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FEATURES OF USING THE CANVAS-ORIENTED APPROACH TO GAME DESIGN

Annotation. *The article proposes an canvas-oriented approach to game design. It justifies the applying of a dynamic cycle of interconnected canvases into creative game design, for the purpose of documenting the progress and results of the creative process, stimulating it while canvases simultaneously are both clues and guides in game development. The author's definition of game design canvasation as a process of creation of a visual abstract structure that generalizes the case goal (the task containing the accumulated experience) for achieving it and creating a unique creative product is given. Projects "Canvas of Player Psychotypes & Aethteticts", "Canvas of Player's needs in Control, Information and Action", "Canvas of Game Mechanics & Dynamics", "Canvas of Narrative", "Canvas of the Game World", "Canvas of Game Level" are presented. Canvases structure the game development process, reduce the time taken to generate game designer ideas and to contrive game mechanic and dynamics. Canvases are an additional road map toward making creative decisions in game design. They can be a convenient basis for automating the process of latter, a paper prototype of the game and the game design as a quest process provided that each canvas is a location with quest tasks, the variability of which depends on the potential and attitude of the leader and team. The proposed set of interrelated canvas has been tested during the training course "Computer Game Design for Education" for teachers of the humanities of Odessa National Polytechnic University within the framework of European Commission Erasmus+KA2-project GameHub. Subsequently, it is planned to develop "Canvas Balance" and "Canvas Ethical Dilemma" to regulate the game with regard to balance and ethics by detecting deficiencies in the gameplay components, controlling the achievement of the necessary aesthetics and solving ethical conflicts, adjusting feedback between channels so that, ultimately, create socially useful human oriented product. The algorithm for routing the components of the canvases also will be developed, allowing to automate the process of filling out sections of the Game Design Document.*

Keywords: *canvas-oriented game design; gamification; creative product; automation of the creative process*

Introduction

Formulation of the problem. The deepening of gamification processes in various areas of the information society activity (education, business, science, manufacturing, leisure, etc.) is an indicator of the increasing importance of creative products in the system of social relations[1; 2].The growing demand for training or motivational computer games created for the respective exigencies of individual enterprises stimulates scientific interest in finding methods of optimization and automation of the process of game design as an integrated system [3; 4].

Game design is a complex multifarious and multistage creative process that includes the founding of a creative (innovative) idea and a business plan, the combination of such activities as testing, monitoring and project management and the implementation skills. Creativity depends on the aptitudes of individuals and organizations involved in creating a gaming product: ingenuity and the ability to find solutions; willingness to take risks and look at the problem from an unexpected angle; interest in experimentation; ability for reflection and continuous learning. All of this variety of game design processes and aspects, we propose to present in a dynamic set of interrelated "canvases" that:

- visualize the thought processes of the game designers and theirs team;
- help to formalize the creative process (concepts and implicit knowledge of game designers),
- document the ideas and their development;
- make it possible to simulate the game space and game situations, to detail and semanticize them in the game maps;
- offer a choice of game plot patterns, characters, and game behavior;
- route the development process of the game from stage to stage;
- automate the process of creating game design documents;
- create prototypes of games - abstract visual models of the game; i.e. the tool that would allow to build experimental prototypes directly from the definition of a set of game characteristics [5];
- gamify the game design process;
- form the basis for interdisciplinary research and a platform for the joint creative work of game developers.

Term analysis. It should be noted that the concept of "canvas" as a method of visualizing and structuring thinking and knowledge is not new [6; 7; 17]. In historiography there are actively developed methods for mapping dataandknowledge [3; 8; 11], data journalism [9; 3], infographics [10]. At the same time, scientists do not formalize a clear difference in

concepts of "canvas", "knowledge map", "infographics", "template" and "model". It is undoubted that all of these terms define a variety of ways of working with information that visualize cogitative processes and allow to maximize the creative and intellectual potential of a person and team in their work. All of them belong to the popular methods used in the world and national practice of knowledge management. They can be used for various purposes: training of beginners, creating opportunities for improving staff communication and sharing experience, visualizing and consolidating all the resources and information capabilities of an organization, solving any creative, scientific, organizational, marketing, project tasks, such as developing digital games.

Game Design Canvas (from French word "Canevas" – a sparse, reticulate, usually starched fabric for embroidery across the cells; the framework of something) is understood by us as a visual abstract structure that generalizes a case subject consisting of such elements as a problem, solution and consequences, and contains accumulated experience. Canvases filled with specific content (ideas, facts, assumptions, feelings, actions, descriptions, etc.) make it possible to effectively solve the task and create a unique creative product. By this, Canvas differs from Template, since the latter does not imply variability and creativity. The template is focused on producing the identical products, whilst in contrast canvas implies the creation of various original projects. Canvas includes templatization as a framework and elements of almost all visualization methods (creative freedom).

Canvasation tools are images and notes on stickers and cards attached to charts, grids, tables, matrices, affinity diagrams, clusters of ideas, patterns, maps, algorithms, ratings. Nevertheless, the method of constructing and reading the canvas is different from, as example, knowledge maps. The point of departure for mapping is generally the center (the main concept), whilst the design of the canvas is determined by the essence, structure and logic of the case task: it starts from the end - understanding the goal – to a tangible state. The logic of canvases reading depends on the mechanism embedded in them: bottom-up-right, if the axis of coordinates of time and significance is important; from chaos to ordering, if based on clustering; clockwise – to describe and analyze the object as a unitary system; etc.

