A Decision-Making Model Based on Persuasive Consistency Applied to MMORPGs

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Abstract: RPG is a game genre that focuses the cooperative interaction among players, as well as socialization and the improvement of communication skills. As these actions form the very context of these games, RPGs have an inherent level of decision-making that naturally occurs at all times throughout the course of the game. Those reasons led the idea to take advantage of the RPG genre to design a model that is built in a Petri Net and that combines concepts taken from the Game Theory and from the Theory of Persuasion for easing the decision-making process in, particularly, MMORPG environments, as they have all the benefits of the RPG genre and additionally, involves a massive number of players in a kind of plot, thus, reinforcing the needing of interaction and of taking decisions.

Keywords: Psychology of Persuasion, MMORPG, Petri Net and Game Theory.

Introduction

In a game context the making of decisions is a crucial process that has direct influence on any player performance, occurs at all times, at different levels of importance and of awareness of the players. Thus, it is impossible to think of games without considering the constant occurrence of the decision-making, which in fact, can even be seen at empirical level by simple observation of a game match [7]. First, this paper uses the Game Theory that consists of models for the analyses of conflicts and operations that are reliant on strategic behaviors in which; a player's actions are partly dependent on the actions of other players [4][5]. Lastly and perhaps taking an even more prominent approach, this paper applies a principle from the Theory of Persuasion to provide support to decision-making process, due to its emphasis on the use of communication skills to change attitudes, beliefs and even the behavior of other people, thus, preventing the use of force or coercion [2].
With the above said, the aim for this paper is to build a decision-making model founded on the Reciprocity concept from the Theory of Persuasion for use on MMORPG environments and in that, taking advantage of an entertainment environment that favors the interaction of several players in order to apply concepts taken from the Theory of Persuasion and from the Game Theory to aid these players to build their own knowledge.

1.   Massively Multiplayer Online Role-Playing Game (MMORPG)

The MMORPG is a variant of the traditional RPG that keeps many its concepts. The main difference is its online game environment, with a massive number of simultaneous players and the constant intervention of a team of Game Masters (see below), that work on plots and create new challenges for players, while a traditional RPG is mainly described by speech representation and thus, emphasizes the imagination of players during the game sessions, which in turn, are commonly the continuation of a previously started session that had to be interrupted [7]. The basic concepts for RPGs as well as MMORPGs are [1]:

- **Player**: the person in charge of one or more characters of the plot (each known as PC, player character). A player has freedom of action in a game scenario, provided it meets the game system of rules;
- **Game Master**: the one who controls all factors that are related to settings and game plot that does not involve any player character (PC) actions.
- **System of Rules**: any action taken by PC must be addressed to the game master, who in turn verifies at the game system of rules which is the result of the PC action under the circumstances at the circumstances in which it was taken;
- **NPCs (Non Player character)**: a common RPG term that indicates a character that is not controlled by any player. Thus, belonging to the game master.

2. The Theory of Persuasion

According to Robert Cialdini [2] persuasion regards is related to the use of communication to change the attitudes, beliefs or behaviors of other people. But, this change must occur voluntarily and not by the use of force or coercion. Hence, the person using of persuasion must leads others to the acceptance of a particular idea by convincing them of it [3].

2.1. Consistency

The principle of consistency regards the desire to be (and appear) consistent with previously established concepts. For example, when someone has to make a choice or take a side on any particular matter – personal or interpersonal – it is important to maintain what society considers a rational behavior. It is this kind of pressure that leads people to have specific reactions that justify the decisions they have made [2]. Thus, the principle of consistency employs the social norms as artifices for exploring the pressure of being consistent with a said society prevailing beliefs, attitudes and behaviors, all of which, must present a positive guise for its members.

To break a commitment or change an already established behavioral pattern is not only seen in a negative way by other members of the society, but can also induce psychological distress in the person infringing these social rules, who might eventually try to minimize such problems by taking a behavior that goes against their own interests.

An extra benefit of this principle is that its strategy strengths itself over time, to the extent that people often seek and define new reasons for explaining behaviors in an attempt to maintain themselves consistent [2].

