



CPR for the Arcade Culture

A Case History on the Development of the *Dance Dance Revolution*
Community

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Introduction

Upon entering an arcade, you come across an unusual spectacle. Loud Japanese techno and a flashing neon glow pour out of the giant speakers and multicolored lights of an arcade console at the center of the room. Stranger than the flashy arcade cabinet is the sweaty teenager stomping on a metal platform in front of this machine, using his feet to vigorously press oversized arrows as the screen in front of him displays arrows scrolling upward. A growing group of people crowd around to watch this unusual game-play, cheering the player on. In large letters, the words “*Dance Dance Revolution 3rd Mix*” glow above the arcade machine. Most people who stumble upon a scene similar to this one would rarely believe that such a conceptually simple arcade game could foster an enormous nation-wide game community, both online and offline. Yet the rules of the game are deceptively simple. The players (one or two) must press the arrows on the platform (either up, down, left, or right) when the corresponding arrows on the screen reach the top, usually on beat with the techno/pop song being played. If the player doesn’t press the arrows on time, the song will quickly come to an end, and the machine will ask for more quarters to continue play.



Arrows scrolling up a DDR screen

Yet despite its simplicity, *Dance Dance Revolution*, or DDR for short, has helped create a giant player community in the United States, manifesting itself through various forms. Numerous websites devoted to DDR have appeared on the internet over the years and one of the most popular DDR forums at DDRFreak.com has nearly 40,000 members actively discussing all aspects of the game, and even topics which are completely game unrelated¹. Furthermore there

are more than 1,896 DDR cabinets in arcades across the nation, and at least 77 DDR tournaments were held in various places across the US in 2002ⁱⁱ. What helped the *Dance Dance Revolution* community develop to such a large degree? In this case-study, I shall focus on the design elements of the game which were essential for the first seeds of a game community to develop in the US and the natural expansion of the arcade community to tournaments, the internet, and beyond. I assert that the DDR community is unique compared to other game communities because it's player interactions were created around the context of the game, not within it like the game community in *Everquest*. However, later forms of the community, the tournament and online aspects in particular, parallel the development of other more traditional game communities like those built around *Doom* and *Quake*.

I will not, on the other hand, heavily explore what makes DDR appealing, what led to the success of the game in the United States, nor its role as an import from Japan as David Liu has already done in his study "A Case History of the Success of *Dance Dance Revolution* in the United States." A focus on community and its development will allow for a more in-depth look at the history behind the formation of a unique game community different from many communities based around other games.

History of Bemani

Before we begin to look at *Dance Dance Revolution*, we must understand the historical context which surrounded the release of DDR and the Bemani phenomenon. Bemani is the term for the rhythm/music games produced by Konami, the now prominent designer of these musical games like *Dance Dance Revolution*.

Although DDR is likely the most notable rhythm game, it was not the first. In December of 1996 in Japan and November 1997 in the United States, Sony released *PaRappa The Rapper* for the PlayStation game console (McLellan). In *PaRappa* the player “respond[s] to the teacher's simple rap by quickly pressing controller buttons to match the onscreen cues and rhythm of the song” (Horwitz). This game was “unlike anything seen before” as stated by an early review of the game and was immensely popular in the Japanese, and later American, game market (Horwitz). *Parappa* was thus the first of the popular rhythm/music games.

In December 1997, Konami, a Japanese video entertainment company, released *Beatmania* (1999 Annual Report). *Beatmania* was different than *PaRappa* in two important fashions. *Beatmania* was made as an arcade game, rather than a home console game, in which players acted as a DJ by following on screen cues, cuing the right sounds at the right time. The second, perhaps more important difference, was that the player interface, namely the turntable, was different than the simple button presses of *PaRappa*; the player was required to “scratch” the turntable at precise moments during the game. This game acted as a transition from the traditional game interface, usually buttons and a directional input (joystick/directional pad), to unique and very different input devices like the dancing platform DDR used.

By the time *Dance Dance Revolution* was released in September 1998, *Beatmania* was already quite popular in the Japanese arcades. The first version of *Dance Dance Revolution* contained songs from the *DanceMania* lines of dance music already popular in Japan. Thus, it is not surprising that DDR was readily accepted by gamers. Lines of coins on top of the machine, or “coin lines,” developed to keep track of the people who were in line to play the game; lines of over twenty coins were common, meaning players had to wait for over an hour for their chance to play (DDR Maine). Within 8 months after the initial release of DDR, in May 1999, 3,500

arcade units had already been sold (1999 Annual Report) and by 2000, Konami saw 260 percent increase to about \$173.6 billion in net revenues, largely due to the popularity of *Dance Dance Revolution* (Wong).

