# Role Playing Games – Comparative Analysis Across Two Media Platforms

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## ABSTRACT

Role Playing Games (RPGs) is a popular game form. RPGs have been translated into all media formats, and are also a rare example of functioning interactive narratives. Despite the popularity of these games, especially within computer games, and the possibility that experiences from RPGs could be used in designing interactive storytelling systems for next generation interactive entertainment systems, there have been very few academic studies focused on cross-platform studies of role playing games. In this paper, the results of a comparative analysis of pen and paper RPGs and computer RPGs, using an information systems perspective coupled with games analysis, is presented. The differences of the two game forms revolve around the different media formats and the limitations these impose and the options they provide. The formation of the collaborative story is a core feature of these games. While the formation of the storyline in multiplayer RPGs are complex, it appears that information systems modeling of multiplayer RPG story and control processes enables quantifiable modeling of an interactive storytelling systems.

## Keywords

Role Playing Game, Computer Games, Interactive Narrative, Multiplayer Games, Information Systems.

## 1. INTRODUCTION

A major source of inspiration of computer games of all genres is role playing games [9]. Being of a somewhat similar age as computer games, Pen and Paper Role Playing Games (PnP RPGs) [2,6,13,15,16], a specialized form of table-top games (TTGs) involving multiple participants interacting in a fictional world, have influenced not only the Computer Role Playing Game (CRPG) genre [6], but virtually all types of computer games - from *Moria* to *Hexen* and *Might & Magic,* from *Diablo, Deus Ex* and *Warcraft* to *System Shock, Chrome* to *Morrowind, World of Warcraft* and *Oblivion.* The use of role playing games (RPGs) in computer games design is varied, from the conversion of the rules systems, themes and fictional world settings of PnP RPGs into the electronic environment (e.g. *Eye of the Beholder, Pools of Radiance, Temple of Elemental Evil* and *Baldur's Gate*), to inspiring themes, game-play and other aspects of computer games. The influence of PnP RPGs crosses all known computer game genres from first person shooters to real time strategy games and massively multiplayer online games [9].

Multiplayer PnP RPGs and CRPGs share a number of features and are structurally quite similar. However, the two game forms provide different experiences, notably because of the use of a virtual representation of the fictional game world employed in CRPGs. In PnP RPGs, the participants must work together to uphold a shared understanding of events taking place in a shared, imagined fictional game world, while in CRPGs the fictional game world is visually presented by a virtual reality engine, as observed in e.g. *Neverwinter Nights* or *Vampire the Masquerade: Redemption.*

The rules systems, themes and fictional settings of RPGs have been applied across every media format. Perhaps due to the high degree of flexibility in these games, RPGs appear to form a prime source for the development of new game forms [e.g. 3,9]. The core element of PnP RPGs, that of actually role playing, can however be lost in the translation from the TTG format of PnP RPGs to other media formats.

PnP RPGs are an example of interactive narratives. The rules and fictional worlds that form the basis for these games function as a vessel for collaborative, interactive storytelling. This is possibly the most important feature of PnP RPGs, and one that CRPGs have yet to reproduce. The interactive nature of the narrative in PnP RPGs have in recent years spawned interest in these games, as programs able to develop interactive narratives form a core component in the development of the next generation of interactive entertainment, e.g. computer games with the ability to develop storylines in real-time [1,3,11,16].

## 2. ACROSS MEDIA PLATFORMS

This paper is written as an early approach towards the development of a comprehensive description of the two game forms, using information flow models as a basis (Section 4.1-4.3), combined with descriptive game analysis (e.g. Sections 4.4-4.11), with information flow analysis focusing on the role of information in these games and generic game analysis detailing e.g. the use of a virtual world in CRPGs and its effect. The analysis is divided into nine sections, each describing one of the core features of these games. The features are generally related to how the games operate and function – e.g. how information is distributed between game and players. Emphasis is also placed on the storytelling aspects of especially PnP PRGs. Not all aspects of PnP RPGs and CRPGs are covered here, notably those that belong to the domain of cognitive science and HCI studies (e.g. why players respond in a specific way to a given verbal or visual input).

