks.

**J. Oganova,** **S. Pochovian**

**DESIGNING OF DATA BASIS OF AUTOMATIC SYSTEM  
OF TESTING THE STUDENTS OF EDUCATIONAL SYSTEM**

**Summary**

There are considered the problems of elaboration and employment of data basis in compound of informational ensuring of automatic system of testing the students of educational system in the work. In the work is given the description of composing of tests (questions) and carrying out the testing on the base of automation for students of educational system.

**A. Tsintsadze, T. Kapanadze, O. Gbedava**  
**ALGORITHM GROUP-NEW FRENCH IN ITERATION MODELLING**

**Resume**

In this work is given iteration multitude in indivisible group and the determination of the problem by means of algorithm group.

**A. Tsintsadze, T. Kapanadze, O. Gbedava**  
**ADAPT MODELLING IN THE PROBLEM OF FULL IDENTIFICATION**

**Summary**

Adapt modelling gives opportunity to solve all problems of full identification for me structure algorithm complex in the scale of real time, ecological cleanliness, simpleness of realization and high effectiveness. These are the characteristics which make adapt algorithms in mathematic modeling unalternative.

**G. Chachanidze, N. Paliani**  
**CONCEPTUAL MODEL OF REVEALING POTENTIAL ABILITIES OF  
SOCIAL-ECONOMIC DEVELOPMENT OF THE COUNTRY**

**Summary**

Conceptual model of revealing potential abilities of social-economic development of the country mainly focuses on defining and discussing the elements of the city's potential abilities. The model enables us to get vector data of potential abilities. On the basis of these data we can resolve the issues of analysis and synthesis which will contribute a lot to the country's social-economic development, essential branches of economic reforms and its management; to the evaluation of different social-economic features and to get the right optimal discussion; to confine strict investing discipline creating solid background and space for the investment directing investing processes in the way desirable.

**B. Meparishvili, M. Daraselia**

**SOME ASPECTS OF CONSTRUCTION OF SEPSIS EXPERT SYSTEM**

**Summary**

Nonexistence of early diagnostics and preventive measures of sepsis can be considered as the main factor of high sick rate and, respectively, of high lethality. It is necessary to create an advising-helping system of expert system of sepsis in early diagnostics, as well as in its therapy for solution making and to introduce it in clinics as an appendix to the existing information-computer systems. New aspects of permanent renewal and study of knowledge base with statistic information received in computer system data base is considered with the purpose of expert system functioning efficiency increase.

**G.Janelidze, B.Meparishvili**

**ADAPTIVE ALGORITHM OF KNOWLEDGE REPRESENTATION  
IN FLOWS CONTROL**

**Summary**

The structure of frame model of flows control in mains, algorithm of working with frames are considered. For flows control processes a certain knowledge, past experience of control about flow distribution in mains or statistic set of slots stored in data base and the set of corresponding made solutions, rules of control or frames are necessary. For each report period, on the basis of information received from mains, the comparison of the given slot with separate slots of the whole statistical set by each component is done when coincidence probabilities are calculated. In the case of acknowledgment, the system directly applies to the corresponding frame as to ready recommendation of controlling action, while if acknowledgment does not happen, control algorithms results forms a new frame and renews the knowledge basis.

**V. Tskhvedadze, I. Tskhvedadze, G. Gordeladze**

**INFORMATION OBJECTS INTRODUCTION ON THE BASIS OF THE  
THEORY OF CATEGORIES.**

**Summary**

The essence of information-computer space is to represent of an external world from different aspects of consideration on various stages of consideration. Axioms of the theory of categories are used as mathematical basis for presenting objects. It gives possibility of more complete and detailed presentation of information regarding each particular object and the entire system itself. Aggregations of categorial components (or sum) are focused on objects inclusion into some predefined classes. On the other hand, objects have their own structure which determines interrelation between components that forming the entire entity. The structure of objects is formalized by composition of components. Any information object, from the theory of categories point of view, is considered as: (1) a component that belongs at least to one class or to hierarchically enclosed subclass; (2) a component that belongs at least to one entire object; (3) any entire object that can be considered as a class itself and its structure is considered as composition of entering components from corresponding subclasses; (4) an object, that hasn't internal structure and represented as subclass, defined by its own value.

**V. Tskhvedadze, I. Tskhvedadze, I. Nadiradze**

**FORMALIZATION OF TECHNOLOGIES OF SYSTEMS' FUNCTIONING.**

**Summary**

The major aspect of introduction (or description) of any system is formalization of its components' functioning in dynamics. The technology is a comprehensive sequence of procedures on transformation of a

subject(in the real world) or data (in information-computer system) from one state to another. Procedure (transformation) is the fragment of technology determining semantic completeness of change of state (properties) of an object at different levels of decomposition. Generally, transformation procedure is decomposed on sub procedures that form the ordered technology. Position of any object-resource within a system is carried out taking into consideration dynamics of change of its components, that can be defined by two related procedures: initiation and ending. In the given article are considered issues regarding technological dependences and transformation types. Dynamic processes within systems are formalized. Time is the integral characteristic of dynamic processes of any system. Time is defined as an abstract object and various semantic interpretations on objects transformation in time are considered within the article.

