



The Digital Matryoshka: Interface Design and Nested Intradiegetic Systems in *Star Wars Outlaws* (2024)

La matrioska digital: diseño de interfaces y sistemas intradieгéticos anidados en *Star Wars Outlaws* (2024)

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ABSTRACT

Contemporary video game design increasingly incorporates intradiegetic ludic systems: games or interactive devices that exist within the game world itself and can be accessed by both the player and the player character. This phenomenon gives rise to “systems within systems” that can be interpreted as a form of interactive “mise en abyme”, conceptualized here as the “digital matryoshka”. This study explores these systems from the perspective of interface design, based on the hypothesis that transitions between ludic systems within a video game are primarily communicated through the interface’s visual language. The study adopts a qualitative approach based on the visual analysis of *Star Wars Outlaws* (2024), selected as a case study due to its inclusion of interactive intradiegetic devices. The analysis focuses on the interface’s perceptual organization, graphic identity, and interaction mechanisms, understood as structuring elements of the player experience. The findings identify visual strategies that communicate transitions between ludic systems during gameplay, as well as varying degrees of aesthetic autonomy between the main game system and the intradiegetic systems. These findings suggest that interface design functions as a perceptual marker of systemic transition. In conclusion, the study proposes an analytical framework that contributes to integrating interface design into the academic study of video games.

PALABRAS CLAVE

Intradieгético
Interfaces
Diseño gráfico
Videojuegos
Lenguaje visual

RESUMEN

En el diseño contemporáneo de videojuegos se observa una creciente incorporación de sistemas lúdicos intradieгéticos: juegos o dispositivos interactivos que existen dentro del propio mundo del juego y que pueden ser utilizados tanto por el personaje como por el jugador. Este fenómeno produce estructuras de “sistemas dentro de sistemas” que pueden interpretarse como una forma de “mise en abyme” interactiva, que en este trabajo se propone denominar “matrioska digital”. El presente estudio explora estos sistemas desde la perspectiva del diseño de interfaces, partiendo de la hipótesis de que la transición entre sistemas lúdicos dentro del videojuego se comunica principalmente a través del lenguaje visual de la interfaz. La investigación adopta un enfoque cualitativo basado en el análisis visual del videojuego *Star Wars Outlaws* (2024), seleccionado como caso de estudio por su uso de dispositivos intradieгéticos interactivos. La metodología se centra en la organización perceptiva de la interfaz, su identidad gráfica y los mecanismos de interacción que estructuran la experiencia del jugador. Los resultados permiten identificar estrategias visuales que comunican la transición entre sistemas lúdicos dentro de la experiencia interactiva, así como distintos grados de autonomía estética entre el sistema principal y los sistemas intradieгéticos. En este sentido, la investigación plantea que el diseño visual de estas interfaces funciona como un marcador perceptivo de transición entre sistemas lúdicos. Como conclusión, el estudio propone un marco analítico que contribuye a integrar el diseño de interfaces en el estudio académico del videojuego.

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1. Introduction

Contemporary video game design is increasingly characterized by the incorporation of multiple ludic systems within a single interactive experience. Beyond structures centered on a single gameplay system, many titles incorporate additional mechanics, devices, and interactive subsystems that expand the player experience within the game's diegetic universe.

In this context, intradiegetic ludic systems are particularly relevant: devices or games that exist within the game world and can be used by both the player character and the player. These structures not only expand the possibilities for interaction, but also introduce an organizational logic based on "systems within systems", generating complex configurations in which multiple ludic layers coexist and interact.

This phenomenon gives rise to structures that may be interpreted as a form of interactive "mise en abyme". The term "mise en abyme" was originally introduced by André Gide (1893–1894) and later developed from a theoretical perspective by Lucien Dällenbach (1989). The concept describes structures in which a work contains reduced or reflected versions of itself. In the context of video games, this same logic can be observed in the incorporation of ludic systems nested within larger interactive systems.

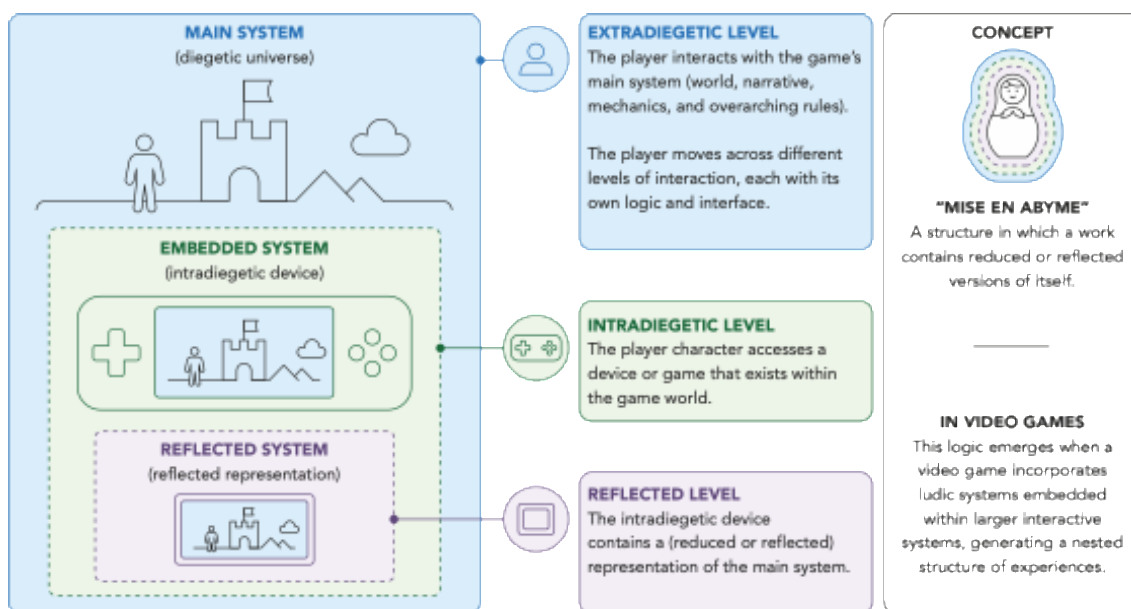


Figure 1. Conceptual framework of interactive "mise en abyme" as a structure of nested ludic systems. Source: author's own elaboration, 2026.

Although academic research has examined video games from perspectives that consider their systemic, narrative, and interactive dimensions (Salen & Zimmerman, 2004; Juul, 2005), as well as the role of the interface as a mediating element in the gameplay experience (Galloway, 2006), the visual dimension of intradiegetic interfaces has received comparatively limited attention from a design perspective. This makes it particularly relevant to examine how the visual language of the interface helps articulate these complex structures, particularly in relation to transitions between different ludic systems within the same gameplay experience.

Building on this premise, the study introduces the concept of the digital matryoshka to describe configurations in which multiple interactive systems are nested within the same diegetic universe. In this sense, the digital matryoshka may be understood as a hierarchically organized ludic structure composed of multiple interactive systems within a single gameplay experience. This concept allows such configurations to be interpreted as a form of interactive "mise en abyme", in which the interface assumes a central role as a mediating element between different levels of interaction.

The objective of this study is to analyze the role of interface design in structuring intradiegetic ludic systems, based on the hypothesis that transitions between systems within a video game are primarily communicated through the visual language of the interface. To this end, the study adopts a qualitative approach based on the visual analysis of *Star Wars Outlaws* (2024), selected as a case study due to its inclusion of interactive intradiegetic devices. The analysis focuses on the visual organization of the interface, its graphic identity, and the interaction mechanisms that shape the player experience. The study thus seeks to contribute to the integration of interface design into the academic analysis of video games.

