«EleSy» Company Corporate Training System

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In the context of the transition to the two-level system of higher education, Russian IT-companies come up against the problem of personnel deficiency in engineeringsphere. To solve the problem of specialist training, adaptation and further development, EleSy Company has introduced a corporate training system. The system is aimed to provide an effective educational process which can be easily combined with daily job responsibilities.

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In recent years, engineering companies have come up against severe shortage of qualified engineers who are the core assets of an enterprise. Most of the experience specialists, as a rule, have outdated knowledge or they do not need to look for a job, while young specialists, graduates of Higher Technical Institutions, are not enough qualified for engineering work and require additional training which may take a long period of time.

Furthermore, companies are in need of the specialists who can be rapidly involved in the technological process with minimum time and financial expenditures required for additional training. This need is determined by the drive to achieve effective work performance. On the one hand, not every manager will task a lead engineer with training a young specialist instead of working on an urgent project as it consequently leads to additional time and financial expenditures. On the other hand, not every company will agree to recruit a new employee «as a reserve» to be involved in future projects and train him from the ground up.

Due to the transition to the two-level system of higher education, which comprises Bachelor's and Master's programs, the graduates with Specialist Diplomas faded away with no alternative being proposed. Neither universities, nor enterprises turned out to be ready for such changes. Today, the crisis in engineering education can confidently be stated.

Conversely, such situation, as well as any drastic changes, has triggered universities and enterprises tocooperate in searching solution of the problem encountered. Even now, a number of universities work within the «Triple Helix» concept which comprises three cooperative elements: business, education, and authorities. Besides, almost all Higher Technical Establishments provide now a variety of different programs for the most promising students, while enterprises in its turn respond to their wishes, for example, by giving money for new laboratory

equipment. Also, there is a trend for universities to engage engineering companies' specialists into the learning process.

However, everything discussed is under changes and it is still to be normalized and experimentally proved.

Besides, the question of employee additional training is still acute for engineering companies. All the existing programs might effectively reduce graduates' employment adaptation period but it could not be enough for modern engineering companies, especially for those in such fast developing industries as automation, IT, information systems and etc. The employees of these companies must be constantly going through additional training and courses.

Thus, it is obvious that an engineering company must develop its own corporate training system appropriate in engineering specialist education.

The present article discusses the corporate training system intended for training engineers, which has been developed by «EleSy» Company.

Actually, the corporate training system comprises a number of programs, technologies, joint projects with universities aimed at continuing assurance of knowledge sustenance and company's competence development

in accordance with the set strategic objectives.

1. Specialist Adaptation Program (Induction Training)

Induction training is given to new employees during the first three months after their employment in order to reduce an adaptation period and provide them with the information required to begin productive and meaningful work independently. The induction training is followed by an exam. After an employee has successfully passed the exam, he is allowed to work independently (except for the employees who are in charge of in-situ monitoring project sites). During the first business trip, the employees who are authorized to install the systems in customer's project sites must be accompanied by an experienced engineer. After this, a new employee is allowed to work independently.

Induction training comprises three main parts: technical, managerial, and humanitarian. The technical part implies the study of system development bases and standard projects, applied devices and program software, as well as training classes in development, installation, connection, adjustment and interworking of system elements. The instructors of technical disciplines are

the leading specialists. The main purpose of such education is to acquaint future employees with the experts who they can call for assistance.

Technical knowledge and skills are the basic requirements but they alone are not enough. The successful completion of a project is largely dependent on the accuracy and efficiency of the selected procedure for enterprise technology processes. Therefore, induction training must also cover the following aspects: technological standards, regulations and specification, organizational-administrative documentation of an enterprise, organization structure and its personnel, the policies and interaction rules that are in place, and standards for system development and implementation.

