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PECULIARITIES OF ONBOARDING IN MODERN IT PROJECTS

Abstract. One of the most important factors in the successful development of modern IT companies is an effective and flexible personnel policy that can ensure the continuous recruiting of new employees and introducing them to professional activities. The article examines the issues of professional development of newcomers in modern IT projects, determines the factors of its success and analyzes the essence of the phenomenon of onboarding in the context of its relation to such constructs as "adaptation", "mentoring" and "tutoring". Onboarding is considered, on the one hand, as a phenomenon that reflects the systematic purposeful interaction between a social organization and its new employee, which aims to integrate a new team member with existent working conditions and ensure their productive performance in the shortest possible time, and on the other - as a partnership between an experienced employee (mentor) and a new specialist for the purpose of training, support, and professional development facilitation. The work contains an analysis of specialized software for successful onboarding in the conditions of modern IT projects. It also reveals the results of an empirical study of onboarding in IT projects with the participation of experienced mentors and young professionals, the results of which revealed the main factors of successful adaptation of newcomers to the new conditions of their professional activity: regulation of onboarding and mentoring processes in the project team and IT companies using internal regulatory documents, specialized software, etc.; productive cooperation between the mentor and the novice, which involves the analysis of project documentation, implemented through reflective technologies and aimed at understanding the new employee's expectations and requirements for their professional performance, communication, behavior in the project team; professional competence of the mentor, which is determined by their experience in project activities, deep understanding of the project and processes in it, as well as non-technical skills (communicative, emotional, regulatory, cognitive and metacognitive).

Keywords: onboarding; mentoring; tutoring; IT-industry; success factors.

1. INTRODUCTION

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Over the past few years, the IT sphere in Ukraine has shown stable and continuous growth, increasingly turning into a completely autonomous industry, which has noticeably surpassed many other forms of business in terms of its financial and personnel metrics.

The intensive spreading and popularization of the modern IT industry led to the expansion of its functions into related areas of business, which, in turn, significantly influenced both the organizational structure of IT companies and their specialists' work. At the stage of its inception, IT industry needed completely different approaches to the organization of the workflow, the accent in which was placed more on technical and technological aspects, and the lack of its mass distribution and low profitability in the general scale of world business made it possible in many cases to neglect many organizational issues, such as personnel policy, internal training of personnel, corporate culture and so on. Today the IT industry has already stepped over the threshold of its massive implementation, so the direction of its global development has changed significantly.

In addition to scientific and purely technical areas, as well as the development of innovative software or hardware for the end users, services such as consulting and outsourcing are becoming more and more popular in the modern IT industry. The main essence of these processes is the transfer of individual actions, functions or entire business processes of a particular enterprise to external suppliers in the case when the latter are able to guarantee the necessary parameters of quality and efficiency of implementation with the possibility of transferring specialists or entire teams to the customer's enterprise. The massiveness and technical triviality of this kind of services in the field of IT [1-3] leads to a shift in the development vector of this industry from the specific and technical to the corporate one: for many modern private IT companies the issues of building organizational policy, corporate culture, autonomous training and optimization of business processes are much more relevant from the point of business development and increasing its profitability than updating and modernizing their technological and research facilities.

One of the most important and problematic aspects of the workflow of many modern IT companies, focused primarily on the provision of consulting services and outsourcing of business processes, is personnel issues, namely: recruiting, training, effective personnel management and, in particular, rotation.

The emergence of such accents was facilitated by a number of factors determined directly by the context of services provided and the situation on the labor market itself. On one hand, outsourcing and outstaffing of IT processes, which are among the most popular services of Ukrainian companies, almost always involve long-term management of each specific project for many months and even years, which does not stop after the end of the phase of active development of the initial product and consists in constant support, updating and revision of the created software for the constantly changing needs of the business. During this time, the technical and organizational base of the project is overgrown with a huge number of specific features and nuances, as well as the adopted architectural and organizational decisions that can affect the development process in the future. In such conditions, the departure of a key person from the development team can lead to the loss of important project knowledge gained solely through experience in a specific position, and the performance of a new team member will be significantly lower for a long time until the specialist gains the necessary experience in the context of a specific project.

On the other hand, we should also consider instability and chaos of the modern labor market in the field of IT: salaries, work context, social package and many other factors of attractiveness of current employers in the industry are constantly changing, while foundation of new IT companies opens up even more opportunities for specialists to profitably realize their professional competence. This leads to a constant wave-like rotation and change of

positions for specialists in almost all areas of the IT industry, which, in turn, forces modern employers to constantly take into account the risk of losing key employees at any time.

Thus, the modern IT industry is in constant search of effective methods to minimize the risks associated with the loss of employees, and to optimize the process of introducing new employees into the context of work on a project, their earliest professional adaptation to its requirements. One of the most common methods of introducing a new employee to a project is onboarding.

The concept of onboarding for the IT industry is a common practice, as evidenced by its active use in professional programming communities: one of the most popular resources for specialists in the IT sphere of Ukraine, www.dou.ua, contains more than 1600 documents on the related subject. In addition, the IT services market offers onboarding automation and personnel adaptation pro-grams (such as PeopleForce, SaaS, BoB, etc.).