The canvases of game design comprise the characteristics of knowledge cards, since they allow to present quite complex concepts in the most intelligible combination of elements and imageries of the game knowledge system (ideas, tasks, process, etc.), make it possible to cover the situation as a whole, as well as to keep in mind simultaneously a large amount of information in order to find connections between individual parts, find the missing elements, memorize information and be able to reproduce it even after a long period of time. However, in contrast to knowledge maps, canvases are not only a means of understanding complex processes, but also peculiar routers in the process of achieving goals. In other words, the knowledge maps and infographics mainly perform an explanatory function (comprehension, awareness, vision, memorization, logging), whereas the canvas stimulates the function of constructing the rules of the game world, levels etc.

Related work. The issues of optimizing game design processes by the instrumentality of visual tools have been examined since the theoretical development of MDA [12] and DPE [13] models as game analysis tools. At the same time, these models were the basis for the development of computer games. Meanwhile the features of the canvas language were studied [17].

Visual game design methods as brainstorming technique were presented in the book [7]. The authors summarized the vast experience in knowledge mapping, creating canvases of business models, business analysis (PEST & SWOT) and making management decisions, project management models, brainstorming, goal tree and morphological analysis.

This gave them the opportunity to transform the process of creating the game and the game itself in the form of a "stubby pencilsharpened at both ends", as a project with initial (divergent)state, target (convergent) state and space of exploration (emergent space) between them, divided in a sequence of steps leading to a certain effect.

Interestingly enough that all forms of visualization of thinking in the process of designing business processes are called "game" by the authors. The latter consists of such important elements as [7]: Game space (conventional topos, agreement-based topos), Boundaries (game chronotop), Rules for interaction, Artifacts (maps, playing dibs, dices, stickers with notes, all tangible movable objects containing information) and a Goal. The main stagesof activities of the game designer in this case are: "imagine the world", "create the world", "open the world", "explore the world" and "close the world". Depending on the game designer's idea, actions can be single, cyclic, parallel, and serial.

The development of design patterns as a single tool and integration language for game producing is one of the top themes in the industry-specific community [5; 14; 15; 16; 19]. Nowadays, such scientific Internet platforms as Academia.edu and Scholar.google

comprise more than 348 thousand and 3.6 million publications on the problems of game design templatization respectively. At the same time, scientists are considering the question: what should be the basis of the game design pattern? Different starting points are proposed for the development of such canvases: classification of serious games [5], project activity [7], game design patterns [19], player profiling and motivation [20]. As a result, it is noted the necessity of creating a database of project concepts [21; 15].

Today, there is a tendency to interpret game design as an automated process, which is based on the universal integrated pattern "Design Pattern Canvas". At the same time, superfluous abstraction of the game design canvas complicates the process of such automation, as it forms only a superficial idea of the game project, limits the degrees of freedom of the game designer (the choice of game genre and aesthetics, the development of game history and rules, their balancing, level design), and narrows variability of creative solutions. It is reasonable to develop a cycle of interrelated canvases, corresponding to the stages of game design, and to detail them in the shape of sets of case diagrams and guide notes, which will later allow to structurally formalizing the process of games producing.

Therefore, the **purpose of the research is** to identify the features and advantages of using a series of interconnected canvases for designing computer games, which will automate the process of creating the Game Design Document.

Research methods. The purpose of the research determined the usage of such research methods as:

- selective analysis – for the study of documents and scientific literature on the research topic;
- terminological analysis – to clarify the categorical concepts of the study;
- decomposition method – to identify individual elements of game design as a system for creating canvases;
- structuring method – to study the relationship between the elements of game design;
- descriptive modeling method – to describe the canvas as a case of game design;
- generalization method – to formulate the relevant conclusions of the study.

Presentation of the main research material. The process of creating a set of canvases for game design is premised on on the logic of the process of computer games developing and drafting of game design documents. We proceeded from the MDA model [12] in the reverse order: Aesthetics - Dynamics – Mechanics, used the valuable experience of designing canvases [22; 23] and had supplemented this scheme with canvases with options for selecting and detailing the game aesthetics, narrative, dynamics and mechanics, and also game levels.

MDA-components of the "Game Aesthetics" include:

1) Studies of consumers as players:
- Canvas of Business Model [24];
- Canvas of Empathy Map [9].

2) Studies of the aesthetics of the game based on the needs of the player:
- Canvas of psychotypes of players & Aethteticts
- Canvas of Player's needs in Control, Information and Action.

The MDA-components of "Game Mechanics" and "Game Dynamics" include:
- Gamification model canvas [22];
- Canvas of Game Mechanics & Dynamics;
- Canvas of Narrative;
- Canvas of Game World;
- Canvas of GameLevel.

Canvas of Business Model [24] is used to determine the economic attractiveness, features of the game, to study the uniqueness of the game, and makes it possible to fill in the relevant blocks of the Concept Document: analysis of the competitive environment, unique game characteristics, resources and playing boundaries. Additionally, this canvas allows developing specific steps to promote the game.