Communicational skills are also very essential for an engineer who aspires to communicate effectively with colleagues, customers, suppliers, and supervisors. When working at the customer's project site, engineers, being representatives of their company, must not only show good technical skills and qualification, but also create a more positive company image through their non-verbal behavior, appearance, corporate culture and communicational skills. As an engineering system is implemented and maintained by stages, an engineer has to visit the project site repeatedly, and it is not always one and the same person. A customer can form an opinion on an engineering company based on how its specialists answer the questions about company's activity, history, achievements and failures. To answer these questions effectively, an engineer should prepare the answers which will show solidarity, commonality, and vision of success shared by all company personnel. The bases of corporate culture must be acquired through the humanitarian part of the induction training [1].

2. Competence Development and Sustenance Programs and Technologies

Specialist Orientation Program is the basis for employee further educa-

tion. Competence development and sustenance programs have been developed to enable employees to progress in their profession and to study the peculiarities and fine points of system development and implementation. The programs constitute an important part of the existing education system. It is these programs which allow employees to convert their competences into the experience, as well as to acquire new knowledge and skills which will help them to stay relevant over the whole working period.

A. Cross Training

The main concept of cross training is to ask an employee to do a different and rather small part of organization's work. For example, an employee can be asked to perform a comparative analysis of similar devices produced by different manufacturers or specify a definite failure diagnostic technique. Besides, there is a time limit given to an employee to complete the task. It allows him to spend no more than 10-20 % per working day.

As soon as the task is completed, the seminar where the employee can present the results is arranged. As a rule, the personnel of the same department or sometimes even other departments should attend such seminars to get new skills and to improve the workflow between the departments.

The fact that either the employee who is making a presentation or other attendees can combine such training with their daily job responsibilities is one of the main benefits. Moreover, it is far easier to arrange such kind of seminar than to organize durable educational programs. Cross training has proved to be an effective technology as even from the psychological point of view, it is more interesting to catch a short break from work and learn something new and useful than to be involved in a long off-the-job educational process. Above all, it is easier to remember things in small parts.

B. Mentoring Program

The leaders within the organization are assigned to serve as mentors

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to new employees who have already completed induction training. The main mentor's tasks are as follows:

- provide further education and development of an employee in accordance with an individual program;
- offer useful materials required for further self-study;
- assist or provide guidance to a mentee in completing work-related tasks;
- offer support and advise a mentee based on personal knowledge and company's experience;
- assist employee to be prepared for certification procedure.

In concurrence with the supervisor, a mentor is also authorized to give a mentee various tests required for quick check and consolidation of knowledge and skills.

As a rule, a mentor is a successful employee who is supportive of the organization and two positions higher in company's hierarchy. Actually, mentoring is a two-way relationship which is beneficial to both mentee and mentors where the latter increases his self-es-

teem and self-confidence, confirms his professional competence, systemize his knowledge and experience by sharing expertise and helping new employees. Due to such work-related activity, mentors can be easily promoted. Thus, mentoring includes education, career interests and motivation.

C. Training Programs

The above-mentioned technologies can be rather effective for corporate employee training. However, there are some competences and skills which can be trained only on the basis of specially developed educational programs. These programs are usually developed not only by leading specialists of a company, but also by commercial organizations and company top management in order to define a number of competences required to be trained now and the competences which are necessary for successful and sustainable future development of a company regarding its strategic objectives.

These educational programs can include such short-term training forms as attendance of the seminars arranged by equipment and software manufactures, organization of refresher courses for a

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group of employees (for example, in network technologies) and etc.

Besides, the educational programs can also include longstanding off-job training courses which can be arranged on the basis of local universities (for example, 2 times a week for 4 hours and 3 months) or such courses can be held in the company (in this case seminars are provided in evenings by guest experts).

In particular, due to the application of one of the above-mentioned programs, the company improved employees' level of the English language in response to company entry into the international markets.

D. Knowledge Formalization

Besides the educational programs, there is so-called «memory» of a company, which exists in the form of developed standards reflecting basic approaches and technical solutions within an engineering system development and implementation, i.e. what the company focuses on. The standards which have been developed by leading specialists of

the company include not only the concentrated knowledge in system development, but also a number of examples of typical technical solutions, as well as recommendations in finding new ones.

