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CRM SYSTEM FOR ONLINE LEARNING

Abstract: The service for registering users for additional professional education courses at SPbPU is described. The appearance of such a service greatly simplified the registration of users and is a step in the development of a CRM system for online learning.

Key words: additional professional education, advanced training courses, online training, professional retraining, registration service, CRM.

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Introduction

This work continues the cycle of works [1-2] on the development of the SPbPU IT infrastructure on the way to the third generation university [3].

SPbPU is one of the leaders in the field of additional professional education (APE) both in terms of the number of students in the APE programs and the number of APE courses [4]. APE courses can be both advanced training courses and professional retraining courses, and students of these courses can be both students (SPbPU or other universities) and employees (SPbPU or other institutions). In order to enroll in a course, you must first write and submit a declaration. For convenience, this declaration is first filled out online, the received declaration is printed and signed, and then it is submitted offline (if necessary with other paper documents). The problem is the huge variety of course enrollment templates. Depending on the category of the course (regular advanced training, professional retraining, mobility course, etc.), on the category of the student (student or employee with higher education - if this is a student, then from SPbPU or not, if this is an employee, then from which organization), on the structure that

conducts the course (and there are APE courses at 12 institutes of SPbPU [4]) different data are required to enter them into the declaration, the declaration itself has a different form, and, accordingly, the declaration templates have a different form. The list of courses also changes over time, new courses appear for which you need to create new declaration templates, which leads to code cloning. Currently, there are hundreds (!) of different declaration templates for enrolling in APE courses at SPbPU, which are also located on different SPbPU portals, which is very inconvenient. Another inconvenience is the following - many people take such courses regularly. And accordingly, each time they fill out these declarations from scratch, entering the same data there. Further, one more inconvenience - after the future student fills out a declaration for enrolling in a course, it is necessary to notify the course administrators that a new student has appeared - therefore, administrators received an email about a new registered user for this course. And since there are a lot of course participants, there were also a lot of such letters, which created inconvenience for administrators.

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Accordingly, the idea arose to create a single registration service for all such courses, because it is already becoming difficult to manage the “zoo” of such declaration templates. This service is planned to become part of the developed CRM system for online learning, since there is a fairly large interest in courses from third-party organizations. First, let's look at existing CRM systems that can potentially be used in online learning.

One of the most popular CRM systems in Russia is Bitrix [5]. Despite the large number of well-known pluses, it is worth noting a minus for us - the need to work within the framework of the functionality established by the developers, since the system is closed in terms of customization, so it's not so easy to make some functionality convenient for us. Although there is open source code and the presence of an API, there is very little documentation on the API, and examples are not enough to quickly learn the features of the system. Another drawback is that the system is paid with a monthly subscription (the free version has a reduced functionality). There are some problems with technical support - owners of commercial tariffs can communicate with the technical support team only in online chat, phone support is not available.

Another well-known solution is Microsoft Dynamics 365 [6]. This is a whole ERP system, including a CRM system. Again, despite the large number of well-known pluses, it is worth noting the minuses. Most importantly, Microsoft has currently suspended all new sales of products and services in Russia. Many note the complex interface and heavy customization for themselves, the smallness of integrations, a lot of bugs. The solution is also paid.

The GetCourse platform [7] is a popular integrated solution for online schools. The disadvantages include the high price (with such a number of students at SPbPU, the tariff will be

expensive), complaints about the work of technical support, the complexity of using the service (the fact that the company sells (!) several courses to study its platform says a lot).

“1C: Elektronnoe obuchenie” is a distance learning system implemented on the technological platform “1C: Predpriyatie 8” [8]. For our purposes, it would be necessary to use a bundle of programs “1C: Elektronnoe obuchenie. Korporativnyi universitet” and “1C: Elektronnoe obuchenie. Web-kabinet prepodavatelya i studenta”. The disadvantages include the high price and the fact that in order to use its competitive advantages, the program needs integration with other programs from the “1C: Predpriyatie” platform.

Such CRM systems as BasePlan [9], ListOk CRM [10], Paraplan [11], Go-CRM [12], AppEvent [13], S2 CRM [14], WireCRM [15], and Arnica [16] are paid and, in our opinion, have insufficient functionality for organizing online learning.

