Open-End Storytelling in Pinball Machines

A Summary of the Narrative Elements and Structures in Pinball Machines

David Krummenacher

Pinball machines have long been part of everyday culture. Today, they have almost completely disappeared from public spaces and can mostly be found in closed hobby rooms or in digital form on the players' private devices. A similar situation applies to their description in a scientific context. They let many players live through their story while playing, but so far nobody has described how these stories are structured and how they are received.

This article is based on a master's thesis (Krummenacher 2018) in the subject area of Game Design at Zurich University of the Arts. It examined pinball machines with regard to their narrative elements and structures, utilizing content analysis as a method. The results were mostly limited to storytelling in physical pinball machines and dealt only marginally with virtual pinball machines. Virtual pinball machines that are subject to the restrictions of a physical pinball machine were of course not excluded, but not explicitly investigated. The purpose of the thesis was to open up the field and to give designers of physical and virtual pinball machines a framework in which they can think about storytelling for pinball machines. The following article provides a summary of the findings of this thesis.

DEFINING STORYTELLING AND PINBALL

Stories are told all over the world and by every culture. The object is for the storytellers to pass on information to the listeners. The conveyance of the infor-

mation follows certain rules of the respective culture so that the information is perceived as a story.

In this article, the term *storytelling* is used to describe how content and concepts are narrated. The conveyance and reception of narrative content is also understood in this work as part of storytelling. This forms the basis for the following definition of storytelling.

Pinball machines are games of skill whose central element is a ball. The ball moves within an inclined, self-contained game space. The object of the game is to collect as many points as possible when the ball hits various game elements. The ball is shot into the playfield by interacting with the machine. This can be done by pulling and releasing a plunger or pressing a button. The presence of a tilt mechanism, which stops the game if the machine moves too much, is not included in this definition.

Furthermore, the game must have at least two paddles, which introduce a further level of skill through increased interaction possibilities. This is necessary to differentiate the pinball machine from the game *Bagatelle*.

As the title of the article indicates, the two previous definitions must be combined. This results in further terms that have to be specially defined in the context of pinball machines.

Storytelling in pinball machines means the process of how the contents or concepts of pinball machines can be narratively charged, communicated and received.

Contents and concepts in this context means the game mechanics, the game goals and the game elements. Furthermore, references to already existing media and the pinball machine as a product are also included here.

Narratively charged means that these contents and concept have been equipped with narrative means. These make it possible to convey and receive the contents and concepts of pinball machines in a non-abstract form.

Conveyance is the process of instructing or guiding players to learn the story of the pinball machine. *Reception* is the activity of experiencing the game from the players' point of view. The players take different roles within the reception. The result is that the conditions for reception are different for each role, which means that the reception cannot always be the same in the different roles.

For readers unfamiliar with pinball terminology the following figure provides a simplifiedₗ visual glossary.[1]

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1 More extensive glossaries can be found online, eg. https://www.ipdb.org/glossary.php

Figure 1: Simplified visual glossary.
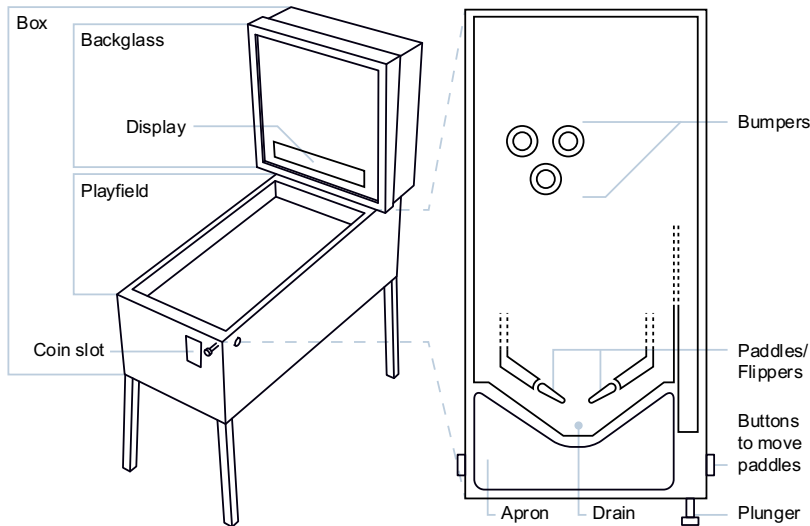
Source: David Krummenacher

THE FUNCTIONAL STRUCTURE

A pinball machine takes on different functions, each of which can be of narrative importance. These functions enable storytelling to frame pinball machines as a game, but also as a product. The following described functional elements are not necessarily always located at the same place, but are present in most pinball machines in some form.

