That Cloud Game: Dreaming (and Doing) Innovative Game Design

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Abstract

This paper describes the application of a methodology for game genre and player experience innovation called "play-centric design." This method is shown in context as the primary design methodology for an experimental play project, *Cloud*, created by students from the USC School of Cinema-Television's Interactive Media Division. The application of the play-centric design method throughout the project is detailed and explored as a potential model for innovating in the realm of overall player experience as opposed to traditional research focus on technology or subject matter innovation.

Keywords: Game design, innovation, iterative process, prototyping, playtesting, emotion in games.

1. Introduction

Game innovation is a phrase that is heard a lot in the game industry these days. It's clear that there is a desire on the part of game players, game designers and even game publishers to break new ground in terms of play experience and thereby grow existing markets as well as attract new players. However, while industry and academia have shown proven ability to set forward-thinking technical and subject matter goals, respectively, as well as to reach those goals, this same cycle of advancement is not typically seen in the more emotional and overall experiential aspects of games.

Design advancement in the industry is generally limited to feature advancement within the existing domains of market genres. So, a racing genre will advance by adding better opponent AI, more realistic destruction of vehicles upon crashing, etc. While a real-time strategy genre will add more complex tech trees, asynchronous starting conditions, etc. The exploration of new genres of games is considered risky in all regards: gameplay, technology, design and market viability. And, while this does not mean that the industry never branches out into new genres of play, it does mean that doing so is a difficult proposition for developers to make to prospective publishers.

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Design advancement in academia, on the other hand, has generally been focused either on technical innovations such as AI, graphics, future control solutions, etc. or on subject matter innovation such as the current interest in "serious games," which includes games for learning, political games, health games, etc. Rarely does academic research focus on increased entertainment value in games in a non-technical regard. So, like the game industry itself, with its focus on "feature innovation," the exploration of new genres of gameplay within academia is limited to a certain spectrum of content, i.e. that which has been deemed "serious" by games researchers.

This paper will describe an approach to genre and gameplay innovation and detail its application during a project funded as just such an experiment by the Game Innovation Lab at USC. The key difference in the approach detailed here is regarding the *type* of design goals which are set and the *methodology* for reaching those goals during the production. As noted above, technology and content are key innovation goals for industry and academia; however, this project points to the ability to set player experience goals as a primary objective, thereby innovating in the elusive area of entertainment value and emotional impact.

The project to be discussed is *Cloud*, an experimental game design implemented by the students from the USC School of Cinema-Television's Interactive Media Division. The game allows players to share the dreams of a child trapped in the hospital; the child dreams of flying into the sky and manipulating the clouds. The player can control the child in the dream, flying freely through the world, playing and painting the sky with different types of clouds, and eventually use weather and nature to save the inhabitants of the world below.

The game was designed and developed entirely by students working in the research lab, mentored by faculty and industry advisors. The project took approximately nine months of part-time effort – weekends, nights, etc. – and was interrupted during part of that time while the students went to fulfill internship requirements during the summer months.

2. Game Innovation in Academia

As mentioned above, the focus on game innovation in academia has generally been limited to either technological research or subject matter innovation. Examples of such research include recent achievements such as *Façade* (Georgia Tech) and the Explainable AI project (USC Institute for Creative Technologies) in the realm of technology; and *Revolution* (MIT) and *Hazmat Hotzone* (Carnegie Mellon) as examples of subject matter innovation. *Façade*, which uses innovative AI methods to build an intelligent dramatic scene simulator, pushes boundaries in the overlap area of how technology creates drama, and yet for all its

significant impact in the field of interactive drama, its emphasis in execution is clearly on technological advancement and not necessarily on creating a deeper emotional attachment on the part of the player, an empathy with the characters or investment in the dramatic moment.[Mateas and Stern 2006] ICT's Explainable AI project takes a similar approach to the issue of conversation in games, breaking down the motivations and impulses of a crisis during wartime and attempting through a branching conversation engine to allow the player to practice decision-making and clear communication skills in an emotional moment.[Institute for Creative Technologies 2006] Again, while the implementation is extremely detailed and quite interesting from a technical perspective, the emphasis in the execution is on implementing those technical achievements, rather than creating an emotional play experience.

Subject matter innovation is also a hot topic in academic game research today. Games such as *Revolution*, which plans to put the player into the role of colonial citizen on the eve of the Revolutionary War; or *Hazmat Hotzone*, which takes on the subject of emergency preparedness in a post-911 world, are only two of many recent examples of how academia is researching new subject matter for games.

In addition to long-term research projects such as those described above, a number of academic programs have also begun to initiate a series of fast-paced, innovation-oriented events called "game jams." These "jams" are so called in honor of the Indy Game Jam held at the Game Developer's Conference for the past several years.[Indy Game Jam website 2006] While the rules for each jam have varied, most of have focused on speed and quantity of games produced. The intention seems to be towards discovery of new ideas by brute force and enthusiastic energy. A fun way to innovate, to be sure, but only a few of the games produced during these highly energized events have provided inklings of true innovation, and unfortunately none have seen any application past their initial demonstrations in respective showcases. It could be argued that the game jam format may lend itself to small innovative "flashes" that would need a secondary level of longer-term research to foster and iterate on these flash ideas.

