Interactive systems as storyworlds. An approach for building coherent interactive narratives

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Unlike the fixed and predestined sequence of narrative, interactive artefacts such as games appear to be based on the relative freedom of the player and his/her ability to influence the course of events. This paper reports on a study investigating the scope of Interactive Storytelling with a narrative approach, emphasising the debate between narrative and interaction and analysing issues related to narratology and ludology. The starting point is framing the friction between the rules that run an interactive system and narrative coherence. Starting from the construction of an imaginary world, it can be possible to trace a framework for the creation of interactive narratives. The framework is applied on a pre-existing story*: The Mask of the Red Death* by Edgar Allan Poe, turning it into an interactive narrative. Then, the original narrative and the interactive one are tested by two groups of users, gathering data through a survey. The results suggest the potential of the interactive narrative in terms of immersion and participation.

CCS CONCEPTS • **Applied computing~Arts and humanities~Media arts • Human-centered computing~Human computer interaction (HCI)~HCI theory, concepts and models** • General and reference~Cross-computing tools and techniques~Design

Additional Keywords and Phrases: Game Design, Imaginary Worlds, Interactive Narrative, Framework

1 INTRODUCTION

Within the game studies literature, the terms 'narrative' and 'interactivity' refer to definitions which boundaries have long become uncertain as their context has expanded over time [31]. Various debates emerged at the end of the last century about the man-machine dualism and how it can be used as a modern form of storytelling that would eventually replace the existing one [1]. As a result, there were discussions about how and whether narrative theory could be used to explain these emerging formats. While narratologists used narratological analysis tools to describe the characteristics of new interactive systems, ludologists sought more precise ones in order to focus attention on rules and competition rather than narrative components, which they considered superfluous [10].

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Today interactive narratives are the subject of study of a variety of domains, such as Design and Computer Science, Cultural Studies, and Psychology. In this panorama, Interactive narratives are becoming increasingly popular as a form of entertainment, proving to be a fascinating and challenging area for various investigations [21]. It is interesting to see how narration and interaction can work together to provide the player with an immersive experience in a believable imaginary world [45]. The goal of this study is to find a point of convergence between these two seemingly opposed models, developing a framework for building coherent interactive narratives.

1.1 Narrative worlds and game rules

In Narratology, a narrative world is not only a container of signs or the place in which actions are performed by characters, but it is defined as "the ecology of narrative interpretation" [15]. Trying to make sense of the story, readers need an overview given by the sum of context, actions and events in such a way that they not only have to understand what is happening, but viscerally live those moments [34]. One obstacle to be solved in the debate between interaction and narrative is the importance of designing imaginary worlds [45] that can be correctly reflected in the rules of a game. The conflict lies where the rules and the representation of the world do not coincide, providing erroneous or inconsistent information to the players [18]. It is possible to give examples relating to adventure videogames, such as *Myst* [8] as an example of friction due to the implementation of the rules of the system within an imaginary world provided with a narrative [19]. The game suggests the possibility to manipulate objects. However, when playing only certain objects react to the interaction, while others remain inert. In the same game, there are complex themes, such as love and hatred, but none of those is reflected in the game mechanics, which see the player solving puzzles to advance to the next section: narrative is used as an accessory for gameplay.

It seems that games cannot be considered narrative because they do not present a fixed and predetermined series of events and, moreover, they must be considered as a set of activities and rules, not as a representation of worlds, given their lack of internal coherence [18]. One of the most significant examples leading to this conclusion is having to explain the death and subsequent respawn of a game's characters for the player to continue their adventure. If from a narrative point of view, the reason for the reincarnation of the character is seldom confirmed and is inconsistent, from the point of view of the rules it provides the player with the chance to try again. Hence the number of possible respawns is the number of lives available – as to say the number of times a certain section of the game can be retried. Another friction lies in the fact that narrative forms often tend to be linear, and the player is not provided with agency on the plot, making the story non-interactive. It is indeed common that plots revolve around well-established themes, thoughtfully framed by the writer in order to best convey a message or narrative experience. From a theoretical point of view, an interactive system should engage an audience providing the agency [11, 24, 39, 43] and ability to impact the plot depending on the in-game choices and actions [6, 18]. The goal is to make the player feel in control of the experience. Players should believe that their decisions drive the story and that if they hadn't been there, the story would not have happened or would have turned out differently [16].

