# **Strategic Planning and Decision Making as Key Components of Economic Digital Gamification**

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**Abstract:** The article examines two forms of gamification with elements of digitalization in the preparation of students of economic specialties and proposes a third form of game learning in 3D-virtual reality. The components of strategic planning and the decision-making process, which can be effectively used in the process of teaching/learning economic disciplines on IT-platforms and in 3D-simulators in the conditions of university business incubators, are analyzed. Attention is drawn to the redistribution of the role of the human factor/capital as a result of the rapid development of smart-robots and artificial intelligence.

**Key words:** strategy, planning, decision making, economic, digitalization, gamification, virtual reality

**JEL:** A20, O34,C88

### Introduction

A strategy can be considered a master plan of action to fulfill the company's goals. A good strategy always depends on tasks and resources. When tasks are clear, they are prioritized sequentially for execution. Only after that is it possible to calculate the resources that are necessary to perform tasks in order to achieve the best result.

In this context, planning as a management function is actually figuring out what the company will do next. It is like an attempt to look into the future development of the company. The future is an image in the human mind, consisting of a field of certainty, knowledge, and ideas about the company. For example, how many products can be produced and sold at what price?

Planning is a combination of the fields of certainty and uncertainty that forms an image of the company's future.

The situation in the world changes every day, so the field of uncertainty and risks basically increases under such conditions. There are only two options for the company:

- Continue as before and hope for better times;
- Take risks and look for growth opportunities.

This is an evolutionary process. However, market conditions do not forgive naive optimism. Therefore, in order to predict any change, you need to create its concept, then set tasks, find solutions for each of them and implement them. Such an algorithm. Then you need to consider the result.

Strategic management doesn't work when it is inconsistent. It is necessary to constantly analyze the results of the implementation of changes for timely adjustment of the strategy. Modern entrepreneurs must have both the imagination to invent alternative courses of action and the logic to analyze their consequences.

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The continuous strategic process and strategic thinking of the manager is the compass and map in the hands of the leader.

#### Literature review

Many interesting publications on the topic of digitization in the form of simulation processes in education in business centers and business incubators are devoted to modern Ukrainian scientists and researchers, such as V. Pazdriy, O. Trubey, O. Ferchuk, E. Malyshko, O. Hrybinenko, A. Notarina etc. Simultaneously. student training on simulators using IT platforms and computer programs takes the form of educational and competitive dialogues with the goal of progress and victory. At the same time, without training strategic planning/forecasting/thinking in and the ability to make effective management decisions, it is impossible to acquire practical competencies qualitatively. Under the condition of digital gamification, in 3D-virtual reality with imitation of live (and not just textreadable) dialogues, and the passage of risky and problematic situations, the authors of this scientific study guarantee to achieve a high level of success. It is time to pay as much attention as possible to these aspects/concepts of modernization/transformation of higher education.

### Methodology

A complex of formal and informal modeling and forecasting methods in strategic planning, as well as operational and applied analytical and prognostic methods (systemic ones), comparative analysis, and theoretical generalizations, were used in the development of this scientific article.

Results and discussion

Effective strategic planning is the foresight and adaptability of a leader combined with consistency and discipline, which are the keys to success. The components are purpose, planning as a function of management, and strategizing.

The goal in the context of this study is the expected future result and a benchmark for the entire company. When the goal is clearly defined, the team experiences not only uncertainty but also anxiety.

Setting a goal is quite a difficult task that requires strategic thinking. To make everything clear and specific, you can't do something that raises the question "why?". Only by understanding the desired result can you bring it into order. At the same time, it is critical to control the situation expertly. Planning in the context of this study is forecasting the future.

The SMART (Specific, Measurable, Achievable, Relevant, Time) technology works well for digitization strategy. It is a very powerful tool for planning the future, because the meaning/heart of it is intelligence.

Specific – very exact goal that immediately indicates the result ("rye is sold, not apples").

Measurable – the goal should lead to a measurable result ("sell 5 tons of rye").

Achievable – the goal should be achievable, not fantastic ("we sell rye because we have its remainder").

Relevant – relevance of the goal ("right now there is a demand for rye").

Time – the goal should be limited in time ("sell rye in 3 days").

According to the logic of SMART, in order to achieve the result in the specified time, you need to formulate a goal, describe the way to achieve it and determine the necessary tools and resources. Each SMART criteria specifies and clarifies a goal.

Goal setting algorithm:

- specify the expected results (S);

- determine target indicators and select evaluation criteria (M);

- estimate and predict the achievement of the result (A);

- justify the necessity and relevance of the goal (R);

- determine the terms of achieving a fully formed goal (T).