While each and every one of the efforts described above is laudable in its own right, and innovative in its own area of focus, the methodology developed at the Game Innovation Lab takes both a quantitative and qualitatively different viewpoint on innovation. The lab itself is a research space and think tank located in the Robert Zemeckis Center for Digital Arts. The space itself has been designed to foster creativity in its function and atmosphere. It includes brainstorm space, a library of current and historical games, a state of the art usability facility, as well as team production spaces. The mission of the lab is to explore new concepts in game design, play, and usability in an environment separate from the constraints of commercial game development. The foundation for the work being done in the Game Innovation Lab is "play-centric design."

2.1 Methodology: "Play-Centric" Design

We have mentioned several times the concept of "play-centric design." But what exactly is this process, what are its benefits and how have we implemented in the design of this game? Put simple, play-centric design is design and technology at the service of the player experience. This process has been the core methodology taught at USC for a number of years and for further reference is described in detail in *Game Design Workshop: Designing, Prototyping and Playtesting Games* co-authored by Tracy Fullerton, one of the authors of this paper.[Fullerton et al. 2006]

In brief, a play-centric design process first stresses understanding the fundamentals of how games work on multiple levels. First, games are formal systems of rules that define and restrict player actions: objectives, procedures, mechanics – these are all part of the formal system of a game. In addition to these formal elements, however, games are also emotional experiences that challenge players to achieve their goals, immerse themselves in their dramatic actions: premise, character, story – these are all part of the dramatic elements of a game. When these formal and dramatic elements are put into play, games exhibit dynamic, emergent properties that can be tuned to create specific types of play experiences and interactions for players.

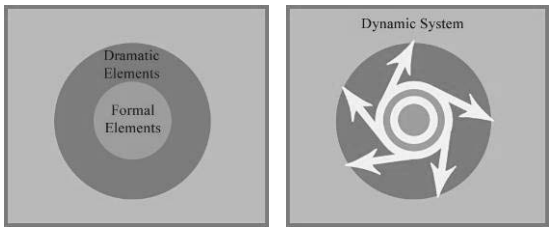


Figure 1: Formal, Dramatic and Dynamic Elements of Games

The game designer creates the rules of play, thinks up the dramatic premise and works with the rest of the team to give it life, to create a compelling player experience. But in the end, neither the designer nor any other member of the team can necessarily predict whether a game's elements will work as planned. Eric Zimmerman and Katie Salen have called game design a "second-order design problem" because of the emergent nature of game systems in play.

> "In a complex emergent system, every element gains its identity by virtue of its possible relationships with other elements. When one element changes, the rest of the relationships are al affected in turn. Key to the iterative process is the ability to think of games as systems, to analyze the way that they function, to know when, why, and how a game system fails to generate meaningful play."[Salen and Zimmerman 2004]

Student designers, especially, look only for success when viewing their design in play. For innovative designs, this means that rigorous playtesting with objective subjects at all stages of design is imperative. By requiring students to go through a number of cycles of formal playtesting during the prototype stage and throughout production, the play-centric process allows them to learn the value of player feedback and practice the art of integrating feedback without compromising overall design goals. In the play-centric design process, students prototype original game systems in simple form using paper prototypes, storyboards, and simple software mock-ups. They do this at the earliest stages of the project and continue to playtest throughout the entire production.

Figure 2: Student designers watch a digital prototype playtest from the usability lab control room. Monitors show test subject and direct feed from game interface in testing area.

This iterative process, which puts players at the heart of the design cycle, is a strong foundation that enables students to evolve their original concepts from the idea stage into realistic and releasable game innovations. Continuous playtesting and revision ensure that game play is engaging before time and resources are spent on software production and art. The principles of play-centric design can be applied to all kinds of games and simulations including computer games, console games, board games, mobile games, location-based games, etc.

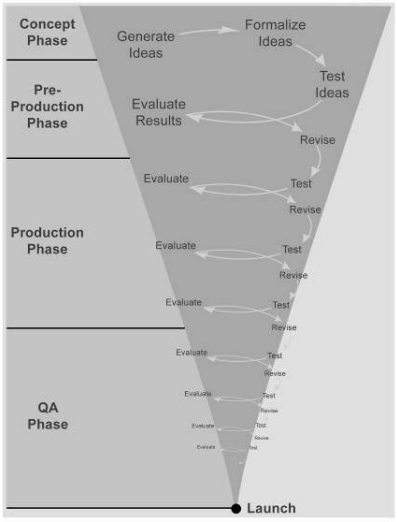


Figure 3: Iterative Design throughout the Production Cycle.