**V. Tskhvedadze, I. Tskhvedadze, N. Kobzev**

**MANAGEMENT INFORMATION SYSTEM ON FORMATION AND PROCESSING  
OF LEGISLATIVE SPACE**

**Summary**

The legislative space (LS) is a normative basis of regulation of mutual relations of various classes of subjects of the State that defines the development goals and regulates principles, forms, and activity conditions of elements within the system. It is the basic form of systemic representation that describing essence and systemic properties of the state. Developers of statutory acts, as a rule, are focused on intrinsic aspects of normative regulation, and systemic dependences of the legislative space itself are considered as secondary. The basic target reference points of the management information system on formation and processing of legislative space are: (1) optimal conditions creation for satisfaction of information needs and requirements of various classes of users due to completeness, reliability and a urgency of the given normative information; (2) intensification of processes of analysis, formalization and decision-making by responsible bodies regarding components of LS based on introduction of progressive and consentient information technologies; (3) the uniform national information-computer environment of the legislative space formation based on unified, complex technology of formation, storage and distributions of the normative information. In the given article there are given statements of ten interconnected tasks on legislative space management information system formation and conduction.

**E. Turkia**

**THE MANAGEMENT UNIFIED VIRTUAL GLOBAL MARKET WITH SERVICE-  
ORIENTED ARCHITECTURE**

**Summary**

The ebXML technology (with application of the language of electronic business expanded formatting ) of development of the unified virtual global market, being based on the servis-oriented architecture and creates new and modern means of the business processes management, correlation between the business parties and realization of the business deals in the distributive regimen is considered. The technology introduced is intended for the platform of modelling of B2B electronic business (business-business) and performs the dealing processes as well as the realization of the documents universal structure. On the basis of the practical example the patterns of transformation of the business model and the one of the basic data components are examined in the present article.

**E. Turkia, G. Erqomaishvili**

**AUTOMATION OF THE GEORGIAN ELECTRIC SYSTEM ON THE BASIS OF  
THE PROCESS-ORIENTED APPROACH**

**Summary**

The items of the automation of the distributed processes inside the Georgian electric system on the basis of the modern informational technologies are examined. The functions of control, monitoring, accounting and forecasting are anticipated in automation, that provides the optimal system management and settle disagreement between the parties of reception and transfer. The article introduces software for the electronic microprocess acounters installation, application of the distributed automatized business and documents turnover on the basis of Java-JSP technology, XML and the system of the data base management, that enables transformation of the territorially distributed service of the centers and the stations of the informational space, documents shifting and the business processes management into one unified system.

**Rochikashvili E.G.**

**PRINCIPLES OF DESIGNING OF SYSTEM OF THE AUTOMATED DESIGNING  
(THE MODULAR EDITOR OF GRAPHIC IMAGES) AND PRINCIPLES OF DIALOGUE.**

**Summary**

Questions of increase of efficiency of use of system of the automated designing, the basic decisions used in system the modular editor of graphic images, opportunities of development of this system in a direction of automation of designing of manufacturing techniques are considered. The analysis of a method of the organization of dialogue with system is resulted.

**M. Kiknadze, T. Zwania, D. Kapanadze**  
**ALGORITHMS ROUTING IN COMPUTER NETWORKS**

**Summary**

Different modes of selection of routes in computer network are considered. Routing in computer networks constitute one of most complicated issues. Quite a number of algorithms are being used at route selection, however most popular are those for finding of shortest ways the negative properties of which is low conductivity and week sensitivity against overload. For the purpose of increment of conductivity in deitogramic networks is advised, from transmitter to receiver in each mode through Petris network, to select one algorithm from among of abovementioned three algorithms.

**N. Jibladze, O.Khutsishvili, T. Khutsishvili, E. Bukhadze**  
**APPLIED ASPECT OF THE LAX METHOD**

**Summary**

We consider the relation between Pontryagin maximum principle and Lax's method. The method allows us to represent Hamilton equation in the form of Lax equation. Lax's method enables us to relate the conservation laws of Korteweg-de Vries equation with optimal control.

**V. Khocholava, E. Chikashua, N. Arabuli**

**MATHEMATICAL MODEL OF THE CHANNEL IN VIEW OF HANDICAPES**

**Summary**

In the given work is constructed mathematical model of functioning of data links with one kind of refusal with intensity  $\alpha$ . Time of check of reliability of a package is a random variable, distributed on the any law. After detection of a mistake to be made repair. Time of repair is a random variable, distributed on the any law. In work realization of performance of a problem for set time and also its population mean is determined.