The box as poster

The first function of storytelling in pinball machines is to recruit potential players. Mostly this is done by the visual and auditory design of the box in its idle or dedicated advertising mode. It is intended to generate attention and create incentives for potential players. A narrative function that is performed here is the establishment of the theme. This is particularly relevant in the case of adaptations from other media. The aim here is to establish a connection to the original work as quickly as possible.

The playfield as a stage

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The display

Another functional level is the playfield. On this level the actual story of the pinball machine is being told. It is the main area where the game takes place, because the ball is visible for the players. The active game elements are located in the playfield, which allow the pinball machine to function as a game, even if any narration is left out. Screens in the upper part of the box or within the playfield can be used to expand the playfield or the game elements.

Other functional elements

In the following section, further functional elements are described which only play a lesser role in narrative terms, but can nevertheless be charged narratively.

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The game instructions
The game instructions are one of the elements designed to explain the game to the players. The instructions can be partly embedded in the theme, but partly completely separated from it. In terms of content, the theme is referenced when formulating the winning conditions.

Furthermore, the game instructions teach the players the pricing and available game modes. Often the price per ball is indicated and whether these can be distributed among several players. The game instructions are usually located at the bottom of the playfield, the so-called apron.

Interaction possibilities

Further functional elements are the interaction possibilities. These are, for example, the buttons on the side which move the paddles, a start button and the plunger that transports the ball into the playfield. The buttons are usually not integrated into the theme in terms of design, but simply highlighted in color. The plunger can often be pulled up and released to control the force with which the ball is released. Sometimes the plunger is replaced by a button or even integrated into the theme of the pinball machine.

For example, *Indiana Jones: The Pinball Adventure* (Williams 1993) uses the handle of a pistol instead of a plunger or a simple button. The players have to fire the pistol to literally shoot the ball into the playfield. A familiar motif from the film is used here.

Figure 2: Plunger button in the shape of a pistol from Indiana Jones: The Pinball Adventure (Williams 1993).

Source: unknown author, from: "Indiana Jones Williams Pinball Machine For Sale UK", https://www.homeleisuredirect.com/pinball-machines/vintage-pinball-machines/indiana-jones-williams-pinball-machine.html.

Relationships of the functional elements

All functional elements are spatially bound to the pinball machine and are narratively united by the given theme or are separated from the theme to achieve special meaning.

A special relationship is that of the display and the stage. The display is a complementary narrative level to the stage. This means that narrative contents of the stage can be temporarily stored in the display. An object that is on the stage

might be taken up again in the display as part of an animation and the stage can thus be extended for a short period of time.

As an example, the genie from *Tales of the Arabian Nights* (Williams 1996) can be mentioned here. He is represented as a figurine within the stage, but also appears in multiple animations.

Figure 3: The genie from Tales of the Arabian Nights (Williams 1996).

Source: screenshot (Krummenacher) from YouTube Video The Pinball Arcade – Tales of the Arabian Nights [98,071,260] (TeaKayKay, March 13, 2014).

Conversely, however, this relationship is also possible if the design of the stage allows for dynamic or interchangeable content. An example of this is *The Machine: Bride of Pinbot* (Williams 1991). Here, the face of a woman is used as a game element but also as a progress indicator. The players have to shoot balls at the face, which then changes.

Figure 4: Progress bar as game element in The Machine: Bride of Pinbot (Williams 1991).
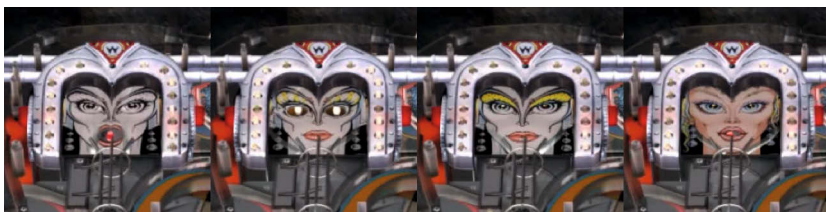
Source: screenshot (Krummenacher) from YouTube Video Pinball Arcade – Bride of Pin*Bot (pinballwiz45b, April 17, 2015).