Thus, there was a need to create our own CRM system for online learning, and the first step was to create a single registration service.

Registration service

Such a registration service was created and is starting to function on the portal ido.spbstu.ru. It was created using the Laravel framework [17] and the mPDF [18] and DataTables [19] libraries. Consider the main features of the created system.

The registration process is shown in Fig. 1. Since there are many students not from SPbPU in the courses, the system is logged in not from Single Sign-On SPbPU [20], but using a separate account.

All declarations filled in by users are parsed - the training program, user data, personal data for the dean's office, etc. are sorted out.

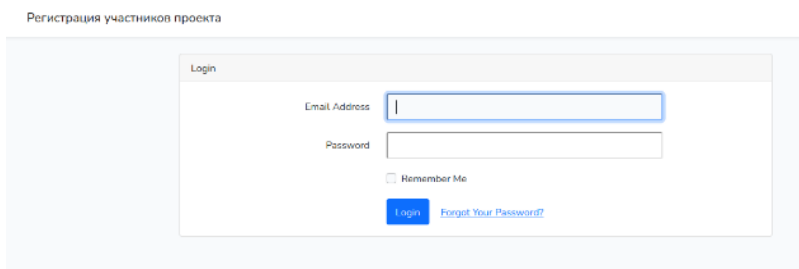


Fig 1. Registration of course participants.

The administrator can view the list of registered users - information about them, upload or delete their declarations - see Fig. 2.

The interface for displaying information about course participants can be configured very flexibly – see Fig. 3. You can select a list of fields to display, it is possible to sort by fields, it is possible to export a list of all or the first filtered records.

All APE programs are divided into 7 groups called Projects, which takes into account the specifics of APE at SPbPU:

- courses related to the “Digital Chairs” project [21];
- courses associated with the mobility module: these are courses that are related to “Educational foresight” or “Career adaptability” [22];

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- courses related to the "GrowUp!" Academy [23];
- courses for heads of educational programs at SPbPU;
- advanced training and professional retraining courses not included in the previous categories.

The project list form is shown in Fig. 4. Note separately the activity button in the list of projects. Each project has an active status - if the project is inactive, then you cannot enroll in the courses of this project, if the project is active, then the course of this project is displayed in the form for recording, from which a record is subsequently obtained in the registration table. For the form, the project has fields that are processed on the server. Fig. 5 shows the project editing form.

The courses themselves in our registration service are called Programs. Fig. 6 shows the form of the list of courses - you can change the list of courses for which an entry is open within the program (project). Fig. 7 shows the course editing form. You can change the name of the course and make the course inactive if the number of registrations for it has already exceeded the allowable limit.

Fig. 8 shows the form of the list of links Project-Course for display within the Project it is possible to

remove a course from the selection list or add a new course. It is possible to flexibly change the composition of courses in the training program for students if the number of registrations exceeds a certain limit.

Conclusion

The service for registering users for APE courses that we created greatly simplifies life for both the administrators of these courses and the users themselves. It is planned to further develop this service - adding the ability for the user to use their digital signature (so that they do not need to print and sign the declaration), adding the functionality of a private office (so that all declarations created and signed by this user are stored in his private office), simplification of filing declarations (loading user data when compiling declarations from the SPbPU database), creation of a unified database of users (combination with existing data in SPbPU and access to archival data), adding various analytics and statistics (section Dashboard in Figures 2-7). As already noted, this is the first step for the planned creation of a CRM system for online learning.

