Cracking the Code: Untangling Game Structure, Properties and Player Experience

Elizabeth Goins
Rochester Institute of Technology
Rochester, NY
esggsh@rit.edu

Introduction

I am in search of the perfect game. That game, which has not yet been made, that will incorporate my love of material culture and artful activities. It will avoid the endless battles and dungeon crawls that appear to be the foundation of so many RPGs as well as the manic task-based spamming of Facebook games. Yes, I am female and most games are not written with me in mind as evidenced by my recent experience with *The Witcher* (CDProjekt, n.d.). Now, don't get me wrong, I loved *The Witcher* but how odd for me to play through the eyes of a noble-hearted mutant who, basically, slept with every girl he met and then collected sex-memento cards. "Wow! So that's what it's like to be a Don Juan," I thought to myself. It eventually dawned on me, however, that the male players were probably thinking the same thing. I felt both curious and creepily voyeuristic, peeking into a male fantasy like that.

But I digress. Let's return to my main point which is that, having given up the idea that any game company will ever make my perfect game, I decided to work towards the development of said product myself. The first steps of this process involve getting down into the nitty gritty of how games work to better control the design process. I teach in a museum studies program and, with the help and support of the *School* of Interactive Games & Media at RIT, have begun to dabble in game making. Ultimately, I want

to make games for museums to use within the context of informal adult education and that I can use in my classes. With this goal firmly in hand, I set out this summer to try to understand the intersection between player experiences, learning and game structure. Bravely, I picked up Bogost's *Unit Operations* and tried to come to grips with it. I'm not sure that I succeeded in fully understanding his approach. However, I was inspired by such statements as, "We should attempt to evaluate all texts as configurative systems built out of expressive units" (Bogost, 2008, p. 70). The shift in perspective is subtle but profound and allowed me to build a model of this space that illustrates how the actions of units, through emphasis or negation, are used by designers to change the player experience.

The Method

How do we know if a game is successful? This appears to be a no-brainer; looking at the sales rankings, awards and reviews will give an answer within a couple of mouse clicks. However, while it is true that these yardsticks do measure game success they are also based on player-centric parameters. For the purposes of my work, I want to consider the entire system. So, while rankings let me know which games are doing well with the players, they don't provide any information about how well the game met the goals of the designers. For those of us involved in educational games, this point is critical for our games must be both popular and deliver specific content to fulfill educational goals and outcomes. Therefore, it was also necessary to include the intentions of the designers into my analytical model. That is, how well does the game fulfill the designer's intentions? Chris Melissinos (2011), curator of the Art of Video Games exhibition at the Luce Center, stated that:

> All video games include classic components of art-striking visuals, a powerful narrative, a strong point of view. What's new is the role of the player. Video games are a unique form of artistic expression through, what I call, the "three voices": the voice of the designer or artist, the

voice of the game and its mechanics, and the voice of the player.

This is the classic interpretation of the relationship between the artist, the medium and the audience adapted to the video game. Traditionally, the audiences for the visual, dramatic and literary arts have been seen as static and passive, which is why Melissinos emphasizes the role of the player as something new, but this is not entirely true. All art uses its medium as a method of creating a dialogue between the artist and the audience, all art is about expression and audiences always interpret art, they are not entirely passive. These three voices are always present to greater or lesser degree. Indeed, this trinity can be understood as existing within a continuum of interactivity where the amount of audience participation required to make sense of the art depends a lot on the aims of the artist, as well as the limitations of the medium. For example, realistic paintings are much easier to understand and require much less initial viewer input than abstract works. Realism delivers the story to the viewer through an artist-dominated experience. Abstraction, however, requires that the viewer complete the story and take on a more active role in the creation of meaning. Scott McCloud (1994) nicely explains how this effect is used within comics to allow readers to put themselves into the characters with more abstracted features or to complete parts of the stories that aren't spelled out through their prior knowledge of genre and narrative conventions.

