**ЧЕРИКБАЕВ М.М.**
[1]КГУСТА им. Н.Исанова, Бишкек, Кыргызская Республика

**CHERIKBAEV M.M.**
[1]KSUCTA n. a. N. Isanov,  Bishkek, Kyrgyz Republic
e-mail: mirulan@rambler.ru

## SIMULATION OF ELECTRONIC LICENSING PROCESSES

## МОДЕЛИРОВАНИЕ ПРОЦЕССОВ ЭЛЕКТРОННОГО ЛИЦЕНЗИРОВАНИЯ

*Бул макалада маалыматтарды иштеп чыгуу тутумдарын долбоорлоо методдорун жана технологияларын изилдөө жана Кыргыз Республикасынын Билим берүү жана илим министрлигинин (КР) интеграцияланган чөйрөсүндө билим берүү мекемелерин лицензиялоо процессин автоматташтыруу моделдерин иштеп чыгуу.*

*Өзөк сөздөр: лицензиялоо, билим берүү мекемеси, моделдер, кагазсыз технология, маалыматтар базасы, интерфейс, бизнес процесс, программалык модулдар, ДББЖ, интегралдык чөйрө.*

*В данной статье рассматривается вопросы исследование методов и технологий проектирования систем обработки данных и разработка моделей автоматизации процесса лицензирования образовательных учреждений в интегрированной среде Министерства образования и науки Кыргызской Республике (КР).*

*Ключевые слова: лицензирование, образовательные учреждение, модели, «безбумажная» технология, база данных, интерфейс, бизнес-процесс, программные модули, СУБД, интегрированная среда.*

*This article covers research of methods and technologies for designing data processing systems and the development of models for automating the process of licensing educational institutions in the integrated environment of the Ministry of Education and Science of Kyrgyz Republic (KR).*

*Key words: licensing, educational institution, models, "paperless" technology, database, interface, business process, software modules, DBMS, integrated environment.*

Lately great attention is paid to quality of educational services, formation of conditions for development of educational organizations where their activities would not depend on departmental affiliation or organizational and legal form. Monitoring of educational institutions should be carried out by the state through licensing, certification and accreditation of these institutions [1].

Licensing is a procedure that officially validates that given educational institution may conduct educational activities according to certain programs by verifying compliance of educational services offered by this educational institution to the normalized indicators of state educational standards and other requirements for educational institutions (Fig. 1).
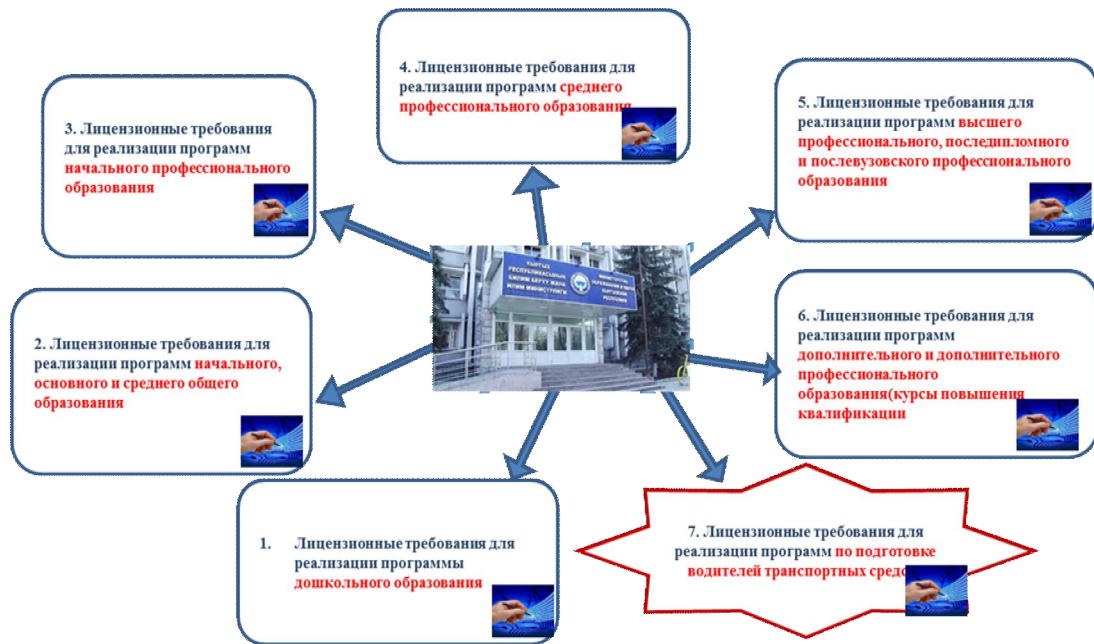
3. Лицензионные требования для реализации программ начального профессионального образования

