Game Design

How to Create Video and Tabletop Games, Start to Finish

Lewis Pulsipher

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Lewis Pulsipher

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For Sue

Acknowledgments

I want to thank the students who have been through my game design classes in colleges in North Carolina. I learn from every class.

Writing a book is not like designing games. Games tend to be quite interactive, even the puzzle-like games. A book cannot change itself from one place to another in reaction to what the reader does. Nonetheless, a book benefits from a form of "playtesting," wherein people read the book and make suggestions for improvement to the author. I'd like to thank the following persons who read and commented on the entire manuscript: Eric Hanuise (Belgium), Sue Pulsipher (North Carolina), Rick Steeves (North Carolina); and those who read and commented on parts of it: Alan Paull (England), Kristan Wheaton (Pennsylvania), Walter Rotenberry (North Carolina). I especially thank my most devoted reader (and biggest critic!), Sue Pulsipher.

Any errors are of course my responsibility.

Some material in this book has appeared in different form in *Against the Odds* magazine, Gamasutra.com, gamecareerguide.com, gamedev.net, boardgamegeek.com, boardgamedesignersforum.com, and my blogs. Reader comments online have also helped improve the result.

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List of Initialisms

AI — Artificial Intelligence
ARG — Alternate Reality Game
CCG — Collectible Card Game
CDG — Card Driven Game
DM — Dungeon Master
FPS — First-Person Shooter
GM — Game Master
IP — Intellectual Property
LARP — Live-Action Role-Playing
MDA — Mechanics Dynamics Aesthetics
MMO — Massively Multiplayer Online
MUD — Multiuser Dungeon
NPC — Non-Player Character
PBM/PBEM — Play by Mail/Play by E-mail
PC — Player Character
RPG — Role-Playing Game
RTS — Real-Time Strategy
TCG — Trading Card Game (Same as CCG)

For a glossary with more but shorter entries, covering video game production as well, see Tom Sloper's at *http://www.sloperama.com/advice/lesson28.htm*.

Preface

This book is written for people who want to design games (and game levels) but lack information about what is really involved and how to go about it. I'm not here to encourage you, or entice you to read, I'm here to inform you. I assume you have the motivation to learn how to design games, you just need to know how. And that means you need to do it from start to finish, to complete games rather than merely start them.

We have information: the process of game design, the best way to start learning game design, what makes games good, ways to provide a framework for your design efforts, ways to keep records of your work, software to help you learn, software to help you make games. Many aspiring game designers have crippling misconceptions (such as the notion that it's all about a great idea), and I'll try to clear those out of your way. I provide detailed lists of the possible structures in games, for example, the kinds of victory conditions you could use, the kinds of interaction that are in games, all the categories of quests, the different origination points of games and of levels in video games, different choices for movement and sequencing; and ultimately what games amount to in simple terms (a lot of games involve exploration, or collection of sets, for example). I discuss the different types of enjoyment an audience might prefer — "fun" is a misleading word — because every game must be aimed at a particular audience.

This is not a comprehensive book about game design as a whole, it is a book about learning game design. Experienced designers will find food for thought here, but they'll also see much that's familiar.

Many video game books become outdated in a short time because they focus only on what's currently popular, and on computer technology. I've done my best to avoid that, because the technology changes rapidly, and because technology is only a means of delivering games to people, not inherently part of games and game design. Too many game designers get wrapped

up in "techno-fetishist" habits that interfere with good game design, or expect the technology to magically solve design flaws — which it cannot do.

While my assumption is that most readers want to design video games, the book is also suitable for those who want to design tabletop games; most of game design is the same for both forms (and the two types are converging). Further, all the video game designers I know who teach video game design start with tabletop games because they're a quicker and easier way to learn, so the book serves both segments.

What I do not do is discuss the business of game design: how to get a job, or how to license or market or publish games. Nor do I describe intellectual property protection or video game production (programming, 3D modeling, etc.). This book is about game design. There are other books that cover these other topics, especially for video games.

Nor is the book about the "meaning" of games. When you see someone ask "what does it mean to play?," you've left the area of practical game design and are in game analysis. Games are, for almost everyone, about doing and thinking, not about "meaning."

Furthermore, this book has nothing to do with "game studies." Rather it is about the activity and process of designing games, which involves a lot of active critical thinking. It is about something you DO rather than something you study and memorize.

When I talk about game design with audiences at game conventions, I'm sometimes accused of "crushing the dreams" of listeners because I tell the truth. I haven't written this book to encourage your dreams, I've written it to help you succeed as a game designer. Reality rarely conforms to our desires, let alone our dreams, but to succeed we have to deal with it.

Who am I? I'm a very experienced teacher who has taught video game design, who is also a professionally published game designer. I have designed games and written magazine articles about games since the late 1970s. More recently I've been a frequent contributor for the most popular websites for those who work in the video game industry, or want to work there (Gamasutra.com and GameCareerGuide.com). I have a professional website and blogs focused on game design. And I'm a person who likes to categorize and organize information. You can look me up in Wikipedia if you like: "Lewis Pulsipher"; "Britannia (board game)"; "archomental."

Introduction

My favorite game is that of designing games. Designing games can be fun, if you're willing to recognize that it's also work. Sometimes you can make money doing it, sometimes not. Sometimes you can become well-known, sometimes not. (I tell my students I'm likely the "least unfamous" person they know.) But always, you can enjoy the problem-solving aspects and the "what happens next" of game design.

I taught myself to design games before games became an industry bigger than film. As a teacher I want to help you avoid "the school of hard knocks" that I went through, as much as possible. There is no "Easy Button," no white knight, in game design: it's not about playing games. Not everyone will enjoy it, not everyone will be good at it, but everyone can try it.

I've compressed as much as I can into a small book so that you can get what you need, and get going as quickly as possible.

Each chapter covers a particular topic. I've not assumed that you have read all the sections that came before. If you do read the book from start to finish, which is certainly practical, you may notice occasional repetition deriving from this format.

Chapters 1, 5, and 6 describe the nuts and bolts of devising a game, creating a prototype, and testing the game until it's "done."

Chapters 2 through 4 discuss the vital preliminaries of making a game: how do you learn to design games, what makes a game good, and what is the nature of the game-playing audience. You might find that what you think you know is only a small part of the whole, or that you're just plain wrong!

Chapter 7 is about designing levels (adventures, missions), Chapter 8 is about technical aspects of video game design, and Chapter 9 briefly highlights important information about many types of games.

The last chapter discusses many resources, including brief reviews of

books and lists of information, and the book concludes with a large game design glossary.

If you don't recognize some of the terms used as you begin to read the book, please consult the glossary at the back of the book.

Throughout the book I use the terms "students" and "beginners" and "novices" interchangeably.

The website for this book (http://pulsiphergames.com/learninggamedesign/) includes many illustrations, diagrams, and photographs that could not be included in the book, as well as audio and spreadsheet files illustrating the process of game creation, and clickable versions of all the links in the book.

The following figures and audio files can be found: Figure 7 — Games and Interactive Puzzles, Video and Tabletop; Figure 8 — Game Idea Records in Info Select; Figure 9 — Game Ideas Pyramid; Figure 10 — Elements of a Video Game; Figure 11 — You're Never Really Done; and Figure 12 — Spreadsheet for Prototype Pirate Game.

You will find the following examples: user interface changes (using a board game map as illustration); a prototype tabletop game board (*War in the Abyss*); and a prototype tabletop game board (*Kingmaker*, *Warmaker*, *Peacemaker*).

Audio files for prototypes *Kingmaker, Warmaker, Peacemaker* and *The Abyss/War in the Abyss* are also available.

I welcome comments at lew1@pulsiphergames.com. You can visit my website and view my blogs:

http://pulsiphergames.com

http://pulsiphergamedesign.blogspot.com/

http://teachgamedesign.blogspot.com

http://gamasutra.com/blogs/LewisPulsipher/774/

My commercial games currently in print:

Britannia, FantasyFlightGames edition is still available in some retail outlets, new edition in process

Dragon Rage, Flatlined Games, *http://www.flatlinedgames.com/*

See *http://pulsiphergames.com* for current information.

1

The Process of Game Design

What are the steps (processes) involved in designing games?

A game designer conceives the framework for a series of interesting challenges in the form of a "game," devises mechanics (rules), creates (or communicates with others to help create) a working prototype, and repetitively and incrementally modifies the design (and prototype) in the light of playtesting, communicating these changes to those who actually make the game, and monitoring their success or failure, until it is a good game for the target audience — or until the deadline is reached and the game must be released!

Notice that being a game designer does not necessarily require skill in programming and art. But if you're making a video game, someone involved must have those skills.

The number one skill needed by a game designer is the ability to think critically, especially about his own efforts. A skill that is almost as important for designers of large-scale video games that require teams to produce is the ability to convey in writing and orally the designer's vision for the game and details of the game so that the rest of the team can actually produce it. But no one begins to design by creating a large-scale video game. Further, the second skill is best nurtured by a good broad education, not by a single book. Consequently this book focuses on the first skill.

Game design combines critical thinking with doing. Chapters 2, 3, and 4 are about how to learn to design games, and about thinking. This book starts with a chapter about what you do when you design games, because so many people want to get to the "do" immediately; yet if you try to do without thinking about all that's involved, or try to design a commercial game before you practice designing more limited games, your games won't amount to much.

This chapter is about the process of game design. The second chapter is about how to learn to design games, what you need to do to have a chance

to be successful. The third chapter is about what makes a game good. The fourth chapter discusses a major question about a game, "who is the audience." Then further chapters will talk about how to pursue your designs all the way to the finish.

When game designers talk about their experience of design, the story varies in many ways. Consequently I can't tell you what it's like in every game designer's mind, so I'll tell you what it's like in mine. I do not work full-time as a game designer, but there are times when I spend many hours a day on game design. I am also primarily a tabletop game designer, which is different in everyday routine (as I'll explain later) from a video game designer, even though almost all of game design is the same whether you're working with the tabletop or video.

Games are funny things. Some almost seem to make themselves up to the point of a working prototype, while others are a struggle. Some take years to "get right," others seem to come together quite quickly, but still take a long time to completion. Virtually no game is easy to design and virtually no game is completed in a short time after it's started — unless there's a deadline to meet.

Sometimes it's necessary to just plug away, trying to solve the problems of a game that hasn't come together. Sometimes it just seems to flow. Successful game designers push themselves to do better. If you don't naturally think in terms of how to solve problems of making games, then you have to consciously tell yourself "I am going to think of a new game" or "I'm going to find a solution for this problem in this game." You don't wait for inspiration to come to you.

For many game designers including myself, their favorite game is the game of designing games. Consequently some of the work (as other people would call it) that goes into creating a game is not work to the designer, any more than playing a game is work. Yet there is also repetitive drudgery, things you would rather not do, and times when you're sick of it. In the end designing games is sometimes hard work, and often exasperating, but it can be also be enjoyable and rewarding.

A. Ideas, and How Little They Have to Do with Success

> *"Strictly speaking, there's no such thing as invention, you know. It's only magnifying what already exists."* — Allie Fox, character in the film *The Mosquito Coast*

A standard notion of novice game designers is that they will get an idea, someone will pay them a lot of money for it, and somebody else will make the game. This doesn't happen. People want to make their own games, they have to be paid for making somebody else's games, and most of the people who make games have their own ideas, so the likelihood that somebody will pay you for your idea and make a game is really, really small. You're more likely to get a commission to make a game out of someone else's idea or intellectual property.

It's the execution of the ideas, turning ideas into complete games, that counts. For every idea you get there are probably a hundred other people, if not thousands, who have similar ideas. The difference between a successful game designer and those other people is that the game designer pursues the idea, completes the game, and successfully markets it.

An idea may seem original to you, but in the long run you'll often find that someone else has already used it in a game. If you try to make a list of truly original ideas in games it will be short. And if you spend your time trying to generate original ideas you'll probably get very little done. "There is nothing new under the sun" applies to games.

"Original" in games comes from how you use ideas and how you put things together, not from having an idea that is actually new.

See Figure 9 — Game Ideas Pyramid, on this book's website (http://pulsiphergames.com/learninggamedesign/).

Getting Ideas

"*Ideas are very funny things. They never work unless you do.*" — Danny Blanchflower

Although ideas themselves are individually worth very little, it is important for you to get ideas, lots of ideas. If you have enough ideas some of them will turn out to be ones that can be made into a game, and some of those games may turn out to be decent games, and a few of those games may turn out to be good games. You are not going to sit and have an idea come to you that will make a really great and wonderful game. You have to work at getting ideas. And if you're very lucky, maybe one of those ideas will turn out to be revolutionary, but revolutionary ideas in games are very, very rare.

Let me restate that. A game designer is not some kind of artiste who sits around waiting for the muse to strike him. Yes, some ideas will just come to you, but you'll get most of your ideas by trying to get ideas. You have to work at it. If you expose yourself to games, and writing about games, and people who play games, then the work is easier. But it's still work.

Novelists are often asked "where do you get your ideas?" Their usual response is that they have more ideas than they can possibly write about. That's because they've been working at generating ideas for years. It's the same for game designers.

Game ideas are often generated by association with something that isn't obviously about games. This is why game designers benefit from a broad education, from diverse reading, from multiple interests: they have more to associate with than the narrowly-defined "gamer" (or "fanboy/fangirl") does.

Game ideas come from asking questions. They come from reading of all kinds, history, fiction, science, etc. They come from looking at pictures and maps. They come from talking with other people, even from using everyday things. They come from reading game rules, from playing games, from reading game reviews, from reading postmortems by game designers, from reading books about game design. Yes, there's a lot of reading there, because when you read you're often exposed to many ideas in a short time, and the association may generate game ideas in your mind. Almost anything can give you ideas. I've even designed successful board games by starting with a particular kind of piece in mind. Finally, ideas come from thinking about the ideas you've already had. Often a designer will have an idea for a game, get stuck on some problem for which there's no evident solution, and years later associate that idea with another one generated at another time. These will combine to solve the problem and push the game forward. But the key is that you have to be trying to get ideas, as well as reviewing the ideas you've had. Talking with others about your ideas can help bring on more.

"Stealing" Ideas

Because so many people have the same idea, several games often use the same idea. Any words you write are immediately protected by copyright law, but game ideas are not protected. Don't worry about people trying to steal your idea. Your idea is almost certainly not worth stealing, and in a relatively small industry, if people do "steal" someone's ideas, the word soon gets around. One way to define "novice designer" is "someone who worries constantly that someone will steal their ideas."

Recording Ideas

It's just as important to write down your ideas. Even if you only have a few ideas, you will sooner or later forget some of the details, if there's much substance to the idea. If you've written everything down, you won't lose any-

thing, and it will all come back to you when you read your notes. Furthermore, writing down an idea helps crystalize and clarify what may only be a vague notion in your mind. I use an obscure (and expensive) text database program called "Info Select" to store all my ideas, but when I'm not at a computer I either write ideas in a notebook, or I talk to my PDA and record my ideas as they come to me, which can be done even when I'm driving a car. (Two extended examples of recorded notes are on the website for this book.) Microsoft One-Note is a more well-known notetaking program, or you can just use a word processor. Whatever it is needs to be searchable, and you want to be able to make multiple copies to store in different places so that you won't lose your ideas to an accident. A paper notebook is only a temporary storage place.

Figure 8 — Game Idea Records in Info Select is an example from my (much, much longer) list of game ideas. It is on this book's website (http://pulsiphergames.com/learninggamedesign/).

FURTHER READING

"The Idea Is Not the Game." In this article I go into much more detail about getting, recording, and using ideas. *http://www.gamasutra.com/php-bin/news_index.php?story=20356*

"Why Your Game Idea Sucks" (They All Do). This is a pretty harsh statement by a video game designer about the worth of ideas. *http://www.escapistmagazine.com/articles/view/issues/issue_221/6582-Why-Your-Game-Idea-Sucks*.

For more about the worthlessness of ideas alone, see Tom Sloper's advice at *http://www.sloperama.com/advice/idea.htm*.

B. Origins of Games

Game-related ideas come from many sources, and can be in many shapes and forms. At some point, ideas coalesce into something that can become a game. Usually there is some immediate stimulus, some spark involved. What kinds of sparks are common to new games, that is, where/how do games originate?

See Figure 1— Five Possible Origins of Games. (The occult-looking lines in the diagram are meant to indicate that a game may have more than one kind of origin.)

They usually come from one or a combination of several aspects of games. Let's describe each in turn. In most cases, only the designer will know the origin of a game, so our examples will be limited.

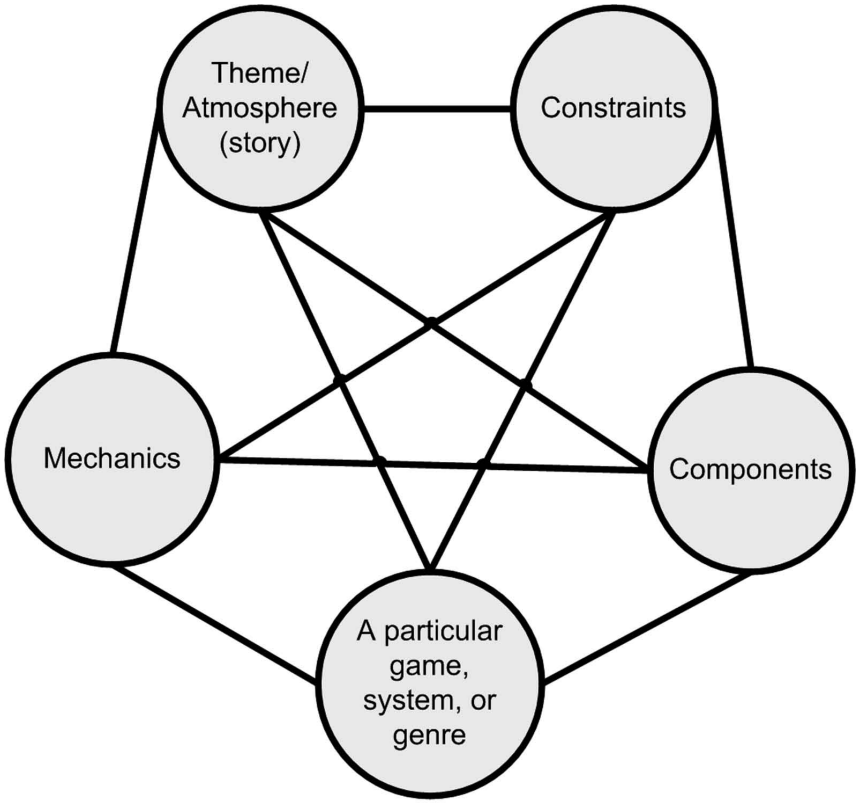

Figure 1— Five Possible Origins of Games.