2. Methodology

2.1. Methodological approach

This study adopts a qualitative visual approach focused on the analysis of intradiegetic interfaces in video games. The analysis examines the relationship between visual organization, interaction, and perception, understanding the interface not merely as a functional element, but as a visual device that actively contributes to shaping the player experience.

From this perspective, intradiegetic interfaces are examined as systems of representation that organize different levels of interaction within the video game. The methodological objective is to identify how the visual language of the interface contributes to communicating transitions between distinct ludic systems.

2.2. Case study and unit of analysis

Star Wars Outlaws (2024) was selected as the case study due to its inclusion of intradiegetic ludic systems integrated into the game world. In particular, the research focuses on the arcade machines *Rider* and *Raven 6*, which function as interactive devices providing access to autonomous game systems within the main game system.

The units of analysis are these arcade machines, examined as intradiegetic interfaces in relation to their visual dimension, forms of interaction, and contribution to the player experience. This selection allows the study of the interface from a perspective that integrates representation, perception, and ludic structure.

For this study, an analytical instrument is developed as an interpretive tool for the analysis of intradiegetic interfaces in video games. The instrument is designed to identify relationships between visual structure, interaction, and transitions between ludic systems, enabling the systematic organization of the elements identified during the analysis. It is subsequently applied to the study of the arcade machines *Rider* and *Raven 6* in *Star Wars Outlaws* (2024).

The development of this analytical instrument draws on contributions from visual analysis, graphic design, and interface studies. Specifically, the work of Gunther Kress and Theo van Leeuwen (2006) offers a useful framework for examining the perceptual organization of interfaces, particularly in relation to composition, visual hierarchy, and the relationships between visual elements. Donis A. Dondis (1973), in turn, contributes analytical tools for the study of visual language and the perception of graphic structures within visual compositions.

With regard to the visual identity of interfaces, Ellen Lupton's work (2014) provides a useful perspective for examining aspects such as typography, interface surface design, and the graphic organization of information. Similarly, the interaction patterns described by Jenifer Tidwell (2010) are useful for analyzing interaction dynamics, system states, and forms of visual feedback within the interfaces analyzed.

Finally, Lev Manovich's approach (2001) to digital visual culture and the interface offers a conceptual framework for understanding the interface as a form of cultural representation, integrating visual, perceptual, and interactive dimensions within the gameplay experience.

The combination of these approaches supports the development of an analytical tool designed for the visual study of intradieгetic interfaces, integrating visual, perceptual, and interactive dimensions within a single analytical framework. Accordingly, the proposed methodology approaches the interface not only as a functional device, but also as a visual structure capable of organizing and communicating different levels of interaction within the video game.

2.3. Dimensions of analysis

The analytical instrument is organized into five main dimensions:

- A) Case identification
- B) Perceptual organization
- C) Graphic identity
- D) Interaction
- E) Relationship with the main game system

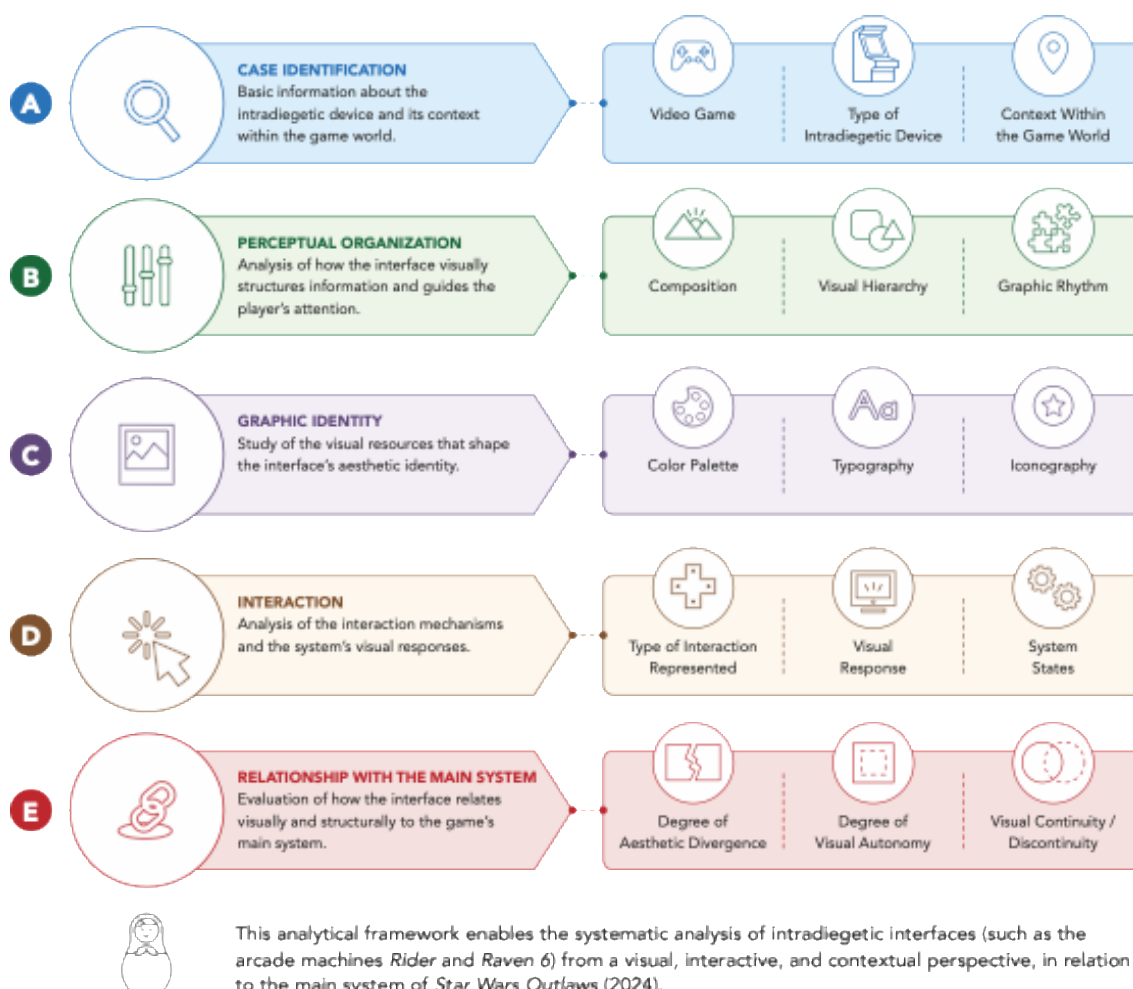


Figure 2. Proposed analytical instrument for the study of intradieгetic interfaces. Source: author's own elaboration, 2026.

These dimensions allow the interfaces under analysis to be examined from a perspective that integrates visual, interactive, and perceptual aspects, facilitating the study of the relationships between interface design, gameplay experience, and transitions between ludic systems.

3. Theoretical Framework

3.1. Video games as systems: rules, fiction, and ludic structure

The study of video games as systems has been extensively developed within the field of game studies, where games are understood as formal structures composed of rules that organize player action. In this regard, Katie Salen and Eric Zimmerman (2004) define games as systems in which players engage in artificial conflict, governed by rules and oriented toward a quantifiable outcome. This perspective positions the video game as a structured network of relationships that determines both the possibilities for action and the conditions of the ludic experience.

