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# ЎЗМУ ХАБАРЛАРИ

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*Аниқ фанлар  
йўналиши*

*Точные  
науки*

*Exact  
sciences*



ВЕСТНИК НУУ<sub>3</sub> ✪ АСТА NUU<sub>2</sub>

# ЎЗМУ ХАБАРЛАРИ

## ВЕСТНИК НУУЗ

### АСТА NUUZ

МИРЗО УЛУҒБЕК НОМИДАГИ ЎЗБЕКИСТОН МИЛЛИЙ  
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CONTENTS  
СОДЕРЖАНИЕ

Xursanov Sh. Ya. $A(z)$ -garmonik funksiyalar .....	5
Aloev R. D., Khudayberganov M. U. Using an a priori estimate for constructing difference schemes for quasi-linear hyperbolic systems .....	9
Aripov M., Mukimov A. An asymptotic solution radially symmetric self-similar solution of nonlinear parabolic equation with source in the second critical exponent case .....	21
Bobokhujaev K. U., Zaynabiddinov S. Electron exchange between impurity centers of tin in PbS and PbSe .....	30
Elov B. B., Primova M. H. Using BPMN methodology in business processes of SMART LMS .....	36
Haydarov F. H. Positive fixed points of Lyapunov integral operators and Gibbs measures .....	45
Абдуллаев О. Х., Хужакулов Ж. Р. Об одной обратной задаче для параболического уравнения дробного порядка .....	50
Абдурасулов К. К., Халкулова Х. А. Разрешимые алгебры Лейбница с пятимерным квази-филиформным нильрадикалом максимальной длины .....	58
Азизов А. Н., Чилин В. И. Мультипликативные вложения симметричных пространств .....	67
Азимов А. Н., Алибеков А. С., Базарбаев Н. Н., Кубаев С. Ш., Махмудов С. К., Муминов И. Т., Муминов Т. М., Раимулов А. А., Солиев Т. И., Холбаев И., Худайбердиев А. Т., Эшкobilов Ш. Х. Радиоактивность остатков древних металлургических производств Сувликуля .....	74
Аликулов Т. Н. Дробные степени дифференциального оператора Шредингера с сингулярным коэффициентом и теоремы вложения .....	80
Алимов Г. Р., Махмудов С. К., Усманов Р. Р., Руми Р. Ф., Холбаев И., Эшкobilов Ш. Х. Освоение технологии сборки фотоэлектрических модулей на основе аморфного кремния на базе НИИ Прикладной физики НУУз и ОАО «Композит» .....	88
Аминов Б. Р. 2-Локальные изометрии гильбертовых пространств .....	94
Балтаева У. И. Краевые задачи для нагруженного уравнения третьего порядка с параболо-гиперболическим оператором .....	99
Буваев К. Т., Сайдаматов Э. М. Об условиях равномерной сходимости спектральных разложений, отвечающих полигармоническим операторам .....	107
Гайназаров С. М. Численное исследование устойчивости откосов карьера ...	113
Джаббаров Г. Ф. О размерности пространства слабо аддитивных положительно-однородных функционалов .....	120
Жураев Г. У. Криптоанализ многоалфавитных традиционных симметричных криптосистем .....	126
Жураев Г. У., Марахимов А. Р. О представлении криптографических преобразований симметричного алгоритмов шифрования в матричном виде для дифференциального анализа .....	133

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## USING BPMN METHODOLOGY IN BUSINESS PROCESSES OF SMART LMS

Elov B. B., Primova M. H. \*

## REZYUME

This article deals with one of the modern methods of modelling business-processes by BPMN model. SMART LMS system's "Administrative Educational Planning" is classified by BPMN methodology in creating models, auditing, working out schedules, defining list of learners and teachers, working out resources, defining and solving resource conflicts.

**Keywords:** BPMN, business processes, curriculum, models.

### 1. Introduction.

The full information about the architecture of system SMARTLMS and its own business processes are come in the author's works. In this works system of SMARTLMS are divided to some independent, integrated missions with each other. As this missions it is mentioned that independent complex of organizational, technical, programming and technological supply of business processes. In this article the most important part of Smart LMS system is "Administrative Educational Planning" which is described according to BPMN methodology of business processes.