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Figure 5: Additional display in the playfield in Big Shot (Gottlieb 1974).

screenshot (Krummenacher) from YouTube Video Pinball Arcade – Big Shot (pinball-wiz45b, April 19, 2014).

THE STRUCTURE OF THE NARRATIVE

Pinball machines have structures in which their stories are told. Structures are understood here to be mechanisms that create content-related framing, time-related sequences and spatial organization for the narrative.

The following chapters show the individual elements of the structure and their relationships to each other.

The narrative framework

As with almost all stories, a narrative frame can be constructed around the stories in pinball machines. The theme is the overriding arc for all the components of a story. It determines the narrative content of all subordinate frames. Three parallel frames can be constructed under the theme.

The first are the primary narrative offers. These contain the overall task that leads to the conclusion of the game, whether by reaching a certain condition or losing the last ball. Primary narrative offers are very strongly tied to the theme and give the pinball machine an overarching tension.

Figure 6: The narrative framework.

Theme		
Primary offers	Secondary offers	Meta offers
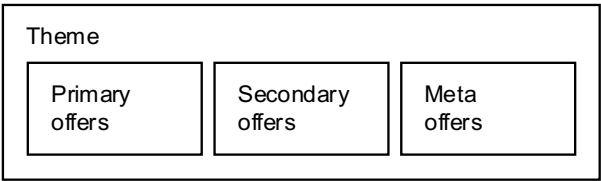
Source: David Krummenacher

Next, there are the secondary narrative offerings. These provide the framework for secondary tasks and serve the logical consolidation of the game world within the theme. Secondary narrative offers can also have informative value.

The last frame contains the meta offers. These serve to consolidate the pinball machine as a product within the theme, draw the player into the story and create motivation to stay in the game.

All narrative offers can be perceived several times. Since a game of pinball inevitably ends with the loss of the ball, this also applies to the main narrative arc in the primary offers. When the main story line is completed without losing the ball, it starts again from the beginning.
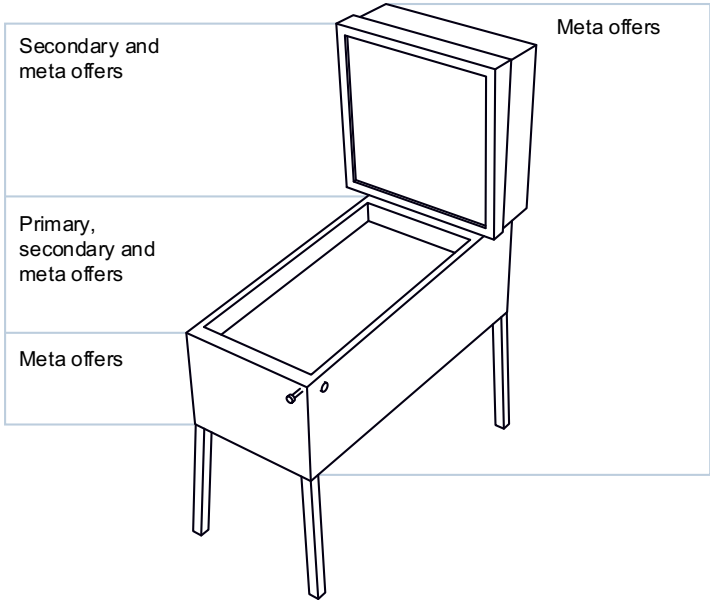
Narrative offers

The narrative of a pinball machine consists of narrative offers that can be perceived or not. The acceptance of these offers is not only deliberately caused by the player, but can also happen due to a lack of control of the ball. This makes the reception of these offers more difficult.

Narrative offers consist of a sequence of events that is logically self-contained. The narrative offers themselves are structured and held together by the narrative framework.

The types of narrative offers set by the narrative frame can be spatially assigned to the pinball machine. The box itself mostly contains meta offers. The upper part of a pinball machine usually contains secondary offers, such as the score display or meta offers like the backglass. All types of offers can be found within the playing field.

*Figure 7: Types and spatial distribution of narrative offerings.*

Source: David Krummenacher (figures 7-15)

Temporal logic

Temporally, a story told in a pinball machine consists of a sequence of narrative offers.

A narrative offer dramaturgically consists of a beginning, an end and a continuation or a connecting event of another narrative offer. Narrative offers consist of individual events that can follow one another in a linear fashion and are triggered by the fulfilment of a condition.

