Players
Making
Decisions

Game Design Essentials
and the Art of Understanding Your Players

ZACK HIWILLER
Dedication

To my grandmother, Betty Hiwiller (1927–2014), who always wanted me to be a writer. Yes, textbooks count, Grandma.

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Preface

― CARL SAGAN

“If you wish to make an apple pie from scratch, you must first invent the universe.”

This Carl Sagan quote from Cosmos intends to cheekily point out that even a simple object like an apple pie contains a multitude of layers, depending on your level of analysis. Although the baker feels that the apples, sugar, and flour are the fundamental building blocks of an apple pie, the physicist sees down to the atoms and fundamental particles that make up the pie itself. It is a profound and long-lasting quotation because of the disconnect that the listener experiences. Making an apple pie is prosaic. Inventing the universe is deity-level stuff.

Teaching game design offers a similar conundrum. Making games is fairly easy, as is apparent from looking at the number of available games. For example, when you look at the games available for just a single platform (iOS) in a single country (the US) at the time of this writing, you’ll see that there are nearly 400,000 games available.¹ In addition, over 110,000 analog games are listed in the BoardGameGeek.com database.² And, of course, the number of games children create every day on playgrounds all across the world is uncountable. With so many games coming out every day, games surely must be easy to make. As a result, teaching about games must be fairly straightforward and simple.

Unfortunately, that is not true.

The primary reason is that there is no reliable algorithm that we can use to create things as wildly disparate as Chess, Grand Theft Auto V, Red Rover, pole vaulting meets, and Jeopardy!. A cursory listing of the skills a game designer of any type will

find useful includes mathematics, psychology, computer programming, composition, rhetoric, drafting, architecture, art history, philosophy, economics, business, history, education, mythology, and animation. I stopped the list not because it was complete, but because I think the list—as incomplete as it is—makes the point that game design is remarkably multidisciplinary.

Because no algorithm exists, we have to attempt to shoehorn the facts and methods of a universe of disparate disciplines to make game design heuristics. Meanwhile, the impatient student just wants to make a simple apple pie.

When I first left the world of full-time development of video games to teach game design, I faced this very problem of distilling a vast universe down to a few salient points. I voraciously consumed every book I could find about design or game design and found that they largely talked about the process from a descriptive perspective. That was useful in some aspects, but not useful when I was looking to teach a prescriptive method. Most game design books were ludicrously padded with obvious statements that were not at all helpful to aspiring or professional designers. Some books, like Schell’s *Art of Game Design* and Salen and Zimmerman’s *Rules of Play* did a great job of merging descriptive and prescriptive insights from numerous areas of study and then backed up these anecdotes with external best practices. As my library expanded, I found more and more areas that I wanted to share with students, but unless I wanted to assign them hundreds of dollars worth of (sometimes overly academic, sometimes out-of-print) reading materials, I had no way to easily teach lessons that would have helped me professionally if someone had taught them to me in my apprentice years. This is the curse of a multidisciplinary field—the sources for insights are limitless, so collating knowledge into a curriculum eventually expands like a gas to fill whatever space you have.

I have created games professionally on over a dozen platforms. I have created large physical games for corporate retreats; I have created interactive books for tablets; and I have created free-to-play games in a brutally competitive market. These platforms seem like they share little in common. Some topics make sense only in terms of analog games, or single-player games, or multiplayer games. But some topics transcend platforms and are timeless. Less than ten years ago, mobile games had few established design patterns. Less than ten years ago, no digital social networks supported formal games. Less than thirty years ago, networked games in general were a quiet niche. What platforms will support the games ten years from now? Thirty years from now? What game design concepts

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will help support the game designers of the future? I cannot possibly claim to know the answer to those questions. But I can provide tools to support game designers today, and I can present them in the most evergreen way I know in order to sustain their relevance. In time, concepts in this book will be updated, expanded, or even retired as the industry gains greater understanding of how we game designers complete our magic.

Teaching has been incredibly challenging and rewarding. Just as my career in game design stemmed from a need to constantly learn about as many things as possible, my teaching career has reflected that as well. Research is enlightening, but it is students who provide me with unparalleled perspective into how to explain what game design actually is and how to do it well. This book is another well-disguised ploy for me to learn more, to pull insights from multiple disciplines, and to share new ideas with others.

Thank you for the opportunity,

—Zack Hiwiller
November 2015
Who Is This Book For?

