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ФАКУЛЬТЕТ ЕКОНОМІКИ ТА БІЗНЕСУ

СУЧАСНІ ВИКЛИКИ ТА СТАЛИЙ РОЗВИТОК ЕКОНОМІКИ І БІЗНЕСУ

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Сучасні виклики та сталий розвиток економіки і бізнесу: матеріали ІІ Всеукраїнської науково-практичної конференції (Запоріжжя, 11 грудня 2025 р.) / ТДАТУ: ред. кол.: І. В. Колокольчикова, Л. О. Болтянська, Н. В. Кукіна, С. Р. Плотніченко, О. О. Яцух [та ін.]. Запоріжжя: ТДАТУ, 2025. 408 с.

У збірнику представлено матеріали ІІ Всеукраїнської науково-практичної конференції «Сучасні виклики та сталий розвиток економіки і бізнесу» за результатами досліджень із трансформації економічних систем, інноваційного розвитку менеджменту та бізнесу, публічного управління у взаємодії з громадянським суспільством, а також цифрової економіки та технологічних рішень для розвитку бізнесу.

Збірник тез є частиною науково-дослідних тем Таврійського державного агротехнологічного університету імені Дмитра Моторного: «Оцінка ефективності підприємництва та вдосконалення соціально-економічних умов його розвитку в регіоні» (Державний реєстраційний номер 0121U109822); «Соціально-економічні засади забезпечення сталого розвитку регіону» (Державний реєстраційний номер 0121U109917); «Формування ефективної системи менеджменту підприємств регіону» (Державний реєстраційний номер 0121U109915); «Маркетингова стратегія розвитку аграрних підприємств» (Державний реєстраційний номер 0116U002738); «Детермінанти фінансової інклюзії та визначення їх впливу на соціально-економічний розвиток регіону» (Державний реєстраційний номер 0121U110094).

Матеріали призначені для наукових співробітників, викладачів, здобувачів і аспірантів закладів вищої освіти, фахівців та керівників підприємств різних галузей економіки й бізнесу, представників органів публічного управління, а також усіх, хто цікавиться актуальними питаннями сучасних викликів інноваційного розвитку, публічно-приватної взаємодії та цифрової трансформації економіки та бізнесу. Менеджменту та публічного управління.

Відповідальність за зміст наданих матеріалів, точність наведених даних та відповідність принципам академічної доброчесності несуть автори. Матеріали видані в авторській редакції.

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INTEGRATED SKILL-SPRINT MODEL FOR THE COMPANY'S HUMAN CAPITAL DEVELOPMENT

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Introduction. Today, society lives in the era of the fourth industrial revolution, where disruptive technologies – artificial intelligence, the Internet of Things and machine learning – have become integral to business reality. In this paradigm, strategic advantage depends less on capital or technology and more on human capital. The rapid pace of change shortens the life cycle of professional skills to five years, and in IT – to two or three. Traditional approaches based on long-term planning and standardized programs lose relevance, as they are too slow and often lead to outdated training and wasted investments. The key problem for organisations is the growing gap between digital economy requirements and existing corporate development systems [1, 2]. Business needs adaptive specialists with deep expertise and interdisciplinary skills – technical, cognitive, and soft – able to learn quickly, work in cross-functional teams, and solve complex problems. This requires a shift from passive knowledge consumption to active, flexible, and result-oriented learning models.

The study hypothesises that the project approach can effectively accelerate human capital development, systematically reducing competency gaps and delivering measurable results. Skill development is treated as a project with goals, resources, deadlines, and a final product. Flexible methodologies like Agile and Scrum emphasise practical skill application in real tasks, fostering responsibility and initiative.

The aim is to substantiate an integrated project-based model of human capital development, adapted to digital transformation and focused on measurable business outcomes. The study analyses key challenges, compares existing approaches, develops a model combining strategic planning with tactical flexibility, and concludes on its practical significance for modern business.

Literature review. The concept of human capital, fundamental to the modern economy, originates from Theodore Shultz and Gary Becker [3, 4]. Schultz showed that investments in education and health are productive assets, while Becker formalised the idea, proving that employee knowledge, skills and motivation function as capital. Companies investing in training gain long-term advantages through higher productivity and innovation.

