Communalizing the Interfaces Of Single Player Games

Mark Santolucito
Yale University
New Haven, CT
mark.santolucito@yale.edu

Maria Hwang
Teachers College, Columbia University
525 W. 120th street,
New York, NY
mlh2169@tc.columbia.edu

ABSTRACT
New interfaces for games have reinvented the experience of play, but every interface works on the basic assumption of responsiveness. If a user sends a command via the interface, they expect to see a change in the game state. The recent multiplayer game *Twitch Plays Pokémon* is revolutionary because it rejects this assumption of responsiveness. By taking user commands in the aggregate, a user does not build a direct mental correlation between input and state change. We call this type of interface a *communally controlled interface* (CCI). A CCI can be used as a game design element to act as an educational tool, to help build narrative, or to inspire players to engage with a game in unforeseen ways.

Keywords
interface, game design, input, responsiveness, multiplayer, gameplay, emergent game mechanic, meta-narrative, communally controlled interface (CCI)

INTRODUCTION
We are interested in the emergent gameplay and communal construction of meta-narrative resulting from the *communally controlled interface* (CCI). By comparing the emergent gameplay mechanics in an MMO adaption and the MMO-CCI adaption, we can explicitly attribute gameplay phenomena to a CCI. In particular we compare:

Pokémon: Red Version -	an RPG
Twitch Plays Pokémon -	an MMORPG with a CCI (hereafter MMO-CCI)
PokeMMO -	an MMORPG (hereafter MMO)

Twitch Plays Pokémon (Anon. 2014) streams video of an emulation of *Pokémon: Red Version* on a gaming community site, www.twitch.tv. *Pokémon: Red Version* is a single-player, turn-based, third-person, role playing game in which the player battles her own Pokémon against non-player combatants (NPCs) and explores an environment as a means

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to complete a number of goals. A player must "catch" her Pokémon and "train" them by engaging in battles. A primary in-game character explicitly states that the primary goal is to catch all 150 Pokémon. However, the game is traditionally played towards the goal of beating the "Elite Four", group of NPCs that are equivalent to the final boss in many adventure games.

Twitch Plays Pokémon is controlled via the chat feature built into the twitch.tv website. To navigate the world, players type commands ("up", "down", "left", "a", etc.) in the chat window, which are then translated into an input command. Because of a technical limitation of the platform, commands are delayed by approximately 30 seconds (Anon. 2014). A further limitation of the platform prevents the execution of all commands received. If the game is in a state of executing an action, all commands will be ignored. Thus, a command sent at time T will only be processed if the game is in an idle state at time T + 30 seconds. With at times more than 100,000 concurrent users, individual users were not able to verify the success or failure of their own input.

The *PokeMMO*, as the name suggests, is a massively multiplayer online version of the original *Pokémon: Red*. In *PokeMMO* multiple players are playing essentially their own game with an independent respective agency. The shared platform of course allows the players to interact and collaborate with each other during the gameplay, but it is also possible that a player could go through every stage of the game without interacting with any other player in particular. In the global chat feature of *PokeMMO*, players mostly ask direct questions that aim to solve their own issues at any given time that does not particularly benefit others than themselves. Therefore, even though *PokeMMO* is designed for sharing a communal space online, fundamentally the shared space does not go beyond the mere definition of co-inhabitance and every player continues with their own gameplay with the one-to-one mapping of input to game action intact.

The *communally controlled interface* (CCI) used in *Twitch Plays Pokémon* fundamentally differs from previous interfaces in the lack of a one-to-one mapping of input to game action. Traditional singularly controlled interfaces are popular because of the importance of narrative or personal achievement in many games (Fuller and Jenkins 1994; Jenkins 2004). The CCI's rejection of responsiveness to the individual in *Twitch Plays Pokémon* is acceptable to the user base in part because of the modern familiarity with the concept of creating a narrative through the collective. As an example, take viral memes, which are created by the anonymous group behavior of online communities. No one person can be attributed to the success of a particular meme, even the creator of the content relies upon the community to make the meme "go viral." Similarly, in *Twitch Plays Pokémon*, no singular person is responsible for success, yet all participants share in a collective feeling of achievement.

We now explore the implications of using a CCI in a game. We look at two major affordances that the CCI adds to the *Twitch Plays Pokémon* that are absent in *PokeMMO*: emergent game mechanics and meta-narrative. We observe these phenomena by examining quantitative and qualitative data from chat logs and external forum sites. With an understanding of how the CCI functions in *Twitch Plays Pokémon*, we lay a framework for how a CCI might be applied in other games. This abstract conception of a CCI is a novel and practical theoretical framework that may be applied to future research and development.