Although *Dance Dance Revolution* was slower in coming to the United States, it nonetheless came. As David Liu describes in his case-history, *Dance Dance Revolution* faced the various obstacles a Japanese game does when transitioning to an American audience, yet it still managed to be largely successful. Despite being priced at \$15,500 per arcade machine, Konami had sold a “triple-digit” number of units in the United States by August 2000, even before the US version of DDR was officially released in September of 2000 (Tran).

Thus the development of the rhythm/music game in the late 1990s by *PaRappa* and the innovative interface of *Beatmania* led to the development of *Dance Dance Revolution* and its transition to the United States. Now that the historical stage is set, we can begin examining DDR’s game design and how this lead to the development of the game community.

Game Design and Play as Performance

Here we will take a break from the historical narrative to examine in greater detail the design of *Dance Dance Revolution* and how the design made play as performance an integral aspect of the arcade experience. The use of computer games has often been extended to performance, as the demos movies created in *Quake* and the machinima like “Diary of a Camper” show (Lowood). While these uses of game as performance pushed the original intended use of the game further than initially expected, DDR *requires* the players of the game to “perform.”

The first important part of DDR's game's design is its interface, or what the human player uses to communicate with the game. Prior to this point in time, the interface for most arcade games was a simple directional stick and a multitude of buttons manipulated with the hands. Other games, including many shooters, involved a light gun which the player could point at the screen and shoot, simulating a real gun fight. Yet interactions with these interfaces were not especially exciting to watch and only involved the hands. Prior to the release of *Dance*



A DDR arcade cabinet

Revolution, there were virtually no successful video game interfaces which allowed for full body movement.ⁱⁱⁱ The raised metal platform with dual sets embedded arrows was an enormous departure from other game interfaces because it implied a performative aspect to play; it required full body movement and rhythmic motion which was often interesting to watch. Furthermore, the platform was often called a “dancing stage,” and being raised slightly above ground level, the game interface

paralleled a theater stage on which performances take place.

Another important part DDR's game design is the atmosphere it creates. During game play, the in-game announcer often spurts commentary on the player's performance. By saying things like “You just became a hero!” and “Did you have breakfast today?” the announcer attempts to recreate the pressure associated with performance. Depending on the quality of play, a virtual crowd either cheers the players on or makes disapproving booing sounds contributing further to the performative atmosphere.

Yet beyond a virtual crowd, several other design aspects of the DDR arcade machine turn the game into a real performance. A multitude of colored lights plaster the sides and front of the *Dance Dance Revolution* arcade machine. As the players dance to songs, the lights flash brightly on beat with the music often attracting large crowds. Furthermore, each arcade unit is embedded with two large speakers and subwoofers which can be heard across the room in even the noisiest arcade. These two design elements clearly reinforce the performative aspect of DDR, and by drawing a crowd, they truly make the game a visual presentation.

Thus, it is clear from the game design that *Dance Dance Revolution* was meant to be a performance. As we shall see next, performance is a crucial aspect of *Dance Dance Revolution* which led to the building of an arcade, and later online community. It is interesting to note that although Craig Levine from Team[3D] asserted that online multiplayer games are necessary in order to create a large and lasting game community, *Dance Dance Revolution*, which is not a multiplayer game in the sense *Counter-Strike* is, still succeeded in created a large game community online (Cliffe & Levine). It is thus logical to ask how DDR, an arcade game with no massively multiplayer option, could foster such an extensive game community.

The Development of the Community

Throughout the history of video and computer games, game communities have often been as interesting to examine as the games themselves. They form an integral part of the entire game environment and without examining the game community, any exploration of a game would be incomplete. In this study, I define a game community as a group of players who feel a common bond playing the game, freely discuss the game, and find the game as an important part of their lives. In the past, most large game communities developed around multiplayer, computer-based

games like *Everquest*, *Doom*, and *Starcraft*. In these games, the community began inside the virtual world of the game and later expanded outwards. Thus it is understandable why Levine would assert that the multiplayer aspect is necessary for community formation.