**I. Kutsia, E. Gugutishvili, E. Kutsia**  
**THE TWO-DIMENSIONAL SPECTRAL ANALYSIS**

**Abstract**

The two-dimensional spectral analysis are used as for files spatial, so temporarily - spatial. Data files, or for development of files of the time data. Generalization for two-dimensional signals it is impossible for the concept of development of one-dimensional signals. For this purpose use methods of two-dimensional periodic diagrams, two-dimensional hybrid and methods which are based on a minimum of a dispersion.

**Sesadze V.K., Mchedlishvili N.P., Kaishauri T.V.,  
Chikadze G.V., Kekenadze V.M.**  
**SYMMETRY PRINCIPLES FOR TASKS OF IDENTIFICATION AND MANAGEMENT**

**Summary**

In article the basic scientific and technical directions which are connected to main principles of symmetry are determined. The role of principles of symmetry and laws of preservation in a modern science and technics is proved; different principles of symmetry in one general the theory are systematized.

On the basis of the strengthened form of the orem of Noether, it is authorized, that for "normal" systems actually there is a biunique conformity between groups not trivial variational symmetry and not trivial laws of preservation.

**A.Prangishvili, Z.Gasitashvili, I. Abuladze**  
**ROAD NETWORK CONTROL MODEL USING MODIFIED PETRI NET**

**Summary**

Modified Petri net describing road network control based on the components of road signs and road network planning is determined. Effective planning and control of traffic becomes possible with the presented *PNTR* network.

**H. Wedekind**  
**WHAT IS THE RIGHT OBJECT MODEL FOR A DATABASE ?**

**Beantwortung einer Frage von Jim Gray**  
**Von Hartmut Wedekind (Uni Erlangen, Germany)**

**Abstract**

In the Article there is represented Profesor Hartmud Wedekind (Germany) answer for the problematic article of Professor Jim Grey and for the questions about modeling heterogeneous bases. in the article is also represented using concept of categorical analyses for the relation model schema, which includes formal grammar contractual aspects of language. the right object for a database is the semantically most precise one.

**SURGULADZE G., TSVERAIDZE Z., KAISHAURI T.,  
GULUA D., KASHIBADZE M.**  
**CONCEPT OF UNIFIED PETRI NETS IN AUTOMATED  
CONTROL SYSTEMS**

**Summary**

Concept of building and using unified Petri Nets for designing and implementing automated control system tasks. It is based on the extension of Petri Nets language with object oriented methods and creating the program kernel for a single common standard infrastructure. As a definition language XML is used, thus ensuring flexible transfer of Petri Nets through internet.

**G. SURGULADZE, V. KACHIBAIA (Canada), I. ILDIZ (Turkey),  
N. TOPURIA, N. GELUTASHVILI**

**DESIGNING CONCEPTUAL MODELS USING UML TECHNOLOGY WHILE  
CONSTRUCTING UNIVERSITY DATABASE**

**Summary**

Issues of the automation process of designing conceptual model for university enlightenment problematic fields are presented for the objective of constructing distributed database, relation database and user interfaces using UML technology. Object-Oriented method of modelling, .NET programming platform, MS Visio instrument, C# and VBA languages are utilized.

**G. SURGULADZE, I. BERZENISVILI, I. VACHARADZE, N. XELADZE**

**DEVELOPMENT OF WEB-APPLICATION FOR CORPORATE SYSTEM OF CONTROL IN  
INTERNET-INTRANET ENVIRONMENT ON THE .NET PLATFORM**

**Summary**

Here is considered design and realization of web-applications for corporate system of control. As an example of serving clients in financial bank there are illustrated tasks of construction their components of interfaces and organizing Data server bases. the system is developed on .NET platform, C#, ASP.NET, ADO.NET and using SQL Server object-oriented tools.

**SURGULADZE G., GIUTASHVILI M., SHAVTVALADZE G.**

**PERFECTION OF THE BUSINESS INTELLECTUAL RESOURCES  
ON THE BASIS OF THE PROCESSES AUTOMATION**

**Summary**

The items of the business operations reorganization in knowledge on the background of the object-oriented approach, processes monitoring and analytic research are examined. From the practical point of view the system of the intellectual business has been developed and offered that may provide of the business operations analysis as well as selection of the optimal order variants and automatized management of the processes of taking decision.

**T. DOLIDZE , D. GULUA, M. SURGULADZE, G. BAKHIA**

**OBJECT-ORIENTED MODELLING AND ANALYSIS OF BUSINESS PROCESSES  
FOR PUBLIC HEALTH ESTABLISHMENTS USING PETRI NETS**

**Summary**

Issues of implementing a computer application for accounting and valuating real estate and movable property, tangible property and bank accounts of the public health sector as well as their monitoring and automated designing of business are presented.

