Thoughts on Creating Better MMORPGs
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Paper 1: Trends in Technology

I. Introduction

Today millions of people worldwide live dual lives, with one foot in the real world and one in the virtual worlds of Massively Multiplayer Online Role-Playing Games (MMORPGs). As the name implies, these games allow for simultaneous play by thousands or even millions of players worldwide, all of whom compete and interact within virtual worlds. Some popular examples of MMORPGs are World of Warcraft, Everquest (I & II), Warhammer Online, Lineage (I & II), Final Fantasy XI, and Asheron's Call. These games combined have a subscriber base in the millions, with World of Warcraft being the undisputed leader and Warhammer Online being today's most promising contender (Caron 1). In combination, these players log a considerable amount of play time, with the average player spending on average 22 per week in-game (Yee, Demographics 2), exploring the large volume of content these games offer, but also interacting socially.

For many of the millions who play them, the attraction to MMORPGs comes not only from the many hours of game play they offer, but also the social relationships and reputations that can flourish in a virtual world. In fact, when considering MMORPGs, it is almost improper to think of them as "games" in the traditional sense, as they can be more accurately imagined massive virtual worlds or settings "filled with a range of narrative vectors" (Smith 4) which players can experience. Accepting this definition of games as settings for the unfolding of unique player narratives, MMORPGs can ideally be thought of as the vehicles through which players define these vectors with their unique their actions during play. It is this ability to define the game's narrative through individual play that sets the MMORPG genre apart from other game genres. This ability is, however, constrained by the rules and limitations of the virtual worlds in which it takes place (hence my "ideally" qualifier). These rules an constraints, I believe, can and should be overcome through innovations inspired by biological systems we see in the real world, thereby ushering in more immersive and compelling MMORPGs.

In this paper I will present a picture of current MMORPG technology by giving a description of today's typical MMORPG experience from a player's perspective (namely, mine). I will then consider some trends in MMORPG research which I deem as possibly leading to improvements to the current MMORPG paradigm. In so doing I will take the first step toward my final term paper wherein I will propose some ideas for improvement in MMORPG system design and development.

II. Today's MMORPG: A player's perspective

MMORPGs offer a unique chance for large populations of players to experience a virtual world together. However, retaining player interest and loyalty is a problem that even the best designed MMORPGs face. As a MMORPG matures and grows, its developers must guard constantly against emergent threats to its sustainability. These threats range from player boredom to abandonment of large parts of the virtual world to economic inflation. It is important when considering these shortcomings to remember that they are not necessarily the result of software deficiencies. Rather, they emerge as a result of unforeseen systemic complexity introduced by interaction between players and the MMORPG world. However, since the majority of MMORPGs maintain revenue through subscriptions, preventing these problems and preserving the subscription base is in the interest of game makers. It is incumbent on the MMORPG maker to justify a subscriber's monthly subscription fee. We will now consider the case of a subscriber.

In order to illustrate emergent factors that can threaten the long-term viability of a MMORPG, let us consider the case of a hypothetical MMORPG player. For the sake of pronoun simplicity, we will imagine this player to be a male in his mid twenties, as is supported by demographic evidence (Yee, Demographics 2). Having heard good things about a given MMORPG, our player decides to give it a try. Once he installs the game client (which was either purchased or downloaded at cost or free) onto his personal computer, the player logs into the game network and uses a built in tool or wizard to create a character (or avatar) which will be his/her representative in the virtual world. The options offered in this character creation process are somewhat limited, but serve to offer some basic level of uniqueness. Once the player is satisfied with the options selected for his avatar, play begins.

When our player first enters the world of an MMORPG, it can initially seem an endless expanse offering endless possibilities for new experiences and adventures. As he begins to explore the game environment, interacting, collaborating, exploring, and competing with other players, this initial impression is quickly reinforced. The challenges presented to our player early in the game are simple, and gains in the stature of his character come quickly and with little effort. As he "climbs the experience ladder" of success in the game, each figurative "rung" gets further apart, by design. Quests become more difficult, computer controlled adversaries become more difficult to defeat, and the risk to reward ratio for each endeavor tips in favor of risk. In this way, the game attempts to grow with the player, ensuring a consistent level of challenge as his skills and his characters powers increase.