Play-centric design is a model for efficiently creating new kinds of game play without taking huge risks in the marketplace. It is a model that can be equally effective in industry as in academia; however, while the process may sound like common sense, is not yet widely practiced by the game industry. On the contrary, industry teams tend to start with an established game play models and genres, and produce feature innovations as noted above. It is the goal of the Game Innovation Lab, through implementation of the play-centric process, to provide successful case studies and examples of low-risk innovation that provides adequate argument for this model to be adopted by other research groups as well as by industry designers interested in overall experience innovation with minimized risk factors.

2.2 Funding: Game Innovation Grant

In order to "jump start' the type of innovation described above, the Interactive Media Division of the USC School of Cinema-Television and the EA Game Innovation Lab have established an interdisciplinary grant to provide funding for innovative games.

The goals of the grant are to:

1) Provide funding and support for innovative student game projects that address compelling design problems or areas of research.
2) Promote cross disciplinary collaboration.
3) Create a set of best practices relating to the play-centric design process described above in order to better manage the innovation process.

The grant has been awarded three times since its inception. Submissions were judged equally on the quality their proposed game innovations and the strength of the proposed team. Teams receive up to $20,000, a team office and equipment in the EA Game Innovation Lab, access to the lab's usability testing facility and a faculty advisor/executive producer. All USC students are eligible to participate. Projects funded under the Game Innovation Grant have been: *Dyadin*, *Cloud* and an untitled project currently in production.

2.2.1 Dyadin – Cooperative Game Play

Dyadin explored the potential of cooperative play mechanics in a 2-player adventure game. The story of *Dyadin* involves two overlapping worlds, and two characters occupying these worlds, but only able to affect objects in their own space. The core mechanic involves moving closer or farther away from the other character to change color and affect objects in the space. Players must cooperate or they cannot escape the puzzle and combat based levels.

Figure 4: Dyadin, a cooperative action puzzle funded by the Game Innovation Grant.

Dyadin was the first game funded by the Game Innovation Grant, and had a crew made up of students from the School of Cinema-TV Interactive Media Division and the Viterbi School of Engineering. The process for the game included the creation of approximately 100 paper prototype levels, which were culled down to the best 25 to be implemented as game levels.

2.2.2 Cloud – Experimenting with Emotion

Cloud was the second game funded by the grant, and its team is also made up of students from the School of Cinema-Television and the Viterbi School of Engineering. As will be described below, the design goal was to provoke emotion through integration of the core mechanic with the universal fantasy of flight.

Figure 5: Concept art from Cloud, an experimental mechanic involving complex emergent cloud formations and fantasy play.

The very simple, yet pleasing, mechanics of flight, gathering and drawing with, clouds evokes many players daydreams from childhood, and taps into a new realm of "peaceful" and "relaxing" emotional territory not generally valued or experimented with in game design. For the development team, *Cloud* became a rich area of exploration into emergent environments and innovative design.

3. Emotion in Games

As we began to describe in the introduction to this paper, innovation over the past 30 years of game design has been mainly focused on technology and content. There has been very little attempt to address innovation in the overall emotion impact of games. The "idea" of addressing new emotions in games, however, has been a rallying cry for a very long time. One only has to look back to the original marketing campaign that launched Electronic Arts to find the famous question "Can a game make you cry?"

Today, that question has been reinvigorated by the interest in narrative in games, so much so that veteran designer Warren Spector has said, "Finding ways to broaden range of emotions you can experience and express in games is the future of games as far as I'm concerned."[Loftus 2005] The topic has been addressed in books such as David Freeman's *Emotion in Games*, in which he gives number of techniques, mostly adapted from narrative techniques on creating emotion-laden game stories.[Freeman 2004]

The topic is also related to peripherally related studies on fun and flow in games by writers and researchers such as Raph Koster, Mihaly Csikszentmihalyi and Nicole Lazarro. Lazzaro's research paper entitled "Why We Play Games: Four Keys to More Emotion Without Story" is particularly interesting in that it points the way to several specific types of emotions that have been addressed in games from a non-narrative perspective and the identification of four "keys" to unlocking emotion: Hard Fun, Easy Fun, Altered States and The People Factor.[Lazzaro 2005] While each of these "keys" is indeed an important aspect of "fun" in games, they do not as yet provide a "design map" to explore emotions that might help us explore new regions of the human experience.

Yet another interesting research study into emotion in games comes from the University of Aveiro in Portugal. In the paper "Emotional Spectrum Developed by Virtual Storytelling," the researchers describe the results of a quantitative study in which they compared the emotional spectrum of "virtual storytelling" (most of the experiences studied were commercial games) in comparison with movies. According to the study, the researchers "found that these videogames were capable of successfully eliciting emotions such as Surprise, Anger, Disgust and Fear. There is also evidence that Happiness could be elicited. It was not possible to verify the existence of Tranquility. The most problematic was Sadness, except when interactivity was absent and emotion propelled through cut scenes."[Zagalo et al. 2005]

As will be seen below, the most interesting point for this discussion is the inability of the researchers to verify the existence of "Tranquility" and the only slight evidence of "Happiness" as emotions available in gameplay, also the problematic notion of "Sadness," all of which point directly to several clearly underdeveloped areas in game design.

