The Wii Remote: An Analysis

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      This examination involves the assessment of the Wii Remote, the primary input device of the Nintendo Wii, released in 2006. The Wii was influential in its early use of non-traditional input methods, namely those involving motion control, powered by the technology implemented in the Wii Remote.

      The Wii Remote had the challenge of repurposing already existing conceptual models and building upon them to redefine how to interact with Nintendo's latest console. Its physical shape and placement in the home did most of the work without explicit instruction. The Wii Remote affords being picked up to use, and this is where it borrows from user's already existing ideas of how TV remotes work. Once the console is booted, simply "Point the Wii Remote at the Screen" is displayed. The user picks up the Wii Remote, and points it at the screen, just like any other TV (or other device) remote that they've used. The screen then displays a cursor that follows the spot at which the user is using the remote to point, the user gives it a wiggle and sees the cursor do the same, and the lesson is taught. It is this idea upon which the methods of interaction with all of the console's software is built, and once it is taught the user is able to relate it to other models like laser pointers and other such pointing devices. Nintendo sought to repurpose a set of actions, gestures, and ideas around objects in order to build the model for users to utilize, and this recycling of existing ideas helped to minimize any learning curves or onboarding struggles for the user. (Norman, 2013, p. 26)

      Affordances, as defined by Norman (2013), refer to "the relationship between a physical object and a person […] that determine just how an object can be used.". (p. 11) When applied to the Wii Remote, one can examine the properties of the properties of the device as ones that afford physical interaction. Its size and weight allows for the user to pick up and grip it in several ways. With no wires or other such attached pieces, the Wii Remote affords a total range of movement and uses many of these axes as methods of interaction with the console and its software. These aspects combine to afford, in more granularity, actions like lifting, shaking, twisting, pointing, waving, and more when combined with additional instruction from the software. These gestures also extend to allow for holding the Wii Remote in several orientations, further broadening the possible interactions between the device and user.

Figure 1: Wii Remote Held With One Hand

      Constraints often are used to limit and guide the user toward proper use without requiring vast amounts of peripheral and remembered knowledge. (Norman, 2013, p. 82) In the case of the Wii Remote, the constraints are less physical and more suggestive, while working in tandem with the present affordances. The Wii Remote, at its core interaction, is meant to be held in one of three orientations: held in one hand parallel to the hand and wrist and pointed at the screen (Fig 1), or held with two hands perpendicular to the hand and wrist with each hand on one end of the device (Fig 2). To guide the user to this, the printed text on the remote faces a direction which favors the one-hand orientation, while the bottom of the device shows its peripheral connection port to dissuade user from pointing that part toward the screen.

Figure 2: Wii Remote Held With Two Hands

      For the two-hand use case, the positioning of the buttons favors holding the thumbs above the device toward the ends. The device also features a trigger-like button on the back, which the body of the remote is sculpted around on the rear. This sculpting causes the grip to feel unnatural in cases where the remote is held upside down or backwards. In this case, the correct grips are the ones that feel most natural, which suggests to the user what a proper method of interaction is.

      For a novel method such as the use of the Wii Remote, Nintendo made sure that the feedback built into the system was subtle but constant. This feedback is crucial in order to inform and reenforce the user's actions and methods. The most primary example of this is the

cursor, following the user's pointing gesture to convey the states of the remote like orientation, acceleration, and rotation around an axis. As the cursor glides across the screen and on-screen elements are hovered over, there is a vibration in the remote simultaneously. There is also a speaker built into the remote, to allow for auditory cues and responses from menus, buttons, and games. The combination of visual, physical, and auditory input in response to user gestures allows the system to not only convey when an action is effective or correct, but the lack thereof also informs. If the cursor is not present on screen, the user is able to correct their aim. With no vibration or sound, the user is guided toward another element on the screen. A balance is struck around positive feedback to inform the user of their actions and their effects.

Mapping plays a role in informing the user as well, conveying the relationship between the control and its results. (Norman, 2013, p. 22) On the Wii Remote most interactions are point-and-click, so of course the primary button is the largest and visually different from the others. It is also positioned in such a way as to be easily pressed from either orientation in which the user is holding the device, conveying its utility in every interactive aspect of the system as a whole. Other buttons on the device are presented as opposite pairs, and map to the menus to allow for dichotomous inputs like yes/no or more/less. There is also mapping in the motions to use the remote, namely that to move the cursor one must simply move the remote in the same direction, and in this case the control and results are perfectly symmetrical which provides a strong mapping between action and output.

To call the Wii Remote a step toward a new frontier in hardware and interaction design is an understatement. In a strong introduction of a new conceptual model, it was able to call upon the models of existing devices like TV remotes, laser pointers, and computer input devices in order to introduce users to a new fashion of interacting with a gaming console. In tandem, its affordances and constraints allowed it to suggest its use through hardware and software design alone, which helped carve its intuitive and ubiquitous reputation in the home gaming market. It's feedback also allowed for coaching of users toward proper use, a crucial aspect of introducing a new methodology of input to users. While these principles were adhered to effectively, the mapping present on the remote and in the system overall is hindered slightly by its novelty. To convey a set of new gestures and interactions mapped to a new device is a difficult task, and one that Nintendo was able to meet at a fundamental level with help of software and interaction design. Overall the Wii was able to introduce new dimensions of input and engagement to the home gaming market by paying close attention to the hardware, software, and interaction design exhibited by its crown jewel, the Wii Remote.

References

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