

Report on the work of research groups ITB departments for 2019

Number of research groups at the Department-2

Results for each research group:

1. Name of the R & d performed - Development of methods and tools for process management of a mining enterprise based on big data analysis and OLAP systems

Performers

| | | |
|-----|-------------------------------|---|
| 1. | Vladimir Viktorovich Yavorsky | scientific supervisor, doctor of technical Sciences, Professor KAF. ITB |
| 2. | Klimov Yury Ivanovich | doctor of technical Sciences, Professor KAF. ITB |
| 3. | Kan Oleg Alexandrovich | Ph. D., associate Professor of caf. ITB |
| 4. | Isagulov Sayat Toleuovich | Ph. D., associate Professor of caf. ITB |
| 5. | Mutovina Natalia Viktorovna | Ph. D., associate Professor of caf. ITB |
| 6. | Klyueva Elena Georgievna | St. prep.Department of ITB |
| 7. | Kadyrova L. B. | St. prep.Department of ITB |
| 8. | Salukazi W | St. prep.Department of ITB |
| 9. | Ospanova A. E | Prep.Department of ITB |
| 10. | Kulbayeva L. Kh. | St. prep.Department of ITB |

Main results

In the course of the work on the initiative topic "Development of methods and tools for process management of a mining enterprise based on big data analysis and OLAP systems", the following works were performed:

1) Development and configuration of a high-level model: automatic summary of budget forms and execution reports.

Performers: teachers Yavorsky V. V., Klyueva E. G., Kan O. A., students Dukishov S. S., Kazantseva E. Yu., Demchenko A. S., Abelseitov S. T., Alda D. D., ber O. A., Velinsky A.V., Viira S. O.

Automated collection and reporting of indicators at the level of the company's divisions, statistics development and data storage for the implementation of automated systems are carried out.

2) Collecting and clarifying requirements from users.

Performers: teachers Yavorsky V. V., Klyueva E. G., Isagulov S. T., Mutovina N. V., Sailaukyzy Zh., Ospanova A. E., Kulbayeva L. H.. the students, Kim E. N., Yambaeva O. E., Anarbaeva S. R., Aleman G. K., Meyrambek A. K., Il'in A. A., Kursakin G. D., Mirzaei B. E., The Council Of The E.

Work is underway to clarify the requirements from users. All this leads to increasing the accuracy of management information; increasing the level of detail and depth of analysis (several times); speeding up the timing of the formation of management reports (up to two weeks);

3) Prototyping and model configuration

Performers: teachers Yavorsky V. V., klyuyeva E. G., Kan O. A., Klimov Yu. I. students Dukishov S. S., Kazantseva E. Yu., Demchenko A. S., Temirkhanov T. E., Tsai V. A., Tsoi V. S., ybyray A. S., Karashulakov N. B.

Work is underway to create a model. This model allows you to perform the following functions:

- сокращение reduction of data collection time for additional Analytics (at least 2 times);
- increase the accuracy of cost accounting (by 20-30%);

□ ensuring compliance with approved regulations when planning expenses for basic technological materials (by 80-100%);
стандарти standardizing and improving the budgeting and reporting system by automating processes.

4) Testing

Performers: teachers Yavorsky V. V., klyuyeva E. G., Mutovina N. V., Sailaukyzy Zh., Ospanova A. E., Kulbayeva L. H., the students, Kim E. N., Yambaeva O. E., Anarbaeva S. R., Aleman G. K., Meyrambek A. K., Il'in A. A., Kursakin G. D., Mirzaei B. E., The Council Of The E.

We have developed a data warehouse with a multi-level automated model for planning technological processes, generating budget forms and reports on work execution, as well as a detailed digital model for technological processes of mining enterprise divisions.

Indirect result

1) 2monographs Released:

1. on creating databases and processing data for enterprise management and implementing data warehouses for project management and multidimensional data analysis-klyuyeva E. G., Salikhov I. M. Practical application of the Rumelhart multilayer perceptron model, LAP Lambert Academic Publishing, 2019, Germany.

2. Kalimoldaev M. N., Utepbergenov I. T., Yavorsky V. V., Akhmediyarova A. T., Klyueva E. G., Organization of data storage for Smart systems of urban public transport-Almaty: Institute of information and computing technologies, KN MES RK, 2019.

2) 3 articles were Prepared and submitted to the KKSON journal.

1) Bartosik F. M., klyuyeva E. G. Working with UNICODE encoding by means of WINAPI Kazakhstan, "Bulletin of Semey Shakarim state University" Kazbc-0.009

2) Bekseitov A. A., (master's student of ISM-17-4) Kokkoz M. M. . Protection of personal data of Kazakhstan, "Herald of state University named after Shakarim of Semey city" Casbc - 0,009

3) received a SIS for the developed Model routesearch Module #2880 from 17.04.2019, authors Yavorsky V. V., Klyueva E. G., Akhmediyarova A. T., Kasymova D. G.

4) received a SIS for the developed model-Database "Urban passenger transport" no. 3003 from 24.04.2019, authors Yavorsky V. V., Utepbergenov I. T., Klyueva E. G., Akhmediyarova A. T.

5) Prepared 3 reports for participation In the international conference "Saginaw readings»

6) Prepared 3 reports for participation in the International scientific and practical conference " Informatics and applied mathematics»

7) The results of the work will be implemented and tested at Mega Sound LLP. – we are working on the conclusion of a business agreement "Development of technology for the synthesis of protective coatings using plasma magnetron spray systems" for the amount of 7000000tenge.