However, the development of the *Dance Dance Revolution* community was very different for several important reasons. First, DDR is not a multiplayer game in the sense that it allows players to play with each other over long distances, thus the community was not intrinsically built into the game like the virtual world in *Everquest*. Also, DDR was an arcade game; very few arcade games have ever given rise to any type of lasting game community beyond the arcade's own walls. The formation of the *Dance Dance Revolution* community can be divided into three main phases: the arcade community, the tournament community, and the online community. Each phase of community development has distinguishing characteristics, and each phase helped lead to an increasingly large community. However, these three communities did not develop one after another or in isolation, but nearly concurrently with an extreme amount of mixing of the communities. Let us begin by examining how the DDR community was built around the arcade.

Arcade Community

As described by Henry Jenkins in "Complete Freedom of Movement," the video arcade is a center around which video games provide a "basis for interaction". Thus, it seems highly logical that the social interactions in the arcade could easily lead to an arcade community. This was largely the case in the 1970s and 80s when arcades were a popular place for adolescent social gatherings. However, since then, the arcade community has been slowly dying as console and computer games become more popular. The number of arcades nationwide has dropped

from 5000 to 4000 in the past five years, and similarly, the 750,000 arcade machines throughout the US in 1990 has declined to about 450,000 in 2000 (Tran, Kirby). Since then, it has been maintained that the arcade culture is “one notch further away from the mainstream in the U.S.” as compared to Japan (Carless “Go East Young Man”).

However, *Dance Dance Revolution* managed to gather a following in the United States despite the falling popularity of the arcades. There seem to be several factors which contributed to the success of the DDR community. In 1999, Konami officially released DDR to the US, however, even a year later, fewer than 12 states had a DDR cabinet and many of these were on the west coast (Wong). This may have been due to the high, almost inhibitory \$15,500 price of the arcade cabinets. Even when the prices of the machines went down to around \$7,000 to \$11,000, many arcade operators still hesitated to buy them (Kirby). Thus, because of the general lack of DDR machines, players of DDR had to gather in one of the few arcades which had the game available.

Thus, many of the players of *Dance Dance Revolution* had to gather in a single place. This fact plus the performative aspect of the game facilitated social interactions which planted the seeds of a DDR community. Without the performative aspect discussed earlier, the game would have been largely a solitary form of entertainment. But by drawing a crowd, DDR involves multiple people who can all interact around the game. “People who might not otherwise spend time together become friends through DDR” as stated in a Santa Cruz Sentinel article (McKee). The Golfland Entertainment Centers were some of the very first places to obtain DDR machines, and “DDR Freaks,” the term used for hardcore fans of the game, congregated at these arcades; a group of especially enthusiastic players traveled as much as 45 minutes every Friday night play at the Milpitas Golfland (McKee).

The DDR arcade community also stood out because it was not nearly as male dominated as the majority of the game communities which were in existence. As Jason Smith noted in his study of *Dance Dance Revolution* fan culture, “women form a significant portion of DDR fans.” Thus, the DDR arcade community, from the start, was able to draw in the other 50% of population which was usually ignored in game communities. In contrast, the *Everquest* community is composed of only 16% female players, yet a game-player noted that at a GameWorks arcade, the majority of the players of DDR were female (Yee, Shin).

Race also contributed to diversity in the DDR community. Although most of the players of DDR were initially Asian, likely due to the fact that DDR began as a Japanese phenomenon, the players of game soon became very diverse (Kirby). In his study “I Can See Tomorrow in Your Dance,” Jacob Smith, somewhat stereotypically, argues that *Dance Dance Revolution* appeals to different races; he states “DDR garners Asian fans via its Japanese origins and connection to anime culture, white fans via video gaming, and African-American fans via hip-hop and breakdancing” (Smith “Tomorrow in Your Dance”). Whether or not this reason for the racial diversity is actually true, it is clear that the community of DDR players was highly diverse.

Therefore, the initial DDR community was very different than other communities like the *Everquest* online community. First of all, the arcade community was highly diverse, in gender and in race. The community also developed through interactions *around* the game rather than *within* the game environment like in *Everquest*. Also, the arcade community phase was marked by face-to-face social gatherings because in order to play the game, the players had to be at the arcade. Thus, the arcade community was also very regional; the community of DDR players was different in different parts of the country and there was generally limited contact between players

from different areas. This regionalism, however, began breaking down as the tournament community began to form.

Tournament Community

As the popularity of *Dance Dance Revolution* grew, different creative play styles emerged. The two main styles of play which developed were called “tech” and “freestyle.” In tech play, the player attempted to be as accurate as possible and maximize their score. However, in freestyle play, the focus was on performing visually impressive dance moves and tricks while also stepping on the right arrows. Yet accuracy was seen as second to performance in freestyling. Tricks like “knee-dropping” (hitting arrows with the knees), “spins” (turning in a circle while hitting arrows), “hand plant” (using a hand to hit an arrow), and “matrix-walking” (holding onto the support bar while walking across the screens) came into popularity which helped push DDR from being a game to a true performance (DDR Dictionary).