Recently, many players have expressed a desire for an entertaining story in their games, and they are willing to give up some freedom of interaction to ensure that everything they do is meaningful. As a result, a lot of interactive narrative games have had global success in recent years. *Detroit: Become Human* [29] is one of them. The game heavily relies on giving the player options and keeping them accountable for their decisions, it soon becomes apparent that the player does not have complete freedom. The players can only act where and when they can, and they can only interact with the limited number of items that have been designed for that purpose [44]. *Detroit:*

Become Human [29] provides a more elaborate and coherent world than *Myst*, but also in this case it creates the idea that certain things are possible that are not explicitly implemented in the rules.

The roguelike genre is an exception where friction has no negative impact on players' experience. In these types of games, the focus is more on the gameplay and the challenge it can offer, than on the story, just like the arcade games of the 1980s. The roguelikes are characterised by procedurally generated and difficult levels without much room for the story. The end of the game coincides with the death of the player and not with a narrative conclusion [28]. The player has agency, but s/he has no control over the story. Even though players can make different choices and levels are different every time, they will eventually have the same linear experience with the fiction [35]. Lately, games like *FTL: Faster Than Light* [38], *The Binding of Isaac* [9], or *Duskers* [25], implemented a different type of narrative than their roguelike counterparts. In those games items, levels and characters serve to enhance the story told by the game. The player is encouraged to continue playing to discover the fictional universe as a whole [4].

Given this premise, this paper questions and reflects on the role of systemic rules, aiming at overcoming their acting as obstacles and a tyrannical authority [18, 33] accompany the player, granting active and effective participation also to a narrative level. Therefore, the research question on the ground of this study is: How can the rules of a system be designed to be consistent with the representation of the fictional world [45]? A new type of approach is needed to challenge the perspective of the friction between the two realms of the game mechanics and their narrative meaning, aiming at focusing on the story rather than on the rules. As discussed, it is clear that both in a story and in a game users find themselves in front of a secondary world. Conceiving a storyworld differs from inventing a story plot in that designers cannot settle on a series of events while scripting, as this will restrict users' ability to contribute to the creation of the story. The designer is not like a writer that creates a world and exercises her/his control over the events predetermining the choices of the characters, but s/he develops a universe of dramatic possibilities with its own rules that revolves around a specific theme and allows the user to explore all of them. In this kind of world, the user in the shoes of the characters is provided with the freedom to act freely, with the only limitation of moving according to the rules of the system. The concept of the game as a series of rules remains, but they are not seen as a tyrannical authority anymore. On the contrary, they are dedicated to ensuring the coherence of the imaginary world. In this case, the sense of agency is dependent on a model of dramatic possibilities involving both the game and the players. It occurs when the actions players crave are among those that they were offered by the game. In this case, just as play is not extinguished, but thrives, on the rules of the game, agency is perceived not despite but because of the dramatic restrictions. The limitations imposed by the rules are not limiting players' agency rather they make it happen [13, 43].

It is clear how especially relying on advanced procedural storytelling systems we are getting closer to building universes containing infinite possibilities. Embedding dynamic possibilities can solve the problem of user participation, which, in this case, is no longer a foreign element capable of destroying a well-structured plot, but an element around which to set up the development of an interactive narrative. Creating a universe of dramatic possibilities means precisely proposing meaningful and balanced choices to the player, who is called upon to always carry out the narrative. Whenever a user enjoys an interactive narrative, the sum of his actions generates a sequence of events, a story that differs from time to time. This is impossible when one approaches the reading of a linear story, as the sequence of events always remains the same reading after reading [1]. Most video games do construct imaginary worlds, but each game does so in its own blurry way [18]. Fictional worlds in several games are inconsistent and incoherent, yet the player does not notice this because the game's rules will provide a sense of direction even though the fictional universe lacks credibility. It is necessary to investigate the possibilities offered

by the methodology discussed above, focusing on a type of narrative approach for the creation of interactive narratives, starting from the construction of the imaginary world, with its infrastructures and its own dramatic possibilities, to then derive a set of mechanics to mitigate the friction between rules and narrative meaning.