3.1 Design Goals for *Cloud*

Because the design process is a creative one and not necessarily one based in quantitative research, the design goals for *Cloud* came from an overall "sense" of those emotions "missing" from game play. In an attempt to find new areas of the "emotional map" to explore, *Cloud*'s lead designer Jenova Chen, created a map of game genres, shown in Figure 6.

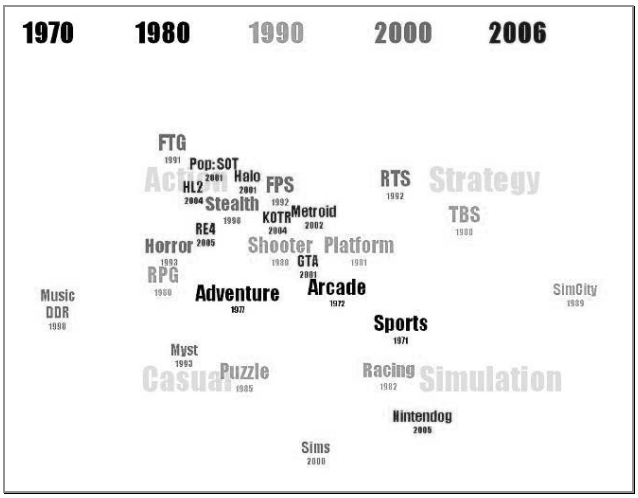


Figure 6: Genre Map 1970 – 2006.

This diagram shows a "clustering" of design focus in key areas, notably a high concentration of exploration in first-person action games. While this not really a surprise, given market trends, Chen's next step was to analyze the emotive focus of each genres. It should be noted here that this was a personal design exercise and not a research study; however, it points to an iterative process of questioning and discovery that is key to a play-centric design process. Figure 7 shows the result of this analysis.

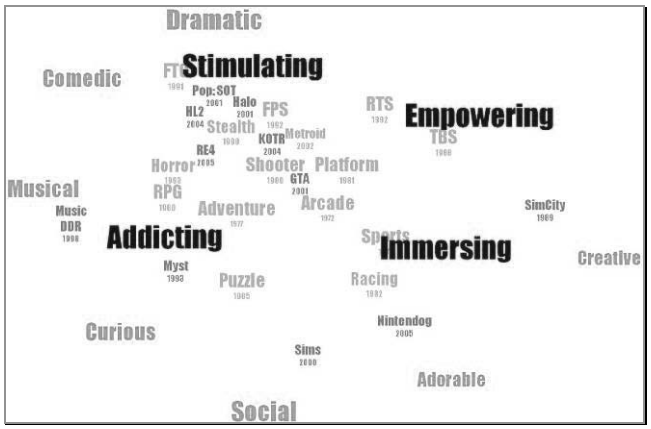


Figure 7: "Emotion" Map.

What became eminently clear upon looking at these diagrams is that feature innovation and technical innovations over the past 30 years have not resulted in a widely diverse palette of game emotions. So, while there is no doubt that games at present *are* emotional experiences for their players, the emotional "map" of games has remained quite static.

Compared with films, Chen found, the emotional experiences that video games encompass lack variety. Although there are thousands of games and a number of well-defined genres, most mainstream games can be described with adjectives like "addicting, stimulating, and competitive." But he thought, is "addiction" all that we can offer? Does every game have to contain "competition"? What about those games out on the borders of this map" Can we define another area on that edge and explore it?

Chen felt that while it would be very difficult to guess what might be the next new genre to breaks the boundary on the genre map (Figure 6), the problem seemed much clearer once we changed our perspective and reexamined video game genres through the lens of emotion. Once this was done, the boundaries of genre disappeared and we discovered a huge world of possible genres that video games have yet to explore. The findings, not unexpectedly, echoed the rallying cry about the lack of sadness, tranquility and happiness in games. The *Cloud* team set out to explore these areas.

Guided by this vision of conquering new emotional territories, *Cloud*'s design direction was quite focused:

- ∞ Gameplay: Create a tranquil, relaxing and joyful emotional experience related to everyone's childhood daydream of flying in the sky and creating shapes in the clouds.
- ∞ Art, Music and Story: Visualize the sky and land below with an elegant storybook-like simplicity, recalling the forgotten beauty and nature. Support the emotional experience with audio landscape and emotional back story.
- ∞ Technology: Simulate the imagined experience of "touching" and shaping clouds; this visceral experience takes precedence over all other technical features.
- ∞ Market: Focus the experience for a less hardcore game audience; provide an experience that is deeper than a "casual" game but with the same simplicity of use.

