WEB OF SYNERGY:
International Interdisciplinary Research Journal
Volume 2 Issue 1, Year 2023 ISSN: 2835-3013
https://univerpubl.com/index.php/synergy

Business Processes Modeling Via Idef and Aris in E-Commerce

Mansurova Makhina Yashnarovna
Tashkent University of information technologies named after Muhammad al-Khwarizmi, docent of ―Information technologies‖ department

Article Information

Received: November 29, 2022
Accepted: December 30, 2022
Published: January 31, 2023

Keywords: *e-commerce, e-business, business process, modeling, modernization, ARIS, IDEF, simulation, business process management.*

ABSTRACT

This article considers the issue of business process modeling, which is one of the methods to improve the quality and efficiency of the organization. This method is based on the description of the process through various elements (actions, data, events, materials, etc.) inherent to the process. The aim of business process modeling is to identify the maximum number of possible alternatives for the process, and by analyzing their parameters to determine the best option (the parameters of the business process). Presented and analyzed modern methods and approaches to create new business processes and their modeling. The characteristics and definitions of basic concepts and terms are given. ARIS and IDEF methods are visually presented; the strengths for their implementation in a modern enterprise are identified.

The use of the latest information technologies in all spheres of human activity opens up new opportunities for optimizing business processes. What seemed incredible 15 years ago, such as online payments, e-banking and virtual currencies, have become part of our daily lives.

In our opinion, the concepts of "business process model", "business model" and "strategic planning" should not be confused. While all three solve similar problems, they show different levels of abstraction in achieving enterprise goals. The activities of an enterprise should be considered at three levels:

1. Strategic planning - defines the goals of the company, its mission and the value that the company is able to offer its customers.
2. Business model - describes the ways to achieve the goal of the enterprise by monetizing the value that is defined at the top level;
3. Business process model - defines the implementation of the business model developed above, and describes the organizational and economic relations that exist between the employees of the enterprise.

The object of this study is business processes that reflect stable organizational and technical relations that arise in enterprises that implement process management using business process management tools (BPMT). The term business process has a fairly broadinterpretation today, so it becomes necessary to clarify this concept, to classify business processes, which will clarify the direction of research.

A business process is a technology for achieving a planned result. Technology in a broad sense is a set of methods, processes, tools and materials used in any branch of activity, as well as a

scientific description of methods of technical production. Technology "in the narrow sense is a complex of organizational measures, operations and techniques aimed at manufacturing, maintenance, repair and / or operation of a product with nominal quality and optimal costs, and due to the current level of development of science, technology and society as a whole." For this, the technology proposes to decompose the work into elementary components, fix and regulate them. Thus, the requirement of reproducibility of the result determines the repeatability of actions performed by employees, and not vice versa. Repetition of work is a necessary but not a sufficient condition. It is wrong to interpret the process as a sequence of repeated work, since this does not guarantee a reproducible result.

Related works on developing e-business schemes can be classified as into certain categories as follows:

E-business implementation management. To realize the successful development of e-business schemes, implementation management is an important issue. Jansen et al. pointed out the difference between business process modeling and e-business process modeling, and mentioned that it is important not to forget the lessons learned from business process engineering, and in addition mentioning project management risks. Chauang and Shaw proposed a roadmap for e-business implementation. Bendoly and Schoenherr analyzed the implementation process of ERP systems from the viewpoint of implications for B2B systems.

E-business investment. Like other implementations of new technologies, investment performance is an important concern in management. Koholi et al. studied the payoff of IT investment in e-business environments, and Amit and Zott considered value creation of e-business. Certain metrics will help in analyzing the success of their ebusiness investments. Riggins and Mitra proposed a framework providing a methodology for mapping ebusiness applications within the proposed frameworks, which then can be used to generate three different types of metrics that should be considered in evaluating e-business strategic initiatives.

