

32. THE PROCESS OF CREATING A COMPUTER GAME

Galkin V. A., Chernyakov A. S.

*Belarusian State University of Informatics and Radioelectronics,
Minsk, Republic of Belarus*

Riabykh V. A. – Lecturer, Master of Arts

This article discusses the main stages of creating a computer game, including choosing an idea, developing gameplay, programming, graphics, and testing. The article provides an overview of the key tools and technologies necessary for the successful implementation of the game project.

In the modern world, the video game industry is developing at a rapid pace. Games are not only entertainment, but also complex software products that require interesting approaches. Creating a computer game involves several key stages, from the idea to the final release.

The main stages of game development include choosing an idea and concept, which is crucial before starting. It is necessary to define the genre, plot, and style (2D or 3D) while keeping mechanics simple, especially for a first project, to focus on understanding the development process. A platformer or a puzzle game are good starting points, as they rely on straightforward mechanics [1]. Prototyping helps test core gameplay elements and measure player engagement. This can be done through paper sketches or simple digital models, allowing developers to analyze strengths and weaknesses early in the process. Creating a prototype also helps visualize the game's structure and refine initial ideas before moving into full development.

Designing gameplay and mechanics requires careful consideration of how the player interacts with the world, the objectives they pursue, and the challenges they face. For example, in a platformer, players jump across platforms and collect coins. Starting with basic mechanics makes it easier to fine-tune the experience and gradually introduce complexity. Choosing the right development tools is essential, particularly for beginners. Popular game engines like Unity (C#), Unreal Engine (Blueprints or C++), and Godot (GDScript) are free and provide extensive educational resources.

Creating graphics and soundtracks enhances the overall experience. Characters and objects can be designed using software like Aseprite for 2D or Blender for 3D. Good visuals make a game more appealing, and those who struggle with drawing can use free online resources with ready-made sprites. Similarly, soundtracks and effects play a crucial role in immersion [2]. Programs like FL Studio, FMOD, and Wwise allow developers to compose music and implement dynamic audio elements that respond to in-game actions. Optimizing assets ensures that visuals remain high-quality while maintaining performance. Artists must balance graphical fidelity and efficiency by using techniques such as LOD (Level of Detail) models and polygon optimization to prevent unnecessary performance issues.

Programming and logic development involve implementing core mechanics such as character movement, interactions, and physics-based actions like object collisions. Those without prior coding experience can start with simpler languages like GDScript in Godot or use visual scripting tools. Balancing the game is another essential step to ensure a fair and engaging experience. Mathematical modeling helps fine-tune elements like the in-game economy, character abilities, and difficulty progression. Developers often use spreadsheets and simulation tools to predict how gameplay changes will impact overall balance.

Before launching, testing and debugging are required to identify and fix potential issues. Developers play the game themselves or invite others to test it, gathering feedback and ensuring smooth performance without crashes or freezes. Performance testing is especially important to ensure the game runs at a stable frame rate on different hardware configurations. The final step is releasing and promoting the game. Once completed, it can be published on platforms such as itch.io for indie developers or Steam for larger projects. To attract players, a well-crafted description, high-quality screenshots, and an engaging trailer are essential. Marketing efforts, such as social media promotion or collaboration with influencers, can further increase visibility and help the game reach a wider audience.

Creating a game is an exciting process that is accessible to everyone. The key is to start small, use simple tools, and keep learning. With time, it's possible to develop more complex projects and even launch a commercial game. Every step of making a game requires careful attention and planning to ensure the final product is of high quality. Patience and persistence are essential, as game development involves constant problem-solving and iteration.

References:

1. *Game development from scratch: a step-by-step guide.* [Electronic resource] – Mode of access: <https://gamedev.net>. – Date of access: 03.02.2025.
2. *Creation of 2D games on Godot.* [Electronic resource] – Mode of access: <https://godotengine.org>. – Date of request: 03.02.2025.