4. Gameplay Innovation: "Emotional Experience"

As stated, the gameplay goal for *Cloud* was to create a tranquil, relaxing and joyful emotional experience related to everyone's childhood daydream of flying in the sky and creating shapes in the clouds. But how to do this? The first step was to create a series of prototypes for the core mechanic of flying and gathering clouds. These were implemented in 2D, using the Processing environment as a development tool.

In the first iterations of the prototype, created by Aaron Meyers, the mouse was used to move around the play field, but the camera was locked onto the player representation so that they were always seen the center of the screen. The prototype generated a random play field that had multi-sized white and grey circles representing different type of clouds, and players could move around the sky, gathering clouds that were smaller than themselves. Moving close to larger cloud would cause that cloud to "suck" away all the little clouds collected by the player – an inherent jeopardy as one moved around the sky.

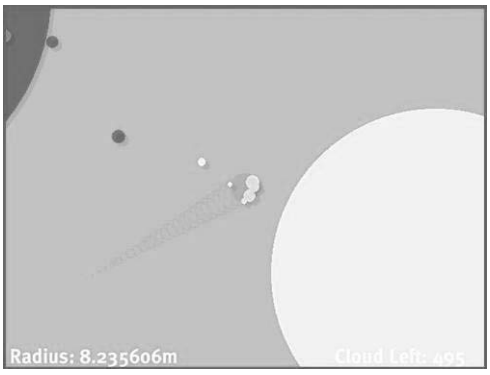


Figure 8: Gathering Clouds Prototype.

This core gameplay was tested by the team and several conclusions were reached. The first was that the 2D perspective, while simple and practical, was not emotional enough. Although the final project had always been planned as a 3D game, there had been an open question of how to achieve a useable player viewpoint and whether or not it made sense to use a 3D environment, but to lock the play within that environment to a two-dimensional plane within the 3D world. At this point, the team began to sense that there was a conflict between the desired clarity for gameplay (which called for a 2D playing field) and the equal desire for an emotional sense of freedom in flight (which called for freedom of movement within a 3D space).

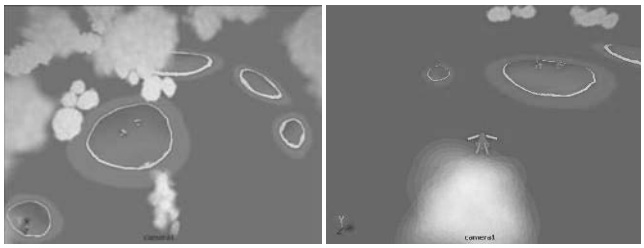


Figure 9a and 9b: Camera Simulation Prototype; left shows camera zoomed out for view of entire sky, right shows camera zoomed in, in order to fly close to the child.

At this early stage, the prototype designer had made the choice to automatically zoom the camera in and out as the player gathered more and more clouds. Because of the team's experience with cinema, we were aware that a "close up" of the boy would lend more emotion to the experience, while a "wide shot" would give more information. This seemed an interesting place to experiment. So, we created a camera prototype in Maya that simply tested the idea of allowing the player to zoom the camera in and out at will. For example, we knew we wanted the player to be able to zoom far out to see what they had written in the sky. But, we also wanted to be able to fly close up with the child, to feel the emotion of flight. As it turned out, this concept, especially when combined another feature -- "free flight" within the 3D space -- solved both the practical interface issue and the emotional issue of flying close-up with the child.

Figure 10 shows a later test of gameplay on several stacked 2D planes, an idea which, through playtesting, was ultimately found to be too confusing. While clouds can be "stacked" in the final version of the game, they are still controlled on the primary plane of play. Free flight mode allowed players to fly away from that primary plane and view the world from new perspectives. However, once a player clicks back on the clouds to control them, they are put automatically back into the 2D play mode.

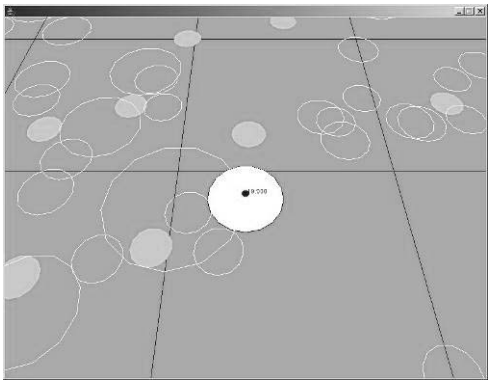


Figure 10: Control, Camera & Rudimentary Gameplay Prototype

In addition to experimenting with the core mechanic and viewpoint, the team began to envision a game without the traditional goals and conflict that drives most games. It would be a simple game, which would encourage creativity and playfulness. In order to achieve this, we began designing the features that would allow players to draw and erase clouds in the sky as easy as chalk. Also, we began to realize that every aspect of the game needed to reinforce these positive emotions. The game needed to be relaxing and refreshing in its play, as well as in its look and feel. So, in order to eliminate all the psychic stress, there is no time pressure in the game, and failure is almost impossible. There are no elements that will trap players, and they can pick up and leave at anytime with no repercussions.