ID	ID ПРОГРАММЫ	ФИО	ДАТА РОЖДЕНИЯ	ЭЛЕКТРОННЫЙ АДРЕС	п/курс	СТАЖ. УЧ.	ДЕЙСТВИЕ
5	1	[REDACTED]	[REDACTED]	[REDACTED]	Основы управления цифровыми проектами		ЗАЯВЛЕНИЕ DELETE
6	1	[REDACTED]	[REDACTED]	[REDACTED]	Архитектор информационных систем		ЗАЯВЛЕНИЕ DELETE
7	1	[REDACTED]	[REDACTED]	[REDACTED]	Основы управления цифровыми проектами		ЗАЯВЛЕНИЕ DELETE
8	1	[REDACTED]	[REDACTED]	[REDACTED]	Основы управления цифровыми проектами		ЗАЯВЛЕНИЕ DELETE
9	1	[REDACTED]	[REDACTED]	[REDACTED]	Разработчик прикладного ПО на языке Python		ЗАЯВЛЕНИЕ DELETE

Fig. 2. Registered users list form.

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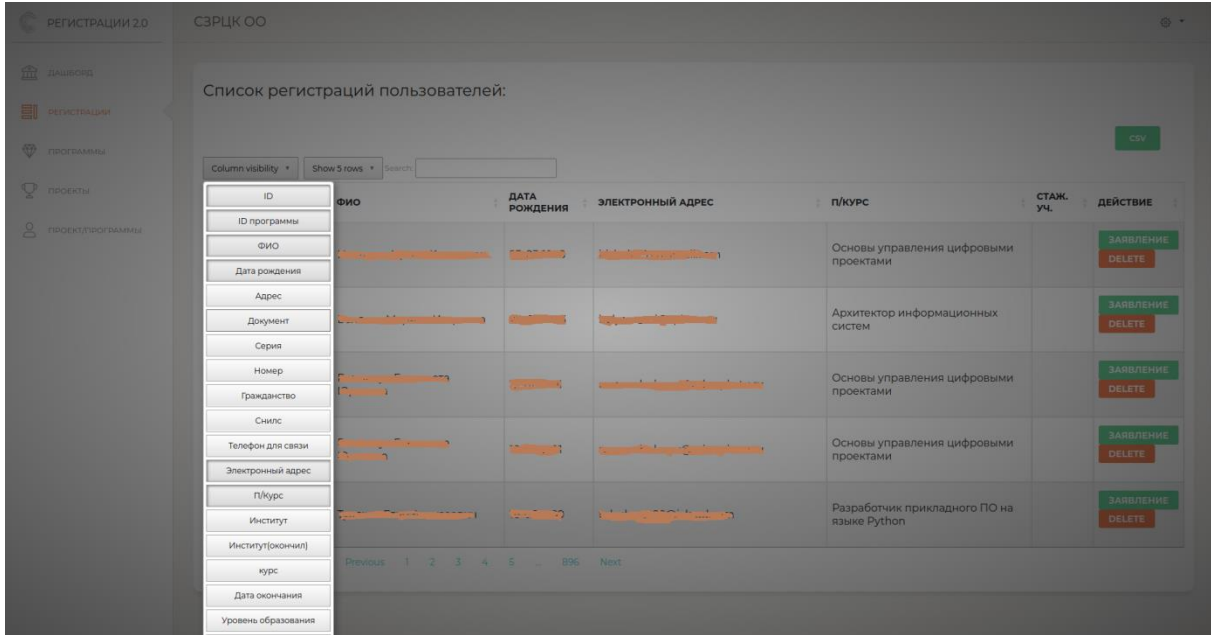


Fig. 3. Ability to customize user list interface.