SMART strategy is a universal language for guaranteed coordinated teamwork of the company.

Under the conditions of digital gamification, students are trained in the successful use of this tool. It is impossible not to say that digital gamification is an emotionally engaging cognitive action/event. The difficult and routine become very quickly easy and accessible under any conditions of a busy life.

The best business goal is the answer to the question: "What exactly is it that we all do not like so much that we need to change

something?". The effectiveness of tactical planning and strategic vision in problem solving depends on the clarity and specification of the answer. Fig. 1 shows the components of the digital economy, which are simultaneously involved in the transformation processes of any country for the better.



Source: [1]

Figure 1: Modern components of an effective digital economy

When we talk about new technologies, we are actually talking about new, more effective ways of solving problems, which in turn are directly proportional to correctly made decisions. Modern components of planning and successful decision-making are clearly demonstrated in fig. 2.



Source: [2]

**Figure 2**: Cyclicality and interdependence of planning processes and decision-making in conditions of digitalization

Digitalization received a rapid development leap during the Covid-19 pandemic, but not thanks to the coronavirus, but in spite of it. Fig. 3 shows the key components of a digital strategy.



Source: [3]

Figure 3: Key components of digital strategy

In 3D-VR, split-second decision-making scenarios are possible. At the same time, there are no ready-made template answers, but there is an interaction with virtual characters/surround/environment that creates and is felt as a real world.

In terms of 3D-VR features, it's impossible to stop at the passage of extraordinary and exciting situations without taking risks. This concerns functional obligations at work in dangerous conditions and in the realities of life (including during military operations). At the same time, competencies for achieving positive outcomes and job satisfaction are developed because the brain adjusts to setting priorities differently in the face of threats and unpredictable situations.

It is proposed to consider the application of these economic categories in the training of entrepreneurs – in a game form – with the help of interactive digitization tools.

Computer (i.e. digital) gamification is used with great utility to develop teamwork competencies, in which strategic planning and the ability to make effective decisions should manifest themselves. In this context, "gamification" is about engaging students in the thinking process while they think they are having fun.

Let's consider 2 games. The first one – economic experiment "Business for social

good". It's conducted on a computer simulator using Excel formulas and spreadsheets.

A student group was involved, for example, of twenty-eight people, which is divided into seven teams. All of them are businessmen from four different cities. The main condition is to spend no more than twenty dollars on various public goods in each round. Each round has its own requirements. Bonuses are received in one round, fines in the other. Each round is independent of the other and in each round they are given twenty dollars (whether they won or lost previously isn't important).

Public goods are created conditionally in four cities: A, B, C, D. For example, in A – Amsterdam, B – Berlin, C – Copenhagen and D – Dublin.

Another principle of this experiment: each community lives individually and they don't overlap.

A product that is a public good is distributed evenly solely within its city. Not between the cities! The public good is distributed equally among all businessmen of their city.

Fig. 4 demonstrates 3 stages of this game. A contribution to a public need is profit, added value – that's why we multiply by a factor of one point six. Then we distribute it among all residents. At the end of the round, we count the results.

# Social Good Business

Source: [3]

Figure 4: The main principles of the experimental game "Business for social good"

For example, there are four influential businessmen in Amsterdam who contributed a total of thirty dollars. We multiply by one point six, and then divide equally by four and get twelve dollars of social profit. They contribute differently, but receive the same.

Everything is graphically described here. This is a very easy example, but we can see the great interest of students to it.

Another principle: every businessman doesn't know where other entrepreneurs are located and doesn't have the opportunity to choose a common strategy. In the second part, entrepreneurs get to know each other and can communicate in order to raise the standard of living in their city together.

The goal is to make more money in five to ten rounds.

In the first round, it is announced that the city is experiencing criminal deterioration and that voluntary contributions are needed to restore order. Each entrepreneur decides for himself: how much money he can provide to save the situation, from zero to twenty dollars.

Then everything is added up, multiplied by one point six, divided by four and returned to entrepreneurs in a larger amount, but equally.

It has been announced that in order to establish a powerful fire brigade in the city, contributions ranging from zero to twenty dollars are required. But! At the same time, a check is made and, when less than six dollars have been deposited, there will be a fine in the amount of the amount that he didn't pay up to six, multiplied by four.

We provide the reward conditions. One player is chosen randomly and his contribution is multiplied by four. He gets a bonus.

The next round is similar to the third one, but now we are talking about the hospital, which is a public good.

The next round is similar to the one before it. However, we are talking about the construction of a theatre, which is a public good.

During the conclusion, the consequences of the game are discussed. The goal was to show the role of the public sector in the life of an entrepreneur. This is inherent in every highly developed city and country.