E-business process modeling (modeling methods, ontology for modeling, and modeling knowledge management). E-business process modeling is important in the sense that process modeling is the process of developing schemes of e-business. Dufresne and Martin investigated how well various process models support e-business. Kim and Ramkaran analyzed best practices in e-business process management extending a re-engineering framework. Basu and Kumar pointed out workflow management issues in e-business. Osterwalder and Pigneur constructed and outlined an ontology (rigorous framework) for e-business models based on an extensive literature review, and insist that the understanding and use of e-business models is essential in an increasingly dynamic and uncertain business environment. Modeling knowledge management for modeling e-business is important in the sense that it would help ensure the feasibility of new processes. Xirogiannisa and Glykasb proposed a method of intelligent modeling of e-business maturity.

E-business technology acceptance. A basic technology acceptance model (TAM) was proposed by Davis, which is a model of how users come to accept and use a technology. The model suggests that a number of factors influence their decision about how and when they will use it when users are presented with a new technology. Bhattacherjee applied this model to e-commerce. It’s focused on an empirical study on e-business adoption.

E-business strategy framework. As for e-business strategy, Li and Chang proposed a holistic framework of e-business strategy.

E-business execution knowledge management system. The knowledge management system for e-business can be classified into knowledge management for ebusiness process modeling and knowledge management system for e-business execution. As for the ebusiness execution system, Malhotra considered knowledge management for e-business performance.

Business process analysis and modelling methodologies have the potential of bridging the gap between the information systems requirements definition and software systems development. Traditionally however, business analysts have had difficulties in capturing 'as-is' models of businesses in order to better understand and subsequently improve them. Fortunately, the advent of modelling tools supporting the application of business modelling methods has changed this situation.

Today such concepts of business process modeling as IDEF and ARIS are especially widespread.

The IDEF (ICAM DEFinition, becoming Integrated DEFinition) methodology was initially intended for use in systems engineering. In the 1970s, the system design and analysis domains were in need of supporting modelling methods. The US Air Force Integrated Computer Aided Manufacturing (ICAM) program addressed this need by devising the suite of methods known as IDEF. The IDEF suite initially contained an activity (function) modelling method, called IDEF0, a conceptual modelling method called IDEF1 and a simulation model specification method - the IDEF2. Since then, other developments saw several constructs added to the IDEF1, which gave birth to IDEF1x. Also, work on a process modelling method known as IDEF3 was started in the 1980s. IDEF3 has actually taken over much of the scope of IDEF2 because it can be used to specify preliminary simulation models.

Furthermore, IDEF3 has an object-state component that can be used to model how objects undergo change in a process. IDEF4 and IDEF5 followed in the 1990s. IDEF4 is an object-oriented software design method that integrates the requirements specified in other methods. IDEF4 also allows capturing and management of (object-oriented) design principles. IDEF5 is a knowledge acquisition and engineering method aiming to support enterprise ontologies - i.e. the theories supporting metamodels.

The complete list of IDEF methods goes from IDEF0 to IDEF14 (from IDEF5 upwards mostly in development and IDEF7 missing from the list). Presently, the methods that are used most are IDEF0, IDEF1x, IDEF3 and IDEF4. Recent developments aim to effectively refine and integrate these methods, so that information may be easily exchanged between them. The IDEF methodology is slightly different from the DFD business process description scheme. The main difference is the availability of additional parameters besides inputs and outputs. Rather, it is proposed to introduce three types of inputs: the first type is called there simply as an input, and the other two inputs are called control and mechanisms:

With the help of control, objects are shown - material and information flows that are not transformed in the process, but are needed for its execution. With the help of mechanisms, they began to indicate the mechanisms by which the business process is implemented: technology, people, software.

