Game designer of Pac-Man World™ and Maximo™ series

SCOTT ROGERS

2ND EDITION

Level UP!

THE GUIDE TO GREAT VIDEO GAME DESIGN

NEW CONTENT THROUGHOUT

Free 2 Play

Fun and UNFUN

Gameplay as Story

Mobile Gaming

What Gamers Want

WILEY

Level Up!
The Guide to Great Video Game Design

2nd Edition

Scott Rogers

WILEY

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Foreword

LIKE A MAGICIAN laying bare the means with which he amazes his audience, Scott Rogers in this, the second edition of *Level Up!* reveals the tricks of the trade for creating compelling video games.

A number of game designers have attempted this feat in the past, but Scott's great book provides something rare and important: a breaking down of and then a deep dive into the specific elements that must come together to create engaging interactive entertainment.

The fact that this book does that important work with a breezy, fun writing style and silly cartoons is a testament to Scott's abilities as a game designer; for the best designers are always aware that no matter how complicated the section of gameplay, the most important rule is to keep things engaging! This book—like Scott's games—does that in spades!

Readers across the spectrum of experience will find much to love and learn in this fun, giant, and necessary book. Folks new to the medium will be amazed at just how much thought goes into creating 'fun.' And experienced game designers who, like myself, have been doing this stuff by gut for decades will be stunned as they discover that there is indeed a method to the madness. Many times reading this book I caught myself thinking, "Oh, THAT'S why that works!"

As you turn the page, know that you are in for a treat! I look forward to playing the games you create after having taken in the great knowledge this book contains!

Best of luck—and enjoy!

David Jaffe, Creative director of the *Twisted Metal* series and *God of War* San Diego, CA December 2013

Press Start!

If You Are Anything Like Me . . .

. . . YOU READ THE first page of a book before you buy it. I find that if I like the first page, I'll probably like the whole thing. I have noticed that many books have an exciting excerpt on the first page in order to grab the reader's interest, such as:

> *The skeleton dragon grabbed the helicopter with bony talons and shook it so hard that Jack's teeth rattled. Evelyn fought at the controls, attempting any maneuver that would free the copter from beast's unyielding clutches. "Hang on!" she screamed over the engine's tortured whine. "We're going down!" The world whirled around and around as the copter and dragon performed a death waltz. Jack didn't remember the copter slamming hard into the skyscraper or the crash or the dragon's bones raining down or being thrown from the wreckage—until Evelyn shook him into consciousness. "Jack! Jack!" she said. "We need to move. Now!" "What's the hurry, Sis? That dragon's toast." Then his eyes finally focused. On the cemetery gate. On the crooked gravestones. On the zombies pulling themselves from the dirt. Jack thought, "Nuts. I should have never opened that book."*

Not that I would ever resort to such cheap tactics in *this* book. I have also noticed that some books try to gain respectability by publishing a positive quote from an industry professional or famous person on their first page:

> *I learned more from reading the first page of the second edition of* Level Up! The Book of Great Video Game Design *than I learned from working for 25 years in the video game industry!*
>
> *–A very famous game designer*[1]

[1] No doubt you are smart enough to have realized that this isn't a real quote, because there isn't a very famous game designer. Unless you count Shigeru Miyamoto, the creator of Mario. Drat! I should have translated the quote into Japanese!

You obviously don't need someone else to tell you how to make up your mind. Just by picking up this book, I can tell you are a discriminating reader. I can also tell you are seeking the straight truth on the creation of video games. This book will teach you the who, what, where and, most importantly, how to design video games. If you have an interest in arcade games, boss fights, chili, deadly traps, ergonomics, fun, giant hydras, haunted mansions, islands and alleys, jumps, killer bunnies, leitmotifs, Mexican pizza, non-player characters, one-sheet designs, pitch sessions, quests, robotic chickens, smart bombs, the triangle of weirdness, unfun, violence, whack-a-mole, XXX, Y-axis and zombies, then this is the book for you.

Before we start, keep in mind that there are many ways to approach game design. All of them are valid, as long as they can communicate the designer's ideas. The tricks and techniques found in this second edition of *Level Up!* are MY WAYS of creating game design.

Another quick reminder: when I say "I designed a game," this is an oversimplification. Video games are created by many, many, many talented people (you'll be introduced to them shortly) and to give the impression that I did all the work myself is not only incorrect but egotistical.[2] There is no "I" in team.[3]

The majority of the games I've helped design were single player action games, so many of the examples found in this edition of *Level Up!* are skewed towards that perspective. It's just the way I think. But I have also found that most of the gameplay concepts are transferable to many different genres of games. It won't be too hard for you to translate my advice to your own game, no matter what the genre.

Another thing before we get started. If you are looking for a single chapter about gameplay, don't bother. Because EVERY chapter in this book is about gameplay. You should be thinking about gameplay all the time and how things affect the player, even when designing passive elements like cutscenes, monetization models, and pause screens.

Since you have made it this far, I may as well start by actually telling you the bad news first. Making video games is very hard work.[4] I have worked in video games for over 20 years and on games that have sold millions of copies.

But in that time, I have learned that making video games is also the best job in the world. It can be thrilling, frustrating, rewarding, nerve-wracking, hectic, boring, vomit-inducing, and just plain fun.

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[2] It's a small industry. No one can afford to make enemies! Be a nice, hardworking person and you'll go far.

[3] Ironically, there is a "me."

[4] I once had an employer who would walk the halls of our office muttering how "video games are a haaaard business." I used to laugh at him back then, but I don't any more. He was right.

No, You Can't Have My Job

Over the course of my career, I came up with some **Clever Ideas** and learned some **Universal Truths.** For your convenience, I have added these at the end of each "level."