Following this approach, Jesper Juul (2005) proposes the coexistence of two fundamental dimensions in video games: rules and fiction. While rules constitute the formal system that defines how the game functions, fiction provides an interpretive framework that gives meaning to the player's actions. This dual nature allows the video game to be understood as a hybrid system in which abstraction and representation operate simultaneously.

From this perspective, the video game can be understood as a complex ludic structure in which different levels of organization interact with one another. This conception is particularly relevant for addressing configurations in which multiple systems coexist within the same experience, opening the door to more complex forms of organization in contemporary video game design.

3.2. Intradiegetic systems and “systems within systems” structures

The notion of systems within systems can be productively situated within theoretical approaches to complex interactive structures. In this sense, Espen J. Aarseth (1997) introduces the concept of cybertext to describe textual forms in which the organization of content depends on user interaction, producing non-linear structures organized across multiple levels. This perspective allows video games to be understood as dynamic systems in which player navigation and action actively shape the experience.

Alexander R. Galloway (2006), in turn, argues that video games should be understood through the actions that constitute them, emphasizing the relationship between interface, system, and user. From this perspective, the interface is not merely a visual element, but a functional device that mediates between player and system, structuring the conditions under which interaction becomes possible.

Together, these approaches support an understanding of the video game as a structure in which multiple systems may coexist and interact within the same environment, giving rise to complex configurations that can be interpreted as distinct levels of interaction. This framework is particularly useful for addressing intradiegetic ludic systems, understood here as devices that operate within the game world and introduce additional layers of interaction.

3.3. Interface and representation in video games

The role of the interface in video games has been explored from different perspectives that emphasize its mediating function within the player experience. In this regard, Henry Jenkins (2004) introduces the concept of environmental storytelling to describe how digital spaces communicate narrative information through their design, integrating visual, spatial, and interactive elements.

From a complementary perspective, Janet Murray (1997) highlights the capacity of digital environments to generate immersive experiences in which the user actively engages with the represented world. This perspective helps frame the interface as a point of contact between the system and the player's perception.

Along similar lines, Kristine Jørgensen (2013) proposes understanding the “gameworld” as a form of interface, in which environmental elements not only fulfil a representational function, but also participate directly in player interaction. This perspective expands the role of the interface beyond the purely graphic, integrating it into the underlying logic of the game system itself.

Taken together, these approaches frame the interface as a mediating structure between representation, interaction, and gameplay experience. This theoretical framework is particularly relevant for examining intradiegetic interfaces, where the interface does not merely provide access to the system, but becomes part of the fictional world itself.

In this context, the interface may be understood not only as a functional access point to the game system, but also as a visual and representational structure that shapes the player’s experience. This perspective is particularly relevant for the present study, which examines the role of interface design in articulating transitions between different ludic systems within the same interactive environment.

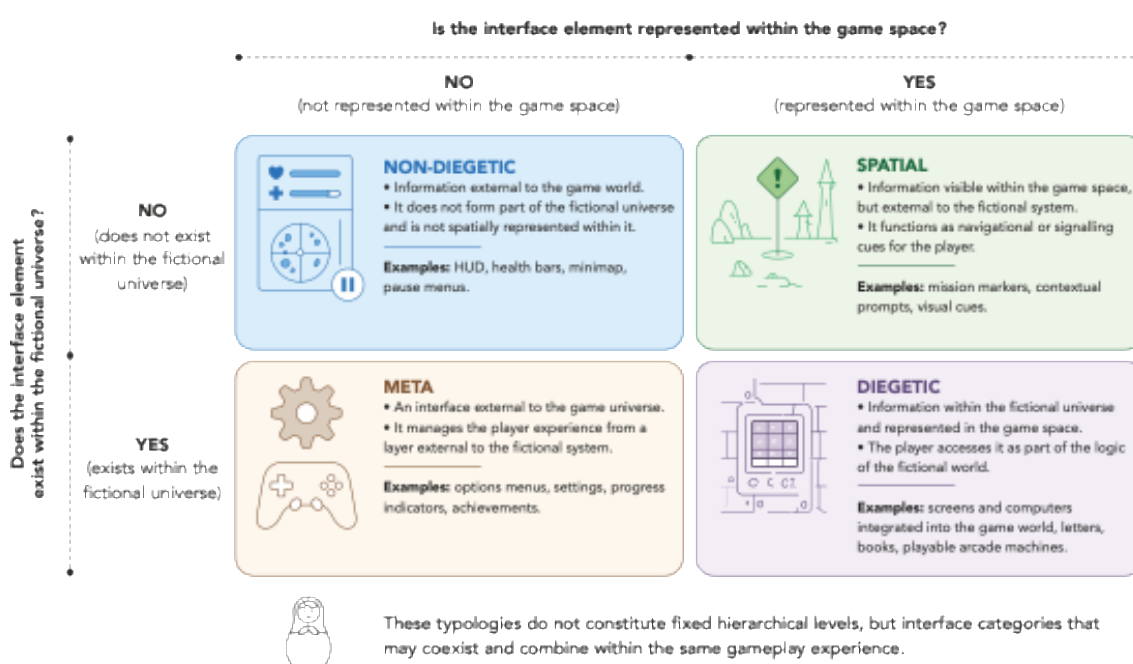


Figure 3. Diagram of video game interface typologies: non-diegetic, spatial, meta, and diegetic, based on Fagerholt and Lorentzon (2009). Source: adapted and author’s own elaboration, 2026.

3.4. Digital visual culture and the interface as a form of representation

The study of the interface from the perspective of digital visual culture allows for a deeper understanding of its aesthetic and communicative dimensions. In this context, Lev Manovich (2001) argues that the interface constitutes a cultural form in its own right through which content is organized and presented in digital media. This perspective positions the interface not merely as a functional tool, but as a system of representation with aesthetic and perceptual implications.

Scott McCloud (1993), in turn, provides useful tools for the analysis of visual language, highlighting how elements such as composition, order, and graphic simplification shape the interpretation of images. These concepts are particularly relevant for examining the visual organization of interfaces in interactive contexts.

Finally, Ellen Lupton (2014) proposes understanding the interface as the “surface” or “skin” of the system, emphasizing its material and perceptual dimensions. From this perspective, the interface becomes a visual surface where form, function, and interaction converge.

Taken together, these approaches frame the interface as a complex visual device whose graphic organization not only communicates information, but also structures the user experience. This perspective is essential for analyzing the role of visual design in the articulation of intradiegetic ludic systems.

4. Case study: *Star Wars Outlaws* (2024)

Building on the theoretical framework outlined above, this study focuses on the analysis of *Star Wars Outlaws* (2024), selected as a case study due to its integration of intradiegetic ludic systems within the game universe. This title provides a particularly relevant context for examining how the interface articulates the relationship between different levels of gameplay, revealing configurations that reflect the logic of “systems within systems.”



Figure 4. *Star Wars Outlaws* (2024) as a case study: official logo and game environment.
Source: Ubisoft / Lucasfilm Games.

4.1. The video game and its diegetic universe

Star Wars Outlaws (2024) is an open-world action-adventure video game set in the Star Wars universe, placing the player within a narrative environment shaped by exploration, interaction with multiple systems, and decision-making within a coherent diegetic context. The game offers an experience in which movement across different spaces, such as planets, stations, and settlements, is combined with a variety of activities that expand the main gameplay structure.