3. A Decision-Making Model based on The Theory of Persuasion

3.1. Circumstances for Consistency in MMORPGs

There are many circumstances in a MMORPG game environment for which the principle of consistency can be applied. A diversity that is justified by the way that this genre of games combines real-world elements with those of a surreal one in a single environment in which players are able to interact with. The most common of these circumstances are:
- The commitment in buying a rare item, which focuses on the knowledge that it was very difficult for the seller to obtain this item;
- The possibility of checking a seller's Reputation (an attribute assigned to a PC that ranks its consistency and that other players can consult);
- Becoming popular (as the game environment tries to emulate the real world it is possible for a PC to become popular);

- Players helping each other, an activity that "demands" an even greater commitment among members of a same faction;

3.2. The module of the Principle of Consistency modeled in a Petri Net

Some ways to activate the Principle of Consistency in a MMORPG environment were mentioned in the previous section and were modeled according to the depiction of Fig. 1 that clearly expresses the operational flow between those concepts on its environment.
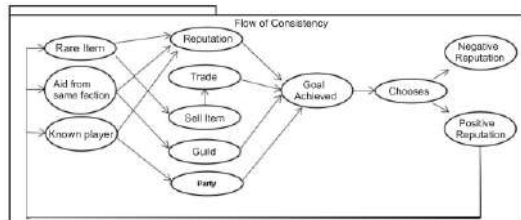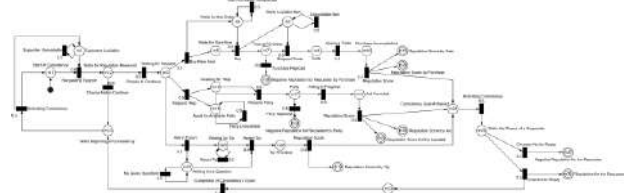

Fig. 1 Flow of Consistency

Fig. 2 Petri Net for the MMORPG Consistency Principle

The flow of Fig. 1 shows that the principle of consistency can be activated when a player asks another player on its same faction for help with simple tasks such as locating an item, completing a *Quest*[1] or hunting a monster. For example, players who want to buy a rare item can use of different tools such as the depicted *Trade*[2], *Guild*[3] and *Party*[4]. The flow shown in Fig. 1 starts when a player appeals to its subjects. All of which, are related to the principle of consistency, such as, *Help from Same Faction*, *Rare Item* and *Known Player*, this last is related to the fact that the consulted player may be someone known (a friend or a player of high Reputation), thus creating a consistent profile for this player.

The Petri Net model for the Principle of Consistency, with its locations (states), transitions and set of guided arcs, is depicted at Fig. 2. The formal definition of this net assumes an m_1 location as initial marking for any of the principles of the Theory of Persuasion. Still, this does not limit a net model to one principle, being possible to create a cyclic movement that extends the net to all other principles of the Theory of Persuasion. Once started, the movement of this net will only cease if the active player decides to not conform to the social norms of the principle. The list below details the states and variables of this net:

- Variable *m1 – Start of Consistency*: the initial state of the model. It corresponds to a player using the Consistency Principle to achieve a desired goal. Next, the player activates the *Requesting Support* transition to change the current state of the net. To proceed, the requesting player requires that a supporting player becomes available;
- Variable *m2 – Supporter Available*: at this state, a supporting player waits for requests coming from the player who activated the Consistency cycle. It also verifies if there is an available supporting player for the request. If there is no player available to act as passive intermediary for the principle, the *Supporter Unavailable* transition is triggered. Otherwise, the *Requesting Support* transition is triggered;
- Variable *m12 – Waiting for Reputation Research*: here, the active player of the principle verifies the consistency of the profile of the supporting player. If the profile is consistent, then the *Chooses to Continue* transition can be triggered. If not (or if the chosen player is unavailable), the *Chooses Not to Continue* transition can be triggered;

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1   In RPGs the term quest denotes a mission or a purpose that must be accomplished.
2   Trade is a MMORPG tool that allows two players to exchange or to sell items between them.
3   Guild is a MMORPG term for a corporation or league of players.
4   Term employed by RPGs for creating a hunting group or task force.

