Minecraft: guided emergent game design

By Ben Cotton

For the most part, in the relatively short history of computer gaming, players have had limited influence over the design of games. Games have lived and died by the reputation they acquire on release, and although they are play-tested while in development, most people who play games will never participate in this process of refining game designs. Therefore it can be said that the only realistic way for most people to determine the future of gaming is by voting with their wallets.

Increasingly these days though, we are seeing more and more so-called emergent gameplay. Gamers are creating their own fun, separate from the entertainment intended by game designers, by exploiting the idiosyncrasies and loopholes in the rules created by said designers. Minecraft (Mojang AB, 2011) is one of a new breed of game which has a strong emergent gameplay element. On initial release it had few rules and no designed goals for the player, making it almost purely emergent in its nature. Doubtless there are other games (such as Garry's Mod (Facepunch Studios, 2010)) which have pushed players to create their own fun just as strongly as Minecraft, but this paper will explain why Minecraft is different.

At its core Minecraft is a very simple game. In it the player is placed in a randomly generated 3D world either by themselves or with other players, where they have a few basic abilities in addition to the basic first person perspective movement schema inherited from first person shooters. As befitting the title you are able to mine materials, collect them, and craft things from them. In other words, it is effectively a sandbox game.

This paper will look at Minecraft from three perspectives in developing its argument: as an emergent game, as a fun game and as a living game.

As mentioned, the gameplay of Minecraft is highly emergent, but more specifically it is player and community-defined. There are three basic reasons why this is the case: the lack of objectives, the lack of documentation, and the lack of context or meaning. These basic reasons and their implications for gameplay will now be explored.
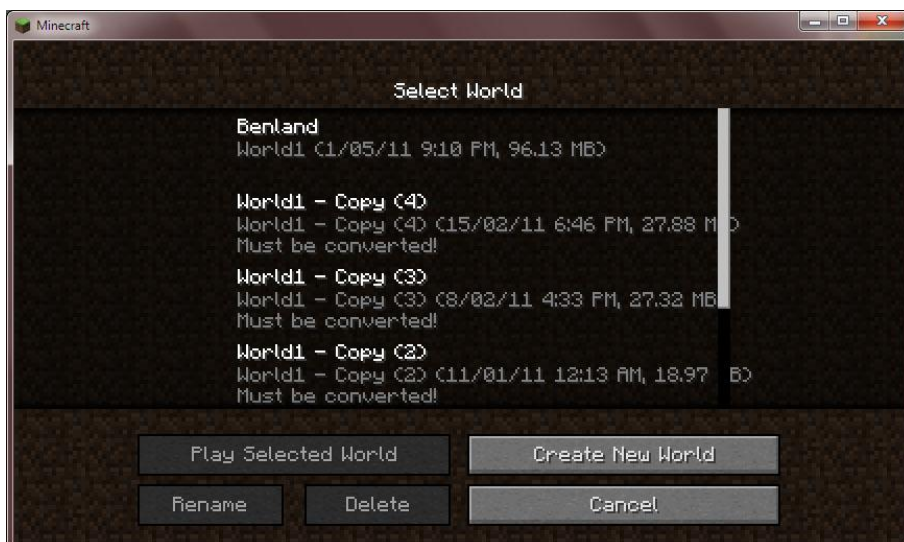
Figure 1: The title screen

