Characterization and Emergent Narrative in Dwarf Fortress

Tarn Adams

When people play games, they tell stories about their experiences. A tale might concern the tactics used in a chess game or be part of a multi-part series recounting the generations of a family in *The Sims* (Maxis 2004). If we view games as a storytelling companion, we can think systematically about what sorts of game mechanics encourage player stories of a certain kind or make the storytelling process easier for players, and we can think about utilizing traditional authorial techniques toward these ends.

In *Dwarf Fortress* (Bay 12 Games 2006), a fantasy settlement simulator, we attempted to provide players with a game to tell generic but intricate stories in a fantasy setting. Most elements of *Dwarf Fortress* are procedurally generated by the game itself, so we could not rely on writers to produce elements of the stories for players to incorporate into their retellings. However, we were still able to improve our players' ability to tell stories and to increase their enthusiasm for doing so by employing methods of characterization.

WHERE WE STARTED

When *Dwarf Fortress* was released in 2006, we had a basic approach to characterization. Each of the player's dwarves was given a name, had work and combat skills, a sex and a specific age, could form family relationships and take a position in the fortress (such as manager or broker), and had likes and dislikes. They had bodies which could be injured, as well as clothing and a few other possible items like weapons and shields.

We came to this list in a variety of ways. Sometimes elements drive mechanics, like skills and preferences, sometimes elements are required to provide crucial information to the player about underlying mechanics, such as injury descriptions, while other elements like names have no mechanical purpose and are used purely as storytelling aids.

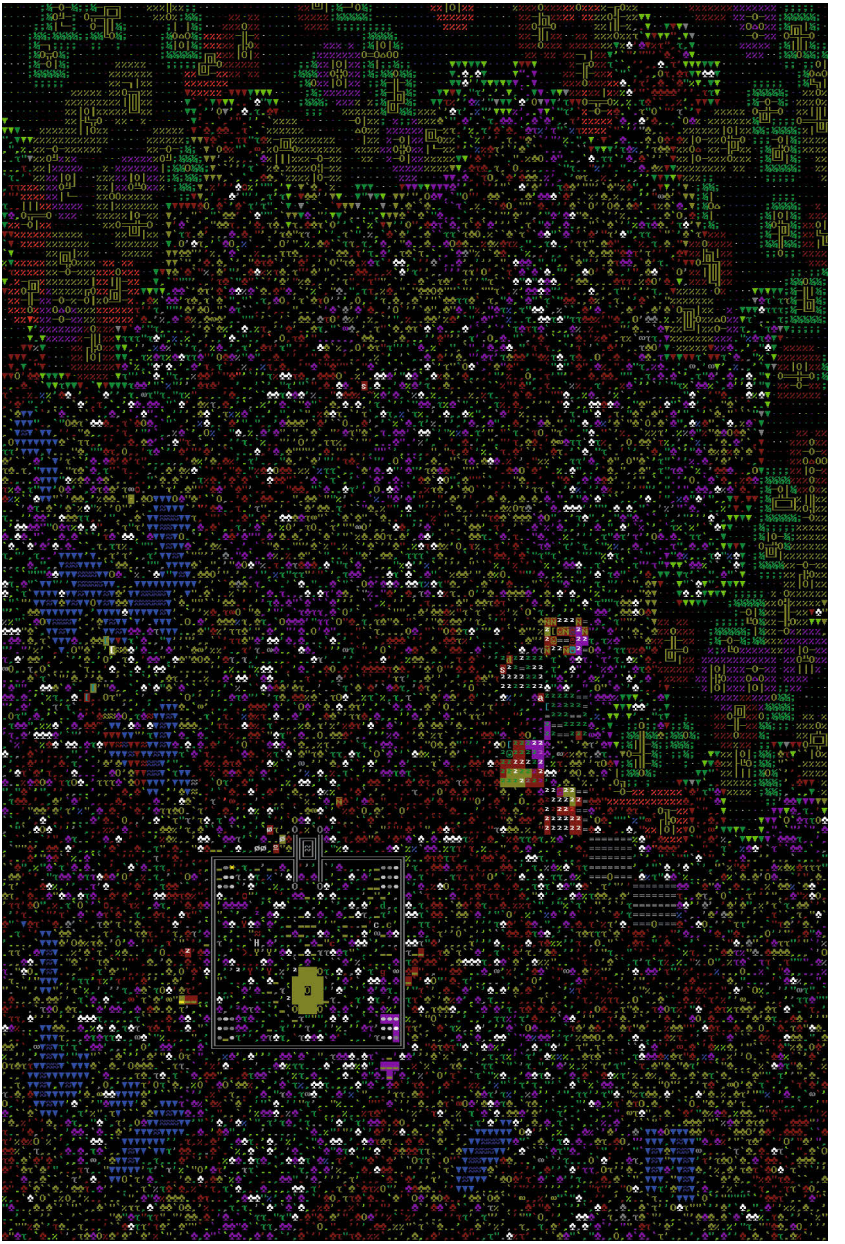
As we developed the game toward emergent narrative and the creation of player stories, each of these systems was expanded, as we will discuss below. At the same time, the initial selection provided a scaffold for what constitutes a "*Dwarf Fortress* story" that still exists to some extent in new stories, as part of the culture of the community surrounding the game, so it is important to be thoughtful about the first features which are provided to the player even in ongoing projects.