Theme or Atmosphere (Story, Title, Image, Emotion)

While many of the most-advertised, most prominent video games include a much-publicized story, most games do not. But even in the ones where story is hyped, if the game doesn't play well then most players will not enjoy it, no matter how good the story sounded at the start.

"Theme" is often used as a term to encompass any story-related elements of a game. We should differentiate between theme, something that makes a difference in how the game is constructed and how it plays, and "atmosphere," something that may attract players to the game but which has absolutely nothing to do with the play of the game.

This is roughly the equivalent of the difference between the smell and

appearance of food on one hand (atmosphere), and the taste of food on the other (theme). I sometimes bake blueberry oatmeal loaf cakes. My wife says they smell wonderful. They look good, too. That is "atmosphere." The actual taste (which is also excellent) is the theme. The overall effect of eating the food might be equated to the gameplay. As you may know, smell/odor does affect taste, and similarly atmosphere can affect perceptions of players as they play the game, but in the long run the gameplay is much, much more important to overall enjoyment for regular game players — though maybe not so much for those who only play games occasionally.

The obvious example of use of "atmosphere" is the many forms of *Monopoly* that use names (and pieces) from a movie, comic, novel, or even a university or other institution. In most cases, the gameplay is exactly the same as in traditional *Monopoly*, only the names and appearance have changed. The gameplay is not affected in any way by the change in branding/intellectual property.

The video game *Angry Birds* is a triumph of atmosphere. The gameplay is about catapults knocking down oddball constructions, which has nothing to do with birds. But when you see stuffed "angry birds" for sale in Walmart you know atmosphere has triumphed.

With the proliferation of games based on the "IP" or Intellectual Property of various movies, comic books, and novels, we can see the separation most clearly. Some "IP based" games actually represent occurrences in the IP, that is, the players can connect what they're doing to something that happens in the story of the IP. Others only use the look, feel, quotations, and such from the IP, but the gameplay itself has nothing to do with the IP. The games may in practice be simple race games. Atmosphere may be as simple as a title or images from the IP.

Most *Star Wars* games have a theme deriving from the original Star Wars trilogy of films (1977–1983), *Civilization* has a theme of the rise and development of civilization, *Age of Empires* is a more consistently military approach to the same idea. *Britannia* is a board game where the theme is "1000 years of British history." (After all, "story" is part of the word "hiStory.") In general, any history, real or imagined (as the Star Wars history is imagined), can be used as a theme. There are many board games based on (that is, borrowing the theme or atmosphere of) video games, and vice versa. For example, *Civilization* the computer game, though not directly derived from the earlier board game *Civilization*, is certainly related to it, while *StarCraft: The Boardgame* is clearly derived from the computer game.

You don't have to use someone else's well-known IP or story to have a theme based game. Sometimes the story is very simple as in my board game

Dragon Rage (attacks by monsters, sometimes dragons, on a city). The title alone helps characterize the game. At least one game's theme comes from a story that was written to provide a game framework for a set of commercial miniature figures (my *Valley of the Four Winds*). The game could have been designed "atmospherically" from the appearance and names of the miniatures, but the designer (myself) and manufacturer (Games Workshop, their first board game) chose to try to match the events in the game to the events in the story. Many video games develop their own story/IP, in fact the video games based on movie and comic book IP have a reputation of being poor games.

Fighter plane video games can illustrate the difference between theme and atmosphere. Some flight-and-fight sims carefully model actual plane flight and the nature of aerial combat (which frequently amounts to "get higher altitude, flyby while shooting, dive away at high speed and break contact" rather than movie-style dogfighting). Here the theme infuses the play. Other fighter games make it easy to control the plane, let the planes do things they cannot do in real life, and let the player(s) dogfight in movie style. Here we have atmosphere rather than theme, the game is just a 3D shooter, really.

Many Euro-style board games have no theme, only an atmosphere, often called "tacked on themes." These don't affect gameplay or mechanics at all, though they affect the appearance of the game. Despite the name, the gameplay in the board game *Ming Dynasty* has exactly nothing to do with China, though the artwork is vaguely Chinese. On the other hand, the board game *Confucius* uses a Chinese theme to strongly affect gameplay.

Some "stories" are merely excuses to blow things up, as in many video shooter games. In these cases the game probably originated somewhere other than through the theme, though it may have originated in some atmosphere.

In a "serious" game, one for training or education, the "theme" is the information or point of view the game should convey to the player. These games are of the rare type where the story is the most important part of the game. Atmosphere is not enough, there must be a real message to convey to fulfill the educational goal.

Many AAA video games — the heavily-advertised games you see on shelves in department and electronics stores — aim at "dream-fulfillment," a subcategory of theme/story that some might list as a separate kind of origin. What kind of hero, or "star," or expert, or even god, do you want the player to "become" through your game? The more the designers want the player(s) to experience the details of this dream fulfillment, the more the game will have a theme. If they're only interested in a mild perception of dream fulfillment, the game is more likely to have only atmosphere.

Mechanics

It's often hard to say what comes first, mechanics or some form of theme. The tabletop version of *Dungeons & Dragons* can be seen as a game originating in mechanics. There were many fantasy games, but the role-playing mechanic, which more or less began the role playing game genre, is the defining characteristic of the game.

Dance Dance Revolution and *Guitar Hero* can be thought to be games that originated in mechanics. In both cases we have an unusual mechanic, the flow of directions that the players follow to make certain physical moves. Yet in a postmortem of the latter game published in *Game Developer* magazine (February 2006), two of the developers from Harmonix said *Guitar Hero* was really designed around letting the player feel like a rock star (theme) rather than a game designed around a new controller. The peripheral device came about as a result of giving this rock star feel to the player.

Many times, when a designer starts with a genre (see next section), he also starts with mechanics that are universally used in that genre.

A Particular Game, Game System, or Genre

A "system" is a case where a set of mechanics have become so well-known that games are made using most or all of the set. Many historical board games begin with a system, such as "block games" (*Hammer of the Scots*), "card driven games" (*We the People*), *Risk*-like games (*Risk Godstorm*), Britannia-like games (*Italia, China: The Middle Kingdom*), and "committed intent" games. Video games, apart from obvious sequels, very often adapt a system, and video game genres themselves tend to involve challenges to players that are common to most games of the genre.

Many video games originate with a genre. "We want to make an RTS" (real-time strategy game), or "let's make a shooter." While there are genres in tabletop gaming, they tend to be broader (RPG [role playing game], CCG [collectible card game], wargame, etc.), related to game format or setting. The genres in video games are quite specific, related to the kinds of challenges the game poses rather than the setting. People expect an adventure game, a platformer, or a turn based strategy game, for example, to have certain characteristics and may be disappointed if something is missing (or added). Consequently the genre can sometimes straightjacket the designers' efforts.

Often the genre goes hand-in-hand with a theme, atmosphere, or system. *Battle for Middle Earth* is a Lord of the Rings RTS. *LOTR Trilogy Risk* is a "Lord of the Rings" atmosphere *Risk*-like board game.

In the end, many games derive directly from specific other games. In the video game world, the "safe" way to go is a game that is much like an existing successful game, but just enough different to be unique and to be perceived as an improvement. While derivation from another game is probably the most common method of origin, it is also probably the least likely to be very successful, because for many players too many resulting games suffer badly from being "too derivative."

Components (Primarily Tabletop Games)

On the tabletop side, components can be at the origin of a game. In my own experience, *Law & Chaos* originated because I wanted to make a game using the "jewel-like" glass beads that have become popular for plant displays, and another game originated in a desire to use stackable plastic pieces from an educational supply house.

A component could be a special controller, such as one allowing the video game player to "drive a car" in a natural way. This may be an existing component, or one that the game designer conceives, perhaps to differentiate his game from any other.

Constraints

> *"Creativity arises out of the tension between spontaneity and limitations, the latter (like the river banks) forcing the spontaneity into the various forms which are essential to the work of art or poem."*— Rollo May

Science fiction authors often ask themselves lots of "what if" questions as they try to originate stories. In contrast, game design often involves setting restrictions more than asking "what if" questions.

Are you a person who works better when faced with a deadline? Many people do better work when faced with constraints, whether deadlines or something else. This is particularly true in art.

In effect, everything you do in design is working within constraints. The answer to the question "Who is the audience" provides constraints. If your audience is pre-school children, you can't design a game that requires a lot of math (or reading)! If you know your game will be a first person shooter, your design choices have been heavily circumscribed.

Many constraints come from the publisher or the licensee. If you're making a game based on the *Sesame Street* TV program, say, you cannot put anything into the game that won't be acceptable on the program. If your publisher only sells games for the Wii, your game will have to be for the Wii.

There are additional constraints on the kind of game you want to make, imposed as part of the process of conception. There are always self-imposed limits, because you have your own preferences, but there are also voluntary limits. A good choice of constraints — choosing more limited goals than "let's make a shooter" — Will probably lead to a better game.

A designer usually benefits from additional limitations, whether imposed by a publisher or studio ("no foul language," or "cannot cost more than $25"), or by himself ("I want a one-hour trading game" or "I want a cooperative zombie game" such as *Left 4 Dead*). Even though a self-imposed limitation may ultimately be abandoned in the interests of making the game better, initially it focuses the designer's efforts and is likely to provide better results. And if you work for a game studio/publisher, you might find that you have to jettison some preferences: if they say "make such-and-such a game," you'll do it or you'll be out of a job.

For example, I started out making a trading game, *The Four Elements*. But in the event I found that players were not trading voluntarily, though they did use a forced-trade mechanism. It's not a "trading game" now despite the presence of the forced trade, but there's still a game there that works.

In other words, self-imposed constraints are "rules" you use to try to help yourself create a better result, just as the "rules" for the various arts tend to yield better results.

Here's another way to look at it. Game design is problem-solving. Set yourself a problem, try to solve it. Sometimes you won't, but you might serendipitously find you've solved other problems.

In any case, be sure you don't design a game "just like I'd like to play." You are not the audience, you are very unusual or you wouldn't be designing games. And the game you'd like to play has likely already been designed. My favorite game for 25 years was *Dungeons & Dragons*, but I have never tried to design a role-playing game. I liked *Dungeons & Dragons*; why would I want to design something just like it? Though I modified it a lot.

It's too much time and effort to design a game just so you can play it. You should design games so that other people will enjoy playing them. Most of the time, you'll like to play them, too.

Let me quote Sid Meier (*Civilization, Pirates, Railroad Tycoon*) from *Gameinformer* #182, June 2008:

> There's a danger with some of the newer designers, a tendency to design the game you like to play. That game has already been designed — We need new games. There's a loss of a little bit of that "sky's the limit, anything's possible" approach we had in the early days. We have these genres — We have first-per-

> son shooters, we have real-time strategy. If you've played [video] games all your life you've gotten these certain styles really beaten into you. To get people to think out of the box is a little harder these days.

On the other hand, DO NOT design a game you dislike to play yourself, at least not until you are very experienced. If you dislike it, why expect anyone else to like it? As you get more experience and understand players better, you may be able to design a game that appeals to a certain segment, even though it doesn't appeal to you. At some point this may be worth doing, to get you "out of a rut," to "think outside the box," but it's not something to be done lightly.

C. The Core of a Good Game Design Process (No, Not Ideas)

There are many ingredients in the process of creating a good game. Ideas play a part, because a poor idea is unlikely to result in a good game. Imagination is important, but much less important than you probably think, and where it is important is as much in the improvement of the game as in the conception of the game. Attention to detail is important; seeing the broad picture is important. Understanding your audience is very important. But the most important part of the design process is constant playtesting and improvement. No game is very good in its initial prototype. Games are interactive, not something that is viewed or consumed passively in the way that a movie or composition or even a novel is consumed passively. The designer must see how the game works in practice, and then improve the game based on observations.

Play testing and improvement is the least "sexy" part of game design, but the most important. This part of game creation is so fundamental that all of Chapter 6 is devoted to this topic.

FURTHER READING

See Chapter 6.

D. Developing a Game Concept: What Should You Ask Yourself?

What are the practical constraints? Some obvious ones: Time available. Budget. Software creation skills available, application software available, component limitations.

- What is the essence or "vision" of the game (list about three things)?
- Who is it going to be marketed to?
- What is a player's primary activity? How many players?
- What are the major challenges (not the same as the overall objective)?
- What are the actions a player can take to overcome the challenges?

If it's a video game, what would the non-electronic/analog version of the game be like?

Build a "skeleton" first. Use the nine structural sub-systems (below) to help give form to the skeleton. Then use the "essential questions" (below) to settle it further in your mind.

E. The Processes Involved in Game Design: A Systematic View of Game Design

Creating a game is a project, and follows the same kind of planning cycle as any project. This is the Plan-Execute-Monitor-Control-Replan cycle, as illustrated in Figure 2 — Project Management and Game Development Cycles.

If you don't plan at all, you'll be constantly fixing things, often taking action to fix something that would not have needed fixing if you'd done things right. If you plan but don't check to see if reality (Execution) matches the plan (Monitor), then sooner or later reality won't match the plan. Further, even if you know the plan and reality doesn't match, if you do nothing to fix the situation (Control), then you deviate into failure. Assuming you Control the deviations, you then need to redo the plan. In other words:

- If you don't know what's supposed to happen, how do you know what to do?
- If you don't know what is actually happening, how can you make the right thing happen?
- If you can't make the right thing happen, how can you get where you need to go?
- If your plan doesn't adjust to reality, how do you know where to go, now?

Further, looking at the second part of Figure 2, we see that the major process in creating a good game is similar to the management process. When you've reached the point of a playable prototype, you play the game, analyze the results, modify the prototype, and play again, around and around until you're "finished," or you give up, or you're forced to stop.

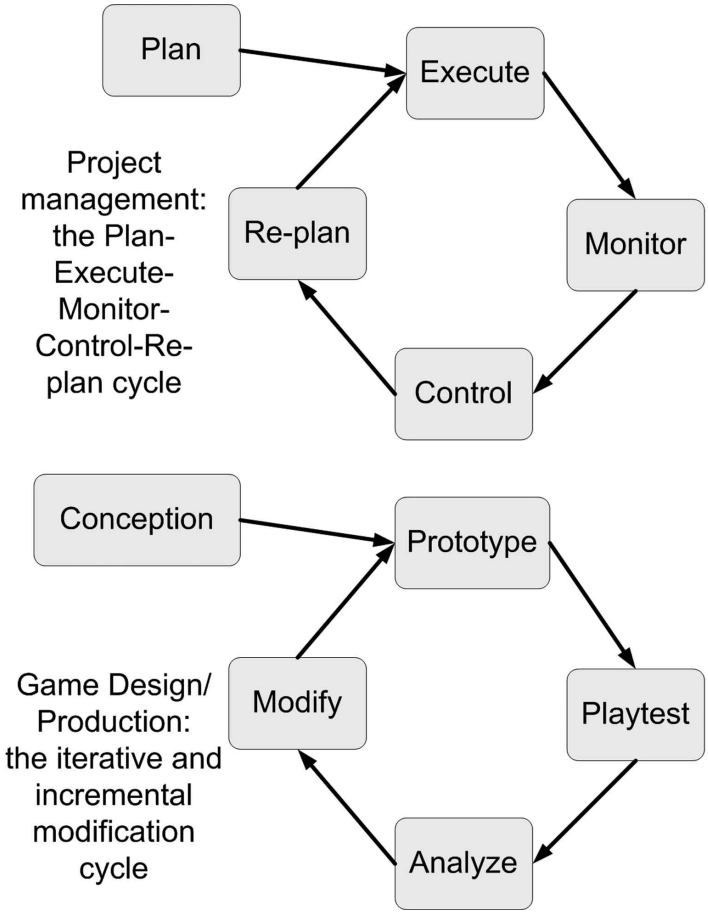

Figure 2 — Project Management and Game Development Cycles.

Figure 3 — Process of Game Design expresses the process a different way, in Data Flow Diagram terms borrowing from Systems Analysis.

A "system" is "an assemblage or combination of things or parts forming a complex or unitary whole." Typically, in systems analysis someone figures out how a system works, or *ought to* work, with the possibility that some of it might be automated. Here we're interested in how it ought to work so that we can use that knowledge in design.

A data flow diagram shows the processes that occur in a system as well as places where data is stored, flows of data/information or objects from one place to another, and external entities that interact with the system.

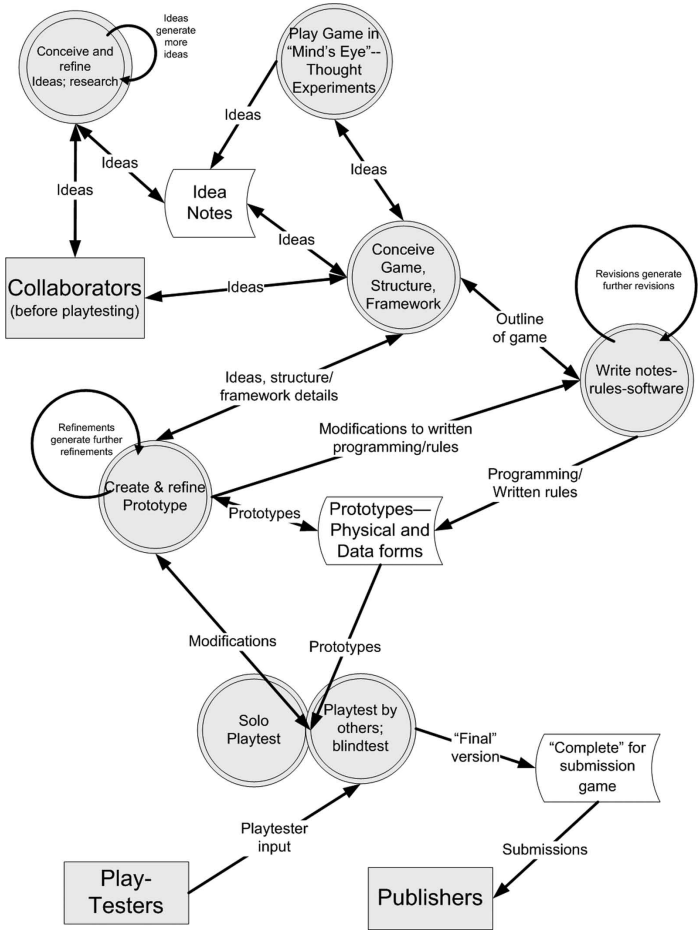

Figure 3 — Process of Game Design.