Canvas of Empathy Map (S. Matthews, D. Gray) [9] is used as the starting point for user-oriented game design. It allows the game designer to highlight descriptors of the external and internal world of the player as a representative of the target audience: his life situation, needs, verbal cliches, daily activities, basic visual and auditory information surrounding a person, his thoughts and feelings(so called "pains and gains"): fears, anxieties, frustrations, desires, needs, hopes and dreams. Since the empathy map canvas formalizes a rather subjective designer vision of the player, the data must be verified and supplemented with facts based on well-founded studies of the gamers psychotypes (R. A. Bartle taxonomy) [25], Maslow motivators [26], user types [16; 27]. The identified key characteristics of the consumer are the basis for building maps that allow exploring and creating the aesthetics of the game.

Canvas of player psychotypes & (game) Aethteticts – the canvas of the correlation the players psychotypes with the desired emotional reactions that should be caused by the dynamics of the game. For the design of the canvas, 8 components of the game aesthetics [12] were used, as well as the taxonomy of player types [25; 29], elements of the theory of entertainment (fun) in learning [30].

On the canvas presented in Fig. 1, the personality types and components of the game aesthetics are detailed and grouped according to the proximity of their characteristics, but the canvas does not limit the interaction of its components, stimulating unexpected creative solutions. The canvas offers the game designer a choice of the target audience, aesthetics and entertainment components (fun), filling the corresponding canvas cells with his vision of these elements. The combination of choiced components gives rise to the general idea of the game. For example, the player "Creator-Explorer" in accordance with the aesthetics of "Challenge" and "Easy Fun" will form a game competition for the speed of searching and creating artifacts.

In the case of designing educational games, the choice of the prevailing aesthetics is not determined by the results of testing and the player's psycho-type examination, but with regard to goals and subject area of the discipline. If one of the goals of the training discipline is to form communication skills, then the game designer needs to choose the type of "Socializer", Aesthetics of "fellowship" and "social" fun. Canvas of Player's needs in Control, Information and Action determine the choice of a computer game genre based on studies of the classification of game genres [31]. An example of the canvas is presented in Fig. 2.

The above mentioned canvases lay the foundations for the subsequent character creation and game history.Gamification model canvas [22] gives an overwiev of game.

Canvas of Game Mechanics & Dynamics presents game mechanics and dynamics as a formula consisting of elements of mechanics (actions, chances, win conditions and bonuses) and control forces of dynamics (rules, time, statistics, balance).

This Canvas, in our opinion, is one of the most difficult to visualize, since the very concept of "dynamics" in the game community is not clearly and broadly defined. In general terms, dynamics can be understood as an instrument of aesthetics, creating a feeling of the game, as the process of the game itself and the game "session", as the behavior of the game as a system; as the rules of the game, which are used in the movement (campaign, process, sequence of turns); as a set of game mechanics created to form a certain result; as triggers that determine the players behavior and the players own actions, as the strategic way of application of the rules and known combinations in the game. Proceeding from etymology of the Greek word δύναμις ("strength, power"), by the term "game dynamics" we mean the state resulting from the interaction of the game mechanics. Therefore, the dynamics can not be considered in isolation from the game mechanic (Fig. 3).

This needs to take into consideration that the main categories of game dynamics are time, rules, statistics and the balance of the game, which support the player's constant interest (Fig. 4).

<table>
<tr><td colspan="10">TYPES OF PLAYERS</td></tr>
<tr><td colspan="3">CREATORS</td><td colspan="4">CONSUMERS</td><td colspan="3">DESTROYERS</td></tr>
<tr><td colspan="2">EXPLORERS</td><td>SURVIVORS</td><td colspan="2">ACHIEVERS</td><td colspan="2">SOCIALIZERS
SOCIAL ACTIVIST OR FRIEND</td><td colspan="2">KILLERS</td><td></td></tr>
<tr><td>MASTERMIND
SCIENTIST</td><td>VIRTUOSO</td><td>DAREDEVIL</td><td colspan="2">BUSINESS</td><td colspan="2" rowspan="3">COMMANDER
MEDIATOR
TRAINER
ADMINISTRATOR-MANAGER
CONSUL
POLEMICIST
ACTIVIST
DEFENDER</td><td>GRIEFER
(SHOOTING)</td><td>POLITICIAN</td><td></td></tr>
<tr><td rowspan="2">HACKER</td><td rowspan="2">SEEKER</td><td>ENTERTAINER</td><td colspan="2">CAREER</td><td rowspan="2">CONQUEROR</td><td rowspan="2">STRATEGIST</td><td></td></tr>
<tr><td>ARTIST</td><td>Opportunist</td><td>Planners</td><td></td></tr>
<tr><td colspan="10">COMPONENTS OF GAME AESTHETICS</td></tr>
<tr><td>DISCOVERY</td><td>FANTASY</td><td>CHALLENGE</td><td>EXPRESSION</td><td>NARRATIVE</td><td>FELLOWSHIP</td><td>SUBMISSION</td><td>SENSATION</td><td></td><td></td></tr>
<tr><td colspan="10">FUN</td></tr>
<tr><td colspan="3">SERIOUS FUN
Significance, partnerships
To help others. Help with useful materials. Create useful templates, instructions. Answer in forums. Order working folders.</td><td colspan="3">HEAVY FUN
Challenge, Make a really meaningful goal. Overcome obstacles. Do things that others can not / do not want. Receive a deserved reward for their efforts. Receive proof of skill.</td><td colspan="2">SOCIAL FUN
friendship, communication
Communicate with other players. Chat with interesting invitees. Get a "like". Perform common tasks. Integrate into interest groups.</td><td colspan="2">EASY FUN
curiosity, chances, bonuses
Sign up for a free course. See a quick lesson. Go to the next material. Explore why the buttons are. Get a quick bonus for action. Get an unexpected gift.</td></tr>
</table>