Furthermore, a start is made towards the description of PnP RPGs and CRPGs as logical Information Systems (IS) [Sections 4.1-4.3]. This by analyzing these games in terms of logical process modeling of information flows [18] and proposing Simple Information Flow Models (or Data Flow Models) to

describe the game process. It is not the purpose of these models to fully describe the complex information processing of PnP RPGs and CRPGs, however, they do add an IS perspective and indicate that describing these games in terms of information flow and processing is a viable path for joint description, and that substantial benefits could be derived from such work (e.g. in informing the design of interactive storytelling systems). Games-based IS' are here defined as: *An arrangement of people, data, processes and possibly technology, that interact to collect, process, store and provide as output the information necessary to support a game process.*

Focusing on information flow allow games to be described in terms of their basic processes. Treating RPGs as IS, is possible because multiplayer games inherently are based on information generation and exchange (i.e. communication frameworks). E.g.: Rolling dice and noting the result to the other players or describing a character action in the fictional game world. IS methodology has limitations, and is not equally applicable to all aspects of RPGs. In these cases, traditional descriptive game analysis provides a venue for comparing these features of PnP RPGs and CRPGs. Additionally, games can be studied from other perspectives, e.g. from a sociological or psychological perspective.

## 2.1 Why study RPGs?

As outlined above, there are several important reasons for studying RPGs, notably: 1) Role playing games is a globally popular game form, and forms a part of mainstream culture in the western world; 2) Role playing games is a rare example of a game form that has been translated between several medias of expression, from CRPGs, PnP RPGs, Massively Multiplayer Online Role Playing Games (MMORPGs) to Live Action Role Playing Games (LARPs). There has however been very few studies focusing on the effect of transferring a game form from one media of expression to another (see e.g. [16]); 3) PnP RPGs form an example of functioning interactive narratives. Experiences from these games could be used in designing interactive storytelling systems for next generation interactive entertainment systems. There are two primary challenges in attempting a combined description and analysis of PnP RPGs and CRPGs:

I) RPGs have only in recent years emerged as an object of study within the larger framework of games and entertainment [13,15,16,17]. Substantially bolstering the academic work on RPGs is however more than 20 years of discussion and development among PnP RPG and LARP players and designers (e.g. [2,7,8,10]) There is however next to no empirical data available on PnP RPGs and LARPs to substantiate any of the models presented in or outside the academia.
II) RPGs vary in their core features, design, style, vehicle of presentation, and the rules systems employed. PnP RPGs, are complex and yet flexible. They have yet to be fully mapped in terms of the processes that take place in them, although general, top-down models of these games or parts thereof, has been suggested [2,5,13,14,16].

## 2.2 Definitions

In this paper, a **game** is defined based on the ludological definition thereof, as a competitive activity conducted within a framework of agreed-upon rules. A game has goal objectives, although these can be abstract. Using this definition, it could be argued whether RPGs are games. For example, PnP RPGs rarely have a winning condition. Each time the players meet to play a game session, the storyline will take them through different tasks and challenges, but there is no overall win condition. In a PnP RPG, you can always go on to another adventure. In contrast, CRPGs have clearly defined goals – at the end of the game, if your character is still standing he, she or it will have reached the victory conditions that cause the game to end. This does not mean that players cannot have personal goals, like reaching a specific experience level or becoming the ruler of a city in a PnP RPG. Irrespective of the lack of a winning condition in the ludological sense, in this study all forms of RPGs are treated as games.

Note that this article purposefully avoids the discussion about whether games can contain narratives or not – defining narrative is not relevant to this endeavor. Due to the differences between LARPs/MMORPGs and PnP RPGs/CRPGs, a comparative study would take up substantially more space than what is available here.

## 3. SHARED FEATURES OF RPGS

The variety of role playing games makes it inherently challenging to provide a common definition. However, all forms of role playing games – be they PnP RPGs, CRPGs, MMORPGs or LARPS - share a group of characteristics, which makes them identifiable from other types of games (modified from [16]):

1) At the heart of the games is an element of "**storytelling with rules**". Each game type faces unique challenges in facilitating this aspect.
2) Each player takes control of one or more fictional **characters**, and uses this/these as a vessel for interacting with the fictitious reality (fictional game world) that the game takes place in.
3) The **fictitious reality** is established by means of a **premise.** This is a shared understanding among the game participants of the game setting, the starting point of the game, the rules and similar framework properties.
4) The game will *usually*, but not consistently, be guided by one or more unique participant/s commonly entitled the **Game Master** (GM), or some derivative of this title. In CRPGs, the GM function is taken over by a game engine and a pre-planned storyline, with rare exceptions where a human GM can be present.
5) The game will *usually* require at least one GM and one player, or a minimum of two players, i.e. RPGs are multiplayer, except for e.g. CRPGs, where the role of the GM can be taken over by an automated game engine/storytelling system.

These features and the functionality underpinning their use in PnP RPGs form some of the primary subjects in current RPG theory writings [e.g. 2].

# 4. DESCRIPTION AND ANALYSIS

Despite both having the term "role playing" in the title, PnP RPGs and CRPGs are different game forms. This difference is here described in terms of nine of the key features of these games.

