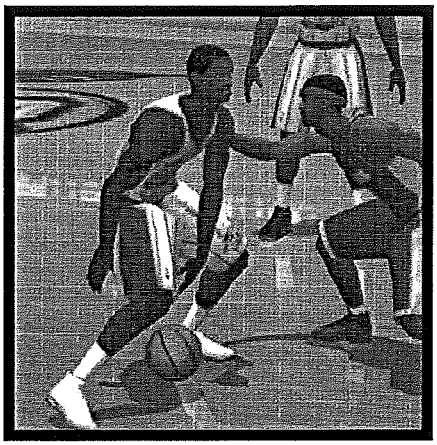
DEFINING DIGITAL GAMES



Basketball | | NBA Live 2001 | EA Sports

immediate interactivity
narrow input and ouput
information manipulation
automation
networked communication

8

[The video game] is the most complex toy ever built and is vastly more responsive than any other toy ever invented. Compare it, for example, with its contemporary, the doll Chatty Cathy, which has about a dozen different sentences with which to respond when you pull the string. Chatty Cathy does not take into account the variety of your responses; the computer does. Chatty has a dozen responses; the computer has millions.—**Brian Sutton-Smith,** *Toys as Culture*

The definition of "game" that we proposed in the previous chapter makes no distinction between digital and non-digital games—the qualities that define a game in one media also define it in another. Most of the thinkers whose definitions we explored were writing before the invention of computer games, let alone before the recent explosion of the video game industry. Yet computer and video games are an important part of the game landscape, as they bring a number of unique qualities and concerns to the practice of game design. Before proceeding any further, in this chapter we take a brief look at the special qualities of digital games.

The Computer Is Not a Computer

Digital and electronic games take a multitude of forms and appear on many different computer platforms. These include games for personal computers or TV-attached game consoles such as the Sony Playstation or Microsoft XBox; handheld game devices such as the Nintendo Game Boy Advance or specialized handhelds that only play one game; games for PDAs or cell phones; and games for arcades or amusement parks. Digital and electronic games can be designed for a single player, for a small group of players, or for a large community. For simplicity's sake, we will refer to all of these game forms as *digital games.*

Digital games are systems, just like every other game discussed so far. The physical medium of the computer is one element that makes up the system of the game, but it does not represent the entire game. The computer hardware and software are merely the materials of which the game is composed. One would not say that a deck of UNO cards is the same thing as the game of UNO. But people often fall into this kind of thinking when it comes to describing digital games. Take a straightforward example of a digital game: the game title Tetris for the Nintendo Game Boy handheld platform. Is the system of the game constituted entirely by the Game Boy console and the Tetris game cartridge? As outlined in ***Systems,*** the four elements of a system are objects, attributes, relationships, and an environment. The identities assigned to these elements within a game depend on how the game is framed: as a formal system of rules, as an experiential system of play, or as a contextual system embedded within larger systems of culture.

In order to see how this analysis functions within the present discussion of games and digital technology, we start with the widest frame—culture—and work our way in. If we view Tetris as a system of *cultural context,* the actual hardware and software of the game is a relevant component, but it hardly tells the whole story. In considering Tetris within the context of culture, we would need to include elements such as game fan magazines (*Nintendo Power,* for example), the marketing, manufacturing, and economics of the Game Boy console, the hybrid cultural identity of the game (Tetris' original designer, Russian Alexy Pajitnov and Japanese publisher Nintendo), the demographics of players, and so on. We would need to take each of these components into account. The exact elements to investigate depend on the specific cultural reading undertaken. In any case, culturally speaking the technological facet of Tetris is merely one element among many others.

Now consider the *experiential play* of Tetris: the cognitive and psychological, physical and emotional relationships that emerge between a player and the game. In this case, the elements of the system are constituted by 1) the player and 2) the Game Boy Advance console. The circuit of interaction between player and game runs in a kind of loop as the player plays, responding to the game even as the game responds to the player. In this picture, the digital technology itself is a part of the system, but certainly does not constitute it entirely.