Fig. 1. Canvas of playerpsychotypes & gameAethteticts

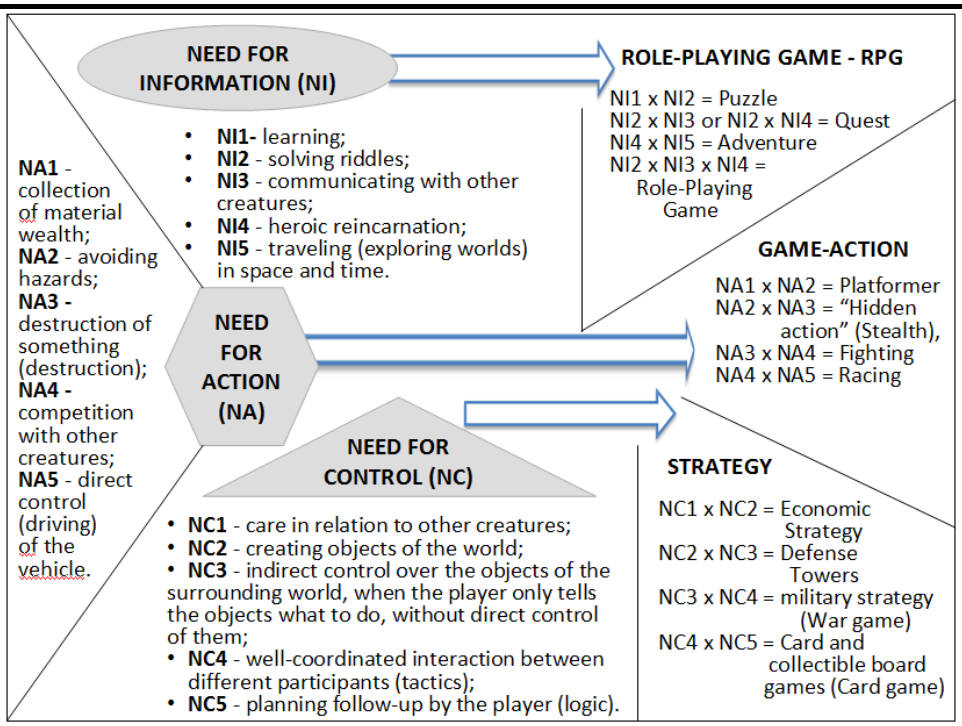

Fig. 2. Canvas of Player's needs in Control, Information and Action

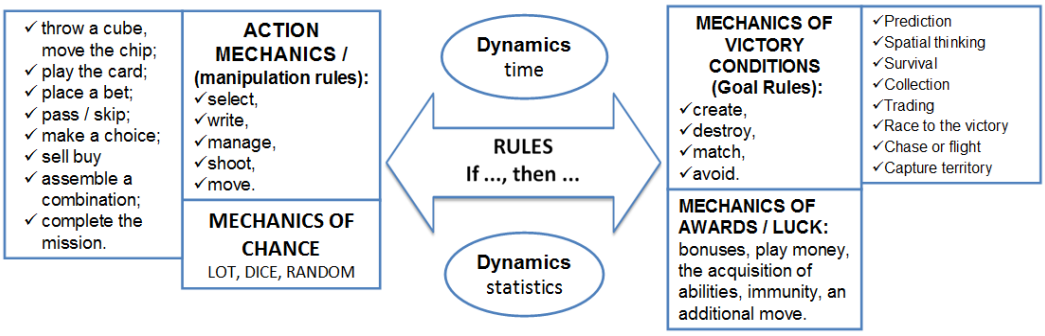

Fig. 3. Canvas of Game Mechanics & Dynamics

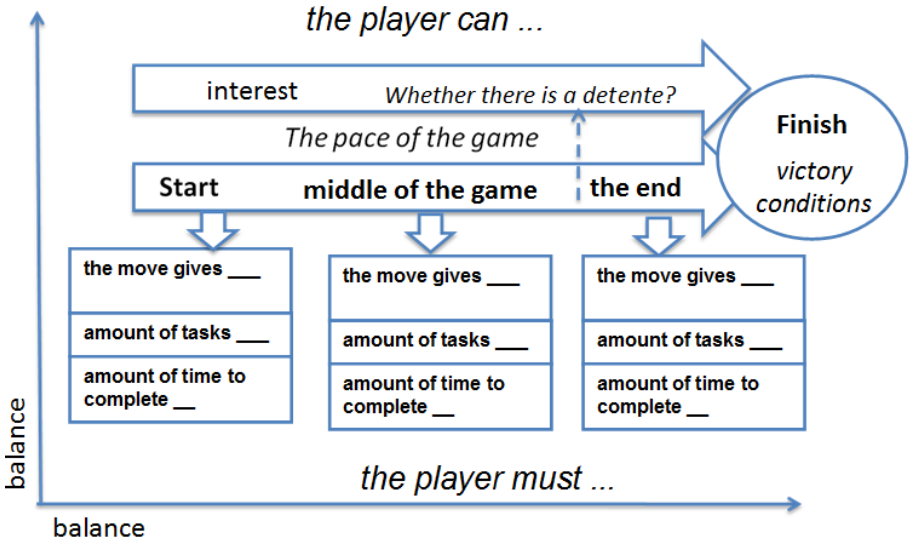

Fig. 4. Game Dynamics Categories

Canvas of Narrative allows to create and develop the plot of the game [32]. The basis of this canvas was taken by the empathy map canvas [7], but the content of the canvas was thoroughly revised in accordance with the cultural and structural-semiotic studies of literary and folklore texts, the theory of cultural universals and the mechanisms, concepts of C.-G. Jung [33], V.Ya. Propp [34]. An example of the canvas is presented in Fig. 5.

