The Development of Corporate Information System of Personnel Training in an Organization

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ABSTRACT
The use of information technologies in personnel management is an important part of modern labour relations in any organization. The purpose of the article is to present the algorithm, which makes it possible to develop and implement corporate information systems of personnel training. The article views modern tendencies of formation of personnel training information systems; the specifics of information systems of training, presented in the market, is shown; the factors increasing and decreasing the efficiency of their use as well as the risks of information training systems implementation, are described; the efficiency of corporate information systems of personnel training is justified.

Keywords
Information systems, corporative training, personnel management, e-learning, business model, risks.

1. INTRODUCTION
Market economy fundamentally changed the approach to corporate personnel training. Previously, higher or secondary education of the personnel guaranteed effective and productive activities for the organization. This was partly due to the fact that the rate of emergence of new technologies was relatively low, so the institutions managed to adapt their educational programmes to the real world, although there was always a delay. In addition, on average, the labour was less skilled, and, therefore, did not require such a volume of knowledge as at present. Today, useful knowledge is becoming more important and relevant, because it is aimed at solving specific tasks that employees face in their work. This situation leads to the increase in demand for professionals with such knowledge [1]. A huge advantage and competitive factor for any company is its staff, and the level of the development is determined by the competence of the staff. For the company, it is becoming increasingly important not only to increase the qualifications of its personnel, but also to give them specific knowledge and skills necessary to carry out professional activities in a particular workplace. Training new type personnel for constantly developing companies required new forms of training, one of which is corporate training [2, 3, 4].

More and more organizations view corporate training as the "engine of progress", a tool to increase company value, and, accordingly, training management becomes more strategic and important for the organization's ability to flourish in a dynamic business environment. New forms, models and teaching methods are attracting more and more attention. Staff training is increasingly being tied to long-term business goals, becoming a strategic function of the company [5, 6].

Last year, for the first time during the past few years, budgets of US companies for staff training were increased by 2%. This was not least due to the growing popularity of e-learning programmes. Today, it is an excellent tool for information sharing, training, and most of large companies are planning to introduce more and more advanced types of e-learning [6].

E-learning programs have changed the very structure of corporate learning. First of all, this affected the organization of internal trainings: the model of a corporate university, involving full-time attendance of classes, is gradually replaced by the model of training services, according to which providers organize employee training online at any convenient time [7].

2. PROBLEM STATEMENT
According to the journal Balance Learning and Training, many organizations are trying to reduce the time that employees spend away from the workplace (for example, training time) by 50%. By the beginning of 2008, the training conducted by instructors and coaches accounted for only 30% of the entire training process implemented by these organizations. Last year, for the first time during the past few years, budgets of US companies for staff training were increased by 2%. This was not least due to the growing popularity of e-learning programmes. The final formation of this type of corporate programmes can be called the main process in the corporate training market in the USA lately, according to Bersin & Associates experts. The rapid development of e-learning, which could be observed from 2002, reached its peak [8]. Today, no one raises the question of its effectiveness. Everyone has made sure that the Internet is an excellent means for sharing information, and most large companies plan to introduce more and more advanced types of e-learning [9].

Initially, e-learning programs were positioned as cheaper analogues of conventional courses. Having conquered the market, e-learning programs forever changed the very structure of corporate training. First of all, this affected the organization of internal trainings: the model of a corporate university, involving full-time attendance of classes, is being gradually replaced by the model of training services, according to which providers organize employees training online at any time convenient for them [10].

Another noticeable trend in the corporate learning world is the outsourcing of training services. Nevertheless, it is hardly possible to talk about the widespread introduction of such a variant of corporate training: outsourcing in the full sense of the word is popular only with a relatively small number of companies, while most companies prefer simply to seek the help of consulting agencies and software providers. At the same time, management training systems (LMS), developed by individual order of organizations, are in great demand [7, 11].

The obvious advantage of organizing the entire training process directly in the company is that the programme is very closely integrated into the actual working process, of course, if it is properly organized; you can involve working personnel in training employees in order to analyze practical tasks in detail. The disadvantage of this approach is its high cost and the need for a large administrative resource to

ensure the functioning of this area of the company's activities [12, 13].

The advantage of training outside the company is the high flexibility of this approach in terms of making changes to the programme, because its development and drafting is done by professionals. In addition, it also allows you to start the process from the very beginning fairly quickly, provided that well-established cooperation between the representatives of the enterprise, for which training and the employees of the company of the provider of educational services is organized. The disadvantage is that situation, in which differences may arise between the training process and the real needs of the production cycle is quite possible, and over time these differences will only expand. As a result, employees who have undergone the training process have to spend additional time on adapting to real conditions, which is a direct loss for the company due to downtime [14].