Narrowing the focus to the *formal rules* of Tetris, the mathematical system of the game that exists apart from the player, are we talking just about the technology? Yes and no. The rules are embedded in the hardware and the software, but they are also something separate from the code. For example, the enactment of the rules is contingent on the player. The rules determine, among other things, what happens when a player pushes a button at a certain moment in the game. In this way, the internal logic of the game is not something that

can be completely severed from the ways that the game exchanges information with the outside world. Even here, in looking at Tetris as a formal system, considering the technology as an end in itself can be misleading.

What is the point of these multiple framings? A game designer doesn't create technology. A game designer creates an experience. Computer and video game technology can be a part of that experience—it can even be the focal point of that experience—but in order to design meaningful play a designer has to consider the complete picture.

What Can It Do?

The key question for game designers and digital media is not, *What is it?* But instead, *What can it do?* Confronted with a digital platform, a game designer needs to understand how to harness the technology into a designed system that results in meaningful play. This emphasis is not unique to digital games: the materials that constitute a game are always crucial in designing an experience.

What can digital technology do? What are the special qualities of digital media that can support gaming experiences not possible in other game forms? We can list four "traits" of digital media. The qualities are not mutually exclusive—there is some overlap between categories—and they do not constitute a definitive list of traits that appear in every digital game. In fact, these traits appear in non-digital games as well. But they do represent the qualities that appear most robustly in digital games, characteristics that game designers should take advantage of when creating games in a digital medium.

Trait 1: Immediate but Narrow Interactivity

One of the most compelling qualities of digital technology is that it can offer immediate, interactive feedback. Designing systems of actions and outcomes, where the game responds seamlessly to a player's input, is a common element in digital games. Digital technology thus offers real-time game play that shifts and reacts dynamically to player decisions.

A common misconception about digital interactivity is that it offers players a broad and expressive range of interaction—that a computer can mimic any medium and provide any kind of experience. In fact, the kind of interaction that a participant can have with a computer is quite narrow. Interaction with a home computer is generally restricted to mouse and keyboard input, and screen and speaker output. Compare the anemic activities of clicking, dragging, and typing with the range of possible non-computer game interactions: the kinesthetically engaging athletic, perceptual, and strategic interaction of Tennis; the performative theatrical communication of Charades; the ritualized formality of a professional Go match. So although the immediate interactivity of digital games is a powerful element for designers to consider, the medium is rife with limitations.

On the other hand, limitations in games help shape the space of possibility. For example, an arcade fighting game such as Street Fighter II gives a player only six button pushes and eight joystick directions as a means of input, far fewer than a mouse and keyboard. Yet within this limited interactive vocabulary, players can develop highly personal fighting styles and take part in a vast range of different game experiences. The lightning-quick response of the program, paired with the streamlined control input, contribute to the uniquely meaningful play of a well-designed fighting game.

Similar pairings of limited but immediate interactivity appear in non-digital games as well. A sport such as bicycle racing gives players a very restricted set of interactions. At the same time, players receive immediate feedback for each tiny modification of speed, steering, and the position of their bodies on their bicycles. Much of the deep engagement that cyclists experience while racing emerges directly from the narrow but immediate interactivity of the sport.

Trait 2: Information Manipulation

One way of framing digital media is as machines for storing and manipulating information. Games certainly capitalize on this capacity for what Janet Murray, in *Hamlet on the Holodeck* calls the "encyclopedic" quality of digital media.[1]

Digital games can and do make good use of data: they are often filled to bursting with text, images, video, audio, animations, 3D content, and other forms of stored data. In fact, it is fair to say that digital games tax the data-rendering capabilities of computers far more than any other genre of consumer software. High-end personal computers, specially configured for the best display of 3D graphics and audio, are marketed as "gamer" machines.