## 4.1 The game process

In PnP RPGs, the general game process consists of information-feedback cycles between the players and the GM, or internally within the group [7, 8]. A generalized example of this process could run as follows: The GM describes how the player characters enter a room with two doors. The players assess the information provided by the GM, and decide how to progress based on the information, their previous knowledge of the fictional world and their characters, as well as previous events of the storyline – e.g. they may know which door to proceed through. The process of deciding which action to take can be complicated, involving discussion among the players, disagreement, conflict, etc. The conversation can take place in-character (speaking as the character), out-of-character (speaking as the player), or a combination thereof. The players can also query the GM and each other for further information about the environment of the characters. Irrespective of the processing taking place between the players, at some point the players will describe what actions their characters perform (or the GM may force their hand by introducing a NPC or opponent). The GM (and/or the players depending on the type of PnP RPG), will then update the storyline accordingly, as well as the game world state. For example, if the players decided that their characters take the left door, they will enter a new area of the fictional world, which the GM will then describe, thus progressing the game narrative and the game world state. It is important to realize that players will often "fill in the blanks" of the information they receive using their imagination [5]. If the GM explains how the characters enter a room, the players have to form their own images of how this room looks like in their individual minds eye. How exactly this process takes place, and the level of detail to which players envision their environments, has not been subject to any cognitive studies.

At a top-down level, it is relatively simple to interpret the game process into an information flow framework, e.g. by building a case story [18]. In essence, the feedback process functions as a circular information flow system, involving processing, querying and storing of information packages (as well as numerous subordinate processes that are not treated in detail here, although some examples are given in the below). Packages of information are sent between two groups of entities, the players and the GM. The information flow generally originates and ends at the GM, while the information contained in the packages is processed and updated along the way back to the GM (Figure 1). Information processing takes place when the GM evaluates what information to provide/evaluates player feedback, and when the players evaluate GM feedback/process the information provided or resulting from a previous cycle.

After each processing step, a decision is made as to what information to forward in the system, actions to take etc.

The information packages are gradually stored in information storage systems (data repositories), where they can be drawn upon in the future. Similarly, these repositories are used during the game to check rules, consult plot outlines, keep track of character health etc. In PnP RPGs, there are two general forms of data storage: 1) **Static repositories**, where the data remain generally unchanged during the game. For the GM these could contain e.g. GM-specific material, rules, world setting information, the scenario (see below). For the players, this could contain e.g. rules and information about the world setting. 2) **Dynamic repositories**, where the data usually change as the game progresses. For example, at the beginning of the game, the GM will typically have some sort of plan for the storyline of the game. As the game progresses, this is gradually updated and revised, as the players go through the various events; add new elements to the story etc. Player dynamic repositories could include information about their character and its inventory. For the GM, these repositories could contain information about the game world (which is affected by the actions of the player characters), state of the story, the condition of NPCs etc.
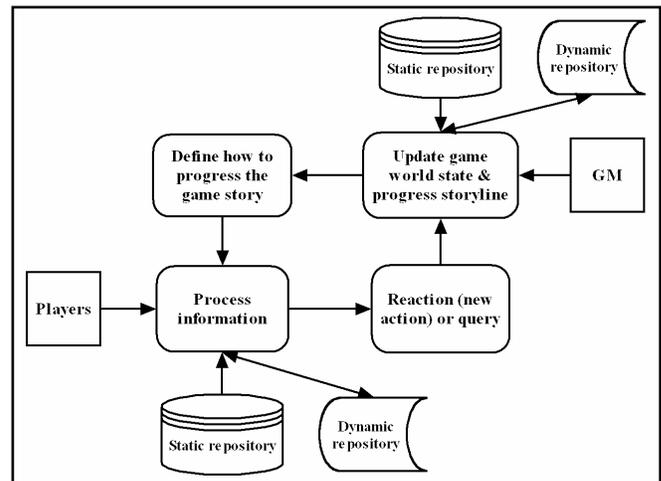


**Figure 1: Simplified overview of the information flow in PnP RPGs. Symbols as in Data Flow Diagrams, however note that two different symbols for data storage have been applied to separate dynamic/static repositories (drum and stored data symbols). Information descriptions have been removed from the flowlines for clarity. Rectangle: External entity, rounded rectangle: Process.**

Static repositories generally include all the background information in PnP RPGs: Rules, knowledge about the fictional world, character backgrounds etc. This information would normally be updated between games, e.g. by the players deciding on a new house rule.

In CRPGs, the job of managing the fictional world and the progressing the storyline is taken over by a game engine and a host of sub-ordinate and automated systems that manage e.g. the pre-planned storyline, non-player characters, rules etc., here collectively referred to as the **game engine.** The game engine repositories store and utilize data in a manner superficially similar to a GM, however, there are data and stored programs/routines present that are not used in PnP RPGs, such

as AI routines, databases of MOB information, trigger conditions etc.

