DETERMINATION OF THE STRUCTURE AND CONTENT OF INPUT INFORMATION RESOURCES FOR MASH-UP SYSTEM WORK

page 4–9

In this paper the research of application of new approaches to overcome of semantic mazes of input information, one of which is the improvement of stage of defining the structure and content of incoming information resources for Mash-up system work has been presented. The general UML-diagram of Mash-up system activity has been constructed and its work, according to the selected state activity has been described. The most important states in the work of Mash-up system such as: finding of need information, extracting of found information and storing it as a service have been shown.

Based on the selected states of activity of Mash-up system, the steps of defining of structure and content of incoming information resources have been developed. The detailed analysis and description of each of developed steps for defining of structure and content of incoming information resources has been displayed. The possible solutions to problems posed by selected steps for defining of structure and content of incoming information resources for Mash-up system have been offered.

The concept of knowledge presenting in local ontology, which are used the formalism of object-oriented network restrictions proposed by A. Smirnov has been consided. The basic operations of creating of local ontology have been shown.

Keywords: Mash-up system, input information resource, states of activity Mash-up system, ontology, formalism of object-oriented networks of restrictions.

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DEVELOPMENT OF THE DOCUMENT MANAGEMENT SYSTEM ARCHITECTURE

page 9–16

Document management is a process of the document creation, distribution and deletion within an organization. Document management encompasses the processes and procedures business organizations use to capture, store, secure and retrieve information on a daily basis. For many organizations, these processes can be greatly improved with the use of document management system. The benefits of using DMS include: improved productivity, economic effect, improved management services, better access and use of information. Document management contains the following characteristics and all of them have been highlighted as system requirements: the subsystem that allows loading of information (documents), storage and archiving methods for files and documents, indexing subsystem, search tool for finding and retrieval of information, workflows for tracking of the life-cycle of a document and the workflow subsystem that allows the automatic routing of documents to responsible person, ability to support and administer system with different privileges and a subsystem of document versioning.

The following results of the research were obtained: a description of the main purposes, analysis of existing software solutions, their advantages and disadvantages, main problems and innovative approaches that are necessary for system implementing. According to the outlined results, an efficient architecture of electronic documents has been developed.

New modules that have been added to the traditional architecture highlight new scientific approaches based on the results of the research:

— Document clustering module aimed at automatic identifying of executor;

— Module performance analyzer instrument, the purpose of which is the automatic generation of the related documents chain and control of their execution.

Keywords: corporate document management, intelligent systems, electronic document, clustering system, processing analyzer.

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ANALYSIS OF THE INTEGRATED LOGISTIC SYSTEM ON EXAMPLE OF TRANSPORT FORWARDING FIRM WORK

page 16–20

The construction of integrated logistics system on the example of transport forwarding firm work is investigated. This system will contribute to the optimal organization of transportation of goods and services. The improving of efficiency of transport forwarding firm and its industrial and commercial activity that will lead to increased competitiveness of forwarding company by attracting additional volumes of cargo will be provided due to this organization.

A systematic approach and methods of system analysis, statistical methods of information processing, comparative analysis, logic modeling are applied for solving these problems. Thus, the logistics system is a set of logistic chains of forwarding companies, joint by logistics agreements.

The construction of a well-functioning integrated transport and logistics intermodal transport system will contribute to the optimal organization of transportation within the system, thereby ensuring its competitiveness by attracting of additional volumes of transit cargo.

Keywords: supply chain, transport forwarding company, integrated logistics system, service, analysis.

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COMPETITIVE ENVIRONMENT ANALYSIS OF FORWARDING COMPANIES IN CONTAINER TRANSPORTATION SECTOR

page 20–26

In this paper we have analyzed the container transportation market of Ukraine for the period 2009 to 2013. The leading company in the market is highlighted and a classification of types of these companies is given.

Market analysis and classification of the main types of companies is done in order to try understand what is the key of successful activities in the market of Ukraine.

The main factors, which are based on the company's competitive advantages, are determined. These factors include the company's resources, wide geographical distribution, effective management, business operation synergy, quality of communication within the company, complexity and stability of business structure, ability to adapt to changes in the market and much more.

It is identified the strengths qualities of the national companies that allow to compete with foreign companies on the Ukrainian market. These qualities include a good knowledge of the national market, the ability to predict changes in the market and the ability adapting to them.

In addition, it is determine what qualities must be inherent in these companies to be able to enter in international markets: high degree of capitalization, professionalism, business building in the framework of international standards, complexity, stability of structure and others.

These data are important for understanding the directions of development of national companies in this market with a view to further entering them in the international market.

Keywords: competition, operator, identification, benefits, classification, containers, transportation, trend, holding.