Specific situations involving different types of entrepreneurs are also being discussed. For example, socialists, rightists, realists, and neutrals.

The next day successes are calculated and it is visually shown how much was given to the public good. It also discusses the effectiveness of each round when helping the community was successful. This game allows you to conduct thorough analysis and develop important team competencies. These are their

high contributions and their interaction. This game helps to understand an important life truth: when the more you give – more is returned. That is, a lot of questions are being worked out.

As a result, you can clearly see the results of students' teamwork (Fig. 5-8).

The second game. Sometimes these games are played outdoors – according to different rules, but with the use of digital tools.

According to the rules, you need to divide into four to six people groups and choose roles in order to develop certain competencies.

Navigator – is responsible for the skillful movement of the group and has a detailed online map of the city. His phone must have a common location with the teacher and his task is to optimize the route between points.

				Č –							
	ė.	6	6	4	5	20	20	20	20	20	297
	10	6	6	19	10	20	20	20	20	20	267
810	10	6	6	12	10	20	20	20	20	20	290
	Ø	8	6	5	10	20	20	20	20	20	289
	9	11	14	7	7	1	6	26	13	20	
	12	8	16	8	8	1	5	15	8	10	216
	5	7	7	10	10		6	15	8	10	246
	4	6	6			1	0	20	8	20	218
	1	6	6		Q	0	5	15	8	10	263
	10	14	14	15	10	32	18	32	32	32	
	12	10	16	10	8	20	10	20	20	20	253
	3	6	6	3	6	20	10	20	20	20	295
	10	10	7	9	10	20	15	20	20	20	277
	1	8	6	15	2	20	10	20	20	20	287

*Source:* Jakub Glowatsky, the international postgraduate practical internship, September 19 – October 28, 2022

1	28	24	24	32	29	32	32	32	32	32	297	297	0
	18	24	24	17	24	32	32	32	32	32	267	267	0
Ι	18	24	24	24	24	32	32	32	32	32	274	290	-16
	28	22	24	31	24	32	32	32	32	32	289	289	0
	17	23	18	19	19	20	21	31	25	30	223	216	7
	24	24	27	17	17	21	20	31	25	30	236	246	10)
	25	25	28	27	27	20	26	26	25	20	249	218	31
-	28	25	28	27	27	21	21	31	25	30	263	263	0
1	18	24	18	25	22	32	28	32	32	32	263	253	10
	27	28	28	32	24	32	28	32	32	32	295	295	0
1	20	24	27	26	20	32	23	32	32	32	268	277	-9
	29	26	28	20	28	32	28	32	32	32	287	287	0
	20	20	20	20	20	20	20	20	20	20	200	0	200
1	20	20	20	20	20	20	20	20	20	20	200	0	200
	20	20	20	20	20	20	20	20	20	20	200	0	200
1	20	20	20	20	20	20	20	20	20	20	200	0	200

Figure 5: The table of team results

*Source:* Jakub Glowatsky, the international postgraduate practical internship, September 19 – October 28, 2022

#### Figure 6: The table of team results

Archivizer – takes care of documenting all events, mainly in the form of photos and file uploads to the cloud on Google Drive. His task is to document the performance of group exercises using photos, videos, etc.

Accountant – manages the group's cash flow; the group has a set number of coins;

records all expenses; and looks for cost-effective ways to save money.



*Source:* Jakub Glowatsky, the international postgraduate practical internship, September 19 – October 28, 2022



Figure 7: The graph of team results

*Source:* Jakub Glowatsky, the international postgraduate practical internship, September 19 – October 28, 2022

Figure 8: The chart of team results



#### Source: [2]

Figure 9: Key components of economic gamification

The central/key role is the Leader – coordinates all the work of the team, is responsible for decision-making and has a decisive voice in conflict situations, and also discusses difficult points with the teacher.

According to the rules of fair play:

- Game participants don't interfere or help other groups.

- Participants move around the city on foot or by public transport. They don't use cars,

bicycles, scooters, horses, etc. They have up to two coins with which they can buy additional time to complete tasks.



Source: [1]

Figure 10: Types of control during digital gamification

When everyone returns – the results are summed up. Here it is shown that the results are also processed in the form of Excel tables, charts and graphs. The computer program itself counts the winners.

This slide shows a variant of the group's movement route as an example. Not long one. One kilometre two hundred meters. It's laid out with certain points to solve certain problems.

Concerning the necessary equipment:

- each participant of the game must have several A-4 format cards and a (functional) pen or pencil;
- The "Archivizer" of the group uses a Google Drive account (https://drive.google.com). The results of teamwork are collected in the corresponding catalog on the website.
- "Navigator" must have Google-Maps app installed on his phone. The phone must be charged and the «Navigator» must have a phone charger and/or power-bank.