The player assumes the role of Kay Vess, the game's protagonist, whose experience of exploration and interaction provides access to the different systems embedded within the game universe. Through this character, the player moves between open environments, secondary activities, and intradiegetic devices that introduce distinct forms of interaction. In this context, the arcade machines *Rider* and *Raven 6* function not merely as environmental elements, but as access points to autonomous ludic systems contained within the broader gameplay experience.

From the perspective of diegetic construction, the game presents a richly developed universe in which visual, spatial, and interactive elements contribute to the creation of a credible and coherent environment. In this context, the interface is not limited to the superimposition of information on the screen, but is integrated into the game world in different ways, adopting distinct forms depending on its function and relationship to the player experience.

This structure enables the emergence of interactive devices that form part of the diegetic environment itself and expand the possibilities for interaction beyond the main game system. In this sense, the game not only organizes the experience through its central mechanics, but also incorporates elements that introduce variations in gameplay dynamics, generating a more complex and diverse interactive experience.

This context is particularly relevant for the analysis of intradiegetic ludic systems, as it provides an environment in which different levels of interaction coexist within the same universe. Within this context, specific devices can be identified that allow the player to access internal game systems, creating configurations that reflect the “systems within systems” logic outlined in the theoretical framework.

4.2. Intradiegetic devices within the game environment

The diegetic universe of *Star Wars Outlaws* (2024) includes a variety of interactive devices that form part of the game environment itself and expand the forms of interaction available to the player. These devices are not presented as elements external to the system, but are integrated into the game world, contributing to the construction of a coherent and situated experience.

These elements include terminals, screens, control panels, and other devices that allow the player to access information, manage actions, or interact with the environment according to an internal logic consistent with the game universe. In this sense, these devices function as intradiegetic interfaces that articulate the relationship between player and system, while also reinforcing the narrative and spatial dimensions of the experience.

Beyond their informational or operational function, some of these devices introduce dynamics that expand the main gameplay system, allowing the player to interact with differentiated ludic structures. This diversity of devices highlights the existence of multiple levels of interaction within the same environment, in which the interface acts as a key element in the organization of the player experience.

In this context, arcade machines acquire particular relevance, as they constitute devices that not only form part of the game world, but also provide access to autonomous ludic systems within the main game system. This characteristic makes them a particularly significant case for the analysis of intradiegetic systems, which justifies their selection as the specific focus of this study.

4.3. Arcade machines as intradiegetic ludic systems

Among the intradiegetic devices present in *Star Wars Outlaws* (2024), arcade machines constitute a particularly significant case, as they introduce a specific form of interaction that goes beyond the informational or operational function of other environmental devices. Unlike terminals or control panels, whose primary function is to manage information or actions within the main system, arcade machines introduce autonomous ludic systems that can be activated by the player from within the game universe itself.

These devices appear as elements integrated into the diegetic environment, located in cantinas, public spaces, or transit areas, and function as intradiegetic interfaces that provide access to differentiated gameplay experiences. By interacting with these machines, the player not only engages with a new gameplay dynamic, but also enters a system with its own rules, objectives, and mechanics, operating independently from the main game system.

In this sense, arcade machines may be understood as intradiegetic ludic systems insofar as they constitute complete gameplay structures embedded within a larger interactive structure. This entails a temporary and perceptual reorganization of the player's experience, as the player shifts from interacting with the main system to participating in a secondary system with its own identity.

In the case of *Star Wars Outlaws* (2024), these configurations take concrete form in the arcade machines *Rider* and *Raven 6*, which allow the player to access differentiated gameplay systems within the game world. Both devices present their own dynamics and interaction logics, functioning as autonomous ludic systems that nevertheless remain integrated into the game environment.



Figure 5. *Rider* arcade machine integrated into the diegetic environment of *Star Wars Outlaws* (2024). Source: Ubisoft / Lucasfilm Games.



Figure 6. *Raven 6* arcade machine integrated into the diegetic environment of *Star Wars Outlaws* (2024). Source: Ubisoft / Lucasfilm Games.

From this perspective, these devices clearly exemplify the logic of “systems within systems,” creating a nested structure in which the interface functions as a point of access and transition between different levels of gameplay. This characteristic makes them a particularly relevant object of analysis for examining the role of interface design in the articulation of intradiegetic systems.

4.4. References for the arcade machines: aesthetics, interaction, and visual culture

The arcade machines featured in *Star Wars Outlaws* (2024) function not only as intradiegetic devices, but also evoke a visual and cultural tradition linked to the history of video games. Their design is constructed through recognizable references that evoke both the aesthetics and interaction models of classic arcade machines, activating cultural memory associated with this type of gameplay experience.

In the case of *Rider*, references can be identified to titles such as *Asteroids* (1979), *Battlezone* (1980), *Tempest* (1981), and *Tron* (1982). These games share an aesthetic based on vector graphics, abstract spatial structures, and a simplified representation of the game environment. This visual language is characterized by the use of lines, basic geometric forms, and a spatial organization that prioritizes the perception of depth and movement over figurative detail. In terms of interaction, these references are based on gameplay dynamics centered on navigation and spatial orientation, establishing a direct relationship between player action and visual response.



Figure 7. Visual references associated with *Rider: Asteroids* (1979), *Battlezone* (1980), *Tempest* (1981), and *Tron* (1982). Source: Atari; Atari; Atari; Bally Midway.

By contrast, *Raven 6* draws on a different tradition within arcade culture, linked to classic shooters such as *Space Invaders* (1978), *Galaga* (1981), *Defender* (1981), and *Star Wars Arcade* (1983). In these cases, the interface is organized around more clearly defined structures, with graphic elements that distinctly delimit the play space, the player's position, and the appearance of enemies. The aesthetic relies on repeated patterns, recognizable iconography, and a more explicit relationship between interface and action, reinforced by scoring systems and immediate visual feedback.

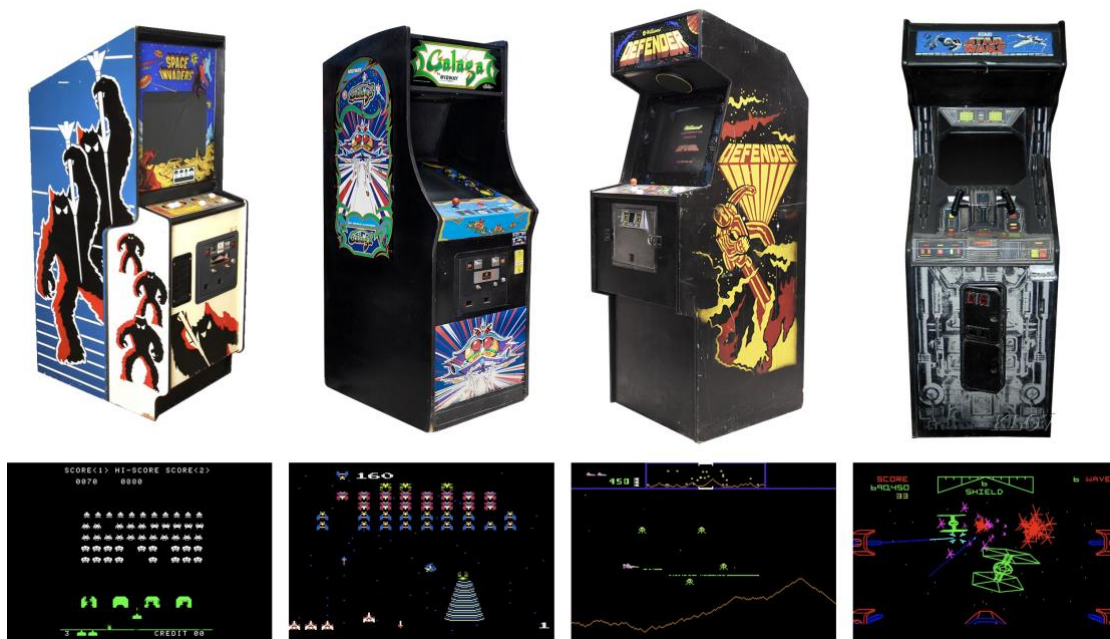


Figure 8. Visual references associated with *Raven 6: Space Invaders* (1978), *Galaga* (1981), *Defender* (1981), and *Star Wars Arcade* (1983). Source: Taito Corporation; Namco; Williams Electronics; Atari.

