Таким образом, можно отметить, что по каждому рассмотренному пункту лидирует *CRM*-система *Bitrix*24, предлагающая наиболее тесный контакт с клиентом и доскональное сопровождение каждого этапа продаж. Грамотная организация бизнеса обеспечит слаженную работу каждого сотрудника, сведет количество ошибок, касающихся показателей взаимоотношений с клиентами, к минимуму и облегчит руководству контроль над работой удаленно.

Список использованных источников

1. *Корнеев, И. И.* Информационные технологии в работе с документами / И. И. Корнеев. – М. : Проспект, 2018. – 304 с.

2. *Конобеева, Е. Е.* Инновационные технологии в обслуживании клиентов банков / Е. Е. Конобеева, О. Е. Конобеева // Фундаментальные и прикладные исследования в области экономики и финансов : материалы Междунар. науч.-практ. конф., Орёл, 25 марта 2015 г. / Орловский филиал РАНХиГС ; под общ. ред. О. А. Строевой. – Орёл, 2015. – С. 271–273.

3. *Конобеева, О. Е.* Система стратегического управления экономикой в России и на региональном уровне / О. Е. Конобеева, Е. Е. Конобеева // Вестн. ОрёлГИЭТ. – 2018. – № 1 (43). – С. 102–106.

4. *Конобеева, О. Е.* Применение бизнес-технологий в управлении продажами / О. Е. Конобеева, Е. Е. Конобеева // Вестн. ОрёлГИЭТ. – 2019. – № 2 (48). – С. 83–87.

5. *Макарова, Т. Н.* Современное состояние и драйверы развития электронной торговли / Т. Н. Макарова // Образование и наука без границ: фундаментальные и прикладные исследования. – 2018. – № 8. – С. 105–108.

6. *Плахотникова, М. А.* Информационные технологии в менеджменте / М. А. Плахотникова, Ю. В. Вертакова. – М. : Юрайт, 2017. – 462 с.

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TEACH BUSINESS, NOT ABOUT BUSINESS – THE WAY REALGAME.FI INTRODUCES ITS TECHNOLOGIES FOR SCHOOL OF BUSINESS OF BELARUSIAN STATE UNIVERSITY

Game-based learning or «learning by doing» is a well-proven, cost-efficient and one of the most beneficial ways to gain invaluable knowledge as it simulates real-world problems through activities such as watching live demonstrations, training or pre-graduation practise, etc. Business games or business simulations – the most perspective tool that helps to connect the learning experience with real-life challenges. Such games are specially designed for students, help them learn important business strategies, real-world practices and industry standards. But most importantly, the games aim towards giving participants a little taste of management and how managerial decisions affect the business.

Some concepts of business simulations and their perspective of implementation into the educational process are discussed in the article. The experience of Finnish RealGame usage of by School of Business of BSU is presented.

Keywords: *RealGame.fi, business simulation game, batch-processed system, black-box paradigm, real-time system*

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УЧИТЬ БИЗНЕСУ, А НЕ РАССУЖДАТЬ О БИЗНЕСЕ – ПОДХОД, ПРЕДЛАГАЕМЫЙ REALGAME.FI ДЛЯ ИНСТИТУТА БИЗНЕСА БЕЛОРУССКОГО ГОСУДАРСТВЕННОГО УНИВЕРСИТЕТА

Обучение через игру, или «обучение посредством практической деятельности», – это хорошо зарекомендовавший себя, экономически эффективный и наиболее результативный способ получения ценных знаний, поскольку он моделирует реальные практические ситуации с помощью наблюдения за демонстрацией работы, практического обучения или преддипломной практики и т. д. Деловые игры, или бизнес-симуляции, – наиболее перспективный инструмент, который помогает объединить учебу с решением практических задач. Такие игры, специально разработанные для студентов, помогают им осваивать важные бизнес-стратегии, получать практические навыки и изучать действующие отраслевые стандарты. Но самое главное – игры нацелены на то, чтобы дать участникам возможность максимально наглядно представить особенности процесса управления и понять значение управленческих решений в бизнесе.