By comparison, however, games are universally agreed to be more interactive. In fact, the interactivity is not just participation in making meaning but in determining the final outcome. The game and the player interact to create something unique: "The game plays the user just as the user plays the game.." (Aarseth, 1997). We say that players have agency, that they can make choices that make an impact. However, the dialog between artist and audience still takes place through the media, be it a book or a video game. The media is the bridge that facilitates the conversation between the designer and the audience or player. It is more a matter of degree, how much can the player or audience

participate? As some art requires more participation than others, so do video games allow different levels of player choice. So yes, games demand greater audience involvement and participation but they do so to varying degrees.

Video games express content and require player input within an interactivity continuum. To explore this concept, I imagine a space that contains our three starting elements: player, designer and game. Content, both conscious and unconscious, is developed by the designer who is separated from the player by both space and time but connected through the medium of the game. The shape of this space is often depicted as a linear corridor with a progression from creation to product to experience as shown below (Hunicke, LeBlanc, & Zubek, 2004):

Designer   Game   Player   →   ↔
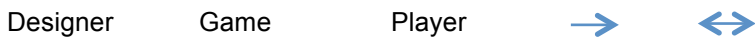
Player activity is shown as a constant unit of input and response as depicted by the double headed arrow. This model, while useful for an initial understanding, does not begin to illustrate the complexity of the real experience. A game is not a black box from which gameplay magically appears but complex media that can be understood as being made up of two basic elements: the formal and the dramatic. The game expresses the content, developed by the design team, simultaneously through the interaction of the formal and dramatic categories of game elements along with the actions of the player. Formal game elements include goals and objectives, procedures, rules, resources, conflict, boundaries and outcome. Dramatic elements emotionally engage the player and are typically understood to be all the elements that create the story world and relay narrative content: challenge, premise, character and story, art and sound. The simple linear expression then becomes a mirrored ternary diagram as shown in Figure 1.
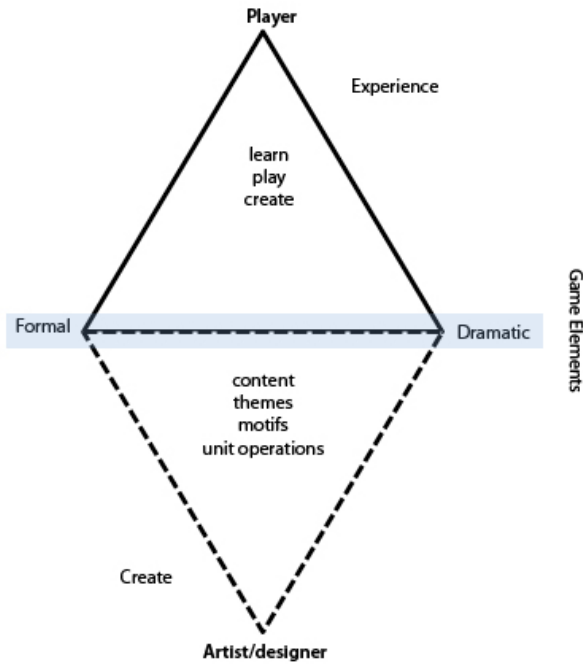
Figure 1

The upper triangle, which represents the game experience, is the primary area of interest for assessing game play. When presented as a ternary diagram, it is suddenly clear that the amount or degree of player interactivity, that is, how much the player really contributes to game outcome is not constant. The player will have more agency in some games than others. The lower, inverted triangle, serves to show the underlying relationship of the designer to the finished game. Outlined by dashes, this area represents elements involved in creating or designing the game and would be the area of interest for analyses that focus on interpretation of underlying game themes. In this area, elements like themes and motifs are incorporated into the game by emphasizing and de-emphasizing the basic units of the game. For example, let's say that the designers decide that they want to emphasize a particular narrative with very little control given to the player as to how the story ends. In order to do that, dramatic elements would need to be emphasized and, accordingly, there would be less focus on formal elements such as game mechanics or the input of the player. On the other

hand, if a sandbox type game was desired in which emergent narratives could happen, the designers would opt for a design that focused on player choice and input and less on the formal and dramatic elements. This is a matter of degree, however. Formal and dramatic elements still remain within the game; they are just de-emphasized to allow more emphasis on player input. Examples of how real games might be mapped within this space are shown in Figure 2.