With two play styles, members of the DDR community often criticized one style or the other with comments like “POWER TO THE PEOPLE WHO ACTUALLY DANCE WHEN THE [sic] PLAY DDR” (Smith “Tomorrow in Your Dance”). A competitive aspect of play began to develop as freestyling became more popular. Hardcore players, like DJ 8-ball as he was known, began creating set routines in an attempt to outperform other players. DJ 8-ball came from a “DJ Battle” tradition, and thus he brought with him a willingness to compete against other players (Smith “Tomorrow in Your Dance”).

In July of 2000, DDR players convinced Playland Arcade at Santa Monica Pier to hold a tournament. This was one of the first of its kind, and it attracted around 50 people from around California (Wong). These early tournaments paved the way for larger and more attractive

competitions. Seattle's GameWork's arcade, Southern Hills Golfland, and the Sony Metreon in San Francisco held tournaments in which top competitors were awarded cash prizes, color televisions, and CD players (Tran). These tournaments allowed players to perform their preplanned freestyle routines, often dressing up in elaborate costumes. Participants would do all types of tricks and dance moves to impress the audience, and more importantly, the judges. At the 2000 Metreon tournament, one competitor apparently "walked up to the machine in an ordinary track outfit and proceeded to backflip and mule-kick the crowd into a state of shock" (Smith, "Tournament Report"). As seen in the judging criteria for the recent "Christmas of Fire" Tournament in New Jersey, performers were scored based more on their movement, preparation, energy, originality, and flow rather than their objective, technical scores ("Christmas of Fire"). Thus the tournaments helped move DDR further into the realm of performance.

The tournaments brought together hundreds of DDR players from all over the state and thus the regionalism present in the early arcade communities began to dissolve. On an online poll hosted by DDRFreak.com, 69.5 percent of the 613 participants stated that they would be willing to travel at least 30 miles to attend a *Dance Dance Revolution* tournament ("Poll of the week"). Thus, the tournaments acted as larger social gatherings at which DDR players could meet, socialize, and discuss the game. These competitions are closely related to the *Quake* competitions, like QuakeCon in 1996, as described by Brad King and John Borland in *Dungeons and Dreamers* (117). They both brought together players from many areas of the country, all of which found the game an important part of their lives. This allowed players to come face-to-face with other players of the game and form larger social networks within the growing community. Thus, although the DDR community was formed differently than the *Quake* community, which

was formed from within the construct of the game, the competitive aspects of the two communities are highly similar.

Jacob Smith, in his study of DDR fan culture, argues that because dance is traditionally viewed as a female domain, many male players of DDR may have felt their masculinity threatened. Thus, male players “masculinized” the game by creating tournaments which require the competition and athleticism of a sport (Smith, “Tomorrow in Your Dance”). Although this argument seems an overgeneralization, the gender ratio of the tournament community seems to mirror Smith’s argument. On a DDR Freak forum, numerous players have commented that they rarely see female players at tournaments; in one case there were ten female players at a tournament, in another there were four, and in another, only one (“Demographic Amusement”). This is highly similar to the general lack of female players in tournaments of the competitive games *Quake* and *Doom* (Borland & King 142).

It is important to note that the DDR players who made up the arcade community did not necessarily become part of the tournament community. The tournament community focused on performance, and those players who did not view the game as performance or were more casual players of the game often remained part of the arcade community. Therefore, the tournament phase of community development allowed for the most dedicated players of DDR to meet other players and engage in social interactions which were not found in the arcade. Thus the tournament community was characterized by increasingly competitive and performative play, by increasingly disproportionate gender ratios, and by eroding regional divisions as players from different parts of the country gathered together, highly paralleling the development of other game communities like those built around *Quake* and *Doom*. Regional barriers, however, soon became virtually nonexistent with the establishment and enormous growth of the online DDR community.

Online Community

Every Friday night, a group of DDR fanatics met at the Milpitas Golfland to play *Dance Dance Revolution* at the arcade (McKee). As the game slowly became more popular, the group decided that a website would be a good way to promote DDR and bring together players in the San Francisco Bay Area. One member of the group, Jason Ko, a 20 year-old UC Berkeley student, thus started the website, named DDR Freak, on March 12, 2000 on a UC Berkeley instructional server (“About DDR Freak”). As weeks passed, the website began registering more than a few hundred hits a week to a few thousand. Although it was largely meant for the California Bay Area DDR community, visitors from all over the nation began exploring the site. In less than nine months, DDRFreak.com had over 30,000 hits a week (Libaw). Soon other DDR fansites, like DDREI.com and DDRSpot.com, began emerging.