- the circles are the processes, where things happen
- the oddly shaped rounded rectangles are the data stores,
- the arrows are the flows of data/information or objects,
- and the rectangles are the external entities, outside the designer himself

The purpose here is not to show time sequences but to show all the things that might occur. Hence during the operation of the system at any given time several of the processes might be occurring. It's not unusual during the design process to be generating ideas, playing the game in your mind's

eye, and even conceiving the game structure and framework all at the same time. Often you could be creating and refining the prototype, writing notes, rules, or software, and playtesting all at the same time.

The system we're diagramming is "game design." The publisher and playtesters are outside the system, as they are not actually designing the game (we hope).

"Complete" is in quotes because publishers usually require changes to a game, sometimes for good, sometimes for ill, sometimes accidentally, sometimes deliberately. Researching and solving mass production issues is outside the system, insofar as the manufacturer does this.

The diagram is meant to show the process for any game, non-video or video. It is a diagram that assumes a single designer, which is not the case for AAA video games, which are effectively designed by groups of people. A AAA video game creation diagram, which we'll see in Chapter 8, Section A, is dominated by communication and cooperation because so many people are involved. Designers of big video games must cope with both sets of demands represented in two diagrams.

Design collaborators are shown outside the system, as well, but in some cases two collaborators will work so closely that they will collectively be within the process just as a single designer is within the process.

The Processes

Each of the seven processes shown on the main diagram can be divided into another diagram (not considered in this book) with sub-processes, until there is no point in drilling down further. For learners, the top level is sufficient.

Remember that the seven processes (activities) may be going on at the same time, not in a particular order. These are:

Conceive and refine ideas. The game begins in the mind. I've discussed above how important it is to have lots of ideas and how you can generate ideas.

This is also where you'll research whatever situation you are trying to model — if any. For example, if you're designing a game about farming, you need to know how farming works, which is likely to require some research. If you're designing a game about the Battle of Kursk in World War II, you'll need to research the battle and the capabilities and intentions of the Soviets and Germans.

If your game is intended to be a simulation, closely reflecting some reality,

then this research will be very important to the accuracy of the simulation. Nonetheless, do just enough research to get you going, then work on the game; some people get stuck indefinitely in "research."

Play game in "mind's eye"— Thought experiments. Gradually you'll have some notions about how the game will work. You should play the game or parts of the game in your mind and ask yourself "what is the player going to do and how is this going to be shown in the game." You can play in your mind's eye any time. You can be riding in a car, you can be waiting in a queue, you can be reading your notes made so far. Experienced designers do this a lot and sort a lot of the game out in their heads before they ever have a prototype to play. Video game designers must rely very heavily on this process because it's relatively difficult and time-consuming to produce a playable prototype of a video game.

Conceive game, structure, framework. At some point you'll have enough information that you'll lay out on paper how the game is actually going to work. Once you do this then you'll want to make a prototype so you can try to play.

Create and refine prototype. Creating the prototype is relatively quick for tabletop games but takes far longer for video games. Some video game designers, if it's practical, will make a paper prototype first to test the concepts that are the essence of the game.

Write notes-rules-software. At some point for video games someone will have to write the software. For tabletop games you can get away with relying on what's in the designer's mind for early playing, but sooner or later rules have to be written. So it's notes at early stages, rules at later stages.

Solo playtest. The designer plays the game himself so that he can work out the worst problems before he inflicts it on anyone else. If a team produces the (video) game, they likely all play the solo version to discover problems.

Playtest with others. Most of the play testing ought to be done by people other than the designer(s) and production team. This will include testing for tabletop games where the designer is present and probably teaches the players how to play, and blind testing where the designer is not present or at least has no part in what happens and the players learn the game as though they had just bought it.

In Figure 3 these two testing processes are adjacent to each other but separate in order to emphasize how important it is for the designer to play the game himself before other people play. (Technically speaking, there probably ought to be one process, Playtesting.) The designer can find a fix for

many problems simply by playing himself. Then the outside playtesters, assuming they're not being paid to playtest, will be happier with the playtesting and more likely to continue to play the game. If the game has big faults when they first play, they're much less likely to play again. You need to work out the really big faults before anyone else plays. (Yes, there are likely to be really big faults.)

In tabletop gaming, the process of refining the prototype is often called "development," and someone other than the game designer may be in charge. "Two heads are better than one," and the developer acts something like a book editor, suggesting or making changes to improve the game. In video games (and many tabletop designs) the designer(s) are also the "developers" in this sense.

Caveats

There is no single proper or right way to diagram this system, given the variety of ways that designers work, and in fact the original diagram was rather different several years ago although it still contains the same seven processes.

This is not a diagram of creativity, it's a diagram of what happens. "Creativity," when it happens, is within the processes. Most of game design is not what we normally think of as creativity.

Quality is not part of the system analysis diagram in and of itself. Ideally, every step in the process will be well done, but there is no assurance of it. If a designer leaves out some of these steps, he's less likely to create a good game. If a designer follows these steps, he may still end up with a lousy game, though it should not be an unplayable game (if it were, the blind testing would never work).

FURTHER "READING"

"Cooperation and engagement: what board games can tell us": *http://www.youtube.com/watch?v=cdTVcFo2EQw*

Alternative Ways to Look at the Process (MDI/MDA)

Adams and Rollings in *Fundamentals of Game Design* list the stages of game design as:

- Conception,
- Elaboration,
- Tuning (which is iterative and incremental)

This describes three successive stages of design, and does not contradict the

data flow diagram, but is a simpler way to look at it. In their view, the conception is a plan for a game. Once you begin to elaborate a game you should not make major changes in the plan, or should recognize that you've switched to a different game. That's OK if you have time and if you don't already have a contract to deliver a game with certain parameters (you often will with video games).

MDI stands for Mechanics, Dynamics, Impressions. It is a way of thinking about the game as you create and modify it, something to help you think of questions and modifications.

The three parts need to be discussed in "reverse" order. What we want to engender in the minds and hearts of the players, what we want them to feel and think, is one of the first things for a designer to think about for a game. What do we want the end result to be in terms of the effect on the players? That is, what *impression* do we want to make on the players? Some designers like to write, early in the conception process, a description in general terms of what they want the players to feel and experience.

Mechanics is the rules or the mechanisms enforced by the programming, the parts of the game that in effect tell players what they can do and what they can't do.

Dynamics involves how the programming or rules interact with the players to produce events and challenges in the game. What a designer intends, what he sees in his mind's eye as he plays the game in his head, is often not what happens when the prototype is played. Often two qualities, emergence and serendipity, become important.

Emergence, "the appearance of new properties," often occurs when two or more mechanics interact to produce something unanticipated, something that is more than the sum of the parts. These new properties may be a surprise even to the designer(s). Rocket-jumping is apparently something that emerged from the mechanics (rules) of video games, not intended by designers. Many rules/mechanics-dominant games (as opposed to story-dominant) exhibit qualities of emergence.

Serendipity is "an unsought, unintended, and/or unexpected discovery and/or learning experience that happens by accident and sagacity." The word is often used in connection with scientific discoveries that someone "stumbles upon" (e.g. penicillin). In this context, some designers may be particularly adept at creating rules which lead to quite different kinds of gameplay than anticipated.

The designer, then, creates game mechanics to provide challenges for the players, things for the player to do, and has in mind certain thoughts and emotions he wants to engender in the players, but the dynamics of those rules will often lead to quite different situations.

The original version of this idea is MDA (Mechanics, Dynamics, Aesthetics), devised by Marc LeBlanc (also originator of "8 kinds of fun"). The word "Aesthetics" doesn't convey adequately to most people, so I've substituted my own preference.

However you look at it, the important thing is to recognize the iterative and incremental nature of creating a successful game.

Stages of Game Design — Average Time Spent on Each

"Making an 80% game is very easy. A lot of games that are out there are just 80% finished. With more testing the game could be more elegant and the last 20% takes a lot of time. That's the difficult part." — Reiner Knizia

Knizia, who makes more than a million dollars a year as a freelance designer of board, card, and (recently) video games, is referring to the last 20 percent of changes in the game, which takes a lot more than 20 percent of the time.

Time taken for each stage:

Video Game Typical	*Tabletop Game*	*Video Game Ideal*	*"New" Style Video Game (Social Network/ Free-to-Play)*	*Stage*
30%	10%	20%	10%	Conception and pre-production
40%	10%	30%	10%	Creating playable prototype(s)
25%	40%	10%	10%	Playtesting and modifying to get something that "works" (to reach Knizia's "80%" stage)
5%	40%	40%	70% (much of this after initial publication)	Playtesting and modifying to make it good — To polish it

This is, of course, my estimate, and can vary greatly from one game to another.

F. The Structural Parts of a Game, from a Design Point of View

A game can be thought of as a system (as in "systems analysis," for the computationally inclined). The objective in this section is a list of the fundamental sub-systems that are necessarily a part of any game (excluding sports such as baseball or swimming). This list may help inexperienced designers, because if they think about all nine of these systems as they rough out their game, this will help them conceptualize and arrive at a playable idea.

We could discuss endlessly what is a game and what is not; let's just recognize that, within your definitions of "game," you can probably find an exception that doesn't have all nine characteristics. That's a function of definition rather than a failure of the analysis, but that must remain a matter of opinion. If one of these systems is completely missing, you might have a toy or puzzle, but not a game.

There are many examples "on the edges," such as *Katamari Damacy,* in which the player rolls a sticky ball through a world, and as things stick to it the ball becomes larger until it can roll up buildings and even islands. To me, *Katamari Damacy* is not a game, and *Solitaire* (the card "game") is not a game, because there's no conflicting interest, no active opposition guided by intelligence — they are more like a puzzle or toy. But both of these activities fit the Nine Structures framework.

This framework will help a designer think about games. There are other approaches that are less useful. Some people, in listing fundamentals of games, discuss "state" in considerable detail. I've avoided "state" and "state-changes" as much as possible, simply because an organization dominated by state is not very useful to an inexperienced designer. "State-change," in particular, seems to lump an awful lot together in one pot. The ultimate goal is to have something that will be useful to inexperienced designers, and to be able to expand each category to exhaustively list alternatives within each structure. Designers should be able to treat the extended list (which is in Chapter 10) as a sort of checklist, to help them make sure they've thought about all the vital aspects of their game early in the process.

These subsystems are listed in a logical order, but every one is just as fundamental as every other one.

Sometimes the system is assumed, or the choice is to have "none," but still a decision has been made about the category. For example, in tic-tac-toe (noughts and crosses) there is no acquisition of resources, but it still has an economy of "unlimited pieces"— it could have a way to gain resources, and there are variations where you do. Another example: a very abstract game has no theme/history/story, but the designer chose to take that approach, nonetheless.

1. Theme-atmosphere/history/story/emotion/image. These are listed in order of common usage, not necessarily importance. Story can be absolutely vital to a role-playing game, but is essentially absent from many games. Historical games use history to a greater or lesser extent. Many Euro-style board games have an atmosphere that may or may not have affected the construction of the game. And we can still have abstract games (e.g. *Tetris*)

without anything related to theme. Many video game designers want to design "an immersive experience" to elicit one or more emotions from players. And even a single image in one's mind, a scene or "movie clip," can characterize a game.

2. Player interaction rules (and number of players). Is it a cooperative game, or a game like *Doom* (the board game) where one player controls the "badguys" and the others cooperate against him or her, or a competitive game (typical), or is there some other relationship between and amongst the players?

How many separate interests are there in the game? How many sides? Some "games" have only one conscious interest (the player) and so may more properly be called puzzles or toys. Some have several sides (many board games, some online RTS). Some have just two sides but several interests because there is more than one player per side (*Team Fortress*, etc.).

This subsystem determines how the players interact with one another. For example, in a multi-sided game, are negotiations allowed? Cheating? (The rules of the classic board game *Diplomacy* encourage what most people would call cheating, such as sneaking a piece off the board when no one is looking.) Even physical intimidation? The answer to that is almost always "No," but it is a decision.

3. Objective/victory conditions. In other words, what causes one player to win, or at least causes the game to end, and what is the goal pursued by the players? The game ending can be arbitrary ("play five rounds" or "play ten levels" or "play to x points"), yet there will usually be a way to determine the winner at that point. Tabletop role-playing games have no end, and usually don't have winners, but do have objectives: most commonly to acquire experience points and powerup items/skills/perks.

4. "Data storage" (information management). Something has to record the current state of the game. This is often a board/map, even if it is "inside" a video game. In tic-tac-toe, it's the nine-box layout. In card games, the layout of the cards on the table, and the cards themselves, store data. Pieces can store data, in particular the traditional cardboard pieces of wargames that contain movement, attack, and defense values. A detailed map stores LOTS of data. A computer can store vast amounts of data, of course, though early computers were very limited in data storage, which in turn limited the games.

5. Sequencing. In what order do things happen? "Simultaneously" or "in real time" is often the answer in video games, while turn-by-turn is typical for the tabletop.

6. Movement/placement. The most typical "piece" in a computer

game is an "avatar," a figure/character representing the player. Tabletop players generally manipulate something, most often pieces on a board or cards in their hand or on the table. Chess and checkers have movement rules, the Asiatic game go has placement rules. Movement/placement one at a time is the norm in traditional games, where in wargames a player can typically move all his pieces in one go. Even paper-rock-scissors has movement (as well as sequencing) rules.

7. **Information availability.** What information about the game is available to all players? In video games much information is tracked by the computer, not available to the player(s). In traditional board games all information is available, but in card games information is largely hidden. Five-card draw poker has a lower level of information availability than Texas hold 'em, because in the latter you see some of the cards "held" by the other players.

8. Conflict resolution/interaction of game entities. What happens when an action of a player leads to a conflict? Conflict in video games often involves shooting (and aiming) or melee. Yet this can be as simple as in tic-tac-toe (conflict is not allowed, you can't place your mark where the other player already has one), or it can be simple as in chess (when a conflict occurs, the moving player always wins). In checkers you jump a man in a conflict. In go you surround stones to capture them.

You might prefer to say that tic-tac-toe has no conflict rules, that movement rules govern where markers can be placed; but a choice has still been made, that there will be no conflict. It is quite possible to have a game without conflict, such as a race game or many card games (*Solitaire*) and many family games.

9. "Economy" (resource acquisition/conversion). How are new pieces/capabilities acquired? Is there any way to convert one thing to another? Some games have no way to do either, but that is still a decision made about the game. On the other hand, economic/resource management video games usually involve construction of buildings that enable creation of further assets, in an increasingly complex process that may also include technology. In video games there are very often ways to obtain new capabilities, whether it involves mining resources and building factories, or just picking up med-kits and weapons that sit in convenient spots.

Even games that don't appear to have an Economy have some elements, for example, in chess you can promote ("queen") a pawn, and in checkers you can make a king.

Are we sure there are just these nine? No, but the list has been stable for

more than five years, though details have been revised. There is also a list of essential questions (below) that designers ought to think about, but which can generally be ignored when creating the framework of a game.

Very useful for learners is to take simple games and change one of the structural choices. This is especially easy with traditional games that "everyone knows" such as tic-tac-toe, chess, *Monopoly, Risk*. For example, the well-known hidden-movement chess variant kriegspiel presents a case of changing from perfect information to very limited information for the players (sub-system 7).

The *Monopoly* variant where someone on Free Parking collects miscellaneous fees that would normally go to the bank is an example of changing the economy of the game slightly (sub-system 9). Increase the tic-tac-toe board to four by four, and let a player win with four in a row or four in a square, and you have a much better game: you've changed the data storage and the victory conditions (sub-systems 4 and 3).

Now for examples.

Traditional games are almost always turn-based in sequence, with one piece moving. Think chess (including oriental versions), checkers, go, *Monopoly, Parcheesi*. Certain genres of video games are almost always real-time movement, such as most shooters (*Worms Armageddon* is an exception).

How do video games fit the nine sub-systems? Most "shooter" video games follow this same pattern:

1. Theme-Atmosphere/history/story/emotion/image. Usually, the story is an excuse to get to the action, though there are shooters with deeper stories that actually affect gameplay. Many games intended to "elicit an emotion" are at least partly shooters, many others are role-playing games.

2. Player interaction rules (and number of players). Generally shooters are one-person games, though we're getting more cooperative/buddy versions as video game machines become more capable. Many have a multi-player (but two-sided) version as well. There are rarely player interaction rules other than common courtesy. Some players try to install their own rules, such as the disdain of "camping" even when "camping" is allowed by the mechanics of the game.

3. Objective/victory conditions. The objective is usually to kill as much as possible before you're killed, but there can be overall game victory conditions. Sometimes there is a story goal that overrides pure killing.

4. "Data storage" (information management). The computer/console provides the storage and management; how the software addresses the details is usually hidden from anyone not on the production team.

5. Sequencing. Almost always, shooters are simultaneous real-time movement.

6. Movement/placement. Almost always, the player has an avatar that moves in ways that are analogous to the real world. The differences from one game to another can manifest in whether the character can jump, swim, fly, etc.

7. Information availability. Most video games involve much hidden information — one of the great virtues of electronic games as compared to non-electronic. In a shooter, you rarely have information that your avatar cannot reasonably see or hear, though there may be scanners or other devices that detect through walls and around corners. (Exception: many games show you, after you're killed, where your killer was when he attacked you.)

8. Conflict resolution/interaction of game entities. Shooting. And perhaps melee.

9. "Economy" (resource acquisition). In most shooters you can find food, weapons, and medical kits just sitting around for the taking. In some, when you score enough you gain additional "lives," or can purchase better weapons. You may be able to despoil the bodies or the installations of your vanquished enemies, as well.