In the knowledge economy, human capital becomes a key factor of value creation. The focus shifts from formal education to continuous learning and adaptation, requiring flexible management models [5, 6]. Digital transformation demands a balance of three skill types:

1. Hard skills – technical expertise.

2. Soft skills – social and behavioural competencies (critical thinking, creativity, emotional intelligence, communication, collaboration).

3. Digital skills – literacy in software, cybersecurity, and productivity tools.

Upskilling (deepening competencies) and reskilling (mastering new ones) are vital to closing “competency gaps” [7, 8]. Project management provides a systematic way to achieve goals within limited resources. Traditional methods like PMBOK and PRINCE2 are too slow, so Agile approaches emerged [9, 10]. Scrum and Kanban principles – short cycles, flexibility, focus on results, constant feedback, and cross-functional self-organisation – can be applied to personnel development.

Agile enables rapid adaptation of learning to business needs. Practices already exist: cross-functional teams solve complex problems while acquiring skills “on the fly” [11, 12]; HR departments use Scrum sprints for short programs, e.g., two-week courses on Python, SQL or Power BI, ending with real analytical tasks [13, 14]. Despite such examples, integrated models systematically combining project management with human capital development are still emerging, which defines this study’s relevance.

Results and Discussion.

Comparison of project approaches to the development of human capital.

Approach 1: Waterfall Project. This approach is a linear, sequential model. Each stage of the project – from the analysis of training needs and program development to its implementation and final evaluation – begins only after the previous one has been fully completed. The process is strictly documented, and any changes to the original plan require formal approval and are undesirable.

Edges of the approach:

1. Clear structure and foreplanning, in that all stages, due dates and finances are agreed in advance.

2. Ease of control. The progress can readily be monitored by management against pre-set milestones.

3. Detailed documentation. All steps are documented, making project handover and future analysis easy.

Drawbacks of the approach:

1. Absence of flexibility. The method is not adaptable to a rapidly changing business climate and technology.

2. Extended development term. From identifying a need until employees develop skills, many months will go by.

3. Risk of irrelevance. Once training has been completed, part of the obtained knowledge will be outdated.

Approach 2: Agile (Scrum) Project. It is an iterative and gradual approach based on short, time-boxed cycles called “sprints” (usually 1-4 weeks). Within each sprint, a small team focuses on mastering a specific, highly specialised skill or solving a small practical problem. Constant feedback, adaptation, and team self-organisation have an essential meaning.

Benefits of the approach:

1. High speed and relevance of knowledge. Training is done “just in time” and is immediately applied in practice.

2. Flexibility. The training plan can change from sprint to sprint depending on the project’s and the business’s current needs.

3. High employee involvement. Participants see the immediate result of apply-ing new knowledge, which increases their motivation.

Drawbacks of the approach:

1. Problems in long-term planning. Foreseeing the entire development trajectory for a year beforehand is difficult.

2. Needs high autonomy of teams. A mature corporate culture that trusts teams to make decisions independently is needed.

3. Not always suited for developing essential knowledge that requires consistent and long-term study.

Integrated skill-sprint model for the human capital development.

Awareness of the limitations inherent in classical and flexible approaches in their pure form has necessitated the development of an integrated skill-sprint model. This model was designed to combine the best qualities of both methodologies synergistically: it borrows strategic clarity and predictability from Waterfall for long-term planning and tactical flexibility and speed from Agile for the operational implementation of educational initiatives.

The concept of an integrated model of a project approach to human capital development. The approach’s key idea is to transform corporate training’s view: from a set of disparate events to managing a portfolio of interrelated development projects. In this paradigm, each project aims to form a specific, measurable and demanded business competence.

Within this context, strategic planning, carried out under the guidelines of Waterfall, is utilised to define global priorities and the development plan. All the studies are created to meet the long-term goals of the company. At the same time, tactical implementation, built on the principles of Agile/Scrum, ensures rapid and targeted acquisition of specific competencies through short iterations, allowing the company to respond to current market challenges promptly.

The skill-sprint model stages:

Stage 1: Strategic session (once every six months/year). This foundational stage, typical for Waterfall, is a strategic working session. It involves top management, heads of key business units and HR management. Their task is to identify key "gaps" in competencies that hinder the achievement of strategic goals based on the analysis of business strategy, technological trends and the competitive environment. The result of this session is a "competency backlog" – this is not just a list of skills, but a prioritised and detailed document, where each competency is associated with a specific business goal, which makes the development process transparent and meaningful.