2 RESEARCH AND DESIGN METHODOLOGY

The framework's research approach is supported by desk research in the disciplines of Game Studies, Media Studies, and Narratology, and reaching out to Design and Computer Science. The research investigates the scope of Interactive Storytelling with a design strategy, emphasising the debate between narrative and interaction and analysing issues related to Narratology and Ludology. The secondary data obtained from the review provided an in-depth look at basic approaches and practices for the development of interactive narratives, while also identifying different techniques used to merge rules and narrative elements in a coherent artefact. To achieve a better insight on the creation of interactive artefacts with a focus on story, the state of the art was analysed examining meaningful case studies related to narrative games and playable stories [33]. Through the finding of approaches for the creation of interactive stories inferred from the literature review and the investigation of case studies, it was possible to synthesize a methodology for the creation of interactive artefacts that uses a narrative approach, starting from the construction of a storyworld and then integrating its infrastructures within the rules of the system that manage the dramatic possibilities of the secondary world. To verify whether the narrative coherence of an interactive artefact can be related to that of a linear story and to investigate how the interactive mode altered the user experience, qualitative and quantitative research was conducted and primary data were acquired through two different surveys administered to two different groups of participants. Each group was made up of 15 participants with various backgrounds, aged between 20 and 30, and with a common interest in games and narratives: one group experienced a linear story, the other an interactive narrative. It was chosen a small group of participants to better focus on their experience and receive feedback on what they perceived. The study aimed to clarify the framework's existing shortcomings and opportunities for future development through an iterative design process.

3 RESULTS

Relying on a comprehensive analysis of the literature on Narratology and Game Studies, a theoretical framework for the creation of an interactive story was designed. The design activity starts from the construction of a secondary world, and its primary and secondary infrastructures [45] Building on the knowledge on transmedia interactive narratives and storyworld building derived from the research through design experimentation conducted by Mariani and Ciancia [21, 22], the framework starts from breaking down the elements of a storyworld: environment, characters, values, relations, objectives, the story and its narrative elements. This means designing a game starting from the storyworld where to set the activities, with the 'what', 'where', and 'how', while being 'why-driven'.

- **What**: First comes the definition of the set of possible activities taking place in the story. Hence, which convey part of the meanings and values to communicate. This part requires outlining *an interactive narrative architecture* [22] that clearly frames all the interconnection and interplays among the parts of the story. In particular, the characters and the values of the storyworld should inform and guide the design of the story, followed by the identification of the possible narrative branches, which require to be associated with in-game meaningful choices from the players.

- **Where**: Identifying the setting in the game environment. In this sense drafting a map can provide valuable help, giving a clear idea of the possible movements of the players in the world.
- **How**: Design these in-game activities considering that they are in charge of transferring meaning and narrative sense by means of the game experience they generate.

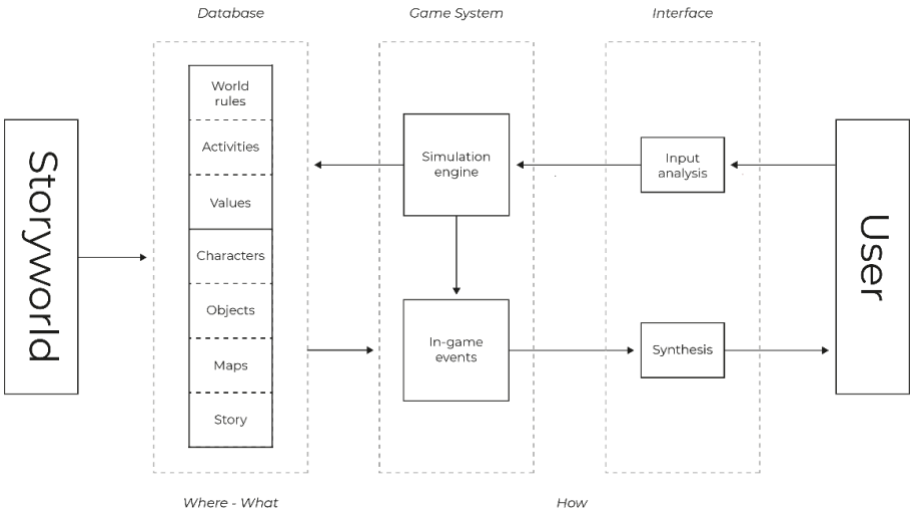

Figure 1: Implementing the framework inside an interactive narrative system.