I also learned a couple of **very important things.** You can tell they are **very important** because they are written in all uppercase letters. The first **very important thing** I learned was:

GAME DESIGNERS HAVE MORE FUN

I know this, because my first job in the video game industry was as an artist.[5] Back in those 16-bit days, video game artists drew images with pixels. There are several great 16-bit artists, like Paul Robertson and the teams that made the Metal Slug and classic Capcom fighting games; but for me, drawing pictures out of pixels is like drawing with bathroom tiles. Here is what a drawing I made out of pixels looks like:

Anyway, as I was "pushing pixels" I heard the sound of raucous laughter coming from the group of cubicles next to mine. I peered over the wall to see a bunch of video game designers yukking it up and have a good ol' time. For the record, I was not having a good ol' time pushing pixels. I realized, "Those game designers are having more fun than I am! Making video games should be fun! I want to have fun! I want to become a game designer too!" And so I did. I eventually worked my way up the ladder to become a game designer. After I became a real game designer, I learned the second **very important thing:**

NO ONE ON YOUR TEAM WANTS TO READ YOUR DESIGN DOCUMENT

This is a horrible thing to discover, but it is something every game designer needs to hear. Here I was, a brand new game designer with brand new game designs ready to go, and no one wanted to read any of them! What was I to do? In order to solve this problem and get my

[5] Actually we were called "pixel pushers" and "sprite monkeys," neither of which, despite how cute those terms sound, were ever meant as a compliment.

colleagues to read my design documents, I started drawing them as cartoons. And guess what? It worked. They conveyed the ideas I wanted to get across to my teammates. And I've been designing games this way ever since, many of which have gone on to become top-selling titles. That is why you will find many cartoons, so you will continue reading and understand the ideas presented. If you do, then you can apply them to your own design and become a great designer, too.

Who Is This Book For?

Why *you,* of course. Provided you are one of the following people.

A working video games professional. There are lots of books about video game design, but most of them are full of THEORY, which I have never found very helpful while making a game. Don't get me wrong, theory is great when you are at a game developers conference or one of those wine and cheese affairs we game designers always find ourselves at. But when I am working on a game, with my sleeves rolled up and blood splattered all over the walls,[6] I need practical nuts n' bolts advice on how to solve any problems I may encounter.

[6] Figurative blood. To my knowledge, no one has died from making a video game.

I mention this because I assume that some of you reading this second edition of *Level Up!* will be experienced video game professionals. I hope you find the techniques and tips in this book useful in your day-to-day work. Not that this book doesn't have uses for beginners.

I'm talking about you, **future video game designers.** Remember, one page ago when I told you I was a pixel pusher? There was a point to that story, which is *I was just like you.* Maybe you're also an artist who is tired of hearing the game designers laughing it up over in the other office. Or a programmer who knows he can design a better enemy encounter than the knucklehead currently doing it on your game. Or maybe you are a tester who wants to move up in the world, but you don't know how to do it. When I wanted to become a video game designer, there weren't any books on the subject. We had to learn everything from other game designers. I was lucky to have a mentor and an opportunity to work as a game designer. If you don't have either of these things, don't fret. Read this book; I will be your mentor. All *you* need to do is follow my advice, be prepared, and take advantage of the opportunity when it finally arrives.

This book is also great for **students of video game design.** Back when I started making games, I didn't take any classes on video game design—because they didn't exist! I just made stuff up as I went along! And I made a lot of mistakes. This is why I wrote this book: so you can learn from all **my** mistakes before they become **your** mistakes too.

Finally, this book is for **anyone who loves video games.** I love video games. I love to play them. I love to make them and I love to read about making them. If you want to make video games, then you must love them too. Ironically, I know several people who work in video games that freely admit they do not like to play video games. That does not make any sense to me. Why would you work in video games if you do not love video games? They are fools. They should just step aside and let someone who loves video games make video games. Someone like you.

Why a Second Edition?

When I first wrote *Level Up! The Guide to Great Level Design* back in 2009, the gaming industry was a different place. Consoles were the undisputed kings, motion controls had just hit the scene, social gaming on Facebook was still becoming a thing, and the app store had just launched the year before.

Things move very fast in the gaming industry. No one was anticipating the popularity of mobile gaming, the importance of monetizaton, or the explosion of the indy gaming market. Looking over the first edition, I realized many topics needed to added, content needed to be updated, references modified, concepts re-explored. I hope that you find that this updated edition provides enough new information to warrant a second purchase for returning readers or a first for new ones.

At the very least, make sure to try the new chili recipe.

Level 1
Welcome, N00bs!

THIS CHAPTER IS written especially for people who are new to video games and how they are made. I talk about what is a game, who makes them, and what kinds of games there are. It's pretty basic stuff and if you already know it all and are not a n00b,[1] feel free to skip it. However, you are going to be missing out on a lot of great stuff. Don't say I didn't warn you.

Within the academic gaming community, there are many different definitions for what qualifies as a game. Some scholars insist that "a game needs to be a closed formal system that subjectively represents a subset of reality."[2] Others say that games need to have "players in conflict with each other."[3] I think those definitions are trying too hard to sound smart.

Game definitions are often simpler than that. Bernard Suits wrote that "playing a game is a voluntary effort to overcome unnecessary obstacles."[4] This is a pretty amusing definition, but still a bit too scholarly for my taste. Let's keep things simple. Let's consider hand ball. You need only one player for hand ball. Where are the other players to be in conflict with? Bouncing a ball against a wall without missing it is hardly a metaphor for reality—unless you lead a very boring life. Let's face it, sometimes a ball bouncing against a wall is just a ball bouncing against a wall.

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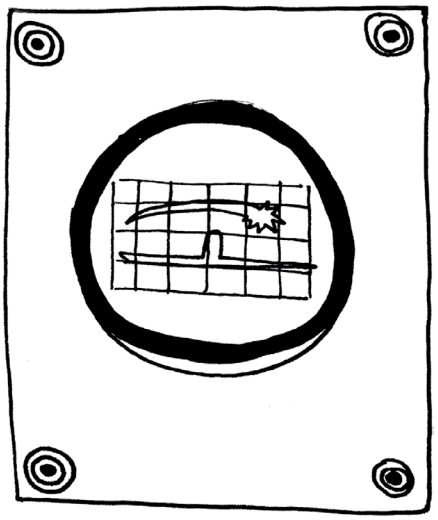
[1] The term "n00b" is short for "newbie," or someone who is new to a game or other venture. While the term predates the Internet, it became popular with MMORPG communities. Not a particularly flattering term, as it implies inexperience and/or ignorance. For example, only a real n00b would read a footnote defining what a n00b is!