Stage 2: Formation of cross-functional teams. Temporary project teams are created for the highest priority tasks from the backlog. The principle of their for-mation is not formal affiliation with a department, but the presence of motivation and relevant experience in the participants to solve a specific business problem. For example, the team "Mastering predictive analytics in marketing" can include marketers, data analysts, IT specialists and even sales managers. This approach not only provides a comprehensive view of the problem but also destroys internal corporate "wells", contributing to creating a culture of knowledge sharing and cooperation.

Stage 3: skill-sprint cycle (2-4 weeks). It is the operational core of the entire project approach, working according to the dynamic principles of Scrum. Each cycle is a completed mini-project for developing and applying a skill. The cycle includes the following phases:

Phase 1: Sprint Planning. At the beginning of the cycle, the team meets to select one specific task from the overall "competency backlog". They jointly formulate a clear and measurable sprint goal (e.g., "Build and test a prototype customer churn prediction model using Python's Scikit-learn and Pandas libraries in two weeks"). Defining specific deliverables keeps the process focused and manageable.

Phase 2: Implementation. During the sprint, the team is immersed in an intensive learning process, which is a blended learning format: short theoretical micro-modules, practical workshops with internal or external experts, and mentoring support. The key element of this stage is the immediate application of knowledge in practice. The team does not just learn, it works on its fundamental business problem, transforming learning from an abstract process into an applied tool.

Phase 3: Daily Stand-ups. Short (up to 15 minutes) daily meetings synchronise the team and maintain momentum. Participants answer three questions: what was done yesterday, what is planned to be done today, and what obstacles exist. It enables the quick detection and resolution of issues and encourages a feeling of collective responsibility.

Phase 4: Sprint review. At the end of the cycle, the team demonstrates the results to key stakeholders – management and representatives of business units. What is shown is not a presentation, but a working prototype, a finished analysis or a solved problem. Not only is the achieved business result assessed, but also the apparent increase in the competencies of the participants, which makes the value of training visible and tangible.

Phase 5: Retrospective. It is an internal, closed team meeting dedicated to ana-lysing the work and learning process. In a safe environment, participants discuss what went well and what can be improved regarding interaction, tools and learning methods in the next sprint. It is a mechanism for continuous improvement of the educational process itself.

Stage 4: Completion and Transition. After completing one cycle and a successful sprint review, the team can either move on to the next skill-sprint, taking a new, more complex task from the backlog, or, if the global project goal is achieved, the team is disbanded. Its members must return to their permanent departments already as carriers of a new competence, disseminating the acquired knowledge and experience in the company. Thus, the integrated model ensures a continuous and scalable human capital-building process.

Visualisation of the integrated skill-sprint model for the human capital development in the company (Fig. 1).

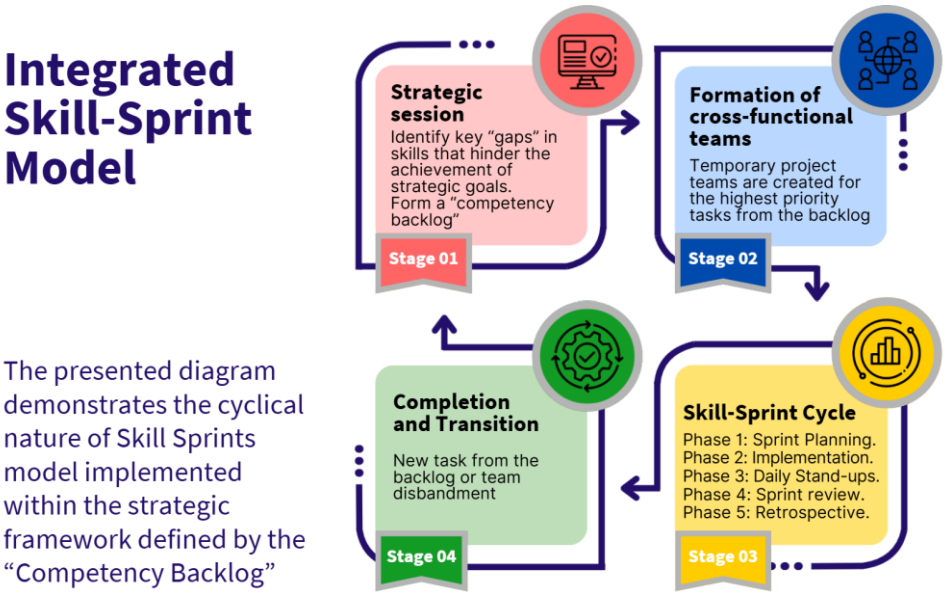

Fig. 1. An integrated skill-sprint model.