In the workflow of modern IT companies "onboarding" ("on board" - boarding a ship) is defined as a process facilitating the entry of a new employee (newcomer) into the team, regardless of his/her project position and qualification level. The main goal of onboarding is to optimize and structure the integration process of a new team member, familiarize them with the specifics of organizing activities on a specific project, namely:

- subject area and business industry;
- legal features of working on a project;
- specific technologies or technical and architectural solutions;
- features of the construction of the software development process, work with documentation, reporting;
- features of interaction with representatives of the customer and third parties [4-6].

This process is not standardized and may differ even within different project teams, but its logical structure usually consists of the following stages:

1) determination of the conditions, duration and program of onboarding, as well as the specialists responsible for the process. At this stage, the team leader assesses the available human and technical resources, after which he/she draws up a mentoring program, which implies a compromise between the completeness of the material presented and the impact of labor costs on the mentor's productivity in the context of his/her direct project responsibilities;

2) entry into the project - at this stage the acquaintance with the newcomer takes place, as well as the transfer of basic information about the features of the project in the form of a conversation, lecture or compiled documentation, which allows the newcomer to gain structured knowledge about the technical and process features of their new place of work;

3) work under the supervision of a responsible specialist. After getting acquainted with the structure and features of the project, the newcomer begins to work directly in the project team and implement production tasks, while constantly consulting with a mentor on each stage of their implementation and checking the results of the work before directly demonstrating them to the customer or other team members.

The analysis of scientific and specialized publications devoted to the problem of the entry of new members of the project team (Barker L., Bauer T., Gajda J., Becker K., Bish A., Martin K., Lombardi M., Talya N.B.) indicates the fact that structured and consistent onboarding as a process of purposeful, guided adaptation, provides a return on investment in the hiring process and ensures that new employees reach their full potential [7]. According to [8], 91% of employees were retained, as compared to 30% of employees at organizations without formal onboarding; 62% of employees hired in the last 12 months met first performance milestones on time, as compared to 17% among organizations without formal onboarding; 33% year-to-year improvement in hiring manager satisfaction, as compared to 3% increase among organizations without formal onboarding [8].

Therefore, the development and implementation of onboarding techniques is an important task for IT companies.

As far as modern scientific literature is concerned, the phenomenon of onboarding is not well understood. Specialized publications contain little information about the methodology, existing integrated approaches to planning, building and directly conducting onboarding, which, in turn, leads to insufficient disclosure of its potential, low efficiency and an unpredictable final result.

One of the main factors in implementing the concept of onboarding in a project environment, which is emphasized by both specialized publications and IT practitioners, is the competence of a specialist who organizes and conducts onboarding. It is the lack of pedagogical and mentoring competencies, as well as the low level of development of non-technical skills necessary for this role, primarily reflection, that is the main reason for the low efficiency and unsatisfactory result of the onboarding process (Barker L., Bauer T., MartinK., & Lombardi, M., Talya N.B.), which makes the study of this aspect of the professional activity of programmers an extremely urgent task of the modern IT industry.

Based on this, the purpose of this study is to scientifically substantiate the phenomenon of onboarding in the context of its comparison with such concepts as "adaptation" and "mentoring"; study the features of onboarding on projects of IT companies; highlight the main requirements for the non-technical skills of IT specialists, which have the greatest impact on the success of their onboarding in the conditions of real project activities.

At the same time, for a comprehensive, multifaceted study of the features of onboarding, the research involved a survey among both mentors who conducted onboarding and newcomers to IT projects who were onboarded during the last six months.

In addition, due to the fact that one of the determining mechanisms and basic moderators of professional development, professional activity and thinking of a specialist is reflection [9-12] (A. Karpov, D. Oshanin, V. Shadrikov, G. Shchedrovitsky, etc.), an additional task of the study is to determine the level of actualization of the reflection abilities of IT-companies' specialists as their significant professional quality in the context of onboarding.

Scientific, psychological and pedagogical substantiation of the phenomenon of onboarding, in our opinion, should be carried out in the context of such phenomena as adaptation and mentoring.

As for onboarding in the context of adaptation, it is a process of active interaction between a new specialist and an experienced specialist (as a representative of the existing professional environment) at the stage of the novice entering the new conditions of his/her professional path. This statement is based on the general scientific understanding of adaptation as a complex process of active interaction between man and the environment, the settlement and harmonization of the interaction between the agent of activity and the environment by overcoming inconsistency between them [13, 14], as well as professional adaptation - as a process and result of professional activity, entry into the professional environment, interiorization of its requirements, norms and values, which in its essence is a permanent process lasting the entire professional life of a person due to constant changes in the conditions of his/her activity [13-15].

At the same time, in some modern publications, onboarding is identified as a formalized adaptation of new employees to a new workplace, with specially organized events aimed at a quick and high-quality entry of a new specialist into the professional environment [16].

In our opinion, the process of an IT specialist entering a new project, even if they have a long experience of professional activity, presupposes the passage of the adaptation stage as an obvious natural process that ensures successful work and subsequent professional development. Thus, onboarding is the concept that emphasizes purposeful activity both on the

part of the social organization, in the structure of which a new employee is included, and on the part of the newcomer him/herself, the purpose of which is to integrate a new team member and ensure their productive professional activity in the shortest possible time.

From the position of an experienced specialist who "introduces" a newcomer to new conditions of professional activity, the onboarding process, in our opinion, should be considered in the context of such a psychological and pedagogical phenomenon as mentoring.