This distinction between the two devices reveals two different modes of visual and interactive design within arcade culture, reconfigured in *Star Wars Outlaws* (2024) as intradieгetic systems. While *Rider* is grounded in a spatial and abstract logic, *Raven 6* adopts a more codified structure oriented toward direct action. Taken together, these references not only situate the arcade machines within a specific cultural tradition, but also contribute to defining their visual identity and their operation as differentiated systems within the game.

In this sense, these references not only activate cultural memory associated with the arcade experience, but also help the player recognize the transition between systems within the game, reinforcing the perception of entering a differentiated ludic experience.

The relevance of *Rider* and *Raven 6* within *Star Wars Outlaws* (2024) has been recognized not only in academic analysis, but also in discourses linked to game development and specialized criticism. In an article published during the game's release, Tomas Franzese (2024), writing for *Digital Trends*, describes both arcade machines as "games-within-a-game," highlighting their role as ludic systems integrated into the interactive universe of *Star Wars Outlaws* (2024). In the same interview, director Thibaut Machin also points to direct references to late-1970s and early-1980s arcade culture, particularly vector-based systems associated with titles such as *Star Wars Arcade* (1983) and *Tempest* (1981). These statements reinforce the interpretation of the arcade machines as autonomous ludic systems embedded within the game's dieгetic universe, as well as their connection to a specific cultural memory associated with the visual history of the medium.

4.5. The arcade machine as device and intradieгetic interface

The arcade machines featured in *Star Wars Outlaws* (2024) may be understood not only as intradieгetic devices, but also as interfaces that provide access to differentiated ludic systems within the video game itself. In this sense, their function is not limited to offering secondary activities, but extends to connecting different levels of interaction within a single gameplay structure.

From this perspective, the arcade machine functions as an access device to autonomous systems with their own rules, dynamics, and forms of interaction. Activating these machines entails a transition from the main system to another system contained within the game universe, creating a "systems within systems" structure articulated through the interface.

In this context, both *Rider* and *Raven 6* present differentiated visual and interactive configurations that reinforce their autonomy in relation to the main video game. Although both devices remain integrated within the dieгetic environment of *Star Wars Outlaws* (2024), each develops its own identity linked to specific traditions of classic arcade culture.

In this way, the arcade machine may be understood as an intradieгetic interface that not only forms part of the game environment, but also organizes access to internal ludic systems within a broader interactive framework. This condition allows the arcade machines analyzed to be understood as devices that mediate between different levels of interaction within a single gameplay experience.

4.6. Role in the player experience: immersion and transitions between ludic systems

The introduction of arcade machines into the universe of *Star Wars Outlaws* (2024) not only expands the player's possibilities for interaction, but also introduces variations in the perception of the gameplay experience. By accessing these intradieгetic ludic systems, the player undergoes a transition between different levels of interaction, mediated both by changes in the rules and by the transformation of the interface's visual language.

In this context, the interface plays a fundamental role in shaping the experience, as it visually delineates the transition between the main system and the secondary systems integrated within the dieгetic environment. Elements such as visual composition, typography, iconography, colour, and

visual feedback contribute to reinforcing the sensation of entering a differentiated experience, enabling the player to recognize the change of system without leaving the diegetic environment.

This transition does not imply a rupture with the game universe, but rather a temporary reorganization of the experience within the same diegetic context. In this sense, arcade machines function as differentiated spaces of interaction that remain integrated within the broader logic of the game, reinforcing both immersion and the perception of continuity within the diegetic universe.

The presence of visual references associated with classic arcade culture contributes to activating mechanisms of recognition linked to the cultural memory of video games. This recognition facilitates the immediate identification of particular gameplay dynamics and reinforces the perception of engaging with a specific ludic system within the broader gameplay experience.

From this perspective, the intradiegetic interfaces present in *Star Wars Outlaws* (2024) do not merely fulfil an operational function, but actively participate in the visual construction of the player experience, functioning as elements that communicate and structure the transition between different gameplay systems.

5. Analysis

5.1. Rider

A) Case identification

Rider is an intradiegetic arcade machine featured in *Star Wars Outlaws* (2024). The device appears physically integrated into various interior spaces within the game world, such as cantinas and transit areas, and can be directly activated by the player through interaction with the arcade machine.



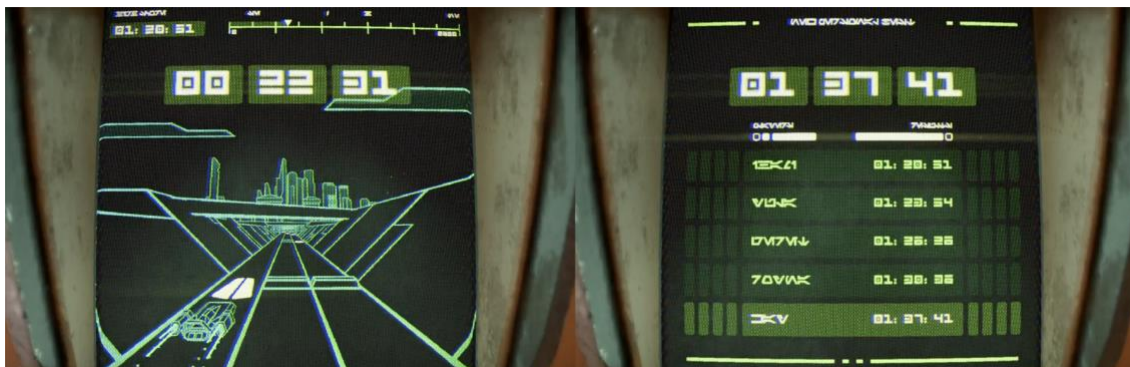


Figure 9. Main *Rider* screens: start screen, gameplay sequence, and final score screen. Source: Ubisoft / Lucasfilm Games.

The arcade functions as an autonomous ludic system within the main video game system, introducing a differentiated experience from both visual and interactive perspectives. Its design explicitly evokes the aesthetic of vector-based arcade machines from the late 1970s and early 1980s.

B) Perceptual organization

Rider's interface is structured around a centered frontal composition, organized through converging lines that construct a vanishing point positioned on the screen's horizon. This configuration generates a constant perception of depth and forward movement, reinforcing the sensation of speed and spatial progression.

The visual hierarchy is distributed across clearly differentiated levels. The player-controlled vehicle appears in the lower area; the main route unfolds along the central axis; and the upper section contains numerical indicators related to time, score, and game status. This arrangement facilitates the rapid reading of information and concentrates visual attention on the central trajectory.