Finally, the overall design should follow what can be defined as a **'why-driven' approach**, embracing a systemic perspective. The story is drafted along with the entire set of events that can happen inside the fictional world, as elements that concur in transferring coherent and consistent meanings. As a result, the system will be based on a mix of top-down and bottom-up approach in which authored-controlled elements take charge of the plot and bring it to a close while the players are given agency. Thanks to the player's active involvement, the story can vary each time [33]. This kind of approach is necessary to establish a dramatic curve of rising and fall [12] and it solves the problem of the user's freedom and the progression of the story. Indeed, an essential point in developing an interactive narrative is to ensure a constant sense of agency for the player [37]. This means that, whenever a choice is made, the resulting event in the story is triggered as a consequence of the choice itself. To guarantee greater freedom to the player the simplest thing would be to provide her/him with many options. However, including a variety of options is more complicated and demanding than it may seem. Those who experience an interactive narrative need quality and complete choices, capable of challenging the player [3, 6] while encouraging a state of *flow* [7]. The final work is an articulated network of possibilities to investigate, each of which plays a significant role in the player's emotional state and should result in plot progression. The theoretical framework can be implemented in a model depicting the relations between storyworld, system, and user. This model is based on a model designed by Aarseth [1], illustrating the components of a generalised interactive narrative artefact. It consists of three macro-areas (Figure 1): on the left it can be seen how all the narrative elements extrapolated from the storyworld are collected inside the database of the system, laying the foundations of the game narrative. The middle area represents the core of the game system, it has the purpose of defining and representing the events of the

narrative based on the users' choices, the world rules and the current state of the story. The interface area is on the right, it is the space for users' interactions with the system and where in-game events are represented.

3.1 Testing the framework

To better understand the dynamics that exist between interaction and narrative, the theoretical framework was applied to Edgar Allan Poe's story *The Mask of the Red Death* [27], creating an interactive narrative artefact here discussed. The activity followed an iterative design process, aimed at collecting data to implement the framework and its elements according to the dynamics observed. Edgar Allan Poe's short stories' mysterious atmospheres are well suited to this type of work because they allow exploring what it appears to be, and what it could be.

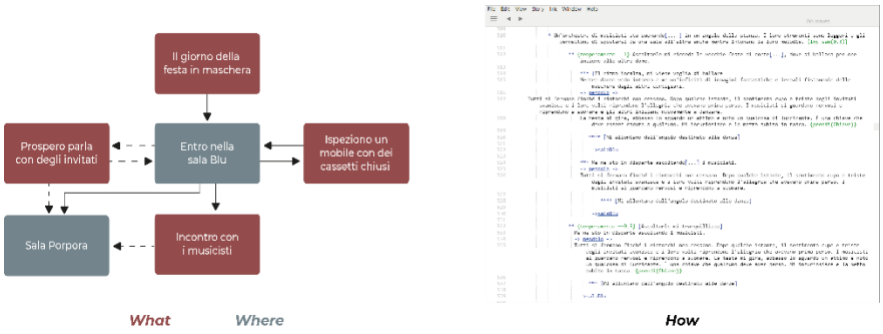

Figure 2: What, Where and How of the interactive narrative.

The development of the interactive artefact focused on the guidelines inferred from the framework (Figure 2):

- **What**: Starting from the original work, the imaginary world is analysed and interpreted, extrapolating the themes and the most significant elements. For this first step, was used the *Storyworld Canvas* [41, 42], a tool to support the process of subcreation of the world [40, 45]. Precisely: themes, places, events, characters and their goals, the values of the storyworld were framed into an interactive narrative architecture [21, 22] to have a complete perspective on the story. The design process shifted towards the identification of the narrative fragments and the design of the main mechanics extrapolated from the themes and infrastructures of the imaginary world.
- **Where**: To describe the user's space of possibility inside the fictional world, a series of maps representing the topography of the virtual world and its narrative structure was drafted. This representation lingers on the places within each event of the story occurs, specifying the player's space of action and how the areas are connected.
- **How**: A drama manager [6, 20, 23] was created to manage the dramatic interaction in real time of a user immersed in the first person who takes part in the creation of the events of an imaginary world. The infrastructures of the world have been integrated within the drama management system, in particular, the values of the story were assimilated to variables in a personality model [6] and in-game activities and game rules were designed following the themes and the messages that the original work wants to depict. To reduce friction, rules were not used as a constraint for players' agency limiting their actions, but they provide, on one hand, instructions to the story management system as to how it should intervene in the construction of the story, on the other, they handle the game mechanics that are in charge of conveying narrative meaning.