Today, mentoring is considered as a process that ensures the professional development of the personnel of many companies, regardless of their size and field of activity. According to scientists, formal and informal mentoring programs are currently being implemented in most foreign universities and organizations. The results of the studies conducted on their feasibility and effectiveness showed that the participants of these programs receive significant positive professional experience in comparison with those who do not [17-18]. Mentoring also helps IT teams increase engagement and retention of their best talent, stay on top of changes in technology and meet expectations of young employees.

The analysis of scientific publications [19-21] showed a significant interest of scientists in the issues of mentoring and its organization, on the one hand, and on the other hand, indicates the variety and diversity of approaches to understanding the essence of this phenomenon. Thus, the phenomenon of mentoring in modern scientific publications is interpreted as:

- a model of experience transfer, in which a mentor acts as a guide and advisor, creates conditions for the development, growth and maintenance of less experienced colleagues: analyzes and evaluates development prospects, assists in setting goals and search for ways to solve them, demonstrates a positive example in the implementation of tasks, controls their implementation, provides emotional and psychological support, performs evaluation, and gives recommendations for further activities [22];

- long-term cooperation and training of a less experienced person by a more experienced person, their support and encouragement in the direction of potential personal development, improvement of professional qualities, skills, and overall performance [23];
- an effective and popular way of transferring professional knowledge and skills in various fields of activity from a more experienced entrepreneur or specialist (mentor) to a less experienced one [24];
- an educational partnership between two people of different levels of training, experience and potential, with the aim of achieving new understanding and personal growth; creating synergy between two people in a training union [20];
- a special partnership of two people based on activities that are aimed at transferring knowledge and skills, competencies from one employee to another and is based on a common goal and expectations, mutual trust and respect, mutual professional development [25] etc.

It should be noted that for the Ukrainian scientific and pedagogical space, the use of the term "mentoring" as a form of education and professional training of young people by advanced, experienced workers, has been and remains traditional [26].

Considering the above, as well as the specifics of the English translation, some authors [27-28] consciously collate the concept of "mentoring" with "tutorship" and reveal its essence as:

- individual or collective patronage of experienced workers over beginners; the form of professional training and adaptation of young employees in the organization, which provides for the transfer of experience by the mentor and instilling work culture and corporate values [28];
- one of the forms of development of applied professional competencies of a person in the workplace, when an experienced and qualified employee of the organization

transfers to the mentee the knowledge, skills and abilities necessary for effective professional activity [23];

- large, distributed, diverse in types, forms and methods of organization training [29].

Most modern scientists in the field of pedagogy [27] reasonably believe that it is "tutoring" that is a traditional basic phenomenon, which reflects the interaction of two specialists within one organization with the aim of knowledge management: transfer of knowledge, professional skills and culture. And other concepts used in modern management, such as "supervision", "mentoring", "consulting", "coaching", etc. are its various models (forms) [30].

As practice shows, mentoring is realized both in individual and group forms [29]; both formal (official) and informal (unofficial) programs [17]; both internally and remotely [31].

Mentoring usually differs according to four criteria [18]:

- intensity (informal mentoring is more intense, since both parties are internally motivated in the relationship, and the scope of the relationship is unlimited);
- visibility (formal relationships are more noticeable than informal ones, since they are defined, formulated and normatively regulated);
- focus (most of the official programs are oriented and limited by organizational goals, respectively, the main attention is paid to the development of the employee's professional competence, and not to the development of the personality as a whole, as in an informal setting);
- duration (official programs have dates for the beginning and end of interaction, in contrast to them, unofficial mentoring is unlimited in terms of duration, frequency or content of meetings [17].

But regardless of its type and form, mentoring is implemented according to the following main stages, corresponding to the structure of activities, namely: 1) analysis and assessment of the development prospects of the subordinate; 2) setting goals and defining ways to achieve them; 3) development of practical cases; 4) psychological support; 5) acquaintance with various contractors; 6) control of practical activities; 7) assessment of activities and recommendations for further work [18, 24].

According to many researchers [18, 20, 27, 32], the key role in the effectiveness of mentoring is played by the personality of the mentor, who should not only have the necessary knowledge, skills and abilities and know the mechanisms of their transfer to the newcomer, but also possess a certain set of personal qualities. This is due to the fact that the mentor simultaneously acts in three roles: a teacher, who ensures the formation of the necessary professional knowledge, skills and abilities; a leader in the style of "coaching", who provides feedback in assessing the effectiveness of professional activities; the tutor who provides conditions for professional formation and development in the organization, the formation of a career development program for a young specialist [27].

In addition, as the practice of mentoring in the IT sphere shows, there can be not only one mentor (traditional mentoring [18]), but several (group mentoring [18]): for example, one specialist covers technology issues, provides advice and assistance in understanding and using certain tools or practices, and another specialist is an expert on the organization of activities and management in a team [33].

Thus, based on the statements above, onboarding is one of the elements of mentoring (as a long process of professional support of an employee in an organization), which directly actualizes it at the stage of a newcomer entering a specific IT project, which has its own clear time frame and specific features.

Based on mentors' functions, in our opinion, it is possible to differentiate between two types of onboarding, namely:

1) orientational or superficial, involving mainly the provision of project documentation by an experienced specialist and information about activities on the project;

2) deep, which involves the implementation of a set of pedagogical measures aimed at forming the necessary professional knowledge and skills in a new specialist, providing professional support and ensuring professional development based on reflexive technologies. This in-depth onboarding fully reflects all the essential characteristics of this phenomenon; however, it is more demanding in terms of its organization, and presupposes a special training of the mentor for its implementation.