These standards should be occasionally updated alongside with the development of company personnel.

E. Knowledge Management System

Special software platform developed with the assistance of the Cybernetic Center of Tomsk Polytechnic University (TPU) was implemented in the company for knowledge management and systematization. As for now, the company works mainly with the platform part intended to collect and organize knowledge in installation and set-up activities. This kind of knowledge is considered to be unique as it concerns some of the most difficult troubleshooting issues including those problems which may appear under definite launching conditions after all successful test operations. All the collected solutions and procedures are experimentally

proved reviewed by the experts. This knowledge base can assist the engineers in installation and set-up activities when testing and eliminating the system troubles, as well as give system developers the ability to retrieve specific knowledge and use it to increase the quality of developed products.

Thus, the training system which is applied by «EleSy» Company enables company management to fill in the blanks in engineering education, which appeared due to the transition to the two-level system of higher education, as well as to collect, develop and sustain the existing company competences.

The list of company personnel competences (not nearly completed) which are trained by the discussed educational system is given below:

Knowledge
- knowledge of modern systems: structure, functions, subsystems, complete problems, possible vectors of development (addition of subsystems and functions), data hierarchy, technical implementation;
- nomenclature of up-to-date and commercially available equipment and software, review and comparative analysis of different manufactures, experience in working with the most famous ones;
- operating systems;
- technical software documentation and interfaces;
- corporate network (knowledge of building-up principle, hardware and software adjustment);
- communication links and equipment;
- applied programming;
- modeling;
- internet-technologies;
- application of analysis, diagnostics and troubleshooting procedures at any system unit;
- information security;
- ergonomics and design engineering;
- IT- company business processes.

Skills
- design and maintenance documentation development;
- system structure and architecture development;
- system development and configuration;
- system debugging;
- troubleshooting;
- development of technical tasks, conditions and requirements;
- problem description;
- information search;
- teamwork experience;
- analysis experience;
- complex plan development and fulfillment;
- planning the working day;
- self-study experience;
- mentoring experience.

Characteristics
- responsibility;
- adequacy (ability to understand a task);
- focus and result orientation,
- quality approach;
- readiness to learn.

The discussed educational technologies have among other benefits two main advantages – efficiency and motivation.

The formalized list of competences which correspond to the professional level of employees (engineer qualification categories) gives personnel a clear idea of what they should know and learn for professional and career development.

The application of the presented technologies can significantly save the time of the leading specialists as they do not have to stop their work regularly in order to develop or update methodological support in accordance with the drastic changes within the field. The methodological support includes only basic and permanent knowledge which is provided in the induction period.

These types of knowledge are concentrated and fixed in company's standards, knowledge management system base, as well as in the presenta-

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tions made for cross-training seminars. Knowledge and ability evaluation is based on the certification of employee performance appraisal.

3. Cooperation with Universities

In order to reduce graduates' employment adaptation period and provide feedback on the performance of universities, strong partnership has been established between «EleSy» Company and Tomsk Higher Educational Establishments.

Within the frame work of such cooperation, a number of Tomsk universities' laboratories have been equipped with the training sets including the pilot systems developed by the company.

Besides, the Department of Electronic Systems was established in 2007 on the basis of Tomsk State University of Control Systems and Radioelectronics to provide specialist training regarding «EleSy» Company profile.

Also, the leading specialists of the company are involved in group project learning (GPL), i.e. educational technology applied in Tomsk State University of Control Systems and Radioelectronics, as supervisors.

Above all, mention should be made of student internship supervision provided by the company employees.

To reduce graduates' employment adaptation period (now it is possible to say not adaptation, but training), a part of the competences enumerated in this article could be trained within the university educational program, for example, in a form of elective courses or special program which is proceeded by Bachelor's Degree and taught parallel with Master's Degree program. In this case, the students who are planning to work within the engineering field after graduation have a possibility to acquire applicative knowledge and skills at university. This will help graduates to settle down quickly into the job.

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