Now let's dissect a non-shooter video game: *Pac-Man*

1. Theme-Atmosphere/history/story/emotion/image. The game is often credited as the first to have a character (sort of) and there is a very simple story, though once again the story is mostly an excuse for action.

2. Player interaction rules (and number of players). One player vs. the computer.

3. Objective/victory conditions. Make it through all the levels. The subsidiary objective is to score points by eating dots, as it is very, very difficult to go through all the levels.

4. "Data storage" (information management). The game uses a square grid, more or less, as a "board."

5. Sequencing. Simultaneous real-time.

6. Movement/placement. The player has one "piece" which can move constantly. The opposition has up to four ghosts, though not always all of them at once.

7. Information availability. Virtually all information is available!

8. Conflict resolution/interaction of game entities. Pac-Man eats dots, ghosts eat Pac-Man, Pac-Man can eat ghosts for a limited time after consuming special dots.

9. "Economy" (resource acquisition). Score points to gain lives.

The video game *Civilization IV* is not much different from most board wargames:

1. Theme-Atmosphere/history/story/emotion/image. Rise from barbarism to the moon. Conquer the world or persuade it to acknowledge your nation's superiority.
2. Player interaction rules (and number of players). Multiple separate interests and sides. Negotiation is possible.
3. Objective/victory conditions. As with some board games, there are multiple ways to win, such as flying to the moon/stars or conquest.
4. "Data storage" (information management). *Civilization IV* uses a square grid (hexes in *Civilization V*), which a player can actually make visible, to regulate movement. The computer keeps track of many details, which of course is why *Civilization* the computer game includes far more detail than any board game.
5. Sequencing. Turn-based.
6. Movement/placement. One side moves all of its pieces in a turn, many pieces can be in one area at a time (or only one per area in *Civilization V*), move into an enemy-occupied area to attack it.
7. Information availability. Thanks to the computer, much of the information is hidden, though *Civilization* provides various aids and warnings to give you some idea of your standing in the world.
8. Conflict resolution/interaction of game entities. When pieces move into an enemy-occupied area, a fight occurs. Unlike most board games, the combat method involves one unit at a time on each side even though many may be in the area. (*Civilization V* has adopted more board game-like methods.)
9. "Economy" (resource acquisition). Much of *Civilization* revolves around acquisition of resources that enable technological research and construction of a great variety of pieces.

What about a non-conflict game, say *Tetris*.

1. Theme-Atmosphere/history/story/emotion/image. None.
2. Player interaction rules (and number of players). One player vs. the computer, which probably administers things purely at random — it is definitely not a conflicting interest.
3. Objective/victory conditions. The objective is to score points by making rows of blocks; but the game has no ending other than ultimate failure of the player's efforts.

4. "Data storage" (information management). The square-grid "board" and the computer.

5. Sequencing. Simultaneous real-time.

6. Movement/placement. The computer generates pieces, you can rotate them and drop them quickly.

7. Information availability. You can see what's on the board, and the type of piece that will fall next.

8. Conflict resolution/interaction of game entities. This is as close as we come to the rules for where blocks fall and when they disappear.

9. "Economy" (resource acquisition). The pieces keep coming.

Let's try a sports video game, say *Madden Football* (or just about any other football simulation).

1. Theme-Atmosphere/history/story/emotion/image. Simulates real-world football.

2. Player Interaction rules (and number of players). The player vs. the computer, or vs. another player.

3. Objective/victory conditions. The same conditions as real football; even in games involving a campaign (entire season), the objective is to win a championship, just as in the real world.

4. "Data storage" (information management). The computer, the virtual football field.

5. Sequencing. Simultaneous with periods of thinking in between, just as in the real thing.

6. Movement/placement. Eleven "pieces" on a side, running, passing, causing collisions.

7. Information availability. Largely available, but similar to the real world.

8. Conflict resolution/interaction of game entities. Complex rules for collisions including blocking and tackling, rules for possession and movement (and loss of) the ball.

9. "Economy" (resource acquisition). Trades, drafts, and other ways of acquiring new "pieces"; injuries.

Finally, let's try a game that may not fit, because it uses the human body only — Rock, Paper, Scissors:

1. Theme-Atmosphere/history/story/emotion/image. None.

2. Player interaction rules (and number of players). One player versus another.

3. Objective/victory conditions. The circular superiorities rule determines a winner.

4. "Data storage" (information management). If there is any, it's the human brain, and only insofar as, if you play best two out of three, something must keep track of the score.

5. Sequencing. Simultaneous.

6. Movement/placement. No pieces other than your hands.

7. Information availability. Only what you can glean from your reading of your opponent.

8. Conflict resolution/interaction of game entities. Here we have paper beats rock, rock beats scissors, scissors beats paper.

9. "Economy" (resource acquisition). No new resources, but anyone with a hand can play.

Chapter 10 includes a detailed list of many of the choices available to game designers in each of the nine categories, that is, what can you choose to do?

G. Some Essential Questions You Should Ask Yourself About Your Design

The following are questions, or "decision points," for a designer to consider after he or she has established a framework.

What's the difference between the structural elements and these questions? A designer MUST choose something within each of the structural elements, or there is no game yet (not consciously choosing is itself a default choice). On the other hand, he or she can ignore any of the following questions, but other elements in the game will create some answer to each as the game is developed. Yet many of these questions are as important, in the long run, as those fundamental structures. As a designer, I'd prefer to answer the questions initially rather than stumble into an answer, but others may have a different point of view.

Many of these questions are primarily of interest in non-race games with more than two sides. Races aren't unusual in video games (*Mario Kart* is the most well-known recent race game), yet they are a very specialized version of multi-sided games because in most races there is little you can (legally) do to hinder the opposition.

Many board games and most card games are "multi"-sided (more than

two sides). A trend in video gaming is toward multi-sided games, a way to have several people participate and compete directly, rather than indirectly via high scores or times, with one another. Over time, then, some of these questions will become very important for many video game makers.

Here in summary are the questions, along with a brief discussion of each.

"Distinct" Questions (Yes/No, or Just a Few Possible Answers)

1. Is it a traditional product, or free-to-play? Although technically this is a business question, not a design question, it makes so much difference to how you design a game that it's include here. For traditional game marketing, you have to make a game entertaining enough to persuade people to buy it. For the digital free-to-play market, the game need only be interesting enough for someone to try, then the problem is how to get them to spend money while continuing to play. This large question is discussed further in Chapter 8.

2. What is the genre of the game? This is related to theme/story, and is very important in video games, less so in tabletop. Genres might be "sweep of history" game, "shooter," role-playing game, real-time strategy game, resource management game, etc. But a designer may not think about genre to begin with, and may end up with a game that defies standard genre-categorization.

3. Is it competitive, collaborative, or cooperative? Most of the time the game will be competitive, but occasionally, all (or almost all) of the players will cooperate with each other. "Co-op," to a video gamer, means two or more players cooperating against the computer, say in a "shooter" game. On the tabletop side we have *Pandemic* and Reiner Knizia's *Lord of the Rings* game, where all players work against the game, along with *Shadows Over Camelot* and *Battlestar Galactica*, where there might be a traitor amongst the players. In a collaborative game, players may suggest specific plays to one another and the game amounts to one side of several players against the game (*Pandemic*). In the (rare) truly cooperative game the players are independent agents who must cooperate in order to win, but only one actually wins. Games with a traitor begin to resemble this form.

4. Is It Symmetric or Asymmetric?

- Symmetric — Similar starting positions/forces (typical of abstract games)

- Asymmetric — different starting positions or forces, and sometimes different objectives, typical of historical simulations

AAA list electronic games are often symmetric, except that there may be asymmetry coming from different starting characters. *StarCraft* (as many other RTS games) is asymmetric because the three races are functionally different.

5. Is it Zero-sum (ZS) or non-zero-sum? In the former, any gain by one player comes from a loss by another.

Diplomacy is an epitome of zero-sum; *Risk* has some aspects of it, as do many wargames with strong economies (e.g. *Axis & Allies*). Role-playing games (electronic or otherwise) are rarely zero-sum, though there is the element of "I kill monster, I get monster's stuff." RTS games are zero-sum in the limited sense that there is usually a finite amount of resources available, and if one player gets a resource, the others cannot get that resource.

Another way to pose this: is your opponent's loss your gain, or your gain your opponent's loss? If the game is two player ZS, the answer will always be "yes." If it is multi-player zero-sum, someone will gain when someone else loses.

ZS vs. non–ZS can be posed a different way, not quite the same thing: how easy or hard is it to hinder an opponent while at the same time helping yourself? If it's easy, you're closer to ZS; if it's hard, you're farther from ZS. (An important aspect of most "Euro" board games is that they are far from ZS.)

Games in which you score points regularly through the course of the game tend to make zero-sum unlikely, and encourage situations where it's hard to hinder an opponent while at the same time helping yourself. (How many games let you take points away from another person that have already been scored?) Of course, there are exceptions, this is a tendency only.

6. How many (human) "sides" (generally, 1, 2, or many) and (human) players? This question is related to the "Player Interaction Rules" sub-system, and one could argue against including it here. This one concentrates on the number of players and sides, however.

Football has 22 players, but only two sides. When video game people say "multi-player," they often mean this in the sense of many people playing, but no more than one or two sides or "every person for himself." "Multi-player" in the tabletop world usually means "more than two sides, one player per side."

Axis & Allies or *War of the Rings* can be played with four or five people, but is a two-sided situation (regardless of attempts to use strange victory conditions to make it appear otherwise, there are only two primary interests).

Video games, until recently, have almost always had one human side, and the computer as a second side. True "solitaire" games have one side and a non-active obstacle that is more like a puzzle than another side. Where there

is only one side, as in the card "game" *Solitaire,* what you really have is a puzzle. Still, someone must design these "puzzles."

7. Is this an "emergent"/rules-dominant game or a "role-assumption"/story-dominant game? Board and card games, especially the "traditional" games, tend to have no narrative, no story. There is a set of rules, and play "emerges" from those rules. "Rules-dominant" might be a better term. Many video games, such as *Tetris*, also have this characteristic. Another way to look at this is that in these games the player does not assume a role, he does not usually think of himself as a person experiencing some aspect of an imagined life. Even in *Monopoly*, theoretically a game about real estate trading, players don't think of themselves as entrepreneurs.

But many video games, especially the newer ones, incorporate an avatar, and a story of some sort happens to that avatar. The player thinks of himself as the avatar. These might be called "role-assumption" or "story-dominant" games. Which is yours?

The epitome of the story-dominant game would be made in an environment like *The Matrix* or the *Star Trek* holodeck. Some designers believe that the designer should, as much as possible, "hide" himself within the game, so that players are less likely to think of it as a game and more like reality. Opposed to this is the rules-emergent point of view, where the players know they are playing a game with rules, and want the designer to do his best to make rules that result in an entertaining game.

Spectrum Questions (a Wide Range of Possibilities Along a Spectrum, "Analog-Style" Questions)

1. How "big" (and how long) will the game be? You can design little games, short games, "monster" games, games that take 10 minutes to play, games that take 40 hours to play. What will it be? The audience has a lot to do with the answer to this question.

2. How complex is the game? Complexity can come from the rules or from the play, or both. The rules of chess are fairly simple, but the play is complex. Generally speaking, the larger number of plausible choices a player has, the more complex the play, but that is not always true. "Euro-style" board games try to keep the number of plausible decisions small at any given time, in order to avoid "analysis paralysis." In many video games, anyone who dallies when making a decision is wiped out, so the number of plausible decisions must be fairly small.

3. What is the level of action or "granularity"? This refers to what

kind of "force" or "agent" the player controls. If it involves violence, is action conducted on a tactical (individuals, skirmishes), grand tactical (battles), strategic (warfare including economics), or grand strategic level (series of wars)? A shooter is always tactical, an RTS is generally strategic, *Civilization* is grand strategic. If the game does not involve violence, it still has a level of action, which is most likely individual. *Mario* games are always at that level, for example.

Another way to look at this is, how many "pieces" does the player control/keep track of, from one up to hundreds. At higher levels of granularity, economics of some kind (production of units) is likely to be important.

Abstract games may be difficult to gauge, though in the end they tend to involve one piece at a time, as in *Tetris*, or a few as in *Bejeweled*. Checkers and chess are tactical games, as the number of pieces is quite small and only one can move at a time. RPGs are necessarily tactical.

4. What is the role of chance, how much does chance play a part in the game? This can range anywhere from essentially none (chess, checkers — the only chance is who plays first) to complete chance (*Candyland, Chutes and Ladders;* the card game "war"; or just rolling dice against each other)

5. How strongly will the decisions and actions of the players influence the outcome of the game? Traditionally, video games have involved failure. In arcade games you ran out of lives and were done. In home video games we usually have infinite lives, so failure does not end the game, you just go back to a save point or respawn and continue. There is no way to lose, though a game can be so difficult that it isn't worth your time. The question here is, do you want to design a game so difficult that people will give up, hence a player's decisions and actions make a big difference? Or do you want to make it so easy that any normal person can succeed, which means a player's decisions and actions are practically inconsequential?

This manifests a different way in games with more than one side. Some Euro board games, and almost all traditional American family games, are designed so that even if a player is making mistakes, the gameplay can allow them to recover and win. In other words, we want the non-adult or inexperienced players to still have a chance to win. Many wargames are not so designed, and a person who isn't concentrating and isn't making good decisions will rarely, if ever, win. I call this characteristic the "gyp factor." If a game lets a less skillful player win often, the skillful player is "gypped" (you can see what school of thought I come from...). Here's the lead sentence: "The Gyp Factor (GyF) of a game is the degree to which it permits or prevents the *expert* (near-perfect) player from winning consistently against less than expert but at least average

players. If the GyF is very low, the expert will beat the good player virtually every time — chess is an example. If the factor is very high, the expert wins no more often than the good player — in other words the expert is gypped because his additional ability cannot be exerted in the game."

See *http://www.pulsipher.net/gyp_factor.htm*.

6. Which kind of skill does a player need to use, improvisation, or planning? Video games, when there is time-stress, tend to require improvisation. You can also suppose that the more information is available, the more planning is emphasized (think chess), and vice versa. As a consequence of limited information, many video games require a lot of improvisation. If you don't have enough information it's really hard to plan ahead. Some tabletop games such as *War of the Ring*, and "card driven wargames," place the premium on adaptability, because you don't fully control what your side does. The roll of the special dice, or the draw of the cards, makes a big difference. Other games (chess, obviously, and traditional hex wargames) place a premium on planning. Euro games tend to focus on adaptability, which often makes for less analysis than older wargames.

Related to this is the question, what is the level of Fluidity or Chaos in the game. How much does the situation change from one "play" (turn) to the next? How much can a single action by one player change the situation? A high "take that" factor (one action changes things drastically) often indicates a highly fluid game, and a fluid game usually requires adaptability more than planning from the players.

7. Which kind of skill does a player need, quick reactions (typical in shooters, for example), or careful deliberation? Probably the majority of video games require quick reactions, while the vast majority of tabletop games require deliberation.

8. Is the game "mechanical" or "psychological"? That is, is the game largely determined by positions and pieces, or by psychological effects? This is a very difficult question: Which one is *Diplomacy*? While the mechanical aspects are important and occasionally vital, mostly it is a psychological game determined by negotiation (as most people play it). *Tetris* is highly mechanical, while poker is highly psychological.

"Romantic" players tend to make any game psychological, while "classical" players tend to concentrate on the mechanics. Further, experienced video game players tend to turn all the single-player games they play into mechanical exercises, finding the very best set of circumstances to give them the greatest advantage.

Other Questions

1. What is the outstanding mechanism involved? It's possible that nothing will stand out, but many games are essentially an exploration of one mechanism — e.g., checkers, tic-tac-toe, *Tetris*, *Pac-Man*.

2. What are the dynamics of being ahead or behind in the game (multi-sided games only)? "Leader-bashing" might be defined as the tendency of players to gang up on, and drag down, the leader. If this is too easy, the game becomes an attempt to avoid looking like the leader. If it is too hard, the game becomes multi-player solitaire. Some games address this question by making it unclear who the leader is. In a three-player game in particular, the "petty diplomacy problem" (as R. Wayne Schmittberger calls it in *New Rules for Classic Games*) is related to this: *when one player realizes he cannot win, how easily can he determine, by his actions, which of the others wins*? (This ability to determine who wins is called "kingmaking.") If it is easy to do this, then the game probably isn't much fun to play, in the long run, for many types of players.

This could be generalized in a different way, as "how easy is it to hinder another player, and how much can you help yourself AND hinder the leader at the same time?"

3. What phases does the game naturally fall into? Some people believe that a good game naturally falls into three phases, the opening or beginning, the middle game, and the end game. Chess is often looked at in this light. (This is something like the "natural" three-act form of plays and films.) While not all games need to have these phases, the question might be, What phases does the game naturally fall into? For example, my board game *Britannia* has four phases: the Roman dominance, the Anglo-Saxon dominance, the Viking invasions, and finally the endgame with three (or four) kings in competition. Many real-time strategy games fall into phases, one being base-building, another being securing adequate resources, the final one being destruction of base(s).

If the game feels the same at all times, it will be less interesting than when it changes through two or more phases.

4. Is the game "serious" or "just for laughs"? Chess is serious, party games are just for laughs. Games for the Wii tend to be less serious than Xbox 360 games. Both types can be combined within one game in different amounts.

5. Is the game "ruthless" or "nice" (a competition or an entertainment)? Some games are "entertainments," games where winning is either not

the main thing, or is something that everyone can do (via cooperative/collaborative gaming). They're "nice." Some games are competitions, where winning is very important, and "nice" is not part of the equation — so "ruthless" for short. This question is different from "serious or for laughs," but certainly related to that.