The major difference from the GM/-s in PnP RPGs (from an information processing perspective) is that the game engine does not make any decisions on what information to provide the players. This point can be debated. Making a decision indicates that there are choices available, and that previous actions or future implications of the choice could guide the decision. In CRPGs, the majority of the ways players can affect the game process is strictly pre-programmed. If a player moves his or her character to an NPC and clicks the "talk" button, the game engine is unable to choose *not* to make the NPC talk to the character. It may be the case that the NPC is controlled by a program that, based on previous actions of the character, controls whether or not to respond to the character (e.g. if the character previously pick-pocketed the NPC and was caught, the NPC is programmed not to talk to the character). However, no actual decision making is involved. On the other hand, games might include an AI controlling e.g. the behavior of the opponents of the players (MOBs). While current games-based AI remains primitive (Combs, 2005), it could be argued that MOBs make decisions about when
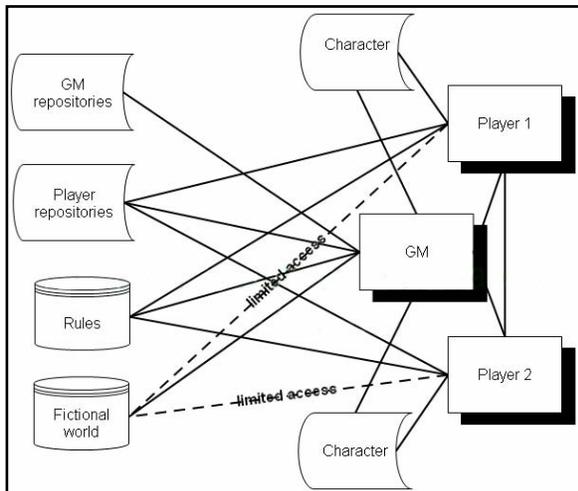


and how to attack player-controlled characters, even if governed by sets of specific rules and conditions. Here, it is has been chosen to define game engines as not making decisions, this also to distinguish them from GMs.

In relation to storylines of CRPGs, trigger conditions are often related to the player character acquiring specific objects or eliminating specific opponents. For example, acquiring an object could trigger a particular non-player character to spawn in the virtual world, which provides the player with information about how to use the object, thus moving the story forward along the storyline.

**Figure 2: Simplified Information Access Diagram of a multiplayer PnP RPGs and CRPGs. In a CRPG situation, the "GM" entity would be composed of a "game engine" entity. Symbols as for Figure 1 (entities shaded to be clear of information access lines). Note that lines mark information *access*, not flow.**

The models presented here are top-down representations of processes that could be described in much higher levels of detail (see e.g. [14]). Because data storage, management and updating form a significant part of PnP RPGs and CRPGs, it is important to discuss how data access functions in these games (see also [7]). In a typical PnP RPG, the GM has full data access to all game elements, i.e. the players, the characters they enact and all information pertaining to the game scenario (the blueprint or storyboard which the GM use to develop the game narrative). The individual players have access to a more restricted set of data, for example their characters, the game rules and some knowledge of the fictional world setting. The access to fictional world knowledge is restricted to the players, e.g. because the GM will commonly have knowledge about the world not publicly available, for example ambitions of non-player characters and similar. Note that this model would be equally applicable to a CRPG, however, the GM could in this case be a game engine (or a human as is possible using the e.g. the *Neverwinter Nights* engine. In this case a "game" data repository would need to be added to Figure 2).

## 4.2 Story control
In PnP RPGs, the control of the game story (or narrative), can rest in the hands of the players and/or the GM. The distribution of control varies, however, in the archetypical situation, the GM is in charge of progressing the storyline, while the players control the actions of the protagonists therein [5, 13, 16] (Figure 1). The GM assumes a variety of responsibilities in PnP RPGs, depending on the playing style used, however, these normally include facilitation of game flow and game story, providing environmental content of the fictional reality, as well as administrating rules and arbitrating conflicts. The GM is thus a game participant but rarely a player. It is often the case that the GM has an overall story outline planned (a scenario), and tries to make the players more or less follow the general storyline, either through direct enforcement or by enticing them to follow it. This means that player freedom comes in two forms: Factual freedom and Perceived freedom. The same forms are applicable to CRPGs.

In CRPGs, the situation is superficially similar; however, the human GM has been replaced with a game engine and a pre-planned game narrative (Figure 1). Due to the current technological limits of computer games, and game design traditions, this has the effect that the players can exert only a very limited control of the game (e.g. the main campaigns of *Neverwinter Nights*). The players are restricted to chose pre-planned pathways through the game, and can only interact with existing non-player characters, and only in the way the game engine allows. Similarly, the players can only to a limited degree affect their environment – if the game engine does not allow players to buy an axe and chop down a tree, this action is simply not possible.

