Technical Description of the Playstation Dualshock 4 Controller

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Historical Background of Sony Playstation

Sony Interactive Entertainment is a multinational video game and digital entertainment company known for completely transforming the tech industry with their innovative Playstation console line and record breaking video games. Launched under the subsidiary brand, Sony Playstation, these consoles presented photorealistic 3D gaming and gameplay, which had never been seen before, taking gaming out of the 80's arcade style and setting off a decade of rapid progression in gaming technology. Although the brand was established in 1994, the project was planned almost as early as 1988. Originally, it was supposed to be a collaboration between Sony and Nintendo, but the deal was broken due to disputes on profit sharing.

Consequently, Ken Kutaragi, a Sony executive, was delegated as the leader of the Playstation project. Kutaragi had a brilliant vision and striking ideas, but his dreams were rejected by the Sony Board in 1992, and he was even transferred to the Sony Music branch. This was largely because developing 3D polygon graphics, a foreign terrain at the time, seemed risky and unrealistic (Racoma, 2019). Due to Kutaragai's persistence, the Sony Board eventually approved of the project and the Playstation was introduced in December 1994. The console was immediately successful, with 4 million units sold by April 1997. After that, Playstation continued to release upgraded versions of the original console, starting with Playstation 2, then the Playstation Portable (PSP), Playstation 3, Playstation 4, Playstation 4 Pro, and more recently, the Playstation 5 (ComputerGarage, 2022).

Historical Background of Sony Playstation Controller

The history of controllers dates back to the late 1950s. Formerly, they were very simple and unembellished, with few parts and functions. For example, in 1958, one of the first multiplayer video games, Tennis for Two, was created by Physicist William Higinbotham. The controller for this game only had two components: a singular button and a small knob. Years later, in 1972, an analog controller featuring two dials used for horizontal and vertical movement was developed for the first home video game console, the Magnavox Odyssey 100 (Witmore, 2008). Throughout the 1980s-90s, new controllers with a variety of features, such as joysticks, number pads and steering wheels, continued to be released along with complementary video game systems. However, their faulty, ineffective designs were causing a saturated gaming market and low demand for video games. According to Wtimore (2008), the market improved once the

Nintendo Entertainment System came out with the Robotic Operating Buddy, or R.O.B., a singular gaming console that featured the classic four directional arrow pad and duo buttons. This design was small, compact, and usable.

The first Playstation controller was released in 1994 as a way to play the games on the Playstation platform. The design was created by Teiyu Goto and inspired by the Super Nintendo Entertainment System (SNES) controller, an upgraded version of R.O.B. which debuted in 1990. Goto considered the fact that many SNES players would be upgrading to the Playstation and might be confused trying to learn an entirely new layout with unfamiliar buttons (Bankhurst, 2020). Thus, taking inspiration from the SNES was a practical decision. As previously mentioned, the first Playstation system garnered much success, foreshadowing the development of the 2000 Dualshock 2 Controller, the 2007 Dualshock 3 Controller, and finally, the 2013 Dualshock 4 Controller, which was considered a huge improvement compared to past controllers due to its "capacitive front touchpad and motion detection" (Bankhurst, 2020).

Product Specifications

Characteristics

The Playstation Dualshock 4 is a PS4 controller, primarily used to play modern video games, such as shooters and action games, on the Playstation 4 and PC. The controller is necessary because it's the only way the user can interact with the console and play the games. They are essential to providing the user with an immersive experience.

The controller has a sleek, comfortable design that can be gripped with two average sized hands. There is a convenient positioning of the buttons to match the fingers and palm, and the shape is generally large and round, which makes it easier to hold for longer periods of time. Users' fingers can spread out and confidently grasp onto the controller. The outer shell is made out of plastic and rubber materials, and the interior has metal components. According to Playstation (2022), the controller also comes in a diverse set of colors: default black, white, silver, gold, red, blue, green camouflage, as well as white, blue, and red transparent "crystal" variants.
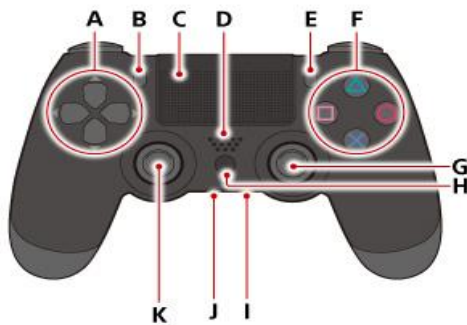
Exterior Components