But graphics and audio are not the only kind of information that a digital game manipulates. Every aspect of a digital game, in fact every aspect of its program—the internal logic, mechanisms for handling player interactivity, memory management—can be regarded as information. Digital games manipulate this information in ways that non-digital games generally cannot. For example, consider the rules of a game. In a typical board game it is necessary for at least one of the players to learn the rules and understand them fully before a game begins. On the other hand, with a digital game it is possible, as designer Karen Sideman has pointed out, to learn the rules of the game as it is being played; to make the discovery of the way that the game operates part of the play of the game.[2]

Digital games are also excellent at hiding information from players and revealing it in very particular ways. Warcraft III, for example, is a real-time strategy game that makes use of a "fog of war" mechanic: the game is played on a large map, and the territory and actions of a player's opponents are initially hidden and only revealed as the player's units explore the game map. Of course, many non-digital games involve information manipulation as well. The simple card game Memory, in which players lay a grid of cards face-down and attempt to pick up pairs of identical cards by remembering past moves of their opponents, is a game explicitly about the manipulation and gradual discovery of hidden information.

Trait 3: Automated Complex Systems

Perhaps the most pervasive trait of digital games is that they can automate complicated procedures and in so doing, facilitate the play of games that would be too complicated in a non-computerized context. In most non-digital games, players have to move the game forward at every step, by manipulating pieces or behaving according to explicit instructions outlined by the rules. In a digital game, the program can automate these procedures and move the game forward without direct input from a player.

When miniatures wargamers get together to stage their battles with tiny lead figures, they follow complex rules that determine the movement, lines of sight, and combat resolution of their armies. Even though wargamers tend to have a high tolerance for complex sets of rules, there are certainly limits on the degree of complexity that they can endure before the game becomes an exercise in tedium. This is exactly the kind of complexity that computers handle with ease. In fact, wargames created for play on computers generally take into account many more dynamic variables than their non-digital counterparts.

This is not necessarily a good thing. As James Dunnigan, a designer of wargames on and off the computer states, "While computer wargames had many advantages over manual games, they had one major minus for game designers. Computer games did not reveal their internal workings."[3] Dunnigan calls this the "Black Box Syndrome" of computer games:

> Another advantage of paper games is that you know why things are happening a certain way in the game. All the rules and probability tables are right there in front of you. Yes, it takes a lot of effort to wade through all of that detail, but you do end up with a good idea of how the inner workings of the game function. A popular

benefit of this is the opportunity to change the game's rules and probability tables. Many players do this, and that's how gamers eventually turn into game designers. Computer wargames show you very little of how it does its thing. The computer program just does it, leaving you sometimes muttering about mysterious "black boxes."[4]

Dunnigan feels that a player's appreciation and understanding of the internal game mechanics are a key component of the play of wargames. Because of the automated nature of digital games, computer wargames generally leave the internal machinations out of the picture, diminishing a player's experience of the game.

The kinds of automated complex systems that appear in digital games vary greatly, from the evolving ecosystems of Sim City, to the sophisticated artificial intelligence opponents of Thief, to the complex light-and-shadow rendering routines of Unreal, to the natural language parsing of Zork. It is safe to say that nearly every aspect of digital games is automated in some way.

Once again, however, there are examples of non-digital games that contain complex automated systems. The Japanese pinball-like game of Pachinko involves a complex randomizing system of metal balls falling over pegs. Once the player launches a ball, the automated, complex process of the game system takes over, determining where the ball will land and if it will score points for the player. Becoming skilled at Pachinko entails getting to know the inner workings of a particular game, and knowing how to use subtle control to arrive at the desired result.

Trait 4: Networked Communication

A final trait that many (but not all) digital games possess is that they can facilitate communication between players. There are many forms of digitally mediated communication, from email and text chat to real-time video and audio communication. Two Game Boy consoles connected through a link cable can even be considered a miniature digital game network.

It is clear that all multiplayer games, digital or non-digital, are contexts for communication among players. However, digital games offer the ability to communicate over long distances and to share a range of social spaces with many other participants. For example, the persistent worlds of Ultima Online draw tens of thousands of players, all brought together in the same complex social space.

Although communication input and output are limited by the narrow input and output of digital media, communication in a digital game does not have to be restricted to text. For example, a Quake deathmatch gathers a small number of players together in a single communicative game space. And although text chat is one way that the players interact, their primary form of communication takes place through the split-second decisions they make about their player's movement and weapon attacks. Game play itself is a form of social communication.