Canvas of Game World helps to visualize and plan the physical world of the game. This Canvas gives game designers the opportunity to explore the game world, as shown below (Fig. 6).

Canvas of Game Level gives game designers the opportunity to explore and design the levels of the game as shown in Fig. 7.

The proposed set of interrelated canvas has been tested during the training course "Computer Game Design for Education" for teachers of the humanities of Odessa National Polytechnic University within the framework of European Commission Erasmus+KA2-project "GameHub: University-enterprises cooperation in game industry in Ukraine" (No. EPP-1-2015-1-ES-EPPKA2-CBHE-JP). The training was attended by over 20 teachers from the following departments of the Faculty of Humanities giving courses of lectures for students of IT in relevant areas of knowledge: Department of Information and Media Communications, Department of Philosophy and Methodology of Science, Department of Psychology and Social Work, Department of Culture and Art Studies, Department of Ukrainian History and Ethnography. Teachers created Game Design Documents.

Since the effectiveness of the game design canvases proposed by the masters of game design [9; 22; 23; 24] is unquestioned, we have found it worthwhile to demonstrate a small selection of games that were obtained as a result of using the canvases we developed.

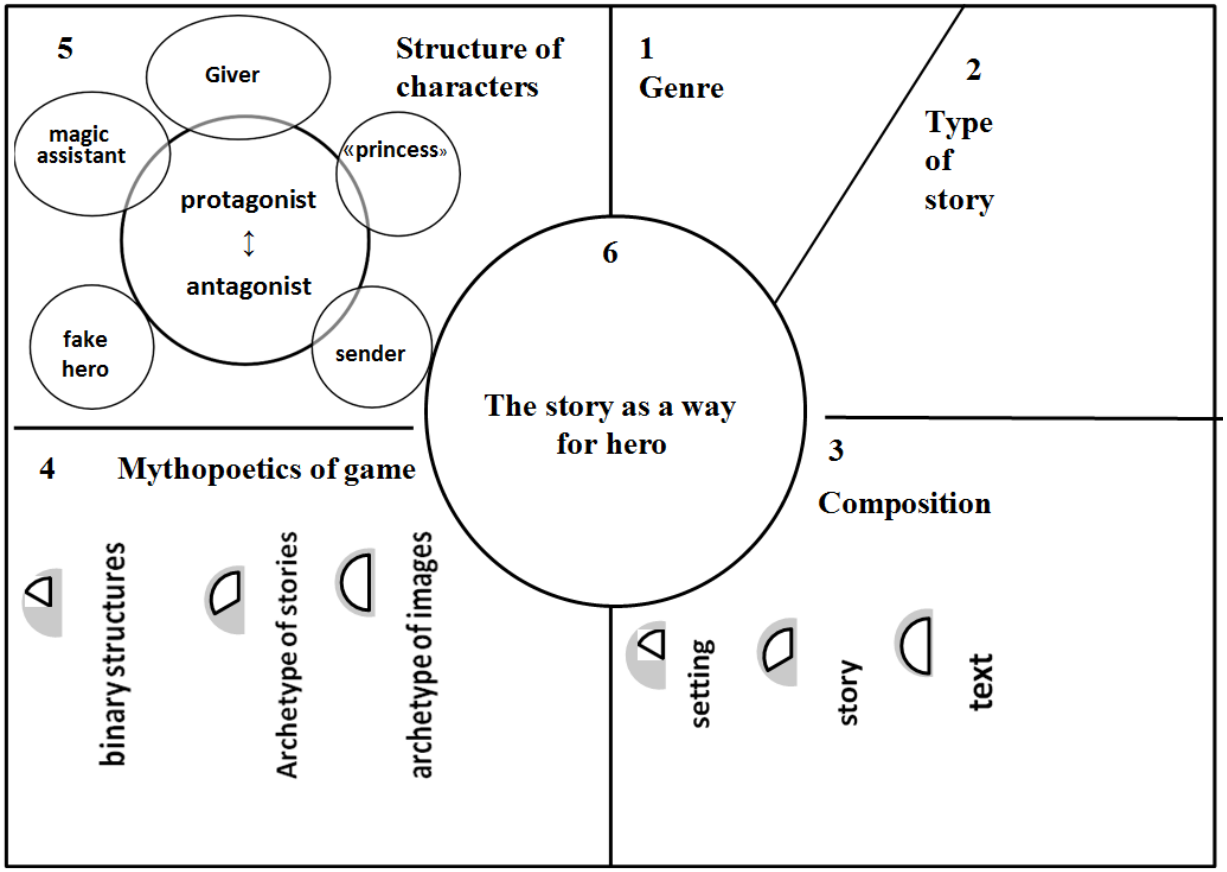

Fig. 5. Canvas of Narrative

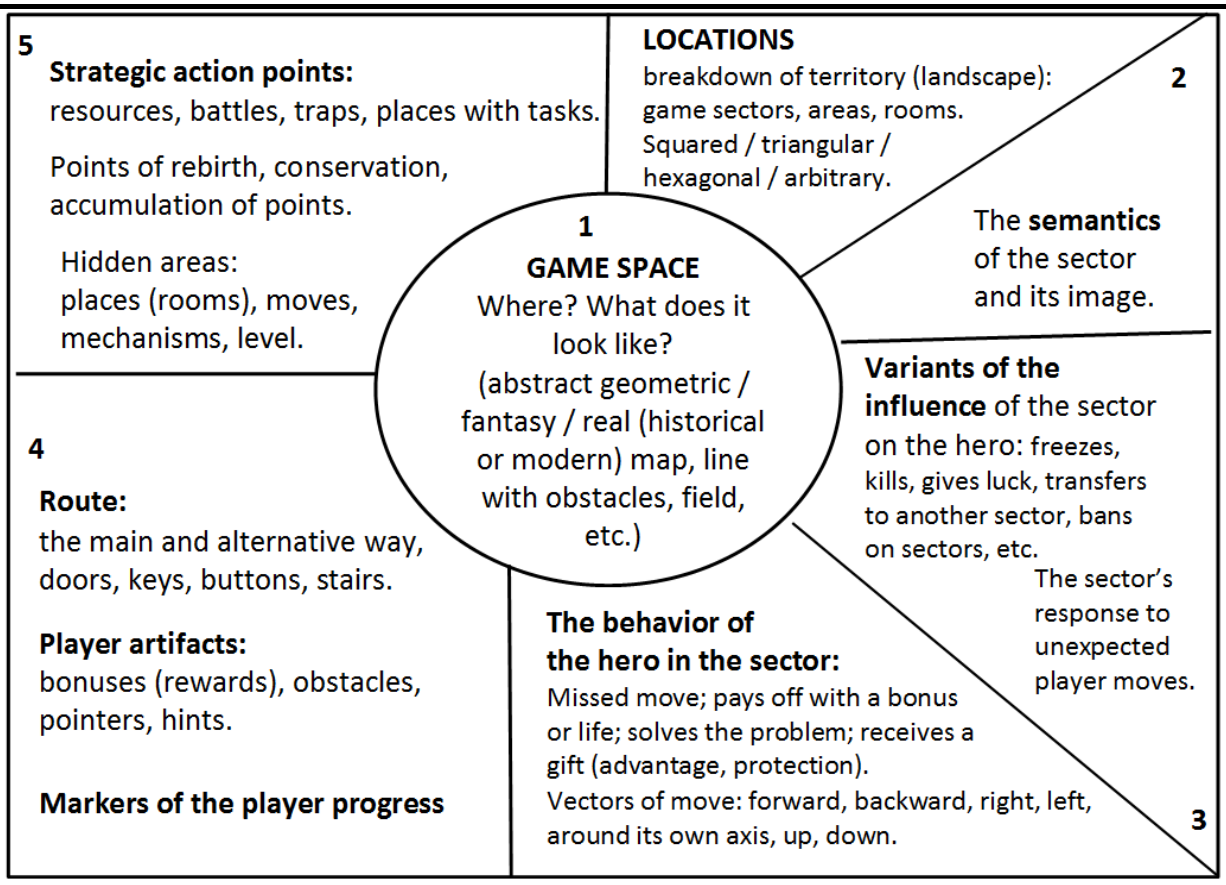

Fig. 6. Canvas of Game World

WHAT ARE THE LEVEL CHANGES ?				
AESTHETICS	**TASK**	**PLOT (STORY)**	**ACTION**	
HOW MAKES THE LEVELS?				
