Universal Usability & Social Inclusion in the Video Game Industry:

Where We are Now and Where We Go Next

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Abstract

Nowadays, games are played by everyone. This poses the need for universal accessibility and social inclusion. With a rapid rise into prominence, it is not until recent years that much of the gaming industry has taken a moment for introspection on these topics and how to achieve them. This paper looks at progress the mainstream gaming industry has made in terms of accessibility of its hardware and software, the inclusiveness of its game content, as well as further steps the big corporations can and should take to up their game.

Introduction

The first ever gaming console, fittingly coined Odyssey, debuted 50 years ago, in 1972. From there, the gaming industry hit back to back wins. Atari released their own spin off of the game Pong three years later. Space Invaders invaded the arcades in 1978. The popular gaming software company, Activision, joined the rising party in 1979. Japan's intense and competitive gaming industry reached the United States through the introduction of Pac-Man and Donkey Kong (History.COM Editors, 2017). After a brief crash in the mid 1980s, the gaming industry continued to rapidly grow with influxes of genre experimentation; parallel breakthroughs in technology of consoles and personal computers; and diverse demographics swimming into the consumer pool. Nowadays, gamers can expect hyper realistic graphics, intense plot lines, and new content every year from one company or another. Video games have easily become one of the largest drivers for technological innovation in much of the STEAM industries.

The Problem Space: Current State of Mainstream Gaming

Unfortunately, similarly to how the vehicle industry rose into prosperity, the concept of usability for its users— much less universal usability— was a bit of an afterthought, especially compared to the prospect of "the next big thing." For decades, the majority of mainstream companies within this industry have largely ignored people with disabilities, women, and people of color with the designs of their hardware, software and overall game content.

With regards to hardware and software, there was virtually no accessibility with games in the beginning of the industry, people with disabilities had to get creative with how they played. From the website *Disabilities, Opportunities, Internetworking, and Technology* (DO-IT), Mira Shin claims, "This caused a trend where video game accessibility was made the consumer's responsibility" (Shin). Despite advocacy and written guidelines from IDGA, mainstream companies just did not seem to bother to follow any guidelines for accessibility. A rather interesting claim Shin makes is that around 2018 is when mainstream gaming companies start to change their ways, with optional features for color blindness, closed-captioning, and more notable or company-specific features (Shin). Building off of that, an observational study on accessibility was conducted on video games developed in 2019. For each game, the researchers focused on the presence and effectiveness of its subtitles, visual acuity in

the user interface, color vision deficiency alternatives/options, and controller remapping abilities. As the summary states, “game developers in 2019 typically attempted to make their games as approachable and accessible as possible” (Brown & Anderson, 2021). However, there is still more than enough room for improvement as “annoying oversights like too small text [for subtitles]” occur too often (Brown & Anderson, 2021).

On the other hand, in terms of social inclusion and video game content, of course there are women and people of color in numerous video games, even as main characters. This is largely thanks to vocal communities and indie creators. When it comes to the mainstream gaming companies, it is very similar to saying there are people who own rabbits on the topic of most popular household pets; It simply isn’t as common or much of a focus point for many involved in the conversation. Fortunately, it is growing to be a more and more common aspect of video game design discussion as companies like IGDA make pushes for social inclusion (VB Staff, 2021). Much like with the topic of hardware and software designs, there is still more than enough room for improvement.

It is one step to accept that a change needs to be made. It is a much grander step to discuss and plan how that change is going to be implemented. Nicola Dall'asen, a writer for the website allure.com, provides a powerful caution on the latter step; “When game creators do place focus on women and people of color, it's paramount that they don't [screw] it up” (2020).

In recent years, one can begin to see some large gaming companies make some accessibility and inclusivity improvements. This paper will take a holistic approach when assessing the progress of greater accessibility in the gaming industry’s hardware and software as well as the inclusivity of general game content through a number of case studies; and discuss next steps for the industry.

Scope

Due to the breadth of the industry and the flooding amount of video games that are released in a year, the scope of this paper will remain on the mainstream, large companies. Within the context of this paper, a mainstream or large gaming company will be defined as a gaming company that makes billions of dollars in profit from their own products a year. The website All Top Everything compiled a list of the top earning companies by their profits in 2022 (2023). The list of companies includes, but is not limited to: Sony, Microsoft, Nintendo, Activision Blizzard, Electronic Arts, Epic Games,

Ubisoft, and more. It is these companies, and those like them, in which the scope of this discussion lies.