1.1 Software tools for onboarding

The onboarding process itself is mostly an organizational phenomenon, and its success depends primarily on the professional competence of the mentor, their personal qualities and ability to properly structure the material, single out and highlight the most important things, as well as correctly present them to the new team member. Nevertheless, in the modern IT industry a large number of various technical means exist and are actively used to optimize the process of working with project knowledge and direct communication between the mentor and subordinate.

Globally, the entire area of project knowledge to be transferred to a new employee during onboarding can be divided into three components - organizational and technical processes, as well as technical artifacts (program code, configuration scripts, etc.). Accordingly, the software tools considered below are primarily aimed at:

1. Description and schematization of project processes, including both organizational (sequence and algorithms for conducting releases, meetings and rituals of iterative development models) and technically oriented (continuous integration/continuous delivery, working with a repository, phases of testing, automated test run sequences, etc.)

2. Optimization of the process of familiarizing a new employee with the program code and other technical artifacts, the logic of their construction and organization.

In the context of describing and documenting design processes, the main factors of efficiency that make a positive impact on onboarding are the following:

1. Visualization and schematization of these processes, giving the possibility to structure large amounts of information and present them in an easily digestible form of diagrams, graphs, block diagrams, algorithms and state-diagrams.

2. Preservation and cataloging of the project documentation described above, organization of easy access to it and effective search, as well as the provision of mechanisms to control its modification and support.

To solve the first task described above, the developers of specialized software creation-related tools add special mechanisms to their applications that make it possible to automatically visualize the processes that may occur during work. One example of such tools is the widely used Blue Ocean plugin, developed for one of the most popular tools for building continuous integration/continuous delivery process - Jenkins. This plugin allows users to automatically build a diagram that visualizes the stages of the pipeline (the process of building, deploying and testing the application) and the stages of its execution.

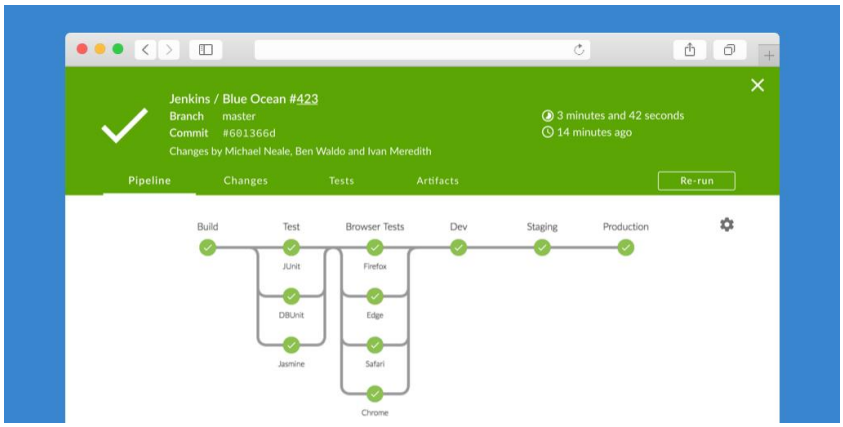

Fig. 1 Jenkins Blue Ocean plugin

In Fig. 1, you can see an illustrative example of the automatic generation of a diagram of the pipeline flow for a specific build, breaking it down into its constituent elements and providing information and the execution status of each of them. This plugin is extremely popular and often used by DevOps engineers in modern development teams. At the same time, it is not mandatory to be used at the design and implementation phases, since it does not provide any significant advantages from the development point of view - nevertheless, the classic presentation of the pipeline passage process in the form of a running line of the server console window is preferable and informative. However, from the point of view of the onboarding process itself, it is an effective way of introducing new employees to the extremely complex and often confusing CI/CD infrastructure of modern projects, while the tool itself requires a minimum time and effort for installation and configuration.

Similar tasks, only at the level of the project code assembly itself, are solved by plugins for project builders. An example is a rather simple in terms of functionality, but extremely important in the context of onboarding the “Gradle task tree” plugin for one of the most popular and flexible tools for building project codebase – Gradle, which provides a large number of branching options for the configuration process, parameterization and assembly of the application, which leads to its extremely confusing logical structure, difficult to trace from numerous configuration files.

Fig. 2. Gradle task tree plugin

The functionality of the plugin is limited to generating a tree of dependencies of the project build stages and then displaying them on the console screen. Like the Blue ocean, this tool does not provide much benefit to the development process and the actual assembly of the application, however, requiring almost no time for installation and configuration, it is

extremely effective in visualizing the logic of the build process and presenting it to a new specialist.

Unlike directly technical processes associated with the use of any software tools, organizational processes (schedule and phases of testing, sequence of access to closed resources, etc.), as well as general project knowledge (composition of teams, a list of addresses and links to local environments, vacation calendar, release schedules), obviously, cannot be generated and visualized "automatically" due to the lack of a technical background in the form of code and scripts, however, they must also be schematized and documented. To facilitate these processes, there are a huge number of both desktop and web applications for building tables, algorithms and diagrams, which also contain additional features, assets and tools optimized for modern software development process.