[2] "What Is a Game?" Chris Crawford in *The Art of Computer Game Design*, McGraw-Hill/Osborne Media, 1984.

[3] "What Is a Game?" Roger Lewis in *The New Thesaurus*, Putnam Pub Group, 1979.

[4] *The Grasshopper: Games, Life and Utopia*, Bernard Suits, University of Toronto Press, 1978.

Playing hand ball may therefore seem like a time-waster, but a time-waster becomes a game when you add rules and an objective. A rule may be to throw the ball with your right hand and catch it with your left, or to not drop the ball. A victory condition could be that you have to catch the ball ten times in a row. A failure state would be if you violated any of the rules or victory conditions. When those criteria have been met, you have created a game. Ironically, while simple, hand ball was enough of a game to inspire the creators of one of the earliest video games: *Tennis for Two*.



Tennis for Two

So, let's ask this basic question:

Q: What is a game?

A: A game is an activity that

- Requires at least one player
- Has rules
- Has a win and/or lose condition

That's pretty much it.[5]

Now that you know what a game is, let's ask:

Q: What is a video game?

A: A video game is a game that is played on a video screen.

Sure, you can start complicating the definition and add requirements about devices, peripherals, control schemes, player metrics, boss fights, and zombies (and don't worry; we'll tackle these things soon enough). But by my reckoning, that is pretty much as simple as it gets.

Oh, there's one other thing to consider at this early stage. A game needs a clear **objective** so the player knows what the goal is. You should be able to sum up a game's objectives quickly and clearly. If you can't, you've got a problem.

Danny Bilson, THQ's former EVP of Core Games, has a great rule of thumb about a game's objective. He says that you should be able to sum up the game's objectives as easily as those old Milton Bradley board games did on the front of their box. Check out these examples taken from real game boxes:

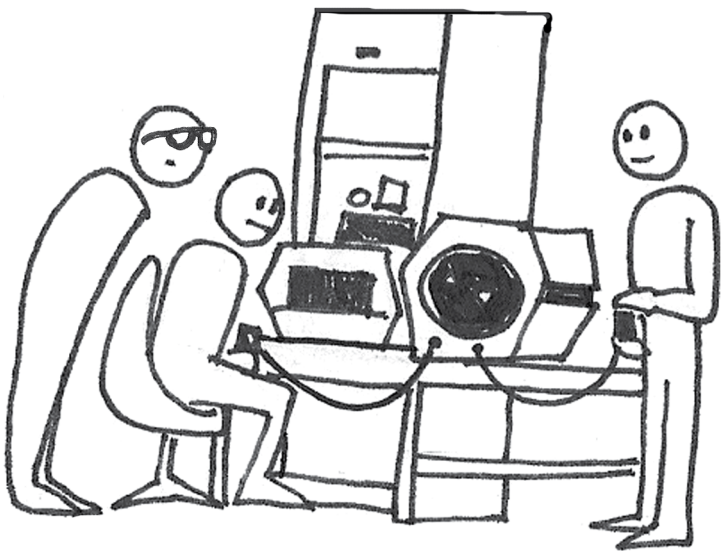
- *Battleship*: Sink all of your opponent's ships.
- *Operation*: Successful operations earn "Money." Failures set off alarms.
- *Mouse Trap*: Player turns the crank, which rotates gears, causing lever to move and push the stop sign against shoe. Shoe tips bucket holding metal ball. Ball rolls down rickety stairs and into rain pipe, which leads it to hit helping hand rod. This causes bowling ball to fall from top of helping hand rod through thing-a-ma-jig and bathtub to land on diving board. Weight of bowling ball catapults diver through the air and right into wash tub, causing cage to fall from top of post and trap unsuspecting mouse.

[5] A game should also be fun, although it's not mandatory . . . but we'll talk about that later.

Okay, let's just ignore that last one. The lesson is, you need to keep your game objectives simple. Speaking of simple games, let's take a moment to travel back to the dawn of video games. They had to start somewhere, right?

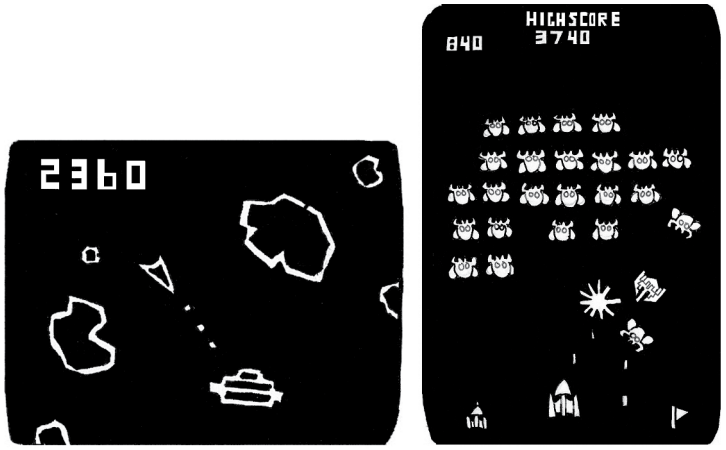
A Brief History of Video Games

The 1950s. The dawn of television, 3-D movies, and rock 'n' roll. Video games were invented in the 1950s too, only they were played by very few people, on very large computers. The first video game programmers were students in the computer labs of large universities like MIT and employees of military facilities at Brookhaven National Laboratories. Early games like *OXO* (1952), *Spacewar!* (1962), and *Colossal Cave* (1976) had very simple or even no graphics at all. They were displayed on very small black-and-white oscilloscope screens.



After playing *Spacewar!* at the University of Utah's computer lab, future Atari founders Ted Dabney and Nolan Bushnell were inspired to create *Computer Space*, the first **arcade** video game, in 1971. While (despite the name) the first arcade games could be found in bars, arcades dedicated to video games began appearing by the late 1970s.