As you can see, each of these options has significant advantages, so the ideal option would be the possibility of their integration in order to increase the efficiency and reduce the cost and the costs of conducting vocational training, retraining and advanced training. That is why recently there has been a rapid growth of products that combine these two approaches [15, 16].

With the emergence and rapid development of IT technologies in recent years, the option of making most of the training online is really possible. Large educational projects appeared, for example, Coursera [17], which made it possible to master any sphere of activity at various levels without leaving home; and they did not stop even at that. By introducing certification of their students, they made a huge step in offline, giving students (applicants) on the one hand, and teachers (employers) on the other, a tool, with which they do not need physical presence of each other in many processes that do not require it. Moreover, many leading universities of the world spread their courses entirely to such sites, giving anyone the opportunity to attend the same programme as the students of Stanford, MIT, Harvard, and so on. Among Russian universities there are also attempts in this direction - Moscow State University, St. Petersburg State University, Moscow Institute of Physics and Technology and others make some of their courses publicly available. The Higher School of Economics is a leader in this direction and over the past few years has made great progress in terms of the quality of its programmes, largely due to its reorientation towards modern technologies [18].

This trend is confirmed by analysts. According to the study of IBISWorld and MarketResearch.com, the global volume of the global online education market for 2018 was $ 52 billion; CAGR (cumulative annual growth rate) is 20% [19].

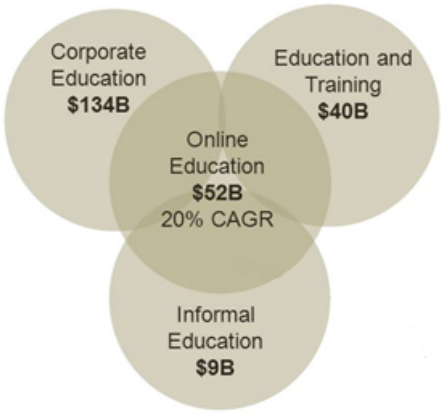

Fig. 1 The results of the study of IBISWorld and MarketResearch.com regarding the size of the Global Online Education Market for 2018.

All this makes it possible to speak about the transition of personnel training processes to information systems; and further development of technologies will only accelerate this process.

3. RESEARCH QUESTIONS

3.1. The Advantages of Information System of Corporate Training

The main advantage of the information system is its autonomy. It is enough to create an automated training system once, fill it with the necessary courses and tests, and the output is a ready-made solution that can be used practically without the participation of service personnel. Courses can be distributed between various regional offices of the company, without the need to allocate staff for each project [20].

It results in another significant advantage: independence from specific people responsible for the personnel training process. It is in the company's interest to prevent a situation, in which a large amount of knowledge belongs to a narrow circle of people (besides the founders), since the departure of any employee from this narrow circle creates a lot of problems (the so-called bus factor), which can lead to the decrease in the productivity of a large number of people; and the departure of all the group can stop the activities of the company in general. Having the information system that contains all the data completely solves this problem, since knowledge is concentrated not only in the minds of people who develop the courses, but also within the system, and a new employee can always continue to develop a course from the point where the previous one stopped. Moreover, such a platform makes it possible to create materials much faster due to parallelization of work, which would be very problematic with the traditional approach to organizing the training process [21, 22].

We should also say about the convenience of using the online platform, and this applies both to those who are engaged in the development of the contents, and to those who use it for training. The staff responsible for developing the courses can create them in a user-friendly interface tailored to their needs, not just using basic tools such as Word and Excel. It is much more pleasant for the person taking a course to interact with interactive content than just to read the text. Moreover, by bringing this platform online, it is possible to use it not only in the workplace, but also at home or on the go with a smartphone.

Another great advantage of the information system is the ability to monitor and analyze the training process. Due to the fact that all the data is stored in the database, it is possible to see the progress of each employee, division or company as a whole at any time. The possibilities of data aggregation are not limited in any way, so you can build a huge number of reports and track various metrics, and all this in real time. This platform also allows you to organize A / B tests effectively, which helps to improve the quality of courses significantly [23].

The online platform can be integrated with other systems, making the training process even closer to real-world tasks. For example, you can set up interaction in such a way that the task manager will not allow the employee to start performing a specific task if the employee has not studied the material on this topic. Another example would be integration with the customer support system, within which the most relevant information on a question from the training platform will be attached to each user request [24].

