Solving the narrative paradox in VEs – lessons from RPGs

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Abstract

The consideration of the narrative question within Virtual Environments (VEs) is a compromise regarding to the conflict between pre-authored narrative structures and user freedom both in terms of interaction and physical movement. By presenting the results of a recent investigation on the narrative structures and mechanisms of Role Playing Games (RPGs), this paper aims at assessing the potential of non-conventional narrative forms for computer implementation and addresses the potential benefits of such consideration on the research currently undertaken by the AI community in terms of storytelling and interactive storytelling.

1. Introduction

The concept of a 'narrative paradox' in virtual environments (VEs) is now well established [1]. This revolves around the conflict between pre-authored narrative structures – especially plot - and the freedom a VE offers a user in physical movement and interaction, integral to a feeling of physical presence and immersion. This paper extends work already carried out overviewing the concept of emergent narrative [2], assessing the relevance of current narrative theory [3], and examining the possible basis for a narrative theory particular to the medium of VEs which could underpin narrative applications [4]. Since a large part of the narrative action in a VE is related to the actions of synthetic characters, the narrative framework adopted is of great significance for the architecture and functionality of such characters, from the internal action selection mechanism to external expressive behaviour. We argue that the defining characteristic of VEs is not their visual realism, which might make the narrative approach of film or television the most relevant, but their interactivity. For this reason, rather than trying to adapt classical narrative theories [5, 6] we are investigating the structures and mechanisms of less-studied but potentially relevant interactive media.

Flowing from interactivity is the participative character of narrative in a VE – thus we focus on narrative as an experience for the user rather than as a spectacle. Whereas a narrative *spectacle* requires a beginning, a middle and an end in the form of a climax in order to achieve satisfaction for the spectator, it is not clear that this is necessary for the production of a satisfying narrative *experience*. One should note too that there is a good match between the perspective of a conventional author and a spectator – typically an author acts as spectator during the authoring process – but not between the perspective of such an author and a participant. Our Emergent Narrative [2] concept is being developed in the belief that the audience, in this case the users, can through their interactions with Virtual agents or Virtual actors, participate in the emergence of a narrative that would be both coherent and satisfying as an experience at an individual level. Such a narrative may not conform to the ideology of narrative as a spectacle and might not be dramatically suitable for simple screenings. Our approach focuses and tries to capitalise on the entertainment values of discovery, interaction and immersion in order to provide the user with a satisfactory narrative experience without regard for the quality of the spectacle resulting from the emerged narrative.

2. Role Playing Games

The motivation for this study of Role Playing Games [RPGs] was to derive elements of a possible solution to the narrative paradox and an approach to reconciling plot structure, plot line, and the level of freedom offered to the user in terms of space, time

and interaction. RPGs cannot easily be characterised in terms of standard narrative theories, presenting a different approach to narrative. Their interactive character-based approach differs both from the classical Aristotelian [5] theory and the analytical models proposed by the French Structuralists [6, 7]. However there are some similarities with the model developed by Vladimir Propp [8] - RPGs, like Propp's model, apply to quest type scenarios in the main. However, RPGs offer more diversity in themes and genres than the quest of the hero in Russian folktales on which Propp based his work. As part of the following discussion, we compare the narrative approach within RPGs to Propp's model in order to clarify how far RPGs overcome the rigidity of the latter [8].

2.1. Aims and background to the study

Investigating RPGs presents many challenges. There is a wide range of such games, making it hard to produce a comprehensive definition of types and categories. The work reported here focused on RPGs in which fictional characters are allocated or created by a party (players), along with the story world and other role-playing settings. Players act in character for the whole duration of the game, which is by nature episodic and varies in length from a single day to as long as a few years. Our study however deliberately excluded LRPG (Live Role Playing Games) where the player physically portrays the character, in favour of those games applying a more verbal approach. Although LRPG is an important subset of RPG, we believed it was not immediately relevant to a study of mechanisms and structure. Our investigation aimed at identifying narrative patterns, elements or factors influencing the creation, development and unfolding of dramatic narratives and stories.