> The system guarantees an appropriate narrative fragment guiding the player inside a coherent world. Each action performed by the player has significant repercussions on the game, altering the state of the system. The drama manager has the task of accompanying the players along his journey, "listening" to the variables they modify through their choices and directing the narrative in the direction considered the most appropriate, so that to combine a structured narrative with an emergent narrative [2, 17, 30, 33].

Once completed the prototype, a web page was developed, focusing on how the interactive narrative could be experienced. The page has two main sections: one dedicated to the text of the interactive narrative and its choices, the other dedicated to the player's status. Within the world of *The Mask of the Red Death* [27], the player can interact with environments and characters using text nodes visible on the screen. This is done in a way as to ensure greater clarity and narrative coherence. Even though not all actions are always visible, the character's stats affect them. The player's interactions should change the course of the narrative, intervening on the variables of the story. With each interaction, the system receives inputs, analyses the state of the narrative apparatus and returns the appropriate story fragment. Once the interactive narrative had been designed, it was considered necessary to create an analysis and evaluation system that would compare the overall experiences of the users who went through Poe's original story and those who, instead, played the interactive artefact. For the scope, a survey was built and two groups of participants were identified. Thirty participants in total between 20 and 30 y.o. interested in games and narrative were involved and arranged into two groups of fifteen people each. The first group experienced the linear work, the second one experienced the interactive narrative. Participants answer a series of questions related to their experience immediately after playing.

The survey is divided into three categories corresponding to three different fundamental aspects for comparing experiences: absorption, agency and immersion. The first aspect relates to the understanding of the story and investigates the degree of assimilation of the context of the narrative. The user's imagination is attracted to the secondary world of the story [32, 45], temporarily leaving the physical universe that surrounds it to reach that of the imagination [32]. The key questions to be analysed concerned how the interactive narrative mode changed the absorption of the imaginary world, that is how places, characters, events are recognised and themes are perceived. The following part explored the agency and evaluated how users felt involved in the narration through meaningful choices that guided them through the events of the story [5, 36]. Specific questions investigated the level of participation and emotional involvement derived from the two typologies of experiences (interactive narrative vs traditional narrative), asking for specific self-reflection on the level of engagement that each artefact produced. The third part examined the ability to generate immersion [26, 33]. Hence, if the first section focused on the ability to absorb information, the following tapped into the relationship between the secondary world and the emotional sensations it generates in the user. Do interactive mechanisms favour immersion or not in relation to linear texts? Both groups have equally grasped the main themes of the narrative as well as the context in which the events are set. Out of the fifteen participants, readers of the original story, eleven felt the desire to change the course of the events through the modalities provided in the interactive narrative. As for the users of the interactive experience, nine of them considered their choices very significant, while six considered them quite significant. Also, nine of them felt the desire to restart the experience by adopting different approaches such as making different choices or impersonating a different character. The two groups were asked to describe their experience using nouns. It emerged that the users of the interactive artefact were less disoriented and more absorbed in the activity than those who read the linear story. This highlights how the use of a guided mode of interaction was the key to a clear and not confusing experience. However, at the same time, it provides a further area of experimentation where guided

interactive modalities, such as choices recorded through links are supplemented by free textual input. Another interesting result comes from the question comparing the bond with some of the elements of the narrative (themes, characters, events and settings). The data summarised showed how the users of the interactive work felt strongly connected to all the elements of the story highlighted by the survey. On the contrary, readers have remained less bonded to all the aspects, especially with the characters, a not very distinctive element of the original narrative.