Exterior: Surroundings: seasons, time of day, weather, calendar holidays or events. Locations / other terrain: city, coast, desert, mountain roads, etc. Heroes: clothes, age.	**Magnification:** more tasks more functions more space / gaming field; more heroes more players (new game play), more weapons more enemies	**Complication:** New features and capabilities: new types of weapons, new rights and actions, new missions) New limitations and risks: temperature, types of enemies or their capabilities, new rules. New awards and bonuses. Score (Scoring System)	**Plot (narrative) - new turns in the development of the plot (*history)*** *Suddenly ...* *It turns out ...* *Meanwhile...* *To be continued* ...	**Acceleration / speed-up**

Fig. 7. Canvas of Game Level

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We presented here some examples of games.

Game "Communicatium" or "Overthrow the Great Tyrant" (discipline "Theory of Communication") is a quest logical game for those who want to acquire communication skills for successful interaction. In the game, it is necessary to give correct answers to thematic questions on the theory of communication for the moving between stages.

Game "Subconscious Games" (discipline "Foundations of Psychology") is a quest logical game with map of three locations. Locations reflect the main stages in the development of psychology: the period of antiquity (philosophical), the medieval period (religious-natural) and the period of 19-21 Centuries (scientific).

Game "Creativity and Art" (discipline "a implementation, modeling, 3 – market entry.

Game "Arche" (discipline "Philosophy") is a quest game in which a player communicates with ancient Greek philosophers, resolves their issues and discovers the primary elements of the world: water, fire, atoms. The player collects "wisdom" and moves to new levels until he meets the wisest philosopher to defeat him in a dispute.