4. Лицензионные требования для реализации программ среднего профессионального образования

5. Лицензионные требования для реализации программ высшего профессионального, последипломного и послевузовского профессионального образования

2. Лицензионные требования для реализации программ начального, основного и среднего общего образования

6. Лицензионные требования для реализации программ дополнительного и дополнительного профессионального образования(курсы повышения квалификации

1. Лицензионные требования для реализации программы дошкольного образования

7. Лицензионные требования для реализации программ по подготовке водителей транспортных средств

Fig. 1. - Licensed educational institutions of Kyrgyz Republic

### Methods

Licensing of educational institutions is carried out according to a certain technology, reflecting the interaction of the licensed organizations with the relevant state bodies (General model of the licensing process. Fig. 2).

Лице́нзия — разрешение на право либо право на выполнение конкретных действий, которое может удостоверяться одноимённым документом.

ПРОЦЕСС ЛИЦЕНЗИИ

ПОДГОТОВКА

ПРОВЕДЕНИЕ ПРОВЕРОК

Полноты и правильности оформления и заполнения заявления и документов

Полноты и достоверности сведений о соискателе лицензии, содержащихся в представленных соискателем лицензии заявлении и документах, возможности выполнения им лицензионных требований и условий

Заключения о возможности выполнения соискателем лицензии лицензионных требований и условий

ОФОРМЛЕНИЕ И ВЫДАЧА лицензии на осуществление образовательной деятельности или ОТКАЗ

ПРИНЯТЫЕ РЕШЕНИЕ

ИТОГИ

Figure: 2. - General model of the licensing process

To obtain a license for educational activities, it is necessary to fulfill all the requirements to ensure high-quality educational activities.

3 main conditions are required:

- Properly equipped premises;
- Educational programs;
- Adequate qualitative and quantitative teaching staff.

Licensed educational institutions must provide a complete set of required documents.

Currently, the licensing process is based on "paper" technology, providing for the provision and processing of paper versions of documents (Fig. 3).
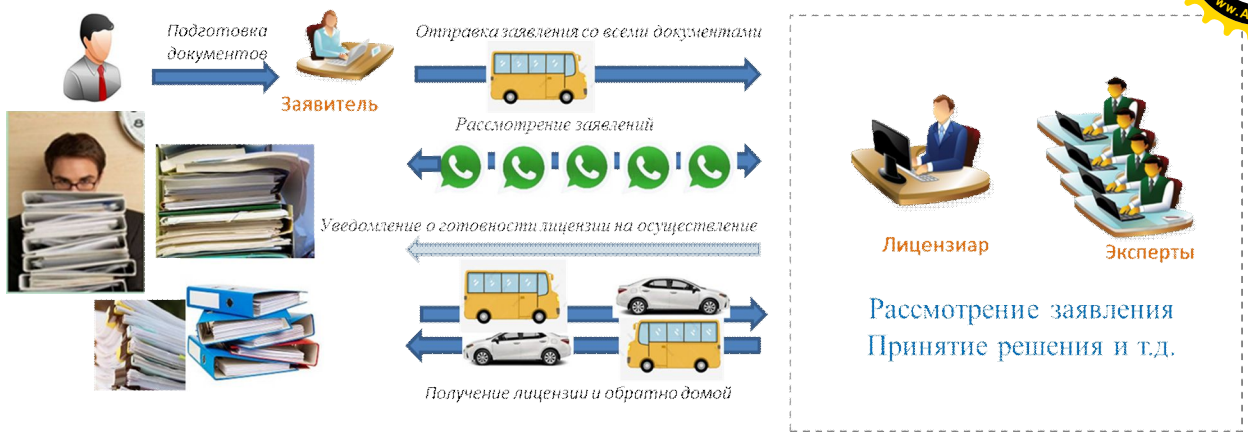
Figure: 3. Current licensing technology