H. What's Important in Designing Games, in "One Page"

This is my attempt to say in "one page" what's important in game design. You should:

1. Know your audience! What do they like? No game can satisfy all tastes.
2. Know your objectives! What are you trying to achieve?
3. Understand that design is "10% inspiration and 90% perspiration," especially if you also develop the non-video game.
4. Know that writing usable rules (or doing the programming) is the hardest part.
5. Always write everything down (and back it up).
6. Accept that playtesting is "sovereign." No matter what you think about how the game will work, only efficient playtesting will actually show how it works. Without a playable prototype, you have nothing! (That's only a slight exaggeration.)
7. Know that ideas are cheap (easy); a playable game is much harder to create.
8. Know that players must be able to influence the outcome of the game by their choices amongst non-obvious alternatives — otherwise it's not a game (though it might be a story or a toy or a puzzle).
9. Be willing to change the game again and again.
10. Accept that hardly any idea is original ... but ideas can be used in new ways. And there's almost always a new way to treat any subject (many, many ways to do real estate — *Monopoly* is only one).
11. Understand that games are supposed to be fun. But "fun" means different things to different people.
12. Never design games for yourself, design for others.
13. Keep in mind the nine fundamental structures of games:
    - Theme-Atmosphere/History/Story/Emotion/Image.
    - Player Interaction rules (and number of players).

- Objective/victory conditions.
- "Data storage." (Information Management)
- Sequencing.
- Movement/Placement.
- Information availability.
- Conflict resolution/interaction of game entities.
- "Economy" (resource acquisition/conversion).

The road to the complete game:

1. Ideas,
2. Playable ideas,
3. Prototypes,
4. Play solo,
5. Playtest,
6. Fully written rules,
7. Keep experimenting.
8. "Blind" test.

"A designer knows he has achieved perfection not when there is nothing left to add, but when there is nothing left to take away."—Antoine de Saint-Exupéry

I. What's Important in Designing Video Games Specifically, in "One Page"

This is a similar "one page" list that concentrates on design aspects specific to video games.

1. Really "good" games are played over and over again. "Decent" video games are played once. Designers should produce good games, not just decent games. So what's important in the game?

2. Graphics are secondary. Virtually no one plays a game for a long time, or many times, because it looks pretty.

3. Story is almost always secondary. Games are interactive challenges; stories are largely passive entertainments, though some video games make them more interactive than in the past. Few people play a game many times because they like the story. Stories, especially simple ones as in video games, wear out.

4. Challenges, and what the player can do to overcome them, are primary. Always ask yourself, what can the player(s) DO? Games are about doing.

5. Always remember your audience. You can't make a game that appeals to everyone, so decide who your targets are.

6. Game design is work, not playing games or "being creative."

7. Don't be afraid of starting over. The majority of games are never finished because they don't deserve to be finished.

8. Get the job done. The last 20% takes as much as 80% of the time. Too many games are issued before that 20% is done. The first playable prototype is a poor game. Yet until you have a playable prototype, you haven't done anything.

9. Playtesting (not bug testing) is sovereign. This is what lets you iterate and incrementally change the design, so that the initial prototype (a poor game) becomes at least a decent game, and we'll hope, a good game.

10. Every game you make can be a really good game, regardless of its size. "AAA" list games are no more "worthy" than casual games.

11. If you make a game that includes all the currently-popular elements, you'll likely end up with a soul-less mess.

12. You won't be famous, at least not anytime soon.

J. Maxims of Game Design

In the age of "instant gratification," of convenience, of the sound bite and video clip, we often look for shortcuts to understanding. "Maxims" are one form, each one a brief "expression of a general truth or principle." A characteristic of a good maxim is that it can lead to wide-ranging discussion, perhaps because of its combination of brevity and trenchant illumination of some "general truth." As part of teaching young adult beginners about game design, I've pursued a list of maxims about game design, even as I know that such brief expressions leave out a great deal that's important.

Internet searching for "maxims of game design" doesn't yield much. "Principles of game design" is much more fruitful, but what you find involves a lot of explanation rather than the punchy directness of the classic "maxim."

The most notable set of maxims I know of comes in the "400 Project." (*http://www.finitearts.com/Pages/400page.html*) This was an effort organized by Noah Falstein and Hal Barwood to collect design maxims from the game design community. The 400 Project evidently has not been updated since March 18, 2006, stopping at 112 entries.

The list is at *http://www.theinspiracy.com/Current%20Rules%20Master%20List.htm* The list includes a brief "imperative statement" and an explanation in 250 words or less.

Some of the entries are more or less repetitions of others, some are very specific to video games while others apply to all types of games, but this list is good food for thought, especially if you want to design standard video games-as-interactive-puzzles.

Many of the entries are very specific and often related to the mechanics of designing the game, while others are much more general and often related to why games are good. For example, "Make the First Player Action Painfully Obvious" is quite specific, though nonetheless good advice for any video game, while "Keep the Interface Consistent" is generally good for any kind of game, and "Make Even Serious Games Fun" is imperative (if we substitute "interesting" or "enjoyable" for "fun").

I've tried to devise a much smaller, general set of maxims that require little or no explanation, at least not by the end of a game design class! At any rate, I'm going to end this chapter with my current list of use-in-class maxims, and leave further discussion to the readers. I've divided them into several groups without trying to label each group...

1. Think!
2. In most situations, focus on gameplay, not story.
3. There is no Easy Button.
4. As with most other endeavors, in game design you probably won't be good at it to start with.
5. Keep it simple. Avoid the "curse of more."
6. Don't forget replayability, which usually comes from uncertainty.

7. What is the player going to DO?
8. In a good game there should be both ways to help yourself and to hinder the "enemy" (and sometimes but not always, both at once).

9. Ideas are a dime a dozen.
10. It's not the idea, it's the execution.
11. It's necessary to WORK to get ideas.
12. Ideas alone are virtually worthless.
13. If you want your game made, you need to WORK at it.
14. Game design is 10% inspiration and 90% perspiration.

15. Write it down!
16. Don't hide behind the computer!
17. Games are not movies. They're interactive.

18. If the player isn't doing something, it's not really a game.
19. If no one can play your game design, you don't have a game yet.

20. Playtesting is the heart of game creation.
21. The prototype will change a lot, don't spend time making it "pretty" or fancy.
22. Learn to play your game solo, even if it's for five players.
23. Plan-execute-monitor-control-replan.
24. Listen most to playtesters who lost the game.
25. Get input from people who don't feel a need to keep you happy.
26. Playtesting is giving people the opportunity to say your game stinks!
27. Games can always be improved, but there comes a point when it isn't worth the time it takes (Diminishing Marginal Returns).
28. When in doubt, leave it out.
29. Don't Panic!
    - Good games take time to mature, regardless of your rush. (Like concrete "drying.")
    - You need the patience of Job.
    - Game designers don't get to play (finished) games much.
    - All games are art — and the players don't care.

And here's one more that has a description:

"A game is always a compromise." You can never achieve as much as your wilder imagination hopes for. So look at the good you've done, don't look at what you failed to do. Games are often models of reality, and reality is too complicated to comprehend in a game (though the Star Trek "holodeck" will come close, should we ever get there). Game design requires idealism, the ability to pick out what's important and depict that, rather than try to depict all of a situation. This especially applies to "realistic" video games; tabletop game designers usually recognize that given the tools available they can only compromise on "realism."

K. Examples of Early Notes for Some Games

The following is the initial note I wrote for a board game I developed. Further notes grew out of this before I settled many questions and made an

initial prototype. As I write, this game has changed quite a bit through playtesting, and is quite playable, but seems to lack a "spark" that can bring it above mediocre. Yet I had no way of knowing what would happen when I started out.

x10/19/2009 Game where principal activity is trading cards.
Master of Magic? High thaumaturge.

What kind of trade — that you know what you're getting, or only partially know?

Are sets of cards the ultimate objective?

Draw one, make one trade?

Some cards are revealed, some secret so you only have some info (for example, color but not symbol)? So you can trade for the face up or for one in someone's hand.

Maybe cards help you progress on a board? A track of colors with symbols? You need to get either a color or symbol of the next area? But then would anyone trade with you? No. But that might be the default move....

Or get two of a kind and progress to that color or that symbol? Maybe three of a kind, or two if you have both the color and the symbol? And it must be within a certain distance, or they'll be going very fast.

4 colors, 4 symbols, 16 combinations. Deck of 48 or 64. Miss out 4 of the "extra powerful" cards to make deck of 60? Board of 32 spaces? When you play cards they go into discard to be reused.

Your turn you must place one card face up, or play a set to move yourself onwards. So some may have none face up.

And some may run out of cards. Hold five? Draw two?

Symbols 4 elements, it's a kind of thaumaturgical game, progressing to level of mastery.

Earth Air Fire Water

Colors are brown toward red, white/silver/blue, red/orange, navy blue (corresponding to elements more or less). So does the white air give more value in certain situations?

Could be quite a quick game.

How do you "pull someone back"? It's a race, essentially.

—

Making cards. Ones with labels are "opposites" (fire and water), as are ones without labels (earth and air)

For trading hidden cards: say "I've got a (color)" or "I've got a (symbol)." Someone willing to trade one of his hidden says the same thing. Or "I'll trade this (face up) card for your (color) card."

I can use numbers 1 thru 4. But for what? Can there be some kind of combat? You need to bracket the numbers on an opposing card?

Want spiral board, spiraling toward the center. Done.

This just out of nowhere from a voice note that I have yet to make a game where principal activity is trading cards.

That's the end of those notes. As a second example, the following is an initial card list for a Ninja game that consists almost entirely of cards. The numbers at the bottom are an effort to gauge how many rounds can be played with cards that don't begin in players' hands.

110	Ninja Survival Cards	
Target Number	110 cards	Draw Deck: 45
20	Missions — Separate draw deck	
15	Objects — dealt at start, separate	
25	=magic items/powerups/buffs /medkits	
20	Action cards (such as strengthen)	
20	Minions and protectors? — Separate	Card does double duty?
10	Ninja characters — Separate deck	
		Sneak capability
		Disguise capability
		Melee capability
		Missile capability (first strike/free shot)
		(Number of wounds)
		Climbing?

			# of plays	# missions per player
	15	"Middle"	if draw every time	
2	4	7	22.5	10
3	3	6	15	6.666667
4	2	7	11.25	5
5	2	5	9	4
6	2	3	7.5	3.333333
7	2	1	6.428571	2.857143

See also Figure 12 — Spreadsheet for Prototype Pirate Game on the book's website (http://pulsiphergames.com/learninggamedesign/).

Following are the steps in making a game using cards.

1. Get a worthwhile idea (e.g. the Ninja game above using more or less traditional form of a card game) (Process 1 of the diagram)
2. Research subject. (Ninjas and related on the Web. This game doesn't demand much detail, which is just as well, because there's almost no historical information, and some doubt that Ninjas even existed.) (Part of Process 1 and 2.)
3. Conceive details. (Process 2 and 3)
4. Make a card list. Create categories of cards. This helps you see what

you can do given available numbers of cards in the categories. (In this game's case, I have categories as shown in the accompanying spreadsheet.)

5. Settle structure, etc., of the game. (Process 3)
    - Nine structures come into play here (Process 3)
    - Figuring out details of the cards (I made a note in a note-taking program for each category of cards, and started listing individual cards.)
    - More details of rules (Process 5)
6. Make prototype. (Process 4) (I use Avery label form in WordPerfect, and put the cards in *Yu-Gi-Oh*/*Magic: The Gathering* sleeves.)
7. Play solo. (Process 6)
8. Revise the prototype. Create full set of rules somewhere in here (Process 5); before that running on extensive notes.
9. Other people playtest (PT). Revise.
10. Revise, PT, etc. (Processes 4, 5, 6, 7) This is the part that takes most of the time.

This particular game is one that I'm sure I'll go back to sooner or later, but at present I have not completed the prototype.

Rather than include initial notes for a video game here, I have included the brief concept documents for a couple games at the end of Chapter 5.

Practice

If you're not willing to do the following, then I'll predict that you'll never be more than a dilettante, a dabbler, as a game designer. Begin and maintain an "idea store" where you record all your game ideas. Ideally this will be computerized in a word processor or note-taking program. If you use a paper notebook, be sure to make copies of it one way or another, because you don't want to lose a great deal of sometimes-irreplaceable work. Back it up, back it up, back it up! If you're not willing to record your ideas on a regular basis, then how will you be able to do the much harder work required to complete a game? Likely you won't.

2

How Someone Learns to Design Games

"Knowing is not enough; we must apply.
Willing is not enough; we must do." — Goethe

To learn to design games, you have to complete games: a plan is not enough.

This chapter is about how to learn to design games, what you need to do to have a chance to be successful. The third chapter talks about what makes a game good. The fourth chapter talks about the most important question about a game, which is "who is the audience." These chapters are about thinking, the principal component of game design. Chapters thereafter discuss more of the nuts and bolts of game design.

A. The Immediate Objective of an Aspiring Game Designer

No one buys game ideas.

Beginning game designers often have unrealistic expectations about game design. Some think that all they need to do is come up with a great idea and someone else will do the work of creating the game and the idea person will make a lot of money. Nothing could be further from the truth. If you have an idea, probably a dozen or even hundreds of other people have had that same idea. What sounds like a great idea to you, will sound trivial or worthless to many other people. It is the expression of ideas in actual games, games that can be played, that matters.

Furthermore, being an expert game player has almost nothing to do with being a game designer. You start from scratch even if you're the best game player on the planet.

What game designers do is complete games they've designed. There are thousands of people who have gone beyond the idea stage to making a prototype (an early version of the game) to actually playing it, but have not completed the game. Yet when you have reached the stage of a playable prototype you have only done a small fraction of the work. Game design involves seemingly endless iterative and incremental testing and modification until the fairly poor game represented by the original prototype becomes a decent or perhaps even a great game. You cannot really call yourself a "game designer" until you have completed a game.

Until you have a playable prototype you only have a plan. And as has been said many times, a plan rarely survives its first encounter with the enemy.

Game designers are thinkers and analysts and problem solvers, but most of all they are DOers. What you need to do in order to prove to yourself and to others that you are a game designer is to create *and complete* games. This is much easier to do initially with tabletop games because no programming is involved. This is why aspiring designers practice with tabletop games, as no programming (or art) skills are needed to finish the game. But if you're going to be a video game designer, ultimately you'll have to learn a relatively simple form of programming so that you can create prototypes and then test them.

You can make small video games on your own that are fun to play, but you'll have to learn skills that aren't part of game design. If you can get other people to help you, so much the better. But you have to finish the game.

You don't want to try to make a big-time video game because, even with a group of your friends or fellow students, you'll never finish it, and an unfinished game means little to game studios and publishers. AAA video games — the kind on the shelves in Best Buy or Gamestop — typically require hundreds of man-years of highly skilled professional effort. You and your friends are not going to do it. However, when you're learning to design games, you're pretty unlikely to design a video game that could be marketed commercially even if you had unlimited production help. Game design takes practice, just as any other creative endeavor such as painting or writing or composing, and when you start out you're unlikely to be good at it even if you're a great game player.

Game design is 10 percent inspiration 90 percent perspiration. Game design is largely a matter of critical thinking, of posing restrictions and constraints, of finding ways to overcome those restrictions and constraints, of solving problems with a game that's "broken" until the game is no longer broken. It may not be a particularly good game but it will be a game that works.

Even the best designers make games that work but are not good games, and a typical designer makes more games that work but aren't good, than games that are good. Most of the "work but not good" games are never published.

Game designers who work on big video games must also be outstanding communicators and cooperators. Video games are created by teams, whereas tabletop games are largely created by one individual.

What many people do to prepare for the video game industry is create levels for existing commercial games, and perhaps even mods for existing commercial games. You can also make relatively simple two-dimensional games using simple game engines like Gamemaker.

Until you have a game that has been played by other people, you are not a game designer. You can talk all you like, you can make plans all you like, you can read all the books you like, yet until people actually play one of your games, you've gone nowhere. If you complete games that play well then you can be successful as a game designer. If you don't complete games, or if they don't have good gameplay, then you're unlikely to succeed.

Further Reading

Ira Glass's widely quoted advice to beginners in any creative endeavor: *http://nprfreshair.tumblr.com/post/4931415362/nobody-tells-this-to-people-who-are-beginners-I.*

B. Differences and Similarities of Video Games and Tabletop Games

Games are games, but what is practical varies.

When you design a game, the fundamental objectives and techniques do not differ, whether you design a board game, card game, role playing game, or any of the many genres of video games.

In fact, the fundamental ideas in games are quite malleable, they can often be applied to several different kinds of games. We see this in the number of times that a video game is based on a board or card game, or a tabletop game is based on a video game. *Doom, Settlers of Catan, World of Warcraft, Carcassonne, Civilization, StarCraft, Ticket to Ride*, and many other games have both video and tabletop versions, whichever came first. There are also cases where a board game begat a card game or vice versa. Some games more or less require treatment in one format or another because there are differences in what is possible. But many do not.

The major difference between video and tabletop design may once have been technical, but is not anymore. For decades, most video games were for one player, while most tabletop games have at least two players. This is gradually changing.

There are a few fundamental technical differences between video and tabletop games, and there are many differences of degree caused by markets and by modern gamer inclination, and there are certainly differences in what is easy to do and what is hard to do. The most obvious technical difference: you can't play a video game without a usually-expensive electronic device such as a game console or computer. Though even this is changing as mobile computing on less-expensive platforms becomes common.

The scope, too, is often different. Think of tabletop games as something like comic books, and AAA video games as something like movies. Both can be entertaining, both can tell a story. The comic book is much simpler, yet requires more imaginative effort from the reader than a movie, which is much more explicit. Comics are also much cheaper to produce. But "hit" movies are seen by many more people than any comic book. Similarly, comics are produced by publishers without outside financing. A few people can create a comic book. To make a big video game you need lots of people, and you need to get financing before you start—just as for a big movie.

Fantasy Flight Games, one of the larger hobby board game publishers, several years ago had an annual revenue around eight million dollars (it is now larger). This is less than the budget of almost any AAA video game of the time. Only Mattel and Hasbro, the latter absorbing traditional publishers such as Parker Brothers, Milton Bradley, and Avalon Hill, can match the size of video game giants.

Here is a list of practical differences.

1. It takes far more time to produce a video game.

2. Even small video games cost much more to produce. As these points involve considerable explanation, they are discussed in detail at several points later in the chapter rather than as part of this list.

3. No one has to read the rules of a video game. The most striking difference, from a player's perspective, is becoming more important as we get further into the visual age. The computer program enforces the rules, so no one has to read the rules. Admittedly, if the game is fairly complex, and especially if there is more than one player, it's an advantage to read the manual/rules, but many people don't bother and can still play.