In spite of the steadily increasing difficulty, before long the player achieves a considerable measure of success in the game, amassing powerful weapons and equipment, gaining experience, acquiring new skills and powers, and gaining a degree of notoriety with the game's computer-controlled non-player characters (NPCs). In addition, the player has made contact with other human controlled avatars or player characters (PCs) with whom he has established friendly or even adversarial relationships.

Such relationships may even have been made formal through the player's association with a guild, faction, or alliance. Indeed, it easily be said that our player has by this time established a second identity within the world of the MMORPG. As he enters his playing "prime", the player is truly immersed in the game, and the line between the player and his character avatar blurs.

Weeks, months, and even years pass, and the player continues to form new relationships with other players while his avatar grows by all measures of success within the virtual world. However, as he nears the top of the figurative experience ladder, the world begins to lose its luster. The player tires of performing the same repetitive types of actions such as killing monsters, gathering treasure, participating in guild events, fighting rival PCs, etc. Furthermore, whole swathes of the world which once offered fertile ground for play are now beneath the player's stature such that venturing there would offer virtually no possibility of adventure or gain. The player has begun to outgrow the world, becoming personally less satisfied with the play even as his/her avatar's power narrows the ways in which adventure can be sought. The player becomes a member of an increasingly crowded set of dissatisfied "end game" players who have advanced through the games levels of achievement, and are now finding themselves running out of things to do. At this point our hypothetical player, along with many others, begins to consider leaving the game, prompting the game's manufacturer to take corrective action.

To forestall and exodus of their game population, the MMORPG creators rush to produce an expansion pack which promises new possibilities for advancement as well as new world content and features. This action causes our player to stick with the game a bit longer, but this action only prolongs the inevitable repeat of the "rush to endgame", and before long players are once again butting up against the game's ceiling, compelling the manufacturer to produce another expansion. Thus begins a cycle wherein the game maker is constantly expanding the world in order to retain player interest, all the while leaving previous areas of the world virtually empty. This has the effect of making the game unappealing to new players, who enter the game's beginning areas to find them virtually devoid of players since most of the game's population is concentrated in the endgame content areas.

Given these developments, our player is now seriously considering quitting the game. Many of his friends are bored and moving on to other games and this is causing his guild to shrink, thereby lowering the social appeal of the game. What's more, it is difficult for him to recruit friends to join the game as new players because they will have nobody to play with at the lower levels since most seasoned players have moved on. In addition, in many cases new players will face a prohibitively inflated economy which makes it difficult for them to afford better weapons, equipment, and other necessary game items. Our player soon finds himself spending more and more time in the game alone. Faced with an exodus of fellow players and able to select from a growing field of competing games, our player finally cancels his monthly subscription, contributing in his small way to the decline of a once popular MMORPG. As the MMORPG's fortunes fall the game maker must how to restore lost revenue, questions arise as to how our player's interest and loyalty could have been retained.

III. Current Trends in MMORPG Development

As game developers compete to create the most compelling and attractive virtual worlds, they seek excellence in a number of areas of concern. These areas, a comprehensive list of which Eladhari provides in his article, "Trends in MMOG Development", include increasing personalization, creating more dynamic game worlds, and populating those worlds with more intelligent computer controlled non-player characters (NPCs). I will now expound on each of these, citing pertinent research.

Increasing Personalization

The ability to customize one's character is among many components that make a MMORPG more immersive (Yee, Motivations 773). Currently, many MMORPGs offer such customization to varying degrees. Though such customization is, in many cases, superficial (i.e. affecting only details such as hair, eye, and skin color, but not the fundamental shape and size of a character), it is generally well received, especially by female players (Tycshen, Tosca, and Brolund 261). As system resources for the display of graphics become more plentiful, more varied and personalized appearances will likely become the norm. But personalization can go beyond the superficial.