Working Definitions & Foundational Expectations

The baseline level of accessibility for hardware and software products has already been set by the United States government with the Revised 508 Standards and 255 Guidelines (U.S. Access Board, n.d.). A subset of the hardware standards and guidelines within chapter four relates to video game design. They can be summarized as follows:

- ➢ Speech, or audio, output is required when there is a screen involved, with exceptions. It needs to "be capable of being repeated and paused" (U.S. Access Board, n.d., Ch. 4). Volume needs to be able to be changed. Text on the screen must have the option of sans serif font and allow for larger text.
- ➢ Privacy levels should not differ amongst users, especially those in differing demographics.
- ➢ In terms of input devices, controls should not blend in with the background and should be unique tactilely. The QWERTY layout for full keyboards must be used, with F and J having some sort of tactile differentiation. Number pads, if placed in a horizontal line, have to be in ascending order; If the keys are in a 3x4 grid, they must be in descending order. The zero key should be at the end in both scenarios, however.
- ➢ In a scenario in which the user must provide some input within a time limit, the user must be informed by visual, touch and/or sound stimuli. Additionally, the user must be able to inform the software that more time is needed.
- ➢ Controls must not require any more than five pounds of force to enact and need to be within a reasonable reach distance of the user both vertically and horizontally.
- ➢ For screen displays, "there shall be no more than three flashes [of light] in any one-second period" and "color coding shall not be used as the only means of conveying information" (U.S. Access Board, n.d., Ch. 4).

Many more details can be found in the U.S. Access Board's website, but the above list encapsulates the primary standards and guidelines for hardware that fall in this paper's scope.

Additionally, a handful of the software standards and guidelines relating to video game software development/implementation can be found within chapter five (U.S. Access Board, n.d., Ch. 5). They can be generalized as such:

- ➢ Software needs to have comprehensive and easily understable documentation on its accessibility features.
- ➢ Users should have control over the documented accessibility features.
- ➢ The program cannot interrupt any use or access to the documented accessibility features.
- ➢ Objects with data in tables must possess appropriate header labels for columns, and rows if necessary.
- ➢ Users must be able to customize their color, contrast, font type, font size, and focus cursor for the software, as a minimum (U.S. Access Board, n.d., Ch. 5).

Again, more information can be found in the U.S. Access Board's website. The list provided above simply lays out the most prevalent standards and guidelines to accessible software in the context of video game design.

The nonprofit International Game Developers Association (IGDA) and its special interest group (SIG) have been vocal about advocating for accessibility and inclusivity in video game design since 2003 (Gittins, 2021). They have hosted numerous events and developed guidelines for having both accessibility in video game design (SIG Guidelines, n.d.). The most recent approach the IGDA's SIG has taken to instruct developers on how to make accessible video-games is a list of questions for introspection. Whereas the aforementioned Section 508 and 255 Guidelines are written in a very intricate and formal manner, SIG's questions are simple and specifically composed in the context of *gaming* hardware and software. The questions are as follows:

1. Can your game be understood without hearing? On mute? In a noisy room?
2. Do your systems account for cognitive load?
3. Could your controls be simpler, more flexible, less demanding?
4. Does your visual information work across all screen sizes and levels of visual acuity?
5. How intense is too intense?
6. Does your gameplay or UI depend on seeing colours?
7. What difficulty level do you want your players to experience? Easy? Hard? Impossible?
8. Is your text both legible and readable?

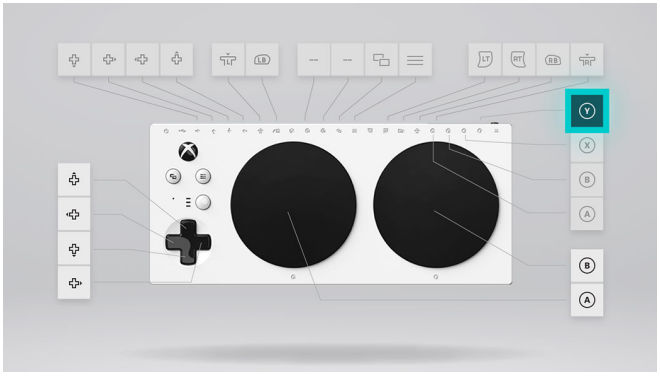
9. Are you sure you know what your players need?
10. Do your players know that your game is accessible? (Chiasson et al., 2021)

The combination of all of these standards and guidelines for accessible hardware and software provides numerous, well-rounded expectations of large gaming companies. Any less of a baseline allows for these companies to walk over a significant portion of their consumer base as they have done for decades.