Figure 2

According to Bogost (2008) these small blocks, the unit operations, that make up the whole should be understood in terms of their interaction, not as isolated components as from the top down view of a generalized system. What this means in practice, to me, is that the game is the final expression of these discreet units and in order to understand the experience, I need to understand how much, and in what way, each is contributing. Comparing the discrete unit structure of games or other media is somewhat analogous to the study of genetics (Bogost, 2008). Genes are universal to all living things and it is the combination of genes within the DNA structure that determine form and function.

Small changes can have a dramatic effect on the resulting organism. So, on the one hand, we can look at the units and understand them to be the simplest form of expression of 'mammal.' However, the type of mammal will be the result of the combination of the entire sequence. The fundamental unit that is expressed by that particular configuration is what might be called a motif. It is important to note that there are a number of abstract motifs that might be identified. If we consider the genetic example again we could have motifs of: living organism, mammal, human, female, blond, etc. Likewise, we can think of the fundamental units, exposed by the game elements, as also being open to a number of different interpretations based on perspective. For example, a fundamental unit of the Sims (EA Games, n.d.) might be considered to be 'consumption' which is expressed by player engagement with game play units as they simulate our consumer driven society. However, we could also discuss fundamental units as suburban America or even that of time management.

There is then a distinction between concrete and abstract unit operations and Bogost argues that sound content analysis, involving the abstract motifs, should be tied to the unit operations of the concrete elements such as game mechanics, procedures and story elements. If we refer again to the first diagram in Figure 1we can see that there are two layers of basic units. The first level, or most basic, are those abstract units of content, motifs and themes. The second level is that which expresses the abstract concepts, the formal and dramatic units that turn an idea into an experience: the procedures, outcomes, character and story. Of course, a game isn't a game until it is played and incorporating player interaction with formal and dramatic units is fundamental to describing gameplay. Ultimately, any analysis must consider all four elements in order to fully contextualize the final experience. To start with, however, it can be helpful to understand just where a particular game falls within this spectrum of player and game elements.

Analysis of Match 3 Games

I thought it befitting that my first analysis start out with one of the simplest of game organisms, the match 3. The match 3 game mechanic basically consists of matching three things by manipulating the objects with a secondary activity like shooting or swapping. Typically found within the Casual games sector, the match 3 games are often considered to occupy the "lowest rung on the cultural ladder….of video game enthusiasts." (Juul, 2009) This, however, has not diminished their popularity and countless variants, of which *Bejeweled* is one of the most recognizable. In fact, the 2010 Gamers' Edition of the Guinness Book of World Records ("Bejeweled – Most Popular Puzzle Game of the Century," 2010) lists *Bejeweled* as the most popular puzzle game of the century. Developed relentlessly by commercial companies, casual games must strike a balance between constant innovation to sell more games and familiarity so that players can learn to play quickly (Juul, 2009). The interesting thing about analyzing these games is that the primary game mechanics stay fairly consistent with the designers changing secondary mechanics and tweaking elements of the primary matching mechanic. The player input remains about the same and it is often the dramatic elements which are responsible for the largest design changes. A number of match 3 games in the casual game space have begun to incorporate a lot more story into the games. *Jewel Quest* frames the game in an overarching story arc to create a puzzle adventure game. *Puzzle Quest*, on the other hand, brings in fantasy elements from RPGs and turn based game play. The development of narrative elements and integration of mechanics is fascinating but beyond the scope of this paper. Instead, I'd like to focus my attention to a comparison of two match 3 games that are true to the simplest form of the game yet deliver very different experiences: *Bejeweled* and *Layoff*. Each of these games resides in a slightly different area of the continuum in Figure 2.