And finally, the cost of servicing of such a solution is much lower than keeping the staff responsible for training. Of course, in the short term, the cost and time to develop an

online platform is higher, but after a year these investments will give a big return [25].

3.2. Market Analysis for Existing Solutions

So, the benefits of using information systems to train staff in organizations are obvious. Before starting the development of such a platform, it is necessary to analyze the market for existing solutions. After all, if there is already a product that satisfies all the requirements of the organization, then it does not make sense to develop its own product. The results of the analysis are shown in Table 1.

Table 1. Analysis of platforms for personnel training on the market

Name	Axis LMS	Digital-Chalk Corporate LMS	Docebo	Firm-water LMS	Litmos LMS	Mind-flash
Target audience	Small and medium busi-nesses	Large business and training centers	Compa-nies of any size	Trai-ning centers	Large busi-ness	Large busi-ness
Integration with CRM-systems	-	+	+	-	+	+
Support of on-line conferences	-	+	+	-	+	-
The possibility to see analytics in real time and build custom reports	+-	+	+	-	+-	+
Open API	+	+	+	+-	+-	+
Training process gamification	+	-	+	-	+-	-
Flexible access rights system	-	+	+	+-	-	+
No limit on the size of stored files	+	+	+	-	+	+
No limit on the number of platform users	-	-	-	+	-	-
No limit on the number of courses	+	+	+	-	+	+
The possibility to use on company servers	-	-	+-	+	-	-

Note: the data for the table are taken from the websites of the specified companies.

3.3. Business Model Development

Developing an information system for staff training is a long and, therefore, expensive process. So, for the company, it is often not advisable to develop such a product only for its own needs. It will be much more interesting to make a platform that can be sold for use in other companies. Therefore, it is required to choose a business model, within which the platform development will be carried out [26].

Taking into account that this is primarily a web product running in the cloud, the option of selling licenses to use the solution is rejected, since such a model is relevant only for desktop applications. The sale of licenses can be used when the customers want to use the product not as a cloud solution, but on their servers. Then it will be a suitable option, but in the framework of this study this option is not considered.

The next obvious option for the products of this kind is subscription. Users can choose different plans depending on the functionality that they need, and regularly pay for the right of access to the platform for a given number of people. This is very convenient because the cost directly depends on the level of use of the platform by the client. For developers this model is very convenient due to the fact that they can predict the level of their income on the subscription basis with a sufficiently high accuracy, since most of the payments are regular. Therefore, you can choose subscription, but there is another option, that, in our opinion, has a much stronger potential.

We are talking about the marketplace - the platform, in which all the functionality, infrastructure, mechanics of use are provided to one company, and the contents or services are provided by a large number of third-party companies or people. The move towards the creation of marketplaces is an obvious trend in IT projects at present. The most successful companies of recent years are those who simply connected consumers and service providers and made it as convenient and profitable for both parties as possible.

The brightest examples that in a couple of years have become unambiguous market leaders from small startups are Uber and Airbnb. Uber completely changed the market of private and corporate traffic, acting as an intermediary between the passenger and the driver. Airbnb gave any person the opportunity to find a temporary home anywhere he or she wants, simply giving tourists the possibility to find apartments of local residents. Of course, the marketplace is not the only reason for this success. The sharing economy (joint consumption of products or services), another vector of the development of the modern economy, also played a big role. And yet, the main factor was precisely the model of direct interaction between the supplier and the service consumer.

In fact, any SaaS product, which includes an online platform for training and certifying the organization staff, is a kind of sharing economy, since several people use the same resources at the same time, both computing power and functional. So, choosing marketplace as a business model, we get a combination of the most relevant and successful modern trends.

In addition to financial advantages of this solution, the problem with content creation is being solved, making the product much more wide scale. Moreover, you can combine the subscription model and the marketplace model, thereby reducing the cost of using the product for those who use it simply as a tool for creating and storing their courses. Most of the income will be paid as the commission for the purchase of finished courses or the development of courses for a specific company. Thus, even small companies that do not have the resources to develop their courses will be able to take advantage of ready-made solutions, and large companies will be able to develop their own methodology for training and certification, which will be deeply integrated into their business processes.

Of course, marketplace has its drawbacks. The most important is the great complexity of quality control of the created content. In the traditional approach, this problem is solved by hiring highly qualified employees and controlling every step. In the case when the author is a third party, site

administrators usually can see only the final result, and if it is necessary to change it, it takes a lot of time. In addition, it is much more difficult to control the disputes between the client and the supplier as you have to act as an arbitrator. Finally, if you want the marketplace to work properly, it is necessary to get a critical mass of customers and performers, which is often difficult without large marketing budgets. But since the market for corporate online education is not saturated with players who offer a similar approach, this factor should not be very noticeable. The rest is more than compensated by the fact that there is no need to develop the content development yourself, as well as the speed of marketplace scalability.