DIRECT PHYSICAL CHARACTERIZATION

The most straightforward method of characterization is simply to provide a description of a character. Reliance on this method is sometimes discouraged in writing ("show don't tell"), but most games sidestep this concern through the use of graphics. For the first decade and more of its existence, *Dwarf Fortress* relied on text and ASCII glyphs, so we had to use paragraphs of text for this purpose. Dwarves have eye colors and hairstyles, and much more. They can have scars from old injuries and gain age markers as the years pass by.

Notably, in player stories, wounds and scars figure most heavily, as well as the strength and other physical attributes of the dwarves. The reason for this is that these descriptors are related to game actions and player choices, and also to system mechanics. We saw these elements used in stories even though the text medium requires the player to seek out this information rather than absorbing it passively through graphics in the main play mode (Figure 1).

Figure 1: The beginning of the fortress "Pickenjoy" in blossoming springtime. What could possibly go wrong?



Source: screenshot (Ulrich Götz)

Beyond the body itself, direct physical characterization encompasses the outfit and mannerisms of a character. Dwarves have a variety of clothing and tools, and they can also collect personal trinkets and trophies from hunts. They use medical equipment such as crutches, splints and sutures. Not surprisingly, again, these personal trinkets, trophies and medical equipment figure into player stories more than standard elements of clothing, as these are linked to action in the game and sometimes reflect the consequences of player decisions.

We also briefly attempted to give the dwarves mannerism descriptions, such as "She taps her foot when she is nervous". As catalysts for emergent narrative, these were a failure, and this can be traced to the lack of a mechanical link to either mechanics or player choices. Emotional states and conversations are hard to model, and we did not link these mannerisms to what systems existed there. The mannerisms were just simple descriptions, and while this can carry weight when done well, as in regular writing, a kind of "show don't tell" principle still exists, with game mechanics being the analogue to illustration through character action. The descriptions most likely to be incorporated into player stories are reflected mechanically. In a way, direct characterization merges with indirect characterization because words potentially become actions when they describe system elements.

We can see this by comparing the mannerisms to our most effective early characterization method, the system of likes and dislikes. Dwarves have favorite foods, gems and pets, and fear vermin, to name just a few examples. When a dwarf produces an engraving, evaluates their living quarters, chooses personal treasures or their next meal, or shrieks in terror at the sight of a rat, this system comes into play, and has an impact on the course of the game as well. The player made or traded for those treasures, and the player carved those living quarters. Player stories and fan art incorporating the likes and dislikes of dwarves turned out to be disproportionately frequent, more common even than stories incorporating wounds or family. Thus, description, mechanics, and player agency all come together to produce emergent narrative.

However, the descriptive paragraph (the direct characterization) is still crucial as it confirms what the player is seeing or may not have noticed. In fact, screenshots of the descriptive paragraphs, with the relevant sentences highlighted, often accompany related player stories.