This book is for those who are interested in what elements are involved in the design of games. Its purpose is to introduce the knowledge areas that are most helpful for understanding game design. This book is not a manual on how to design a game. There is no such book possible. Neither is it a book that claims to let one in on all the “secrets” of successful game design. Anyone promising that should not be trusted. Nor is this a book to teach a specific programming language or scripting toolset. Those books can be incredibly useful, but go obsolete quickly. This book focuses on concepts that can be used to help you understand the design of any type of game—analog or digital.
How Is This Book Organized?

This book is split into eight sections, each of which covers a topic I feel is essential to being a game designer—no matter the platform—and is not completely obvious to new designers:

- Part 1, "Getting Started," is about how to start from nothing. Although some games are iterations of previous games, most start with just the seed of an idea. What should that seed look like? What are some prerequisite elements that will help you organize your ideas into an actionable project?

- Part 2, "Prototypes and Playtesting," talks about how to plan and test your game before it is a final product. There is a pervasive myth among novice designers that games are largely birthed finished from idea to product, with only moderate tweaking along the way. This section sets out to debunk that myth and provide designers with the tools and inspiration required to make quick, testable versions of their games.

- Part 3, "Meaningful Decisions," covers one of the most interesting topics in games: decision-making. It is incontrovertible that interactivity is one of the key-stone characteristics of games. Interactivity means that the players make some decisions that the game reacts to. How do designers present these decisions? What makes for interesting decision-making?

- Part 4, "Describing Game Elements," covers a number of topics concerning the different elements of games and different considerations thereof. There is little uniformity when talking with designers and academics about how game elements should be classified or applied, so this section takes a cross-section of the most pragmatic approaches for actually designing games.

- Part 5, "Game Theory and Rational Decision-Making," considers how players should behave were they to act rationally. By examining game decisions from this perspective, designers can remove elements that should be consistently never chosen. This leaves players with decisions between possibly interesting options.
• Part 6, “Human Behavior in Games,” eschews the convenient fable of the rational player and looks to the realm of psychology to try to understand how real human players actually act. If games are truly about decision-making, then the whole branch of study spun off from psychology and economics that explores how humans actually make decisions is relevant to game design.

• Part 7, “Game Design Tools,” considers the different tools designers use to document, analyze, and communicate ideas, such as the universally misunderstood game design document (GDD).

• Part 8, “The Game Design Business,” considers the craft of game design as it relates to business. The old joke that is appropriated for nearly every industry is this: “How do you make a small fortune in the games business? Start with a large fortune.” If a designer’s craft is done for more than just a hobby, she must understand the requirements of the business aspects of game design.
If I can relate only one lesson in this book, it’s that the way to become a game designer is not found in the pages of any book, no matter how well-written. The key to becoming a game designer is simply to make games.

When asked about their game ideas, students often answer with riffs on their favorite large AAA games. Their ideas are often about making the next *Skyrim*. That is taking an overly large bite. They subtly ignore the massive complexity of these games, which often have development teams that number in the hundreds.

Making games is a complex affair. Even comparatively simple mobile games can be really complex. Rami Ishmail, cofounder of award-winning developer Vlambeer, is no stranger to complexity: “Even the simplest of games is really complex. When you’re starting out you can’t see that yet. That’s why you need to start simple.”

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Analog Games

Many aspiring game designers do not even consider analog games such as board or card games. Fewer still consider role-playing and storytelling games or sports. Yes, even sports have designers! Games are such a broad medium that limiting yourself to just large, complex games for specialized game consoles is narrow-minded and will lead to only a narrow understanding of the craft. Analog games in particular are a great place to start your design practice because of how analog games typically expose all the inner workings of the game to the player. You may lack exposure to some of these games, so in TABLE 4.1, I have provided a list of some analog games—board games, card games, role-playing games (RPGs), and sports games—along with their level of complexity.

**TABLE 4.1** Example Analog Games and Complexity Levels

<table>
<thead>
<tr>
<th>Game Type</th>
<th>Simple</th>
<th>Medium</th>
<th>Complex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board Game</td>
<td>Loopin’ Louie</td>
<td>Ticket to Ride</td>
<td>Power Grid</td>
</tr>
<tr>
<td></td>
<td>Can’t Stop</td>
<td>Pandemic: The Cure</td>
<td>Dead of Winter</td>
</tr>
<tr>
<td>Card Game</td>
<td>Love Letter</td>
<td>San Juan</td>
<td>Race for the Galaxy</td>
</tr>
<tr>
<td></td>
<td>The Other Hat Trick</td>
<td>Dominion</td>
<td>Magic: The Gathering</td>
</tr>
<tr>
<td>RPG</td>
<td>A Penny For My Thoughts</td>
<td>A Quiet Year</td>
<td>Dungeon &amp; Dragons</td>
</tr>
<tr>
<td></td>
<td>Fiasco</td>
<td>Microscope</td>
<td>Pathfinder</td>
</tr>
<tr>
<td>Sports</td>
<td>Four Square</td>
<td>Badminton</td>
<td>Football (American)</td>
</tr>
<tr>
<td></td>
<td>Darts</td>
<td>Dodgeball</td>
<td>Roller Derby</td>
</tr>
</tbody>
</table>