DATA ANALYSIS

Emergent Game Mechanics

The predominant emergent game mechanic we observed was based around the concept of *planning*. The limitation of interface responsiveness triggered players of *Twitch Plays Pokémon* to coordinate future plans to overcome difficult stages. To observe *planning* as a game mechanic, we graph the frequency of chats containing the word "plan" (see Figure 1).

We choose to discuss three peaks in the graph representing significant events. The *Pokémon* Tower and Viridian Gym are two places that were particularly hard to navigate in *Twitch Plays Pokémon*. To successfully complete these sections of the game, players need to organize and work together around a single plan. "Bloody Sunday" is the name of a particularly unfortunate sequence of choices made in the game. In the aftermath of the event the community needed a plan for recovery and a plan to avoid making a similar mistake in the future.

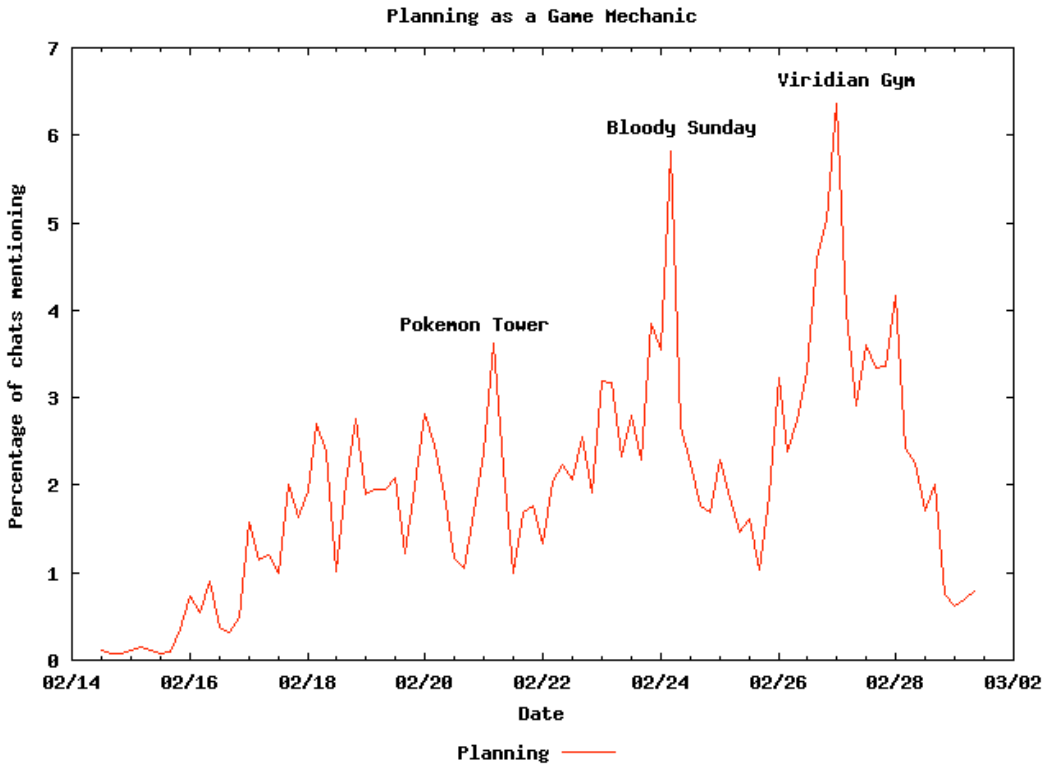

Figure 1: Frequency of chats containing the word "plan" sampled over four hour periods of *Twitch Plays Pokémon* game chat logs.

In the MMO, we see a similar, but distinct group planning behavior. *PokeMMO* has implemented "teams", in which small groups of player may band together both in and out of game. Since in *PokeMMO* gameplay is not team based, coordination between members is limited to more of a chatroom style interaction. However, it is not uncommon in other MMOs for small teams to coordinate at a high level. "The players of [Dark Age of Camelot, EverQuest, and Anarchy Online] reported that their guilds staged pre-planned

activities, often called raids, 1-2 times per week" (Saey et al. 2003). Although we observe planning behaviors in both MMO-CCIs and MMOs, each is a specific style of planning that provides a different intellectual challenge to the players.