- Variable *m13 – Waiting Start of Consistency*: this state indicates the moment at which the principle of Consistency starts to act. This instant effectively marks the network start and triggers the *m1* and *m2* states;
- Variable *m3 – Waiting for Support Request*: this state occurs while the active player of the principle is deciding what to ask the passive players. This state has redundant paths due to have been modeled to support parallel, concurrent, asynchronous and non-deterministic systems (due to the net have been modeled after human activities). The decision of which route to take is entirely up to the active player, who might choose to trigger either the *Buy Item*, *Request Help* or *Ask in Forum* transition;
- Variable *m5 – Waiting for Rare Item*: this state establishes that the passive player will sell a rare item to the active player. This state might trigger the *Buy* transition;
- Variable *m6 – Waiting for the Order*: a passive player may only proceed with the negotiation of an item if such item is properly requested. If such request does not happen, then the *No Request for Purchasing Item* transition is triggered. Otherwise, the item is addressed to the *Buy* transition where the item value will be negotiated;
- Variable *m7 – True to Purchase*: this state is attained after the value of a product is set and a reliability bond is created between the involved players. At this state either the *Request Trade* or *Purchase Rejected* transitions might be triggered;
- Variable *m9 – Negative Reputation for Requester by Purchase*: one of the final states of this Petri Net model. It is activated when a player at the active role of the principle decides to abort the purchasing of an item, which creates a bond of unreliability among the involved players. As the player is breaking the consistency cycle he/she might be subjected to a penalty that decreases its points of reputation. This is an undesirable (for players and for the intents of this paper) but it may occur;
- Variable *m8 – Waiting for Available Item:* as implied by its name, this state concerns the availability of an item owned by a passive player who may negotiate it. In case the passive player does not currently have the item being negotiated the *Unavailable Item* transition is triggered and this condition persists until the passive player can obtain this item in order to sell it. Then, the *Request Trade* transition is triggered;
- Variable *m4 – Trade*: is the state where the actual selling of an item occurs. Once an item becomes available for selling and its value is set the *Approve Trade* transition is triggered in order to check the goods being transferred, items and values alike;
- Variable *m10 – Purchase Accomplished*: it is the state where the player completes a purchase and that triggers the *Score Reputation* transition;
- Variable *m11 – Score Reputation by Sale:* the model final state for the analyses of the amount of sale a player accomplished by using the principle of consistency, thus granting the player a better reputation on future sales;
- Variable *m26 – Score Reputation by Purchase*: this state works similarly to the previous one, but focus the buyer instead of the seller;
- Variable *m24 – Goal of Reciprocity Achieved*: the principle of consistency does not always acts as a cycle, thus it is possible to attain a final objective. For this to happen, a player just needs to provide the assistance being required by another player. Thus, taking the passive role of a seller or adviser and in that, assuming a position within the principle does not "demands" a repayment. This situation fits the context of the model at the same time that employs the principle of consistency. Hence, at this state it is up to the active player to decide whether or not to trigger the *Activation of Consistency* transition and repay the received aid;
- Variable *m25 – Waiting for the Choice of a Requester*: this states stands for a "waiting room" where players are placed while they decide what action to take. To trigger the *Chooses To Not Repay* or the *Chooses To Repay* transition;

- Variable *m27 – Negative Reputation for the Requester*: it is a final state of the net that occurs when the active player decides to not conform with the social norms of the principle of consistency and thus, acquires a negative score on his/her reputation;
- Variable *m28 – Reputation for the Requester*: there are two parallel routs that a player may take at the *Chooses To Repay* state, one of which is the *Reputation for the Requester* state. Here, a positive reputation is assigned to the active player, a fact that will benefit him/her on future activations of the principle of reciprocity. The other option is the *Waiting Completion of Consistency Cycle* state;
- Variable *m29 – Waiting Completion of Consistency Cycle*: this state can be achieved when a player triggers the *Chooses To Repay* transition. This state poses as a waiting room where a player waits the activation of the *Completion of Consistency Cycle* transition. After that, the cycle returns once again to the *m13* state;

However, a Petri Net requires one more variable in addition to the above ones. This variable is given by the net weight function and is responsible for launching the network. Thus, a minimal weight value is required to effectively start the Petri Net.

3.3. Game Theory

The application of the Game Theory principle to the proposed model aims to achieve the studying of the choice of the optimal decision for the activation of one of the principle of the Theory of Persuasion (here, the Principle of Consistency) under conditions of conflict. Moreover, as each player has its own set of strategies, every time a player chooses a desired strategy a new profile is created at the space that comprises all possible situations. Each of these situations also corresponds to a profile, due to every player having different interests that are focused on the outcome of different circumstances. Mathematically, it is said that each player has its own utility function that assigns a real number (the gain of the player) to every game situation [8].

4. Conclusion

What this paper presents is an attempt to bring into focus the real benefits that the principles of the Theory of Persuasion can add to the development of a decision-making environment by demonstrating their advantages in an existing game environment in order to model an architecture that meets the real needs of players (a problem present in usual playable environments). Thus, it is held that the application of decision-making systems to MMORPGs environments, combined with the principles and theories mentioned above, can act in accordance with the conditions proposed for the model of persuasion, giving these games a support that will allow players to better build their knowledge.

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