### 2. "Administrative Educational Planning"

Systemizing administrative educational plan is used for adapting some of educational models, which are put into practice in the single base of resource Each educational model has its own content and form. **Administrative educational plan** is composed for deadline which is indicated with diagram of educational process (**admins of educational plan** - the document of beginning and ending dates of periods). In this system some members of staff are active such as a **director a dispatcher, a central dispatcher and others.**

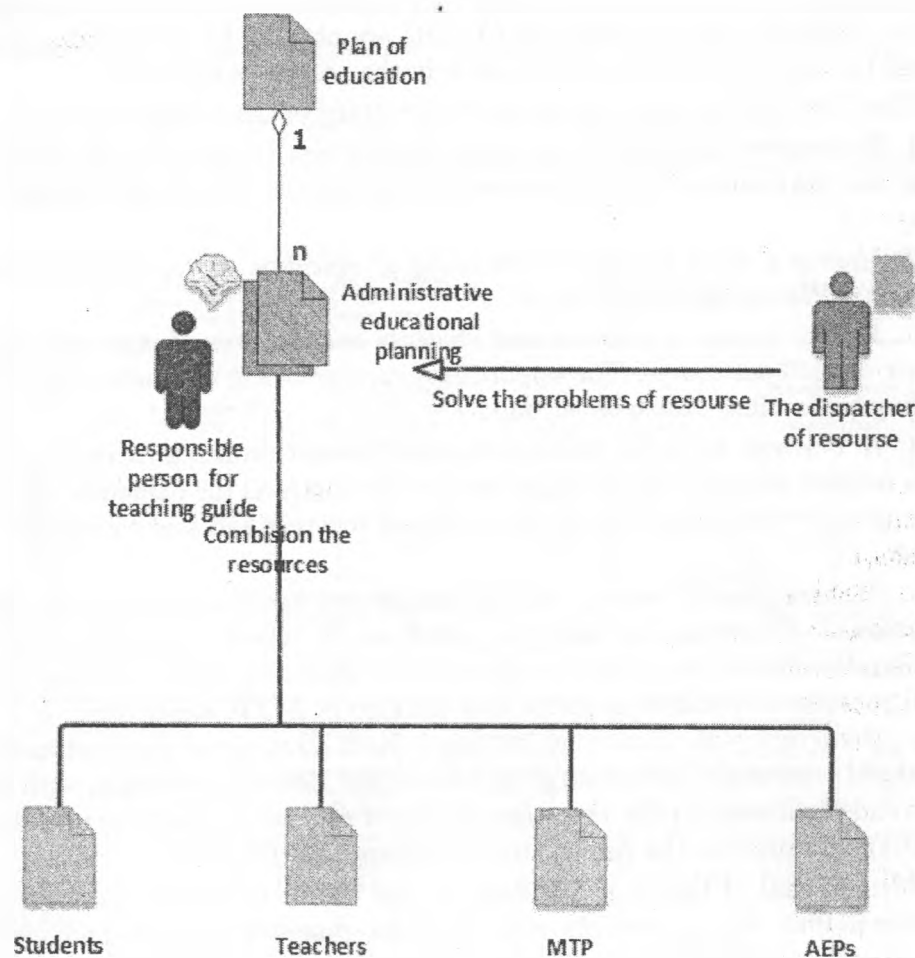
Responsible member of staff the director is composed to each educational model. More than one models might be composed to this member when collision occurs among different educational modules, the dispatcher of the system is busy with solving these problems.

Admins educational plan contains this list of *educational plan models, professor-teachers who teach this module students and the list of required material technic resources* (the 1-picture).

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Picture 1. The trendy scheme of AEP

The zone of education which is the part of the educational plan, is formed according to the trend of influence in students with educational process and organized materials of Educational

The information about the zone of education is needed to supply with course collections which are exchanged with each other in zone and implementing choice of course collections.

Course collections are the supportive educational unities of the model of education

**Admins Education Planning** requires to following parameters of course collections:

- *Description of educational systematic component*
- *The count of training*
- *The count of offered scores*
- *Owner of department module*

The count of offered scores is needed to account scores which are separated for that filled course collections in the model of education.

The other parameters are needed to directors of departments who complete course collections with Education Plan Modules

In this system, during the particular time to collect the models of education, teachers and students, material - technic resources (MTR) are planned for determining parameters which are used to support the model of education in the process of education.