Game "Kaleidoscope of Advertising" (discipline "Creative Advertising Technologies" for the branch "Information, Library and Archives") is a logical game in which the player creates an original advertisement based on large set of elements: archetype images, artifacts, various characters (fairytale, typical, historical, etc.), styles, phrases and words, fragments of texts, sounds that are shuffled and dealt randomly.

Game "Political Tic-Tac-Toe" (discipline "Political science") is a logical game with historical layers in which players try to seize the territory, successfully responding to questions on political science.

Game "Complaint" (discipline "Fundamentals of Social Work") is a quest game for studying the development of social work at two historical levels: 1th level - until the 20th century; 2nd level – in 20th century.

Game "Möbius Quest" (discipline "Higher Mathematics" for the specialty "Information, Library and Archives") is a quest+logic game with a variety of locations to solve mathematical tasks and transitions between rooms in the form of isomorphic and homeomorphic graphs, graphs of a functions, Euler-Venn diagrams, Möbius Letters, Klein Bottles and projective planes.

Game "Bubble words" (discipline "Ukrainian language in the professional direction") is a logical+shooter game in which the teacher-player blows bubbles with words, and the student-player tries to hit the target words of the Ukrainian language.

Game "Vocabulary style and fashion show" (the discipline "Ukrainian language in the professional direction") is a logical game of text stylization, whereby the clothes of the characters change depending on the choice of words: business suit, casual wear, scientists clothes, historically artistic costume, wear of religious identity. If a player incorrectly chooses a stylistically colored word, he puts on a meaningless and comic costume.

Game "Communicatium" or "Overthrow the Great Tyrant" (discipline "Theory of Communication").

Canvas of psychotypes of players & Aesthetics:

- Player type – "Socializer", since the goal of the game is to acquire communication skills for successful interaction.
- Aesthetics components – "Challenge", "Fellowship".
- Fun – "Social", "Serious".
- Canvas of Player's needs in Control, Information and Action.
- The prevailing Needs of the player is for information (NI1, NI2) and control (NC4, NC5).
- Genre – quiz, collectible game (gathering the teams, collecting points for answers)

Canvas of Game Mechanics & Dynamics:

- Action mechanics – searching for a correct answer.
- Mechanics of victory conditions – becoming the first to create a team of five people, defeating the "Big Tyrant" so that team members simultaneously answer to his question.
- The Mechanics of luck – a random selection of questions from the theory of communication.
- If two or more players answer the same question correctly, they create a team ("Create" mechanics). If none of the team members answered the question correctly, the team is destroyed ("Destroy" mechanics). If at least one of the team members answered the question correctly, the team is saved and can take on a new member who also answered correctly ("Avoid" mechanics).

Canvas of Narrative:

- The Plot type – unilinear, cumulative.
- History – the hero (or team) advancement towards the "Overthrow of the Tyrant" event.
- Binary oppositions: "friend-or-foe" (if not in a team, then a foe), "correct-or-not".
- Characters: protagonist - team, antagonist (tests, interferes) – Big Tyrant

Canvas of Game World:

- The Game World – fantasy, the Universe of the Big Tyrant.
- Game boundaries – the field with the players' avatars, where their gathering in teams is shown.
- Player progress is presented by his spot in the team and the number of personal bonuses for correct answers.

Canvas of Game Level:

- team gathering,
- answering to the questions of the Great Tyrant.
- Levels: acceleration of the time allotted for the answer, sophistication of questions.

Game "Arche" (discipline "Philosophy").

Canvas of psychotypes of players & Aesthetics:

- Player type – "Seeker", "Polemicist".
- Aesthetics component – "Discovery".
- Fun – "Heavy".

Canvas of Player's needs in Control, Information and Action:

- NI1, NI2, NI3.
- Genre – quest, puzzle.

Canvas of Game Mechanics & Dynamics:

- Action mechanics – searching for a correct answer.
- Mechanics of victory conditions – resolving all the issues, discovering all the primary elements.
- The Mechanics of luck – hints.

Canvas of Narrative:

- The Plot type – unilinear, concentric, with clear causal linkages between episodes.
- History – the hero's journey to Ancient Greece, where he communicates with the ancient Greek philosophers, resolves their issues and discovers the primary elements of the world – water, fire, atoms

Canvas of Game World:

- Game World – Ancient Greece.
- Locations – the places of life of famous philosophers, their issues.
- Player progress is shown by his place on the map (map of Ancient Greece), the number of primary elements discovered.

Canvas of Game Level: the player collects "wisdom" and moves to new levels until he meets the wisest philosopher to defeat him in a dispute.

Game "Bubble words" (discipline "Ukrainian language for vocational branches").

Canvas of psychotypes of players & Aesthetics:

- Player type – "Destroyer".
- Aesthetics component – "Challenge".
- Fun – "Easy".

Canvas of Player's needs in Control, Information and Action:

- NA3, NI1, NI2.
- Genre – arcade, quiz.

Canvas of Game Mechanics & Dynamics:

- Action mechanics – select&shoot.
- Mechanics of victory conditions – choosing the correct answers in accordance with the rules submitted.
- The Mechanics of luck – randomly blowing bubbles with the words
- The term "shoot" is not considered in the literal sense, but invites the player to touch an object located at a distance, or somehow influence it. At the same time, the "Destroy" mechanic offers the player not only to destroy the objects of the game, but also to collect or catch them for further targeted collection and accumulation.

Canvas of Narrative. Plot and history are not required.