The data collected through the survey shows that both research groups have a common interpretation of the theme of the story. It is reliable to conclude that neither narrative modes [31] significantly alters the plot key points. The relation between the users and the story elements, on the other hand, differed slightly. Those who experienced the interactive narrative felt more connected to the characters, the events, the environment and the themes, than those who read Poe's original story. This is linked to the fact that projecting users in a secondary world by identifying them with an avatar, will increase their emotional involvement [33]. The viewpoint shifts and users are no longer passive observers, but rather participants in the story: they become able to interact with other characters and take actions that lead to the development of the events. According to the data gathered, developing an interactive story with a narrative approach will effectively help the player to be involved even more than in a linear artefact, without altering the narrative coherence by experiencing a coherent imaginary world.

4 CONCLUSIONS

Analysing the intersection between narrative and interaction, it emerged that the use of a narrative approach is necessary for the construction of an immersive and coherent interactive artefact. The contribution of this research is hence to provide a framework for guiding designers in the creation of interactive narratives starting from the construction of a secondary world from which the narrative elements that will form the basis for interactive mechanics are extrapolated. As said, the results from the surveys confirmed that this approach is promising and can be the basis for future improvements and iterations. Concurring with the literature, the analysis of the experiences analysed reports that interactive narratives are indeed powerful and effective in actively engaging users without altering the understanding of the fictional elements. An interesting point to be further developed is then the system of choices. Future research will regard systems capable of managing both the textual input and the choices within the text. In doing so, those who feel the need to experiment with the actions of their character would feel less limited by the options made available by the author and those who were disoriented to insert textual inputs could easily use the classic links present in the text. The creation of interactive narratives is a topic that can still provide several hints for thought, both to analyse interactive experiences from different perspectives and to allow these two different but close realities to collaborate one with the other. Rules and plot seemed to be two polar opposite concepts, but as it turns out they are not at all. The awareness of those who write interactive stories, such as those of video games, is changing [14]: the type of approach is being shifted in order to put storytelling first and subordinate the rules to it. In the last few years, a narrative approach to video game development was born. Mechanics and narrative elements are tied more strongly and it is the starting point for the birth of a new way to tell stories, which combines the active involvement of users with the dramatic structure of traditional storytelling.

REFERENCES

[1] Aarseth, E.J. 1997. *Cybertext: Perspectives on ergodic literature*. JHU Press.

[2] Aylett, R. 1999. Narrative in virtual environments-towards emergent narrative. *Proceedings of the AAAI fall symposium on narrative intelligence*, 83–86.

[3] Bertolo, M. and Mariani, I. 2014. *Game Design. Gioco e giocare tra teoria e progetto*. Pearson.

[4] Xu, C. 2016. *Story Behind the Story*.

[5] Ciancia, M. 2018. *Transmedia design framework: design-oriented approach to transmedia practice*. FrancoAngeli.

[6] Crawford, C. 2005. *Chris Crawford on interactive storytelling*. New Riders.

[7] Csikszentmihalyi, M. 1990. *Flow: the psychology of optimal experience*. Harper & Row.

[8] Cyan, Inc. 1993. *Myst*.

[9] McMillen, E. and Himsl, F. 2011. *The Binding of Isaac*.

[10] Ferri, G. 2014. Gioco e narrazione. *Game Design. Gioco e giocare tra teoria e progetto*. M. Bertolo and I. Mariani. Pearson.

[11] Frasca, G. 2001. Rethinking agency and immersion: video games as a means of consciousness-raising. *Digital Creativity*. 12, 3 (2001), 167–174.

[12] Freytag, G. 1895. Technique of the drama: An exposition of dramatic composition and art. S. Griggs.

[13] Girina, I. and Jung, B. 2019. "Would You Kindly?" The Interdisciplinary Trajectories of Video Game Agency. *G| A| M| E Games as Art, Media, Entertainment*. 8, 1 (2019), 5–28.

[14] Guarneri, A., Ripamonti, L.A., Tissoni, F., Trubian, M., Maggiorini, D. and Gadia, D. 2017. GHOST: a GHOst STory-writer. Proceedings of the 12th Biannual Conference on Italian SIGCHI Chapter (2017), 1–9.

[15] Herman, D., Manfred, J. and Marie-Laure, R. 2010. *Routledge encyclopedia of narrative theory*. Routledge.