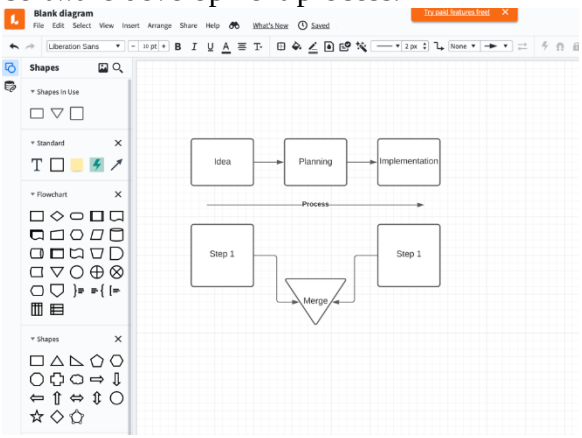

Fig. 3. Lucid chart

One example of a software product designed to visualize both technical and organizational processes is LucidChart web application, which combines the functionality of text and graphic editors, and also has specialized capabilities useful for representatives of the IT industry, such as:

- templates and functionality aimed at creating State and UML diagrams;
- a set of specialized elements that visualize the subjects and processes of cloud computing, databases, elements of the program code etc.;
- ability to style text for the source code with appropriate markup;
- possibility of simultaneous modification of the diagram by several authorized users;
- integration with popular documentation repositories, project management tools and development tools.

One of the most important tasks in the context of creating project documentation and using it for onboarding purposes is its structuring and cataloging: even the most relevant and competently created documentation is not useful in the absence of comfortable access and correctly working search. The need for its deep integration into the workflow and technical infrastructure should also be attributed to the global problems of project documentation management: all team members should be instantly notified of changes in requirements or design received from the customer, and the policy of access to particularly sensitive documents (for example, quarterly financial reports) should be automatically updated and always be in line with personnel changes on the project.

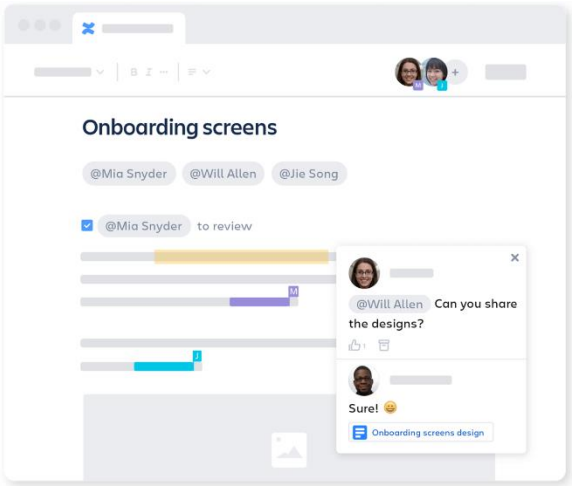

Fig. 4. Atlassian Confluence

One of the most popular and functionally rich applications for organizing the structure and storage of project documentation is Atlassian Confluence. This software product is a repository of design documentation, working as an online encyclopedia with cataloging, cross-references, fast and optimized search with configurable filtering. Users can create new pages, update and delete old ones, as well as create their own personal private storage for local use. The main advantages of this software include:

- intuitive interface stylistically similar to popular graphics and text editors, which makes it easy for new team members to get to know it;
- flexible possibilities in cataloging and building a hierarchical structure of project documentation: page trees, section hierarchy and nesting;
- availability of most specialized standard templates for project documentation and reporting, as well as artifacts for various phases of project development: roadmaps, templates for planning development tasks, test reports, team performance analytics, etc.;
- flexible and customizable search that allows you to find the desired pages both by subject matter or the occurrence of certain words, as well as by the presence of applications, the author's project position or the type of the document itself;
- user management and the ability to restrict access to certain documents / sections or even individual parts of a document;
- integration with versioning systems, Continuous Integration/Delivery, project management systems, which gives the possibility to increase both the coverage of project documentation for a larger number of development processes, and vice versa, to directly increase the scope of its application (for example, add links to documentation directly to the program code, which will allow a new employee to immediately draw parallels between a technical solution and a business problem it solves without the need to restore all links in the chain “requirements-technical documentation - task - program code”);
- extended possibilities for organizing parallel work with a document: versioning and storing the history of changes, the ability to leave comments, links to the author or users of the documentation, parallel editing and modification.

Another extremely important aspect of technical onboarding is organizing the opportunity for specialists to work on one task together, which becomes extremely relevant during the COVID 19 epidemic and the massive transition of modern IT companies to the “work from home” mode: due to the inability to directly approach a colleague, discuss the

solution of a certain technical problem and immediately implement it together at one workstation, modern specialists have to coordinate and organize calls and screen broadcasts in advance, which, of course, takes much more time and negatively affects their performance. Moreover, several IT engineers are not able to work in physically the same technical environment (e.g., PC or local development environment), which deprives the mentor of the opportunity to "come and see what exactly does not work" for a new team member who is not yet familiar with the project infrastructure and is technically unable to correctly describe the problem they are having.