## 4.3 Story development process
Story is a core element of RPGs, and the formation thereof a complex process that it is only possible to provide a brief overview of here. In RPGs, the players enact [see however 5] below) characters who take part in a narrative that are shaped collaboratively between the game participants [5,7,8]. The development of the story is supported by the fictional world that

the game takes place in, which provides a backdrop for the events and actions of the player characters.

The stories in RPGs are rarely entirely improvised [7]. In CRPGs, all of the possible choices that the player or players can take have been pre-programmed. This means that the variety of stories possible to the players is strictly limited by the pre-programmed content. In PnP RPGs, because the story is shaped collaboratively, there is a much wider possibility space for story development. However, normally the GM will guide for formation of the story based on a plot outline, or **scenario**, which contains the information the GM needs to manage the game narrative. Scenarios could include a list and description of major plot points and events that could take place in the game, as well as descriptions of non-player characters, places and objects. The level of detail in the scenario can vary in PnP RPGs, where the story is dynamically developed by the participants as the game progresses [7]. The scenario combined with the characters, the fictional world and the game rules form the elements from which the participants shape the game story.

The story of a RPG can be divided into conceived and a perceived parts (Figure 3). The already played out part of the game story is **perceived**, the part of the story that has not yet been communicated through the shared play space is the **conceived** story (Figure 3). The conceived story rests in the scenario, and thereby in the mind of the GM, in PnP RPGs, as well as in the un-mapped actions of the player characters. In CRPGs, the conceived story is the pre-planned game narrative.

As the game progresses, the conceived story is gradually transformed to a specific perceived story. The process through which this transformation takes place has yet to be analyzed in detail, however, it basically rests on the feedback cycles described above. The GM describes an event, the players react to it, the GM describes the effect of the actions of the players, and the story is thus brought forward [7,8]. Because RPGs are story-based games, the conceived story will always be composed of an infinite number of possible narrative paths in PnP RPGs, or a finite number of possible narrative paths in CRPGs (Figure 3). As the players and GM complete

feedback cycles for sections of the story, a path is formed through the space of possible conceived stories. This gives rise to the formation of two forms of perceived stories: 1) The shared story, which is the storyline that can be filmed or taped. As the game progresses, the contributions from players to the shared play space affects the way that other players perceive the unfolding game-story; 2) The individually perceived stories of each participant [8].

During the game the GM manages the storyline, according to the scenario and the desires of the players to explore different aspects of the story elements – or add elements of their own devising in PnP RPGs (see e.g. [2,5,13,14,16]. The principle is the same for CRPGs, except for the GM being replaced by a game engine and the influence of the players on the unfolding story being limited by what has been pre-programmed.

The story of multiplayer RPGs can be divided into increments based on the story content. Here a typical dramatic division consisting of three layers is utilized, which is applicable to both RPGs and CRPGs:

**Scenes:** The scenes of an RPG form the basic layer of PnP RPGs and CRPGs. Scenes can be of variable content and length, but are generally pre-planned in PnP RPGs (although they can be improvised on-the-fly), and form substantial and important elements of the game narrative. An example could be that the characters are going to the king's castle to hear about his dragon-napped daughter.

**Events:** Scenes consist of events. These can again be of variable content and length. In the above example, the scene could have the following events: 1) Gaining entrance to the castle; 2) Getting permission to see the king; 3) Talking with the king about his missing daughter.

**Interactions:** Events are formed by a series of interactions, either between the player characters, the characters and elements of the fictional world, or any combination or subset thereof. For example, event 1) above could consist of: A) The player characters discussing the situation on the way to the castle; B) The player characters being rejected by the guardsmen at the entrance to the castle; C) One of the player characters in secret bribing a guard to let them in.