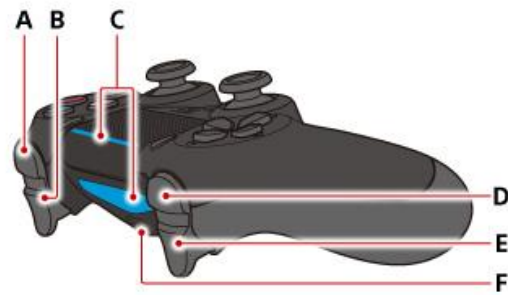Figure 1: Dualshock 4 Front

View Diagram (Playstation, 2021)

Figure 2: Dualshock 4 Side View

Diagram (Playstation, 2021)

A) *Directional pad/buttons*

B) *SHARE button*

C) *Touch pad/Touch pad button*

D) *Speaker*

E) *OPTIONS button*

F) *triangle button/circle button/cross button/square button*

G) *Right stick/R3 button*

H) *PS button*

I) *Stereo headset jack*

J) *Extension port*

K) *Left stick/L3 button*

A) *R1 button*

B) *R2 button*

C) *Light bar*

D) *L1 button*

E) *L2 button*

F) *USB Port*

Please refer to Figures 1 and 2, the front and side view diagrams of the controller, in order to identify the position of each button and their individual purposes. Labels K and G on Figure 1 display the left and right analog sticks. These are used to control movement and positioning in game. They are also the L3 and R3 buttons, which can be activated by pressing down on the corresponding stick. In contrast to the Dualshock 3, which placed the twin analog sticks excessively close together, these improved analog sticks are farther apart and have concave tips that let the center of your thumb rest on its surface. Additionally, the smaller size allows for a greater range of motion.

The D-Pad, or Directional Pad, is on the left side of the controller, as shown on Label A on Figure 1. Similarly to the analog sticks, the D-Pad can be used for movement, but it is moreso meant for navigating through the options in the console or game, such as menus or settings, rather than controlling a character. They can also be assigned different controls depending on the game and the user's preference.

In contrast, the right side button pad utilizes a triangle, square, cross, and circle button in order to control different actions in the game (see F on Figure 1). On the playstation itself, these buttons can be used to open or close an application, to accept or decline, and to go forward or go back. Within the games, they can be used to punch, attack, continue or pause, etc. These buttons are not too thick and not too thin, allowing for an easy and satisfying click that also has a pleasant sound.

The left and right shoulder buttons, which are on the top of the controller, are the L1, L2, R1, and R2 controls (see Figure 2 and 4). They are curvy and slim, and can be held down for longer periods of time. The shape also concaves to fit the roundness of a fingertip. These are different from the D-pad buttons because the amount of force used affects the resistance, which goes on to affect the gameplay.
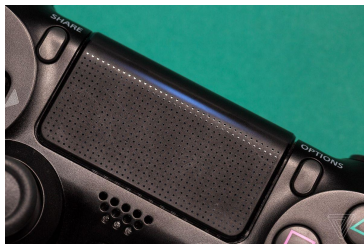

Figure 3: Dualshock 4 Touchpad (Krales, 2019)

Figure 4: Dualshock 4 Top View (Krales, 2019)

Figure 5: Dualshock 4 Bottom (Krales, 2019)

The touch pad is a new, unique feature of the Dualshock 4 that hasn't been implemented in previous versions (see Figure 3). Its large rectangle space is hard to miss, sitting right in the center of the controller. The touchpad is essentially another button that controls an action, except that it detects touch operations, like finger swipes or taps. It has potential, but so far, the touchpad is not fully utilized by game developers and can sometimes fail to register touches.

Next is the integrated light bar, which is used as an indicator or warning for a specific

event (see Figure 4). In an extensive review, Polygon (2013) elaborates that the light "glows blue for the primary connected player and changes colors based on the order in which it's synced to the console". The video game being played can also have control over the light bar, flashing red when danger is near or a player is low on health. When the light bar glows amber, that means the controller is charging. Although the light bar adds to the overall experience of the PS4 gameplay, some users find it unnecessary and irritating, especially because it can't be disabled.