EXPANDING THE LIKES-DISLIKES SYSTEM

Seeing this initial success, we decided that expanding the interior life of individual dwarves would be an important focus of further additions. Games, notably strategy games, have incorporated visible, mechanically-realized personality traits into rulers and other characters to diversify play experiences, and these also have the effect of encouraging player narratives in these games. A personality trait here is generally an adjective such as "Wise" or "Cruel" that has an impact on AI decision-making or overall statistics. A character with two or three of these becomes more distinct as a story entity and a game object.

Ultimately, we decided that using a few distinct traits would not work in *Dwarf Fortress* because characters in the game need to respond to a diverse set of circumstances on an ongoing basis, and employing only a few traits would not differentiate characters in stories enough. We therefore decided to use a more general set of personality facets and intellectual values. Every character is rated on a 100-point scale in roughly 50 facets and roughly 30 values. For instance, a dwarf might be rated "Merciful +10" on the "Merciful-Impartial-Cruel" facet, and +25 on the value of "Scholarship". Numbers are not shown to the player, but the dwarf's personality is described in text, as stories without numbers are generally more compelling and shareable beyond the confines of the game's knowledgeable community.

When work on the personality expansion began in 2007, we started with the 30-facet NEO PI-R inventory based on the Big Five (OCEAN) model (Costa and McCrae 1992). This was adequate to start, but ultimately, we found this system of characterization was not narrative enough; in some cases, we wanted dwarves and others to be judged harshly. This inspired us to derive some additional facets from collections of literary character archetypes. We also drew from a variety of related lists, such as Thomas Aquinas's virtue and vice inventories from *Summa Theologica* (Aquinas 1920: II, Q1-170), culling improper elements and molding the material to fit the fantasy setting and our narrative goals. Intellectual values were cobbled together through simple brainstorming.

DEALING WITH LACK OF STIMULUS

The new personality system was an immediate success, with facet descriptions finding their way into player stories regularly, relating an interior life for characters often well beyond what the game was actually modeling.

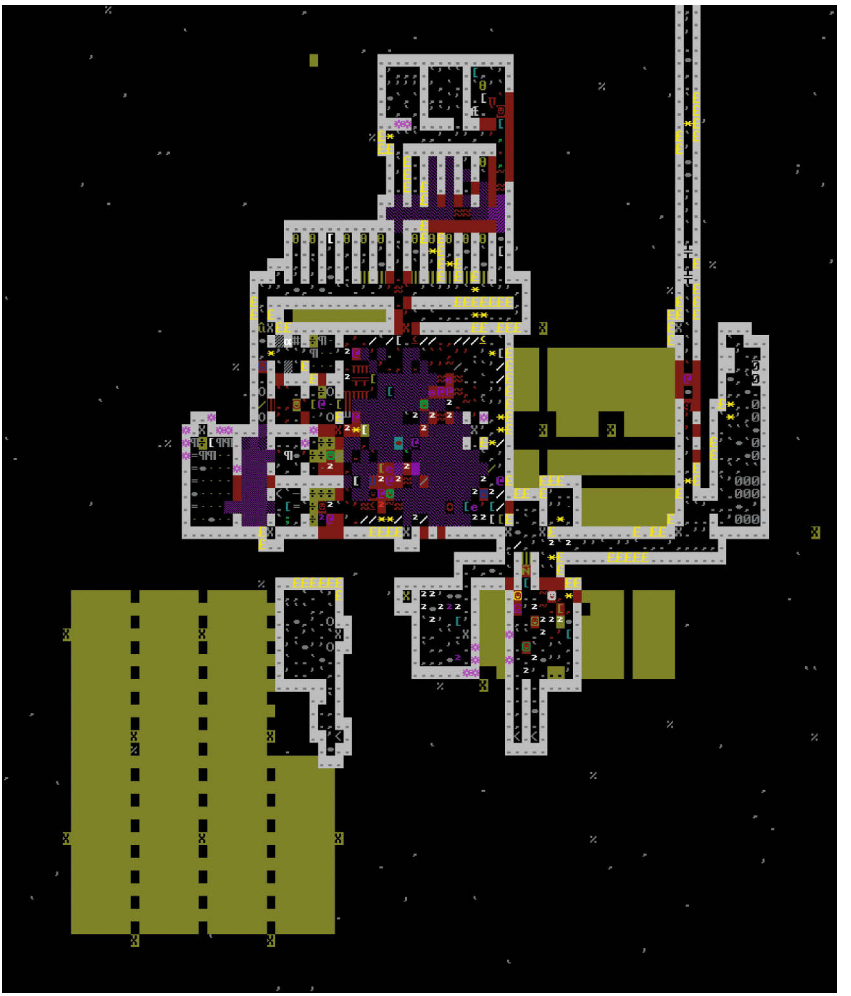
Despite this progress, there were flaws in stories where dwarves were left by themselves or did not participate in any positive events. These dwarves could still be entirely happy, which caused some stories to feel odd. We eventually addressed this by adding a set of needs derived from every character's personality facets and intellectual values. Dwarves that did not meet their needs would complain and suffer from stress and distraction, and we further encouraged player engagement with needs by making dwarves that met their needs more satisfied and focused in their work.