В статье обсуждаются некоторые концепции бизнес-симуляций и перспективы их внедрения в образовательный процесс. Представлен опыт использования финской бизнес-симуляции RealGame в Институте бизнеса БГУ.

Ключевые слова: *RealGame.fi, игровая бизнес-симуляция, система пакетной обработки, парадигма черного ящика, система реального времени*

The objective of the study. The objective of this study is the assessment of the feasibility of implementation of business simulation games such as RealGame into the educational process of School of Business of BSU. RealGame was selected to this study because we wanted to get some experience and evaluate functions and environment of a complex simulation game that is not visually as attractive as common entertainment games or some other business simulations with lower functionality compared to RealGame.

Besides, Finland, RealGame's home country, is renowned for its high-quality education and state of the art technological solutions. The Finnish educational system and approach to learning based on trust, accountability and responsibility recognize the importance of empowering students and youth with practical knowledge and skills. They leave room for analytical thinking and problem-solving, for both teachers and learners. Instead of competition and comparison, the Finnish system focuses on support and guidance for learning.

Moreover, RealGame training is based on years of academic research conducted by RealGame Business Training CEO Timo Lainema [8]. The efficiency of RealGame's computer-based learning environment (CBLE) has been proven in the course of the PhD research and documented in various research projects, in which the author was directly involved [7].

The concept of Business Simulation Game. Starting back in the 1970s when the International Simulation and Gaming Association (ISAGA) was created, the construction of generally accepted typology and taxonomy of simulation gaming has continued down to the present. In line with the generally accepted approach, the terms *business game* or *management game*, *business simulation*

or *management simulation*, and *business simulation game* or *management simulation game* can be used interchangeably and there is no well-established difference between these terms. It is also possible to find *tycoon games*, *business sims* and *role-playing games* can be considered to be synonymous with the terms referred to above.

Greenlaw et al. [4, p. 5] determine a business game as a sequential decision-making exercise structure around a model of a business operation, in which participants assume the role of managing the simulated operation. Keys and Wolfe [6] define a management game as a simplified simulated experiential environment that contains enough verisimilitude, or illusion of reality, to include real world-like responses by those participating in the exercise. Other definitions given, for example, by Forrester [3] and Naylor [10] do not differ significantly from the above-mentioned.

In other words, in business simulation games players are given a model of hypothetical invented business and an imaginary environment and make decisions – on products, prices, advertising, research and development, etc. – about how their company should be run and operated. Every participant of the game typically acts as a member of a team of managers. Each team is managing a company allocating economic resources to achieve a particular goal: to increase sales (production, income, liquidity, etc.), to decrease expenses (costs, liabilities, obligations, etc.), to expand the market, etc.

Naylor [10] gives quite a detailed view of the contents, structure, and operating of management games. It is still valid nowadays which makes it interesting to be reproduced here with some modifications.

Business games are built around a hypothetical oligopolistic industry consisting of several (usually three to six) firms or teams. Each firm whose managers or players are the participants of the game allocates a specific amount of resources in the form of cash, inventories, property, plant and equipment, and so forth.

The game proceeds through several series of interactive iterative sessions, steps, operating periods or rounds and at each session, the players make decisions that can concern, e. g., price, output, advertising, marketing, raw material acquisition, changes in plant capacity, and wage rate and will depend not only on the individual conditions but also on the external environment (the market). The latter usually can be changed by the administrator of the game by altering the parameters of the operating conditions of the game. So, in view of the internal situation and within the existing market, the firms find it necessary to react according to the change imposed by the internal situation and external environment.

Based on players inputs, all the data is processed with the help of hardware and software – a set of algorithms that implements mathematical models implemented to the game. Typically, those models are presented by a cohort of behavioural and accounting equations, such as demand and cost functions, cost, revenue and profit functions, depreciation and amortisation calculations, tax payments calculations, salary exemptions calculations, etc. They provide a critical link between the operating results and operating decisions of the individual firms under the current market environment.