And yet, the game is not "easy" in the sense that there is always something new to do or try. Finishing the tasks in each level is never the only way to play. In testing, and once the game was released, we found that some people enjoy the game by simply flying around and looking at the world, others like to construct complex cloud formations; still others like to generate interesting weather patterns. In *Cloud*, players never gain any points or special abilities for doing these things – the rewards are intrinsic and this was a key design choice. Players are rewarded by the pleasure of admiring their own creations and the emotion of wonder at the natural phenomena simulated in the game.

5. Visuals, Sound and Story: "Beauty of Nature"

The concept visuals for *Cloud* were all created in a very simple, elegant painterly style. It was important to make the sky itself a dramatic character in the experience. This style was used through out the design, in the game menus, the box art, and the website design. Within the 3D world of the game itself, the colors of blue sky, with bright green islands below and, of course, the white clouds are predominant in the palette. The colors are highly saturated, suggesting happiness and freedom. The team was greatly influenced by the work of filmmaker Hayao Miyazaki.

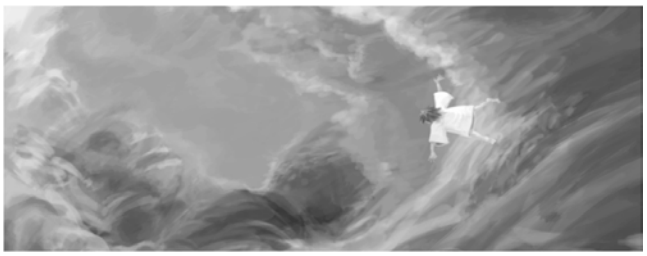


Figure 11: Concept painting for *Cloud*.

The music for *Cloud* also shows cinematic influences. The composer, Vincent Diamante, worked closely with the game designer Jenova Chen, and the two created a tight iterative cycle in which music sketches suggested level designs and vice versa. So, while the theme itself was developed fairly early on, the specifics of each piece were integrated tightly with the level designs.

In terms of story, the game went on a rollercoaster journey. The team began with a very large and deep story – one which included a child-like alien who flew in the sky to save the environment. As prototyping went on, and with the integration of more visuals and music, the team realized that they were able to achieve most of their emotional goals without resorting to the heavy-handed back story originally envisioned. In the end, a simple "poetic" introduction to the cloud child trapped in a hospital bed provides enough emotional context for the fantasy dream segments of play: It is a longing to be free from the sterile environment of the hospital that propels the "story" to launch into the sky. We found we needed nothing else to prompt players to enjoy their time amongst the clouds.

6. Technological Innovation: "Simulating Clouds"

While our gameplay prototyping focused on mechanics and camera controls, the technical team had several other hurdles they knew they had to face. The first was an upgrade to the internal game engine being used to develop the game. "Bushido," as the engine is called, was used in the development of *Dyadin* the year before, however a number of upgrades needed to be done in order to implement the kind of dynamic flight experience envisioned for *Cloud*. Engineers Erik Nelson and Glenn Song were responsible for much of this core engine design and coding.

Beyond engine re-design, however, there were specific requirements in the design of *Cloud*, however, that required technical innovation. The most important obviously, was the simulation of believable, malleable and computationally practical clouds. Engineering Consultant John DeWeese came up with an interesting solution for the team: the use of a Leonard-Jones particle simulation underlying the clouds which would give them a dynamic underlying structure that would feel like playing with globs of mercury.

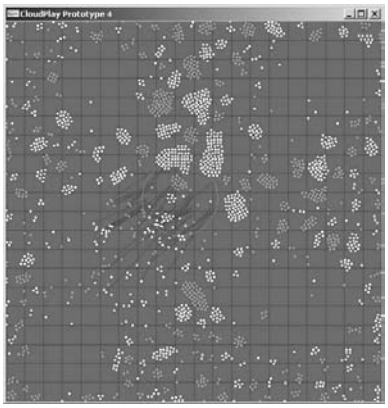


Figure 12: Particle Simulation Prototype.

The first implementation of this concept (Figure 12) was most useful in the fact that it proved we could create "clouds" out of clumps of dynamic particles – and that we would be able to support a lot of them. The image in Figure 12 shows the result of several thousand particles in a prototype environment that are (thankfully) not over-taxing the machine. These particles can be grabbed and shaped, much as the team had envisioned the cloud drawing feature.