This technology has the following disadvantages:
- Shipping and transportation costs
- Unknown status of application consideration
- Corruption risk (the possibility of direct interaction between the applicant and the licensor)

It is possible to eliminate the above mentioned disadvantages by switching to the "paperless" technology, presented in fig. 4.
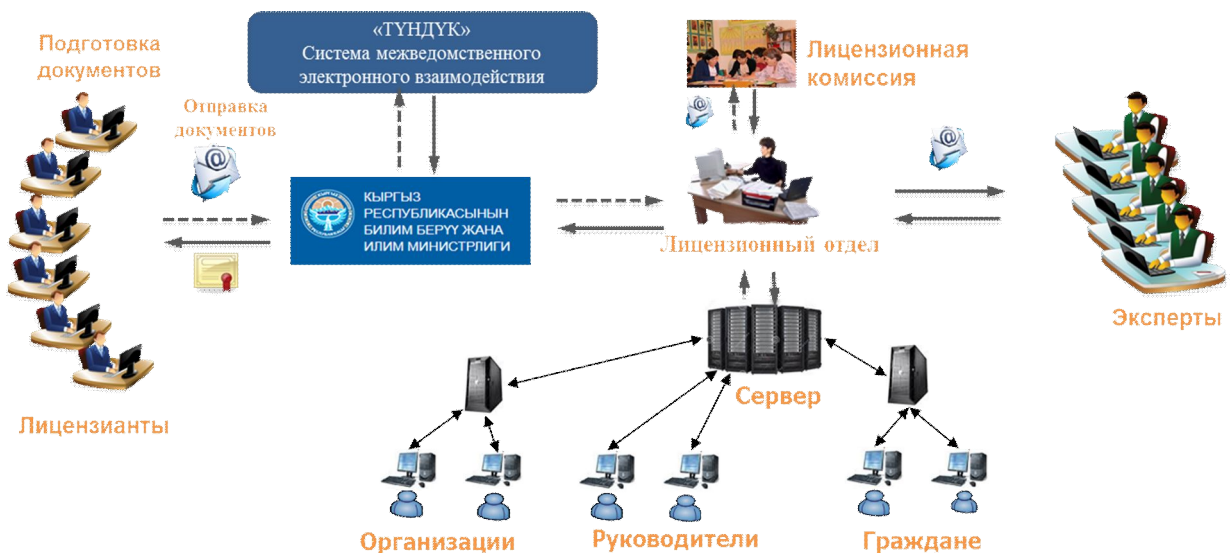


Figure: 4. Proposed licensing technology

For the successful functioning of the proposed technology, it is required to create an information system that includes a database and software modules that implement the corresponding business processes and interact with the database through the DBMS and interfaces [2].

When modeling the processes of electronic licensing of educational institutions, all business processes were analyzed, entities and their attributes were identified [4]. Based on the results obtained, an info logical model was developed. The info logical model presents data grouped into tables, relational links between these tables, reflecting the essence of the business processes of electronic licensing of educational institutions [3].

The info logical model includes tables: "article"; "program category"; "program classifier"; "list license"; "form1"; "organization"; "professional education"; "program_AMC"; "programs"; "general education"; "ProgramPomeshenie".

On the basis of the info logical scheme, a database scheme (Fig. 5) of electronic licensing was developed.
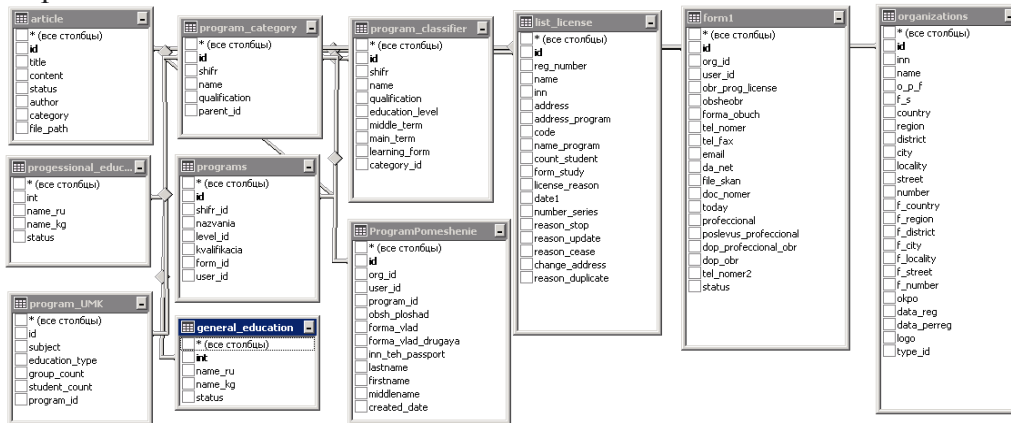


Figure: 5. Fragment of the electronic licensing database schema.