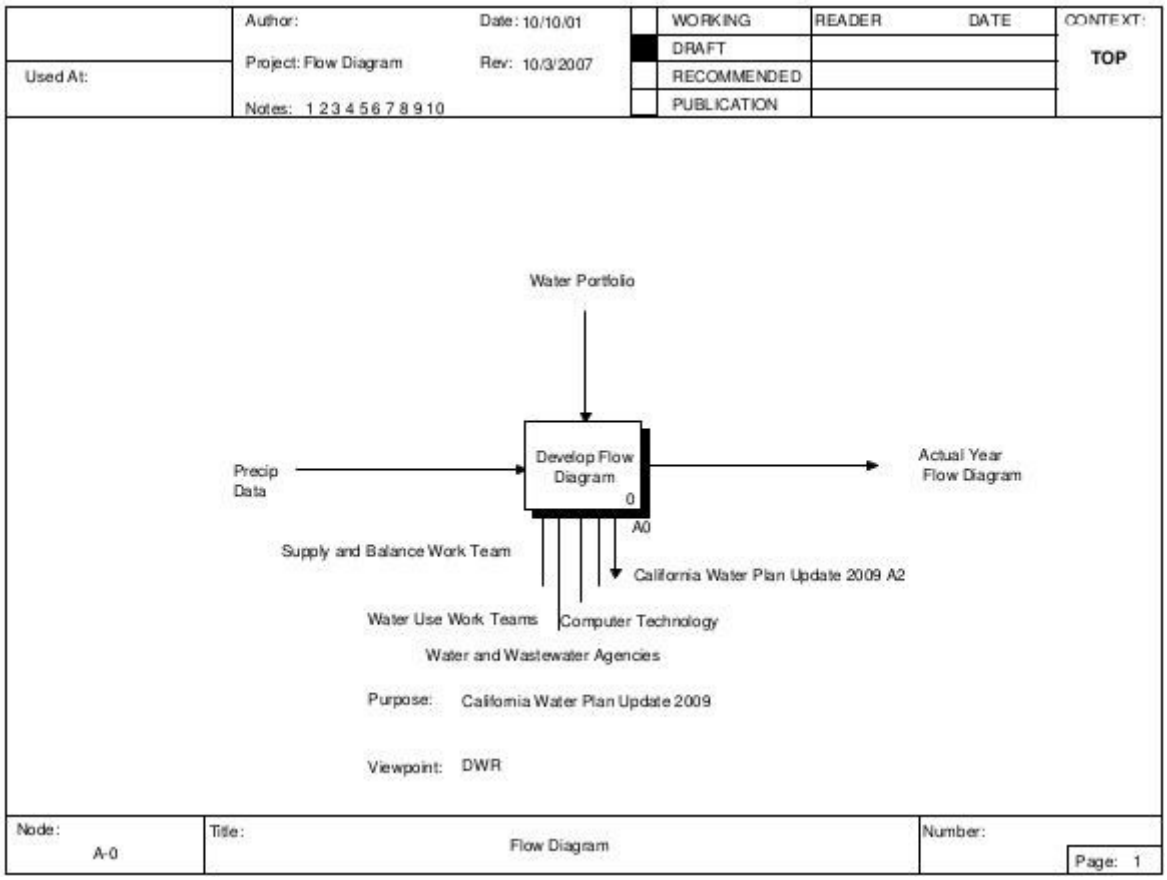

Fig. 1. Simulation of e-commerce BP through the IDEF

As you can see, the diagram does not give a complete vision of the process, but only a general view of its vectors. In order to view the sequence of the process execution, you need to decompose the scheme down to the lower-level processes - to give a more detailed description of the process. But in this case, such a standard scheme may turn out to be information oversaturated and too complex.

Another modern business modeling methodology that has become widespread is the ARIS methodology.

One of the most popular business process modeling concepts is ARIS(Architecture of Integrated Information Systems), developed by Professor A.V. Scheer, - Architecture of Integrated Information Systems.

ARIS (an acronym for the Architecture of Integrated Information Systems) is a methodology and a replicable software product for modeling business processes in organizations. ARIS product is used in various projects for re-engineering and optimization of business processes, IT projects such as implementation and operation of ERP-systems, in particular, there is a developed integration solution for SAP R/3.ARIS software is the basis of Business Process Analysis Suite of Oracle corporation. Technically, ARIS toolkit is simple enough to learn, has an intuitive interface. Models are copied and inserted into document files (for example, Microsoft Word format) as drawings.