With the help of software, the operating results of each firm are generated at the end of each operating period in the form of reports such as profit and loss statements, balance sheets, cash

flow, production and sales reports, etc. Naylor mentions that some of the more sophisticated and more realistic games and RealGame is a notable example, even permit to use multiple products, plants, and marketing areas, stochastic production periods, stochastic demand, labour negotiations, to investment in research and development activities and sale of common stock.

*Classification of Business Simulation Games***.** There is a wide variation in the type of business simulation games. They vary in focus on how to expand a company's share of the market to how to undertake a corporate takeover. So, there are several different approaches to the classifications of business simulation games. For example, they can have an industrial, commercial or financial background [2]. Ju and Wagner [5] differentiated them by natures. The first type of business simulation games can include decision-making tasks. In this type of games, the player withstands harsh environments or hostile opponents. These simulations have a nature of strategy or war games, but usually are very terse in their user interface.

In other types of business simulation games – resource allocation games – the teams or players have to allocate resources to areas such as production, marketing, human resources, etc. in order to produce and sell goods.

But the most complete taxonomies of business simulation games were introduced at the beginning of the 1960s by Greenlaw et al. [4] and later on by Biggs [1]. They classify business simulation games by such dimensions as:

– functional or Total enterprise – whether the game designed to focus specifically on problems of decision-making in one functional area or designed to give participants experience in making decisions at a top executive level and in which decisions from one functional area interact with those made in other business areas;

– competitive or Non-competitive – whether the decisions of teams or players impact upon another party's results or not;

– industry-specific or Generic – whether the game replicates closely the actual specific industry or only general business relationships are replicated in the game, etc.

The genesis of Business Games. The first use of games for education and development was the war game simulations in China in about 3,000 B. C. that was distantly associated with the early 17th-century chess [6]. In European history, war games date back to the mid-nineteenth century and the German Kriegspiel – a war game in which blocks representing armies or other military units are moved about on maps – is the most known. Different war games have also been conducted in Japan and have been long used in Great Britain and the US to test battle strategies before World War II [8, p. 77–78].

Military officers trained with war games in the 1930s and 1940s started the use their experience in managing civilian businesses. Some of the business game evolution can be traced to RAND Corporation (https://www.rand.org/) – an organization formed immediately after World War II to connect military planning with research and development decisions. It separated from the Douglas Aircraft Company and became an independent, non-profit organization in 1948. At the project's beginning, RAND Corporation started with one client – the U. S. Air Force – and in 1955 the corporation created for military specialists the game which simulated the inventory management within its supply system [6].

According to Greenlaw et al. [4], the use of games in business and economics goes back to 1957 when the American Management Association developed The Top Management Decision Simulation, an early «serious game». In this simulation, five teams of players operated firms competing in a hypothetical, one-product industry. Teams made quarterly decisions covering price, production volume, budgets, research and development, advertising, and sales force and could request selected marketing research information. Although the game models idealized and simplified business transactions, specialists recognize it as the first non-military competitive business game [11].

Greenlaw et al. note that the Top Management Decision Simulation induced the design and use of dozens of other games. A prompt growth in the number of business games had been observed in subsequent years. Hundreds of management games have been developed by companies, business associations, educational institutes and research organizations. These management games have been used both for research purposes and for economics, management, finance, accounting, marketing, etc. training.

Nowadays many education institutions have their business simulation games created for educational purpose or use simulations specially created for them in the educational process. The MIT Sloan School of Management – one of the seven super-elite private schools for MBA programs alongside Harvard, Wharton, Chicago Booth, Columbia, Kellogg and Stanford – is a good example of how by creating real-world applications of classroom knowledge, they help students learn their way to the top.