- The guide/leader must have a QR code reader installed on his/her phone.

The placement of QR codes on poles, on trees, at bus stops, under bridges, which must first be found. Students map out a route and run - looking for QR codes to get tasks from the sites and think about their solutions. Coins are obtained for correct decisions, which are also used to buy additional time. It's very important.

Each student has a smartphone that can be used to locate the web page with the QR code where the task with the challenges is posted.

It's necessary to realize that the purpose of this game isn't only learning to navigate the terrain, but also learning to use nontraditional ways to overcome problems. The main principle is to cooperate as a team, so each individual has neither points nor money. Everyone has what the whole team has. One for all and all for one.

At the end of the game, the program also processes all results entered using digital tools. Examples of what it looks like are fig. 11-16.

1		2			1.1		224			22
2	6	2	6	10	20	10	10	12	20	284
10	15	6	20	10	20	20	10	10	20	232
20	20	7	8	13	20	12	10	0	20	260
4	6	20	9	1	2	11	12	0	20	298
12	11	10	13	13	32	32	24	31	27	
18	9	6	11	2	19	20	19	18	18	265
5	6	6	10	15	20	20	10	20	10	282
1	6	6	2	5	20	20	11	20	20	296
5	6	6	10	10	20	20	20	20	20	268
5	10	12	18	11	32	24	32	32	32	
Ø	6	7	9	6	20	15	20	20	20	283
D,	6	6	15	10	20	15	20	20	20	276
8	6	11	10	1	20	15	20	20	20	287
5	6	6	10	10	20	15	20	20	20	265
16	18	18	14	21	13	20	19	25	18	
15	17	18	20	7	5	10	12	8	11	259
5	6	6	6	15	6	10	12	18	10	288
2	6	6	8	15	6	10	12	18	10	297
17	15	15	0	15	15	20	12	18	15	240
7,3	8.9	8.4	9.6	9.1	15.8	15.2	14.4	15.1	171	

*Source:* Jakub Glowatsky, the international postgraduate practical internship, September 19 – October 28, 2022

At the same time, team spirit and readiness for high competitiveness are well developed. Students must have certain competencies in order to effectively face challenges and have stable success in all spheres of life in the conditions of high globalization, when there is a constant fierce struggle for labor markets, raw material and capital markets. In these economic games, the understanding of necessity, strategy, planning, human will and professional like-minded people comes into practice. Under the conditions of the digital economy, that is, when it not only consumes resources, but also creates them, development, competitiveness and innovation are transformed.

							10.					
32	33	32	31	24	25	31	27	17	32	284	284	-0
24	24	28	17	24	25	21	27	19	32	241	232	9
14	19	27	37	21	25	29	27	29	32	260	260	-0
30	33	14	28	33	43	30	25	29	32	297	298	4
14	22	24	22	31	33	32	25	33	29	264	265	1
27	25	24	23	18	32	32	34	31	37	282	282	0
31	25	24	33	28	32	32	33	31	27	295	296	1
27	25	24	23	23	32	32	24	31	27	267	268	4
25	24	25	29	25	32	29	32	32	32	284	283	1
25	24	26	23	21	32	29	32	32	32	275	276	1
17	24	21	38	30	32	29	32	32	32	286	287	4
20	24	26	28	21	32	29	32	32	32	275	265	10
21	21	20	14	34	28	30	27	37	27	258	259	1
31	32	32	28	26	27	30	27	27	28	287	288	1
34	32	32	34	26	27	30	27	27	28	296	297	1
19	23	23	34	26	18	20	27	27	23	239	240	1

*Source:* Jakub Glowatsky, the international postgraduate practical internship, September 19 – October 28, 2022

Figure 12: The table of team results



*Source:* Jakub Glowatsky, the international postgraduate practical internship, September 19 – October 28, 2022



*Source:* Jakub Glowatsky, the international postgraduate practical internship, September 19 – October 28, 2022



Figure 14: The graph of team results

*Source:* Jakub Glowatsky, the international postgraduate practical internship, September 19 – October 28, 2022



In such games, students experience 3 key areas of digitization of economic processes:

- to motivate and stimulate business towards digitization;

- to encourage citizens to form a demand for digitization, to inculcate in them the vital need to use digital tools to improve the good;

- to create new powerful digital infrastructures for everyone.



*Source:* Jakub Glowatsky, the international postgraduate practical internship, September 19 – October 28, 2022

Figure 16: The	e chart of team results
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Looking ahead, it is important to take into account the speed of digital technologies updates, because in fact it is this that opens up new opportunities in the new technological landscape.