ARIS products provide the ability to create scripts for automating the preparation of various analytical reports, regulatory documents, new models. Each scenario is a subprogram that runs in ARIS Business Architect (or Toolset - earlier versions) or directly on the ARIS server. Scenarios are written in a special programming language - SAX Basic. For the automated generation of a report in ARIS, scripts operate with data from the model database, extracting from it specific objects and models.

The ARIS Script technology allows you to automatically perform:

- the formation of regulatory documents based on ARIS models (eg, process passport, process regulations);
- formation of the analytical reports, based on ARIS models;
- integration of ARIS Toolset with other applications and databases;
- formation of ARIS model base on the basis of ready-made specifications.

For example any organization in ARIS methodology is considered from five points of view: organizational, functional, processed data, structure of business processes, products and services. Each of these points of view is divided into three sublevels: requirements description, specification description, implementation description. For the description of business processes it is proposed to use about 80 types of models, each of which belongs to one or another aspect.

The general principle in the toolkit is the ability to integrate models of different types within a single repository by decomposing (detailing) objects. Thus, any organization can be described using a hierarchy of models - from generalization: for example, VACD (value added chain diagram) to the level of procedures and resource environment of functions.

Among the large number of possible methods of description, it is possible to distinguish the following:

- ✓ eEPC (extended event-driven process chain);
- ✓ ERM (entity-relationship model) - entity-relationship model for data structure description;
- ✓ UML (unified modeling language) is a unified object-oriented modeling language.

This concept has two main advantages:

1. allows you to choose methods and integrate them, based on the main features of the modeled object;
2. serves as a basis for managing complex projects, since, thanks to the structural elements, it contains built-in models of procedures for the development of integrated informationsystems.

The ARIS architecture includes the ARIS Toolset, which allows you to build, analyze and evaluate the company's work processes in accordance with the methodology using simple modeling tools, documenting business processes.

The ARIS methodology is based on an approach to the formalization of data on the activities of an organization, graphical representation in the form of various models. The graphical presentation is convenient and easy to understand for any kind of user.

Models in the ARIS methodology should be detailed to the extent dictated by the objectives of the project for which the modeling is being performed. The models are used for business analysis and creation of solutions for reengineering of business processes, implementation of information management systems.

The ARIS methodology implements the principles of structural analysis and allows you to determine and reflect in the models the main components of the organization, ongoing processes, produced and consumed products, information used, as well as to identify the relationship between them.

ARIS models include knowledge about the organizational structure, processes occurring in the organization, interactions with third-party organizations, internal documents of the organization, the sequence of stages of processes, job descriptions of organizational units and employees.

The ARIS methodology provides a data repository that allows for model verification. The

repository contains all the information that makes the analysis and modeling process complete and consistent. A repository is a database where all models and objects are stored. It allows you to develop an integrated, holistic model of the described subject area.

ARIS methodology makes it possible to view the organization from different points of view. This is achieved by using different models to describe at different levels. An object can be viewed in terms of organization, management system, structure, and many others.

A rich set of modeling methods in the methodology allows you to build a large number of different models that reflect various features of the simulated subject area of the organization.

- ARIS methodology allows for multiple use of modeling results; the accumulated corporate knowledge about all aspects of the organization's activities can further serve as the basis for the development of various projects directly in the ARIS environment and using interfaces and other means.

In contrast to the IDEF methodology, ARIS views organization as a set of five views:

- ✓ a look at the organizational structure (Organizational View);
- ✓ look at the structure of functions (Function View);
- ✓ look at the data structure (Data View);
- ✓ look at the structure of processes (Control View);
- ✓ look at the structure of final products / services and information exchange (Product / Service View).

Among the large number of possible methods for describing business processes in this methodology, the following can be distinguished:

- EPC (event-driven process chain) is a process description method that has found application to describe the processes of the SAP R / 3 system;
- ERM (Entity Relationship Model – entity relationship diagram) - entity-relationship model for describing the data structure;
- UML (Unified Modeling Language) is an object-oriented modeling language.

A special advantage of the ARIS methodology is the ergonomics and high degree of visualization of business models, which makes it convenient and accessible to use.