Each business simulation game of the MIT Sloan School of Management offers video user guides and online instructions for students. Registered educators from academic institutions can access video teaching notes and slides that introduce and debrief all aspects of the simulation. Corporate trainers, consultants, and educators from non-academic institutions can access simulations directly from MIT Sloan's simulation partner [9]. In the list of business simulation game of the MIT Sloan, it is possible to find such simulations as:

– cleanStart: Simulating a Clean Energy Startup;

– eclipsing the Competition: The Solar PV Industry Simulation;

– fishbanks: A Renewable Resource Management Simulation, etc. (fig. 1).

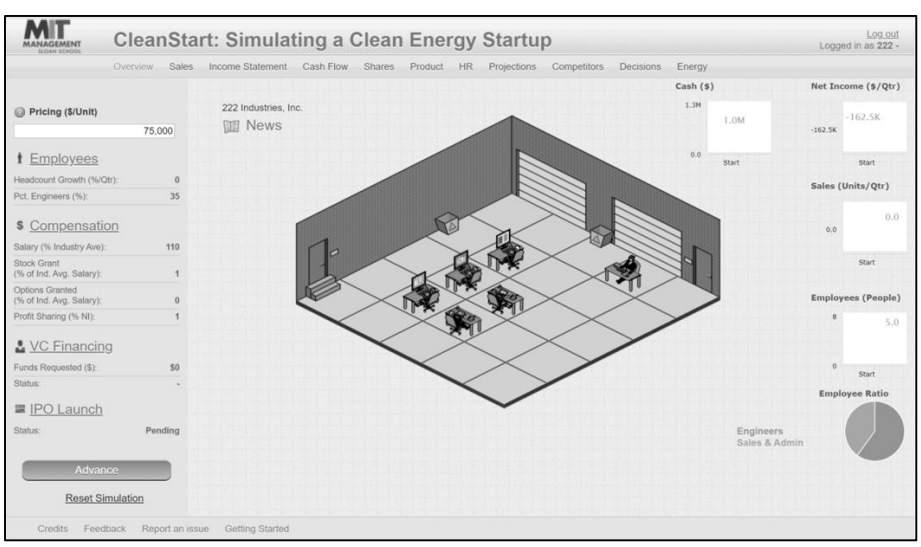

Fig. 1. The interface of CleanStart by MIT Sloan School of Management

Capabilities and functionality of RealGame. The functionalities of RealGame simulation company are almost the same as those in modern Enterprise Resource Planning (ERP) information systems. Thus, RealGame can also be seen as an ERP system, which provides the users with a common process and data model, covering a broad range of processes, such as those found in finance, HR, distribution, manufacturing, service and the supply chain. In RealGame company the player can make decisions on purchasing, manufacturing, sales, marketing, product development, finance and strategy. RealGame is clock-driven and decisions are made continuously as the time passes. As in real-life, the simulation runs 24 hours per day, and there are 7 days in a week. All the weekdays are equal (weekend days are similar to other days). There are 28–31 days per month, as in the real-world calendar.

RealGame simulation company – BioCounter Ltd – is a company manufacturing high tech laboratory equipment for the Nordic, European and the American markets. The company currently has two end-products: Bio counter and Bio counter DLX. A new improved model of the product – Bio counter XL – being under development at present.

There are several companies in the market manufacturing and selling different bio counters which are analogues of Bio counter and Bio counter DLX by BioCounter Ltd. The market is currently very competitive, and it is difficult for any company to gain more market shares.

So, based on this hypothetical case, players or manages of BioCounter Ltd have to increase company profitability and process efficiency, to maintain a steady demand for products and have a balanced product portfolio, etc. To achieve these objectives, players have a wide range of tools to manage the company:

– production – for managing three production lines with three shifts (morning, evening, night), special tools for investments in machine capacity and hiring workers;

– inventory – for real-time current inventory levels manipulation (including tools for tracking the level of raw material deliveries, raw material usage, end-product production, product deliveries);

– offers – for manipulating by offers' terms and conditions;

– delivery terms – for having information on delivery methods;

– delivery orders – for having information on incoming delivery orders from the customers, etc.