Figure 2: The start game screen

Figure 3: In-game

Firstly, Minecraft lacks any apparent overriding objectives and, until recently[1], any intermediary objectives, other than the objectives players define themselves. At no stage in the game are you given any instructions telling you what your broad objectives are. The menu screens (Figure 1 and Figure 2) feature no directions other than the most rudimentary, functional labels, and upon entering the game you are simply and unceremoniously dropped into the game world (Figure 3). As you can see from the screenshot, there is no visible scoring system, and although there is a health bar at the bottom of the screen, you have an infinite number of lives. Furthermore, both the game world and time are for all intents and purposes limitless, thus the game does not even create tension in the player to motivate them towards a particular outcome.
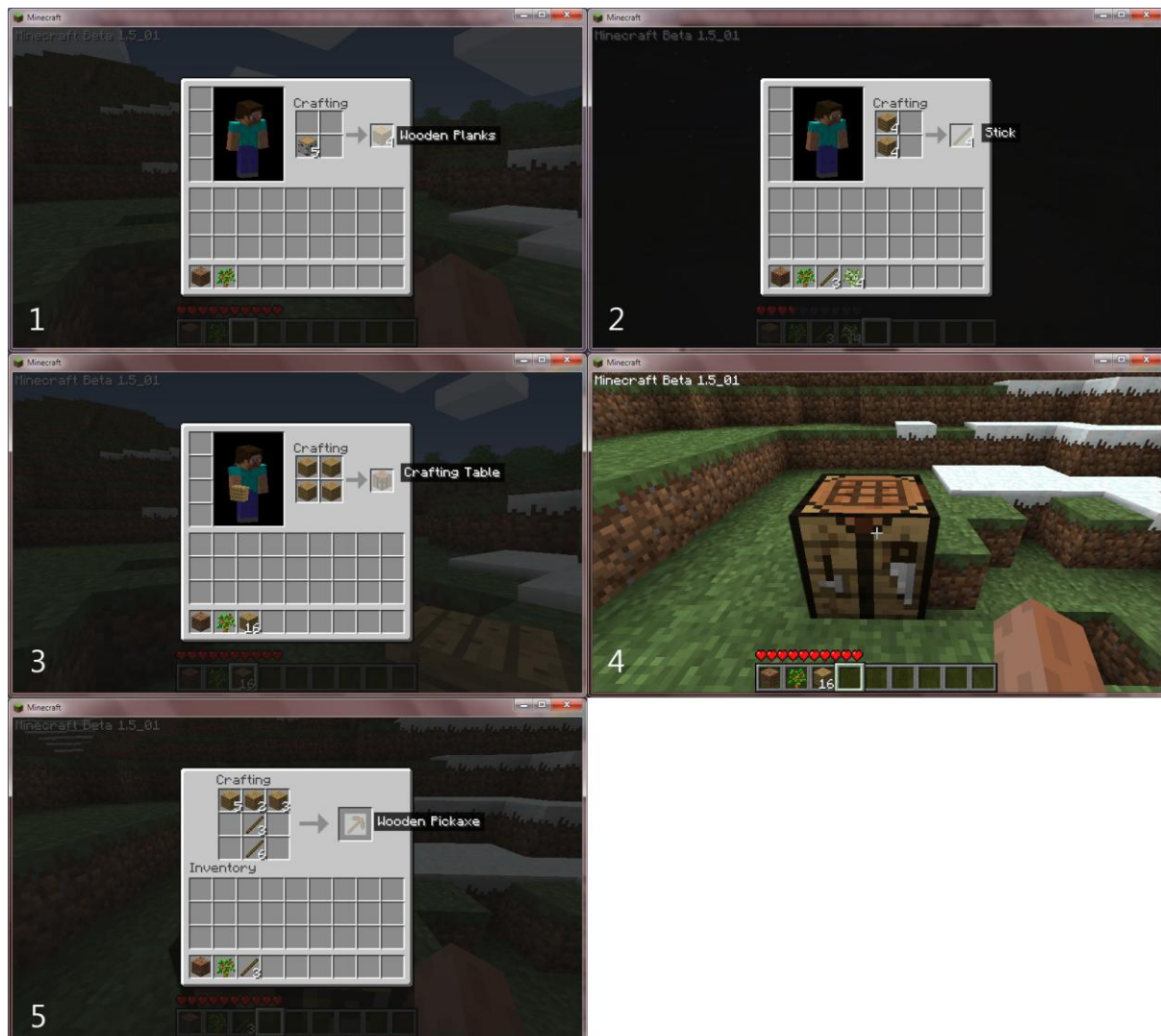
Figure 4: The steps required to make a simple wooden pickaxe

Secondly, as mentioned and shown in the screenshots (Figures 1, 2 and 3), Minecraft features little in the way of documentation. There is also no detailed online or print documentation for the game, or for that matter cinematics either which explain any aspect of the game[1]. It is the responsibility of the player to either learn how the game works through trial and error, or as is probably more