Early arcade games were rendered using either **vector graphics** (images constructed from lines) or **raster graphics** (images constructed from a grid of dots called pixels). Vector graphics allowed for bright, striking images like those seen in *Battlezone* (Atari, 1980), *Tempest* (Atari, 1981) and *Star Wars* (Atari, 1983) while raster graphics spawned cartoon-inspired characters like Pac-Man (Namco, 1980) and Donkey Kong (Nintendo, 1982). These early characters became pop culture icons overnight; appearing in everything from cartoons and t-shirts to pop-music and breakfast cereals.

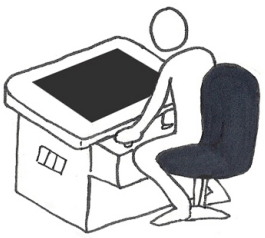


Asteroids
(Vector Graphics)

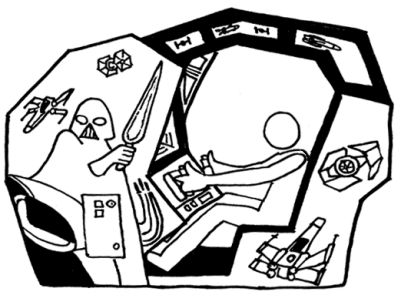
Galaxian
(Raster Graphics)

During the early 1980s, three styles of game machines dominated arcades: **uprights** (cabinets which the player stood in front of while playing), **cocktail tables** (arcade games set into the top of a small table, allowing the player to sit down while playing), and **cockpits** (elaborate game cabinets that allowed the player to lean or sit down to further enhance the gaming experience).

Upright Cabinet



Cocktail Table



Arcade Cockpit

In the mid-1980s, arcades began springing up everywhere, and video games took the world by storm. Game genres and themes became more varied, while gaming controls and cabinets became more elaborate with realistic controllers and beautiful graphics decorating uniquely designed cabinets. You could sit back to back in a two-player spaceship cockpit while playing *Tail Gunner* (Vectorbeam, 1979), battle Klingons from a replica of Captain Kirk's command chair in *Star Trek* (Sega, 1982), or "drive" in a miniature Ferrari Testarossa that moved and shook in *Out Run* (Sega, 1986). By the late 1990s, many arcade games started to resemble

single-rider theme-park rides complete with rideable race horses, gyroscopically moving virtual simulators, and fighting booths that allowed players to battle virtual foes using actual punches and kicks. The most elaborate of these arcades was Virtual World's BattleTech Centers—steampunk-themed arcades with linked "battle pods"[6] that allowed eight players to fight each other while stomping around in giant virtual "mechs." But these elaborate arcade games required lots of floor space and were very expensive to maintain. In the late 1990s, home systems began to rival and eventually surpassed the graphics seen in most arcade games. Arcades went out of business by the dozens. The video games were replaced with more lucrative redemption machines[7] and games of skill like skeeball, whack-a-mole, and basketball hoops. The golden age of video game arcades was over.

But you can't keep a good idea down. Since the late 90s arcades have become social and virtual experiences. **LAN gaming centers** combine retail and social space to allow players to play computer and console games on a per-hour basis. Many have upgraded to feature large-scale gaming experiences held in movie theater-sized venues. Internet cafes are similar to LAN centers but with an emphasis on cultivating a café-style environment. Meanwhile, the few arcade game manufacturers left are creating even more epic experiences—Namco's *Deadstorm Pirates (2009)* and *Dark Escape 4D* (2013) are more like theme-park dark rides[8] than arcade games.

If arcades are becoming more like theme-park rides, theme parks are becoming arcades. Theme park creators are gamifying their attractions, turning dark rides into full sensory arcade games. Theme parks around the world such as Futuroscope and Warner Brother's Movie World offer several virtual games and interactive dark rides. For example, *Toy Story Midway Mania!* at Disney's California Adventure (2008) whisks a four-player cart past a succession of giant video screens where players compete in a variety of carnival-style shooting games. Players use cart-mounted pop-guns to shoot virtual projectiles at on-screen targets. When some targets are hit, players are sprayed with air or water mist effects, creating an immersive "four-D" effect. The cycle of modern arcade gaming and home gaming has come full circle with the release of a Wii version of the *Toy Story Midway Mania!* attraction for home use (minus the air and water effects).

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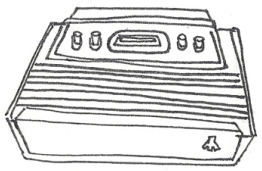
[6] In the mid-1990s, I had the pleasure of going to a BattleTech Center on several occasions. The battle pods were a video gamer's dream come true. The player sat in a photo booth-sized cockpit. Dual control joysticks and foot pedals operated the mech's movement. Triggers and thumb switches fired the arsenal of weapons. Surrounding the pod's video monitor were banks of dipswitches—each one actually having a function within the game from activating tracking devices to venting overheating weapons. It took at least one gaming session (about a half hour) just to learn what all the switches did! It was as realistic a gaming experience as I've ever had.

[7] Redemption machines are those claw catcher "games" you see in American toy stores and supermarkets. Personally, I would rather play the lottery than try my luck with one of these vending machines, which are rigged to (almost) guarantee you to lose. However, if you are ever in Japan, I recommend playing them as they are winnable and are usually stocked with some very cool toys and prizes.

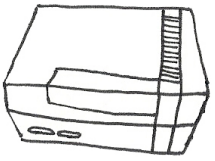
[8] A "dark ride" is an indoor amusement park attraction where riders travel in vehicles past scenes containing animation, sound, music, and effects. Famous examples of dark rides include Disneyland's *Pirates of the Caribbean* and *Haunted Mansion* and Universal Studio's *Men in Black: Alien Attack* and *Revenge of the Mummy*.

Happily, historians and academics have realized the impact and importance of video gaming. Museums have sprung up around the world, such as the Computerspielemuseum Berlin and New York's Museum of the Moving Image. Retro 80s arcades are making a comeback, complete with glo-in-the-dark carpet and tokens, offering players another chance to play their favorite vintage arcade games and revisit their old-school home system favorites.