It is not possible to base such a study on existing literature since there appears to be very little other than specific campaign role-playing setting books. A protocol-based approach would involve observing and documenting actual games, but this is practically demanding and potentially difficult to generalise. The selected approach to this study was therefore knowledge acquisition through elicitation from an expert, using appropriate knowledge acquisition techniques and tools, as is commonly carried out in the construction of knowledge-based systems. The success of such an approach depends heavily on the quality and level of expertise of the expert involved: the results displayed in this paper are based on knowledge elicitation sessions conducted with Dr Ian McBriar, an experienced RPG Games Master and the 2001 World Champion of Ultra Modern World Team Championships, who presented at the NILE02 [9] conference in Edinburgh on the subject of Role Playing Games. Dr McBriar builds live RPG campaigns from scratch and so possesses a thorough and extensive knowledge of the subject. The knowledge elicitation session took the form of two 3-hour long interviews.

2.2. The knowledge elicitation technique

Knowledge acquisition is known to be a difficult and time-consuming activity, to the extent of being a bottleneck in knowledge-based system construction, so that the application of professional tools and a known methodology is very desirable. Empiricom Ltd (http://www.empiricom.co.uk) [10] made their KAT^{TM} Builder software [11], as well as essential training, available to us for this study via utilisation of the KAT^{TM} Technique and KAT^{TM} Builder software.

The process known as "Knowledge Elicitation" is that of actually getting tacit knowledge out of a human expert and putting that knowledge into a form which is computable, that is, a format suitable for use by a computer system. The methodology behind KAT^{TM} Builder is based on 15 years of Artificial Intelligence research.

Empiricom's Knowledge Acquisition Technique (KAT[TM]) applies a highly rigorous logical formalisation of the philosopher Karl Popper's "falsificationism" [12]. Essentially, it states that the most efficient way to solve a problem is not to try to find all of the conditions that must be true for a hypothesis to hold, but rather seek out only the evidence which would disprove a hypothesis. Since you only need one piece of counter-evidence in order to disprove a hypothesis (as opposed to the almost infinite number that are required to prove one) this is quick, efficient and also requires much less computable code.

3. Results of the study

In this section we discuss the results of the knowledge elicitation exercise just referred to. The rules actually derived can be seen in the Annex.

3.1 Creating a campaign

One of the first and main differences between the model proposed by Propp and RPGs arises in the way a campaign is created. This is a collaborative process where the characters, as well as the worlds and environments in which the campaign is set, are developed in common accord between the Game-Master and the players. Character definitions include details such as histories, activities, work, physical characteristics or eating habits. Environments and worlds are defined with the same level of detail. This laborious but highly participative creation process allows the Games Master to prepare the campaign episodes with a good understanding and knowledge of the different characters and worlds involved. This favours the delivery of a highly flexible narrative structure, potentially challenging all the different protagonists of the party.

This creation process illustrates important differences between participative and non-participative structures. Where character or role-based approaches, such as the one undertaken by RPGs, aim at a fairly equal sharing of actions, interactions and narrative developments between characters, Propp's model focuses mainly on a single character, the hero. The user/reader experience is limited to that of a spectator following the narrative unfolding around this particular character in a fairly stereotypical, expected and known environment, that is. the fairy tale world. The hero is the centre of interest and is the only character whose life and history are developed beyond that strictly necessary to the achievement of the plot [8] with little attention to other characters' lives, histories and development. While this works when an authorial perspective is taken [13] it is difficult to adapt for a computer-based implementation not pre-scripted for the sequence of events directly involving the hero, as this particular sequence is required for the displayed story to make sense and only the hero is of narrative interest.

In RPGs, the simple fact that each character develops its own story mainly through interactions with other characters, non-player characters (NPC) or challenges proposed by the Game-master, increases the number of possible scenarios by a factor depending on the number of characters involved in the campaign. It also gives the user a much broader choice regarding the type of character they are to be involved with. As character development itself is a permanent goal and requires the constant attention of the player, the attention of the user/player is persistently mobilised, keeping the user's interest at a satisfying level. While plot-based structures such as the one proposed by Propp concentrate on potentially decisive plot events or actions, RPGs address the importance of roles in narrative structures by providing the user with a constant object of interest, the character and its development.