Canvas of Game World. Game space – a window where "bubble-words" are blowing; window with task, window with statistics of dialed correct answers.

Canvas of Game Level:

1) Increasing the speed of response options supplying (blowing "bubble-words").
2) Increasing the number of options (words).
3) Changing the theme of the discipline.

The applying of the proposed series of canvases allowed teachers not only to ascertain the target audience (students), but also to understand their needs and interests, to correlate them to the requirements of academic discipline. At the same time, the use of canvas made it possible to create sufficiently dissimilar games that differ in genres, game worlds, histories and rules.

Conclusions and perspectives of further research. The proposed series of game design canvases is a kind of springboard to rising the intuition and creativity of game developers. It could be used in individual and group work as a tool for cooperation. Canvas document the progress and results of the creative process, stimulate it, while being both clues and guides in game design. In this case, the canvases correspond to the principles of visibility and intuitive clarity, conciseness, renewability, transparency and variability. They structure the game development process, reduce the time taken to generate game designer ideas and to contrive game mechanic and dynamics. Canvases are an additional road map toward making creative decisions in game design. They can be a convenient basis for automating the process of latter, a paper prototype of the game and the game itself.

Subsequently, it is planned to develop Canvas Balance and Canvas Ethical Dilemma to regulate the game with regard to balance and ethics by detecting deficiencies in the gameplay components, controlling the achievement of the necessary aesthetics and solving ethical conflicts, adjusting feedback between channels so that, ultimately, create socially useful human oriented product. The algorithm for routing the components of the canvases also will be developed, allowing to automate the process of filling out sections of the Game Design Document. It seems promising to use a series of canvases for gamification of the game design process provided that each canvas is a location with quest tasks, the variability of which depends on the potential and attitude of the leader and team. In such a case each cell of the canvas is an object for the game designer's mechanics, and the variants of the game desing solutions can be the result of a a carefully considered choice of characteristic combination within the canvas and the result of randomness mechanics by using dices and playing cards with content of the canvas.

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ОСОБЛИВОСТІ ВИКОРИСТАННЯ КАНВА-ОРІЄНТОВАНОГО ПІДХОДУ ПРИ ПРОЕКТУВАННІ КОМП’ЮТЕРНИХ ІГОР

Анотація. *У статті пропонується канва-орієнтований підхід до проектування комп’ютерних ігор. Обґрунтовується впровадження в творчу роботу по розробці ігор динамічного циклу взаємопов'язаних канв, які документують хід і результати творчого процесу, стимулюють його, надаючи підказки та забезпечуючи маршрутизацію творчих шляхів в*

розробці ігор. Дається авторське визначення канвізації проектування комп'ютерної гри як процесу створення візуальної абстрактної структури, узагальнюючої кейсові завдання (задачу, яка містить в собі напрацьований досвід) для вирішення поставлених завдань і створення унікального креативного продукту. Методика багаторівневого канва орієнтованого проектування містить наступні канви: "Canvas of psychotypes of players & Aethteticts", "Canvas of dynamics and game mechanics", "Canva Narrative", "Canvas of the game world", "Canva -evel". Канви структурують процес розробки гри, скорочують час на генерацію ідей дизайнера гри, проектування ігрових механік і динамік, балансування гри і контролю досягнення необхідних естетик. Канви є додатковим інструментом для прийняття рішень в творчому шляху проектування гри. Можуть бути зручною основою для автоматизації процесу проектування, паперовим прототипом гри і самого процесу проектування як гри у жанрі квест, в якій кожна канва є кімнатою із ігровими завданнями, варіативність виконання яких залежить від потенціалу і настрою лідера і команди.

Ключові слова: *канва-орієнтоване проектування комп'ютерної гри; гейміфікація; креативний продукт; автоматизація творчого процесу*

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ОСОБЕННОСТИ ИСПОЛЬЗОВАНИЯ КАНВА-ОРИЕНТИРОВАННОГО ПОДХОДА ПРИ ПРОЕКТИРОВАНИИ КОМПЬЮТЕРНЫХ ИГР

Аннотация. *Предлагается канва-ориентированный подход к геймдизайну. Обосновывается внедрение в творческую работу по разработке игр динамического цикла взаимосвязанных канв, которые документируют ход и результаты творческого процесса, стимулируют его, одновременно являясь и подсказками, и маршрутизаторами в разработке игр. Дается авторское определение канвизации геймдизайна как процесса создания визуальной абстрактной структуры, обобщающей кейсовую задачу (задачу, содержащую в себе наработанный опыт) для решения поставленных задач и создания уникального креативного продукта. Представлены проекты "Canvas of psychotypes of players & Aethteticts", "Canvas of dynamics and game mechanics", "Canva Narrative", "Canvas of the game world", "Canva –Level". Канвы структурируют процес разработки игры, сокращают время на генерацию идей геймдизайнера, проектирования игровых механик и динамик, балансирования игры и контроля достижения необходимых эстетик. Канвы являются дополнительным инструментом для принятия решений в творческом пути геймдизайна. Могут быть удобной основой для автоматизации процесса геймдизайна, бумажным прототипом игры и самого геймдизайна как квестовой игры, в которой каждая канва является комнатой с игровыми заданиями, вариативность выполнения которых зависит от потенциала и настроя лидера и команды.*

Ключевые слова: *канва-ориентированный гейм дизайн; геймификация; креативный продукт; автоматизация творческого процесса*