In a multiplayer RPG, multiple interactions can be running at the same time. In the above example, interactions B) and C) could take place at the same time – both chronologically in the game storyline, and at the same time in the game. In PnP RPGs, it would even be possible for the two interactions to be role played simultaneously even if they were chronologically at two different points in the game story-time. Note that any given utterance will be specifically related to one specific interaction.
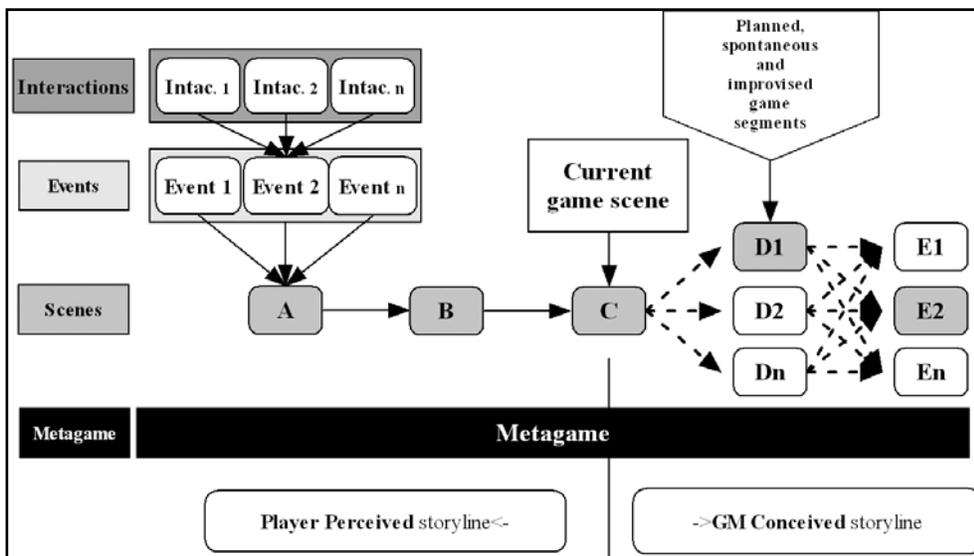


**Figure 3: Story development/composition in multiplayer PnP RPGs and CRPGs. The meta-game layer is formed by all activity taking place outside the fictional game world.**

In PnP RPGs, it is possible for these interactions to retro-actively affect game story backwards chronologically. If two interactions conflict, the GM and/or the players can decide that one of them ended in a different fashion than what was played out, retro-actively affecting the outcome of the other interaction. Outcomes of interactions can also be changed or ignored by the GM or the game participants if e.g. they conflict with another interaction. This process of story fragmentation and assimilation is a result of the freedom of the players to decide on the actions of their characters. Presumably, a similar situation could be applied to events and scenes, however, it could be argued that the larger the segment of the interactive narrative, the less likely it is to be modified retro-actively.

In both PnP RPGs and CRPGs, player choices with regards to the game story will generally be fewer the higher in the interaction-event-scene hierarchy these choices affect the game story. This because choices at the scene level requires the development of more content – i.e. if the player can make a choice as to whether to proceed to Scene X or Y, both scenes have to be pre-programmed (CRPGs), planned or improvised (PnP RPGs). This not only adds content development time, but there is also a risk that some of the content will not be used by the player [6]. In CRPGs, giving a player three different reply options to a non-player character is in comparison content that it is cheaper and faster to develop than a scene. Similarly, in PnP RPGs the GM can more easily create a non-player character for the players to interact with on-the-fly, than an entire scene. Thus the GM will generally try to make the players follow a story framework, outlined in the scenario. The amount of freedom within the story framework varies substantially from game to game, scenario to scenario.

## 4.4 Role playing

Contrary to what the names of the four major RPG forms (PnP RPGs, CRPGs, MMORPGs and LARPs) imply, role playing is not a shared feature among RPGs. For example, CRPGs rarely involve elements of actual role playing on part of the player or players, as is typical of PnP RPGs. Depending on how RPGs are defined, it could be argued that CRPGs are in fact, not role playing games, but computer games inspired by PnP RPG elements (theme, setting, rules systems etc.). However, both PnP RPGs and CRPGs vary immensely across a variety of core features. For example, some PnP RPGs place substantial weight on simulating the imagined world the games take place in as precisely as possible, and the players may not role play as much as roll dice to determine the effect of the actions the characters they play take in the imagined world [2]. On the other hand, the *AURORA* toolset from the CRPG *Neverwinter Nights* has an in-built GM client, allowing a player to take on the mantle of GM. Combined with a multiplayer virtual environment, by using the *AURORA* toolset and possibly even third party voice software, participants are able to create game situations with as strong role playing elements as most PnP RPGs.

PnP RPGs are characterized by featuring collaborative storytelling formed via the interaction between multiple participants, requiring immediate and on-the-fly control of an often complex game narrative. This while at the same time the games are supported by a rules framework that can be very complex. However, the choice of how many of these rules to utilize is up to the players, and furthermore a lot of these rules pertain to character generation, rules for the fictional world etc., and thus are not continually in use during game play.

## 4.5 Presentation of the fictional world

As noted above, PnP RPGs and CRPGs both utilize a fictional world as the setting and backdrop for the gaming activity. The fictional world setting provides the information processed to form stories and scenarios, and includes basic considerations about how the players should interact with it – e.g., that there is gravity, a 18th century equivalent technological level, etc.

In PnP RPGs, the participants (i.e. the players and any GM) visualize the events taking place in the fictional world. Therefore it is termed an imagined fictional world. This can cause substantial problems with interpreting the events of the game story, because the participants perceive events differently. This can lead to real-world conflicts about the interpretation of what took place in the game narrative.