3.2 The function of encounters

During the course of the campaign, RPG players are confronted with a certain number of *encounters*, distributed in time and space by the Game-Master as a source of challenging and interesting activities for the party. The Game-Master expects that the encounters specifically created for an episode or a session, if wisely distributed, will trigger actions, reactions, discussions or decisions from the party in such way that an anticipated plot will unfold. This plot however has a hypothetical aspect since what actually happens is the direct result of the party's generated reactions to the different encounters. Thus to a large extent RPGs are encounter-driven rather than directly plot-driven. Section 3.3 below develops the role of the Game-Master in more detail, his influences on the overall plot and his actions to ensure a dramatically satisfying narrative. There are generally five different types of encounter at the disposition of the Game-Master as shown in Table 1. Their presence in any game is, however, dependent on the genres and themes of the campaign and its specific settings.

Name	Content	Purpose
Descriptive	Game-master describes scene to players; makes announcements; states rules; describes functionality	Substitutes for lack of direct player perception of environment and for attentional focus
Social	NPC voluntarily communicates information or specific message to particular player in a social context	Help players identify goals, steers players in direction desired by Game-master
Information-gathering	NPC assesses state of player knowledge for gaps; provides information or clue only if specifically asked. Documents or other media can be used instead of an NPC	To help players who cannot solve a puzzle, meet a goal or progress
Problem-solving	NPC confronts player with puzzle or problem; some puzzles (e.g combination locks) may not require an NPC	Gate-keeper of resource needed for further progress which is released on solution of puzzle
Combat	NPCs for action encounters – battles, fighting	Repercussions on the members of the party's health state, weapon, power, strategy etc.

Table 1: RPG encounter types

Encounters can be used by the Games Master to shape and pace the dramatic unfolding of the narrative as well as presenting the main source of entertainment to the players, and embodying key events in the construction of the plot. Their smooth orchestration by the Game-Master is critical in ensuring the players participate in interesting stories and interactions with each other, and also helps them in achieving a personal level of satisfaction around character development and overall plot. The role of the Game-Master is primordial and crucial to the creation, development and unfolding of an RPG campaign.

3.3. RPG and narrative control

The narrative paradox already referred to can be summarised in the question 'who has control?', with a conflict between the control of the author, expressed through a pre-scripted plot, and the user, autonomous within the narrative environment. We have already argued [2] that a hierarchical view of narrative allows us to separate out issues of control into different levels of abstraction and had suggested the levels shown in

Name	Type	Example
Plot	Narrative	Boy meets girl Boy wins girl
Abstract action	Character	Boy walks up to girl
Physical action: Cog	Character	Utterances: "How are you?"
Physical action: React	Character	Facial expression

Table 2: Abstraction levels

Table 2. Control within RPGs can be viewed as dynamic negotiation across these levels. The Game-Master exercises control at a high level over narrative unfolding, plot, pace and structure of the story. Since the *a priori* plot line for a campaign is only hypothetical, the Game-Master needs specific tools – in the form of the encounters just described - to gain some control over the overall campaign, and justify their role as master of the game. The players, through their actions, decisions, strategies, the skills of their character and their own personal capabilities to act in role, produce the content of all levels from *abstract action* downwards. The players exercise a narrative control at a character and individual level, whereas the Game-Master is in charge of issues of greater narrative importance. Of course these levels interact producing an interdependency between Game-Master and members of the party with respect to narrative unfolding and development. RPGs thus lie partway along a spectrum of control which might have a pure form of emergent narrative at one end, in which everything arises purely from character interaction, and pre-scripted narrative at the other.

As the players do not carry any narrative responsibility, in the next section we concentrate on the actions of the Game-Master, since this seems the most relevant area both in characterising the narrative structure of RPGs and drawing the lessons for virtual environments and virtual agents.