The graphic rhythm is constructed through the repetition of lines, platforms, and geometric structures that segment the space into regular intervals. The progressive appearance of obstacles and changes in trajectory introduces variations in visual continuity, intensifying the perception of movement and speed.

The spatial representation evokes arcade references based on vector graphics, such as *Battlezone* (1980), *Tempest* (1981), and *Tron* (1982), where depth is constructed primarily through luminous lines and synthetic geometric structures.

C) Graphic identity

Rider's graphic identity is based on a minimalist visual aesthetic with a distinctly vector-like appearance. The interface employs a reduced colour palette dominated by green, bluish, and white tones against a dark background, creating a high level of contrast that enhances the legibility of on-screen elements.

The graphic composition evokes the visual systems of early vector-based arcade machines, employing luminous lines, simplified geometric structures, and a synthetic representation of space. This visual construction, also reminiscent of early vector display systems such as the Vectrex console (1982), prioritizes perceptual clarity and the sensation of movement over figurative detail or visual realism.

The typography features a geometric and modular construction consistent with the retrofuturistic technological imaginary associated with classic arcade culture. At the same time, the typographic system incorporates graphic forms that evoke the visual universe of *Star Wars*, through partially abstract characters and alien-like symbols that prevent entirely conventional reading. This visual

strategy contributes to reinforcing diegetic continuity between the arcade machine and the universe of *Star Wars Outlaws* (2024).

The iconography likewise maintains a reduced level of figurative detail. Both the vehicle and the environmental structures are represented through linear contours and simplified geometric forms. This visual reduction facilitates the immediate readability of the game space and places emphasis on navigation and movement within the interactive environment.

D) Interaction

Interaction in *Rider* is based on the movement of a vehicle along a route divided into different lanes and passage structures. The system requires constant positional shifts in order to avoid obstacles and take advantage of acceleration zones, establishing a gameplay dynamic centered on spatial coordination and visual anticipation.

The system's visual response is immediate and continuous. The lateral movement of the vehicle, the progressive approach of geometric structures, and the constant transformation of perspective directly communicate the consequences of the player's actions.

The system presents several clearly differentiated visual states: standby screen, start sequence, countdown, active gameplay, and final score screen. Each of these states partially modifies the interface's graphic organization, reinforcing the perception of the arcade system's autonomy in relation to the main game.

E) Relationship with the main game system

Rider presents a high degree of aesthetic rupture in relation to the main system of *Star Wars Outlaws* (2024). In contrast to the three-dimensional, textured, and cinematic environment of the main video game, the arcade introduces a flat, abstract representation based on low-complexity linear graphics.

However, this visual rupture coexists with diegetic continuity, since access to the system occurs through a physical device integrated into the game world. The arcade machine functions simultaneously as an environmental object and as an interface providing access to an autonomous ludic system.

In this sense, the transformation of the interface acts as a perceptual marker of the transition between gameplay systems. The shift from the main environment to *Rider*'s vector-based aesthetic immediately communicates entry into a differentiated experience, reinforcing the perception of a "system within a system" that structures the intradiegetic logic of the device.

5.2. Raven 6

A) Case identification

Raven 6 is an intradiegetic arcade machine located in various recreational spaces within *Star Wars Outlaws* (2024). Unlike *Rider*, which is centered on speed and movement, *Raven 6* offers an experience based on space combat and target destruction within a vector-based graphic environment. The player controls a spacecraft through a targeting and shooting system directed at enemies represented through wireframe geometries and floating structures, establishing a clear connection with the tradition of arcade space combat video games developed in the late 1970s and early 1980s.

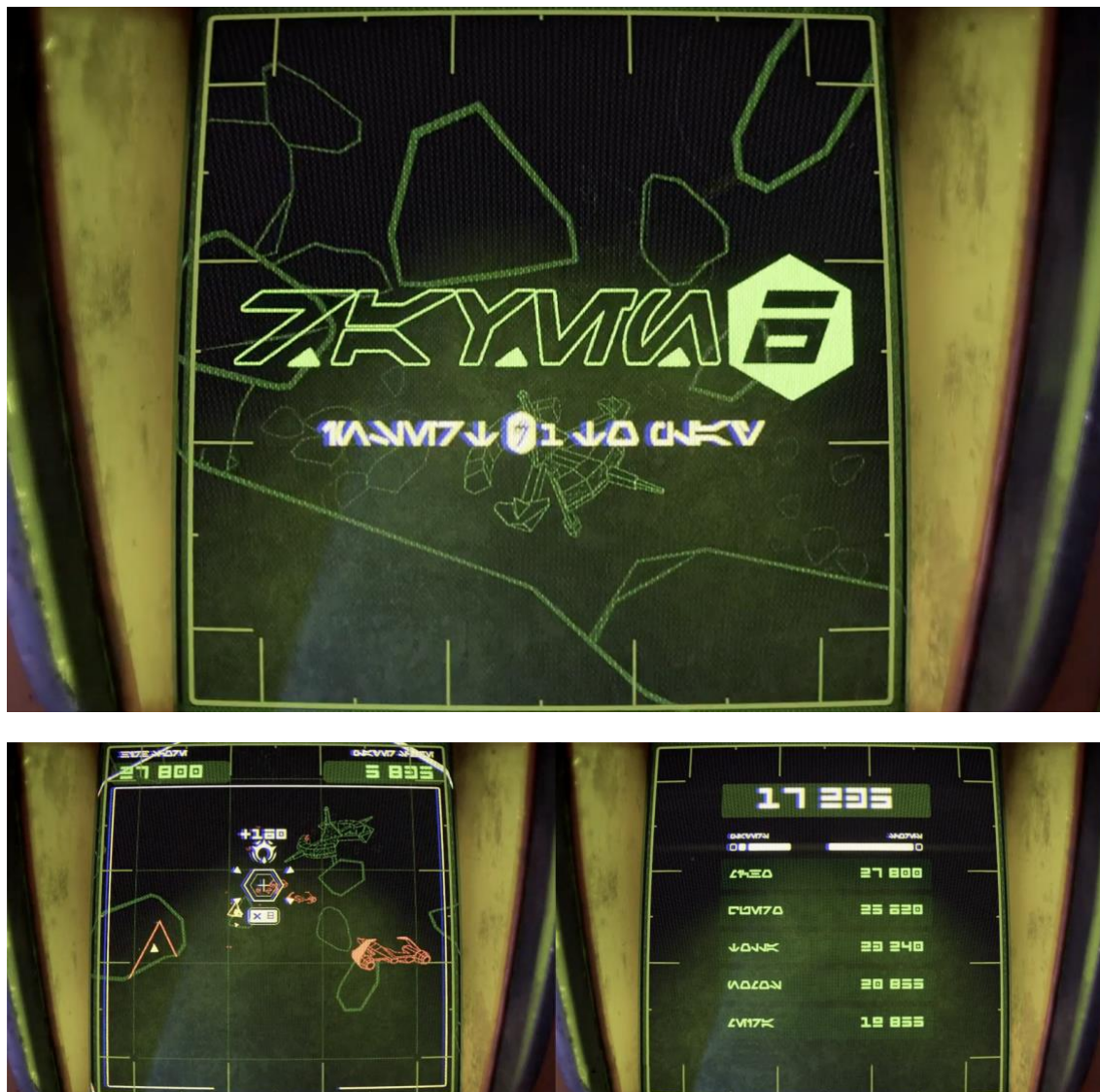


Figure 10. Main Raven 6 screens: start screen, gameplay sequence, and final score screen.
Source: Ubisoft / Lucasfilm Games.