In the ARIS methodology, color has a meaning, which improves the perception of schemes. For example, business units are shown in yellow, business processes and specific operations in green.

In addition to a larger number of models compared to other methodologies, this methodology has a larger number of different objects used in building business models, which increases their analyticity. For example, material and information flows on process diagrams are indicated by objects of different shapes and colors, which allows you to quickly determine the type of flow.

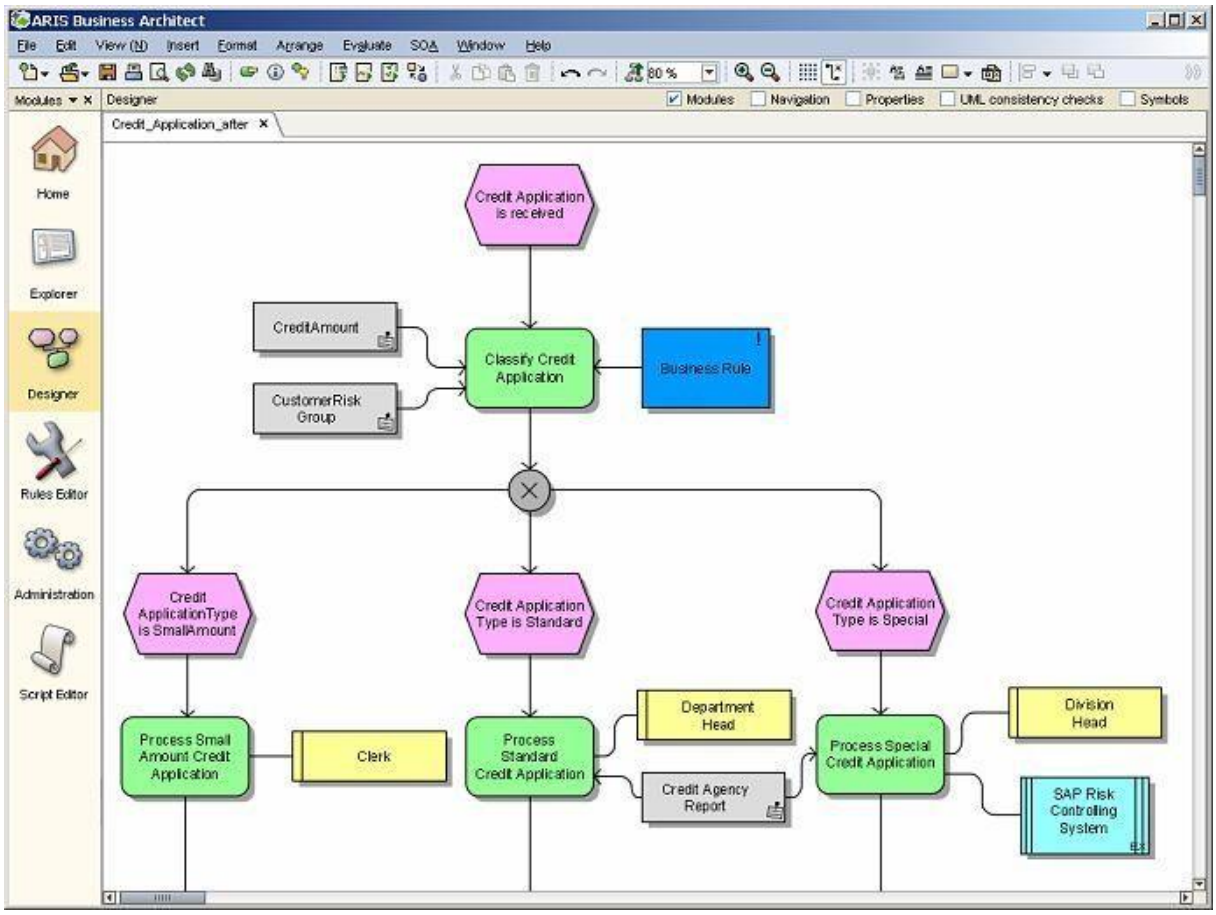

Fig. 2. Simulation of e-commerce BP through the ARIS

Finally, we note that despite all the advantages of the ARIS methodology, one can often hear reproaches against it related to the excessive complexity of the diagramming rules (althoughpart of the complexity is associated with the use by many users of the MS Visio tool, which is rather inconvenient for describing large organizations). Thus, we can conclude that there are several basic methodologies for describing business processes - which, on the one hand, are somewhat similar to each other, but, on the other hand, have their own characteristics in terms of looking at both the process itself and its environment. Therefore, a very important issue is the correct choice of methodology for the exact solution of the tasks of a particular project - which will become one of the fundamental factors of its success.

The main disadvantage of the above tools and methods for modeling processes is that they only allow formalizing the description of business processes, but do not provide an opportunity for the systematic formation of functional structures and optimization of business processes It should also be noted that the implementation of IT in a separate enterprise and the creation of a new integrated information environment above the enterprise level are associated with various problems and tasks. Therefore, taking into account all the positive aspects of the ARIS and IDEF concepts, it is necessary to develop a special methodology for complex modeling of processes in the design of information systems.

Список литературы

1. Алтухов А.А., Жирнов В.В. Анализ морфологии и стехиометрии пленок CoSi/Si(100), полученных методами ТФЭ и РЭ // Материалы II-го Всесоюзного межотраслевого совещания “Тонкие пленки в электронике”: Москва-Ижевск. 1991. С. 15-22.
2. Н. М. Мустафоева, Н. М. Мустафаева // Исследование Физические Свойства Нанопленок Nisi2/Si // Таълим ва ривожланиш таҳлили онлайн илмий журнали, 2022

йил октябр, Vol. 2 No. 10 (2022)