To understand these differences, we qualitatively analyze the planning strategies employed by exploring the out of game communities. The *PokeMMO* just like any other MMO game germinated activities and communities outside the game itself. We investigate our preliminary inquiry of CCI in comparison to MMOs on the notion of "community of practice" (Lave & Wenger, 1991; Wenger, 1998) as research supports the proliferation of "out-of-game" communities based on the communally shared experiences developed through MMOs. The ties and bonds that are formed through these communities encourage learning, offer rapport, and extend a safe place for identity formation and development. "At the aggregate level of the community, ...learning process takes the form of an emergent reorganization of the patterns of member participation coupled with a growth of shared knowledge through changing practices and artifacts" (Steinkuehler, 2004).

Certainly, with the *PokeMMO* there are many communities that show evidence of the previously mentioned characteristics of community of practice. However, these *PokeMMO* communities are limited in the sense that the "collaboration" and "planning" could not be brought back into the game, unlike the guilds' pre-planned activities in the aforementioned MMOs. Because *PokeMMO* is not a team based game, the discussions involving planning in these communities is reduced to an individual level and must be interpreted as such.

An example of an out of game community for the CCI is represented in Figure 2. In order to navigate particularly difficult areas, users create strategies on external sites. For example, a particular path might be successfully navigated in two moves by either "up-left" or "up-right", where failure can be caused by a "left" on the first move. Some users will recognize that the optimal path is "up-right" as it reduces risk of failure (specific ordering of moves is impossible in a CCI) and attempt to organize the community to follow the plan.

Because of the necessity of coordination and planning between players to create probabilistically successful strategies, a CCI can be employed to introduce planning as a game mechanic. We will explore the implications of this observation in our discussion of the theoretical framework.

Figure 2: A sample document made by user PhreaksChinstrap from Reddit. This is an example of a planning strategy to avoid a worst case scenario.

Meta-Narrative

A further consequence of using a CCI in *Twitch Plays Pokémon* can be seen in the community behavior of players. The community has created an entire meta-narrative on top of the narrative constructed by the original game designers. For example, the community treated a particular game item as a holy relic, where no such connotations exist within the original game design. This narrative construction is driven by the lack of agency individual players have over gameplay, allowing for a suspension of disbelief that the game in fact is autonomously generating a narrative. This meta-narrative demonstrates the especially rich potential for CCI games to engage players in ways unforeseen by designers.

In Figure 3, BirdJesus and Lord Helix are major plot components to the meta-narrative, whereas Misty and the Moonstone are secondary plot elements. Major plot elements, once introduced, continue to consistently appear in game chats, at times having moments of particular prominence. Secondary plot elements, may persist in low levels through the game as with the Moonstone, or may have isolated moments of high importance as with Misty.

This phenomenon of meta-narrative is rarely observed within traditional MMO games. By retaining their own agency in an MMO, players also have the responsibility of putting that agency to use. In order for a meta-narrative to be established, all players must not only agree on the meta-narrative, but take an active role in executing the plot.