One method of increasing MMORPG personalization proposed by Tychsen, Tosca, and Brolund involves making the game world sensitive to elements of a PCs history or background. In this paper the authors propose that such sensitivity can be implemented as points based traits system wherein a character has a certain number of points that can be assigned to different traits. Allocating points in certain areas can confer certain advantages, but these might come at the expense of deficiencies in other areas. The example given in by Tychsen and colleagues considers that proficiency in orc-fighting might be taken, even at the expense of poor ability in spider-fighting. I believe this approach could make for interesting player interaction, as it would cause players to seek out those with certain proficiencies when trying to complete certain goals. However, as the authors note, care would have to be taken to ensure game balance.

Given the potential game balance issues arising from overly proficient PCs with unfair proficiencies in certain areas, the authors propose a second approach wherein player background does not affect abilities or confer advantages. Rather, a character's background merely influences a PCs personality and to some extent how NPCs react with that PC. An example of a PC receiving a request from an NPC for demon eradication given that PC's anti-demon leanings is presented by Tycshen, Tosca, and Brolund to illustrate this approach. I agree with the authors that this approach is far more conservative and that it could be more easily implemented in the framework of existing MMORPGs.

Tychsen and Hitchens examine some of the challenges of personalized narrative when they discuss time and consequence in the MMORPG setting. Concerning time, given that MMORPGs are experienced by players through their PCs in real-time, these authors

point out that there is a “lack of temporal control” such that traditional methods of narration fail. Specifically, it becomes nearly impossible to separate a player’s “fabula”, or “ordering of events” in a story, from the story itself, which is described as the “presentation of the fabula” (Tychsen and Hitchens 303-305). It is therefore very difficult to have one character’s story line influence that of others since objective time, which is necessary for the ordering of events in traditional storytelling, does not exist in the real-time MMORPG setting.

Making more dynamic game worlds

Since MMORPGs serve as the play setting for large populations of gamers, reliability and a reasonable degree of fault tolerance are essential. Woe to the MMORPG known to be prone to server crashes or long stretches of downtime. Such failures can infuriate a game’s player base. Given the need to support multiple concurrent users in stable, reasonably failure proof environment, it is no surprise that MMORPGs to date have been fairly static, with the world not changing very much except in patches or new releases. It is my opinion, however, that building a virtual world which changes both on its own and in response to actions by PCs is imperative for the advancement of the MMORPG genre. More dynamic environments will be more immersive environments, and these environments will provide more nonlinear and unpredictable game play experiences, thereby retaining player interest.

In current MMORPGs, the degree to which players interact with their virtual worlds is limited. Interaction is generally confined to combat with adversarial PCs and NPCs, completing tasks or quests for friendly NPCs, gathering resources from the environment and from defeated enemies, and, in some cases, generating content to a varying degrees degree. As Tychsen and Hitchens put it, PCs in a typical MMORPG occupy a “ghost world”. In such a world they can “interact with the physical part of virtual world, including talking to its inhabitants and each other; however, they cannot permanently affect it” (Tychsen and Hitchens, 301). According to Eladhari, developers of MMORPGs (some 114 at the time of his writing in 2006) are striving to fix this problem by “creat[ing] worlds that provide an alternative to the real world but with similar perceived levels of complexity. This in-game complexity is born when developers are able to make systems that are so dynamic that a massive number of players can use in-game features to create systemic complexity by interacting according to different varieties of frameworks for social structure, politics and economics” (Eldahari 1).