In CRPGs, a visual world is provided to the participants. Actions are carried out via player character avatars, and their effects are clearly visible to all participants (unless the game allows players to operate in different geographical areas). The advantage of a visual representation of the fictional world is that it eliminates interpretation problems. Furthermore, it might be argued that the presence of the virtual world provides a more immersive environment than an imagined fictional world. The problem with virtual worlds is however that they limit the freedom of the participants to interact with the game world, affect it and importantly, for the GM to update the world on-the-fly as the game progresses.

## 4.6 Character impact

In general, the storylines of CRPGs and PnP RPGs – especially those produced in the western world – place the player characters as the main protagonists of the story. The specifics vary from game to game, however, as a general feature the player characters are central to the game story, and the game story often involves elements of dramatic nature, e.g. saving the world, saving the village, defeating the evil wizard, solving a murder case etc.

In PnP RPGs, the players can via their characters – again, depending on the nature and style of the game in question and the preferences of the participants – affect the entire fictional setting, and alter the state of the game world (i.e. affecting the scene level of Figure 2). The fictional world exists to entertain them. In CRPGs, the player character or characters will also typically be the harbingers of major change, or restorers of status quo. The player character is still the hero, or anti-hero (e.g. *DungeonSiege, Baldur´s Gate, Icewind Dale, Pools of Radiance*). However, it is important to note that the player or players in a CRPG will be very limited in determining *what* effect to have on the world – the impact has to be allowed within the confines of the pre-planned game narrative (e.g. pre-generated choices when interacting with non-player characters – the interaction level of Figure 2).

## 4.7 Character freedom

In theory, players have in PnP RPGs complete freedom to decide what their characters think and do (the player processing stage of Figure 1), however, these actions generally have to be logically consistent with the world fiction. For example, if the game takes place in a contemporary Earth setting, humans cannot fly unaided. Note that in some RPGs, magic or other supernatural effects can bend such laws of physics – such effects form part of the world logic and form part of the framework players can act within. In CRPGs, the freedom of the player is limited by the flexibility of the game engine (Figure 1). For example, players might not be able to make their character avatars break an object if that object is not programmed to be breakable.

## 4.8 Rules and rules management

In RPGs, the rules specify a great deal more than how pieces are moved on a game board. Because these games are focused on player characters, the rules are designed to govern the nature of these story protagonists and the fictional reality they act in. This provides a framework for how the fictional world operates, and the understanding of this framework is crucial in running a PnP RPG - without a shared understanding of how the fictional world operates, it is at best challenging to play RPGs that rely on a non-visible, shared understanding of game events between the participants.

PnP RPGs rule systems vary from simple to complex. In RPGs, the actual game rules are supplemented by rules defined by the game premise and the fictional contract. The players need to collaboratively decide what they want out of playing the game, what is socially acceptable, the responsibilities of the GM etc. In general, the more complex the rules system, the temporally slower the information feedback cycle (Figure 1). Note that the rules systems in PnP RPGs can be modified or ignored on the fly by the GM or players if so desired. It remains the responsibility of the players to decide on the interactions their characters take within the rules framework.

In CRPGs (and MMORPGs), flexibility with the rules is only possible if pre-programmed. This because the rules form the foundation for the operation of the virtual world, in which the vast majority of CRPG rules are operating, handling the simulation of the environment, rather than actual game rules. This also means that CRPGs in general have more rules than PnP RPGs. The game engine needs to deal with a lot of information that is normally handled by the mind's eye of the players in PnP RPGs, e.g. the color of walls. Due to amount of rules present, some of them have to be kept hidden from the players to some degree, in order not to overtly burden them with information. The focus on static rules in CRPGs means playing styles that work well therewith have better support than those that do not. For example, playing with the rules as a support tool, to be used when desired and ignored when not as is possible in PnP RPGs, is very limited in CRPGs.

## 4.9 Interaction

In PnP RPGs, the participants can interact freely with each other, either in person or via their characters (Figure 2). In multiplayer CRPGs the players interact via their avatars and any enabled communication pathways, such as voice and texting. Because interaction takes place through avatars, communication via body language, signs etc. is restricted to the options built into the game engine (e.g. emotes). Physical movement can be important in PnP RPGs. For example, freeform types of PnP RPGs encourage physical movement of participants, e.g. to another room when discussing tactics, or utilize an entire building or area. It could be argued that these games are LARPs, not PnP RPGs, but where to distinguish between the two game forms is at best difficult [12,16,17]. It is important, however, to realize that PnP RPGs are not confined to the *Dungeons & Dragons* stereotype.

