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IT 265 - Game Architecture & Design
Case Study 1: Platformers 2D vs. 3D (Game Mechanics)

Sonic the Hedgehog (Sega Genesis) vs. Super Mario 64 (Nintendo 64)

Since this case study is about platform games, it is important to know what that entails. A platform game belongs to a video game genre where game characters jump to and from suspended platforms. The player must be able to control these jumps as well as fall off or miss platforms. A platform game can either have two or three dimensions, but there are some inherent differences in the game mechanics between the 2D and 3D versions. For this match up, I chose to compare “Sonic the Hedgehog” for Sega Genesis as the 2D platformer, and “Super Mario 64” for the Nintendo 64 as the 3D platformer.

Since “Sonic the Hedgehog” is a 2D side scrolling platformer, the camera is always in the same place relative to Sonic. As Sonic moves through the level, he moves around on the screen, but the camera automatically follows him as he runs through it. The player has no control over the camera’s position relative to Sonic.

In “Super Mario 64” however, the player has much more control over the camera. In this game, Mario is always horizontally centered on screen. By using the C buttons, the player can change the camera position relative to Mario. The camera can be moved left and right around Mario as well as zoom in and out. The player doesn’t have complete control over the camera in that it doesn’t move smoothly, but rather moves to predetermined angles. The game also tries to auto position the camera as Mario runs through the levels so that the player doesn’t have to constantly reposition the camera, but it’s not perfect. There are also some spots in the game where the level is designed in a

way to prevent sideways movement of the camera. In these areas, only zooming in and out is possible.

Movement in “Sonic the Hedgehog” is pretty simple and typical of many 2D platformers. Sonic is moved back and forth across the screen using the left and right buttons on the controller’s D-pad. Jumping, which is only a single jump, is achieved by pressing either the A, B, or C buttons on the controller. While Sonic is standing still, down on the D-pad will cause Sonic to crouch, but if Sonic is moving, it will cause him to roll into a ball. Sonic’s speed can also be increased by jumping on a power-up monitor showing red running sneakers.

There are a few ways to get from one platform to another in “Sonic the Hedgehog.” Sonic can use a basic jump to get to the next platform as well as use springs or spring boards which are located in strategic locations. Sonic can also use bumpers to help move around, especially in areas where the platforms are spread far apart. If Sonic is below a platform, he can jump through it and land on top of it. Sonic can also use some arc-shaped ramps to launch himself into the air, especially while using the running sneakers power-up.

In “Super Mario 64,” movement is a little more complex. Mario has the ability to freely roam his 3D environment in any direction he chooses, unlike earlier 3D platforms which prevented diagonal movement. This is assisted by the analog control stick on the N64 controller. A simple jump is performed using the A button. These simple jumps, if timed correctly, can be repeated to perform a double and triple jump that lets Mario reach higher heights. Mario also has the ability to jump backwards and can long jump by

crouching right before jumping by pressing the Z button first. Mario also has a punch attack, or kick if jumping, by pressing the B button.

Like Sonic, Mario has multiple ways of reaching different platforms. In addition to the single, double, triple, and long jump, Mario can also jump off walls by jumping as he hits it. There are also cannons located around each of the worlds that Mario can use to reach areas as well as the wing hat to glide. Unlike Sonic, Mario can't jump through platforms, however the invisibility hat will allow him to walk through some walls. Because of the 3D environment, jumping from platform to platform is more difficult than in a 2D environment. Distances and direction of movement aren't always clear and it is much easier to miss the next platform. However, the shadow directly under each object does make this a little easier.

Saving isn't an option in "Sonic the Hedgehog" and there are no passwords. If the player wanted to stop and continue where they left off, they could not turn off the system. The game must be finished in one sitting as the player will start from the beginning of the game each time they play. The only option the player has if they don't want to start from the beginning of the game is to use the level cheat. By using this cheat, the player can start from any level, but will still have zero points and three lives. "Sonic the Hedgehog" does have checkpoints though. As Sonic progresses through each level he can activate checkpoint posts which will allow Sonic to start there if he dies.

Saving in "Super Mario 64" is a different story. Every time Mario recovers a power star, he has the option of saving. In fact, the "Super Mario 64" cartridge can hold four simultaneous games. Because the player has the option of saving after recovering

each power star, there are no checkpoints in any of the worlds. If Mario dies, he is warped out of the level and must reenter it at the beginning.

Although the 2D and 3D game mechanics differ slightly, they are essentially the same. The player jumps from one platform to another in order to complete an objective. How that happens differs between 2D games and 3D games, but it also differs between games in each of those sub-genres. This comparison is also not entirely fair as “Sonic the Hedgehog” was release in 1991 and “Super Mario 64” was release in 1996. A lot had changed in the game industry and in the platformer genre during those five years. However, there really isn’t an entirely fair way to do it.