3.4. The Structure of Information System of Corporate Training

On the assumption of the needs of product users in MVP, it is advisable to include the following modules in the system:

- Interface to create and edit courses.

This is a necessary element, because without it there is no point in this platform. The interface at the first stages may not be very complicated, for example, it will not have some of interactive elements, AJAX requests, but, at the same time, it should allow you to create and edit courses quickly and conveniently using ready-made material in a consistent format.

- Module of testing and certification of employees.

This module can be developed in a simplified form. First of all, this is due to the fact that the period that makes it possible to understand whether it is worth developing the product further or it is unsuccessful is usually 3-6 months; it can be stated that this is the lifetime of the MVP. During this time, no client company will be able to build a normal method of testing and certification of employees inside, therefore this functionality will not be necessary for them within this period. At the same time, some basic testing methods must be implemented, for example, tests for a specific course that check the degree of knowledge of the material.

- System of monitoring and analytics.

This functional should be implemented, since this is one of the main distinctive features of this platform from the existing solutions, but in the first version only the main functions will be implemented, showing the depth of study of courses by the selected employee.

3.5. The Risks of the Development of Corporate Training Information System

Before starting the development of any product, it is necessary to analyze what risks may arise in the process of its implementation, what is the probability of their occurrence and what can be done in order to reduce them.

The main risk of any product is that it solves a non-existent problem. That is, developers (or investors) believe that they create a very useful solution, but in practice it turns out that this it is not and, as a result, there is a product, but it has no users. This is the most common reason for stopping startup life. The solution to this problem is not the development of something fundamentally new, but the improvement of the existing approach to online corporate education platforms that are in consistently high demand. Therefore, the most important thing here is to make a product that will most successfully combine the mechanics already working on the market. In any case, it is always worth starting development with the creation of an MVP (minimum viable product), a product version that fulfills the basic functional requirements, but is far from being perfect. This allows you to check the mechanics and, if necessary, modify it, without spending a lot of resources. MVP is not necessarily the root of the product, the presentation may change over time, but it is MVP that allows you to understand what direction you should follow.

Another, even greater risk is the wrong team responsible for developing the project. The team plays a significant role in the success of any IT project. And the team is not just the sum of all the professional skills of its participants, but first of all their ability to interact with each other. It is very important that each team member clearly understands his role and the area of responsibility and this is basically the task of the product manager.

When developing a marketplace, another big risk arises - the selection of partners who will be responsible for creating a content, i.e. courses, methods, training programmes, tests, etc. Even if you make the most convenient tool in the world, but do not fill it with useful data, then there will be no value in it. In the framework of MVP, it is not necessary to cover the full range of educational programmes; therefore, a company can limit itself to those partners with whom cooperation has already been established in the framework of current activities.

3.6. The Efficiency of the Development and Implementation of Corporate Training Information System

The social efficiency of the development of information system for training the organization personnel is realized in the possibility of achieving positive and excluding socially negative changes in the organization.

Positive changes include the following changes:

- The increase of the level of skills of the personnel;
- Understanding of the area of responsibility of each employee;
- The development of strong sides of the employees;
- Favorable socio-psychological climate.

The main social effect is the improvement of the socio-psychological climate in the enterprise team. This will undoubtedly have a positive effect on the labour productivity and the level of quality [27].

The assessment of the social efficiency based on the results of the development of an information system for training and certification of the organization personnel can be carried out by means of a sociological survey with the use of the questionnaire method.

We can assess the economic efficiency with the help of the analysis of the factors that directly affect the effectiveness of the personnel management in connection with the development of the information system of the personnel training, such as:

- The improvement of the use of the personnel;
- The increase of the performance of the management personnel on the account of faster training, retraining and advances training;
- The increase of the level of professionalism of the employees;
- The decrease of the staff turnover;
- The increase of the corporate culture.

It is difficult to carry out a material assessment of the above factors separately, taking into account the peculiarities of the personnel training system, namely its “intangibility” and long-term results.

4. CONCLUSION

Summing up the study it can be noted that the introduction of the automated system in corporate training provides the

increase in the efficiency of the personnel work and the company as a whole due to such factors as:

- flexibility and scalability,
- lower service cost in comparison with the traditional approach,
- great opportunities for personnel analytics,
- optimization of training programmes for each employee.

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