---

[1] Achievements were introduced to Minecraft in beta 1.5, but these are only arbitrary objectives designed to teach basic aspects of the game world in the absence of documentation, for which the player receives no reward.

common, go online and learn how to play from other players who have shared their experiences and acquired knowledge of the game. Indeed, the rules of the game are too complex and hard to discover without a players sharing their individually acquired knowledge. Within the game, acquired materials are combined in specific pre-defined ways and with specific pre-defined methods to yield tools and composite materials. The problem is that although these "recipes" for tools and composite materials are technically discoverable, there are so many possible combinations that it is not realistic for a single player to discover them all through trial and error (Figure 4). More importantly, it certainly wouldn't be fun (for most people at least). In this way it can be said that the game depends on its community—with its collective knowledge (Banks & Potts, 2010)—to make the game fun.

Finally, Minecraft gives rise to emergent gameplay and lacks context or meaning for several reasons, chiefly the aesthetics that it offers and the lack of narrative.

Aesthetically speaking, Minecraft clearly falls into the category of what Simon Egenfeldt-Nielsen, Jonas Heide Smith and Susana Pajares Tosca (2008) describe as caricaturism. Although based on the real world, as seen in Figure 3 the elements of the game are clearly radically simplified and stylised, with a blocky style harking back to the 8-bit era of games. Given the lack of detail in the visual design, and the basis of the design on the real world, it is difficult to say that the game aesthetics are loaded with subtext. The limited resolution of the game elements limits the amount of meaning that can be conveyed by them, and the inclusion of any subtext within the aesthetics of the elements is further limited by the fact that they are first required to evoke their real world counterparts.

Within Minecraft, just as the only objectives are those defined by the player, so are narrative, subtext and meaning. Henry Jenkins (2003) describes four ways in which narratives can appear in a game: evoked narratives, where the environment of the game is a reproduction of a world from other fiction which brings its own narrative with it; enacted narratives, where stories are structured around the players movement through a space; embedded narratives, where the player reconstructs the plot from the contents of a space; and emergent narratives, where a game space is filled with behaviour-rich objects from which the player constructs their own story. Given that the game world is entirely randomly generated, by this categorisation, Minecraft only features emergent narratives, where the player or players are completely in control of their own destiny—there is no designed narrative. There are no overriding objectives and no documentation and furthermore, although there is an implied emphasis on resource acquisition and construction, the effectively limitless nature of the resources and time undermines any possible designed environmental resource management theme.

If one small concession can be made it is that to a large degree that the rules of the game, just like the aesthetics, are derived from the real world – but to an almost pointless degree. The "recipes" for making tools, although simplified somewhat, generally require much the same materials in similar proportions as they do in the real world. For example, making a iron pickaxe requires similar amounts of wood and iron, which each occur in the game world in proportions that are in the ball park of their real world proportions. Gold also appears in the game in similar proportions as it does in the real world, but it is ultimately rather useless beyond its aesthetic qualities as it shares the real world qualities of being too soft to be practical for most applications (Croshaw, 2011). In this sense an ecological message about the use of resources could be read into Minecraft, but only in so far as

the same ecological message could be read into the real world. The world of the game really appears to be only a simplified reflection of the real world—a caricature—without any explicit subtext.

However, despite the fact that the designer has imbued it with few goals and little underlying meaning, Minecraft is a fun game by design, primarily due to the scope and freedom of it in contrast to many other games on the market today. However, as Jesper Juul (2005) posits, fun in games arises because of rules, because only through being challenged by rules can the player be entertained. Given that the game does not provide any objectives—these are defined by the players—we therefore must consider what objectives (i.e. motives for the player to overcome challenges) can be imposed on the game when evaluating why it is fun.

There are two main forms of objective that players can define for themselves within the game: construction and exploration.

The first—construction—is the most commonly recognised: Minecraft is widely seen as a construction toy analogous to Lego blocks. As alluded to earlier and seen in Figure 3, the game world is made up of blocks. The player can smash any solid block in their vicinity by clicking the mouse while the crosshair is aimed at it, which makes it so that the block can be picked up. Through collecting numerous blocks of different types, recombining them in countless ways using the aforementioned "recipes", and placing them one-by-one in the world the player can create almost any kind of structure they desire. Examples can be found on the internet of people setting out to build famous landmarks, giant sculptures and even pixel-art images on a grand scale, purely on their own accord. This is one way in which players of this game can define their own objectives.