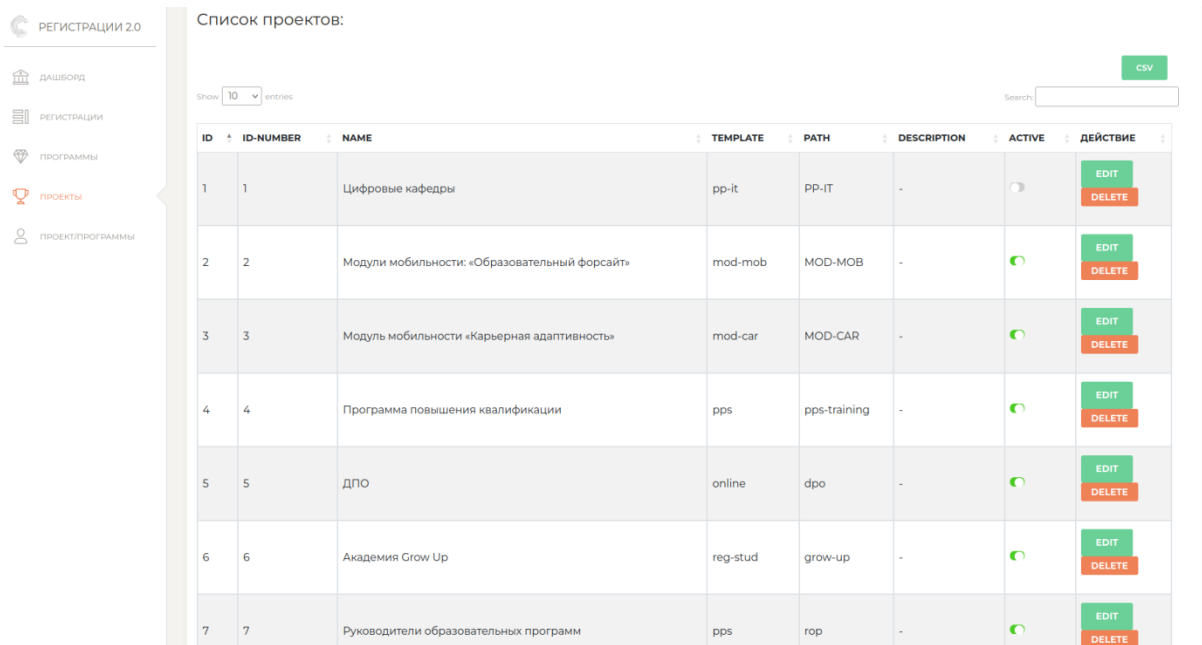


Fig. 4. Project list form.

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РЕГИСТРАЦИИ 2.0 СЗРЦК ОО

Редактировать программу:

id_number: 2

Name: Модули мобильности «Образовательный форсайт»

Path: MOD-MOB

Description: -

template: mod-mob

Active: Активная

EDIT

Fig. 5. Project editing form.

РЕГИСТРАЦИИ 2.0 СЗРЦК ОО

Список программ:

Show 10 entries Search CSV

ID	ID-NUMBER	NAME	DESCRIPTION	ACTIVE	ACTION
1	1	Архитектор информационных систем	-	ON	EDIT DELETE
2	2	Основы управления цифровыми проектами	-	ON	EDIT DELETE
3	3	ИТ-консалтинг	-	ON	EDIT DELETE
4	4	Программирование для ВМ-платформ	-	ON	EDIT DELETE
5	5	Разработчик прикладного ПО на языке Python	-	ON	EDIT DELETE
6	6	Системное и сетевое администрирование Linux	-	ON	EDIT DELETE
7	7	Управление цифровыми продуктами для потребностей бизнеса	-	ON	EDIT DELETE

Fig. 6. Course list form.

РЕГИСТРАЦИИ 2.0 СЗРЦК ОО

Список регистраций пользователей:

id_number: 1

Name: Архитектор информационных систем

Description: -

Active: активная

EDIT

Fig. 7. Course editing form.

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ID	НАЗВАНИЕ	ACTIVE	ACTION
66	Legal Security (правовая безопасность)	<input checked="" type="checkbox"/>	DELETE
67	Гибкие Agile подходы в управлении командой	<input checked="" type="checkbox"/>	DELETE
68	Контент-маркетолог	<input checked="" type="checkbox"/>	DELETE
69	Лидеры молодежи	<input checked="" type="checkbox"/>	DELETE
70	Продакт-менеджер в Digital	<input checked="" type="checkbox"/>	DELETE
76	Таргетолог	<input checked="" type="checkbox"/>	DELETE
72	Фасилитатор в цифровом обществе	<input checked="" type="checkbox"/>	DELETE
73	Цифровое производство и быстрое прототипирование	<input checked="" type="checkbox"/>	DELETE

ID	НАЗВАНИЕ	ACTIVE	ACTION
78	Современные подходы к управлению образовательным процессом	<input checked="" type="checkbox"/>	DELETE

Fig. 8. Form of links Project-Program.

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