It’s important to note that board, card, RPG, and sports are not the only categories of nondigital games. So many examples fit these categories that it makes them salient choices to study. Games are incredibly diverse if you take the time to look. What labels categorize fantasy baseball, *I Love Bees*, Mafia/Werewolf games, or the activities involved in the Jejune Institute?

To illustrate what I mean by complexity, let me give you an example. I once created a 15-card analog game for a game design contest. I really enjoyed the experience, so I thought I would make a digital version in Unity, which is a popular game engine for digital-game development. What took me only an evening to design, assemble, and test as an analog game took weeks to fully implement digitally. I had so many contingencies I needed to address. Although bugs or vagueness can be reasoned out in a card game, a digital program needs to be explicitly told how to handle all contingencies. Changes are more robustly handled by humans who are OK with ambiguity; programs need clarity.

**NOTE** Complexity can be measured by various metrics. For the purposes of this table, I used only an imprecise measurement of the length of the rules.

**NOTE** For an entertaining explanation of the Jejune Institute see the film: The Institute [Motion picture]. (2013). Gravitas Ventures.
Another reason to start your game design experience by making analog games is that analog games tend to expose all their workings to the players. Digital games, on the other hand, often hide their mechanisms from both players and designers—they hide their mechanisms from players behind code and from designers by abstracting the game’s workings. For instance, in an RPG, you may notice that players have difficulty rolling die to get a certain number, and thus they allow an attack, twice in a row. In an analog game, the reasons should be easy to track down: The players are doing the math themselves, so the inputs and outputs are clear. In a digital game, these calculations are obscured in code somewhere. When you get clear feedback, it allows for quick iteration. However, when you are making digital games, it’s often the case that you can’t even find out where a problem is hiding!

In the book, Tabletop: Analog Game Design, famed designer Greg Costikyan writes: “As many game studies programs have discovered, tabletop games are particularly useful in the study of game design, because their systems are exposed to the player, not hidden in code. It’s easy to misunderstand the essential nature of a digital game, if you focus on graphics or narrative without appreciating the way in which system shapes the experience.”

Always err on the side of simplicity. With this rule in mind, it makes sense to start by developing board or card games.

Theme and Mechanics

When you are creating games, but most saliently, when you are designing board and card games, it’s important to decide whether to focus first on theme or mechanics. By mechanics, I mean the rules and procedures of the game. In 7 Wonders, the main mechanic is clearly drafting cards. In Terror in Meeple City, the main mechanisms are flicking, dropping, and blowing on game pieces. Theme, in this instance, is the overarching setting or antecedent elements that relate to the game’s mechanisms. In 7 Wonders, the theme is building ancient civilizations. In Terror in Meeple City, the theme is monsters destroying metropolitan areas.

If the game’s problem statement focuses on thematic concerns, then the game might be too concerned with keeping consistency in that theme at the expense of fun. For instance, if 7 Wonders was truly interested in taking the theme of building a civilization

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seriously, then some mechanics should manage population, taxation, and land usage. However, additional mechanics about these things would slow the game down and distract from the game’s actual problem statement, which focuses on a seven-player drafting experience.

Likewise, if a game’s problem statement suggests mechanics, then parts of the game may not make sense in terms of the game’s theme. The point of theme is to make the game understandable.

I was once working on a game where players shuffled passengers around an airport. It was an area control game, so it was important to move passengers at the right time to the right spots. Yet playtesters balked at ever moving passengers: “Why would they get on a different flight than the one they came to the airport for?” The mechanics made perfect sense in terms of game operation, but they did not interact well with the theme. Many European board games are criticized for being games about mechanics with a theme “pasted on.” This criticism comes only if the game’s theme does not assist players in understanding the mechanics and world of the game. For instance, Dominion could easily be about any number of themes; this game is about building a deck of cards, and what names the cards have hardly matter. Similarly, the theme of Chess does not matter. Trying to “paste on” a theme beyond basic notions of warfare is distracting and not helpful to players.