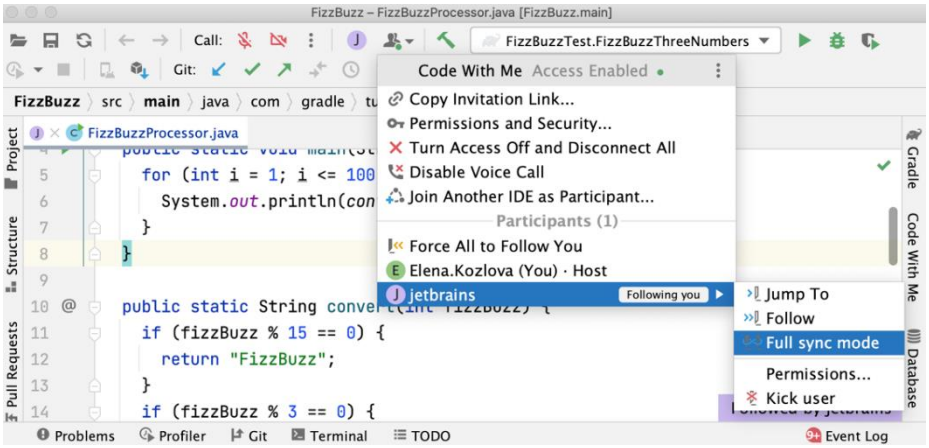

Fig. 5. IntelliJ Idea Code with me plugin

To solve this problem, specialized software products and plug-ins for existing development environments are designed to provide several employees with the opportunity to work in the same environment, see a common screen and be able to simultaneously edit the program code in real time. One of the most successful examples of this concept implementation is the "Code with me" plugin developed by JetBrains for the Intellij Idea - one of the most popular and widely used development environments for the Java family of languages, used in most IT companies.

This plugin allows you to share your locally working project with colleagues and organize an online session for real-time collaboration, code editing, sharing a local server, and starting a debugging session. Features that have an extremely positive impact on the effectiveness of the onboarding process, especially in the context of the COVID-19 pandemic, include:

- built-in support for audio and video communication;
- the ability to create internal comments to project modules, files or even lines of code;
- tracking and visualization of changes made by each participant in the session;
- mentor mode, which allows you to view and compare the states of the local repository of each session participant.

Thus, considering the concept of onboarding as a means of optimizing a company's business processes, aimed at shortening the period of a new employee's adaptation and reaching the expected level of productivity, the use of specialized technical means becomes an extremely desirable factor that will further reduce the onboarding period and enhance its educational effect. Without providing fundamentally new approaches to the problem of transferring knowledge to employees, the technical means described above give the possibility to create a comfortable and effective ecosystem, simplifying and automating as much as possible such key aspects of onboarding as structuring and schematizing information,

organizing access to it and the environment for interaction between a new employee and their project mentor.

2. METHODOLOGY AND METHODS

An empirical study was conducted among Ukrainian specialists in the field of software testing during February-March 2021. Two categories of specialists took part in the study:

- 20 specialists from leading IT companies (EPAM Systems, Plarium, Global Logic), who have experience in onboarding as a mentor, of which 30% are women, 70% are men, aged from 24 to 45 years, with experience in the IT field from 2 to 18 years of different professional levels (Middle - 25%, Senior - 55%, Team Lead - 15%, Technical Lead - 5%). At the same time, the working experience varied: from 2 to 5 projects - 40% of specialists, from 6 to 10 projects - 40%, more than 11 projects - 20%. In addition, 80% of the study participants had their own onboarding experience as a newcomer to the project;

- 20 specialists from leading IT companies (EPAM Systems, Plarium, Global Logic), who have experience in onboarding as newcomers to a project during the last half of the year, of which 20% are women and 80% are men aged from 21 to 28 years old, with work experience in the IT field up to 2 years of professional level Junior. At the same time, the number of projects a specialist has worked on varies: 1 project - 20% of specialists, from 2 to 3 projects – 80%.

The methodology used in this piece of research was a mixed one combining qualitative and quantitative methods. For the statistical analysis of the collected data the "IBM SPSS Statistics 23" was used.

The diagnostic toolset contained a set of techniques, including:

1) the author's questionnaire aimed at identifying the features of onboarding in modern IT companies (on IT projects), factors that ensure the success of onboarding, as well as requirements for the mentor who carries out onboarding.

The questionnaire contains open-ended questions (Have you taken courses / trainings / other training programs on mentoring and resource development? How long did you do onboarding on your last project? What was the qualification level (title) of a colleague who conducted onboarding on your last project? Does your team / company have a described and documented onboarding algorithm? How much time does your team spend on onboarding a new team member? What factors do you think are key to successful onboarding? What factors, in your opinion, can reduce the effectiveness of onboarding? What qualities, in your opinion, should a specialist who conducts onboarding have first of all? What qualities of a specialist, in your opinion, are contraindications to carrying out onboarding?), as well as a scale: the importance of onboarding for the subsequent activities of a specialist on a project; self-assessment by mentors of the level of their own competence in conducting onboarding;

2) Test of reflection of activity (V. Shadrykov, S. Kurginyan), which is a validated method that gives the possibility to determine the degree of individual relevance of partial reflection of activity on three scales: a) information basis of activity - reveals the person’s reflection and conditions of activity that ensure its organization in accordance with the goal and expected results; b) motivation and goal-setting of the activity, which reveals the reflection of the motives and goals of the activity related to its content and expected results; c) decision-making and activities - determines the reflection during the process of identifying the problem situation, hypothesizing and working out judgments about options for its solution.

3. RESULTS

Based on the results of the study, the following data was obtained.

From the point of view of the mentors who conducted onboarding on the project, it is characterized by:

1. The regulation of onboarding in project teams is situational in nature: 50% of the research participants claim that they have regulation of onboarding and mentoring in the form of a certain document, 50% of the participants claim that they do not. At the same time, as for the regulated onboarding time in the current project team, 15% of the mentors answered that there was no set time, 10% - onboarding lasts up to 3 days, 60% - from 1 to 2 weeks, 15% - from 1 to 3 months.