THE ROAD TO CHARACTER ARCS

Emergent narrative is bolstered by the interplay of presentation, system mechanics, player investigation and player agency (Adams 2019: 149-158). We add new systems and expand existing systems in ways that the player can see and interact with, in ways that align with the story types and qualities we want to arise. The needs system addressed a particular problem in this way. But our player stories to this point had broader characterization problems in that, mentally, dwarves never really changed. Physical trauma could change a dwarf, and they could form social relationships, attain a position in society, or craft a masterwork, but they had the same essential personalities at age 20 as they did at age 130.

We arrived at character arcs in *Dwarf Fortress* in a roundabout way. After the initial release in 2006, player stories often revolved around a phenomenon the community came to call a "tantrum spiral". These were caused by the model for dwarven happiness. Each event a dwarf experienced in a season was assigned a happiness or unhappiness value. These were added up, with the unhappiness values considered to be negative, and the sum represented the dwarf's current happiness. Dwarves that were sufficiently unhappy could throw a tantrum. The problem was that after the first tantrum, the resulting bad events caused unhappiness levels to rise among all those affected, leading to further tantrums, and the eventual fall of the fortress (Figure 2).

Figure 2: The soon fall of the fortress "Pickenjoy", with significantly increased unhappiness values among all dwarves affected.



Source: screenshot (Ulrich Götz)

Our first attempt to address this problem was the stress system. Instead of a dwarf's emotional state being determined by the season's events, the old happiness number was repurposed into a stress number which was added to a dwarf's total stress over time. Only dwarves that accrued enough stress would throw tantrums. To increase the story potential of this new system, we also added 120 emotion glosses to the events, filtered through the dwarf's personality. For

instance, one dwarf whose masterwork is ruined might feel vengeful and gain some stress, while another dwarf might feel depressed (while gaining a similar amount of stress), whereas a third dwarf in this situation might simply feel resigned or accepting of the misfortune and gain no stress at all. These circumstance and emotion pairs are displayed for the player, again without any numbers. The total stress level of the dwarf is also described.

This process caused us to reflect on memories. With the needs system, we solved the problem of dwarves not minding total neglect. With the stress system, we solved the problem of them living entirely from moment to moment. But they were still creatures that did not much appreciate their pasts, and their pasts did not provide any kind of buffer for the stress that accumulated in their lives. So we decided to give them memories.

The strongest events in several categories, such as "work" or "family", are selected and stored into a first layer of memories each season. Any existing weaker memories here are overwritten (that is, forgotten). Dwarves, at random, can remember any memory in the top layer, and reexperience the emotion they felt when it happened, often with less severity. This adds or subtracts stress from the dwarf in the standard way. The player can see this happening along with the current season's regular circumstance-emotion pairs.

After more time passes, any top layer memory that has survived the overwriting process passes to a deeper layer of permanent memory. This process always causes personality changes in the dwarf, related loosely to the circumstance and which emotion it produced. The game allows this to be cathartic. A dwarf who was deeply humiliated might find that the memory is now freeing, for instance, and that they no longer care as much about the opinions of others. The personality change and the date and circumstance that caused it to occur is recorded for the player to see in the dwarf's personality readout. In the example above, occasionally remembering the permanent memory causes the dwarf's stress to be reduced rather than increased. Other unfortunate dwarves have permanent harmful memories. The personality changes affect play on an ongoing basis. This has been recorded in player stories, complete with screenshots of the personality and memory text.