The proper way to start your design of an analog game is by seeing which way the problem statement points. Some great games have been designed with theme first and some with mechanics first. The two cited examples, 7 Wonders and Terror in Meeple City, come from the same designer (Antoine Bauza) and are clearly mechanically focused and thematically focused in their problem statements, respectively. 7 Wonders’ problem statement asks, “What if a game played well with seven players?” Terror in Meeple City’s design started with the intention to make a board game to match the thematic elements of the classic arcade game Rampage.

By having a poignant problem statement, you eliminate the need to ask the question of whether the designer should start with theme or with mechanics. The problem statement itself will dictate the direction in which to start. A problem statement is just a guide to help direct your efforts. If the development warrants it, you may change the problem statement. To return to Antoine Bauza’s work, his Spiel des Jahres winning

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game *Hanabi* is a cooperative imperfect information game about collectively creating a fireworks show. However, it was made from the pieces of another game he designed, *Ikebana*, which was a competitive set-collecting game about arranging flowers that played wholly differently. You never know what direction your ideas and testing will take you, but it is good to have a destination in mind.

**Next Steps**

The next step is to come up with basic rules. If your problem statement suggests mechanics, this should be easy. If your problem statement suggests theme, then you may want to consider what mechanics may match that theme. It’s not important that you get the rules right on your first try, because everything is on the table as far as change goes. In fact, the first version of *7 Wonders* was not about card drafting at all.

Write these rules down on paper or in a digital document, but go only so far as to make a playable game. Do not worry much about the edge cases or complicated matters—the key is to have enough rules to make a playable game. The goal is to build your first prototype.

This prototype is likely to have breakable systems, unnecessary materials, ambiguities, and imbalances. You will have plenty of time to iron these out through playtesting and revision. The key of the first prototype is to get a feel for the game.

The first time that you play your new game, you are quite likely to identify many areas in which the game needs to improve. Perhaps there are not enough interesting decisions for players. Perhaps the rules are unclear about edge conditions. Perhaps the game always plays out in one particular way. Perhaps real players do not do what you expect. These are all areas I’ll cover in upcoming sections and chapters, but to apply any of these lessons to your game, you must first have a game on which to test them.

**Designing for Others**

The 18-to-35-year-old male demographic really, *really* loves first-person shooters. Most students I teach in game design classes are 18-to-35-year-old males. Most pitches that I receive in assignments are for first-person shooters. This is natural. Many game designers want to learn about game design because they want to make games like those that they themselves have enjoyed. Game design can be a long, tedious process. Is it not better to go through all that work for an idea that you love instead of one you don’t have a passion for?
If the answer is yes, who is left to make the *SpongeBob* games? They do not hire 8- to 12-year-olds to make games for the 8-to-12-year-old demographic. In fact, much of the industry is making games that do not serve the “core” demographic of 18-to-35-year-old men. It is a gift to be working on games for a living, but it is an extra-rare gift to be working on games that you like for a living. This can be a double-edged sword. Sometimes working on a genre you like can sour you on the genre entirely. For example, I worked on AAA sports games from 2004 to 2009, a genre I really liked. I have not bought a sports simulation game since I left that job. I just played them too much in my day-to-day life, so the magic behind them was lost.

Another issue that arises when you work on the types of games that you already enjoy is that you may find yourself stuck remaking the things that you already enjoy instead of pushing the envelope to make something new and exciting.

The point, however, is that if you are working on a game and you plan on selling 100,000 copies of it, it is quite likely that all 100,000 of those copies will be bought by someone other than you. So you need to be able to step into someone else’s shoes to deliver an experience that they will enjoy. And it can be really difficult when what those people enjoy differs from what you enjoy. Yet this is the norm and not the exception. Most designers are designing for people vastly different than themselves. Legendary MUD designer Richard Bartle says, “Designers don’t create virtual worlds that they, personally, wish to play; they create virtual worlds that people wish to play.”

However, some design breakthroughs can be made by considering first how other people react to different elements of games. Independent designer Zach Gage made the hit game *SpellTower* because he did not like the mobile word games that existed and he wanted to make one that would challenge him to understand their appeal. His outside view on the genre allowed him to make an acclaimed and popular title, one that he would not have made if he only made games he enjoyed. The same is true for Michael Brough, who made *Corrypt*. He did not like puzzle-style games, so he made one that was excellent as a puzzle-style game but (because he was not beholden to the norms of the genre) one that also subverted the genre effectively.

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It’s easy to say that you should just leave everything to playtesting and that your target audience will direct you on what to make. This is tempting, but also quite dangerous. Playtesters cannot help until they have something to test, which means you must make something with them in mind. Additionally, playtesters reject new ideas as confusing if they are not familiar with them. Sometimes you have to warm them up to a new idea before they embrace it. Also, playtesting is expensive in terms of time. You cannot bring in playtesters every day to make every little decision, nor can you spend the engineering time to A/B test every possible decision. At the end of the day, the designer needs to have an innate understanding of what he is trying to do.