The following business process are implemented in this category:

1. *To structure timetable for the model of education. To determine studies and days without studies, also the mount of training courses in a day and the time of these training courses during the day.*

2. *Making a mark the list of the model of education for operating in Administrative Educational Planning for each model*

3. *Making groups of teachers and students and resource of material - technic resources for each educational course. The opportunity of conducting of educational model is checked according to the time - table of this model.*

4. *To organize agreeable Administrative Educational Planning in a faculty. To end clashes between students and professor teachers. In this level the demands which are dealt with the resources of educational models are collected together and sent to central dispatcher once a month*

5. *To share general resource of High Educational Establishments among Administrative Educational Planning of different faculties. To check proportionality of unities of Administrative Educational Planning for example, according to the schedule in a month. Also, Normal particles of teachers, students and the kind of MTR are checked. In addition, in this system general orders of educational meeting in High Educational Establishments are designed. Educational processes of Administrative Educational Planning are begun with creating its own graphic and confirming. In the next stage, the list of educational planning modules is determined for putting into practice the Administrative Educational Planning.*

**Educational Planning Module** is the most important part in Administrative Educational Plan and it contacts with students, professor teachers and material - technic resources with each other. After determining educational planning modules, students, professor teachers and material - technic resources are shared in parallel ways.

Organizing process of Administrative Educational Planning is divided into two business process: project and forming. The goal of project business process is to determine the sums of modules which are implemented in this Administrative Educational Planning. The goal of forming business process is to combine students and professor teachers with educational planning modules.

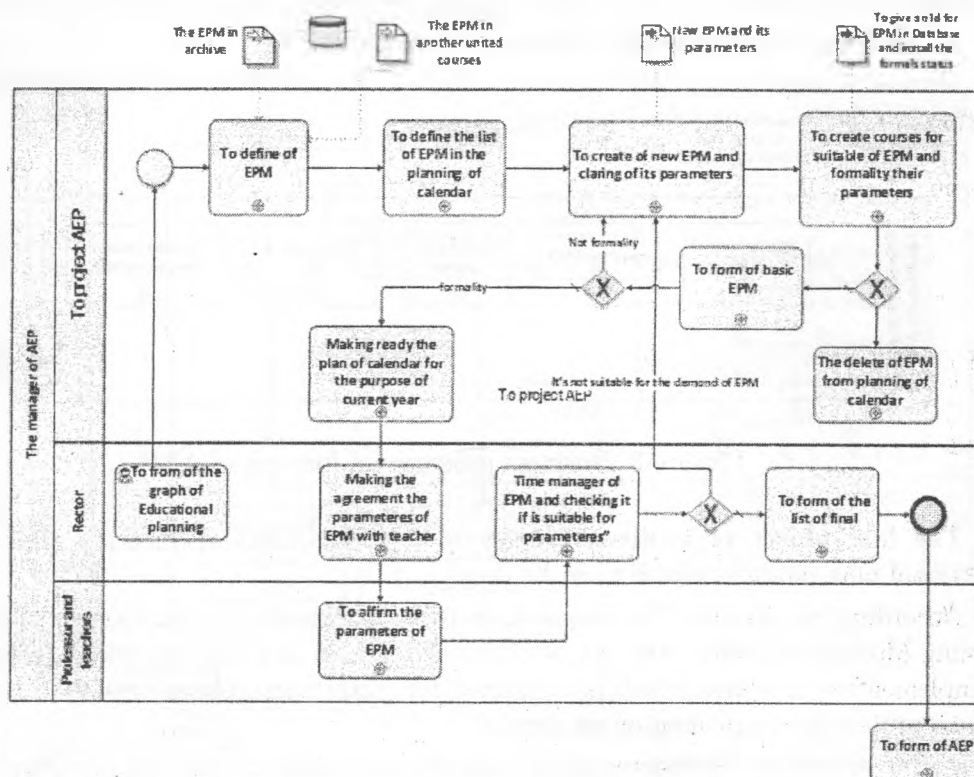
### **3. To design Administrative Educational Planning.**

After having been formed the graph of educational process by one who is responsible for educational model, does the following demands for Educational Planning Module (the 2-picture)

- *To show course collections which must be filled*
- *The date of presentation of the first variation of filled course collections*
- *The date of presentation of the latest variation of filled course collections*

Owners of **Education Planning Module** fill course collected with the modules of educational plan according to the demands which are mentioned above. It is possible to use **Education Planning Modules** which are in the other educational modules for filing course collections.