Visually, *Raven 6* draws particularly on references such as *Star Wars Arcade* (1983), *Battlezone* (1980), and *Tempest* (1981), both through its use of vector graphics and through the presence of grids, tactical interfaces, and spatial compositions based on luminous geometric lines against a dark background. These references do not function as mere nostalgic quotations, but as elements integrated into the universe of *Star Wars Outlaws* (2024), operating simultaneously as historical homage and as a coherent extension of the main game's technological visual language.

B) Perceptual organization

Raven 6's visual organization is structured around a composition centered on the logic of targeting, shooting, and spatial surveillance. The screen organizes information through grids, geometric frames, and reference lines that delimit the play space and continuously direct the player's attention toward the center of the action. Unlike *Rider*, where perception was structured through depth and forward movement, *Raven 6* employs a more static and tactical composition based on the detection and destruction of threats.

The interface establishes a clear visual hierarchy through the contrast between chromatic and geometric elements. Enemies are represented in reddish or orange tones, distinguishing them from

the monochromatic green environment that dominates the rest of the screen. This chromatic differentiation does not serve a purely aesthetic function, but operates as a perceptual mechanism for prioritizing targets and facilitating the immediate reading of the interactive space.

The constant use of grids, hexagons, impact indicators, and scanning frames generates an aesthetic closely associated with navigation and combat systems drawn from military and science fiction aesthetics. In this way, the visual composition functions more as a control interface than as a naturalistic representational space, reinforcing the sensation of operating a technological device integrated into the game's diegetic universe.

C) Graphic identity

Raven 6's graphic identity is articulated through a vector-based aesthetic inspired by the visual limitations of early arcade machines. The use of luminous lines, wireframe geometries, and dark backgrounds recreates the appearance of old CRT monitors and vector-based graphic systems, directly evoking the visual materiality of classic arcade video games. This graphic construction generates a retrofuturistic aesthetic that combines historical references from video game culture with visual elements associated with the *Star Wars* universe.

The typography used in titles, score displays, and scoring systems features geometric and distorted characters that simulate technological alphabets or alien languages. Although these forms retain part of the functional legibility necessary for interaction, their design prioritizes aesthetic integration within the game universe. In this way, typography ceases to function solely as an informational element and also becomes a resource for diegetic construction and visual world-building.

The interface also incorporates multiple graphic elements associated with tactical and military systems: energy bars, score indicators, geometric symbols, targeting grids, and tracking frames. These elements generate a visual identity consistent with the arcade's space combat logic, clearly differentiating it from *Rider* in both formal and perceptual terms.

D) Interaction

Interaction in *Raven 6* is based on mechanics of targeting and destroying objectives within a two-dimensional space organized through vector-based layers. The player must identify threats, lock onto targets, and fire using a central targeting system that concentrates much of the visual and operational focus of the experience.

The interface responds continuously to the player's actions through visual indicators of impact, scoring, and destruction, generating immediate visual feedback that reinforces the arcade rhythm of the system. This visual dynamism is accompanied by the progressive appearance of multiple enemies and floating geometric forms, increasing the screen's perceptual density and producing a constant sensation of pressure and surveillance.

At a formal level, the interaction reproduces many of the logics present in early space combat video games, where visual precision and the ability to rapidly read the environment were essential to player survival. *Raven 6* recovers these classic dynamics and recontextualizes them within a contemporary intradiegetic system integrated into the narrative universe of *Star Wars Outlaws* (2024).

E) Relationship with the main game system

Raven 6 functions as an intradiegetic system that expands the cultural and technological construction of the universe of *Star Wars Outlaws* (2024). Its presence within the game's recreational and social spaces contributes to reinforcing the sense of everyday life and depth within the game world, allowing the player to interact with ludic devices that exist simultaneously as narrative objects and as autonomous playable systems.

Unlike traditional non-diegetic interfaces, *Raven 6* forms a material part of the explorable environment and can be directly used by the protagonist. This integration transforms the arcade machine into an “interface within the interface,” exemplifying the concept of the “digital matryoshka” proposed in this study: interactive systems contained within larger interactive systems.

Furthermore, *Raven 6* does not function merely as a decorative element or secondary activity, but as a device capable of activating cultural references linked to the history of arcade video games and the visual language of science fiction. The result is a hybrid experience in which cultural memory, interface design, and diegetic construction converge, reinforcing the capacity of contemporary video games to integrate multiple levels of interaction and visual representation within a single game world.

5.3. Interpretation of results

The analysis of *Rider* and *Raven 6* identifies different visual strategies used to construct differentiated ludic systems within *Star Wars Outlaws* (2024). In both cases, the interface acts as a central component in defining the gameplay experience, visually organizing space, interaction, and the player’s relationship with the system.

Although both machines share an aesthetic inspired by vector graphics and visual technologies associated with early arcade machines, each develops a distinct graphic identity in accordance with its own ludic logic. *Rider* prioritizes the perception of movement and depth through abstract geometric structures and converging lines, while *Raven 6* develops a more tactical visual organization based on grids, surveillance systems, and space combat elements.

These differences demonstrate how the interface functions not merely as a functional support for interaction, but also as a mechanism of perceptual construction capable of communicating different forms of gameplay through specific visual resources. Composition, typography, spatial organization, and the use of colour thus contribute to defining autonomous visual identities within each intradiegetic system.

The findings show that the transformation of the interface plays a fundamental role in communicating the shift between gameplay systems. Accessing the arcade machines entails not only a modification of rules and interaction dynamics, but also a visible alteration in graphic organization, spatial composition, and the visual codes employed by each system.

In *Rider*, this transition is constructed through an aesthetic based on abstract geometric structures, vector lines, and a simplified spatial representation that significantly transforms the perception of the environment in relation to the game’s main system. By contrast, *Raven 6* develops a more tactical visual organization supported by grids, surveillance systems, and graphic elements associated with combat and target tracking.

These visual differences allow the player to rapidly identify access to differentiated ludic experiences within *Star Wars Outlaws* (2024). The interface thus functions as a mechanism capable of communicating the transition between interaction systems through specific graphic resources, reinforcing the perception of each arcade machine’s autonomy within the video game.

Despite the strong visual and interactive differentiation of the arcade machines analyzed, both systems maintain perceptual and cultural links with the broader universe of *Star Wars Outlaws* (2024). Elements such as alien-like typography, specific colour strategies, and the technological aesthetic of the interfaces help preserve diegetic continuity, integrating the arcade machines into the game world.

This coexistence between autonomy and integration allows for a more nuanced understanding of the intradiegetic systems analyzed. On the one hand, *Rider* and *Raven 6* construct distinct visual identities, with differentiated rules, dynamics, and graphic languages. On the other hand, these

identities remain embedded within the cultural and visual universe of the main system, avoiding a complete rupture with the overall gameplay experience.

In this context, arcade machines may be understood as devices that expand the structural complexity of contemporary video games by incorporating autonomous interactive systems within larger systems. The presence of references associated with classic arcade culture and early visual technologies also activates a cultural memory of video games, integrating different historical and visual layers within a single interactive experience.

6. Discussion

6.1. Relationship between the findings and the theoretical framework

The findings establish a direct connection with the theoretical approaches that conceptualize the video game as an interactive system composed of multiple levels of interaction. In line with the contributions of Katie Salen and Eric Zimmerman (2004), *Rider* and *Raven 6* may be understood as differentiated rule-based systems integrated within a broader ludic structure, configuring autonomous experiences contained within the interactive universe of *Star Wars Outlaws* (2024).