Figure 8: Process of a narrative offer.
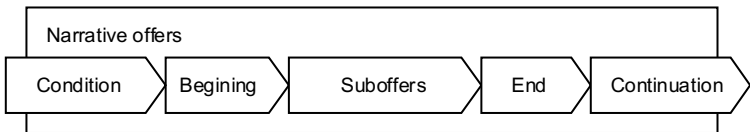
The model of a linear sequence of events can be applied, but it is not sufficient, since offers can also be multilinear or branching.

Figure 9: Linear sequence.
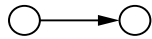
The model of a multilinear structure can also be applied to the individual narrative offerings. This means that decision points are created that lead a single storyline in a new direction. However, a multilinear model cannot be applied to the narrative offerings as a whole, because they are not linearly linked to each other.

Figure 10: Branched sequence.
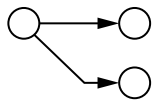
The offers themselves may be non-linear in time and may cause jumps within their own or another storyline. As a result, a new term to describe the process must be found.

Narrative offers run asynchronously and parallel to each other. However, only one narrative offer can always be perceived as active. Therefore, a model is required which allows the narrative offers to be divided into asynchronous parallel narrative or plot strands.

The new model combines the linear and the branched model and introduces a structure of narrative strands. Within the overall narrative, it allows for jumps between the individual strands, which in turn can influence the state of a narrative strand. This means that narrative strands can be moved forward or backward from other narrative strands.

Figure 11: Parallel asynchronous sequence.
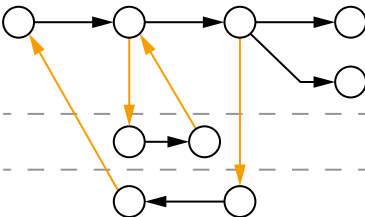
The individual process

Narrative offers consist of a sequence of events. These can only be perceived linearly by a player. Although the individual narrative offers remain the same, the story perceived by a player can be considered individual and emergent.

This individual procedure contributes to the fact that the reception of the story in a pinball machine as a whole is made more difficult. The players are required to engage with the respective pinball machines over a longer period of time in order to be able to perceive and classify the narrative offerings at all. This is also aggravated further by the fact that bad players are denied access to the narrative offerings that appear later.

Spatial logic

The spatial narrative logic in pinball machines is comparable to a stage play or a fairground of narrative offerings. Spatial elements are bound to narrative offers, but can fulfill functions for several such offers. They never perform these functions for several offers at the same time, since only one narrative offer can be the active one.

Spatially the stage is strongly vertically structured. This can be explained by the fact that the ball and gravity are the central elements of the game. At the lower end of the stage there are often meta offers, such as the game instructions. These are immediately followed by the central elements of the primary narrative offerings, the paddles and the drain, which are associated with the loss of the ball. In the middle of the stage there are mostly secondary and meta offers. Secondary and primary offers are at the top. This arrangement reflects the games playing with gravity. The players move up and down on the stage between these narrative offers.

Another spatial element is the display, which can reproduce narrative offers of all kinds.

Figure 12: The vertical structure.
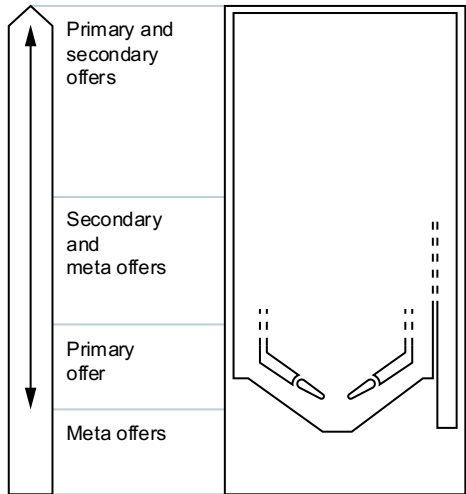
Source: David Krummenacher

Conveying the offers

Both visual and auditory channels are used to convey the narrative offers. Often the offers are visually represented as graphics or figurines.

The narrative offerings are supported by guidance and feedback systems, which are designed to be both visual and auditory. Guidance systems can increasingly be found in the playfield and are supported by acoustic indications. Feedback systems are often of an auditory nature and, in addition to the lighting design in the playfield, are often outsourced visually to a screen. Feedback is sometimes also given physically. For example, when a player has won a free game, the so-called knocker within the box hits the inside of the box and lets the player feel the blow as well as the audible bang. Furthermore, due to the physical nature of the pinball machine, the impact of the ball is often felt directly by the players.