- The followings go parallel with other for the modules which are filling course collections
  - All parameters of module are renewed or formalized (if the module does not exist, it should be created)
  - The opportunity of providing teachers are checked for doing module
- The opportunity of providing with all needed material - technic resources are checked by sending query to services with infrastructure



Picture 2. Business processes of the project of AEP

If filled course collections are not presented the owner of the model, the one who is responsible for educational module might make a design from one of the followings:

- Delete course collections from current AEP
- Exchange course collections to another empty collection. In this case business process is repeated to fill educational process with the modules comparing with the latest one. After demands which are put presentation of course collections are cancelled, primary list of educational plan modules which must be done are considered to be ready, and the first step of designing AEP - the process of determining modules are finished

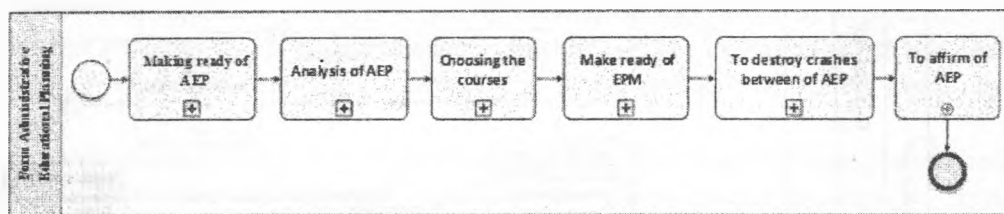
If selecting business - process of course collections are considered by students in educational module, after the first step of design AEP the students choose them. The result of choice some of course might be removed from current AEP.

When *Educational Planning Module* comes across to failure, the owner of Educational Planning Module changes the module of educational plan or choose another complex of modules

which is satisfying current demand. Then the owners of Educational Planning Module give course collections to one who is responsible for educational module. One who is responsible for educational module which fill course collections how much they are suitable for time norms and parameters. If they are suitable, the modules are considered to be ready and at the next step the scores are counted for administrative planning according to the modules. If the modules are not suitable for the demands, they are given back to the owner of the module. If the modules are not proportional they are given to the owner to review and then they are checked again so, designing on business - process of **Administrative Educational Planning** is finished.

#### 4. To form Administrative Educational Planning

General scheme of business process of forming Administrative Educational Planning are described in the following (the 3-picture)



Picture 3. Business processes of forming of AEP

The first object of business process of forming Admin Education Planning is the educational plan modules which must be done.

According to this list the responsible person demands to the owners of Educational Planning Module to prepare the list of professor teachers and also material - technic resource for implementing modules which are planned for infrastructural services then three parallel business process are implemented as parallel

1. *The person who is responsible for educational module divided requirements according to the modules*
2. *The head of department choose professor teachers and contact them with each other in order to implement modules*
3. *Infrastructural services run the ordered works according to the preparation of material - technic resources for educational module.*

If the minimum amount of students is not combined with module, the responsible person might make one of the following decisions:

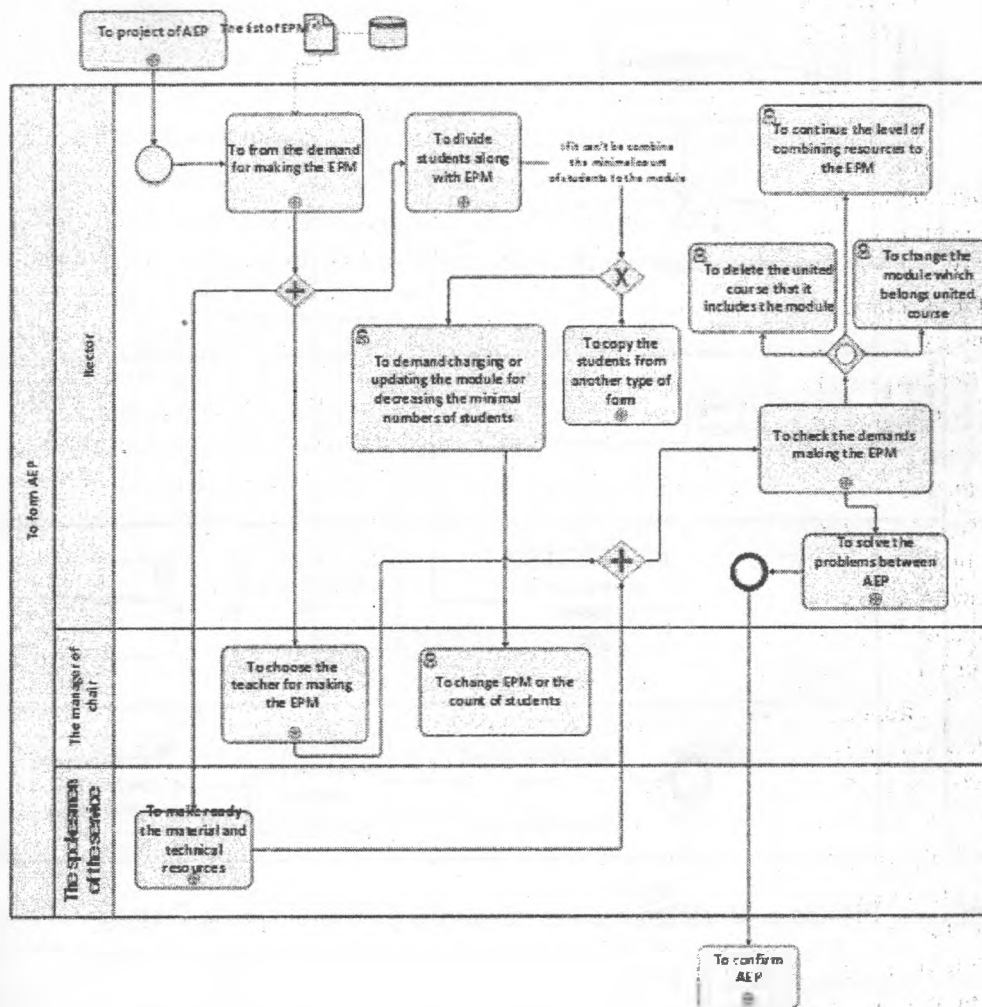
- *Demanding from the head of department to change or exchange modules for decreasing minimum amount of students*
- *To transfer the students who are not more than minimums amount of students on another collection to the given course collections. (the courses collections must be transferred to another education zone).*

When the second and the third terms are not implemented the responsible person in education zone might make one of the following decisions:

- *To continue combining stage of resource with educational plan module*



- To delete the whole course collections which include the current module
- To change module in current course collection



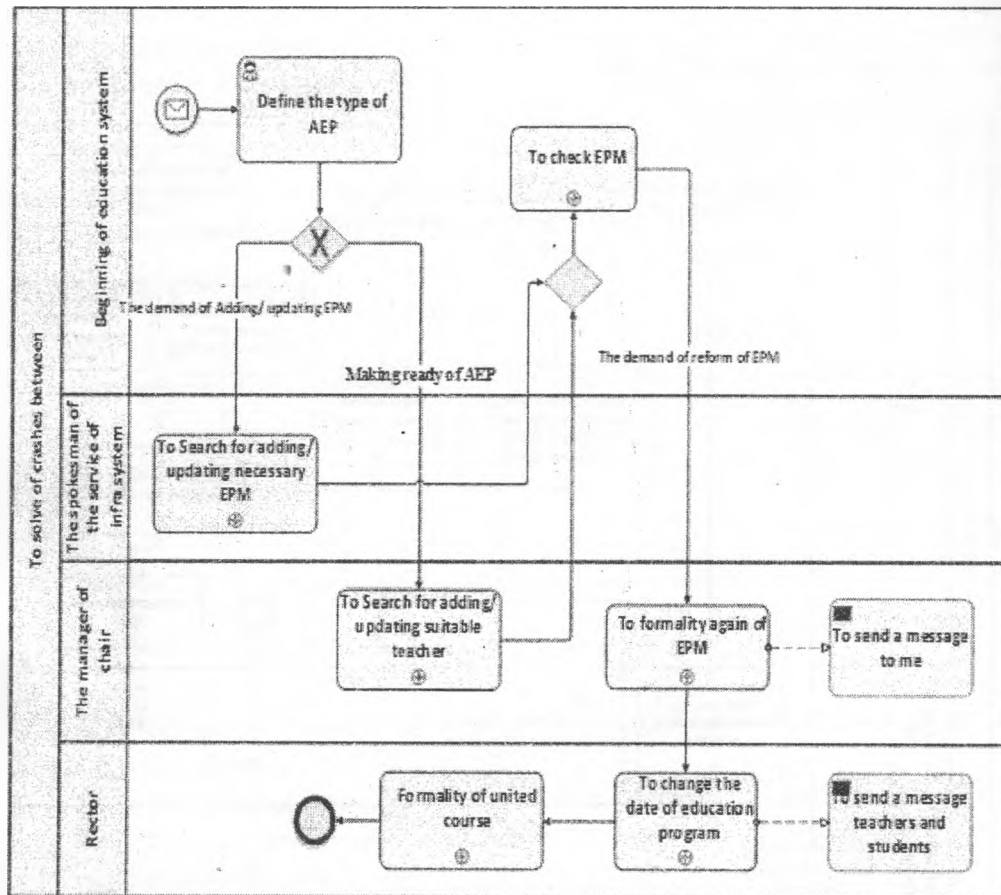
Picture 4. Business processes of forming of AEP