The way to begin to achieve this advantage with tabletop games is to

provide a video in the box that explains how the game works, and shows a sample of play. In other words, you do your best to give the players a chance to learn how to play from someone else, rather than from the rules. Flash tutorials are also useful, though not as detailed. Some game reviewers now use videos to discuss games, but a game designer cannot depend on reviewers to teach people how to play his game.

4. "Fog of War"/hidden information about pieces and terrain. This is much easier to do in video games, where the computer keeps track of and hides this information. In a typical strategy video game such as *Supreme Commander* or *Command & Conquer*, you explore unknown lands, and only see opposing forces when they're near your own. Otherwise, the world is in darkness. In shooters you often don't know what enemies are nearby until they show themselves or start shooting. This is a case where computers contribute a realistic feel to games.

In tabletop games this is harder to achieve. *Stratego* and "block games" such as *Hammer of the Scots* use wooden blocks with information visible on one side to the owner, and a uniform side visible to the opponent(s). Some games, including most tabletop role-playing games, use a referee or "GM/DM" to provide the same function as the computer. (In fact, you can conceive of the computer as a substitute for a human referee.) Card games usually involve hidden information, whether cards are in hand or face down on the table. Cardboard counters can also be used face down, and some may be decoys. Old-timers may recall *Convoy/Task Force*, a game using plastic ship pieces with strength numbers hidden on the bottom, so that every cruiser looked the same (though different from destroyers) yet had a different strength. Another method is a divider (such as used in *Battleship*) or three concealed boards, one for each player, one for the referee, as in the chess variant kriegspiel.

5. Mathematical calculations. Many people nowadays don't want to and sometimes cannot add and subtract in their heads, let alone do a more complex calculation. Computers take care of all of this, tabletop games do not. Tabletop games that require any kind of calculation are becoming rare.

6. Record-keeping. Designers of tabletop games must simplify so that record-keeping is easy to do. We don't want to make anyone write anything down any more, with few exceptions. With video games the computer can track all kinds of information with no effort from the player (e.g. think of the avatar's inventory in shooters and RPGs).

7. Computer opponent(s) and Autonomous units (AI). Typical video games can provide an opponent through the computer programming. Some-

times this is called AI or artificial intelligence, though purists would argue that this is not "intelligence." Computers can also provide for units that move and act on their own through computer programming. This is very difficult to do with tabletop games, although there are cooperative games such as *Pandemic* that use decks of cards to provide instructions for the opposition. Dice tables may also be used. Autonomous units are virtually unheard of in tabletop games unless there is a neutral referee to provide the intelligence.

8. Real-time and simultaneous games. Some tabletop games, such as *Diplomacy*, use simultaneously adjudicated movement, but are still turn-based. In a real-time game action is both simultaneous and continuous rather than turn-based. Real-time tabletop games are quite rare, usually amounting to simple card games involving dexterity and quickness of movement. Thanks to computer programming, both of these types of games are quite common in the video game world.

Real-time games provide for constant interaction with the environment if not with other players. Tabletop role-playing games can episodically provide the same kind of constant interaction, and large segments of video gaming derive from tabletop *Dungeons & Dragons*.

9. Saved games. Most video games let you save and continue play later. Most of those let you save so that, if you fail, you can go back to your save point. No such facility exists in tabletop games, though the advent of the digital camera let's us freely keep a record of what a board looks like at a given time. Tabletop games that have electronic versions may also allow saves.

10. Complexity by virtue of many elements and rules. Although most video games have a simple essence (for example, explore and conquer for most strategy games), thanks to the ability of the computer to keep records and act quickly a video game can have many more elements and mechanisms than most tabletop games. And MMOs such as *World of Warcraft* are far more complex than a tabletop game can be. Insofar as a video game might resemble a puzzle, the designer(s) might want to increase complexity to make the puzzle harder to solve. This is much less common in tabletop games.

11. Role fulfillment vs. rules-dominance. Video games can provide the detail in the graphic visual reinforcement to help a player feel as though they are "really there." This means it is easier to create video games that are forms of wish fulfillment for the players as they feel like they're doing something they couldn't possibly do in real life.

This can be done in tabletop games, primarily role-playing games, but relies heavily on the player's imagination and the skill of the game master.

Board and card games in general are dominated by rules, not by wish fulfillment. Another way to look at this is that video games can provide much more support for a story than tabletop games, other than RPGs, can provide.

On the other hand, video games rely on programming and computing power, necessarily restricting what a player can do. In tabletop RPGs with a good referee, the players can choose to "do" almost anything, and the game/referee can accommodate their desires.

12. Tabletop games are less likely to suffer from production errors ("buggy software"). Video games are sometimes nearly unplayable when issued because of buggy software. This is less common in tabletop games. On the other hand, it's often possible to download a free patch that will fix the problems in the video game. While rule tweaks for tabletop games can be posted online, a more significant overhaul ("expansion") usually costs additional money.

13. No additional components are needed for tabletop games. To play a tabletop game you don't need a computer, console, or handheld video game machine or smartphone.

See also Figure 7 — Games and Interactive Puzzles, Video and Tabletop on this book's website (*http://pulsiphergames.com/learninggamedesign/*).

C. Why Aspiring Designers Should Start with Tabletop Games

When there's no computer, there's nowhere for the designer to hide.

Young people feel that they should be able to become experts at something without going through any preliminary steps, such as practicing. This is a manifestation of "the age of instant gratification." But it doesn't work in the real world. (Remember, no matter how much you've played games, that has almost nothing to do with designing games.)

Learning game design with tabletop games is much more effective for beginners than trying to produce video games. A list of the reasons below includes a discussion of each in turn. This is followed by a description of what happens when beginners try to learn by using electronic games.

1. It's much more practical for beginners to make tabletop prototypes — Specialized skills such as programming and digital artistry are not needed. If you're familiar with how movies are made in the 21st century, think of the

storyboards and "pre-viz" electronic versions of the movie that are made before actual filming. These are all prototypes, in effect. But it is much easier, cheaper, quicker, to make storyboards or even the computer pre-viz, than to shoot the actual movie. The same is true for tabletop games, they are much easier, cheaper, and quicker to make than video game software. Many video game designers recommend making simple tabletop prototypes to test ideas for electronic games, just as storyboards test ideas for films.

Less time is required for preliminary design of the tabletop game. By their nature, tabletop games are simpler than most video games, if only because there is no computer to handle complexity. Moreover, you can play a paper prototype when you haven't figured out all the details, while an electronic game requires more detail before a playable prototype can be programmed. With a tabletop game, if the designer is present he can make a ruling anytime a question arises that isn't covered in the rules — the rules may not even be written, yet. This cannot be done with electronic games, the program must be fully functional, which means the "rules" must be complete and detailed.

A usable playable prototype of a tabletop game can be made in an hour or two. A playable electronic prototype, even a simple one, will take an aspiring game designer many dozens of hours for painfully simple video games, and will take a lifetime (for one person) if it's intended to be a AAA game.

2. Much of game design is iterative and incremental; this is much easier for beginners to understand when they can quickly make *and modify* playable prototypes. The playable prototype is what really counts; virtually every prototype is a poor game to begin with. I tell students, "playtesting is Sovereign." The problem with any electronic production of a game is that it takes SO long, compared to making a tabletop prototype, that beginners fail to do the most important parts of design: repeated testing, and modification in light of that testing. They get a working prototype, play it a few times, and think they're done, instead of understanding that they're just getting started. Unfortunately, the emphasis in the video game industry, and in video game design books, is on planning a video game, in order to obtain funding to produce the prototype. This obscures the primacy of testing once you have that prototype. NO prototype is a good game when it is first played.

The refinement process mainly consists of playtesting for modifications, not for bug finding. It's important to "lose" any feature of a game that doesn't contribute to good gameplay. A tabletop game designer can simply wave his hand and change a rule of a game, or remove a feature, whereas the video game designer faces a lengthy period of software modification — and tends to be reluctant to make changes.

The "natural" way to design a game, the way it was done before computers, used to be pursued in the video game industry, and may still be done for small games. A playable prototype is produced as soon as possible. It is played, revised, played, revised, played, revised, seemingly *forever*, until a stable "good game" has been produced. Sid Meier did this with his famous game *Civilization*. He programmed, he and (mostly) Bruce Shelley played, they decided what needed to be changed, Sid programmed, they played, and so on. (This was 1990, the end of the era when it was still practical for one person to program a commercial video game.)

More recently, Sid Meier said on the website Slashdot,

> My whole approach to making games revolves around first creating a solid prototype and then playing and improving the game over the course of the 2–3 year development cycle ... until we think it's ready for prime time. My experience in this area helps me to know what to do and where to start. I definitely spend a lot of time playing the game before I let anyone else look at it.

Beginners tend to miss the point that design almost never turns out the way you intended, when you actually play the game. If they only work with video games they have played, they easily think their ideas would "make the game much better" because they have no way to try them out. The experience of game designers is that changes rarely work out exactly as you expect, and often quite drastically different, when you test them in practice.

On the other hand, it's easy for beginners, when practicing, to "redesign" traditional games like chess and *Monopoly*, perhaps one feature at a time. Because the games are quite simple, it's easier to predict the actual result of the changes. Most important, they can actually play the changed versions immediately and see what happens.

Tabletop games let students start out with small steps rather than attempt a big project that may fail for many reasons other than poor design.

3. Tabletop games force students to concentrate on gameplay, not looks/slickness/coolness that have no staying power. Many novice designers equate good looks with a good game. If they're making electronic games, they'll spend a lot of time trying to make them look good, trying to reach AAA quality even though that's impossible in any reasonable amount of time.

With tabletop games students quickly see that there's little reason to worry about slick looks until the game is actually "done." Paper game designs are, by their nature, utilitarian, though published paper games can be full of eye-candy and slick parts.

Beginners nowadays often have only played "traditional" tabletop games

such as *Monopoly* and *Game of Life* that are, in fact, somewhere between mediocre and downright bad game designs. (They succeed largely because so many people already know how to play them, and virtually no thinking is required, making them "safe" gifts.) Discussion of traditional games opens their eyes to what good design really is, and helps them think critically about gameplay. (See Section G below.)

4. Much less time is wasted on poor ideas — and most ideas are poor ideas. Beginners tend to think their first idea will be "the best game ever." And if that doesn't pan out, the next one will be "great." Experienced designers know that they should have many, many designs "in the works" at any time. And they know that to get a few really good ideas you need to generate a great many ideas altogether.

Furthermore, there's no reason to expect beginners to come up with excellent game designs when they're starting out, any more than writers or artists or composers start out with excellent ideas or results. Science fiction novelist (and former *Byte* magazine computer pundit) Jerry Pournelle says you must be willing to throw away your first million words (10–11 novels) if you want to become a successful novelist. Why would game design be any different?

Why waste huge amounts of time producing an electronic game that is a fundamentally bad design? When beginners design tabletop games and very soon thereafter play their prototypes, they quickly discover that their "great ideas" are not very good, in practice. This helps them learn to critique their ideas at an early stage, and discard the obviously bad ones before spending a lot of time on them. In a sense, it teaches them humility, something that every designer must learn.

These are especially important lessons for the "Millennial" generation in the "age of instant gratification." Some people think they're in "The Matrix," where a quick pill is all they need to be an expert. Starting out with electronic games obscures the nature of these delusions.

5. The greater simplicity of tabletop games forces concentration on good gameplay. Beginners tend to identify "games" with AAA video games, rather than with much simpler casual games or games of 25 years ago (e.g., *Tetris, Space Invaders*). AAA games are often terrifically complex "under the hood." This is the kind of game most beginners want to produce, though as a practical matter most of them actually won't work for companies producing AAA games, and while they're learning they can't make such complex games requiring hundreds of man-years of professional effort.

All this complexity obscures the actual game design in the games. That

obscuring complexity rarely exists in tabletop games; furthermore, beginners aren't likely to design complex tabletop games because they cannot expect the computer to take care of the details. Gameplay is a much more obvious element of tabletop games than it is of video games. The result: the student is forced to concentrate on the most important part of the game, gameplay.

For example, beginners designing video games tend to concentrate on story rather than gameplay, usually a big mistake. When there's no computer, they're less likely to do this, because they don't have a computer to "describe and depict the world" for them.

6. Beginners cannot "hide behind the computer" (the "easy button"). Beginners tend to design an overly-complex video game and assume "the computer will take care of" problems that are, in fact, game design problems. Instead of figuring out how a game is going to work, they imagine what they want the game to do. What they want the game to do is simply a more detailed idea, and we've already discussed what ideas are worth. This is "hiding behind the computer." Unfortunately this is easy to do, because only at the end of a very long design and modification cycle will it become obvious that the computer cannot solve the problem, that it's a design problem.

People make computer games complex ... because they can, because they think the computer will mask the complexity. But an overly complex design cannot be saved by putting it on a computer. If the design is flawed, turning it into software won't fix it.

Designers, especially novices, should live by the maxim of Antoine de Saint-Exupéry, French engineer, author, and airmail pioneer: "*A designer knows he has achieved perfection not when there is nothing left to add, but when there is nothing left to take away.*"

It's much easier to learn to do this effectively with tabletop games.

With tabletop games, there's clearly no "easy button"; when there's no computer, there's nowhere to hide. When you design something that results in a crappy video game prototype, you might blame it on the programming, or the art, or the sound, or something else. When you make a crappy tabletop game, you're out there on your own, *it's your fault*, so you are forced to figure out what you need to do to get better.

Designing tabletop games is actually more challenging, for most people. And more educational for beginners.

Finally, designing tabletop games takes away all the excuses that wannabe game designers often put forth: "I don't know how to program," "I'm not an artist," "It's much too big a project for one person." If you don't design games NOW, you're not going to design them later.

Having described these six reasons, now let's consider an important question.

7. What happens when you start to learn with electronic games? If you begin with video games, in the end, you rarely actually learn game design, you learn game production, which is quite another thing, and you learn it in an exceptionally half-baked way.

If you use a simple game engine, even something as brilliant as Gamemaker, this not only severely limits what games can be made, most of the effort goes into making the prototype work, not into the design and testing/iteration phases.

When you create electronic games for learning purposes, you'll wind up spending almost all of your time on game production elements that are not game design.

FURTHER READING

"How to Be a Game Designer Right Now." *http://www.gamecareerguide.com/features/755/sponsored_feature_how_to_be_a_.php*

For more about iteration see this article: *http://www.gamecareerguide.com/features/577/iterative_design.php*

Game Developer Conference presentation/workshop, "Paper Simulations of Digital Games" *http://209.128.81.248/view/14012-MjU1Y/Paper_Simulations_of_Digital_Games_flash_ppt_presentation*

D. Why No One Can Make AAA Video Games by Himself

Some things take too long and cost too much.

The kind of boxed video game that you see in Gamestop, Best Buy, or other chain stores is a product of far more than a hundred man-years of work by well-paid, experienced professionals. There are independent video games that are created by small groups of people, and many casual video games such as *Bejeweled* are produced by small groups of people working for many months rather than years. But no matter how good you are at programming or art or anything else that has to do with a video game, it is practically impossible for you to produce a AAA video game in your lifetime.

The budget for a AAA video game runs into the tens of millions of dollars. Much of this is salaries for the people who produced the game, funds for offices and facilities, funds for marketing. MMOs cost even more.

The point here is that you as an individual have no hope of creating a AAA game both from the point of view of time available and money available.

For example, *Bioshock*, released in 2007 — a long time ago by computer standards — took three years to produce. The number of full-time developers at the peak of production was 93 in-house developers, 30 contractors, and 8 on-site publisher testers. There were 758,903 lines of native C++ code. A fast typist typing eight hours a day would take years just to type that much code, let alone to write it. That doesn't count the 187,114 lines of scripting code. And that's only the code. For modern AAA games more artists work on the game than programmers, three times as many for *Bioshock*, and for a much longer time in total.

The biggest problem that novice video game creators face is to recognize what's possible and what's not. It's very common for beginners to try to produce a game that is simply way beyond the time and money that they have available even if they're really good at what they do. Remember where we started: you have to complete games. It's far better to set your sights lower and have a completed game than to set your sights higher and never finish.

So the point of this section is to do a quarter (or even a tenth) of what your mind tells you is possible, not what your heart wants you to do: your heart will want you to do far too much.

This cannot be emphasized enough. You have to do things that you can complete, that you can show someone, that can actually be played.

Further Reading

"Seven Sins of a Startup." *http://www.gamedev.net/page/resources/_/reference/105/169/296/the-7-deadly-sins-of-startup-companies-r2603*

"So You're Going to Make a Game for the Very First Time," Gamasutra Expert Blog, *http://gamasutra.com/blogs/LewisPulsipher/20110516/7453/So_Youre_Going_To_Make_A_Game_For_The_Very_First_Time.php*. Be sure to read the reader comments.

E. Derivative/Subsidiary Forms of Video Game a Beginner Can Make

Make levels or mods of existing games.

It's easy to imagine a wonderful video game, but very hard to create one that people can actually play. If you want to get noticed as a video game

designer you will probably have to make some video games to demonstrate your skill as a designer.

The alternative route here, and one that I recommend if you enjoy games that have "levels," is to create levels for video games. Some games come with excellent level or world editors, for example *Unreal Tournament, Neverwinter Nights, Civilization, Little Big Planet,* and *Spore*. You can find entire books about level design that use the Unreal engine for their examples. Chapter 7 of this book is devoted to designing levels.

Many of the people now working at video game studios started out as modders, people who modified existing video games successfully. Modding is much more complex than level creation because it involves reprogramming some of the guts of the game. Most mods require a team of people working for years. Game levels can be produced by one person in a much shorter time.

For people just learning to make games, level creation is much more attainable than modding.

FURTHER READING

There are many websites devoted to level design and modding (such as *http://www.worldofleveldesign.com/*).

F. How One Person Can Make a Complete Video Game from Scratch, Rather Than Modify an Existing One

Gamemaker is amazing.

A game can be simple, it can use two-dimensional graphics, and it can still be a really interesting game to play. Often the presence of constraints results in a better game design than if there were no constraints. Your constraints as a beginning designer include the difficulty of actually producing the game. So embrace the limitations and try to devise a really interesting design that you can nonetheless make with a simple video game engine.