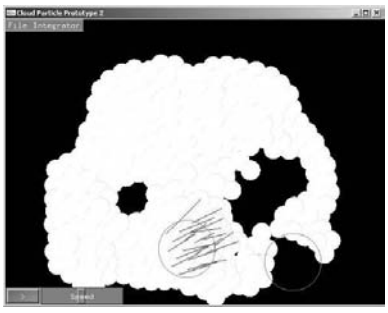
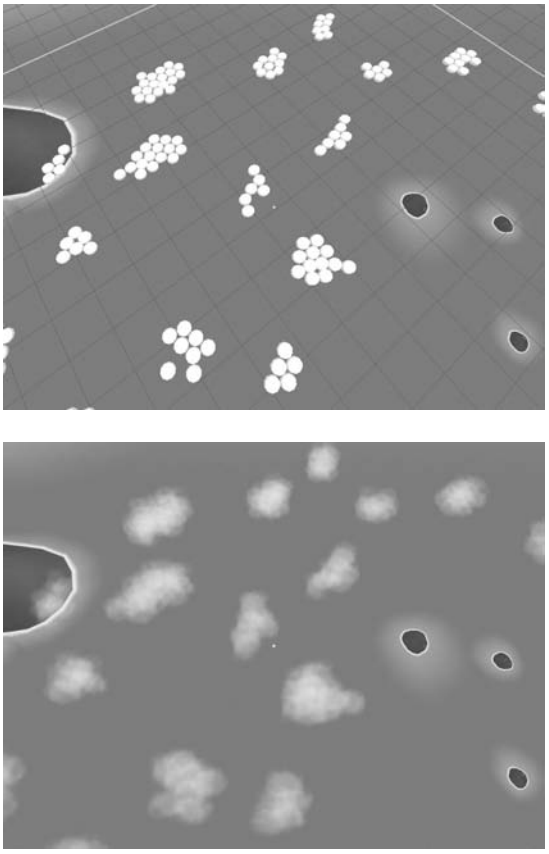


Figure 13: "Puffy" Particle Simulation Prototype.

The next stage of prototypes focused on making that underlying particle simulation "feel" more "puffy." Figure 13 shows such a test. In this version, tests revolved around using the "clumps" of clouds to draw faces, pictures, and an overall excitement about how the clouds would ultimately "feel" to play with started to permeate the team.

In addition to creating this underlying simulation, Glenn Song also implemented a billboarding method for rendering the cloud art onto the simulation. Figures 14a and b show screenshot from the final game with rendering turned on and off to demonstrate how the method mapped to the final simulation.



Figures 14a and 14b: Cloud simulation layer (above) and with rendered clouds overlying simulation (below).

In the end, a number of compromises were made in order to finish the game on time, including the fact that a number of other technical features were cut in order to concentrate on the cloud simulation. Concepts like wind, a day and night cycle, terrain features linked to cloud state, etc. were all prioritized under the perceived need for a satisfyingly dynamic sky.

This decision itself is an example of the affect of play-centric design on the technical process. While a traditional design team might have tried to implement all features, but with less depth in each, the iterative testing and re-evaluation of the design based on overall experience made it clear that players were focused on the "feel" of the clouds and flight, not necessarily interactive terrain, day and night cycles, wind or other "missing" elements.

7. Market Innovation: "Core Games"

All of the above design challenges point to the fact that *Cloud* does not fit easily into a niche in today's game market – there was no design model to follow, no prior feature list to refer to. Innovation in positioning and marketing of the game would be necessary as well, were the project to be launched commercially. Although this was not the final objective for the current version of the game, the team did do a lot of thinking about how to innovate in the potential marketing of *Cloud*.

In general, the today's video game market is heavily polarized into casual and hardcore games. However, the *Cloud* team has observed that as a new generation of players becomes adults, they also become short on time to invest in long and intensive hardcore games, while casual games do not offer the depth of play and experience offered by the hardcore offerings.

The notion of "core games" defines a new video game market that comprises relatively easy, less time consuming but emotionally deep and powerful games. With such game, we can appeal not only to segments of the existing hardcore and casual game markets, but it is also possible to capture "grown-up" gamers who are looking for games that will give them rewarding experiences in their limited play time.

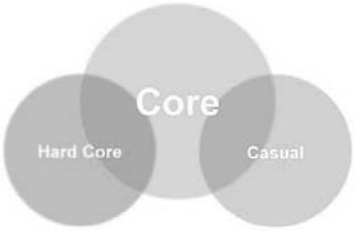


Figure 15: "Core" Games: A Potential New Market.

Examples of Core Games would be games like *The Sims*, *Rollercoaster Tycoon*, and other games that provide deep but easy experiences that reward the player on multiple levels. *Cloud* attempts to position itself in this potentially powerful new area of the game market. As next generation consoles move into the downloadable arena, it is quite possible that this niche of games will become an even more important segment than casual or hardcore games.

8. Integration & Playtesting

As we have mentioned numerous times, our design process was extremely iterative throughout. All of the areas of innovation described above – gameplay, art, music, story, technology and market – were constantly rethought as the process went forward.

Even when the team had worked out the details of most of the gameplay, and was verging on releasing the game to the Internet, we decides to do a last series of formal user tests in our usability lab to tweak the "tutorial prompts" that teach the player how to use the game controls in the main four levels. During this exercise, we made a number of subtle, but important changes so that even non-gamers could pick up the game fairly easily.