3.4: The Game-Master's responsibilities and action range

We have identified two major responsibilities for the Game-Master. First is the technical duty to ensure that the story is moving forward second is the moral duty to build, produce and orchestrate an interesting and enjoyable experience for the players. Each may trigger a different set of actions by the Game-Master.

Ensuring the progress of the story

This is achieved in the main through a wise use of the different encounters available to the Game-Master. However, due to the hypothetical nature of the plot and its encounters, players can misread hints or clues or deliberately decide to act against or engage themselves towards a different direction than the one anticipated or expected by the Game-Master. For this reason, the episode's encounters, framing a hypothetical scenario, are written as the campaign unfolds rather than completely upfront, and develop from session to session. However a Game-Master may dynamically introduce specific actions if the delivery of an interesting story or their control over the overall narrative seems threatened. Interventions are generally caused either

Encounter type	Possible actions
Descriptive	Short and unambiguous answers to player question
Social	NPC actively closes conversation Extract player from unexpected conversation NPC initiates expected conversation Information-gathering encounter introduced
Combat	Weaken or withdraw enemy Give players line of retreat
Problem-solving	NPC provides hint Game-Master provides hint (last resort)

Table 3: Actions when players are taking longer than expected

by players taking longer than expected in dealing with encounters or by the story branching in an unexpected manner. Some of the actions that can be taken when players take longer than expected in a particular encounter can be seen in Table 3.

Intervention can prove more critical when an unexpected branching of the story occurs. This highlights the need for the Game-Master to be well prepared and flexible

Some possible actions
Provide 'blank' encounters
NPC provides hint
Provide insurmountable obstacle
Force next encounter
Break session to rework plot
Negotiate as Game-Master with individual character

Table 4: Dealing with unexpected branching

regarding the plot and illustrates its provisional nature. Branching may occur when the party incorrectly determines their role and what is expected from them, pursues future plot events omitting essential encounters or attempts to reinvent themselves. The Game-Master first assesses the potential value of new resulting sub-plots for the party, decides whether or not this allows the campaign to continue, and if not takes appropriate actions. Table 4 includes some of the large number of actions that may be taken in the face of unexpected branching.

Ensuring the satisfaction of the party

In entertainment of nearly any form, there is always at some stage the idea of the targeted audience in the minds of theatre directors, novelists or film directors/ screenplay writers. The same could be said of the Game-Master even though the common values of theatre, novel and cinema do not obviously apply to a participative narrative form such as RPG. What matters for a spectator might not match the priorities of a character in a participative environment.

Although RPG players have a good idea of the overall story in which they are involved, they are more concerned by the development of their characters and their focus is situated at a fairly low level within the overall story, the individual level. The spectator generally follows a story globally, and functions at a higher level of abstraction than the RPG player. Moreover a film director / screenplay writer or a novelist generally produces a film or writes a book for a generic audience, while the Game-Master is expected to consider specific individuals so as to deliver an interesting and enjoyable experience to trusting players.

It is therefore important that the Game-Master monitors players' behaviours both in and out of character, and decides corrective measures if it appears that certain players are not enjoying the game. Corrective measures generally involve NPCs and the involvement of those specific characters in more action and interaction, but in the majority of cases, it is the Game-Master's responsibility to discuss the situation with the player, generally out of character. The most common signs that such actions are needed are where a character is not interacting or is not attentive, although he is involved in a situation; where a character knows what he should be doing but is looking for something else to do; or finally, where a character is behaving in a suicidal way and knows exactly the consequences of these actions.

4. Conclusions

This study of RPGs was carried out specifically to see how far, as an interactive medium, it provided solutions to the narrative paradox [14] in VEs. We have shown that this system combines a certain freedom at the individual level of character role play with a relatively satisfying level of control over the overall story for the author, the Game-Master. It seems to offer a good compromise between the freedom exercised and experienced by the user/player and the narrative control necessary for the development and unfolding of interesting stories, though not relying as much on characters as other narrative forms such as Interactive Theatre [15]. Relevant work here is that of Mateas and Stern in their Façade system [16] though their concept of *beats* operates at a far lower level of abstraction than the interface between Game-Master and players in RPGs.