As for inclusivity, the concept of social inclusion was first introduced to the World Summit for Social Development in 1995. Social inclusion was defined as “the process by which efforts are made to ensure equal opportunities” (United Nations, 2020). How does a term with political connotation relate to video games? The rise of the video game industry came with the side effect of a new international culture, often dubbed as gaming culture. Gaming culture, in a similar manner to social media, has had its effect on the world (“10.4 the Impact of Video Games on Culture,” 2010). For women and people of color, the effect has been almost entirely negative (Schott & Horrell, 2000; Nakamura, 2019). The baseline expectation of social inclusion at this point is that the gaming companies make a bare minimum effort to have more than one diverse character as well as a spectrum of options for character customization, when customization is available.

Video-game Hardware

Most gaming hardware consists of a console and controller combination or a PC with a keyboard and mouse. As previously mentioned in the problem space, for decades, mainstream gaming companies left accessibility to be the consumer’s problem (Shin, n.d.). This often meant consumers with disabilities had to rely on third-party hardware or pay ridiculous amounts for a gaming setup that worked for them. So far, there are two primary cases of improvement on this issue from mainstream companies: Xbox’s Adaptive Controller (XAC) from Microsoft and Sony’s Project Leonardo, pictured below from left to right (XBOX, 2018; Nishino, 2023).



Xbox's Adaptive Controller

The XAC is just as it is titled: adaptive. It has the ability to connect and function to a vast number of controls— such as buttons, switches, joysticks, mounts, and more — and has a simple but effective design. The adaptability allows for any guidelines related to motor function or control inputs to be reached in a user-specific manner. The main controller has extra large buttons with no small buttons in close proximity to mitigate issues of limited movement and accidental button clicks that people with motor function disabilities often run into. Microsoft got this right by seemingly conducting various cognitive task analysis techniques. They made the necessary effort to remember the human in "human-computer interaction" by getting feedback from the demographic they were designing for (XBOX, 2018). With this controller, Microsoft truly seems to do virtually everything right.

However, there is one aspect of the whole purchase that does not sit well. It is advertised to be about $100 for the main controller, but all the mix and match controls are sold separately. A regular Xbox Wireless Controller goes for about $70 and no additional hardware is truly needed. This $30 price disparity is not unheard of or ridiculous by any means, especially considering that this controller is not as mass produced. The problem lies with the buttons. It is clear from this controller's design that its base, worth $100 alone, has less input controls than a standard controller, worth $70. Meaning that without the purchase of additional, 'optional' controls, a vast majority of popular games will be unplayable. When one factors in the cost of the other controls, though, the price disparity can quickly grow to be ridiculous. This dampens the effect of this well-designed piece of accessible hardware.

While there seems to be some effort to save cost with the mention of 3D printing controls and "flexible payment options" (XBOX, 2018), it still falls short. Users should get the same amount of functionality, or input controls, for a similar price. Microsoft

should have the power to provide that. For example, Microsoft could bundle the main adaptive controller with a selection of the mix-and-match controls they also sell to equate to the same functionality as their standard Xbox controller. Moving forward, Microsoft should be careful with the line they are on. Accessible video games should not be behind an additional and/or higher paywall.

Sony's Project Leonardo

At the time of this paper, Sony has not released Project Leonardo, only announced it. Many details are simply not available. With that said, Sony is advertising Project Leonardo to be a kit, not just a controller. Developers and consultants on the project allude to the kit being highly adaptable with the ability to layer and move buttons around as seen fit (Sony, 2023). In terms of guidelines and standards, Sony seems to have accounted for most that can apply. From pictures, one can see that the design seems to factor in mobility issues in regards to reach and fast movements. Consultants on the project rave about how the flatness of the controller allows for better mobility with it, how one can layer two buttons to make two motions into one, and, in general, how customizable this hardware is (Sony, 2023). It is important to note that Sony has not made any mention of a price for this kit nor a set release date. The same caution of pricing goes to Sony as stated about Microsoft's XAC. Time will tell if this hardware remains to be as great as advertisements suggest.

Further Steps For The Gaming Hardware Industry

With a holistic approach in analysis, the level of accessibility hardware has does not end with the design of it, but also how it is presented to the market. Microsoft is the pioneer company with the release of its XAC. They also took advantage of being the pioneer a bit with how they sell the product(s). The verdict is still out on Sony's Project Leonardo. As for the rest of the mainstream companies in the gaming industry: catch up. Push Microsoft and Sony to do better by joining the race and learning from them. The fastest and easiest way to make accessible hardware for gaming become a norm is to flood the market with it. Having accessibility be a norm in the gaming world would be a giant step in a good direction for society.