Focus on the Formal Elements: *Bejeweled*

Bejeweled is a classic casual game that focuses primarily on formal game components. Developed by PopCap Games in 2001, the objective of *Bejeweled* is to obtain as high a score as possible by matching three or more gems of identical color in vertical or horizontal rows. The *Bejeweled* craze spawned the creation of many clones and also variation from PopCap: *Bejeweled 2* (Figure 3) and *3*, *Bejeweled Twist* and the Facebook game *Bejeweled Blitz*. The basic Pop Cap game has evolved over time, but never strays too far from the original concept. An example is *Bejeweled 3* which is made up of different modes including Classic, Zen, Lightning and Quest, ostensibly to compete with some of the RPG or adventure match 3 puzzle games. However, the Quest mode still resides firmly in the formal section of our triangle as the quests are highly simplistic.

Residing in the left corner of our triangle in Figure 2, narrative components are virtually non-existent. Originally called *Diamond Mines*, the title *Bejeweled* references an abundance of precious gemstones and is the only link to meaning of any kind. The linkage to a precious material, supported by the artwork, allows the player to contextualize the game as the swapping, collecting and sorting of jewels. However, this is incidental and the player experience is primarily derived from scoring through the completion of matches which can be varied to include timed game play and even quests in *Bejeweled 3*. Learning within this game is restricted to the improvement of play and no external content is introduced. Players are able to achieve higher and higher scores by learning the best scoring strategies. In order to progress in the game, players do acquire skill and become more adept at identifying high scoring patterns.

The art primarily helps to support player connection to the game by using a bright, highly saturated palette and simple geometric shapes for the jewels. In essence, dramatic elements have been compressed and reside entirely within the art work. The design of the game pieces and environment are responsible for creating the entire story world concept. Sound arguably plays a more

important role than the art in giving player feedback during the fast paced game play. And it is the juiciness of the deep voiced male announcer and the riotous cacophony of cascades that undoubtedly keep the player coming back for more. However, the art, minimal as it is, does also reference and link to the external world. In an interview, Jason Kapalka (2011) of Pop Cap said:

> We've always gone for a pretty bright and colorful palette, as opposed to the "space dungeon made of cinder blocks" look that a lot of hardcore games have. But we take a lot of care with each game to make sure it has its own internally consistent style. We were worried *Peggle* might come off as a game for toddlers made by crazy people, but the surreal aesthetic seemed to come through for most players. For *Bejeweled 2*, we created a lot of fractally generated alien worlds that were intended to be reminiscent of sci-fi book covers from the 70's and 80's. For *Bejeweled 3*, we went for a more fantasy-based look, and so did more hand-painted backgrounds rather than computer-generated.

Figure 3: Bejeweled 2 ("Bejeweled® 2 | PopCap Games – Download Games," n.d.)

Personally, I favor the untimed versions of the game and tend to shy away from the more socially competitive versions like *Bejeweled Blitz*, although I know of many, particularly male,

players that are exactly the opposite (Juul & Keldorff, 2010). I'd like to point out, however, that I have a love-hate relationship with this type of casual game. To be sure, I have spent many, many hours playing *Bejeweled* but there comes a point when I realize that I have long since stopped enjoying the game and am manically coming back for more like the proverbial Pavlovian dog. Thinking about my experience, the initial stages of learning the strategies and becoming familiar with the different levels are the most satisfying. After a time, however, I begin playing compulsively. It is at the point when I am really not learning or rising to any new challenge. Instead I am playing for that elusive sweet spot where I am totally on my game and where the gems fall in an optimum arrangement that will allow me to eke out a little higher score. I am engaged, surely, but this is not satisfying. This is the equivalent of the desperate denizens of the casino slots, waiting for that lucky break. It is at this point, that I am forced to limit my time on the game or walk away from it completely for a while. Because, that's the kicker, this game never ends; there is never any resolution or conclusion to give me that ultimate satisfaction so I can move on with my life.