Similarly, the coexistence between rules and representation identified by Jesper Juul (2005) is reflected in the way both systems combine specific gameplay dynamics with distinct visual identities. The interface does not function solely as a functional support for interaction, but also as a representational element capable of communicating to the player that they have entered a differentiated ludic system.

The findings also resonate with the perspectives of Espen J. Aarseth (1997) and Alexander R. Galloway (2006), particularly in relation to the idea of the video game as a complex structure composed of multiple levels of action and interaction. In this context, the arcade machines analyzed function as systems contained within other systems, activating new dynamics of navigation, perception, and interaction with the interface.

The contributions of Henry Jenkins (2004), Janet Murray (1997), and Kristine Jørgensen (2013) are especially relevant for understanding the role of the interface in the construction of the interactive environment. The arcade machines do not appear merely as secondary activities or decorative elements, but as devices integrated into the game's diegetic universe, capable of expanding the player experience and reinforcing the perception of inhabiting a complex and layered interactive world.

6.2. The intradiegetic interface as a mediator between systems

The analysis shows that intradiegetic interfaces perform a mediating function between different levels of interaction within the video game. The visual transformation of the interface enables the player to perceive the transition from the main system to autonomous secondary systems, enabling recognition of changes in rules, dynamics, and forms of interaction without leaving the game universe.

In this sense, the interface not only organizes the visual experience, but also functions as a mechanism of transition between differentiated ludic systems. Elements such as composition, typography, iconography, grids, and spatial organization help construct distinct visual identities for each arcade machine, reinforcing the perception of autonomy in the systems analyzed.

At the same time, *Rider* and *Raven 6* maintain graphic and cultural links with the broader universe of *Star Wars Outlaws* (2024), avoiding a complete rupture with the main system. This coexistence between visual differentiation and diegetic integration positions intradiegetic interfaces as hybrid spaces that function simultaneously as narrative devices, interactive systems, and structures of visual representation.

6.3. Conceptual contribution: the “digital matryoshka” as an interpretive model

The findings of this study suggest that the concept of the “digital matryoshka” offers a conceptual framework for understanding the arcade machines analyzed as ludic systems contained within larger interactive systems. This notion of “systems within systems” is not limited to the functional dimension of the video game, but also manifests in the visual and perceptual construction of the gameplay experience.

The concept of the “digital matryoshka” thus offers a way of understanding how certain intradiegetic devices generate additional levels of interaction within the game universe, incorporating autonomous rules, interfaces, and visual languages that coexist within a single interactive structure.

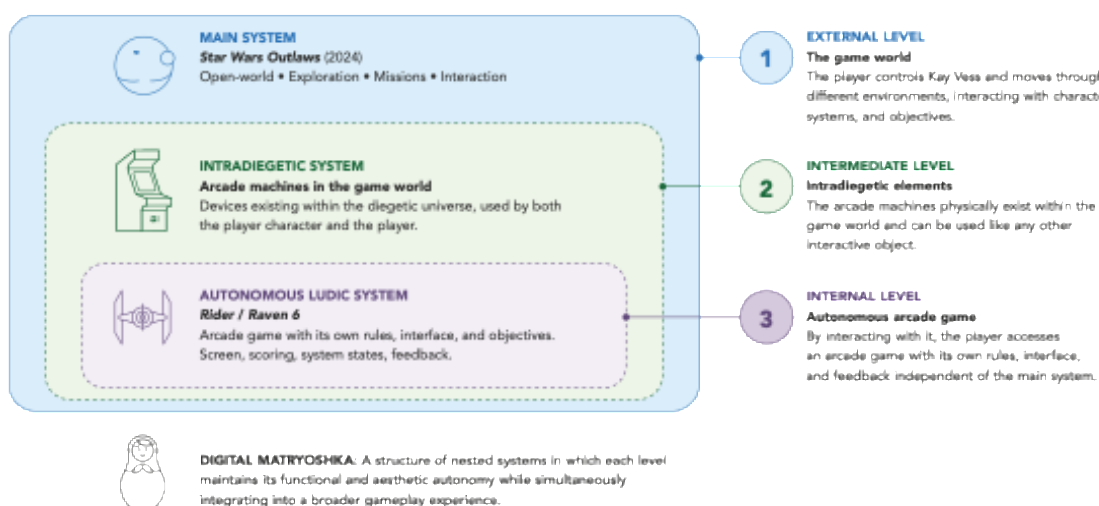


Figure 11. Interpretive model of the “digital matryoshka” applied to the analysis of intradiegetic ludic systems. Source: author’s own elaboration, 2026.

In this context, *Rider* and *Raven 6* do not function merely as mini-games embedded within *Star Wars Outlaws* (2024), but as complete systems that develop their own graphic identities, perceptual dynamics, and forms of interaction. The interface thus becomes the element that communicates access to these internal systems, visually articulating the transition between different levels of ludic experience.

6.4. Implications for interface design analysis

The findings of this study contribute to expanding the analysis of interface design in video games beyond perspectives focused exclusively on functionality or usability. The study demonstrates that the interface actively participates in the perceptual, narrative, and cultural organization of the interactive experience, particularly in contexts where multiple ludic systems coexist within the same digital environment.

The presence of references associated with classic arcade culture and early visual technologies highlights how contemporary interface design recovers and reinterprets historical visual memories linked to video games. Elements such as vector graphics, wireframe structures, and aesthetics inspired by early CRT monitors do not function merely as nostalgic resources, but as mechanisms capable of communicating specific forms of interaction and visual interpretation.

In this sense, the study of intradiegetic interfaces opens new avenues of research related to the visual dimension of video games, the construction of interactive systems organized across multiple levels, and the relationship between cultural memory, graphic design, and ludic experience in contemporary video games.

7. Conclusions

This study has examined the *Rider* and *Raven 6* arcade machines in *Star Wars Outlaws* (2024) as intradiegetic ludic systems integrated within the game universe. Through an approach centered on the visual analysis of interfaces, the study has identified how different graphic and interactive resources contribute to constructing differentiated gameplay experiences within the main system.

The findings highlight the importance of the interface in structuring ludic systems contained within larger interactive structures. In this sense, the concept of the “digital matryoshka” proposed in this research offers a conceptual tool for analyzing the coexistence of multiple levels of interaction within contemporary video games.

The study also expands the analysis of intradiegetic interfaces by foregrounding their visual dimension, incorporating aspects such as composition, typography, iconography, and spatial organization as fundamental elements in the construction of the interactive experience.

One of the principal limitations of the study lies in the specificity of the case examined, which focuses exclusively on the arcade machines featured in *Star Wars Outlaws* (2024). Future research could broaden the analytical corpus to include other video games incorporating comparable intradiegetic systems, as well as explore different typologies of interfaces embedded within complex interactive universes.

Likewise, future lines of inquiry could further examine the relationship between interface, narrative, and sound, as well as other forms of visual representation associated with complex interactive systems in contemporary video games. In addition, the analytical instrument proposed in this study could be applied in player-centered research aimed at exploring how different users interpret transitions between intradiegetic ludic systems.

Ultimately, the concept of the “digital matryoshka” invites us to understand the contemporary video game not as a single closed system, but as a layered structure of interactive experiences in which the interface acts as a mediator between different levels of gameplay, representation, and perception.

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