Opening Questions

As an exercise, you can go through a number of key questions about your game to get a good sense of where to begin. These questions are just to help you get started. Most of them will be obsolete by the time you make changes to your first prototype. It is usually a bad idea to keep any of these answers locked down and written in stone:

- What is your problem statement?
- How many players will there be?
- What is the object of the game for each player? What are their short-term goals?
- Do players work together or alone? Who is their adversary: the game, other players, or something else?
- Do you have any key rules in mind?
- What resources do the players manage?
- What do players do? What decisions do they face?
- What information is public, hidden to particular players, or hidden to all players?
- What hinders players? What are the trade-offs?
- How does the game end? Are there winning conditions?
- Explain a turn or two (or equivalent time period) of the game.

After answering these questions, you can make an attempt to write down the rules for the game.
To use the example of the airport game I mentioned above, earlier in my career, I had a period of about a year when I had to fly somewhere about every month. One evening, I was in New York while a huge blizzard was approaching. It was hammering the Midwest and the flight network was already suffering from delays. As I sat awaiting the fate of my flight, I could feel the tension in the room rise as flight after flight was delayed and announced over the loudspeaker. Periodically, it would be announced that a flight was changing gates. I watched as dozens of stressed travelers grabbed all their belongings and rushed off in unison to another part of the terminal. This happened a half-dozen times as I sat and watched. Having nothing better to do, I started to brainstorm an idea for a board game where passengers rushed through an airport. Here is what I came up with when I worked through the previous checklist of questions:

- **What is your problem statement?**
  What would a board game be like where you had to shuffle weary and stressed passengers through an airport?

- **How many players will there be?**
  I’m going to guess 3 to 5 players. I imagine it will be similar to a Eurogame like *Ticket to Ride*, and those games generally have 3 to 5 players.

- **What is the object of the game for each player? What are their short-term goals?**
  Each player tries to score victory points by getting as many passengers onto correct flights as possible.

- **Do players work together or alone? Who is their adversary: the game, other players, or something else?**
  Players work alone, trying to achieve the best score. Players can out-position other players’ passengers to score.

- **Do you have any key rules in mind?**
  Passengers have to make it through security before they can move freely through the airport. Players should be able to move their passengers all at once. When a flight fills up, it leaves, kind of like the boats in *Puerto Rico*. Flights will change gates often.

- **What resources do the players manage?**
  Players will manage the passengers on the board. I want this game to be as minimally random as possible, so no cards or dice.
• What do players do? What decisions do they face?
  Players get one action on their turn. They can move people through security, move
  passengers to gates, or move passengers into club lounges.
• What information is public, hidden to particular players, or hidden to all players?
  All information is public. The flight board will show the order of flights.
• What hinders players? What are the trade-offs?
  Players hinder players because there will not be enough room on each flight for all
  passengers. Players must choose to spend their action on getting more passengers,
  placing them effectively, or changing the flight board.
• How does the game end? Are there winning conditions?
  When all the flights are gone from the flight board, the game is over. The player with
  the most points wins.
• Explain a turn or two (or equivalent time period) of the game.
  Each player gets one main action. They choose from a menu of actions. A player may
  choose to put passengers through security, move their cleared passengers, or move a
  passenger into a club lounge.

The descriptions from these questions are not enough to write the rules of the game.
There is still a lot of work to do. However, it does help to frame the ideas that are
nascent. From this, I could start a sketch of what the actual rules look like. Once I have
something that can direct play, I could craft a prototype to test where my idea of the
rules are broken, fun, or both.

If you do not have answers to all these questions, it’s OK. You can still attempt to build
a prototype at this point. Playtesting suggests answers. Some of the best games were
started by having a broad problem statement that could be built into a functional toy
that suggested directions for further development.
Summary

- Analog games such as board and card games offer the interactivity that makes games compelling in a medium that offers easier prototyping and development than digital games.

- A fertile place to start from when considering a game’s problem statement is to examine whether you want to start building around a theme or around specific mechanics.

- It is important to try and understand the positive qualities of games you do not like along with the negative qualities of games you do like. You will rarely be making games for an audience that directly aligns with your tastes.

- Whether you start with theme or mechanics, you need to start by determining some basic rules for your game in order to be able to create something that is testable. A great backstory is fine, but it does not help to create something testable.

- By going through a battery of generalized opening questions, you can begin to narrow down your idea into a form that will allow you to construct a prototype that you can use to run playtests.
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