3. N. M. Mustafoeva, A. K. Tashatov, N. M. Mustafaeva, X. J. Mavlonova //Investigation of Physical Properties of Nisi 2/Si Nanofilm // Pioneer: Journal of Advanced Research and Scientific Progress (JARSP) Volume: 01 Issue: 04 | 2022 ISSN: 2751-7551
4. N. M. Mustafoeva, A. K. Tashatov, N. M. Mustafaeva, X. J. Mavlonova //Surface Morphology of Nisi 2 /Si Films Produced By Solid-Phase Epitaxy// Pioneer: Journal of Advanced Research and Scientific Progress (JARSP) Volume: 01 Issue: 04 | 2022 ISSN: 2751-7551
5. А. К. Ташатов , Н. М. Мустафоева //Нанопленок CoSi2 На Поверхности Si При Твердофазном Осаждени // Miasto Przyszłości Kielce, Vol. 25 (2022):
6. Bobokalonov, M. K., & Khamdamova, D. (2022). USING ARCGIS SOFTWARE TO CREATE A LAND RECLAMATION MAP. *BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI*, *2*(11), 385-388.
7. Bobokalonov, T. M. K. (2022). The procedure for performing parametric equalization of a triangulation grid using Microsoft Excel. *The Peerian Journal*, *11*, 19-30.
8. Bobokalonov, M. H. (2020). Planning of Erosti Communications on the Basis of Building Standards in the Planning and Construction of the City. *International Journal on Orange Technologies*, *2*(7), 9-10.
9. Бобокалонов, М. Х. (2022). МЕТОДОЛОГИЧЕСКИЕ ОСНОВЫ СОЗДАНИЯ ЦИФРОВЫХ КАРТ В УЗБЕКИСТАНЕ В ARCGIS 9.3. *Central Asian Journal of Theoretical and Applied Science*, *3*(12), 194-197.
10. Vinceti, B., Elias, M., Azimov, R., Turdieva, M., Aaliev, S., Bobokalonov, F., ... & Loo, J. (2022). Home gardens of Central Asia: Reservoirs of diversity of fruit and nut tree species. *PLoS One*, *17*(7), e0271398.
11. Ismoiljon O'g'li, T. N. (2022, October). MODERN MANAGEMENT SYSTEM IN LEADING AMERICAN COMPANIES. In *Archive of Conferences* (pp. 157-160).
12. O‘g‘li, T. N. I. (2022). STRATEGY OF GREAT LEADERSHIP IN RUSSIAN COMPANIES. *American Journal of Pedagogical and Educational Research*, *5*, 1-3.
13. Abdirazzakovich, B. A. (2022). Effects of intercropping on soil fertility and yield of winter wheat. *The Peerian Journal*, *13*, 80-82.
14. Abdirazzakovich, B. A., & Razzak, O. (2022). EFFECT OF PREVIOUS CROPS ON SOIL FERTILITY AND WINTER WHEAT YIELD. *Web of Scientist: International Scientific Research Journal*, *3*(12), 723-727.
15. RIZAEV, S. (2021). THE INFLUENCE OF AGRO-TECHNICAL AND CHEMICAL WEEDS CONTROL MEASURES AND YIELD OF AUTUMN WHEAT IN ZARAFSHON VALLEY OF UZBEKISTAN. *PLANT CELL BIOTECHNOLOGY AND MOLECULAR BIOLOGY*, 38-46.
16. Uzaqbaevich, I. D. (2022). EFFECTS OF SHORT-TERM CROP ROTATION SYSTEMS ON THE GROWTH AND DEVELOPMENT OF COTTON.
17. Буриев, А. А., & Орипов, Р. (2018). ВЛИЯНИЕ ПРЕДШЕСТВЕННИКОВ НА УРОЖАЙНОСТЬ ОЗИМОЙ ПШЕНИЦЫ В УСЛОВИЯХ ОРОШАЕМЫХ ТИПИЧНЫХ СЕРОЗЁМОВ. In *WORLD SCIENCE: PROBLEMS AND INNOVATIONS* (pp. 254-256).