This system is still imperfect, naturally, as the character arcs can often be about trivial matters if the dwarf has not experienced sufficient situations. A common problem is dwarves upending their whole life outlook due to being caught in the rain! This can be addressed through some additional gates and other checks, though we might keep some of this behavior to allow seemingly unimportant circumstances to be touchstones for characters on a rare basis.

CHARACTERS IN SOCIETY

Characters are not defined in isolation. Events are not just experienced internally but can be witnessed and talked about. Relationships can change and rumors can pass through communities. Dwarves have family, friendships, grudges, citizenship, religious affiliations and positions in society. Spies and vampires can adopt secret identities, and evidence might be given on the grounds of appearance alone. Agents can manipulate dwarves by appealing to their ideology or their greed. All of this contributes to characterization. It is clearly a broad topic, but in *Dwarf Fortress*, we have not spent quite as much time on this as on the physical and interior life of individuals. Here we will present a few decisions that made a difference.

In the original 2006 release, when a fortress reached a certain level of prestige, a baron or baroness would be installed, traveling to the site from the larger world. The noble needed to be taken care of, causing a drain on fort resources and a distraction from the player's goals. This did have a large impact on stories, but the repercussions were mostly of the variety "noble inexplicably drowns in magma". In order to address this, we instead allowed the player to elevate one of their own dwarves to the position of baron when the time came. The dwarf selected is likely one they have a history with, possibly a favorite or one with a story rationale for attaining the position. The dwarf's story advances, and the overall stories diversify (though "noble accidents" are still a common theme in player stories).

The addition of taverns and libraries also had an oversized impact on emergent narrative and the characterization of dwarves. Most activity in the fortress is inward-facing, as treasure is mined and crafts are produced, and up to this point, trade and warfare were the most realized activities relating to the rest of the world, and, as implemented, they did not contribute much to social ties. Taverns were different. Travelers could come, speak to dwarves, be served by the dwarven bartender, make friends, get into fistfights, and even ask to become permanent residents or eventual citizens of the fortress. Existing dwarves had their character elucidated and changed by the proceedings, and new residents became new characters with an entirely different aspect to them, such as "resident human poet in the dwarven fortress". Migration and travel are resonant themes with a lot of people, and diverse and enthusiastic player stories were immediate.

PROCEDURAL AUTHORING AND COLLABORATIVE STORYTELLING

Emergent narrative relies on the ability of players to form stories from partial information, imagining connections, investigating details, and then using words artfully and sharing their tales. But none of the stories arising from video games rely on these player abilities alone, and developers can increase both the quantity and quality of narratives emerging from their games through their designs.

Beyond characterization, one can imagine every tool in a traditional author's toolbox as being at the developer's disposal, once the developer finds a fitting transposition of the underlying concepts. This is a difficult process, human authors are not replaceable, and the results are imperfect at best, but consideration in this direction can only strengthen the power of games as storytelling companions. And just as the author respects the reader, the developer must respect the player. This is done by valuing the player's choices and time, giving them the ability to find the information they are seeking, providing them with resonant material and connecting mechanics into a coherent whole.

REFERENCES

Literature

Adams, Tarn (2019): "Emergent Narrative in *Dwarf Fortress*." In: Tanya X. Short/Tarn Adams (eds.), Procedural Storytelling in Game Design, Boca Raton, Florida: CRC Press/Taylor & Francis, pp. 149-158.

Aquinas, Thomas (2008 [1920]): Summa Theologica, trans. Fathers of the English Dominican Province (https://www.newadvent.org/summa/3.htm).

Costa PT, McCrae RR (1992): Rev. NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI), Professional Manual, Odessa, Florida: Psychological Assessment Resources.

Games

Dwarf Fortress, Tarn Adams/Zach Adams, Bay 12 Games, 2006.

The Sims, Maxis, Electronic Arts, 2004.