

# How Do I Implement It? Towards Software Patterns for Accessible Player Experience

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## Abstract

This poster proposes an approach to support the implementation of accessible game design patterns. Therefore, it examines the Accessible Player Experience (APX) Design Patterns developed by the AbleGamers Charity from a technical perspective and presents our approach to supporting the implementation of these patterns as software solutions. Our aim is to advance accessibility in digital games by supporting developers with practical tools and guidance. To this end, we explore multiple pathways for integration—ranging from ready-to-use implementations and frameworks to plugins and tailored advice—helping developers seamlessly embed accessibility features into their games.

## CCS Concepts

• **Human-centered computing** → Accessibility systems and tools.

## Keywords

Accessibility, Inclusion, Design Patterns, Software Patterns, Game Engine, Technology, Player Experience, Game Developer

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## 1 Inclusion and Accessibility

Equity goes beyond equal opportunities. While equal treatment often assumes a one-size-fits-all solution, equity recognizes individual needs and the barriers faced by marginalized groups [14]. The 2030 Agenda for Sustainable Development (SD) emphasizes this principle by committing to the full inclusion of persons with

disabilities across education (SD Goal 4), work (SD Goal 8), and leisure (SD Goal 10), in line with the Convention on the Rights of Persons with Disabilities [35, 36]. Within game development, this translates into educating developers about accessibility, involving diverse people in co-design [5]—especially people with disabilities—and ensuring everyone who wishes to play the same digital games as everybody else has the opportunity to achieve it [7].

### 1.1 Problem Statement and Research Question

Games are used for more purposes than entertainment [3, 4]: Games play a huge role in education [20], cognitive training [22], and advancing diversity, equity, and inclusion [5]. Playing games can improve a person’s mental health and overall well-being [3, 16] and assist them in navigating through tough times [21]. Games foster social interactions by enabling players to interact with each other, leading to reduced feelings of isolation for players with disabilities and fostering connection and belonging [2, 4, 17].

However, people with a disability face barriers when playing games, which might negatively impact or even exclude them from these experiences. Ensuring access to games for the largest number of people possible is relevant for social participation.

To address these problems and support the SD Goals, we ask the following research question: *How can we make accessibility in digital games more achievable and practical for game developers?*

We investigate which technological approaches can facilitate the integration of accessibility into game development, and we consider what forms of support—such as education, documentation, or tools—enable developers in this process. We explore how existing accessibility guidelines can be translated into practical, actionable tools that developers can incorporate into their workflows.

## 2 Background and Related Work

As game developers, researchers, and players, we draw on existing accessibility guidelines and examples of accessible games while examining the technical structures and accessibility of game engines.

### 2.1 Guidelines Towards Accessibility

The *Accessible Player Experiences (APX)* [1, 24] are a design-thinking tool organized into *Access Patterns* and *Challenge Patterns*. The former support players in entering and engaging with a game, while the latter address how players with disabilities can overcome

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challenges and progress in gameplay [1, 24]. The *Game Accessibility Guidelines (GAG)* [13] provide practical recommendations and a broad range of techniques for accessible game design, structured into basic, intermediate, and advanced levels. *Can I Play That (CIPT)?* [8] is an online platform publishing accessibility reviews, news, and feature updates. It serves both players and developers as a community-driven resource for accessibility in games [8].

## 2.2 Accessibility in Game Engines

Game engines, to some extent, incorporate accessibility measures aimed at supporting developers with disabilities, thereby extending accessibility beyond gameplay to the development process itself. Enhancing the accessibility of engines enables greater participation of developers with impairments, fostering broader representation and allowing their perspectives to enrich game development.