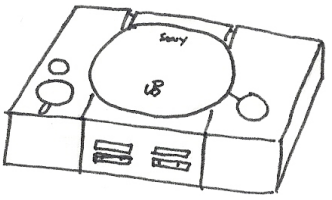
A **console** is a gaming platform that can be used in the home. A microprocessor runs the electronic device, which sends a video display signal to the user's TV set or monitor.[9] Unlike the dedicated controllers of an arcade machine, a home console controller has enough buttons, triggers, and analog controls to allow for a variety of games to be played. And unlike the dedicated motherboards in early arcade games, which could hold only one game, console games use cartridge, CD, and DVD media to allow players to quickly change games. The first commercial home console was the Magnavox Odyssey (1972) created by gaming pioneer Ralph Baer. Technologically, the Odyssey was pretty far ahead of its time. It featured an analog controller, games on removable ROM cartridges, and a light gun—the first gaming peripheral. From the late 1970s onwards, there have been many home consoles. Some of the more popular and/or well-known previous generation ones include the Atari 2600 and Jaguar, the Mattel Intellivision, the ColecoVision, the Nintendo Entertainment System and Super Nintendo, the Sega Genesis and Dreamcast, the 3DO interactive player, PlayStation 3, Xbox 360, and the Nintendo Wii. Current consoles such as the PlayStation 4, Xbox One, Nintendo Wii U, and the Ouya continue to bring gaming into the homes of millions of gamers worldwide.



Atari 2600



Nintendo Entertainment System (NES)

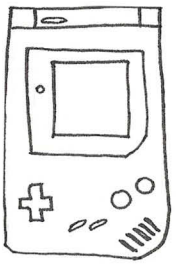


PlayStation (PSX)

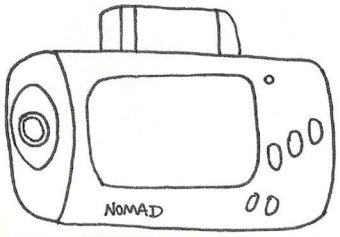
Like arcade games, **handheld games** have a visual display, a processor, and a controller, but are small enough to fit in the hands of the player. The first handheld titles were dedicated to only one game per unit. *Auto Race* (Mattel Electronics, 1976) used a digital display while the Game & Watch series (Nintendo, 1980) featured a more appealing liquid crystal display. Microvision (Milton Bradley, 1979) was one of the earliest handheld systems to have switchable cartridges.

[9] One console exception is the wonderful Vectrex portable game system (Smith Engineering, 1982). The Vectrex's processor, screen, controller, and even one game were all in a self-contained, portable system.

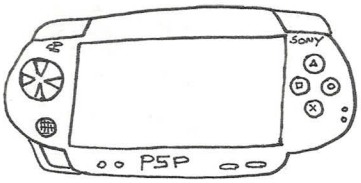
Handheld gaming took off when Tetris became a phenomenon on the Game Boy (Nintendo, 1989), the forerunner of the Nintendo DS.[10] Recent handheld systems have become quite powerful. The processor on the Sony PlayStation Portable (PSP) can run the equivalent of a PlayStation 1 game. That's quite a jump since the digital blips of Mattel Football! Recent systems like the Sony Vita and Nintendo 2DS and 3DS offer a wide variety of games and control schemes, combining more traditional controls and games with second screens, touch controls, and digital content.



Nintendo Game Boy



Sega Nomad



PlayStation Portable (PSP)

The Brave New World of Gaming: Mobiles, Online Distribution, and Touchscreens

Handheld gaming, particularly on **mobile devices,** is the main way people play games today. With the advent of digital-only content, you can carry an entire gaming library around in your pocket on a smartphone or tablet. Gaming, which used to require a monitor, a computer, and a controller, can now be played anywhere and at any time. Touchscreens have enabled the creation of new control systems and genres of games.

Mobile gaming has changed not only the way we play games but also the way they are made. Games that used to require large teams and large budgets to create are now being made by small teams and even individuals. The games can be created quicker and for less money than their console and computer counterparts. Gameplay is built around short play sessions and repeated play. Sounds familiar, doesn't it? Mobile game production resembles the early days of game development, when games where the product of small teams or even one person. And even the way a game can earn money has changed. Monetized game design has changed the way revenue can be generated, giving the developer and publisher more opportunities to earn money. It is fair to say that mobile gaming has changed the way we game forever.

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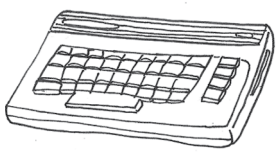
[10] Not ironically, the Nintendo DS bears several design semblances to the original Game & Watch series devices.

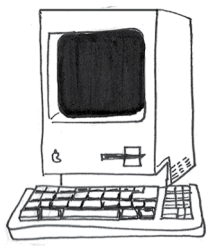
Another impact to gaming is the advent of **digital distribution.** Games can be purchased and downloaded at any time through the Internet. Digital gaming platforms such as Steam, Ouya, XBLA, the PlayStation Store, the Nintendo Store, GameStop App (formerly Stardock), and Origin's Client have enhanced or even replaced the need for a console. iTunes and the Android store allow gamers to download games for mobile and tablet devices. Physical storage space is no longer an issue because gamers can have as many games as their hard drives can hold. Of course, digital distribution has caused retailers to react with incentives for gamers who want to buy games the traditional way—sweetening the offer with season passes of exclusive content and collectable merchandise.

As **personal computers** (or **PCs**) became popular in the late 1970s, both video game programming and video game playing became more common. An entire generation of game developers started off in their bedrooms, programming games on their PCs. These early games were stored on cassette tapes that would be placed in tape drives or later on floppy disks that were placed in floppy drives. While early video game consoles attempted to emulate games found in arcades, early computers like the Apple II took advantage of the keyboard. The keyboard allowed greater user input and created unique genres including the text adventure game, like 1976's *Colossal Cave Adventure*. Since computer players could spend more time gaming (and would be more comfortable sitting down!) computer games necessitated a different gaming experience. Story-based adventure games, construction and management games and strategy games provided longer play experiences than their arcade counterparts and gave the consumer more perceived value for their money. I distinctly remember determining how much play time I was getting for my money: let's see, an average arcade game costs a quarter and *Temple of Apshai* cost $30, so I should be able to play it for how long . . . ?