After you think you know enough about game design to design a video game — which means after you've designed some tabletop games that work well — then you can learn a small video game "engine." A game engine is software that simplifies the programming required to create a video game. Many AAA video games are created using major 3D game engines, in particular the Unreal III engine and now-defunct Gamebryo. It's possible to download a version of Unreal III to use, but it is very complex. Even a simpler

3D engine like Unity, which is also free to download, requires considerable programming knowledge and experience.

There are much simpler game engines which use drag-and-drop methods to enable users to create simple two-dimensional games. Many of the classic games of the past such as *Pac-Man* or *Space Invaders* can be reproduced by novices in a few hours with these tools — after they've learned how to use the engine. (If you're making a game to distribute then you need to have new graphics created to avoid copyright violations, otherwise you can borrow graphics for personal "fair use.") You may think "oh but those are old games," yet they were good game designs that are just as good now as they were 25 or 30 years ago.

For many years the most prominent of these simple engines has been Gamemaker. Gamemaker Lite is freely downloadable and Gamemaker Pro is quite inexpensive. A book co-authored by the creator of Gamemaker, *The Gamemaker's Apprentice*, makes it very easy to learn the system. A second book, *The Game Maker's Companion*, will take you further. For more complex games there is a Pro version that is still very inexpensive. The engine is very well supported online by a large community. It also includes a programming language, although you can make some very interesting games just using the drag-and-drop interfaces.

Even if you have no interest in computer programming, if you're interested in video game design I strongly recommend that you learn Gamemaker. It will help you understand what your colleagues are doing as they make the video game that you imagine. More practically, it's difficult for a novice to get other people to make the video game you want, so you may have to make it yourself.

Further Reading

For up-to-date information see Wikipedia entries such as *http://en.wikipedia.org/wiki/Game_engine* and *http://en.wikipedia.org/wiki/List_of_game_engines.*

G. Traditional Games Are *Not* a Good Guide to What We Can Do with Tabletop Games

Habit drives traditional games.

While people learn with tabletop games, don't get the idea that these are the traditional family and strategy games that have been known for many

decades. Beginners are rarely familiar with non-traditional "hobby" board games such as Eurogames and wargames. The traditional ones offer many "false lessons," that is, what has worked in traditional games is often not good game design.

Put another way, game design students often adopt characteristics of traditionally popular games in their designs. Part of the reason for discussing traditional games is to point out that they are not necessarily designs worth emulating.

So here is a brief analysis of what is wrong with (and right with) some of these games. Sometimes this will include the following questions as a framework, after a general discussion of the game. When you design your own games, you'll want to ask these questions about it.

1. What are the challenges the player(s) face?
2. What actions can player(s) take to overcome those challenges?
3. What can players do to affect each other?
4. Is the game replayable many times without becoming "just the same" over and over?
5. Is the game fair (balanced)?
6. Is there an appropriate mixture for the audience and game type?
7. What is the "essence" of the game?

There are two types of "traditional" games, the public domain ones that have come down to us over centuries such as chess and parchesi, and those that are commercially-produced games that have become habits with the buying and playing public. The former tend to be for two players only, while the latter are often for two or more players.

Keep in mind that recently-designed games are not necessarily better designs than "old" games. Ignore "the cult of the new." But the really old traditional games often benefited greatly from the lack of competition when they were first devised/published. Most "traditional" games are now played because "everyone knows how to play." They are bought because "everyone is familiar with it." They are not traditional because they are particularly good game designs, in many cases. They have attained a place in contemporary culture, becoming "a habit." When you ask board game fanatics how well such games would fare if published today, the response is often something between "a dog" and "just another game."

One general comment about the "roll dice and move accordingly" mechanic used in many commercial traditional games. This mechanic gives a player little to no control over what happens. It is almost universally despised

by experienced board gamers. Video gamers can look at it this way: "if you were playing a video game, and your avatar suddenly slowed down for a while, and then sped up for a while, and periodically changed maximum speed at random, wouldn't that annoy the heck out of you? And what if other players' avatars were moving at different speeds than yours? You'd hate it. So why would you want to do that in a boardgame?" Yes, it's easy randomization, but there are better ways to randomize, and in any case don't we usually want to make games of skill, not games of chance?

Let's dispose of a class of traditional games here: *Bingo, Candyland,* and *Chutes and Ladders* are all entirely random games. This is OK for little kids, who don't recognize the randomness, and who aren't up to "strategizing" to beat older players. It's OK for people who don't want to think while playing. It's OK for gambling, too. But it's worthless to people who like games involving skill, who want to take actions to overcome meaningful challenges.

Another point worth discussing is player elimination. Insofar as multi-sided traditional games tend to be family games, the possibility that players can be eliminated is undesirable. The argument runs, when a player is eliminated, he's no longer part of the fun. The counter-argument is, why stay in the game when you don't have a chance to win? My response is that in family games the purpose is not to win but to enjoy socializing with your family, and there is more interaction if you're still in the game even if there seems to be little chance that you can win. Some games, such as *Careers* (one of the best traditional games, recently back in print), do not include player elimination, but some do, including our first subject.

Monopoly

As this is the game people often think of first, we'll discuss it first. *Monopoly* is a "family game" with a leaning toward adults. It is a mediocre game at best, quite despised by many board game experts. The "roll and move" mechanic is the first point of complaint, but there are others. (Keep in mind that most people don't actually play by the rules. For example, if someone lands on a property but does not want to buy it, the property is supposed to be auctioned off.)

There is a dominant strategy — buy everything you land on, if you possibly can, early in the game. This leads to the strong possibility of stalemate, as players may choose not to trade properties to make the sets that allow house building. Consequently, there is a strong possibility that the game can go on

for many hours with many players. In any case, it is a long game — students often say they've never actually finished a game. Further, the game works poorly with fewer than four players.

Unfortunately, we don't have space for a full critique of the game. Let's examine the questions:

1. What are the challenges the player(s) face? The player must get sets of properties, construct buildings to raise the rent, and avoid big payouts.
2. What actions can player(s) take to overcome those challenges? Not much. Movement is random, and decisions are fairly simple. Trading is a major action, as is management of funds (how much to spend on buildings, how much to hold against the possibility of paying large rents).
3. What can players do to affect each other? Trade properties. Building houses and hotels, apart from being more or less an automatic choice when possible, cannot be targeted at any one player, affecting all equally.
4. Is the game replayable many times without becoming "just the same" over and over? Replayability is low. The game quickly becomes repetitive. Few people actually play *Monopoly* a lot in a short stretch (say a year), but they may play a lot over a very long period, when they will forget how repetitive it actually is.
5. Is the game fair? It's symmetric, and the advantage of moving first doesn't seem to make much difference in the long run. There are no "take that" cards to drastically change the game, though a bad roll or two can be deadly.
6. Is there an appropriate mixture for the audience and game? It's a family game, and there can be big changes in fortune depending on the dice rolls, but it seems appropriate to a "game for all ages."
7. What is the "essence" of the game? Theoretically it's a real estate trading and development game, but trading is so uncommon that the emphasis is on the chance of movement.

There are many variations of *Monopoly*, in fact most people don't play according to the rules. An interesting variation from Boardgamegeek (the major website for board game fans) is, every unowned property landed on is auctioned. The "lander" does not get an opportunity to buy before the auction.

As with most traditional games, *Monopoly* has a very poor score on Boardgamegeek.

FURTHER READING

http://boardgamegeek.com/game/1406.

Tic-Tac-Toe (Noughts and Crosses)

Here is a traditional simple game popular with kids. It is so simple that it has been "solved" by many, and it's easy to write a one-page set of instructions to follow that will result in a draw every time, or a win when it's available. The problem is that there's a dominant strategy, which amounts to "occupy the central square whenever you can."

A major advantage of the game is that there is no chance involved, other than the big difference-maker of who plays first. The major value of the game is to teach kids that they can play a game and not understand its strategy, but as they get older they can learn to be a perfect player within its context.

A much more interesting variation on this game is a four by four grid. You win with four in a row or four in a square.

The seven questions would be overkill here.

FURTHER READING

http://boardgamegeek.com/game/11901.

Pachisi/Parchisi/Parcheesi *(and* Backgammon*)*

This is a race game dominated by chance (roll-and-move again). It does have the virtue that more than two can play. There is some strategy in the use of blockade, either to stop opponents or to clean up behind the blockade by "hitting" stopped opponent pieces. The frustration factor can be high when you're the one who's blockaded.

Backgammon is a two-player Western game resembling *Pachesi*, but with a little more strategy especially deriving from the doubling cube.

The seven questions would again be overkill.

FURTHER READING

http://boardgamegeek.com/game/2136

Chess

Next we'll turn to the ultimate Western traditional strategy game, chess. Chess rules are fairly complex for a traditional game, though it's really quite simple to learn and play. The play is very complex and highly strategic, of course. Theoretically the game may represent Indian (subcontinent) warfare, but practically speaking it is abstract.

Also unlike most traditional commercial games, there is no chance element other than who moves first. As with tic-tac-toe, a perfectly played game will always have the same result (this has been proved mathematically), but because no one has specifically "solved" chess, we don't know which result it would be, white win, draw, or black win. In practice, as played by experts white has a significant advantage, and draws are common (55 percent of top-class human games, 36 percent of top computer-program games).

One of the unusual aspects of the game is that a big advantage accrues to those who know "the analysis" of certain situations, such as the openings. Chess has a vast literature, and the solution(s) to certain situations are known, but only to those who learn the literature. In effect, other people have done the thinking for you. Yes, this is a possibility in any game without chance or hidden information, but other games have not been intensely studied for centuries.

Former world champion Bobby Fischer advocated a variation of chess that would remove the "prior analysis" advantage, at least for a while (even though Fischer was one of the best at remembering prior analyses when playing). He suggested scrambling the order of pieces in the back row, imposing that order on both players. So from one side of the board you might have bishop, queen, knight, rook, rook, etc.

For most people, there are too many possibilities to calculate once the game gets going. This can lead to what is called "analysis paralysis": people cannot decide what to do and take a long time. Even when played by experts, chess can be a very long game, hence the artificial limitation of two hours for 40 moves imposed via chess clocks.

Finally, many people would say there are too many draws. In a game designed today, the designer would try to find a way to avoid draws; though given the advantage of moving first, perhaps it's just as well that draws are possible.

Despite all of the above, chess is obviously an excellent game. But would it stand out among other games if published today? In an era that values short games, simplicity, and "that was easy," perhaps not. Let's consider the questions:

1. What are the challenges the player(s) face? Deploy pieces in a superior arrangement in order to take more of an opponent's strength than one gives, and finally to capture the king.
2. What actions can player(s) take to overcome those challenges? With perfect information, it's all about looking ahead, anticipating your opponent, finding ways to make your opponent feel that he is

defeated even if, in reality, he is not. Everything revolves around the moves of the pieces.
3. What can players do to affect each other? Player interaction is very high in a two-player, eliminate-enemy-pieces game.
4. Is the game replayable many times without becoming "just the same" over and over? History shows that it is, despite its fundamental simplicity.
5. Is the game fair? Symmetric, but significant advantage to first mover.
6. Is there an appropriate mixture for the audience and game type? Yes.
7. What is the "essence" of the game? Movement and position.

FURTHER READING

http://boardgamegeek.com/game/171

Battleship

This is a traditional game popularized by Milton Bradley's boxed plastic version. It is largely a guessing game, though some would call it a "deduction" game. As with any game, you can "play the player," predicting what your opponent will do. For example, a colleague of mine noticed that his sons would not place their ships in the outer squares. Consequently, instead of 100 squares to shoot at, he has 64. Chance should tend to award him the game most times.

Beyond simplicity, there isn't much to recommend this game.

FURTHER READING

http://boardgamegeek.com/game/2425

Scrabble

An excellent word game.

1. What are the challenges the player(s) face? Make words from random letters, and find places on the board where those words can be placed and score well
2. What actions can player(s) take to overcome those challenges? Very much a thinking game, and helps vocabulary development.
3. What can players do to affect each other? It may be possible to block occasionally, but in general, not much.

4. Is the game replayable many times without becoming "just the same" over and over? Given the complexity and variety of language, yes.
5. Is the game fair? There may be a very slight advantage to playing first.
6. Is there an appropriate mixture for the audience and game type? Evidently.
7. What is the "essence" of the game? Creation of words preferably using uncommon letters.

FURTHER READING

http://boardgamegeek.com/game/320

Checkers (Draughts)

This is a simpler-than-chess strategy game. The game is sufficiently simple that it has been "solved" by computer using brute-force (trial and error) methods.

As with most of the public domain traditional games, this one is only for two players.

FURTHER READING

http://boardgamegeek.com/game/2083

Risk *(Pre–2008 Version)*

Game design students who have played hardly any commercial tabletop games, have usually played *Monopoly* and have often played *Risk*. *Risk* is very simple to learn and to play, with so little real strategy that there is rarely "analysis paralysis." Although the theme is world conquest, it has abstracted the world so heavily that few players will feel like there's a real war going on.

However, *Risk* is a weak strategy game, and a "dicefest." There's a heavy dose of luck in combat and in the cards. It is a long game with player elimination, a poor combination in today's terms.

The turn-in-cards-for-armies mechanic is necessary to end the game in a few hours, but is fairly random.

The "Mission cards" victory condition introduced many years ago mitigates some problems, but unfortunately the missions aren't tailored to the number of players in the game, and they are hardly ever used.

As with *Monopoly*, most experienced hobby board gamers dislike *traditional Risk*.

In 2008 a revised version of *Risk* was published that eliminates some of the problems through use of multiple limited-objective missions.

1. What are the challenges the player(s) face? Management of resources to end up with more armies than the opposition; there's a little strategy involved in acquiring armies; and choosing the right time to try to wipe out an opponent and obtain his territory cards.
2. What actions can player(s) take to overcome those challenges? Choosing where to attack, with how many armies. Choosing where to defend with more than one army.
3. What can players do to affect each other? When it is not a player's turn, he is usually inactive except when attacked. However, every move affects at least two players.
4. Is the game replayable many times without becoming "just the same" over and over? Strategies are limited, but there's a fair bit of variety.
5. Is the game fair? Symmetric, but there may be a slight advantage to moving first.
6. Is there an appropriate mixture for the audience and game type? Well, lots of people fondly remember playing it as kids, so there must be something to it.
7. What is the "essence" of the game? Some would say "interminable dice rolling." Choosing where and when to attack is probably the essence.

Further Reading

http://boardgamegeek.com/game/181.

Go

The Chinese/Japanese game of go, the analog of chess in East Asia, is an outstanding abstract strategy game. It is played on a 19 by 19 line grid, with black and white stones places on the intersections of the lines rather than in the squares. The rules are very simple. The strategy of controlling areas is very deep, even compared with a game like chess. From a game design perspective, the game is so unusual that there may not be many lessons to learn.

Further Reading

http://boardgamegeek.com/game/188

Hobby games are much less well-known than these traditional games, but they're often much better designs. Some of them, along with traditional games, are discussed in the following article and books

FURTHER READING

"Game Design Essentials: 20 Real-World Games" *http://www.gamasutra.com/view/feature/5986/game_design_essentials_20_.php.*

Books: *Hobby Games: The 100 Best*, and *Family Games: The 100 Best*, both edited by James Lowder.

H. Formal Education

The game industry is still a "meritocracy."

The game industry does not require formal education, though this is likely to change as time passes. Employers are interested in what you can do, not what degree you have. Many colleges have only recently begun to teach game-specific classes or offer degrees, and few teach game design as a specialty. Many call their curriculums "game design" but mainly teach game production, even in nominal "game design" classes. Most game design teachers have no practical experience, that is, they've never completed a game. So choose very carefully. Be sure to read the articles listed below.

A broad college education certainly benefits would-be game designers. Those with a programming degree may be taken more seriously than others, because video game designers work so closely with programmers.

FURTHER READING

"Industry Hopefuls: Prepare Intelligently." *http://www.gamecareerguide.com/features/757/industry_hopefuls_prepare_.php.*

"Identifying a Good Game School." *http://www.gamecareerguide.com/features/838/identifying_a_good_game_.php.*

I. Math

A game designer ought to have all-around skills, both on the qualitative (verbal) and quantitative (math) sides. If a video game designer, he ought to know programming but need not be a programmer, understand art even if he isn't an artist.

Contrary to the belief of some, games are not all math, nor is game

design primarily a mathematical exercise. (When it approaches a mathematical exercise, the design is probably a puzzle, not a game.) Nonetheless, a designer should understand basic probability.

Here are three "math challenges" I present to my beginning game design students. My experience is that some of them get the first (a simple calculation in their heads), but few understand the probability challenge. This is a problem: a game designer should understand these things, and if he or she doesn't, some work is needed.

First I say, "What are the odds for particular sums occurring when you roll two normal dice and add the result?" This is elementary probability, but so many people don't have a clue to the answer that the American edition of *Settlers of Catan*, includes a table explaining the odds (rolling two dice determines what resources are available).

This is an example of the "normal" or "bell" or "Gaussian" curve. What percentage of the time do you roll a "7" with two normal dice? How often do you roll a "12," or an "11"? Such probabilities are going to come into play in games where randomizers (dice) are used. If you don't know the possibilities by heart, you can lay out all the possible rolls and come up with the following table. You can figure this out by listing all the 36 possible combinations of results of two dice rolls. The following table is a summary:

Dice Odds, Rolling Two Dice

Dice Result	*Chance in 36 Rolls*	*36*	
2	1	2.78%	
3	2	5.56%	
4	3	8.33%	One twelfth
5	4	11.11%	
6	5	13.89%	
7	6	16.67%	One sixth
8	5	13.89%	
9	4	11.11%	
10	3	8.33%	One twelfth
11	2	5.56%	
12	1	2.78%	
Total	36		

So, for example, for "11" you can roll a 5 and a 6, or a 6 and a 5, hence two possibilities.

For the second challenge I say, "You all know you're not allowed to miss more than 15% of classes." (This varies from school to school, and there may not be any limit at all, but it serves for illustration.) "We have two classes a

week, and there are 16 weeks. What is 15% of classes. DO IT IN YOUR HEAD."