In this study it is proposed to combine the two analyzed games into one using 3D-VR technology. This is the same computer simulation as in the first game, only using 3D. All running around and communication with team members take place in virtual reality. Thus, with the help of digital gamification, the competencies of a real virtual business are practiced. If students are taught today not according to Soviet methods and techniques, but with the help of modern digital technologies, then in the near future higher education will be transformed. And practical skills and abilities will no longer be developed during industrial internship, but during the last course of the university - in the form of a startup. Very quickly, the era of smart robots supplant the teaching profession will altogether, and all economic higher education

will be transformed into the acquisition of practical-theoretical competencies by students in business incubators, when instead of higher education diplomas there will be a bunch of various certificates at graduation. And we – scientists – should contribute to this and be open to changes.

An example of a SMART-exercise is offered as a practical component of this article.

Game «TRIP TO THE MOON». Time to complete the task: 25 minutes. You are a member of a group of astronauts sent on a research mission to the Moon. Your crew was supposed to land near a previously established stationary base located in the center of the illuminated side of the Moon. Because of the damage your space vehicle had to land in an emergency at a distance of about 190 miles from the base. During the landing, most of your equipment was completely destroyed, except for the 15 items listed below. Since the possibility of your experience depends on reaching the base, only the most necessary items have to be chosen on the way to the base.

In order to do so, a hierarchy of usefulness of the items listed below in lunar conditions has to be established. The task is to determine the hierarchy of all items based on their usefulness in the subsequent journey. The most important object should be placed to the first position, the second one should be placed to the second one, etc. up to the least useful object, which will be given the number 15. During making a hierarchy, no object can be omitted. No number can be assigned to two different objects. You have 10 minutes to complete the task yourself. Fill in the column 2. Then solve the same task in a team. To do this, fill in the column 3 (in 5 minutes). Then solve the same task again on your own, having another 5 minutes for it. To do this, fill in the column 4.

Items	Individual decision	Group decisio	Individual decision	According to NASA	Difference between columns 4 and 5
Box of matches					1 0
Food concentrate					
50 feet of nylon rope					
Parachute silk					
Portable heating unit					
Two 0,45 caliber pistols					
One case of dehydrated milk					
Two 100 lb. tanks of oxygen					
Stellar map					
Self-inflating life raft					
Magnetic compass					
20 liters of water					
Signal flares					
First aid kit, including injection					
needle					
Solar-powered FM receiver-					
transmitter					
				Sum	

Source: [2]

To fill in the column 5, you need to scan the QR code and find out the solution according to NASA.



Source: NASA web-site Figure 17: NASA QR-code

You need to summarize the values of all the differences between NASA and human solutions and fill in the column 6.

# Conclusion

1) Strategic planning and decision-making in the digital economy are highly interconnected and synergistically reinforcing processes.

- 2) The digital industry, like digital business, requires new approaches and new thinking, which digital gamification helps to acquire easily, interestingly and fruitfully.
- 3) Various types of economic games, from performing tasks in open space with the help of digital tools to 3D virtual reality in business incubators, contribute to the deep learning of theoretical material in interactive and creative forms, and also develop all competencies for the successful advancement of university graduates in all areas of human life activities.
- 4) Team and role-playing games form not only leadership, but also humane qualities

of character in young people, which are then necessarily reflected in their adequately socialized work in the team.

- 5) The speed of updating of digital technologies changes/modernizes approaches to student learning and forces higher education to be transformed in the form of abandoning Soviet methods and methods of conducting lectures and seminar classes by transitioning to teaching on IT platforms, including not only in classrooms, but in business incubators on simulators.
- 6) The implementation of elements of cosmonautics/cosmography should be mandatory for progressive practices of the modern educational process, because it contributes to the formation of human consciousness of the new digital generation.
- 7) The era of smart robots is slowly but surely displacing many traditional professions, and higher education should be ready for this today, in case of stopping preparing students for specialties that are losing their meaning.

# References

- Cornelia Gerdenitscha, David Sellitscha, Markus Besserc, (2020). Work gamification: Effects on enjoyment, productivity and the role of leadership. Journal «Electronic Commerce Research and Applications».
- 2. Nikoletta-Zampeta Legak, Nannan Xib, (2021). The effect of challenge-based gamification on learning: An experiment in the context of statistics education. Journal «International Journal of Human-Computer Studies».
- 3. Agnessa Spanellis, Viktor Dörfler, Jillian MacBryde, (2021). Investigating the potential for using gamification to empower knowledge workers. Journal «Expert Systems with Applications