18. Муродов, М. М., & Чулиев, Л. Э. (2021, October). Турли Объектлар Асосида, Яъни Пахта Тозалаш Корхоналарининг Толали Чиқиндилари Ва Павлония Ҳамда Банан Целлюлозаларидан Е-466 Олиш Технологияси Ва Унинг Физик-Кимёвий, Механик-Структуравий Хоссалари. In *" ONLINE-CONFERENCES" PLATFORM* (pp. 316-320).
19. Kholmuradovich, K. B. (2022). " People's Diplomacy"-An Important Factor for the Development of Regional Cooperation. *The Peerian Journal*, *6*, 71-74.
20. Kholmuradovich, K. B., & Kizi, A. G. R. (2020). The Concept Of" People's Diplomacy", Its Content And Significance. *The American Journal of Social Science and Education Innovations*, *2*(07), 177-183.
21. Raupov, C., Karimova, A., Zokirov, F., & Khakimova, Y. (2021). Experimental and theoretical assessment of the long-term strength of lightweight concrete and its components under compression and tension, taking into account the macrostructure of the material. In *E3S Web of Conferences* (Vol. 264, p. 02024). EDP Sciences.
22. Hakimova, Y. T. L., & Daler Doniyor o'g'li, R. (2022, October). YANGI O 'ZBEKISTON YOSHLARI. In *INTERNATIONAL CONFERENCE DEDICATED TO THE ROLE AND IMPORTANCE OF INNOVATIVE EDUCATION IN THE 21ST CENTURY* (Vol. 1, No. 5, pp. 51-53).
23. Shermukhamedov, U., Karimova, A., Khakimova, Y., & Abdusattorov, A. (2022). MODERN TECHNIQUES FOR THE CONSTRUCTION OF MONOLITHIC BRIDGES. *Science and innovation*, *1*(A8), 790-799.
24. Mardonov, B., An, E., Shojalilov, S., Khakimova, Y., & Ismoilova, G. (2021). Transverse Vibrations of Underground Pipelines with Different Interaction Laws of Pipe with Surrounding Soils. In *E3S Web of Conferences* (Vol. 264, p. 02035). EDP Sciences.
25. Nurmatova, F. B. (2022, October). Integrative Learning of Biophysics in a Medical University. In *" ONLINE-CONFERENCES" PLATFORM* (pp. 43-46).
26. Файзиева, У. Р., & Худойкулова, Э. А. (2017). Эффективность применения препарата АкваДЗетрима при рахите. *Интерактивная наука*, (12), 75-77.
27. Tatochenko, V. K. (2021). Community-acquired pneumonia in children– problems and solutions. *Rossiyskiy Vestnik Perinatologii i Pediatrii (Russian Bulletin of Perinatology and Pediatrics)*, *66*(1), 9-21.
28. Гляделова, Н. П., & Унич, Н. К. (2009). Инспирон: новый этап в патогенетической противовоспалительной фармакотерапии респираторных инфекций у детей. *Современная педиатрия*, (6), 115-115.
29. Tatochenko, V. K. (2021). Community-acquired pneumonia in children– problems and solutions. *Rossiyskiy Vestnik Perinatologii i Pediatrii (Russian Bulletin of Perinatology and Pediatrics)*, *66*(1), 9-21.
30. Халимова, Х. (2022). COVID-19 ЎТКАЗГАН БЕМОРЛАРДА ПАРКИНСОН КАСАЛЛИГИНИНГ КЛИНИК КЕЧИШИ.
31. Усманходжаева, А. А., Матмуродов, Р. Ж., & Эгамова, М. Т. (2020). Развитие физиологические движения у детей с детским церебральным параличом. *ЖУРНАЛ НЕВРОЛОГИИ И НЕЙРОХИРУРГИЧЕСКИХ ИССЛЕДОВАНИЙ*, *1*(1).
32. Халимова, Х. М., & Матмуродов, Р. Ж. (2016). ЭКСТРАПИРАМИДАЛ КАСАЛЛИКЛАРДА S100B ОҚСИЛ МИҚДОРИНИНГ ҲАРАКАТГА БОҒЛИҚ БЎЛМАГАН БЕЛГИЛАР БИЛАН ЎЗАРО БОҒЛИҚЛИГИ. *Журнал теоретической и клинической медицины*, (2), 91-94.