The electronic licensing process consists of several main stages, which should be reflected at the stage of developing interfaces for the interaction of software modules responsible for electronic licensing business processes [5] with a DBMS that controls the information system database. These stages are presented below (Fig. 6).
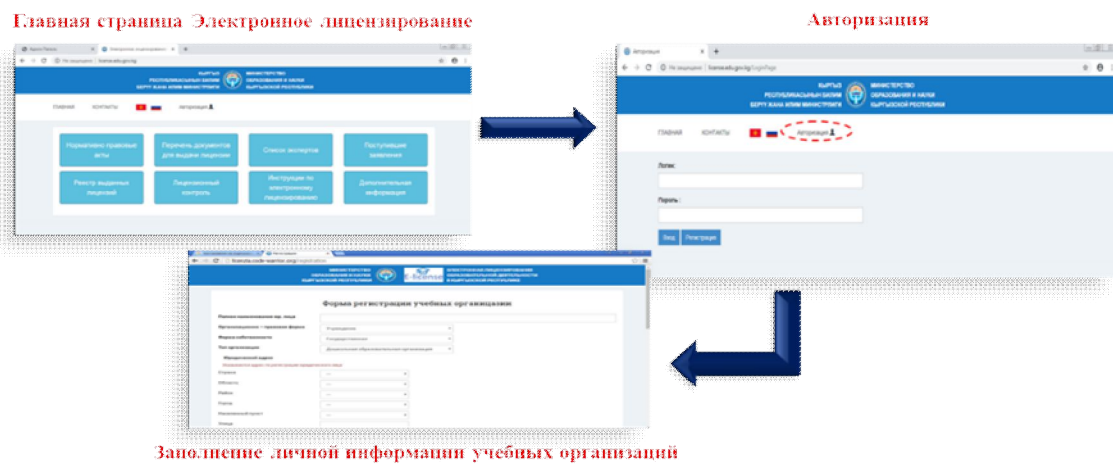


Figure: 6. Interfaces of various stages of obtaining a license

Electronic licensing technology provides for a sequence of processes, some of which are presented below (Fig. 7).
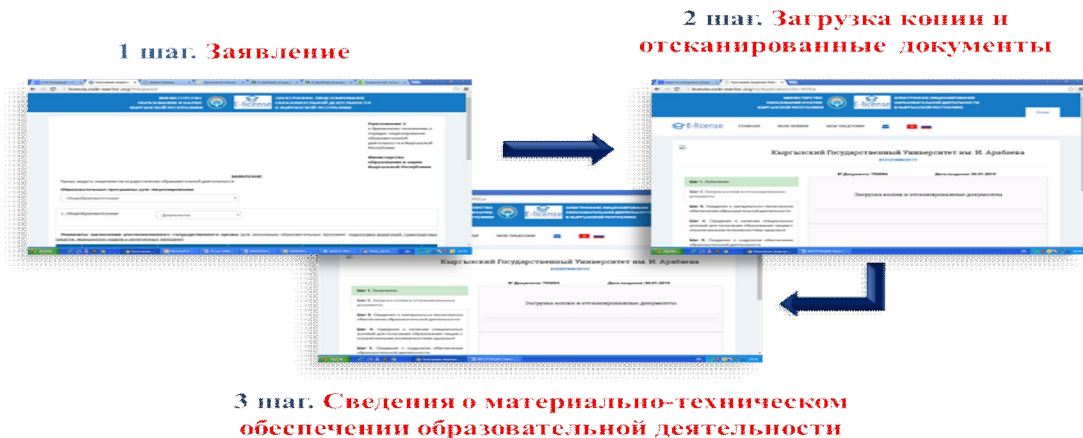