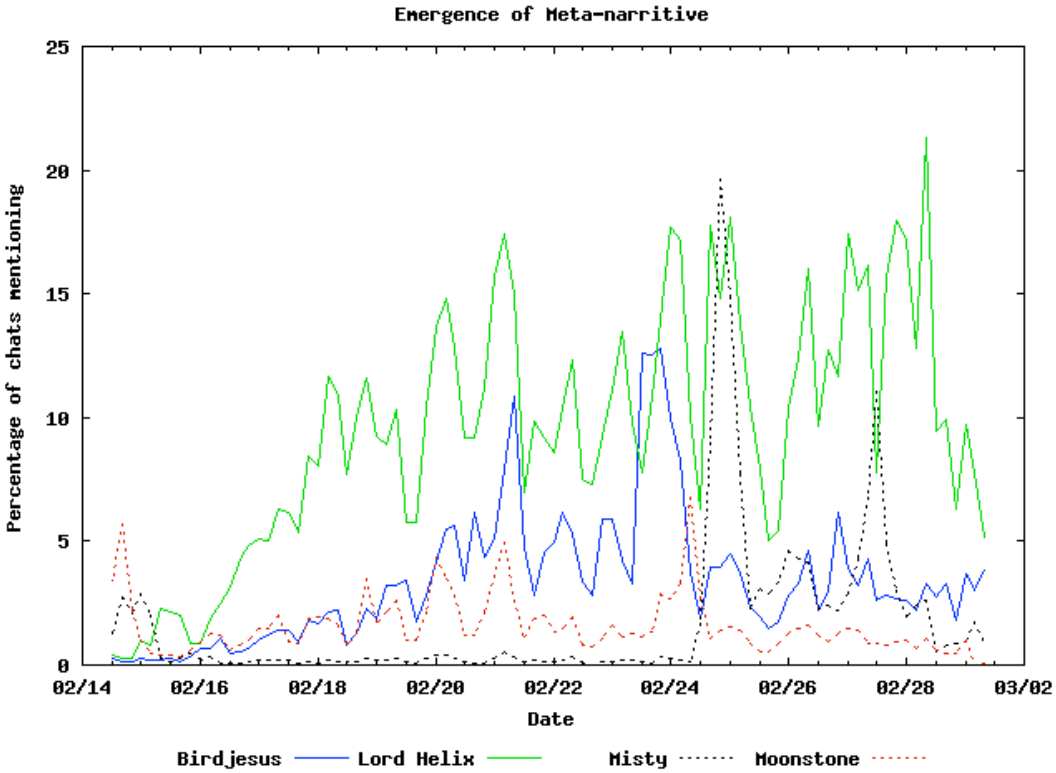

Figure 3: Frequency of chats mentioning some meta-narrative elements sampled over four hour periods of *Twitch Plays Pokémon* game chat logs.

A more common meta-narrative in MMOs is a feud between guilds or teams. This meta-narrative can persist only as long as members of the guild make an effort to continue the feud. In an MMO-CCI, the lack of agency of individuals also absolves them from the responsibility of executing the narrative. The narrative instead adapts to the agency and choices of the collective.

THEORETICAL FRAMEWORK

On a more theoretical level, we look at the requirements for a CCI to function properly. To do this we first examine *Pokémon: Red Version* and the elements of its game design that made it well-suited for a CCI. Abstracting these elements allows us to build a more generalizable framework for a CCI.

A critical feature of *Pokémon: Red Version* is the experience and leveling system. In a trainer battle, the player must defeat a number of pokemon in succession. Every time the player defeats a single opponent pokemon, the player's pokemon will gain experience and be more likely to defeat that same opponent pokemon in the future. Even if the player loses the overall battle, defeating a single pokemon will increase the likelihood of future success. This allowed *Twitch Plays Pokémon* to make progress, however incremental, even after repetitive losses. This concept will call *recoverability*.

Recoverability is best understood if the game is conceptualized as a decision tree. In the first attempt at the beating a stage, the decision tree may contain few pathways to success

states. Upon a failure, the decision tree must be updated to contain relatively more pathways to success. Essentially, we are dynamically adjusting the game difficulty. In this way, the systematic randomness of the CCI can be overcome and game can be guaranteed to progress.

Other important mechanics include turn-based combat and limited input options. Turn-based combat removes time as a confounding factor to gameplay. Especially with the thirty second delay in the implementation, the idea of a time dependent game seems unachievable. In *Pokémon: Red Version*, you may also only press one of any seven buttons at a time. This makes it easier for players, to build plans, predict, and execute appropriate moves.

However, the benefits of both turn-based combat and limited input are eclipsed by the importance of recoverability. With a large number of input options, in a game such as *Civilizations V* (Firaxis Game 2010), we simply have a tree with many branches where many of those lead to failure. By maintaining recoverability, this tree can be updated to encourage progress. In fact, a continuous controller game is simply an extreme case of a game with many input options. So we see, turn-based combat and limited input are simply tools to make recoverability easier to implement.

FUTURE WORK

Throughout the duration of *Twitch Plays Pokémon* certain implementation choices were reevaluated and re-implemented. Of particular interest is the dichotomy within *Twitch Plays Pokémon* that existed between the two game modes, anarchy and democracy. In later iterations of *Twitch Plays Pokémon* and with fewer players, as is the current state of *Twitch Plays Pokémon*, every command can be processed.

The type of planning required for these different modes is complex and requires reasoning about uncertainty and distributed control. It seems to align closely with control-flow analysis and scheduling theory for parallel computation (Rayward-Smith et al. 1995). To investigate this further requires a more thorough review of scheduling theory than is appropriate to provide here. However, this could lead to development of educational games for high level computer science topics. These games could also be used to teach valuable soft skills such as teamwork and communication.

In an existing commercial game, a CCI mode could be introduced to add replay value. However, care must be taken to ensure that the game has the recoverability property. If it does not, it must be implemented in some way. A limiting factor in this is the apparent need for a large user base. Future work may include exploring methods to effectively implement a CCI with a relatively small user base.

It would also be possible and interesting to develop a game entirely around a CCI. While it is clear a CCI can spur emergent game mechanics and communally created meta-narratives, more research must be done to understand the best ways to take advantage of these phenomena when the CCI is a foundational part of the game design.

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