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LEARNER OPERATION ALGORITHM DEVELOPMENT WITH MODEL OF REQUIREMENTS ELICITATION TO SOFTWARE

page 26–32

The article is devoted to modeling the process of requirements elicitation to software. The authors argue that the problem of IT analysts' training is topical, and offer their own development as a solution. The process model of requirements elicitation is given in the article and it is demonstrated the algorithms by which the worker with models can examine this process. It is determined the

evaluation technology of all learner actions, which were made at each time point. The authors consider the number and quality of the collected requirements in evaluating and monitor all learner activity. Process model of requirements elicitation has been implemented in the simulator. Using a simulator for learner training in the control group shows a knowledge quality improvement. This model can be adapted to different subject areas and demonstrates the effectiveness of IT analysts' training.

Keywords: model of requirements elicitation, learner operation algorithm, subject area, knowledge assessment.

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MATHEMATICAL MODELING OF LOGISTIC SYSTEMS OF INDUSTRIAL ENTERPRISES WITH DISCOUNT ACCOUNTING

page 32–39

It is investigated the reasons for the low efficiency of warehouse logistics models taking into account discounts and analyzed their construction. In determining the form of the function of the general costs in models with discounts not taken into account that the cost of shipping and storage, as well as the amount of money spent on the purchase belong to different moments in time. The combination of these observations is one of the main factors affecting the adequacy of mathematical models for inventory management, taking into account the discounts.

Analysis of mathematical model, based on the principle of bringing one point in time incoming and outgoing cash flows, showed the possibility of significant differences in decision-making, based on the use of this and classical models.

It is developed the algorithm for determining the optimal batch size of delivery with accounting of discounts and optimal number of vehicles to deliver it, which will create an effective information system of logistics.

Keywords: information system, logistics, mathematical models, discounts, optimization, inventory management.

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WORK ADVISABILITY EVALUATION OF TRANSPORT AND LOGISTIC CENTERIN THE TRANSPORT SERVICE MARKET

page 40–43

The technique of work feasibility evaluation of the transport and logistic center in the transport service market, allowing to select the best package for maximum profit is developed. The presented object of study allowed to determine its structure, internal communication between the system elements, as well as input parameters: the number of services provided by the transport and logistics center, consignment volume, transport distance, ordering interval and output parameters of the system — the maximum profit. Based on the analysis of the ordering flow in the «IRBIS-AUTO» LTD it is determined, that the consignment volume is distributed by normal distribution low of random variables, and the ordering interval and the transport distance — according to an exponential distribution law. The received regression models and profit calculations for each package of services for different values of the expectation allow to select the optimum service package.

Keywords: transport and logistic center, market, transport services, regression model, optimal package, profit.

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PLANNING AND ORGANIZATION OF NEUTRALIZATION PROJECT OF CHEMICALLY-ACTIVE SUNKEN OBJECTS

page 44–47

The main tasks that decided by enterprise to neutralize chemically-active sunken objects are considered in the article. A list of high-tech works for neutralization that gives a theoretical basis for the detailed planning and carrying out the necessary research is formulated. Gantt chart is designed to perform a basic design work, calculated on an annual cycle of their conduct. It is justified the project office creation as the most effective structure for design work organization to neutralize chemically-active sunken objects at the lowest cost to own operation. It is suggested the creation of a project office in structure of predictive monitoring group, as the institutional framework to address the main objectives of the project to neutralize chemically-active sunken objects. The priorities of predictive monitoring group to consider the specific factors in the area of disposal works are formulated. The list of project office tasks associated with the management of knowledge and value of the project is determined and the peculiarities of project knowledge management planning are detected. A list of high-tech works with developed Gantt chart can serve as a theoretical basis for development of administrative tasks of project office management, which is necessary for its creation and successful functioning of UPDO neutralization work.

Keywords: underwater potentially dangerous objects, project management, organizational structure of enterprise.

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RESEARCH ALGORITHM DEVELOPMENT OF STRENGTHENING POSSIBILITY OF EMERGENCY FIRMNESS OF BELT CONVEYOR UNITS

page 48–50

The article is devoted to development of algorithms and software for research of strengthening possibility of emergency firmness of belt conveyor units. The material of the article is a part of the research of the structures of mine belt conveyors from the point of view of operation safety of units and components of the development requirements for their design. It is formalized one of the stages of mine conveyors designing — research of strengthening possibility of emergency firmness of belt conveyor units. It is developed the visual form of user interface based on the example of the basic parameters of the mine conveyor, which is created in the programming language Delphi. To automate the calculation of these parameters of conveyor used programming language Delphi, developed by the visual forms of the algorithm for calculating the gain traction, strength of belt, traction factor, probability of emergency danger and heat transfer equation.

Keywords: conveyor, parameters, stability, unit, characteristics, algorithm software.

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DEVELOPMENT OF COMPLEX OF INTERACTIVE TESTS ON MATHEMATICS IN ADOBE CAPTIVATE

page 51–55

The topic of this article is devoted to computer testing that is one of the most actual problems of pedagogy.

Computer test development is one of the most time-consuming tasks that arise every day for professors. The author gives his own algorithmic approach to solving this problem. The uniqueness of this approach to creation of such computer tests consists in using the algorithm given in the article for creation a similar test in any discipline that allows you to use this article as a guide for professors who do not have special education in computer technology.