ELEMENTS OF THE NARRATIVE

A narrative or narrative offers in pinball machines consist of several elements. However, not all of them are necessarily always present. The elements of the narrative are listed and described below.

Events

Events are the smallest unit of a narrative offer. They are triggered by interactions with the pinball machine by the player or the ball. A narrative offer consists of the concatenation of such events. Events are strongly linked to the tasks within the pinball machine.

Tasks

From a game mechanics point of view, the most important elements are the tasks. They guide the player to trigger certain events and formulate the challenges. In order to use tasks and their completion in a meaningful way, the pinball machine must be able to map the respective states of the tasks. Probably for technical reasons, older pinball machines simplify tasks considerably. In modern pinball machines more complex task sequences occur. These can consist of main and subtasks.

With regard to storytelling, tasks can be structured. In older machines, tasks can be performed without restriction throughout the game.

Figure 13: Task cycle of older pinball machines.
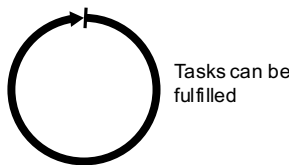
In more modern pinball machines the tasks follow a dramaturgical sequence. At the beginning the main task is usually established. After that, tasks can be performed concurrently until they come to a head at a certain point at the end of the main task.

Figure 14: Task cycle of modern pinball machines.
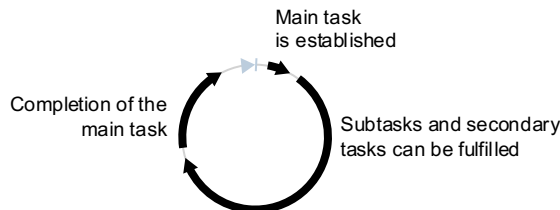
Tasks can either be formulated explicitly or implicitly. Explicitly formulated tasks are emphasized through narrative means, for example auditively by a voice over of the narrator or visually by the lighting up of a surface or by an animation within the screens. Implicitly formulated tasks are only introduced when they first occur, for example, the bonus points that can often be achieved by hitting the bumpers can be understood as implicit tasks.

The world

Every pinball machine creates a world in which its story is told. The world is defined and held together by the theme or narrative framework. The world is experienced by the player through the design of the individual elements.

Characters

As in most other stories, the stories in pinball machines are also about characters. Characters take on certain roles within the story and these are represented in some form in the machine. The following roles are often given special emphasis.

Narrator
Many pinball machines have a narrator that sometimes is represented in the machine, but often is not. Narrators guide the players through the game and its story. Narrators are also used as a means to advertise a pinball machine that is currently in idle mode.

Protagonist
The protagonist of the story is in most cases the player. Their role is mostly characterized externally. That means, if they have any representation in the game at all, the role they take on is explained by other characters – for example the narrator. A representation of the protagonist is most often found in the display, i.e. in the backglass or in a digital screen.

Antagonist
The antagonist is the opponent of the player, who is often represented by a toy within the stage or on the backglass. A toy is a three-dimensional model that represents an object in the narrative and is placed in the stage. For example a bust, an object or a building. Antagonists are the representation of the main task or the overarching challenge that has to be overcome in the game.

Secondary characters

In many pinball machines you also find secondary characters. These are usually assigned to secondary tasks and provide access to these tasks by personifying challenges or conveying content through them.

The ball

A special case is the figure of the ball. It can take on different roles within the narrative or a narrative offer. For example, in one offer the ball can represent the player and thus become an avatar, in another offer it can represent a projectile with which the player is supposed to hit a certain target.

Since the ball is the central element of the game, because it is directly linked to the win/loss conditions, its relationship to the player is probably the closest.

The creation of meaning

An important part of the narrative in pinball machines is the creation of meaning. Without it, the game of pinball becomes an abstract process in which individual machines can hardly be distinguished from one another and goals can only be formulated in an extremely complicated way.

One requirement for creating meaning is a coherent world logic within the narrative. As soon as this logic is not consistently adhered to, the narrative collapses.

Another aspect that charges the narrative with meaning is the game's inherent struggle against gravity. The players are in constant conflict with it and being defeated by gravity equates to the end of the game.