Video-game Software

When it comes to gaming software, recent years have shown that even the smallest changes make a world of difference. The most discussed example is how Ubisoft started setting subtitles to be on by default in their games; Over 95+% of their players keep them on (Stoner, 2020). Most people enjoy subtitles (O'Connor, 2019). The inclusion of subtitles in video games has become an industry standard, for the most part, but it should not be considered a monumental step. Many large games have shown there are a vast number of optional, accessibility software features that can and should be implemented in video games. The most popular game that seems to do it completely right is *Last of Us Part II*, made by Naughty Dog.

Last of Us Part II

After substantial success with accessibility features like one-handed mode and repeated button presses mode in their game *Uncharted 4: A Thief's End* (Bayliss, 2021), Naughty Dog decided to go many, many steps further. With other 60+ accessible features offered, the game *Last of Us Part II* hits every standard and guideline previously mentioned and added even more (Bayliss, 2020). In terms of audio features, the game includes directional subtitles, visual cues, awareness indicators, and more. Its visual features include a pioneering high contrast mode, lock-on aim, navigation and traversal assistance, ledge guard, etc. Its motor accessibility features include auto weapon swap, auto pickup, infinite breath, and more (The Last of Us Part II - Accessibility, n.d.). Truly, the *Last of Us Part II* is ahead of the rest of the industry.

Further Steps for the Gaming Software Industry

Naughty Dog is one company that is doing the most. Fortunately, they are not alone in their efforts. The YouTube channel GameMaker's Toolkit does a yearly accessibility review on a number of the most popular video games released in that year. The latest video was on video games from 2021, where 25 video games were reviewed. Overall, Mark Brown, the creator of the channel, was surprisingly amazed. He claims almost every game had some kind of setting for accessibility purposes and over half the games had a "dedicated accessibility or assist menu" (Brown, 2021). He even goes on to say that "Accessibility [in games] is here and it's here to stay" (Brown, 2021). There's a catch. As awesome as it is that the majority of the gaming industry has

some kind of accessibility features by default, there is a lot of oversight that occurs with these features. Whether it is general functionality bugs; features that exist but don't do their intended use properly— like subtitles with too small of text; or features that exist for some aspects for the game but not all necessary aspects— such as toggle abilities for sprinting but not aiming, game developers have plenty of room for improvement (Brown, 2021; Brown & Anderson, 2021). The industry has done it, now they just need to do it well.

Video-games & Social Inclusivity

Recent years have seen more and more diversity across multiple facets within mainstream games. There is a standard for customizable characters and/or alternative options for the main character. A popular example is the shift from solely male protagonists in the game franchise *Assassin's Creed* to having the option of choosing between a male or female protagonist. For social inclusion, the industry is a very similar situation as it is for software accessibility features. With popular games like *Animal Crossing* having the typical character customization feature, but only providing two black hairstyles (Dall'Asen, 2020), the industry hasn't quite mastered the ability to do it well across the board.

Further Steps for Social Inclusion

The approach most discussed to mend this issue is sometimes called #OwnVoice. The gist of the approach is for companies to hire people in the demographics they are trying to represent in their games in order to do it properly and respectfully (Duyvis, n.d.). The previously mentioned game, *Last of Us Part II*, actually performed this method and gamers raved about it in their reviews (Bayliss, 2020). The industry is more than capable of having a norm for improved social inclusion and diversity amongst its mainstream companies. It is a matter of the companies making the choice to do so.

Conclusion

Factoring in the hardware, software, and social aspects of the gaming industry, the industry is leagues ahead of what it used to be in the 1980s for accessibility and inclusion. The hardware, specifically from Microsoft and Sony, has started to have human-centered designs that focus solely on aiding those with disabilities play video

games easily and for longer periods of time. The software has improved to make at least some accessibility features present an unwritten industry standard, with games like *Last of Us Part II* showing a potential future standard for the mainstream companies. Lastly, there is more diversity in game content and characters than ever before. In short, the majority of any revolutionary insight or technological advancement needed to make games accessible and/or inclusive already exists. Gaming companies don't need the "next big thing" right now. They need to refine what they are currently doing in order to do it right. They need to up their game(s).

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