[16] Heussner, T., Finley, T.K., Hepler, J.B. and Lemay, A. 2015. *The Game Narrative Toolbox*. CRC Press.

[17] Jenkins, H. 2004. Game design as narrative architecture. *Computer*. 44, 3 (2004), 118–130.

[18] Juul, J. 2011. *Half-real: Video games between real rules and fictional worlds*. MIT press.

[19] Juul, J. 1998. Jesper Juul: A clash between game and narrative. *Digital Arts and Culture Conference*, Bergen.

[20] Laurel, B. 2013. *Computers as theatre*. Addison-Wesley.

[21] Mariani, I. and Ciancia, M. 2019. Building interactive narratives: characters, stories and in-betweens. Experimentations and critique. *Proceedings of the EDULEARN* (2019), 6844–6853.

[22] Mariani, I. and Ciancia, M. 2019. Character-driven Narrative Engine. Storytelling System for building interactive narrative experiences. *Proceedings of the 2019 DiGRA International Conference: Game, Play and the Emerging Ludo-Mix* (2019), 1–19.

[23] Mateas, M. and Stern, A. 2002. *Towards integrating plot and character for interactive drama. Socially Intelligent Agents*. Springer. 221–228.

[24] Mäyrä, F. 2019. The Player as a Hybrid: Agency in Digital Game Cultures. *G| A| M| E Games as Art, Media, Entertainment*. 1, 8 (2019), 29–45.

[25] Misfits Attic 2016. *Duskers*.

[26] Murray, J.H. 1997. *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*. The Free Press.

[27] Poe, E.A. 1991. *The masque of the red death*. Creative Education.

[28] PopMatters Staff 2014. *"FTL" and the failure of text narratives in roguelikes*. Pop matters.

[29] Quantic Dream 2018. *Detroit: Become Human*.

[30] Ryan, J. 2018. *Curating simulated storyworlds*. UC Santa Cruz.

[31] Ryan, M.-L. 2006. *Avatars of story*. University of Minnesota Press.

[32] Ryan, M.-L. 1980. Fiction, non-factuals, and the principle of minimal departure. *Poetics*. 9, 4 (Aug. 1980), 403–422. https://doi.org/10.1016/0304-422X(80)90030-3

[33] Ryan, M.-L. 2015. *Narrative as virtual reality 2: revisiting immersion and interactivity in literature and electronic media*. Johns Hopkins University Press.

[34] Ryan, M.-L. 2014. *Possible worlds*. De Gruyter.

[35] Short, T.X. and Adams, T. 2019. *Procedural Storytelling in Game Design*. CRC Press.

[36] Spallazzo, D. and Mariani, I. 2018. Stories, Metaphors and Disclosures: A Narrative Perspective Between Interaction and Agency. *Location-Based Mobile Games: Design Perspectives*. Springer International Publishing. 59–82.

[37] Stang, S. 2019. This Action Will Have Consequences": Interactivity and Player Agency. *Game Studies*. 19, 1 (2019).

[38] Subset Games 2012. *FTL: Faster Than Light*.

[39] Tanenbaum, K. and Tanenbaum, J. 2010. Agency as commitment to meaning: communicative competence in games. *Digital Creativity*. 21, 1 (2010), 11–17.

[40] Tolkien, J.R.R. 1947. *On fairy-stories*. Oxford University Press

[41] Venditti, S. 2017. *Social media fiction. A framework for designing narrativity on social media*.

[42] Venditti, S., Ciancia, M., Goldoni, K. and Piredda, F. 2015. Social Media Fiction. *Interactive Storytelling: 8th International Conference on Interactive Digital Storytelling, ICIDS 2015 Proceedings* (2015), 412.

[43] Wardrip-Fruin, N., Mateas, M., Dow, S. and Sali, S. 2009. Agency Reconsidered. *DiGRA Conference* (2009).

[44] Waszkiewicz, A. 2019. (Trans)humanism and the Postmodern Identities: the Player in Detroit: Become Human (2018). *Acta Humana*. 9, (2019), 197–212. https://doi.org/10.17951/ah.2018.9.197-212

[45] Wolf, M.J. 2012. *Building imaginary worlds: The theory and history of subcreation*. Routledge.