A limitation of the study was the involvement of only one expert, whose experience lies in co-operative quests in which the party of players are fulfilling the same overall quest. More complex RPGs may result from competitive quests where players have conflicting objectives. Before over-generalising the results it is also worth adding both that quests are only one type of narrative, with specific features, and that RPGs are social experiences as well as narrative ones.

Like every structure or mechanism the RPG approach has weaknesses and strengths. A VE implementation would require not only NPCs of typically greater richness than in current computer-based RPGs but also persistent synthetic players to form the overall party. Simulation of individual and low-level (character level) narrative control within the model seems feasible to some extent, though removing the traditional computer game restart capability and incorporating a continuing interaction memory would be necessary. Some of the high-level decision control (Game-Master/referee level) also seems feasible, though the interventions dealing with narrative or individual difficulties clearly draw on human judgement and creativity beyond the current state-of-the-art in synthetic characters. Although the signs of narrative impasse can be relatively easily categorised, it would be much more difficult to build a computational system able to assess and act on users' satisfaction levels. We believe that, using encounters, the role played by the Game-Master could be considered somewhat between that of a theatre or cinema director whose plot events are staged and that of an IMPROV artist who has to deal with the situation live and in real time in the majority of cases, that is, a real-time director.

The upfront creation of world and characters clearly requires human authors, but a simulated Games-Master could be used along with the input of the player group. Of course the high-level campaign cannot be authored in this way without removing the element of surprise and discovery for the players, and undermining their experience as participants, but it is worth adding that there is already a substantial literature specifically to aid the Games-Master with this task which could form the basis for campaign libraries. The dynamic authoring carried out by the Games-Master within an episode corresponds to a continuous planning-replanning system [17], while the design of encounters for the next episode requires hierarchical expansion from a high-level campaign.

Although direct comparison between RPGs and the model developed by Vladimir Propp has to be undertaken at an abstract level given their fundamentally different approaches, it still allows us to identify essential elements from the former that could potentially modify Propp's ideas in the direction of greater interactivity. In particular, one can replace his plot-oriented view with more stress on character and role, and incorporate the user-as-author, though this moves away from the participant discovery element of RPGs. Such an approach has already been partially explored in the past [18] with some success.

As a source of mechanism and ideas for the Emergent Narrative concept we are exploring, RPGs have limitations, in spite of their interesting approach to narrative control and character interaction. Although RPGs work with a hypothetical plot which is dynamically modified, the mechanisms supporting this dynamic modification seem to rely too much on out-of-character and out-of-play direct interactions. The complex thought processes and negotiations involved in scenario preparation and encounter design also pose major problems for direct computer implementation.

4.1. Future work

Further analysis of the quest narrative form is required in order to establish how far the role plot plays in it is specific to the genre. In addition we plan to assess whether an RPG quest with conflicting party goals is different in any significant way from the co-operative quest studied so far.

Other interactive narrative forms remain to be studied, with Interactive Theatre [15] of particular interest for a further assessment of the relationships between plot and characterisation. In fact interactive techniques such as the ones developed in IMPROV (improvisational drama) are, contrary to appearances, still very much dependent on structure and plot, but it appears that certain theatrical forms like interactive theatre or street theatre place more importance on characterisation and participation. Interactive theatre in particular seems to have developed precisely in order to accommodate to the constraints imposed by interactivity and spectator freedom, making it very relevant to a concept of Emergent Narrative incorporating both user freedom and interactivity, the very nature of Virtual Reality.

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Annexe: Rules from RPG Knowledge Elicitation

Rules

If *"Taking longer than expected"*
And *"It is a descriptive encounter"*
And *"The player is asking questions"*
Then report, **"Give short unambiguous answers that don't prompt further questions"**

If *"Taking longer than expected"*
And *"It is a social type encounter"*
And *"The scripted conversation has happened"*
And *"The expected player's initiated conversation has not happened"*
And not *"The player has initiated non-expected conversation"*
Then report, **"The NPC has to initiate conversation with the player and has to hint on the information given"**

If *"Taking longer than expected"*
And *"It is a social type encounter"*
And *"The scripted conversation has happened"*
And *"The expected player's initiated conversation has not happened"*
And *"The player has initiated non-expected conversation"*
And *"The majority of players are not involved or interested"*
And *"It is taking more than half an hour"*
Then report, **"The conversation with the NPC must be closed"**.