The other form of objective that players can give themselves is the task of exploration. As mentioned earlier, the game world of Minecraft is a randomly generated landscape based on nature, of a greater size than Earth and containing all manner of caricatured natural features including cave systems, snowy mountains, oceans, waterfalls, grasslands, forests and deserts, to name a few.

Aside from constructive and exploration objectives, the rules of the game also set up destructive elements in the form of hostile NPCs (known as mobs) which can attack and easily kill you, therefore survival and defence can be another objective the player defines for themselves in . As you have infinite lives, in the grand scheme of things this is only an inconvenience, however in the process the player does lose their inventory of collected materials and is returned to the original point where they entered the game, thus hindering accomplishment of construction or exploration objectives. In addition, certain mob types can destroy the landscape, including elements constructed by the player, further setting back construction.

When you consider all of these possible objectives players can impose on the game, you can see how the freedoms offered by Minecraft differ from those offered by similar sandbox games. Specifically, because of the way Minecraft is designed all of these objectives are challenging in their own ways, but they also each have sizable psychological rewards to counterbalance those challenges (Malstrom, 2010). In the case of construction every block used in construction needs to be mined by the player, and the reward is seeing your creation complete, which, considering the size of the game world, could be very large. On the other hand with exploration, there is the challenge of navigating and surviving the vast, and what some would consider beautiful (Figure 5), landscape, with a psychological reward similar to that of exploring the real world, being of a similar size with similar features.

In contrast, the Grand Theft Auto series (Rockstar, 1997-2009) to name one example, features designed objectives, but fails to provide comparable challenges or psychological rewards for exploration, as the worlds within those games aren't nearly as big; furthermore, there is no construction element to the gameplay. In both cases the player has significantly reduced freedom in contrast. Garry's Mod (Facepunch Studios, 2010) on the other hand features creative freedom like Minecraft, but there is no comparable challenge element with regard to collecting materials.

Figure 6: A Minecraft "city" (Minecraft city, 2010)

Expanding on this, although Minecraft can be played as a single player, it also has a popular multiplayer mode where you can play in the same world as other players scattered across the Internet. Large communities have been formed to cooperatively create towns and other massive collectively built structures within a single game world (Figure 6), in the absence of any competitive goals inserted by the designer. Beyond being just a game built around the sharing of ideas and knowledge, Minecraft is a game built around cohabitating and cooperating. In this context, it is a throwback to games that existed prior to computers—games that evolved in reaction to their player's needs and the social interactions around them.

At this point you might argue that the preceding arguments are invalid due to the fact that Minecraft is still in beta and therefore not a complete, finished game, and that all of the points this paper has addressed will be rectified in the finished product. It is true that the game is officially an unfinished beta, but that is beside the point. Almost two million copies have been sold (Goldman, 2011), therefore this distinction is quite irrelevant from the point of view of its (sizable) audience.

The designer's intent is not what drives Minecraft. As explained earlier, it is not reasonable for it to be defined by the will of the designer – the players and surrounding communities imbue it with disproportionately greater purpose, meaning and narrative. Furthermore, without the players it wouldn't be playable, as they are the ones who discover and document it, removing hurdles to its accessibility and acceptance.

The first version of Minecraft was released after a week's worth of development and it has been developed as a released product ever since, with updates being pushed out to users on a regular basis. Unusually for what is currently a beta, new features are regularly being added to the game with each update. These features are not limited to the superficial or just the intent of the designer.

As an example, within Minecraft you can build rail systems with minecarts, which are subject to momentum, thus to make it from one end of a track to the either they may need to be pushed several times. Players found that they could exploit the game logic to create minecart boosters (http://www.minecraftwiki.net/wiki/Boosters) which would provide extra momentum to minecarts at points along a track without requiring the player to intervene. Subsequent updates have now added minecart boosters as actual in-game objects that can be constructed thus removing the need for the workaround.

In this way it can be seen that there is a feedback loop in effect as a result of the game's dependence on its community. The designer influences the players through design, who in turn indirectly influence the design, as they are the ones who map it and define its purpose. Minecraft is in effect, a living game, with the course of its design and development shared between its designers and developers, and the communities of people who play it.