After having been finished these business process the stage of creation **Admins Educational Planning** is considered to be finished

Created **Administrative Educational Planning** is sent to the manager of educational department to confirm. When collision occurs between another ready **Administrative Educational Planning** (both confirm and not confirmed), the manager of educational department solves these collisions with changing confirmed **Administrative Educational Planning**. The last **Administrative Educational Planning** which is given to confirm is changed **lastly** Confirms might be as followings:

- Increasing of normal tasks in auditory
- Increasing of normal tasks professor teachers

Collections are analyzed in the followings (the 5-picture)



Picture 5. Business process of solving problems between AEPs

Before beginning planned period of educational processes , the manager of educational department confirm Admins Educational Planning in the planned time then, any changes are not inserted to its structure except the following

- *Exchanging professor teachers*
- *Joining separating students according to the conduction ability of educational plan of module.*

After having been confirmed “Administrative Educational Planning”, their educational plans are published for students and professor teachers. It is important to point that, even all necessary business processes which are needed to create “Administrative Educational Planning” are done the time that is limited to the date of confirmation is spent for the connection of “Administrative Education Planning”.

The following functions are implemented in “Administrative Educational Planning”:

1. “Search for educational course in order to implement in Admin Education Planning”
2. “To create educational course”

3. "To transfer educational courses to Admin Education Planning"
4. "To change parameters of educational courses in Admin Education Planning"
5. "To audit educational courses"
6. "To formalize educational courses again"
7. "To write priorities of educational courses"
8. "To create plans of educational courses"
9. "Determine list of students and teachers in AEP study courses"
10. "Determine recourse requirements in AEP study courses"
11. "Forming accomplishment calendar of AEP study course"
12. "Determine collision of recourses and eliminate in education program"

### Conclusion

One of the main components of SMART LMS information system, which is produced by NUU professor-teachers is "administrative education planning" undersystem. In this undersystem, models of business-processes such as, creating study courses, audit, developing the calendar, determine the list of students and teachers, recourse requirements, recourses conflicts and elimination are described with the help of methodological tools of the modern BPMN. This models are the most significant for developers of software of information system's (LMS) education process management.

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### REZYUME

Maqolada biznes-jarayonlarni modellashtirishning zamonaviy usullaridan biri hisoblangan BPMN orqali modellashtirish keltiriladi. SMART LMS tizimning "ma'muriy o'quv rejalashtirish" tizim ostidagi o'quv kurslarini yaratish, audit qilish, taqvimlarini ishlab chiqish, ta'lim oluvchilar va o'qituvchi ro'yhatini aniqlash, resurs talablarini ishlab chiqish, resurs nizolarini aniqlash va bartaraf qilish kabi biznes-jarayonlar modellari BPMN metodologiyasi vositalari yordamida tavsiflab berilgan.

**Kalit so'zlar:** BPMN, biznes-jarayonlar, ta'lim dasturi, model.

### РЕЗЮМЕ.

В данной статье презентуется моделирование через BPMN, которое считается одним из современных методов моделирования бизнес-процессов. Также в статье показаны такие модели бизнес-процессов SMART LMS, как создание учебных курсов, аудит, разработка календарей, определение списка студентов и преподавателей, разработка требований ресурса, определение конфликтов ресурса и их устранение, которые осуществляются подсистемой «административно-учебное планирование».

**Ключевые слова:** BPMN, бизнес-процессы, учебная программа, модель.