If *"Taking longer than expected"*
And *"It is an information gathering encounter"*
And *"Insufficient information to proceed to the next encounter"*
Then report, **"Need for information".**

If *"Taking longer than expected"*
And *"It is a problem solving encounter"*
And *"The puzzle is solved"*
Then report, **"Force them on the next encounter"**.

If *"Taking longer than expected"*
And *"It is a problem solving encounter"*
And *"The puzzle is not solved"*
And not *"The player is enjoying the challenge of the puzzle"*
Then report, **"Need for help to carry on quest"**

If *"Taking longer than expected"*
And *"It is a combat encounter"*
And *"The combat is stalemated"*
And not *"The stalemate is intentional"*
Then report, **"Need to influence in combat"**

If *"Experience of an unexpected branching of the story"*
And *"There is a single character involved"*
And not *"The player is happy to retire the character from the campaign"*
And not *"Quick rejoin of the character to the main party"*
Then report, **"Need to act on character"**

If *"Experience of an unexpected branching of the story"*
And *"Party pursues a player defined activity"*
And not *"The party coincidentally pursues future plot events"*
Then report, **"Need to act on plot"**

If *"Experience of an unexpected branching of the story"*
And *"Party pursues a player defined activity"*
And *"The party coincidentally pursues future plot events"*
And not *"The party has not omitted an essential encounter"*
Then report, **"Need to redirect the party towards plot"**

If *"Experience of an unexpected branching of the story"*
And *"The party incorrectly determine what is to be done next"*
Then report, **"Give them hints that they are going the wrong way"**

If *"Experience of an unexpected branching of the story"*
And *"The party reinvented itself"*
Then report, "Can they still continue the mission?"

Action expansions:

The conversation with the NPC must be closed
- The NPC actively cease the conversation.
- Another NPC acts to interrupt the conversation and talk away the conversation NPC.
- An NPC takes the player away (either by speaking to the player or other member of the player's party)

Need for information
- Meeting an NPC that they need to talk to (force the encounter to t
- Meet with an NPC (the patron) that is going to question them abou what they know, assess their knowledge and highlight the gaps.

Force them on the next encounter
- Pulling them by bringing the encounter to them by hinting on what the next encounter is (natural=consequence of the problem solving).
- Push them. Less satisfactory, out of character. (Something literally pushes them out of where they are). Contrived and not always possible. Alternatively, remind them out of character to get on with it. Break of the immersion

Need for help to carry on quest
- Give them a hint by having them notice something.
- Give them an out of character hint.
- Solve it for them (either directly out of character or through an NF

Need to influence in combat
- The enemy makes a mistake
- The enemy withdraws or attempt to withdraw.
- You provide the player with the possibility to withdraw.

- Agreement with player that this action will be resolved on a one tc one session and offer of a temporary player for the meanwhile.
- With the agreement of the rest of the players, resolve it at that tim
- Kill off the character and take him out of play (kill, marry, prison

Need to act on plot
- Is this going to be an enjoyable subplot to have?
- How do I tie this back to the original story?
- Present some sort of insurmountable obstacle (provides thinking ti
- Drag them back to the main story and throw pieces of information to re-generate interest in the main plot"

Need to redirect the party towards plot
- Present them with an obstacle.
- Present them with information that prioritises something else.
- Force them onto the next encounter.
- Let them go anyway and meet the encounter not properly preparec but make sure that they are going to be able to escape by provision of a way out.

Give them hints that they are going the wrong way
- Blank encounter. No information about what they should do next. Give them emptiness.
- If they don't pick up the hint, send another NPC that will point them in the right direction.

Can they still continue the mission?
- Do what the referee has prepared (information-wise)
- Break the session (for re-planning = question them about the re-invention and prepare adequately for the next session"