This is consistent with the data [8] that only 37% of organizations have been running a formal onboarding program for more than the last two years.

2. As for the factors of successful onboarding, 60% of the participants from the group of mentors identified the presence of onboarding and mentoring regulations in the project team and in the IT company as the main factor in successful onboarding; 50% indicated face-to-face productive communication between a subordinate and a mentor; 30% - availability of up-to-date project documentation; 25% - positive motivation of a subordinate and a mentor for professional interaction. At the same time, 100% of the mentors identified the qualities of a mentor as the main factor, among which the most significant are the following (in terms of significance): 1 – sociability, friendliness; 2 - tolerance, patience; 3 - calmness, poise, emotional maturity; 4 - extensive experience in the project, deep understanding of the project and the processes in it; 5 - the ability to solve problems; 6 - responsibility; 7 - the ability to interest, motivate. Among the contraindications to onboarding, the specialists named (according to the degree of significance): 1 - emotional imbalance, irritability, aggressiveness, nervousness; 2 - inability to express their thoughts, explain competently and clearly; 3 - overestimated self-esteem, a sense of superiority, self-importance; 4 - lack of communication; 5 - lack of motivation for mentoring; 6 - lack of time for onboarding.

The data obtained is consistent with the results of research in various professional fields. Thus, scholars note such basic qualities of a mentor as: patience, sense of tact, mastery of communication techniques, responsibility, dedication, responsiveness, high self-organization [34-37]; emotional maturity, tolerance, ability to listen, share, care, encourage and accept mistakes [32, 35, 38-39].

Some scholars [32] additionally focus on such personal aspects of the mentor as:

- age: the best mentors are those who are at the peak of their careers, but not retirees who focus on what they have achieved;
- gender: men are more likely to look for male mentors, and girls - female models of professional implementation;

3. The majority of mentors rated their own level of competence in conducting onboarding at the average (40%) and sufficient (40%) levels, 20% of the participants rated it at a high level. And the main factors for increasing the level of competence in conducting onboarding were: participation in special programs and trainings aimed at developing non-technical skills (80%); participation in mentoring trainings (70%); familiarization with successful onboarding practices on projects (30%).

4. As for the level of actualization of the performance reflection by mentors as their significant non-technical professional quality in the context of onboarding, the following data were obtained based on the results of the study:

- the general indicator of the performance reflection as a result of the mentors' ability to understand the means and methods of their own work, the causes and consequences of the

successes and failures achieved in it, was revealed at a high level in 10% of the mentors, at an average level - in 45% and at a low level - 45% of the mentors;

- since the performance reflection is of a partial nature and in its various constructs is characterized by different degrees of severity [11], the analysis of the representation of reflection at different stages of the professional activity of experienced mentors was of research interest.

Thus, the reflection on the informational basis of activity, its motivation and goal-setting, as well as decision-making and its implementation, is actualized in the majority of the mentors at the middle level (70%, 90% and 75% of the participants, respectively), while a high level of actualization of reflection was revealed only at the last stage – decision-making and implementation of activities.

The results of the survey indicate that, despite the representation of reflection at different stages of the professional activity of mentor, in general, half of them demonstrate its insufficient level. This, in turn, negatively affects the success of their both specialized professional activities and professional development in general, which also affects the process of mentoring a new employee on a project. The low level of reflection is determined by the specialist's lack of skills necessary to assess the objective and subjective conditions of activity, to identify the motives and goals of activity related to its content and expected results, to identify a problem situation, make assumptions and formulate judgments about the options for its solution [11]. Within the context of the onboarding process, the specialist may find it difficult to analyze the activities of a newcomer to a project, use reflexive mentoring technologies, and, in general, implement deep onboarding.

5. In the context of the technical aspects of onboarding, the majority of the respondents (90%) use specialized software while transferring project knowledge to new team members, namely: tools for schematization and visualization of processes (70%), tools for autogenerating project documentation (50%), catalogs and libraries of project documentation (90%), tools for organizing a parallel work between mentor and mentee (30%) and others.

According to the research, onboarding from the point of view of newcomers to IT projects is characterized by the following features:

1) has no clear regulation: it takes from several days (70%) to 1-2 months (30%);

2) the role of a mentor is carried out by specialists of different professional qualifications - Middle (60%), Senior (20%), Team Lead (20%);

3) depends on such factors as: regulations and the provision of project documentation (80%), professional and personal qualities of mentor (70%), regularity in the presentation of information (40%), creating a comfortable atmosphere on the project, interaction with the whole team (30%);

4) depends on such professional qualities of the mentor as: motivation to conduct onboarding (100%), extensive experience on the project (80%), sociability (80%), the ability to explain clearly, the ability to take the position of a beginner (80%), poise, patience (60%), the level is not lower than Middle (60%), the ability to form a feeling of being needed, belonging (40%), emotional stability (30%);

5) is of great importance for the subsequent activities of the specialist on the project and in the IT company as a whole (the significance was assessed at the maximum level of 100% of the research participants).

The results of the research among the newcomers of IT projects reflect the same characteristic features of onboarding, highlighted by experienced specialists-mentors, which gives a reason to assert their universality (Table 1).