Figure: 7. Stages of electronic licensing
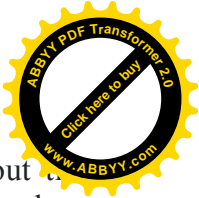
At the first stage, the scanned documents are loaded (Fig. 8). Then - filling out the documents for classrooms (Fig. 9). It should be noted that all these processes are performed on the client side, i.e. a representative of an educational institution can stay at his educational institution or any other place with access to Internet and send at any convenient time of the day.
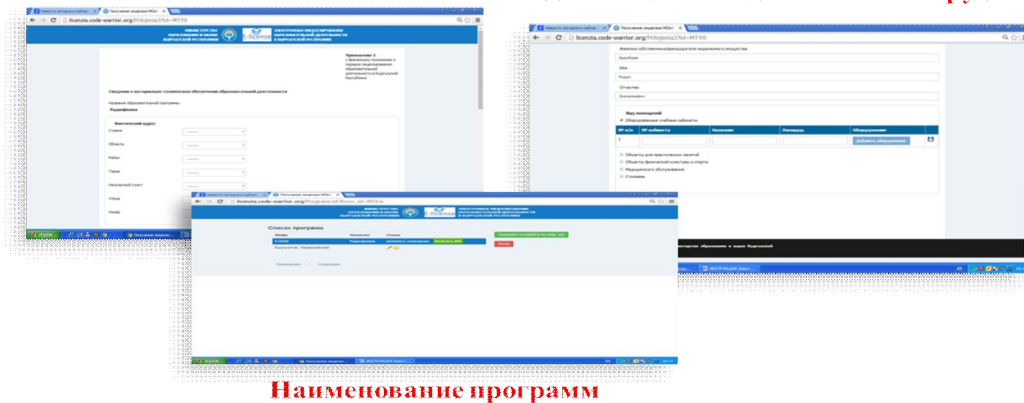


Figure: 8. Filling out documents for classrooms

At the next stage, information is loaded on the availability of special conditions for obtaining education for persons with disabilities (Fig. 9) and information on the staffing of educational activities (Fig. 10).
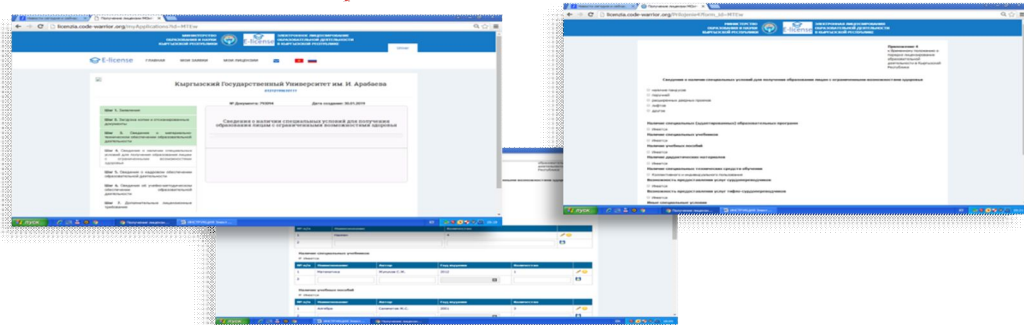


Figure: 9. Uploading information about the availability of special conditions for obtaining education for persons with disabilities
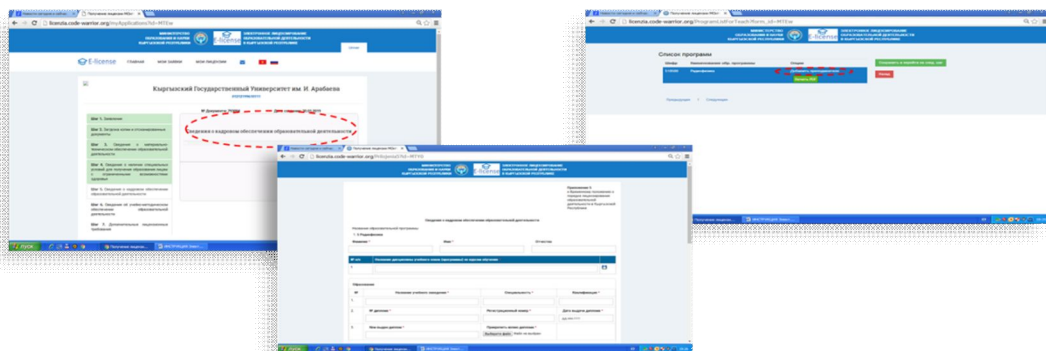