As the computer hardware, memory, and storage evolved to CD and DVD media, computer games became more detailed, more involved, and more complex. The rise of the **first person shooter** (or **FPS**) can be attributed to the popularity of the mouse controller. By the mid-1990s, the computer was the ultimate gaming platform. Several gaming genres, particularly strategy, FPSs, and **massively multiplayer online** games (or **MMOs**) remain very strong on the computer platform. Touchscreen games, which were found only on handheld devices, are even more popular now that touchscreens are becoming the standard on desktop and laptop computers.



Commodore 64 (C64)



Macintosh Plus

Personal Computer (PC)

Game Genres

The term **genre** is used to describe a category of something—often the categories used to describe books, movies or music. Music can be rock and roll, gospel, or country. Movies can be action, romance, or comedies. Books can be dramas, biographies, or horror; you get the idea.

Video games can be classified into genres too, but here's where it gets a little tricky. Games have *two* types of genres: **story genre** and **game genre.** Just like the preceding examples, *story genre* describes the type of story-fantasy, historical, sports, and so on. *Game genre* describes the type of *gameplay*—much in the way that a movie can be a documentary or an art film. The difference is in the game's format and the player's interaction. The game genre describes the play, not the art or story. Simple enough, right? While I talk about story genre later, let's look now at the different kinds of game genres:

- **Action**—Action games rely on eye/hand coordination and skill to play. There are lots of stylistic variations available, making it one of the most diverse genres. Many of the earliest arcade games were action games.
- **Adventure—**Adventure games focus on characters (like in a role playing game), inventory management, story, and sometimes puzzle solving.
- **Augmented Reality**—Augmented Reality (or AR games) incorporate peripheral devices like cameras and global positioning (GPS) into gameplay.
- **Educational**—An educational game's primary intention is to educate while entertaining. These games are often aimed at a younger audience.
- **Party**—A party game is specifically designed for several players to compete in a variety of different styles of gameplay from quizzes to games of skill.
- **Puzzle**—Puzzle games are based on logic, observation, and pattern completion. Sometimes they are slow and methodical. Other times they require quick eye/hand coordination like an action game.
- **Rhythm—**In a rhythm game, a player tries to match a rhythm or beat to score points.
- **Serious—**At first glance, serious games seem similar to educational games but with a focus on social issues. But the genre is more diverse than that. Serious games are used to provide training, for advertising, or just exist as art!
- **Shooter—**Shooters primarily focus on players firing projectiles at each other. It's one of the most popular genres (at least here in the West) and there are many variations.
- **Simulation**—Simulations focus on creating and managing a world. Or a theme park. Or a farm. Or the life of an adorable monster. Many simulations cross over into the realm of "**toy games**"—games that provide tools for creativity but have no win or lose conditions.

- **Sports**—These games are based on athletic competitions from traditional sports to extreme ones. Like action games, there are many stylistic forms with this genre ranging from realistic simulations to fantasy variants.
- **Strategy**—Thinking and planning are the hallmarks of strategy games. This is one of the oldest genres of games; strategy games' roots are in ancient games like Senet, Chess, Go, and Mancala games.
- **Traditional—**Speaking of board games, traditional games are usually (but not always) based on games that existed in other, often physical, formats. Card games, board games, and casino games fall into this genre.
- **Vehicle simulation—**Players simulate piloting or driving a vehicle, from a race car to a star fighter. There are a variety of stylistic and control options for the player making the experience arcade-like or like a realistic simulation.

This list is just the tip of the iceberg! In addition to the genres in this list, you'll find a big list in **Bonus Level 5** describing all sorts of sub-genres and hybrids genres with lots of examples.

As games combine several genres and subgenres, new ones are constantly being created. For example, the *Grand Theft Auto* series combines action-adventure, third person shooter, driving, life simulation, and action-arcade genres into one game! *Tuper Tario Tros*.[11] seamlessly combines *Super Mario Bros.* and *Tetris*! What's next? What will be the most popular game genre in the future? Who knows? Perhaps you will create it!

Who Makes This Stuff?

Just as there are many genres of games, there are many types of people who make them. Video game teams that create games are known as **developers** or **development teams.** They are similar to a production team that makes a movie or TV show—several creative people all working together to create entertainment.

In the early days of video game development, games were created by individuals; one example is the original *Prince of Persia,* created by one person[12] who programmed, designed, and animated the entire game. He even composed the game's music!

[11] You can play *Tuper Tario Tros*. by Swing Swing Submarine at `www.newgrounds.com/portal/view/522276`.

[12] The one-man development team in question is Jordan Mechner.

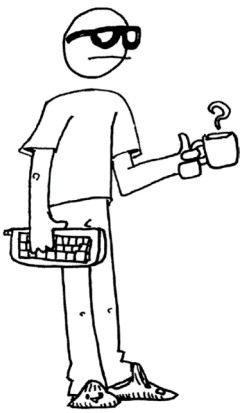
Game creation eventually evolved into teams as commercial video game development became more technologically complex, and games that originally required two or three programmers to make now needed people with a wider range of skills. As graphics capabilities improved, many game creators lacked the artistic skills to fully utilize the new computing power. Since audiences demand better-looking games, teams added art specialists.

Games were initially designed by whichever team member had the best idea for a game. When game content became too involved to design by the programmers and artists, a dedicated design position was created. Both *Mario* creator Shiguru Miyamoto and I started as artists who moved into the area of game design. Although team members can still wear many hats, specialization is common place on larger production teams.

With the rise of mobile and independent gaming, the production cycle has swung away from the larger development teams. More and more games are being created by small teams and even individuals. *Minecraft, Spelunky,* and *Tiny Wings* were each created by one person! Now that creative teams are no longer reliant on huge budgets and publishers, the power is back in the hands of the developers! So who has this power? Here's a rundown of the different members of a development team.

Programmer

Using programming languages such as C++ and Unity, a **programmer** writes the code that draws the game's graphics and on-screen text, develops the control systems that allow players to interact with the game, creates the camera system that allows the players to view the game world, programs the physics system that affects the players and game world, writes the artificial intelligence (AI) system that controls enemies and object scripting . . . you get the idea.