33. Маджидова, Ё. Н., Халимова, Х. М., Раимова, М. М., Матмурадов, Р. Ж., Фахаргалиева, С. Р., & Жмырко, Е. В. (2011). Молекулярно-генетические и некоторые биохимические аспекты болезни Паркинсона. *Международный неврологический журнал*, (1), 91-94.
34. Матмуродов, Р. Ж. (2009). Роль NO-системы и дофамина в патогенезе болезни Паркинсона. *Врач-аспирант*, *36*(9), 821-828.
35. Матмурадов, Р. (2022). Енгил бош мия жароҳатларидан кейинги даврда когнитив бузилишларнинг динамикаси.
36. Raimova, M. M., Khalimova, K. M., & Matmurodov, R. J. (2013). Parkinson's disease: Molecular-genetic investigations in Uzbekistan. *Journal of the Neurological Sciences*, *333*, e144.
37. Абдуллаева, М. Б., Раимова, М. М., Турсунова, М. О., & Ядгарова, Л. Б. (2021). ТРАНЗИТОР ИШЕМИК АТАКАЛАРНИНГ ИШЕМИК ИНСУЛЬТЛАРНИ РИВОЖЛАНИШИДАГИ АҲАМИЯТИ, ДИАГНОСТИКАСИ ВА ДАВОЛАШ УСУЛЛАРИ. *ЖУРНАЛ НЕВРОЛОГИИ И НЕЙРОХИРУРГИЧЕСКИХ ИССЛЕДОВАНИЙ*, (SPECIAL 1).
38. Raimova, M. (2012). Study of the role of environmental factors in development of Parkinson's disease. *Medical and Health Science Journal*, *11*, 22-27.
39. Халимова, Х. М., Раимова, М. М., & Матмуродов, Р. Ж. (2012). Влияние L-аргинина на когнитивные расстройства у больных хронической ишемией мозга с синдромом паркинсонизма. *Український хіміотерапевтичний журнал*, (3), 148-150.