More Power to the Player

Layoff (Figure 4) is a serious game, it has a point to make and it makes it by using familiar gameplay to highlight the underlying ruthlessness within the business world's use of the bottom line. Developed by Tiltfactor Lab and RIT in 2009 ("tiltfactor >> LAYOFF," n.d.), the game uses the basic match three mechanics familiar to most players through *Bejeweled*. The game mechanics of these two games are identical but the resulting game play is at opposite ends of the spectrum, while *Bejeweled* is manic and addictive, *Layoff* is contemplative and sad. If we consider the games within the ternary diagram (Figure 2), we can begin to analyze the underlying design features which bring this about. *Layoff* still tends to emphasize the formal elements of the game but requires more input from the player in order to interpret and conceptualize the experience. There is some drift towards the dramatic as well due to greater emphasis on content as expressed through in-game snippets of text and the tutorial.
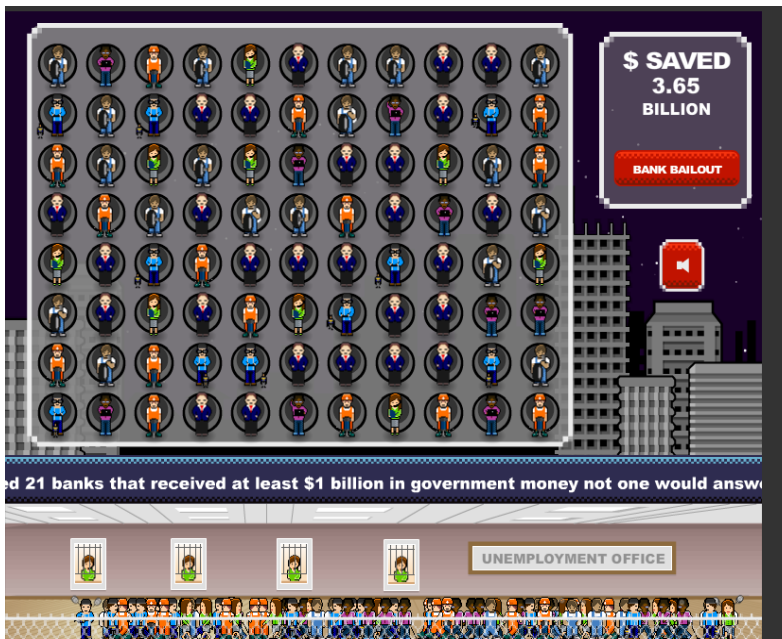
Figure 4: Layoff ("tiltfactor >> LAYOFF," n.d.)

In order to play *Layoff,* players match groups of three or more workers which are removed to the bottom of the screen where they wait in the limbo of the unemployment office. The player wins by laying off as many workers as possible which increases their score in units of millions of dollars saved. Players can take advantage of a bank bailout if there are no more moves which randomizes the screen again - at no penalty to the player. Making matches becomes increasingly difficult as the game goes on because the tiles become over populated with business men who can't be fired and thus eventually bring the game to a halt. The narrative content is expressed through small bits of text attached to game elements: a ticker tape of the financial crisis news items scrolls across the bottom of the screen, each game piece has a personal biography that is visible when the player moves over it and there is a tutorial which clearly frames the game perspective by depicting the business men as all powerful, disconnected bullies who cannot be touched by the crisis. The artwork for *Layoff*, in contrast to *Bejeweled*, is somewhat understated with a de-saturated color scheme and generic game pieces that represent workers with all the individualization of a set of nesting

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dolls. The sound is not the high intensity feedback of *Bejeweled* but a repetitive and hypnotic background soundtrack.

At first, the player notices the color of the workers (orange, blue, etc.) and thinks of them simply as objects or tiles to be matched to increase the score (money saved). However, the game has a very slow pace. Matched game pieces leave slowly, without any fanfare they slide off the board and into the unemployment office. These elements coupled with the lack of juicy visual and audio feedback gives the player a lot of time to look around; eventually, reading the touching biographies, written in third person, that accompany the workers. The game board is slowly filled with businessmen with whom the player can do nothing. The text that accompanies each businessman piece is usually written in first person and portrays their character as unfeeling and untouched by what is happening.