**D. Gulua, L. Petriashvili, N. Topuria, M. Oxanashvili, L. Kvavadze**

**USE OF SYSTEM OF PETRI NETWORKS FOR PROBLEMS OBJECT-ORIENTED  
MODELLING IN THE MANAGEMENT INFORMATION SYSTEM**

**Summary**

Questions practical implementation language PNML (Petri Net Markup Language) by the purpose of creation initial Software infrastructures for the future Design of simulators of Networks Petri, or for updating already existing simulators are considered{examined}. In work the Object-oriented approach is used, by means of which the library of classes (modules) PNK (Petri Net Kernel) for performance base function Networks Petri is created.

**Okanashvili M.**

**IMITATING MODEL OF DISPLAY OF PROCESS  
MARKETING FOR MANUFACTURE**

**Summary**

Are considered functions of marketing in manufacture, a urgency of introduction in this sphere of computer technics and new information technology, efficiency of application of imitating modelling. Are resulted model системи marketing and algorithm of construction of imitating model.

**G. SURGULADZE , I. VACHARADZE**

**AUTOMATION OF EXPERT JUDGEMENTS PROCESSES USING  
OBJECT-ORIENTED METHODS**

**Summary**

Issues of the process of perfection of corporate planning of enterprises based on their automation are presented. Design and implementation of expert judgements automated elaboration system for the decision support software on the basis of Ms\_Visio and .Net platforms are provided.

**ANDREAS BERL, HERMANN DE MEER**

**MOBILITY, MOBILITY MANAGEMENT MECHANISMS AND A MOBILE  
P2P ARCHITECTURE**

(University of Passau, Germany)

**Summary**

Mobility management mechanisms are used to provide mobility. Different kinds of mobility require different mobility management mechanisms. Common P2P applications are designed for fixed networks. Applying mobility to P2P applications is still a research issue. There are some approaches to improve P2P overlay networks in order to support the mobility of users.

**L. Imnaishvili, G. Verulava**

**TO THE QUESTION OF TECHNOLOGICAL SYSTEM' RELIABILITY  
ESTIMATION**

**Summary**

In the article the new approach to reliability's increasing of technological system is considered. According to this approach, as a result of increase of reliability of information about functioning of technological system, the amount of reserve elements increases in a system. Proceeding from this, a reliability of system raises as a whole



**A. Prangishvili, L. Imnaishvili, G. Verulava**  
**COMPUTER SYSTEM FOR MONITORING OF TECHNOLOGICAL PROCESS**  
**Summary**

In the article one concept of construction of system for monitoring of technological process is offered. The system of monitoring is created on the basis of a personal computer and microprocessor' controllers.

**L. Essafi, G. Bolch**  
**Approximation of the Variance of Waiting Time in**  
**a Two-Queue Time Dependent Priority System**

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**ABSTRACT**

In this paper we derive an approximation of the variance of waiting time in a two-queue time dependent priority system. The derivation method is based on a transformation of the time dependent priorities system onto a static priorities system, with partial class switching. The derivation technique, proof, numerical and simulation results are presented and discussed.

**N. Bohra, H. De Meer**

**IP MULTICAST ROUTING PROTOCOLS AND ALGORITHMS FOR TVOIP**

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**Abstract**

There has been a great interest in developing and delivering the live TV broadcast over an all-IP infrastructure in the same way as the TV is broadcasted today through satellite, cable or terrestrial network. This paper basically discusses the main aspects of IP multicasting that can be used for broadcasting live TV. Multicasting technology is an important feature that can be used by IP-networks and allows an efficient distribution of content from single source to multiple destinations and it is a practical solution in implementing the services like TVoIP/VoIP, VoD/MoD, and Internet access over an existing infrastructure using broadband technology like DSL (Digital Subscriber Line). The paper mainly concentrates upon the multicast protocols and algorithms used by these protocols in order to provide a platform to support one-to-many and many-to-many applications as, presently most of the IP infrastructure is based on unicast networks whereas IP –multicast networks are much more efficient.

**P. Wüchner, H. De Meer, J. Barner, G. Bolch**

## **A BRIEF INTRODUCTION TO MOSEL-2\***

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### **Abstract**

The versatile *MOdeling, Specification and Evaluation Lan-guage* is the core element of the MOSEL-2tool. This *description lan-guages* provides a high-level means for specifying models, performance measures, and the graphical presentation of results. The description lan-guages is implemented in form of an *evaluation environment* that com-prises translators to the modeling languages of several third-party per-formance evaluation tools that evaluate the specified model.

**G. Gogichaishvili**

## **SITUATIONAL MANAGEMENT IN THE AUTOMATED SYSTEMS**

### **Summary**

In the article scientific results got at the faculty of Management Information Systems concerning of situational management in applied automated systems are presented.