With the release of Godot 4.5, screen reader support was added to parts of the editor, allowing more people to create games with it [18]. Similarly, with Unity LTS 2022.3, the Unity Editor has been made more accessible. Users can traverse the editor with a keyboard, contrast in the interface has been improved, and the accompanying use of colors and symbols makes information accessible to a wider range of people [37]. There are also advancements towards creating more accessible games. Unity now includes the Accessibility Module, offering screen reader support and tools for testing colorblind accessibility [38]. Epic Games' Unreal Engine provides screen reader support since version 5.2, together with text-to-speech plugins for creating blind-accessible interfaces [11]. Additionally, popular game engines such as Godot, Unity, and Unreal all include systems that allow developers to define multiple input methods for triggering the same in-game action. This enables more flexible controls, allowing players to customize input mappings according to their preferences. Besides these built-in solutions, the help of third-party plugins is usually required to integrate accessibility in games.

## 2.3 Accessible Games

Games praised for their accessibility include AAA titles like *The Last of Us Part II* [12, 23], *Ratchet and Clank: Rift Apart* [15, 28], *Forza Motorsport* [34], and *Gears 5* [29]. Recent Indie games like *Lost and Hound* [6] and *The Vale* [9] have blind players as their main target audience. Further titles making meaningful progress towards accessibility include: *Call of Duty: Black Ops 6*, which advances accessible audio design [25]; *Diablo IV*, which implements audio navigation assistance, auto-pin and compass functionality [10, 26]; *Dragon Age: The Veilguard*, noted for its comprehensive role-playing accessibility features [19]; and *Prince of Persia: The Lost Crown*, an accessible platformer that incorporates options supporting players with cognitive disabilities [27]. In addition to documented accessibility features, some games provide developer reports and articles; however, these sources often lack sufficient detail regarding the underlying materials, processes, and resources that would enable other developers to effectively implement similar accessibility patterns and advance the creation of more accessible games.

## 2.4 Identifying the Research Gap

While game engines increasingly provide accessibility tools, their support remains limited, often restricted to basic features such as

screen reader compatibility. The APX and the GAG offer valuable design principles, yet developers lack guidance on translating these into concrete technical implementations. This gap between high-level design patterns and practical integration in modern game engines leaves developers without clear strategies. Addressing this gap is essential to ensure that the inclusion of accessibility features becomes a matter of design intent rather than technical feasibility.

## 3 Our Approach

Our overarching goal is to ensure that all people who wish to play and develop games can do so and fully participate in game culture. To reduce the barriers developers face when implementing accessibility features, we propose extending existing design patterns with a technological layer—categorized into basic, intermediate, and advanced levels—that provides concrete implementation strategies and technologies. We illustrate the technical layer with selected examples. For instance, the *Clear Channels* pattern, which emphasizes clarity of information, could be realized by enabling developers to toggle non-essential visual layers via a “reduce visual complexity” setting [30]. The *Same Controls but Different* pattern can be supported through input remapping using engine features such as Unity's input system, while providing developers with platform-specific implementation guidance [32]. Similarly, *Distinguish This from That* could be addressed by integrating color scheme presets or symbol-based alternatives, ensuring flexibility for players with visual impairments [31]. Finally, the *Total Recall* pattern may be supported through shortcut-triggered instructional overlays, allowing developers to easily attach contextual images or videos via an engine's inspector interface [33]. By strategically linking design-level accessibility patterns with practical technical solutions and implementation strategies, we aim to lower implementation barriers and equip developers with actionable resources for integrating accessibility into their games. To evaluate these, we may conduct expert interviews or focus groups with researchers and game developers to assess the framework's feasibility and practical applicability. After obtaining ethics approval, we may run user studies with people with disabilities to examine the performance and perceived usefulness of the resulting accessibility features. This multi-stage approach allows us to validate both the technical soundness of the framework and its real-world impact on users.

## 4 Conclusion and Outlook

Accessibility must be embedded into the game development process from the very beginning. Existing guidelines and design patterns provide a solid foundation, but further progress requires co-design with people with disabilities and the inclusion of accessibility across all scales of game development. This work contributes to bridging the gap between design principles and their technical realization by moving towards software patterns and implementation strategies. Decisions regarding the inclusion of accessibility features in games should not be constrained by the technological complexity of their implementation, but rather driven by design intent. Future research must focus on providing developers with concrete, practical solutions that enable seamless integration of accessibility into their workflows.

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