The player begins by quickly eliminating workers at first, in order to learn the optimum strategy for high scores (that to many is very familiar through *Bejeweled*). However, the narrative theme quickly becomes apparent as the player learns that the workers aren't pieces but real people. The player is playing out the story of the all-powerful business magnate, distanced from the workers, making decisions disconnected from any human link to the "units" that make up the workforce. The relentless, inevitable results, driven by a game mechanic that becomes the embodiment of ruthlessness, trap the player into the role of the heartless CEO. As summed up by Flanagan, "It is cute and fun to play, but when you realize how frightening the situation is, the game in fact functions as a very dark portent." (Flanagan, 2009)

The narrative here is expressed through the scrolling news facts and the characterization of the game pieces thus allowing the player to reference and bring in information exterior to the game from their own knowledge of the news, the economy and contemporary business practices. Gradually, the player becomes aware of the tension between achieving the game goal and the high cost that will be paid on a personal and societal level. This

game references current events that must be well known to the player in order for the game to make sense. The end result (educational content) is achieved through the tensions derived by pitting the empathy players ultimately feel for the worker pawns against the game mechanics and scoring associated with current corporate practices. The match three mechanic is, after all, fairly mindless. The mindless eradication of a person's livelihood seems a high price to pay for winning a game and after a while, the player realizes there is no winning within this game structure. *Layoff* works by thoroughly integrating educational and narrative thematic components with the game play so that the themes are expressed, not through cut scenes or dialogue, but by the interaction of the player with the dramatic and formal elements.

Conclusion

Which of these is the better game? Well, to my mind, this is comparing apples to oranges. The intentions of the designers for each are very different so they chose to emphasize different areas to achieve the end goal. *Bejeweled* may be useful for stress reduction but it is also an addictive time suck, as I know firsthand. By focusing purely on the formal elements that tap into player compulsiveness to play again and again, *Bejeweled* is hugely successful. However, the desired experience envisioned by the *Layoff* team was not to addict players but to make them think and to express a perspective on a current social topic in order to raise awareness and to help change behavior. This required a couple of things from the design. The first was that the emphasis had to shift to include more narrative content, which means things have to slow down in the game to give players time to think and understand. The other, I think hugely important thing that happened was that the player was given a bigger role. In *Bejeweled*, players have very limited choice. They can use a simplistic move to make combinations over and over again to achieve one of two end states: either they beat their previous score or they don't. *Layoff* also restricts the players choices as in *Bejeweled* but instead of an exhilaration the player feels trapped by the limitations of the mechanic exposed through its interaction with the narrative elements. This narrative is not an imposed

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linear progression but rather bits and pieces of a narrative that the player must assemble into coherence, informed by the characterization of the pieces. Similar to the reading of an abstract art work, the player must work to make sense of what is going on in *Layoff*. This leads to a curious dilemma: in order to keep the emphasis on the formal elements, the narrative component of the dramatic elements has been compressed down into its simplest form. This puts the act of meaning making onto the player which means they must have the background to "read" this game. Players without external knowledge of the banking industry and Wall Street might find this game difficult to interpret. In order to make this game more easily understandable to anyone, more narrative content would have to be included. However, this would have resulted in a lessoning of the role of the player. They would go from participating in meaning making to passively receiving meaning.

Now, is *Layoff* a game most people would play over and over again? No: It has an ending, a conclusion. You leave that game wondering about all the faceless people who have lost their jobs, how do they cope, what has happened to them all, will the inequities of the system ever change? *Bejeweled*, on the other hand, leaves you thinking about nothing, perhaps seeing rows of colored gems when you close your eyes, but otherwise, nothing – which is perhaps why it's a good stress reliever. It's fun and it never ends. *Layoff* ends: the suits bring down the system and you can't really win in this scenario. It's a pretty depressing end but one that fulfills the designers aims of making people think.

This brings me full circle, back to my original point of finding the perfect game. By working through the analyses of these games through the interaction of their basic components, I understand the relationship between designer, game and player differently. I am now in search of perfect games, plural, depending on some basic conditions: As a player or designer, do I want dessert or a salad? Do I want a game I can play over and over while I wait in the airport? Or do I want a game that will make me think or involve me emotionally? Finding the perfect game will depend on

how I answer these questions. Making that perfect game will require me to emphasize the appropriate elements that express what I have in mind.

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