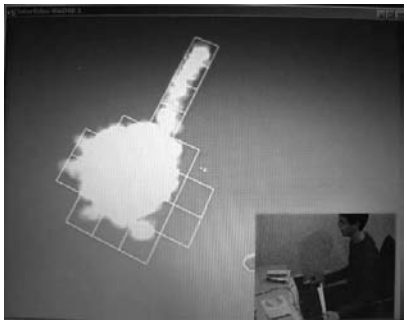


Figure 16: Level 2 Playtesting Session -- Sky Drawing Lesson.

Since the game has no persistent HUD, it was imperative that players learn the controls quickly and that the tutorial prompts appear at just the right time. However, during what we thought were "final tweaks" we actually discovered that it was necessary to re-design the break between Level 1 and 2 so that players could get a sense of "completion" once they had learned to gather clouds and draw with them in Level 1. Level 2 then became about using those skills to draw a more complex design (Figure 17). While this involved a delay in release, in the end it made for a much more satisfying experience for new players.

Other key findings included a proclivity of almost all users to hit the space bar when they wanted to slow down the flight of the cloud boy. Even though we tried several methods to prompt them to use the designated control, in the end we simply changed the feature to use the space bar instead. Something about that feature seemed to link it to the space bar in players' minds, and so it seemed best to simply go with this instinctive behavior. These final tweaks were done just as the game was about to be released online.

9. Launch & Results

Cloud was released as a free downloadable game at the beginning of November 2005, at www.thatcloudgame.com. Since that time, the website has had more than 6 million visits and over 600,000 people have downloaded the game (not counting unofficial servers and Bit Torrent downloads). The game has been downloaded and reviewed in twenty-four different countries around the world, and the registered players range from ages six to sixty-five.

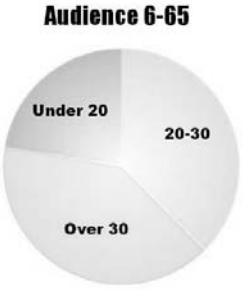


Figure 17: Registered Cloud Users by Age Group.

The experiment has been a huge success in the team's eyes because of the great response we've gotten from players. People from all over the world have sent letters, kudos and suggestions

for future versions.

> "*Cloud* is just utterly impressive. It is a vastly original and marvelous work, and originality is so very rare in games these days."
> –PC Gamer UK

> "I am in fucking love. Seriously. I FUCKING LOVE THIS GAME. Holy fuck, this game is awesome."
> -The Sonic Retard, Penny Arcade Forum

> "*Cloud* is exactly the kind of game that we need more of, one that frees the possibilities of the medium."
> -SomethingAwful Forum

Many of these letters are from people who are gamers looking for different types of play experiences, but some of them are from people who don't usually play games, but have tried this one because it looked different. Since one of the original design goals was to reach a broader audience for games, hearing responses from these people was extremely validating. We clearly have an audience in those people, and they have proven our theory that more people would play games if games offered a wider variety of content.

In addition to praise, we have also received a number of letters expressing the depth of emotions felt by players of the games. Because eliciting such a response was one our primary design goals, we are especially glad to receive these letters.

> "I played '*Cloud*.' Then it have me almost cry. I feel my eyes hot. And when I am on the ground with some trouble or disappointment, looking up the sky, blue sky and white cloud, make me feel beauty. 'The sky always there.'"
> -Tokyo Fan

> "I actually, literally cried at the sheer beauty of it. I just wanted to let you know that your work engendered such emotion. *Cloud* is just utterly impressive."
> -Email from fan

Figure 18a and 18b: Fan Art Posted to *Cloud* Forum

In addition to correspondence, players have used the creativity tools in *Cloud* to make messages, which they have posted in the *Cloud* forum and on other sites (Figures 18a and 18b). The game has been translated into Mandarin by Chinese fans. And a number of people have written to say they have created their own levels.

Additionally, *Cloud* has been recognized in a number of festivals and magazines including the IGF 2006 Student Showcase, Slamdance Guerrilla Gamemaker Competition, the Experimental Gameplay Worshop at the GDC 2006, Game Informer Magazine (Issue 156, Top Ten Games You've Never Heard Of), Edge magazine (Internet Download Game of the Month, Issue 156), G4's Attack of the Show.

10. Conclusion

Can a student research project provide a model for game genre and emotional gameplay innovation? Having been influenced strongly by the Cinderella story of *Katamari Damacy*, we think so. Overall, though the design process had fits and starts throughout, and though we were not always certain of success, the methodology of play-centric design, and a clear design goal of finding new areas of emotional experience for games brought this project safely to conclusion. So, while risk was high, we had confidence in both the type of innovation we were exploring and the method by which we were doing our exploration.

For those setting out their own risky design goals, we offer this description of our design goals and methodology as both inspiration and encouragement. We hope to provide a model for industry and academia alike in the practice of overall player experience innovation as part of a low-risk, play-centric design process.

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