As with the other traits of digital games, networked communication, even over long distances, occurs in non-digital games. The postal system has long served as a medium for game play, from play-by-mail games of Chess and Diplomacy to role-playing games that take place entirely through written correspondance. In a wider sense, sports stats and records, whether for the Olympics or for a high school Basketball team, serve a communicative function similar to online high score boards.

Integration

In concluding the discussion of the qualities of digital games, it is important to remember that these four traits are not a roadmap for designing games or a checklist for analyzing them. They simply highlight ways of understanding the capabilities of digital game design. In a Quake deathmatch, for example, we can see all four traits in operation:

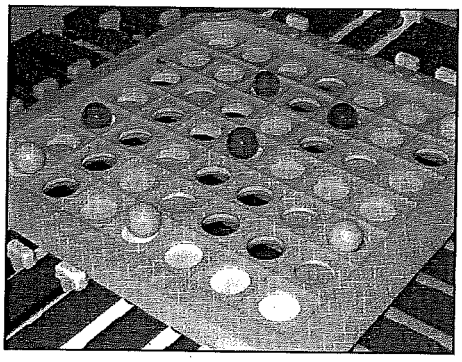
- *Immediate but narrow interactivity:* The game controls require deft manipulation of the mouse and keyboard, with instantaneous response from the game system.
- *Manipulation of information:* Like all digital games, Quake manipulates information, from the 3D data defining the deathmatch map to the way that players' movements are present but hidden from each other.
- *Automated complex systems:* The graphics engine, control routines, opponent AI, and all other formal aspects of the game are automated.
- *Networked communication:* The online deathmatches create a forum for rich social interaction between players.

During any actual game experience, the four categories generally overlap and operate simultaneously, together providing the overall experience of play.

Before we end this chapter, let's take a moment to consider a "border-line" case: the board game Stay Alive. In this non-digital game, play takes place on a grid that houses a simple mechanical set of plastic switches. There are two sets of switches, at ninety degrees to each other. Some of the switch positions have holes and some do not. Players place their marbles on the grid and then try to eliminate opponents' marbles by moving the switches in turn.

Stay Alive is not a digital game, but it has some of the properties of a digital game. For example, Stay Alive contains a complex system that functions semi-autonomously from the players. Because there is hidden information about which positions of the sliders have holes and will drop marbles, players interact with the system indirectly, moving sliders on the margins of the system to see how the playfield is affected as a result. Players do not internalize the rules of all of the positions of the sliders; instead, this information is contained in the mechanical construction of the playfield.

Stay Alive



Is Stay Alive a digital game? Of course not. It is not electronic and does not make use of digital technology. However, it clearly demonstrates how many of the elements of digital games are not really unique to the medium. In fact, a deck of cards can hold information as well: if a player shuffles the cards, the player does not need to internalize the order of the cards. Instead, the physical properties of the deck (the fact that it can be shuffled and that the cards can be face-down) lets the cards contain information that is autonomous from the players, such as which card is on the top of a face-down deck.

These examples of game technologies (a deck of cards, Stay Alive, a digital game) provide a sliding scale for the kinds of complexity that game materials can embody. They also help to underscore a larger point: although different game materials allow for different game experiences, the underlying properties of games are ultimately more similar than different. The core challenges of designing meaningful play hold true in any game medium.

Notes

1. Janet Murray, *Hamlet on the Holodeck* (New York: The Free Press, 1997), p.83
2. Karen Sideman, Game Design address, 2000.
3. James F. Dunnigan, *Wargames Handbook: How to Play and Design Commercial and Professional Wargames,* 3d ed. (San Jose: Writers Club Press, 2000), p. xii.
4. Ibid. p.74–5.

Defining Digital Games SUMMARY

- If a game is framed as a system, it is clear that the game's physical medium is an important element of the game, but does not constitute the entire system. Digital technology should not be emphasized as an end in itself, but instead should be understood as one element in a larger designed system.
- There are four traits that summarize the special qualities of digital games. These traits are also present in non-digital games, but digital games generally embody them more robustly:

  Trait 1: Immediate but narrow interactivity
  Trait 2: Manipulation of information
  Trait 3: Automated complex systems
  Trait 4: Networked communication

- The underlying properties of games and the core challenges of game design hold true regardless of the medium in which a game manifests.