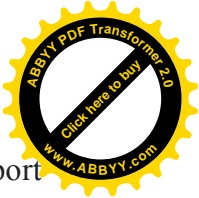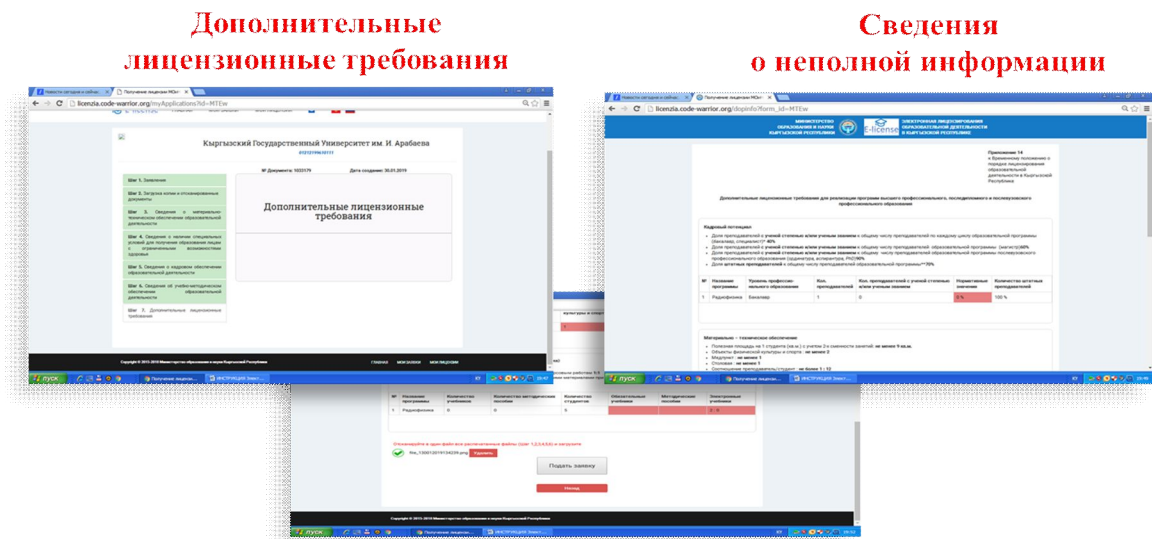Figure: 10. Information on staffing of educational activities

At the next stage, information about the educational and methodological support of educational activities is loaded (Fig. 11).
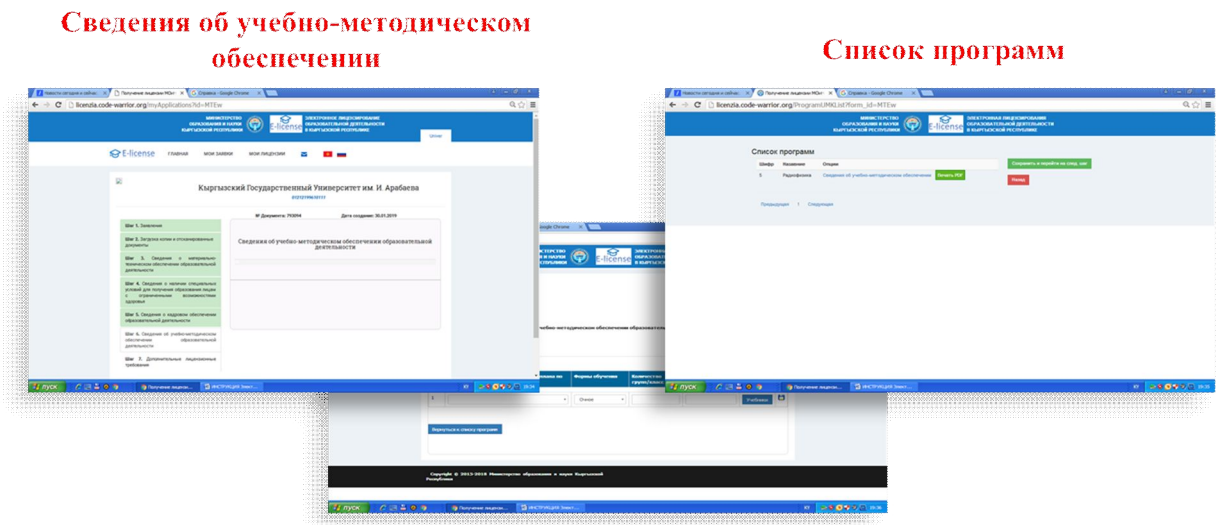