The above mentioned and other tools are used for the organization of supply, production, selling, R&D, marketing, HR management, etc. in order to achieve the companies' goals.

RealGame advantages. RealGame differs from the huge majority of business simulation games. The most important difference is the use of the internal clock and comprehensive real-time tools to assess the state of the business processes.

To track the impact of every time-bound transaction based on the decision made by players, such as raw material purchase, transferring the average cost of inventory items to the costs of the manufactured items, hourly output progress, delivery process, etc. the system presents special tools for the user (fig. 2). In other words, RealGame records every transaction that takes place in the business processes, producing realistic transaction-specific data that can be used in performance analysis, if needed. This is a huge difference compared to aggregate-level data in traditional business games. Moreover, the set of reports including financial statements such as balance sheet, profit and loss and cash flow statement is presented in the system. So, it helps not only to understand how the cost of raw materials is allocated to the cost of finished goods but also to understand the organisation of supply chain process of the company and how the cost is transferred to profit or loss.

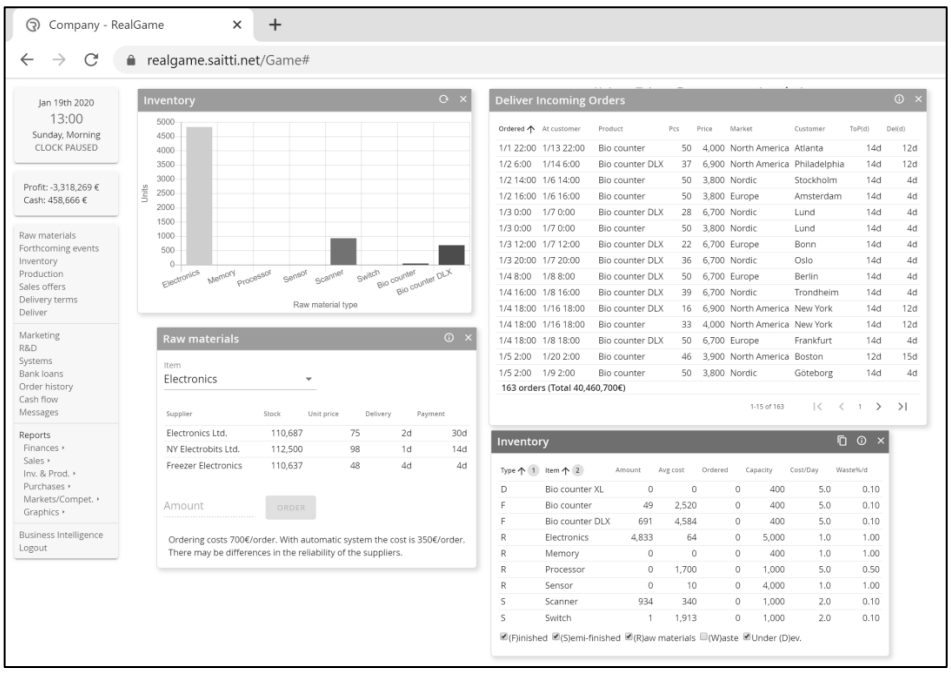

Fig. 2. The interface of RealGame

Thus, unlike the vast majority of the existing business simulation games, RealGame is not a batch-processed system. This means that the player doesn't need to make decisions about economic resources allocation before each session (step, operating period or round), input those decisions every time as a batch into business simulation game and wait for the sending the results of system's processing back to the player. Players can quickly and easily understand what is happening across their company in real-time, to drill down into specific areas of interest and to change the situation during the simulation (not in a very specific moment of the game). RealGame's model allows the players to have direct access to what happens during the simulation process – the simulation is not a black box and the current game results' analysis is a very important part of the simulation.