The Dualshock 4 Controller also has built-in speakers that relay in-game sounds, improving the gaming experience. They are located just above the PS button, in the middle of the analog sticks. These speakers add onto the music and sound effects that come from the TV or monitor. The PS button is also an essential outer component. This button is used to turn on the controller (see Figure 5).

The Dualshock 4 Controller has functioning connectivity features. On the bottom of the controller, there is a 5 mm stereo headset jack used to plug in headphones and headsets in case users want to listen to the game audio privately or communicate with other players using a microphone. Next to the audio jack is an extension port for additional accessories and devices (Stewart, 2022).

Interior Components

Figure 6: Motherboard with
Analog Sticks (Wong, 2018)

Figure 7: Plastic Contact Board
(Devnol, 2020)

The interior components of the controller help the exterior components function properly. Firstly, underneath the two button pads are conductive rubber gaskets. Whenever the user presses a button on either pad, these rubber gaskets push against a flexible, insulated plastic contact

board that has several sets of wires (see Figure 7). The conductivity of the rubber gaskets allow electricity to flow in between these wires, which communicates to the main circuit board what action will be taken on the PS4 console (Tablante, 2020).

The analog sticks work due to an interior mechanism as well. The joysticks on the circuit board are constricted into a small metal box, which contains two brackets, one red and one blue, called followers that change the up, down, left and right movement of the analog stick (see Figure 6). Then, a component attached to the followers, called a potentiometer, measures how much the joystick is rotating. These components work together to help the joystick move based on the user's control. Below this ensemble is a spring and button for when the user clicks the analog stick (Tablante 2020).

One important function is when the controller vibrates in order to imitate a sudden event in game, making the gaming experience much more immersive. Within the handles of the controller, there are motors attached to heavy weights. When these motors spin, the weights cause the controller to vibrate.

The main circuit board is in the midframe of the controller (see Figure 6). On top of it there are many individual components that work together to operate the device. These include the microcontroller unit, which is considered the "brains" of the controller, the two analog joysticks, a wireless communication microchip, an antenna, and others (Tablante, 2020). Similarly, the backside also has important components, such as the "highly sensitive built-in accelerometer and gyroscope microchip [that] detect the motion, tilt and rotation of your…wireless controller" (Playstation, 2022). These two components give the Dualshock 4 controller improved motion sensors, which adds physical movement to the users' gameplay. Below the circuit board is the battery. Finally, there is the daughterboard, which contains the MicroUSB port and multicolor LED lights which are used to flash the light bar (Tablante, 2020).

Pairing the Device/Bluetooth

Since the Dualshock 4 Controller is wireless, users must pair it with their PS4 system. In total, four controllers can be paired with one console. Each controller will be assigned with their own color, which will glow from the light bar. According to Playstation (2022), in order to pair the device, the user has to connect the controller to the PS4 using a micro USB cable and then

press the PS button on the controller. After the controller turns on, it should be automatically paired, and the USB cable can be unplugged.

When in pairing mode, the controller uses Bluetooth to connect to other Bluetooth devices, such as a PC, phone, or tablet. In order to use Bluetooth, press and hold the PS button and the share button simultaneously. The share button is on the left side of the touchpad. Please refer to Figure 1 in order to locate these buttons. Afterwards, the light bar will start flashing, which will signify that the controller is in pairing mode. To connect, simply choose "Dualshock 4 Controller" on your other device's bluetooth when it searches for pairing devices. To signify your success, the controller's light bar will no longer flash.

Charging

The USB cable can also be used to charge the controller when it's plugged into the PS4. However, the PS4 must be on or in rest mode. The light bar will indicate that it's charging by flashing an orange light. Once the charging is complete, the light stops flashing and stays a constant bright blue color. The controller takes about two hours to fully charge. Once it is fully charged and paired with the PS4, users can begin to play with it. Unfortunately, the controller only has about 7-8 hours of battery life, which is a sharp decline from the previous PS3 controller, which had almost 30 hours.

Conclusion

Thank you for learning about the Dualshock 4 Wireless Controller. Be prepared to embark on thrilling adventures and immerse yourself in new worlds, dark storylines, and competitive multiplayer lobbies, simply by turning on your PS4 and Dualshock 4 Controller. In order to do so, make sure to pair your device with the PS4 using a USB cable and pressing the PS button. Remember to keep the controller fully charged. The twin analog sticks, D-pad, shoulder buttons, and touchpad can all be used as controls to play the video games.