Figure: 11. Downloading information about educational and methodological support of educational activities

And at the final stage, additional licensing requirements are loaded (Fig. 12).



Figure: 12. Downloading information about educational and methodological support of educational activities

The electronic licensing IS analyzes the submitted documents, checks their completeness and delivers the data to the specialists of the Ministry of Education and Science of Kyrgyz Republic to issue a license for educational activities (Fig. 13).
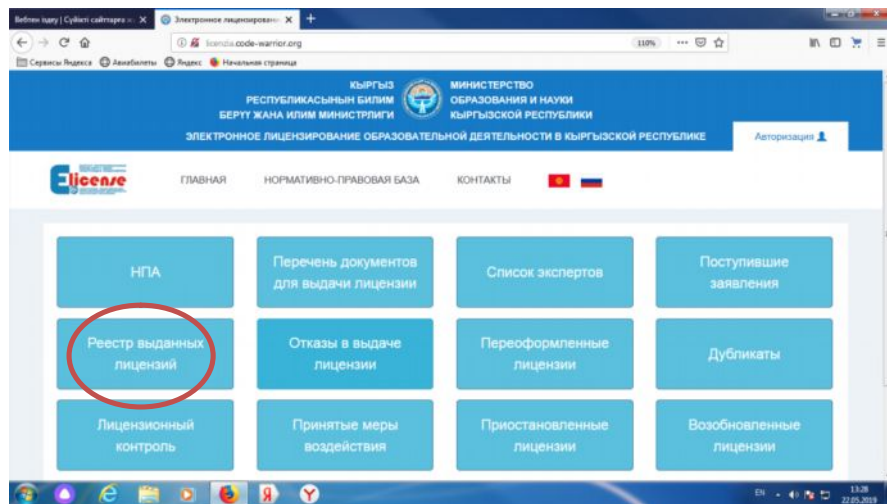
Figure: 13. IP Electronic Licensing Home Page

The developed information systems are integral parts of the unified integrated environment of the Ministry of Education and Science of Kyrgyz Republic.

**Results**

As a result of the research, models of electronic licensing of educational institutions of Kyrgyz Republic interacting with the integrated environment of the Ministry of Education and Science of the Kyrgyz Republic were proposed and created based on the technology of optimizing structural components with an analysis of the quality of their functioning. A database model and algorithms for managing and processing data have been developed, reflecting the features of managing the activities of educational institutions. Software systems for electronic licensing have been developed and tested under the conditions of using the proposed integrated data processing environment.

The developed new models and methods make it possible to improve the level and quality of management through the widespread introduction of modern technologies using an integrated data processing environment.

LITERATURE

1. On amendments and additions to the Resolution of the Government of Kyrgyz Republic "On licensing of certain types of activities" dated July 23, 2014 No. 412

2. Stanek U. R. Microsoft SQL Server 2005. Administrator's Guide / Per. from English - M .: Publishing house "Russian Edition", 2008. - 544 p .: ill.

3. Ukuev, B.T. Research and analysis of complex software data processing systems [Text] / B.T. Ukuev // Problems of Automation and Control. - Bishkek, 2013. - No. 2. - S. 59-64.

4. B.T. Ukuev M.M. Cherikbaev M.M. Shadiev M.E. Aralbaev Problems and tasks of developing a system of electronic licensing of educational activities [Text] // Bulletin of KGUSTA. - Bishkek, 2018 .-- 2 (60). - S. 69-75.

5. A.S. № 44. Database "Electronic licensing of educational institutions" [Text] / B.T. Ukuev, M.T. Japarov, T.T. Karimbaev, M.M. Cherikbaev, M.E. Aralbaev, M.M.Shadiev 2018; - 2 p.