Table 1

Specific features of onboarding in IT projects

Category	Mentors, %				
Newcomers, %	Frequency intervals	> 25%	26 - 50%	51 - 75%	76 -100%
	> 25%	-	-	-	-
	26 - 50%	-	-	-	-
	51 - 75%	-	-	Has no clear regulation, but depends on it	-
	76 -100%	-	-	-	Carried out by experienced professionals of various qualifications, depends on the professional qualities of the mentor, primarily non-technical communicative, emotive and regulatory, cognitive and metacognitive, determines the productivity of a specialist on a project and in an IT company as a whole, requires professional training of mentors

4. CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

The conducted research allows us to formulate the following conclusions.

Despite the fact that onboarding in modern IT companies is one of the topical areas of personnel policy, its regulation on IT projects is situational, non-systematic: there are no established time frames or basic documents that allow assessing its quality (in procedural and effective aspects).

The main factors for the success of onboarding, both in the opinion of experienced IT specialists acting as mentors and new employees of IT projects, are, above all, the following:

- general regulation of onboarding and mentoring on the project team and in the IT company as a whole, which involves the development of internal regulatory documents, the creation of special programs, accounts, etc.;
- productive communication between the mentor and the novice, which includes the analysis of project documentation, is implemented using reflexive technologies and is aimed at the new employee's awareness of the expectations and requirements for his/her professional activities, communication, behavior in the project team;
- the professional competence of the mentor, which includes, on the one hand, the experience of project activities, a deep understanding of the project and the processes in it, and on the other hand, such non-technical skills / qualities, substantiated by us in [40] as: 1) communicative - friendliness, sociability, openness, the ability to take the position of another, tolerance; 2) emotive and regulatory - emotional stability, poise, self-regulation, patience, responsibility; 3) cognitive and meta-regulatory - the ability to formulate your thought and voice it, the ability to solve problems.

One of the determining factors for the success of onboarding, which can be considered as a system-forming one, in our opinion, is the shift of its content from the information-organizational component to the essential, deep one. This, in turn, requires special training of mentors aimed at developing their competence in the implementation of onboarding - its essence, stages, mechanisms (first of all, through the use of reflexive technologies), factors of success as well as technical knowledge and skills in the use of special software; development of their significant non-technical skills / qualities - both communicative, emotive, regulatory, and metacognitive, and first of all - reflection, which determines the success of their activities.

This paper was aimed to reveal the most basic concepts of onboarding as a mechanism for an effective involvement of a specialist into organizational and technical processes of a

typical IT project. However, it should be noted that the continuous growth and development of IT industry dramatically expands the areas of application of information technologies. Therefore, these completely new subject areas of relevant IT projects with their own specific technical and organizational features strongly affect the context and process of onboarding itself. For example, the military industry or governmental projects aimed at working with highly sensitive data require tangible changes to the usual onboarding process, including several rounds of background checks, organization of multi-level access to the data etc. Also, the organization of the process of getting a new specialist acquainted with new working conditions is very dependent on the project position. Aside from the technical specialists, the staff of almost any IT project consists of managers of different levels, business analysts, HR specialists and other non-technical employees who require special approaches to the organization of onboarding process.

Considering the obvious tendencies for further growth and development of the IT industry, we believe the peculiarities of the onboarding process to be an extremely promising and in-demand topic for future research.

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ОСОБЛИВОСТІ ОНБОРДІНГУ В СУЧАСНИХ ІТ-ПРОЄКТАХ

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Анотація. Одним з найбільш значущих факторів успішного розвитку сучасних ІТ-компаній є ефективна та гнучка кадрова політика, що здатна забезпечити неперервну адаптацію нових співробітників до оновлених умов їх професійної діяльності. У статті досліджується проблема професійного розвитку молодих фахівців в умовах сучасних ІТ-проєктів, визначаються фактори їх успішності, а також здійснюється аналіз сутності явища онбордінгу у контексті його взаємовідношення з такими конструктами, як «адаптація», «менторство», «наставництво». Онбордінг розглядається як явище, що, з одного боку, відображає системну взаємодію, цілеспрямовану активність соціальної організації та його нового співробітника, метою якої є інтеграція нового члена команди, забезпечення його продуктивної діяльності в оптимально короткі терміни, а з іншого, - як партнерство між досвідченим співробітником (ментором) та новим фахівцем з метою навчання, підтримки та супроводу останнього, а також їх взаємного професійного розвитку. Здійснюється аналіз спеціалізованих програмних засобів для здійснення успішного онбордінга в умовах сучасних ІТ-проєктов. У статті розкриваються результати здійсненого емпіричного дослідження особливостей онбордінга в ІТ-проєктах за участю досвідчених менторів та молодих фахівців, за результатами якого основними чинниками успішного входження новачків до нових умов професійної діяльності в проєктній команді визначені такі: регламентація онбордінгу та менторства в проєктній команді та ІТ-компанії в цілому завдяки внутрішнім регламентуючим документам, спеціалізованим програмним засобам тощо; продуктивна співпраця ментора та новачка, що передбачає здійснення аналізу проєктної документації, реалізується завдяки рефлексивним технологіям та спрямована на усвідомлення новим співробітником очікувань та вимог до його професійної діяльності, комунікації, поведінки у проєктній команді; професійна компетентність ментора, що визначається його досвідом проєктної діяльності, глибинним розумінням проєкту та процесів у ньому, а також нетехнічними вміннями (комунікативними, емотивними та регулятивними, когнітивними та метакогнітивними).

Ключові слова: адаптація; наставництво; менторство; ІТ-індустрія; фактори успіху.

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