One programmer may work exclusively on tools to help team members build the game more efficiently. Another programmer may write code to simulate real-world physics making water look realistic or develop inverse kinematics for characters. A programmer may even work solely on sound tools to play music and effects.

Like many of the jobs in the game industry, programming jobs are becoming more specialized. Regardless of the position, a programmer needs to have an excellent understanding of mathematics, 2-D and 3-D graphics, physics, particle systems, user interface, artificial intelligence, input devices, and computer networking. These skills are always in high demand, and some programmers make a good living as contractors, moving from project to project as "hired guns," writing code and providing temporary solutions to beleaguered teams.

Artist

In the early days of video games, programmers created all of a game's art. Because that early art was so blocky and crude, we now call placeholder game art "programmer art."[13] Thank goodness real artists came along. One of the first artists working in video games was Shigeru Miyamoto, who created Mario and Donkey Kong. He was able to create memorable cartoon characters with an 8-bit CPU using only 2-bit pixels—that means background elements have four colors and sprites only have three. That's a lot of personality per pixel! There were a few exceptions in the early days, such as *Dragon's Lair* (Cinematronics, 1983) and *Space Ace* (Cinematronics, 1984), beautifully animated games created by ex-Disney animators like Don Bluth, but those games were rare exceptions because they employed laser discs to play the video footage. Eventually, new, better hardware with more memory, color depth, and the ability to display larger graphics meant artists could create more detailed images, backgrounds, and characters like those seen in beautifully hand-drawn and animated games such as *Darkstalkers* (Capcom, 1994) and *Metal Slug* (SNK, 1996).

As high-end computer software became more affordable to developers, 3-D graphics, which had been limited to movies like *Tron* (Disney, 1982) and Pixar's animated shorts like *Luxo Jr.* (1986), began appearing in games. True 3-D graphics had been in arcade games as early as *Battlezone* (Atari, 1980), but the move to bring 3-D into homes started on the 3DO with *Crash and Burn* and *Total Eclipse (*both by *Crystal Dynamics, 1993)*. The popularity of real-time 3-D games like *Wolfenstein 3D* and *Doom (*both by *id software, 1993)* and the use of pre-rendered 3-D graphics *Myst* (Broderbund, 1993) and *Donkey Kong Country* (Nintendo, 1994) made sure that 3-D was here to stay.

Just as with programming, video game art has become a specialized job. A **concept artist** uses both traditional medium and computers to draw what game characters, worlds, and enemies will look like in the game. Concept art is never used in the final game, only as reference for other artists. **Storyboard artists** illustrate the game's cinematics and sometimes elements of gameplay design to be passed along to other artists and animators. **3-D Modelers** and **environmental artists** build characters and environments using programs such as Maya and 3D Studio Max. **Texture artists** literally paint surfaces onto 3-D models and locations. **Visual effects artists** create spectacular visual effects using a combination of 2-D and 3-D art. A **user interface (UI) artist** designs icons and elements that are used in the game's interface and heads-up display (HUD). **Animators** animate the player character and create cutscenes exactly

[13] I apologize to any programmers reading this, but I didn't make up this term.

as they do in big-budget animated movies. **Technical artists** help every artist on the team by doing a variety of tasks, including rigging models to allow animators to move them and teaching fellow artists the latest tools and technology. The **art director** supervises the work of all the artists while maintaining the artistic vision for the entire project. Regardless of what kind of art position you are interested in, make sure you study the basics and keep drawing!

Designer

Director, planner, lead designer, or senior game designer—no matter what the job title is, the designer's role is the same: create the ideas and rules that comprise a game. A **game designer** needs to possess many, many skills,[14] and must love to play games. As a game designer, you should be able to tell the difference between a good and bad game and, more importantly, communicate why. Remember, "because it sucks" is *never* an acceptable answer.

Just as with programmers and artists, design is becoming a specialized profession. **Level designers** create paper maps, build "gray box"[15] worlds using 3-D programs, and populate the levels with everything from enemies to treasure. **System designers** develop how the game elements relate to one another, whether it is the game's economy or technology tree. **Scripters** use tools to write code that allow things to happen within the game, from springing a trap to choreographing a camera movement. **Combat designers** specialize in the player's combat experience, whether against an AI or human opponent, and "balancing" the player's experience. The **creative director** maintains the vision of the game while supervising the other designers, often offering suggestions for improving their work.

There is one other task that a designer is responsible for: ensuring that the game is "fun." However, I will leave this can of worms unopened until later in the book. I hope you can stand the suspense.

Producer

Overseeing the entire game development team is a **producer.** Originally, producers were members of the development team who also managed the work of their team members and had the authority to make all decisions, including creative ones. A producer's role has expanded

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[14] According to Jesse Schell in his book *The Art of Game Design* (Morgan Kaufmann, 2008), a "well-rounded" game designer understands animation, anthropology, architecture, brainstorming, business, cinematography, communication, creative writing, economics, engineering, history, management, mathematics, music, psychology, public speaking, sound design, technical writing, and visual arts. I think it's a pretty accurate list.

[15] A "gray box" level is a preliminary version of a game level that contains gameplay but lacks visual detail.

dramatically over the years in some cases requiring several producer roles on one game including **executive producers** who oversee all the other producers!

The producer's responsibilities include hiring and building teams; writing contracts; contributing to the game's design; managing the team's work schedule; balancing the game's budget; resolving disputes between creative and programming leads; acting as the team representative to upper management and publishers; coordinating the creation of outside resources such as art, music, and cutscenes; and arranging testing and localization. Producers are usually the first team member on and the last team member off a game's production. More often than not, you will find producers acting as the public face of the game, talking to the press and public about the game they are managing.[16]

Because a producer has many things to do, often you will find **assistant** and **associate producers** helping out with day-to-day tasks. Sometimes the task can be as "trivial" as ordering dinner for a team that is working late. Believe it or not, some of those "menial" chores are some of the most important that a producer can provide to a team.