References

Racoma, B. (2019, May 10). *How Sony PlayStation Expanded Around the World.*
DayTranslationsblog. https://www.daytranslations.com/blog/sony-playstation-world/
#:~:text=Arguably%2C%20Sony%20PlayStation%20revolutionized%20gaming,
support%20its%203D%20gaming%20requirements.

ComputerGarage. (2022). *The History Of PlayStation: How The Game Console Has Evolved.*
Computer Garage. https://computergarage.org/the-history-of-playstation-how-the-game-
console-has-evolved.html

Witmore, C. (2008, December 22). *The Game Controller: From the Beginning.* 13 Things.
https://www.brown.edu/Departments/Joukowsky_Institute/courses/13things/7643.html

Bankhurst, A. (2020, April 8). *The Evolution of the PlayStation Controller.* IGN Entertainment.
https://www.ign.com/articles/the-evolution-of-the-playstation-controller

Playstation. (2022). *Dualshock 4 Wireless Controller.* Playstation.
https://www.playstation.com/en-us/accessories/dualshock-4-wireless-controller/

Playstation. (2021). *Playstation4 User's Guide: Dualshock 4 Wireless Controller.* Playstation.
https://manuals.playstation.net/document/en/ps4/basic/pn_controller.html

Krales, A. (2019). *Dualshock 4 Controller* [Photograph]. The Verge.
https://www.theverge.com/circuitbreaker/2019/1/31/18205524/playstation-4-dualshock-
touch-pad-button-pause-controller

Polygon. (2013). *Controller Dualshock 4*. Polygon.
https://www.polygon.com/a/ps4-review/controller

Stewart. (2022). *DualShock 4 Review.* https://www.gamingscan.com/dualshock-4-review/

Tablante, T. [Branch Education]. (2020, August 11). *How do Video Game Controllers Work? ||*
        Exploring a PS4 Game Controller [Video]. Youtube.
            https://www.youtube.com/watch?v=vQesgAtr2e4

Wong, J. (2018, November 29). *Dualshock 4 Teardown.* Ifixit.
            https://www.ifixit.com/Teardown/DualShock+4+Teardown/116769

Devnol. (2020). *DualShock 4 Button Flex Board Replacement.* Ifixit.
            https://www.ifixit.com/Guide/DualShock+4+Button+Flex+Board+Replacement/121986

Audience Profile Sheet

Kind of Reader: Primary _✔___ Secondary ____

Reader's Name: Teenagers and adults ranging from 13-44 years old, gamers who enjoy playing on the PS4 and are interested in purchasing it

Reader's Job Title: could be unemployed, or in the workforce in any job or field

Education: High School, and/or bachelor's degree.

Professional Experience: unknown

Job Responsibilities: unknown

Personal Characteristics: creative, curious, problem solving

Personal Preferences: unknown

Cultural Characteristics: unknown

Attitude Toward the Writer: appreciation for the assistance

Attitude Toward the Subject: Interested in their entertainment preferences. Eager to inform them on the product

Expectations about the Subject: They are able to read and understand basic aspects of technology like buttons

Expectations about the Document: n/a

Reasons for Reading the Document: to learn about the dualshock 4 controller, to understand how to use it or whether or not they should buy it

Way of Reading the Document: Skim it _✔__ Study it ____ Read a portion of it ____ Which portion?

Modify it and submit it to another reader ____

Attempt to implement recommendations _✔__

Use it to perform a task or carry out a procedure ____

Use it to create another document ____

Other ____ Explain:

Reading Skill: High School English.

Reader's Physical Environment: n/a

Audience Profile Sheet

Kind of Reader: Primary _✔__ Secondary ____

Reader's Name: technology enthusiasts, game developers, technology developers etc.

Reader's Job Title: unknown.

Education: High School, and/or bachelor's degree.

Professional Experience: People who work in technology companies and video game companies.

Job Responsibilities: Creating and developing products for the gaming industry

Personal Characteristics: intelligent, curious

Personal Preferences: unknown

Cultural Characteristics: unknown

Attitude Toward the Writer: n/a

Attitude Toward the Subject: eager to inform the audience about the subject

Expectations about the Subject: The subject is most likely familiar with most technology terms and components.