Significance is also created by the need to pay in order to play the machine at all. Just as with slot machines or digital arcade games, players have to insert money into the pinball machine first and thus put something at stake, which in turn increases the meaning. However, pinball machines differ from slot machines and arcade games, since the game usually cannot be extended by inserting more money, which increases the importance of the individual game. It also increases the importance of free plays or additional balls, which reward especially good players. Since no cash prizes can be won in pinball, the importance of the game itself is further increased.

The individual elements are given meaning by visually highlighting them in the best slot machine manner through lighting, flashing or movement. This is also seen in the feedback systems which give importance to the events and the actions of the players.

The need for points

Points have a special position in pinball machines. They not only measure the players' performance, but also have a narrative function.

Points are an important indicator of how far the player has progressed within the narrative. As a player it is hardly possible to keep track of the different narrative offers due to the narrative structures. The completion of a narrative offer is usually accompanied by an increase in the score, thus making narrative progress readable.

THE ROLES OF THE RECIPIENTS

There are different ways in which recipients can relate to pinball machines. The following describes which roles recipients can take on, how their perception of the pinball machine changes and what effects they have on the narration of the game.

Figure 15: Framing of the roles of the recipients.
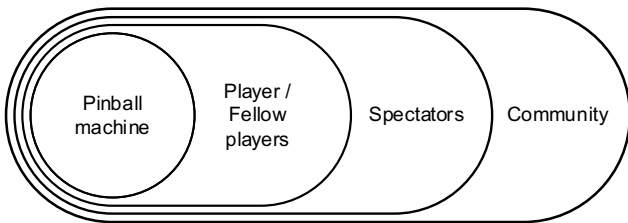
Source: David Krummenacher (figures 7-15)

Around the pinball machine different reception frames can be constructed. In the center is the pinball machine itself, which is directly received by players or fellow players. From the outside the pinball machine is received by spectators. The box directly and the game itself indirectly via the players. The community forms the outermost frame. The community receives pinball machines indirectly via the narration of the spectators and players. Anecdotes are an essential part of this frame. Within the community frame, technical language can also be found. However, due to the widespread cultural distribution of pinball machines, mastery of them cannot be considered a mandatory criterion for membership of this community.

The player

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Fellow players

Fellow players are players that currently are not actively interacting with the machine, but are still involved in the game.

Fellow players focus on the stage and the display. They have the opportunity to deal with the narrative offerings of the pinball machine much more extensively, since they do not have to concentrate as much on the ball as the active players.

Spectators

A spectator is not actively interacting with the machine and is not involved in the game. They focus on all functional elements of the box and beyond that on the players and fellow players.

Pinball machines as a topic of conversation

Pinball machines not only tell a story within themselves, but also become a narrative subject. The narratively charged game elements make it easier for players to talk about the game mechanics and the rules of the game, because narratively charged game elements do not require technical terms that a layperson is usually not familiar with.

Furthermore, pinball machines are also talked about in the community that is formed around pinball machines. The competition surrounding the games or certain maneuvers are narratively charged by the players. Stories are told about failing or winning at certain pinball machines.

CONCLUSION

The work should be understood as a first proposal for a collection of evidence and a description of structures. This collection and classification can by no means be regarded as final, because only a small part of the whole catalog of published pinball machines was examined. In a further step, other pinball machines would have to be investigated – especially earlier pinball machines manufactured when it was technologically rather difficult to represent complex states.

A point of criticism of the work is certainly that, in the current state of the model, it does not clearly distinguish between narrative mechanics and game mechanics, but a separation nevertheless seems possible and would lead to a clearer terminology. A further point of criticism is that the work tries to cover a very large area and thus remains only superficial at certain points. It should also be investigated whether the developed model can only be applied to pinball machines or whether it is too openly formulated and does not differentiate itself sufficiently from other media.

The topic of how pinball machines tell their stories proved to be extremely profound and entertaining. Pinball machines are a good topic of conversation. Most people who were confronted with the topic during the research had a personal anecdote to tell or a hint of exciting projects in this field. Furthermore, there was no-one among these people who had never played a pinball machine before or perceived the game experience as particularly negative.

Last but not least, a question is raised here which is not completely serious, but also cannot be completely dismissed as a joke. Are pinball machines the leading narrative medium of modern games? Open-world games, for example, give the impression that their narrative structures and elements are closely related to those of pinball machines. Furthermore, their reception is very similar. Narrative offerings are provided in a game world, which are perceived by the player in a temporal arrangement and thus form a user story. The only, but probably rather significant difference is that in open-world games players have more control over whether and when they want to perceive these offers.

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