Regardless of how helpful producers can be, some development studios consider producers to be an unnecessary part of development. Others feel that producers should not have any creative control, just manage the game's production and schedule. As with designers, the role and influence of producers varies wildly across the industry.

Tester

Do you like to play games? Do you like to play games over and over? Do you like to play the same level over and over and over and over and over and over and over and over and over and over and over again? Then testing is for you!

While **testers** work long hours, work in cramped environments, and have to play games to a degree that many would classify as mind-numbingly boring, being a tester requires more skills than you may think. Good testers have patience, persistence, and great communication skills to report back any problems (or **bugs**) they find in the game. It's not a glamorous job,

[16] Producers often end up as the "face of the game" because they are the one team member who can keep all the moving parts straight!

but without testers, we would be plagued with games that crash upon loading and have crappy cameras, broken combat systems, and unfair difficulty balances.

Quality assurance (or **QA**)[17] is crucial to the successful completion of a game. Publishers hold games to a rigorous standard of quality so the game that you buy is (mostly) bug free. That standard can be met only by thoroughly testing a game for weeks, if not months. Only after it has passed muster with the QA department can it be offered for **submission** to the game manufacturer. Then only after the submitted version of the game is approved is it truly ready to be released to the public. Sometimes several submissions are needed before a game is ready for release.

Testing is a great gateway job position for newcomers to the game industry. I have seen testers go on to become designers, artists, producers, and even heads of studios. You can find out a lot about games in a short time by working as a tester. Testers prevent games from sucking. Remember that the next time you think about making fun of a tester.

Composer

In the earliest days of video games, music was nothing more than crude beeps and bloops to accompany the game's action. But how many of you can still hum the music to *The Legend of Zelda* or the *Super Mario Bros.* theme?

Music is extremely important to the gaming experience, and a **composer** creates that music. Most modern composers create their music on a keyboard or synthesizer because it can be used to simulate any musical instrument. As sound technology has improved, many composers have created actual "live" and orchestral pieces; this requires a whole new set of skills, including conducting an orchestra, waving a baton and all.

Home versions of modern audio software are powerful enough to mix and master professional-sounding samples. If you want to become a composer, you should write some music, record it, and get your samples into the hands of a game producer. As someone who has reviewed lots and lots of composers' audio resumes, I can tell you it goes something like this: the designer has a specific idea for the style or feel of music in his mind. If your music sample matches what the designer wants, she will contact you for the job. What matters most is that your music is unique and fits the needs of the game. Look at the success of a movie score composer such as Danny Elfman. He composed very distinct music for *Beetlejuice* and *Pee*

[17] "Quality assurance" is just a fancy way of saying "test department."

Wee's Big Adventure, and soon all the producers in Hollywood wanted his style of music in their own movies.

Writing music for games is somewhat different than writing music for movies. Most game themes are either very short or have to repeat over and over again. Being able to compose powerful and exciting music with these limitations in mind will make your music more appealing than someone who just writes "songs."[18] Don't worry; I cover more about music in Level 16.

Sound Designer

Unlike a composer who creates the music for a game, the **sound designer** creates all the sound effects that are used in a game. Go ahead and fire up a game, turn off the sound, and try playing it. Do you notice that the game just isn't the same without sound effects? Often, a lot of information is delivered to the player via sound. These audio cues are the sound designer's responsibility to create.

Personally, I think sound design is a lot of fun. Games tend to come to life when sound is added to them. That is why it is important to even have placeholder sound effects while creating your game. Sound design requires a lot of creativity. Mixing and blending sounds to create something no one has ever heard before is pretty cool. However, a good sound designer needs to understand the game he is working on and how to create sounds that help the player with the game. Some sound effects need to sound "positive" to encourage players that they are doing something right or collecting something good. Other sounds warn players of danger or possible bad choices. A sound designer can make a sound effect sound happy, deadly, scary, or like a big pile of treasure. Or sometimes all the above!

If you want to be a sound designer, you also need to take direction from people who may or may not know what they want. For example, see whether you can create a sound effect based on the following description: "I need this creature to sound like a phlegmy cougar from hell . . . but make it sound more shriek-ey than growl-y."[19] Did you do it? Congratulations! You are now ready to be a sound designer.

Writer

Unlike in Hollywood, where **writers** come up with the initial ideas for a movie, in the video game world, writers are usually hired pretty late in the game's production process. If you want to be the "idea guy," I suggest sticking to game design.

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[18] Don't let that comment cause you despair, songwriters. Plenty of games still use traditional songs—in particular, sport and rhythm games.

[19] Sadly, yes: this was an actual direction to a sound designer. And yet, he still delivered a great sound effect.

That's not to say that writers don't contribute to games. However, writer is not usually a full-time team position. Typically, writers are freelancers brought into the game's production for one of the following reasons:

- To rewrite the design team's story into something that makes sense after everyone on the team realizes that it is drivel.
- To write dialogue for the game characters and cutscenes after everyone on the team realizes that writing good dialogue is actually hard to do.
- To make elements in the game clearer to understand, as in the case of instructional or directional prompts.
- To write content for heads-up displays that must meet manufacturer's submission requirements.

Lately, game developers have begun to understand the importance of bringing a writer into the game development process earlier. The writer can help direct the flow of the game's content. In this era of story-driven games, a lot of content needs to be created. Some games have scripts that run as long as hundreds of pages! Sometimes it can be difficult to find steady work as a writer at a single company, which is why most game writers work freelance.

Once upon a time, development teams hired **technical writers** to create game manuals—little books that came with the game to explain how to play them. However, physical manuals have mostly become a thing of the past; the content is either included in the in-game tutorial system or made available digitally.

The upside of being a writer in the game industry is that there is usually plenty of work, as long as you don't mind doing different writing jobs and working for different companies. If you want to be a game writer, you obviously need to know how to write, use proper grammar, and write in screenplay format. But the most important thing to know is how to write for video games. Writing for video games can be very different from writing a novel or a screenplay. Fortunately, this book has a whole chapter on how to do this.[20] Good thing you are reading it!

Well, now you know all the different employment possibilities in video games, right? Wrong! People don't generally know this, but there is a second career path in video games: publishing.

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[20] Level 3, to be exact.