Thus the online DDR community was born. Very early in the development of this community, forums became an important venue for heated discussion of DDR. Forums allowed players to exchange tips and tricks, discuss styles of play, and interact with DDR players from all over the nation. As of today, nearly 40,000 members of the DDR Freak forum actively discuss everything from “what songs do you think are overrated?” to “what do you drink while playing DDR” (“DDR Freak Forums”). The forums were the main avenue through which players met other players online, breaking down regional barriers. These forums clearly parallel the extensive use of IRC (internet relay chat) within the *Quake* and *Doom* communities in the 90s (Borland & King 119).

Thus, the top players from around the nation, like DJ 8-ball, J Dogg and Kid Zero, became well known and thoroughly discussed in the forums despite many players’ spatial separation from them. One good example of disintegrating regional barriers was the

controversial discussion of the A-Team around 2000 to 2001. Many players were impressed by the A-Team's flashy routines, but many other players criticized them for "bar raping" or excessive reliance on the arcade machine's support bar to perform tricks (Kenobi). The interesting thing about the A-Team, however, was not that they were controversial; it was mainly that they received so much attention in the US despite being a Korean DDR team. Thus the online medium allowed the DDR community to expand and "globalize."

Furthermore, the online community also allowed for a "remediation" of the traditional performative play. While the spectators of DDR performances were usually physically gathered around the machine, the internet community allowed for famous "demos," or videos of DDR routines, of top players to be viewed from any online computer. This parallels the *Doom* demos created by the respected player "noskill" in 1995 and 1996 (Lowood). These demos allowed aspiring players to watch the "pros" at tournaments, and the online community thus added a whole new aspect of performance. Thus we see that while the arcade community allowed the DDR community to develop *around* the game rather than within the game like in *Doom*, *Quake* and *Everquest*, the DDR tournament and online communities tend to parallel the development of these older communities.

It is important to remember that the online community was not a separate entity from the arcade or tournament communities; it was an extension of both. For example, on the DDR Freak website, an entire section of the webpage was devoted to upcoming tournaments showing how the tournament community is an integral part of the online community.^{iv} Furthermore, the website also maintains a database of all known DDR cabinets in the 50 states, showing that the online community is inextricably linked with the DDR arcade culture. Thus, each of these three aspects, the arcade, the tournaments, and the internet, contributed to the overall success of the

DDR community, providing a multitude of methods of social interaction leading to a booming success in DDR as a game.

An Expansion Beyond Community

Thus far, we have largely focused on the DDR community consisting of players who have been enthusiastic enough to find DDR to be part of their lives, and interact with other players of DDR. Up to this point, we have ignored the casual players of DDR who play less than once every few weeks, usually whenever they happen to be at or near an arcade. It is important to consider these players because, although they tend not to be part of the DDR communities through the forums or tournaments, a large number of DDR players are these casual players.

As DDR became more and more popular, in part due to the previously discussed DDR community, many people began trying the game “just for fun” once in a while. At the Santa Cruz Beach Boardwalk arcade, the game “attract[ed] many new players,” nearly 2000 in three months, however many of the players didn’t continue playing immediately because they were “scared [they’d] look stupid” (McKee). Thus, many of the casual players of DDR occasionally play the game for amusement and do not consider DDR as a factor in their lives. This led to an expansion of the game beyond the hardcore community of players.

This expansion beyond community was highly accelerated with the release of DDR for the PlayStation home console in April, 1999 in Japan (GameFAQs). The first release for the United States, however, was not until March 2001, two years after the first DDR arcade machines were available in the states (GameFAQs). The home version allowed players, who bought plastic dance pads which could hook up to their game console, to play the game without the embarrassment often associated with playing at the arcade. This allowed casual players of

DDR to play in the privacy of their homes, avoiding the social settings which made up the DDR community.

The home console version of DDR, however, must not be interpreted as focusing solely on casual players of the game, breaking away from the mainstream DDR community. In contrast, it was highly popular among hardcore DDR players as a practice tool, to sharpen their skills for the arcade. It is clear that the designers of the game expected the home version to supplement the arcade version as well; by October 1999, Konami had included slots for PlayStation memory cards on their arcade consoles, allowing players to play their homemade step patterns at the arcade (Carless, “Fly Me To The Moon?”). These “edits” later became an integral part of tournaments, allowing players to make their routines even more original by creating their own dances.