Interactions with non-player characters in PnP RPGs are handled similarly to interaction between the players, typically with the GM role playing the character. In CRPGs, conversation with computer-controlled characters is limited to pre-programmed options. This means that it is difficult to integrate meaningful interaction between non-player characters and player characters in CRPGs. Furthermore, the limited variation and intelligence of non-player characters renders the establishment of social relations between them and player-controlled characters nigh impossible to create. This limitation is a subject of some interest in the game industry today, and the area is being addressed primarily via e.g. AI research projects such as *Façade* and *Cyc*.

The advantage that CRPGs do have in relation to interaction with non-player characters is the ability to present fantastic or non-realistic elements visually. The negative side of this is that some PnP RPG players may feel that the use of a dragon model negatively impacts on their individual minds eye perception.

## 5. CRPG WITH A HUMAN GM

World building and editing tools are sometimes released together with the games that they have been used in building. These tools are used by players to create modifications, or mods, of the original games. In CRPGs, editor tools have been released for e.g. *Morrowind, DungeonSiege, Vampire the Masquerade: Redemption* and *Neverwinterwinter Nights.* Included in the toolset for the latter two are GM clients, which basically allow one of the game players to take on a responsibility comparable to that of a GM in a PnP RPG. For example, by using the AURORA engine of *Neverwinter Nights*, a player can not only build an entire fantasy world and design in-game storylines, however also operate in real time as a GM. In addition, these games can be run persistently, and even linked to provide a MMORPG-like platform. The virtual world still imposes limits on the freedom of the GM. While it is possible to control NPCs and warp in (add in real-time) components to the game world such as entities or objects, the GM cannot modify the state of the game world nor the rules on-the-fly as in PnP RPGs. In short, the rules governing avatar interaction with the virtual world cannot be altered during game play. In comparison, in PnP RPG situations the GM can change and update the broader state of the fictional world at any time in order to support the flow of the narrative.

# 6. CONCLUSION AND DISCUSSION

It would appear that the weaknesses of CRPGs generally are the areas where PnP RPGs have their strength, and vice versa. The differences are generally related to the use of two different media of expression. PnP RPGs inherently feature limitations imposed by the format of the fictional world that forms the basis of the game genre. Because the game is based on a shared understanding of a fictional, imagined reality, there is a basis for misunderstandings. Uncertainties about the state of the fictional world and character actions can disrupt or delay game play. The synchronization of the perceptions of the players as to what is happening in the game, to a degree is dependent on the ability of the GM to manage the game process. As a player, it can be difficult to maintain a clear view of what happens in the fictional world, especially in combat situations where spatial placement is important. By providing a virtual representation of the fictional world, CRPGs avoid the synchronization problem. However, the use of the virtual world via a game engine – at least with current technology – limits the freedom of the players and the flexibility of the story. It is at best difficult to improve CRPGs in the areas where these games have their weaknesses. Addressing these issues involve AI, automated story management and other computationally intensive methodologies. Multiplayer CRPGs managed by a human GM however appears to alleviate some of these problems. While the virtual world restricts the ability of the GM to manage the game process, the inclusion of a GM in a CRPG means that a group of players can interact meaningfully with non-player characters.

**Future work:** As mentioned above, the analysis presented here is an early approach towards developing a joint description of the two game forms. It would appear that the use of IS methods such as model-driven IS analysis using e.g. Data Flow Diagrams [18], combined with a form of reverse engineering of the game design, provide a way of describing RPGs, by focusing on how information if generated and distributed in these games. Future work will focus on deepening the analysis presented here and use formal methods of IS to describe PnP RPGs and CRPGs. These methods could include Object Oriented Modelling (OOM) using a modified Unified Modelling Language (UML), developed for the specific purpose [18]. OOM is used e.g. to describe entities and their functionality (e.g. the GM, the players). Finally, Atomic Task Analysis (ATA), a method developed by [4], could be combined with or inform the above. ATA basically attempts to break down the components and processes of a game into their smallest parts, e.g. moving a game piece, and describing the game as a function of these tasks. Such analysis could ideally be combined cognitive studies, e.g. of how the GM operates, and describing these cognitive processes as information flow, decision and analysis systems. Such work would be of interest e.g. in relation to describing the formation of story in multiplayer RPGs. The question is whether this process can be quantified to provide a venue for programming interactive storytelling systems [11]. In this paper a possible path to describing PnP RPGs and CRPGs in a quantifiable framework has been outlined. By further developing this framework to include more detailed levels of game processes described in formal models, it might be possible to progressively map the way collaborative interactive narratives are formed in multiplayer RPGs, which would be useful in the task of designing and programming interactive storytelling systems as well as the design of PnP RPGs and CRPGs.

# 7. ACKNOWLEDGEMENTS

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