Expectations about the Document:

Reasons for Reading the Document: to study the product and understand how it works for their own personal benefit.

Way of Reading the Document: Skim it ____ Study it _✔__ Read a portion of it ____ Which portion?

Modify it and submit it to another reader ____

Attempt to implement recommendations ____

Use it to perform a task or carry out a procedure _✔__

Use it to create another document ____

Other ____ Explain:

Reading Skill: High School English.

Reader's Physical Environment: n/a

Reflection

For this technical description, my audience was targeted towards consumers looking to buy the Dualshock 4 Controller or the Playstation 4, who are hesitant on their decision and want to know if the product is worthwhile. Additionally, my audience can be owners of the controller, who want to function the device properly, or simply technology enthusiasts who are interested in taking apart the product or observing its features. Since the Dualshock 4 Controller is used to play video games, the audience is most likely teens and adults from 15 to 30 years old. Before, the target audience in the gaming industry were adult males, but many females have also pursued interest in games within the past ten years.

This document was made with the purpose of educating my audience on the Dualshock 4 Controller history, design, features and functions. I wanted to provide a thorough examination of the device so that my readers can fully understand how to use it and how it works. By listing the exterior and interior components, Dualshock 4 users might be able to identify any problems or errors with their device. For example, if the light bar isn't working, users will learn that the multicolor LED lights are the responsibility of the daughterboard, which is behind the main circuit board in the back frame of the controller. Thus, they might realize that their daughter board is broken, and instead of paying for an entirely new controller, they could try to replace that component instead.

My stance on this product is that it's a very impressive and effective piece of technology. As a gamer myself, I have used the Dualshock 4 Controller to play on the PS4 since 2018. I've played many different types of games that utilize the controller in different ways. My first impression was that the smooth, elegant design looked visually pleasing. Immediately, I noticed how comfortably the controller fit in my hand. I enjoyed holding it, wrapping my palms around the handles and letting my fingers naturally fall into place on whichever buttons. I've held XBox controllers before and they always felt awkward and clunky in my grasp due to their large, wide frame. In comparison, the Dualshock 4 Controller is much slimmer. My thumbs are pretty small, but they could easily reach the analog sticks and control them effectively. When playing games, I could repeatedly click buttons without having to press too hard. I also appreciated the light bar, which showed me when the controller was done charging or warned me when something dangerous was coming my way. Overall, I enjoy using the Dualshock 4 Controller and I think that it's worth my money.

The genre of this document is a technical description. A technical description is a piece of text that explains every aspect of an object or process, going into lengthy detail on its outer and internal parts, visual characteristics, purpose, and functions. Technical descriptions are used by people who are looking to learn more about a specific product. This document focuses on the Dualshock 4 Controller, which is complementary to the Playstation 4. I follow the general outline of a technical description. First, I provide historical background on the Sony Playstation brand and controllers themselves. Then, I elaborate on both the exterior and interior components by explaining each of their purposes and the mechanisms that occur in order to help them function, using images along the way to further understanding. Finally, I wrap up the document with a conclusion.

The media is an online, digital google document that can be accessed through a sharing link. I used this medium so that people would have easy access to my technical description. However, were this to be published, the medium would be multimodal since it would be published online as an article or guide, and also distributed physically in printed copies.

The exigence of this document is that I'm very interested in the development of video games and technology. I'm currently a freshman in the Computer Science major, and my goal is to join the technology workforce as a programmer, designer, or developer. I've been inspired by the innovativeness of Playstation and I'm looking forward to the future developments in gaming, such as virtual reality. Controllers are an essential aspect of gaming, and I wanted to learn how the Dualshock 4 Controller functions since I've used it for so many years.

During the process of completing this technical description I've met multiple course learning outcomes. The first one is that I've developed and engaged in the collaborative and social aspects of writing processes. This is mainly due to the peer review exercise I did in class with my group members. We reviewed our drafts together and advised each other on how we can improve and what we did right. Through this exercise I had to communicate with my peers and take their criticisms into consideration. Another course learning outcome I've met is strengthening my source use practices. I learned how to use APA Style formatting and citation. Throughout the document I've paraphrased, quoted, and summarized many sources, but never without properly citing the author and year in parentheses at the end of the sentence. Then, I listed all of my sources in the references page in proper APA format.