1. Name of the R & d performed - Computer modeling of physical processes

Performers

| | | |
|----|------------------------------|--|
| 1. | Danenova Gulmira Tlendieva | scientific supervisor, Ph. D., associate Professor of KAF. Meaty |
| 2. | Pshenbaev Sadat Keskenovic | Ph. D., associate Professor of caf. Meaty |
| 3. | Mendicino Rope Kenzhegalieva | |

| | | |
|-----|----------------------------------|---|
| 4. | Ettel Vladimir Abramovich | Ph. D., associate Professor of caf. Meaty |
| 5. | Apachidi Nikolai Konstantinovich | |
| 6. | Moldovanova I. G. | Ph. D., associate Professor of caf. Meaty |
| 7. | Sotirova B. H. | G. Moskvapolis.primas'. primas'. CFR. Meaty |
| 8. | Bigalieva A. | G. Moskvapolis.primas'. primas'. CFR. Meaty |
| 9. | Murah E. L. | G. Moskvapolis.primas'. primas'. CFR. Meaty |
| 10. | Duisenbekova S. D. | G. Moskvapolis.primas'. primas'. CFR. Meaty |

In the course of the work on the initiative topic "Computer modeling of physical processes", the following works were performed:

1) Analysis of technical documentation for computer modeling of physical processes

Performers: teachers danenova G. T., Ettel V. A., Pshenbaev S. K., Klimov Yu. I., Shodyrova B. H., students Kudaibergen D., Kazakova M., Aliyev O., Kim T. E., lim S. S., Suleimenov A. S., Arkenov T. K., Gellert A. S., Dauletov A., Emzharova A. S.,

Automated collection and reporting of technical documentation indicators is carried out. An analytical review of computer programs was conducted. The technical documentation of the ANSYS PC has been studied.

2) Computer modeling of technological processes of grinding raw materials

Performers: teachers Apachidi N. K., Bigalieva A. Z., Mendikenov K. K., Moldavanova I. G., students Karaeva A., Aliyev S., Senkin M., Chaban E., Ibragimova.V., Ibragimov S. K., Kaliev R. A., A. V. Korneenkov, Mohan D. D., Soin G. D.

Work is underway to justify and create an effective technology for waste-free processing of agricultural raw materials to obtain high-quality bakery products for the intended purpose.

An effective technology for waste-free processing of agricultural raw materials with the production of high-quality bakery products for the intended purpose has been justified and created.

Develop a method for determining the impact of grinding parameters on the physical, biological and sanitary parameters of flour product from cereals, legumes and their combinations with each other.

3) Computer modeling of thermal and deformation processes during welding

Performers: teachers danenova G. T., Ettel V. A., Pshenbaev S. K., students lim S. S., Suleimenov A. S., Arkenov T. K., Gellert A. S., Dauletov A., Aliyev S. S., Vlasov A.D., Egorov S. S., Orazgaliev E. B., Nurkenov E. A., Timofeev A. Yu.

Work is being done to develop a numerical procedure for solving the thermodeformational problem when welding products with modulated current. A three-dimensional problem with a moving heat source is solved. The resulting computer model allows us to analyze in detail the impact of any effects (temperature, mechanical) on all components of stress and strain. This makes it possible to purposefully create a comprehensive method for eliminating dangerous residual factors after welding

4) application Features of the ANSYS CAE system for modeling welding processes

Performers: teachers Moldavanova I. G., Bigalieva A. Z., Duisenbekova S. D., Shodyrova B. H., students Karaeva A., Aliyev S., Senkin M., Chaban E., Ibragimova.V., Ibragimov S. K., Kaliev R. A., A. V. Korneenkov, Mohan D. D., Soin G. D.

Methods of investigation of thermodeformational processes in welding in the environment of the ANSYS computer system are developed.

To date, a number of automated analysis tasks based on the ANSYS PC have been solved to find such dangerous accompanying welding factors as temporary and residual volumetric stresses and deformations.

1. Numerical simulation of thermal deformation processes for single-pass arc butt welding with modulated current of thin plates depending on various technological parameters. At the first stage of the study, based on the ANSYS system, the temperature distributions in the

plate under the action of a driving heat source are determined and the curves of the thermal welding cycles for certain points of the welded joint are constructed.

2. The solution of the volumetric problem of finding temperature fields when a welding heat source is exposed to a metal plate during butt welding is necessary to obtain initial data for finding such dangerous accompanying welding factors as temporary and residual volumetric stresses and deformations.

The obtained computer models allow us to analyze in detail the impact of any effects (temperature, mechanical) on all components of stress and strain. This makes it possible to purposefully create a comprehensive method for eliminating dangerous residual factors after welding.

Indirect result

1) published a monograph on modeling of hydro-mechanical systems of technological machines-Klimov Yu. I. Modeling of hydro-mechanical systems of technological machines. publishing house LAP Lambert Academic Publishing, 2019, Germany.

2) Published 1 article (#1) in the journal Scopus

| | | | | |
|----|---|--|--|-----------|
| 1. | Nurguzhin, M. Danenova, G. , Akhmetzhanov, T. | Computer modeling of residual stresses and strains at arc welding by modulated current | Швейцария, Lecture Notes in Mechanical Engineering, 2019 | SJR 0,139 |
|----|---|--|--|-----------|

Head of ITB Department _____ **Kokkoz M. M.**

Head of the laboratory _____ **Danenova G. T.**