To test the viability and practical effectiveness of the proposed integrated skill-sprint model, it was tested within the framework of the activities of a company. The Polyemos company acted as a pilot site, faced with the need for accelerated development of competencies in the field of predictive analytics among marketing department employees to solve the problem of reducing customer churn.

The pilot project was implemented from September to December 2024. The project involved 19 employees. They were trained in the following practical competencies in the field of predictive analytics:

1. Programming in Python and working with its key libraries for data analysis (Pandas and NumPy for processing, cleaning and manipulating data, Scikit-learn for building machine learning models).

2. Data visualisation using libraries (Matplotlib and Seaborn for creating graphs and interactive dashboards).

Thus, the training focused on studying the full cycle of data analytics: from data preparation to building a predictive model and visual presentation of results.

The testing took place in the format of three two-week sprints. The team mastered basic data processing tools during the first sprint and prepared a dataset. They created and tested a basic logistic regression model with 61% accuracy during the second. During the third sprint, the model's accuracy was increased to 72% and an interactive dashboard was created for end users. The results were analysed in three key areas: impact on business indicators, dynamics of competency growth, and efficiency of the process itself (Table 1).

Table 1

Results of the implementation of an integrated skill-sprint model for the development of human capital in the Polyemos Company

Indicators	**Results of the indicator evaluation**
Business Impact	
Reduce customer churn	Churn rate in the target group decreased by 6.2% in the first quarter after implementation
Creating a business tool	During the project, a working prototype of a customer churn forecasting model was developed and implemented
Competency Growth	
Increasing the level of competencies	The average level of predictive analytics competencies among team members increased from an initial 2.5 to 4.2 points on a 5-point scale

Mastering practical skills	Participants demonstrated a strong command of Python and visualisation tools
Process Efficiency	
Participant satisfaction	The overall level of satisfaction with the learning process was 8.7 out of 10, indicating high motivation and involvement.
Speed of getting results	From team formation to receiving a working prototype with measurable business value, it took only 2 months, which is 2-3 times faster compared to traditional approaches

Source: compiled by the author

Testing of the integrated skill-sprint model demonstrated the effectiveness of its application both for the accelerated development of complex digital competencies and for solving current business problems.

Thus, the proposed skill-sprint integrated model is not just a training method, but a comprehensive approach to managing human capital development as a strategic business process. Implementing this model can bring significant benefits to the company, but it is associated with several potential barriers that require a conscious approach to overcoming them.

Conclusions. The study's main conclusion is that digital transformation creates a fundamental gap between the speed of change in competency requirements and the inertia of classic corporate training models. Long, standardised educational programs are losing relevance, giving way to flexible, adaptive and practice-oriented approach-es. The analysis showed that to respond to this challenge, it is necessary to move from considering training as a separate function to its integration into work processes through project activities. The study confirmed the first hypothesis that the project approach can be used for quick and concentrated human capital development under modern conditions. Moreover, it was found that integrated models that combine strategic planning and tactical agility are the most efficient. The proposed integrated skill-sprint model for the human capital development is a direct confirmation of this thesis, demonstrating how it is possible to systematically manage the development of competencies while maintaining high speed and adaptability to the challenges of the digital economy.

The scientific novelty of the work lies in developing an integrated skill-sprint model, which systematically adapts the principles and artifacts of Agile methodologies (sprints, backlog, retrospectives) to solve corporate development problems. Unlike isolated cases of applying flexible approaches, the proposed model is a holistic system that links strategic business goals with operational activities to build competencies. The study's practical significance is that companies can use the proposed model of the project approach as a ready-made framework for creating an adaptive training system. The skill-sprint model provides a specific tool for quickly closing "competency gaps", increasing employee engagement and ensuring a measurable return on investment in human capital.

The presented work opens up several promising areas for further scientific re-search. The most relevant include:

1. Quantitative assessment of the impact of this approach on key financial and operational indicators of the company (productivity, Time-to-Market, innovation activity).

2. Research the possibilities of using artificial intelligence technologies to automate diagnosing competencies, forming a backlog and personalised selection of employee development projects.

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