In addition to changing in response to PC actions, online game worlds seeking to more closely approximate our ever-changing world should exhibit emergent behavior independently of any action by players. One example of such behavior is proposed by Griffith when he describes the conservation of virtual objects (Griffith 1). Griffith points out the problem of inflation in MMORPGs as being brought about by the fact that in-game resources are infinitely generated at a faster rate than they are destroyed. As a solution, he proposes a conservation of objects similar to the conservation of mass and energy in the universe, with such conservation controlled by “an engine that controls the creation and transfer of persistent objects according to the following rules:

1. Only the conservation engine may create new persistent objects.
2. In all other cases persistent objects can be transferred, and in some cases destroyed, but not created." (Griffith 1)

Among the things that would be controlled by this proposed engine are the aggregate wealth held by enemy NPCs (Griffith calls them "creeps") and the number of persistent versus expendable items in existence in the world at any one time. When considering the possible effectiveness of such an engine, it becomes easy to imagine an engine similar to this controlling other aspects of the game world such as the generation and distribution of NPCs, fauna, and flora.

More intelligent NPCs

MMORPGs offer a unique chance for interaction among players, but NPCs that offer richer, more intelligent interaction are also essential. In today's MMORPGs, NPC behavior tends to be predictable. NPCs that behave more like real players can therefore only improve the player experience. In "Game Player Modeling Using D-FSMs" and "User Adaptive Game Characters Using Decision Trees and FSMs", Yoon et al propose the use of Dynamic Finite State Machines (D-FSMs) to allow NPC agents to behave more like player controlled characters. While exploring the use of these D-FSMs, Yoon and colleagues describe two types of NPC agents.

The first class of agents is elementary agents, which have simple behavior which is hard-coded into the game. These agents, which behave in the same way in every encounter are representative of typical NPCs. Since their behavior is defined in a somewhat concrete manner, changing their behavior is difficult. The second class of agents are adaptive agents are discussed which "show dynamic response to the game players by analyzing the game player's gaming data" (Yoon et al., Game Player Modeling 493). These agents can exhibit behavior quite different from their hard-coded default behavior as they adapt to PC play patterns (as gleaned from PC data). Yoon et al propose the use of D-FSMs, for which state transition can be modified to alter NPC behavior. This ability could be used to modify NPC behavior so that NPCs could adapt to PC strategies and behaviors. In addition, the authors suggest that FSMs could be used to model human behavior since "if players' models are applied to NPCs, an NPC will play intelligently or in a way similar to how players' play in the game" (Yoon et al., Game Player Modeling 495).

Another way to enhance the intelligence of NPCs is by making them BDI (Belief-Desire-Intent) agents. While the use of these agents is widespread, Liu, Yu, and Chen present a novel adaptation of BDI with their AIPlayer. AIPlayer actually adds another layer of computer control so that an agent actually acts as a player of the game. The addition of this AI layer adds behaviors that that traditional BDI agents can't exhibit, such as mental states, desires, and even philosophy. I believe, based on my reading of the AI Player as described by Liu et al., that the behavior of the AIPlayer they propose could be made to closely mirror that of human players. This could be accomplished if its behavioral patterns were defined based on observation or polling of real players. If such artificial players could be perfected, they could be used in lieu of human controlled PCs for special

in game events or other occasions where it is desirable for NPCs to exhibit unpredictable and sometimes even irrational behavior.

IV. Conclusion

Given the constant advances in computer power, the day will soon come when the considerable cost of dynamic, changing MMORPG worlds populated by intelligent agents will technologically and financially feasible. Increased personalization through unique, customized narrative will engage players like never before. Making virtual worlds more complex and dynamic will provide a compelling setting in which players can define their own personal narratives. At the same time, they will be able to contribute to the story of the virtual worlds in which they play by affecting the environment around them. Finally, NPCs that act intelligently, in a human-like fashion, will enrich the character of MMORPG worlds, with players interacting with them in unpredictable ways.

In order for game developers to be poised to take advantage technological advances, research into how to create systems that exploit them should be done now. If the conceptual foundations for improved artificial worlds are laid down today, they can easily become a reality tomorrow. As a gamer and computer science student, I look forward to seeing how trends in the design of MMORPGs evolve and play out over time.

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