Another important component of computer test is creation a text «scenarios» that have a high degree of validity and reliability. The problem of reliability and validity of specific example of the student group testing results of Simon Kuznets Kharkov National University of Economics is shown in detail in the article.

Developed interactive computer test can objectively assess the level of knowledge of students, and its use on personal computer does not require installing any additional software. Automatic calculation of test results reduces a workload of professors, related to spending time on revise of student work. The test has a high degree of validity and reliability.

Keywords: interactive test, higher mathematics, validity, reliability, Adobe Captivate.

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SELECTION AND JUSTIFICATION OF CRITERIA FOR EVALUATING THE EFFICIENCY OF A WIRELESS INFORMATION SYSTEM

page 55–58

The paper suggests criteria for assessing the quality of a wireless information system under design using broadband technology. On the basis of activity-based costing, a set of criteria describing the solution is divided into two subsets: the technical criteria reflecting the parametric side of the designed system; economic ones, which characterize the expenditure for the design, creation and maintenance of the designed system. The proposed criteria for evaluating effectiveness are formalized, which allowed them to be applied with the proposed design method based on multi-criteria optimization method one can solve the analysis of different variants of design solutions. A mathematical model of designing a wireless information system, which is represented by a number of conditions — limitations is suggested. With the proposed design method based on multicriteria optimization method one can solve the problem of choosing the optimal infrastructure of the wireless information system with high demands to the structural secrecy, confidentiality and reliability of information. This will speed up the process of designing such systems.

Keywords: mathematical model, criteria of evaluating efficiency of a designed system, vector optimization.

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DEVELOPMENT OF RETINAL VISUAL ACUITY MICROCONTROLLER ANALYZER

page 58–62

The method of electroretinography, which is a graphical representation of the electrical activity of the retina that occurs in response to light stimulation is applied to retina research. The potentials registration is performed after the impulse retina gating using special equipment through a sensor mounted in a contact lens, which is superimposed on the eye, then the flash lamp produces a flash of considerable intensity and short duration. Relevant for the registration of the total bioelectric activity of all retina neurons of the reina is the automation of receiving electroretinogram, study its amplitude characteristics and timing, which is a diagnostic tool to quantify the degree of impairment, localization, depth and prevalence of pathological processes. Microcontroller electroretinograph allows to define how the smallest biochemical disturbances and biggest degenerative and atrophic processes, to study the mechanisms of development of pathological processes in the retina, and facilitates the early differential and topical diagnosis of retina diseases. Management of diagnostics is performed in accordance with the standards recommended for the study of visual functions. Processing of the received information and its output and mapping are performed in the interpretation of friendly medical staff. It is organized an ability to transfer the measured data to a PC for further display, statistical processing, and analysis of the consulting activities in the Internet.

Keywords: retina, vision, light stimulus, sensor, information, interface, keyboard, display, software.

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THE MODIFICATION THE BI-DIRECTIONAL SOFT OUTPUT VITERBI ALGORITHM FOR DECODING OF TURBO PRODUCT CODES

page 62–65

A modification of the bi-directional iterative soft-output Viterbi algorithm (Bi-SOVA) for decoding of turbo product codes is proposed. It was shown that the modification reduces the number of mathematical operations of comparison. An assessment of modification effectiveness is done. It is conducted the simulation of data channel of turbo codes with different parameters work which showed that the loss of energy efficiency of the decoding algorithm is compared with the modification to the algorithm without modification is not detected. These results allow to recommend the use of modified algorithm in the receiving equipment to reduce the computational complexity of the device and, therefore, reduce the cost of the final product. Further study may be devoted to the modeling of other channels of communication with other parameters of turbo product codes and assessing the modification effectiveness of bi-directional iterative soft-output Viterbi algorithm (Bi-SOVA) for decoding the codes of product.

Keywords: turbo product code, bi-directional Soft Output Viterbi Algorithm (Bi-SOVA), Bi-SOVA performance.

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MEANS FOR BUILDING OF MATHEMATICAL MODELS OF OPTIMIZATION PLACEMENT PROBLEMS IN THE INTERVAL SPACES

page 66–73

The research is devoted to the development of modern design tools for building of mathematical models of geometric objects and relationships of geometric objects interval spaces and their use in constructing the interval mathematical models of optimization problems of geometric design in interval space. The result of research is the further development of interval geometry theory: three-dimensional and multi-dimensional interval metric spaces introduced new concepts formulated statements that create a new modern design tools for modeling of optimization problems of geometric design, taking into account the errors of initial data. It is building an interval surfaces. Their interval equations are involved in analytical description of the boundaries of the interval object. It is defined an interval geometric objects as mathematical models of geometric objects in Euclidean spaces. Their metric features and placement parameters have errors.

The obtained new science-based development in the theory of geometric design and geometry provide a solution of interval

important applied problems of accounting errors in modeling and solving of optimization problems of geometric design. They are a significant achievement for the development of optimal geometric design.

Keywords: geometric design, interval geometry, interval mathematical model of optimization problem of placement.

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