As argued by Jesper Juul (2005), while rules specify limitations, they also specify affordances by adding meaning to the allowed actions and giving structure to games. In this case, the designers have initialised emergent gameplay by setting up a set of gameplay rules that balance the game effectively, and the players have further refined these rules through the affordances allowed by them and the unique relationship with the designers and developers. Beyond merely a sandbox game, Minecraft can be viewed as a indirect democratisation of gaming and game design, where the designer conceives it and the players give it life: the ultimate in emergent gaming.

To summarise, Minecraft is an emergent sandbox game which is defined by the community of players around it. This is shown through the lack of underlying objectives, lack of documentation, and simple, unladen aesthetics. Only by players imposing their own objectives on it does it become fulfilling game.

The fun in Minecraft is derived from the objectives that each player gives themselves, be it construction or exploration. In the case of construction, the challenge of collecting materials and creating player-imagined structures on a large scale is what makes it fun. On the other hand, the challenge and thus fun in exploration comes from the vast scale and detail (relatively speaking) of the game world, as well as the hazards it contains. The freedom and challenge provided by the game are what differentiates it from other games. In addition, the formation of game world communities as a result of the environment provided adds another level of depth.

A key aspect of Minecraft is its unusual development cycle, where it was released to the public early in development and has had updates pushed out ever since. There is an implicit feedback loop in place as a result of this progression, where emergent gameplay is integrated into the game on a continuing basis. Because of this, the game can be considered the result of an ongoing collaboration between the designer and the game's community of players.

In conclusion, Minecraft is an engaging game not because the designer has a strong and unyielding vision of how people should play the game, but because of the freedoms they provided for, and the unique, two-way relationship between the designers, who regulate gameplay, and the players, who innovate it.

Bibliography

Banks, J., & Potts, J. (2010). Towards a cultural science of videogames: evolutionary social learning. *Journal of Cultural Science , 3* (1).

Croshaw, B. (2011, January 27). *Zero Punctuation: Minecraft [Video file].* Retrieved April 15, 2011, from The Escapist: http://www.escapistmagazine.com/videos/view/zero-punctuation/2680-Minecraft

de Castell, S., & Jenson, J. (Eds.). (2007). *Worlds in play: international perspectives on digital games research.* New York: Peter Lang.

Egenfeldt-Nielsen, S., Smith, J. H., & Tosca, S. P. (2008). *Understanding video games: the essential introduction.* New York: Taylor & Francis.

Garry's Mod. (2010). Facepunch Studios. Published by Valve Corporation. Designer Garry Newman.

Goldman, T. (2011, April 4). *Minecraft Sales Figures Reveal $33 Million in Diamonds.* Retrieved May 8, 2011, from The Escapist: http://www.escapistmagazine.com/news/view/109044-Minecraft-Sales-Figures-Reveal-33-Million-in-Diamonds

Grand Theft Auto series. (1997-2009). Rockstar. Published by Rockstar Games.

Jenkins, H. (2003). *Game Design as Narrative Architecture.* Retrieved April 15, 2011, from Henry Jenkins: http://web.mit.edu/21fms/People/henry3/games&narrative.html

Juul, J. (2005). *Half-real: video games between real rules and fictional worlds.* Cambridge, Massachusetts: The MIT Press.

Malstrom, S. (2010, September 28). *Minecraft is game of the year.* Retrieved May 9, 2011, from Malstrom's Articles News: http://seanmalstrom.wordpress.com/2010/09/28/minecraft-is-game-of-the-year/

Minecraft. (2011). Mojang AB. Published by Mojang AB. Designers Markus "Notch" Persson and Jens Bergensten.

Minecart booster. (n.d.). Retrieved May 9, 2011, from Minecraft Wiki: http://www.minecraftwiki.net/wiki/Boosters

(2010). *Minecraft city.* Retrieved May 10, 2011, from: http://andre.siuc.edu/?m=201010

(2011). *Minecraft landscape.* Retrieved May 10, 2011, from: http://www.minecraftseeds.info/2011/03/9028489474908844496.html