The hardcore DDR community further expanded the home console culture by demanding more responsive, longer-lasting, dance pads which could emulate the arcade platform well. Companies like RedOctane and Cobalt Flux emerged and began selling high-performance dance pads for as much as \$300 for a single pad (Cobalt Flux).



\$300 Cobalt Flux dance pad

Yet the many of the owners of the home version were casual players who would never be seen at the arcade. Players had many different reasons for playing the game; one of the most interesting reasons was called the “DDR Diet.” The vigorous physical activity led many people to use the game as an entertaining way to lose weight; some testimonials claim that people have lost up to 150 pounds by playing DDR alone (“Testimonial Mode”). Most versions of the home

game even included a “workout” mode which counted calories burned and kept a journal of the time and length of the workouts.

Thus, for a multitude of reasons including those listed above, by December 2, 2003, Konami had sold 6.5 million copies of the home version of DDR (“News Release”). From this figure, it is clear that the game has expanded beyond the boundaries of the hardcore community and into general public acceptance. Furthermore, fewer and fewer arcade machines are being produced; the last newest cabinet was DDR Extreme release two years ago in 2002 (GameFAQs). At the same time, more DDR mixes are appearing on home consoles; DDRMAX and DDRMAX2 for PS2 came out in October 2002 and September 2003, while DDR Ultramix for Xbox was released in November 2003 (GameFAQs). Moreover, DDR Ultramix allows players to compete or play together through online play, thus bringing the social aspect of the game away from the arcade and into the home (Gerstmann). What does this imply for the DDR arcade culture? *Dance Dance Revolution*, which was once called “CPR for the arcade industry,” seems to be headed to the home console like so many other games (Kirby). It is highly possible that the movement to the home console may create a decline in the DDR arcade community. Yet in the end, we’ll just have to wait and see what affect this trend has on the global DDR community.

Conclusion

Through our examination of the *Dance Dance Revolution* community, several things are now clear. The community was built from three unique, yet highly intertwined segments, each of which helped break down the regional barriers between players and each of which allowed the players to interact in unique ways; the arcade community, the tournament community, and the online community all provided venues for player interactions, discussions, and competition. The

DDR community is thus unique in that it was not formed through interactions *within* a game, but rather through interactions *around* the game at the arcades. Yet as we have seen, the tournament and online community development highly parallel the structure of these other, older, game communities like *Quake*, *Doom*, and *Everquest* suggesting that there exists a common thread in all game communities, no matter how different they appear to be.

Looking at the DDR community has been important because it shows us an exception in the traditional form of a game community. By examining this unique player community, we have gained a better understanding of how a game community can develop outside the traditional massively multiplayer setting, making us realize that there is enormous diversity in games as well as their associated communities. As games in general become more diverse and more creative, it is highly likely more exceptional communities as interesting as the *Dance Dance Revolution* community will develop in unusual and intriguing ways. The study of these communities will provide greater insight into the diverse forms of player interaction built around games. Yet only time can tell what forms these new communities shall take and what games these communities shall form around.

ⁱ The number of members was calculated from numbers obtained on the DDR Freak forum <<http://www.ddrfreak.com/phpBB2/memberlist.php>>. The number of members per page of the memberlist (30) was multiplied by the number of pages (1236).

ⁱⁱ The number of DDR cabinets in the United States was calculated based on the “Machine Location” list on the DDRFreak.com website <<http://www.ddrfreak.com/locations/locations.php>>. Because this list is most likely incomplete, in all likelihood, there are many more uncounted DDR machines than this. The number of DDR tournaments was calculated by counting the number of events listed for 2002 on the events page of the DDREI.com website <<http://www.ddrei.com/events.php>>.

ⁱⁱⁱ The Sega Activator, released in the winter of 1993, was a full body interface for the Sega Genesis console. It consisted of a octagonal ring which was placed on the floor, inside which the player would stand. The player could thus move arms and legs outside of the ring to imitate punching and kicking when playing fighting games. However, it had inaccurate and slow response times, very limited game support, and was largely unsuccessful (Rubenstein).

^{iv} This section of the webpage was recently taken off the site because “the popularity of DDR has boomed, and tournaments are held in many places across the globe” thus making it difficult to keep track of the numerous events which occur every month <<http://www.ddrfreak.com/events/events.php>>.

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