The refusal of the batch-processed concept of the game and black-box paradigm was made possible by the fact that RealGame has a simulation internal world clock and the simulation companies follow this world clock. RealGame is a clock-driven or real-time system. This means that the time in the participants' companies follows the time of the market and the administrator can start and stop the clock at his discretion. In other words, all the companies live the same internal clock time. The market clock runs hour by hour and the clock speed may vary during the session according to the administrator's decisions. At the beginning of the game the clock is set to run slowly, and gradually the clock speed is increased. So, the players have a real-time visualization and can analyse real-time data.

Results. The experience of using RealGame in the academic group No 813BA of School of Business of BSU prove that the business simulation game serves as a good learning tool that combines game-based learning with hardcore business and supply chain management education. The RealGame concept engages and motivates because it connects the learning experience and real-life challenges in an influential and coherent way. This makes games ideal learning environments.

Virtual RealGame training concept is based on synchronous online distance learning, meaning that everyone participates in the learning event at the same time. Hence, RealGame provides both a collaborative environment fostering teamwork and cooperation as well as hands-on learning

experiences. The main advantage of RealGame's CBLE is that unlike in the real world, managers are free to experiment with recourses and strategies without fear of putting the company into a situation in which there is a danger of loss, harm, or failure (bankruptcy). This process includes the kind of reflection and inquiry for which there is no time in the hectic everyday world.

RealGame helps to enhance students' decision-making skills, especially under conditions defined by limited time and information. This type of action learning has more impact on students than engaging in a case study discussion, not to mention the passive acceptance of other people's knowledge by listening to a lecture. Students who participate in a simulation can see the immediate consequences of their decisions and learn what it's truly like to juggle competing priorities amidst a constant influx of information.

References

1. *Biggs, W.* Introduction to Computerized Business Management Simulations / W. Biggs // Guide to Business Gaming and Experiential Learning / W. Biggs. – London, 1990. – Chap. 3. – P. 23–35.

2. *Elgood, C.* Using Management Games. / C. Elgood. – 2nd ed. – Aldershot : Gower Press, 1996. – 123 p.

3. *Forrester, W.* Industrial Dynamics / W. Forrester. – Cambridge : The M.I.T. Press, 1961. – 484 p.

4. *Greenlaw, P.* Business Simulation in Industrial and University Education / P. Greenlaw, L. Herron, R. Rawdon. – Englewood Cliffs : Prentice-Hall, 1962. – 356 p.

5. *Ju, E.* Personal Computer Games: Their Structure, Principles, and Applicability for Training / E. Ju, C. Wagner // The DATA BASE for Advances in Information Systems. – 1997. – Vol. 28, №. 2. – P. 78–92.

6. *Keys, B.* The Role of Management Games and Simulations in Education and Research / B. Keys, J. Wolfe // Journal of Management. – 1990. – Vol. 16, № 2. – P. 307–336.

7. The Design Principles for Flow Experience in Educational / K. Kiilia [et al.] // Games Procedia Computer Science. – 2012. – № 15. – P. 78–91.

8. *Lainema, T.* Enhancing Organizational Business Process Perception – Experiences from Constructing and Applying a Dynamic Business Simulation Game. Series A-5:2003 / T. Lainema. – Turku : Turku School of Economics, 2003. – 274 p.

9. LearningEdge [Electronic resource] / Website of MIT Management Sloan School. – Mode of access: https://mitsloan.mit.edu/LearningEdge/simulations/Pages/Overview.aspx. – Date of access: 15.03.2020.

10. *Naylor, T.* Computer Simulation Experiments with Models of Economic Systems / T. Naylor. – New York : John Wiley & Sons, 1971. – 502 p.

11. The Top Management Decision Simulation [Electronic resource]. – Mode of access: http:// gameorigo.com/the-top-management-decision-simulation-mainframe-1957. – Date of access: 15.03.2020.

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НАПРАВЛЕНИЯ РАЗВИТИЯ БИЗНЕС-АНАЛИТИКИ

Сегодня рынок продуктов бизнес-аналитики и управления данными находится в постоянном движении. Каждый год появляются новые направления в развитии бизнес-аналитики, в свою очередь некоторые направления становятся менее актуальными. Сегодня в мире существует несколько