Many people can get this on paper. Most people don't know the shortcuts to use in calculating in their head, so they try to do the multiplication in their head as though they were doing it on paper. The answer: 2 times 16 is 32. 10 percent of 32 is 3.2 and 5 percent is half that, 1.6. So add those together for 15 percent or 4.8 classes. It's the shortcut, and the willingness to try doing it in one's head, that is important. The majority of people fail.

Third challenge: "You're in Las Vegas, and someone presents you with a gambling proposition. You choose one of the two ways to roll dice to see if you win a prize, and he'll take the other. Here are the two possibilities:

1. Roll one six-sided die. If you get a 4, 5, or 6, you win.
2. Roll two six-sided dice. If you get a 5 or 6 on either or both dice, you win.

Which is the better choice for you?"

The majority of students will pick #1, which is the worse choice. #1 is 50 percent. What are the chances for #2?

Since there's one chance in 3 of getting a 5 or 6, there is one chance in 9 (⅓ times ⅓) of getting it with both dice, but that doesn't tell us the chance of getting it with one or both. So what do we do? The trick is to calculate the chance that neither die will be a 5 or 6 both times, which is ⅔ times ⅔, which equals ⅘. So the chance of getting at least one 5 or 6 is ⅕ (⅑ for both, so it must be ⅕ for one 5 or 6 out of the two).

Again, the emphasis has to be on the trick, looking at the problem "in reverse." Sure, there's a formula to calculate the actual percentages, but we only need the simple math proficiency of multiplication, and a basic understanding of probability.

Practice

If you're willing to practice with tabletop games, here's a quick way to start: modify an existing, but not entirely satisfactory, game. For example, *Monopoly* is a very long game: what can you do to fix that? Tic-tac-toe is always a draw when played perfectly. Can you expand the game to make it more competitive? Checkers is awfully bland. Is there a way to make it more exciting without making it significantly more complicated? After you figure out rule changes, PLAY THE GAME TO TEST YOUR RESULTS.

Now take a game you know (chess, *Monopoly*, and *Risk* if nothing else),

list its Nine Sub-Systems, and then change just one to (try to) improve the game. If it's a tabletop game that you own, you can try out the change, which is absolutely the best practice you can get. It will help you understand that what you think will work out, may be quite different in practice.

In either case, *play more than once*. Too many oddities can occur in a single play to make results conclusive, from a designer's point of view.

3

What Is a Game and What Makes It a Good Game?

While we can benefit from thinking about what a game *is*, we really need to know what makes a game "Good."

In this chapter we're taking time to think about what makes games interesting and enjoyable. There is no "right answer" to some of these questions, but if you think seriously about possible answers, this will help you make better games.

A. What Is a "Game?"

One well-known book about games (*Rules of Play*) takes 80 pages to define what a game is. Rather than take a lot of space we'll make a few points and then leave it to you to decide what a game is. Yes, it's important to understand the characteristics of games as opposed to puzzles or toys, but if you call something a game and you want to design it then that's probably good enough.

A reasonable definition of "toy" is that a toy is something you can play with that has no rules or goals. You decide what you want to do with it and there are all kinds of things that you can do. If you make paper boats you can use those toys for target practice, you can use them as pieces in a game if you make up rules and goals for a game, you can choose to make them paper hats instead, or you can do something you haven't thought of yet.

A "puzzle" usually has a goal, some state that you want to reach. A puzzle can be solved. Once you've solved it there's not much point in doing it again. Some puzzles, like a jigsaw puzzle, may be so big and complex that you can't remember the solution. Some puzzles, like many traditional one player video games, have so much variety that you might play again. Where the traditional

video game has no chance factors, such as the arcade version of *Pac-Man*, then you can ultimately solve it just as arcade *Pac-Man* has been solved. (Someone has perceived the patterns and played all the way through 255 levels to the end, eating every ghost and never dying, at which point the game crashed.) Moreover, puzzles do not involve conscious intelligent opposition. There is (as yet) no intelligence or consciousness in a computer, although it can do some complex calculations. We call the card activity *Solitaire* a game, but in fact it is a puzzle, by this definition. So we see how some things that we call games are more properly characterized as puzzles.

A game involves interaction, generally interaction amongst the human players of the game. There is no single solution to a game, though infallibly optimal lines of play can be discovered in the very simplest such as tic-tac-toe. A game involves both rules and goals although the goal does not need to be winning—there is no victory condition in many tabletop role-playing games. But there must be intelligent opposition for something to be a game rather than a puzzle. Tic-tac-toe (noughts and crosses) is such a simple game that it has been solved, but when played by people, the opponent can make mistakes that lead to a win instead of a draw.

Some people characterize games as a series of interesting challenges. Those interesting challenges can be posed by the designer of a video game working through the computer, or they can be posed by the designer so that the game allows the players to provide the strength of the challenges. Many video game people like to use a definition involving challenges because that allows for the computer to provide challenges, even though by my definition a video game that doesn't involve more than one person (or reasonable person-substitute via computer) is generally a puzzle, because computers cannot yet provide intelligent opposition. But this will change, sooner or later.

FURTHER READING

Fundamentals of Game Design 2nd edition by Ernest Adams. *Rules of Play: Game Design Fundamentals* by Katie Salen, Eric Zimmerman.

B. The Characteristics of Good Games

"It depends" on players' preferences (see Section D below). But we can generalize. Many game designers would say that the three most important factors in games are gameplay, gameplay, and gameplay. But we can go further (an "ideal" game would have all of these):

1. "Player-centric design." "*What is the player going to do?*" Games exist to benefit the players.

Games designed "to be art" or "to please the designer" are rarely successful as games.

2. Interesting challenges. One well-known definition of "game" involves presenting interesting non-trivial challenges to the player. The challenges are the obstacles to be overcome.

3. Choice. Players should be able to significantly affect the outcome of the game. They should be able to take actions to defeat or overcome challenges. They must be allowed to succeed or fail. Why play if what you do makes no difference? Players want to be able to influence or even control what happens, if they do the right things.

4. Interaction with other players (or other entities such as the computer). Games are about doing as well as thinking.

5. Activity. Movies and books are mostly passive, games should be active.

6. Replayability. Which means variety. This is not needed for the typical interactive-puzzle video game, though still desirable. Many games provide different playable characters and character classes in order to improve replayability. What "replayability" does NOT mean is doing the same thing over and over again, as often happens in MMOs and "social network" games, in order to "earn" dubious rewards. "Grinding" is not replayability, it's punishment, it's too much like work.

7. Memorability. This tends to improve when more than one person is playing the game, of course. When you kill time, you don't need to remember what you did. When you play a good game, some of the occurrences should be memorable, the kind of thing you talk with your friends about later. If it's a really good game, you may talk about it years later.

8. Play balance. The game should be "fair." As people learn to play a game more expertly, they want to be rewarded for what they're doing. Rewards and incentives should be commensurate with skill and effort expended. Video games are often divided into episodic levels, with some kind of reward as a player completes each level. "Player improves 'self'" is a common theme in games. (And yet, "fairness" is much less important in East Asia, where "showing off" is more important than it is in the West. "It depends.")

As with all games, player perception may be different from reality. This is something that can come out in playtesting.

9. Multiple ways to win. If a game has a dominant strategy, that is, one that everyone must follow in order to win, then it starts to resemble a puzzle that has been solved. Why play it again?

10. Control scheme/user interface (how it's presented). Even for tabletop games, you can have an otherwise excellent game that is hard to manipulate, that doesn't clearly present what happens. Are people going to play it much?

For tabletop games: the clarity and completeness of the rules.

For video games: the smoothness and "non-bugginess" of the programming.

11. Story/narrative is not necessarily important. Games are not an ideal way to deliver story. If you want to be a storyteller, you're probably better off with novels, plays, or movies. Keep in mind, stories are traditionally passive, games are active. Famously, one video game designer compared story in games to story in porn movies, just an excuse to get to the action. But there are exceptions.

12. Graphics are there "for atmosphere," not for the mechanics of play. As far as how the game plays, graphics are largely irrelevant, though graphics may be important to the game interface (to ease of use). But in the 21st century, many people won't play a game unless it looks at least "decent."

See Figure 10— Elements of a Video Game on this book's website (*http://pulsiphergames.com/learninggamedesign/*)

13. Commercial viability. Some games are good but cannot sell for a variety of reasons. If it is easy for people to make the game using home components, will people buy the game, or just get a copy of the rules? For example, a commercial game using the same components as checkers or chess isn't likely to be published. Yet some games are sold that use components available at home, e.g. *Liar's Dice* (the game played by Davey Jones, Will, and his father, in *Pirates of the Caribbean II*, commercial version credited to Richard Borg).

In the end, if the game is not entertaining, challenging, or instructive in some way, why would anyone bother with it?

C. What Makes a Game "Epic" or Even "Great?"

While a game designer cannot deliberately set out to design a "great" game, a designer can set out to create an "epic" game, though this effort is just as subject to failure as any other game design.

We're interested here in game designs that most players would call "epic," not in an individual play of a game that might be regarded as epic. I've played and refereed epic adventures of First Edition Advanced *Dungeons & Dragons*, but I wouldn't call *Dungeons & Dragons* an epic game.

"Define: epic" at Google gives this first definition: "very imposing or impressive; surpassing the ordinary (especially in size or scale); 'an epic voyage'; 'of heroic proportions'; 'heroic sculpture.'"

Another definition: "heroic; majestic; impressively great."

In common among these definitions is feeling, rather than logic. Games can "feel" epic — They emotionally involve the player. But once again, *Dungeons & Dragons* emotionally involves the player yet is not an epic game, though there can be epic adventures. There's more than just emotional involvement required to make a game epic.

Any and all definitions of anything, of any length, can be picked apart. As we're interested in characteristics that define an "epic game," our list must be fairly detailed, hence open to even more nit-picking. In the course of the discussion we'll see some of the things designers can try to do to create an epic game.

Characteristics that can be divided into three categories: (1) scope, (2) player commitment, (3) tension and memorability. We'll briefly describe the characteristics, then talk about them in more detail with some examples. Epic games won't necessarily have every characteristic. That's the flaw of any detailed definition.

Scope

1. Geographically and chronologically broad setting *without feeling abstract*. "Sweep of history" games that involve many centuries and countries or the world, such as *Britannia*, *History of the World,* and *7 Ages,* are generally regarded as epic. So, too, is *Civilization*, both the original board game that preceded the computer games and the computer games. Yet other games with big scopes are not epic, for example *Vinci* and *Risk*, because they feel so abstract that the "real world" no longer feels present. Real-time strategy computer games are generally too short to feel epic. A short game with the same subject as a long epic might not feel epic: for example, I've designed a 90 minute version of *Britannia* (admittedly leaving out the Roman conquest) that is unlikely to feel epic to most players.

2. Represents a titanic struggle important to very large numbers of people and possibly many generations. *Age of Empires*, the *Total War* series, and *Civilization* meet this criterion. Some Napoleonic games might qualify here, perhaps even some American Civil War games, certainly a vast World War II game like *Axis & Allies*. *War of the Ring*, *Master of Orion*, *Sins of a Solar Empire*, and *Twilight Imperium* qualify, even though the struggle is not "real"; it can

be fictional, as long as players suspend their disbelief and adopt the fiction. In all cases these are great "slugfests."

3. Non-mundane theme. You're not likely to regard a game about selling real estate as epic (*Monopoly*). Nor a game about building a house. Nor a game about eating fish. Many people expect "epic story elements" from an epic game, such as becoming king or saving the world. Many video games and action movies involve saving the world, to the point that anything less seems mundane to some.

4. Story "arc" reflecting great changes. A great story isn't necessary to an epic game, and certainly many games with great stories are not epic. Yet in some epic games, the game "story," what it represents, reflects major changes over time. It is a saga with beginning, middle, and end, so that the situation at the end of the game is very different from the beginning, almost like it's a different world.

Player Commitment

1. Depth of gameplay including high replayability. This is clearly open to differing opinions about depth of gameplay. The video games we've been citing have deeper gameplay than most other video games. This is another case where *Vinci* and *Risk* fail my definition, as there is little depth to their gameplay. But you could argue the same thing about *History of the World*.

2. Sheer length or complexity (or both). *Civilization* is one of the most widely acknowledged epic games. Can you have a two hour *Civilization* game and retain the epic feel? Many would say "no." Can you drastically simplify what the players do without losing the epic feel? Hard to say. It seems that length, rather than complexity, is part of the mystique of the epic game.

An epic game need not be both very long and very complex. I cite *Britannia*-like games here, as *Britannia* is lengthy but not complex. But an epic game will very likely be at least one or the other, very long or very complex.

3. Oddly enough, often this means no role assumption is involved! In role-assumption games, you can conceive yourself as taking on the specific role of an individual person. For example, you might be a squad leader, or a castle builder. It's too much like something you might do in the real world, and we rarely think of the real world as epic! In many epic games you cannot name a specific individual that you play, at best you might take on the roles of a series of individuals (kings, presidents, generals). Perhaps a game (as opposed to a *Dungeons & Dragons* adventure) feels more epic for the very reason that you cannot identify with one (mortal) person.

In the many video games where you have an avatar, what you're doing is so personal and immediate that the "epic feel" often isn't there. In many epic games you don't even play just one nation, but several. You have an "omnipresent" (though not omnipotent or omniscient) point of view.

Tension and Memorability

In the following list of characteristics related to tension and memorability, we might keep in mind a trait of many popular video games, "immersiveness." Yet a game can be immersive without being epic.... Immersion: "state of being deeply engaged or involved; absorption."

1. The gameplay reflects major changes over time, end of game gameplay feels very different from the beginning. Another way to put this, is by the time you get to the end of the game, it seems very different from the game you were playing in the beginning. In computer *Civilization* or a typical RTS, you usually begin with a very small force, work through exploration and expansion, optimize your exploitation of resources, and finally engage in a huge war. "Sweep" board games tend to feel this way. In *Britannia*, for example, in the beginning most players are trying to survive the Roman conquest with a healthy nation, yet give the Roman some trouble. At the end, all are concentrating on who will be king of England, and often trying to kill opposing candidates. These require different kinds of strategies. In *History of the World*, players begin in a relatively small area, but by the end are acting all over the world.

Further, what was an important and useful move early in the game might be a weak, poor move by the end. That is, there may be an increase in "power" and scope of the things the player can do.

2. Uncertainty about who's winning. If you certainly know who's winning at a particular time, a multi-sided game becomes subject to all kinds of defects such as kingmaking and sandbagging. This tends to annoy players and reduce tension, and may be another downfall of *Risk* and *Vinci*.

If it's a two-player game and one player is obviously winning, the other will probably resign/surrender — end of game, no epic provided. A long, drawn-out struggle in chess might be called "epic," but the game itself is not.

Point games can be a problem. The plastic Hasbro version of *History of the World* added secret scoring bonuses in an attempt to obscure who is in the lead. In *Britannia* the nations and colors score at different rates, at different times, so it's never quite clear even to experts who is in the lead, by how much, until the game ends.

3. Asymmetry. In asymmetric games, each player has a different starting position/situation. The opposite is symmetric, a common characteristic of "Euro" style games and multi-sided video games, where each player starts with an identical position. Abstract games tend to be symmetric, and tend not to feel epic.

Most epic games are historical or pseudo-historical, and history is rarely symmetric. So we may only be seeing a symptom, not a cause, in this characteristic.

4. The game engenders "gaming stories" that you remember fondly and retell with pleasure (or chagrin!) Some games result in memorable sessions, some do not. They are more than games, they are "experiences." This goes back to the idea of "immersion," of buying into the game. It leaves out most "Euro" board games, which tend to be somehow inconsequential: games, not memorable experiences.

This is certainly a characteristic of "great" games, and is sometimes a characteristic of "epic" games.

Great Games

Now what makes a game "great"? Not good, not a flash-in-the-pan, rather an all-time great game. A game is great if you can (and want to) play it again and again with great enjoyment over many years, if you can almost endlessly discuss the intricacies of good play, if you can create many variants that are also fine games.

Obviously, a game is not "great" to everyone. Chess is a great game, but many gamers can't stand to play it (though a great many have tried).

Longevity is important. A new game may be "great," but we simply cannot tell until years have passed, no matter how much we like it when it comes out. Perhaps not every great game is great by current "design standards," but it may still be a great game in terms of how it has affected people and the enjoyment it has given to people. "New" certainly doesn't mean "good" and "old" certainly doesn't mean "bad." In other words, ignore the "cult of the new" so prevalent in today's gaming tastes.

Popularity is not a criterion. There are many popular tunes, movies, games, books, that disappear from our notice in a year or two or three. Great games should continue to be loved year after year after year, just as great novels, movies, music are enjoyed perennially.

If a game is one of hundreds that people might want to play, can it be a great game? No, it should stand out from the crowd. If you play a game

just to kill time, then the fact that you're playing it certainly doesn't make it a great game, no matter how many times you play. It's not "oh, yeah, we can play that" it's "I'd love to play that"—again, and again, and again. If you can spend your valuable time playing this game or thinking about this game, when you have other valuable things to do, then it may be a great game. If lots of people don't play it hundreds of hours each, over many years, can it be a great game?

Yes, video games become "outdated" in a way that tabletop games rarely do, but that doesn't prevent many people in the 21st century from playing 20th century classics like *Pac-Man*, *Missile Command*, *Mega Man*, and so on.

One person, speaking of the video game *Left 4 Dead* , highlighted the memorability of great games: "the hours we spent were well-invested because we came away with incredible water-cooler moments: the perfect Smoker pull off a precarious ledge, pouncing on the last survivor inches from the safe room, heroic sacrifices to save incapacitated teammates and last-second 'Get to the chopper' leaps into rescue helicopters."

If it's a game that can reasonably be played solitaire even though it is designed for more than one player, then a great game will be played very often solo, by a great many people.

Can we summarize the above? Perhaps you could say, if a game is played by a great many people, who love to play it, who play it for hundreds of hours (by each person) altogether over the years, who can still enjoy it many years after it was first published, then perhaps it is a great game.

Is *Monopoly* a well-designed game? Definitely not. Is it a great game? Here you can argue that it is played by default, because it's traditional, rather than because people truly want to play it. Nonetheless a case can be made that it is a great game even though it's a weak design.

FURTHER READING

Hobby Games: The 100 Best and *Family Games: The 100 Best*, both edited by James Lowder.

D. Why People Play Games

Some authors have made lists of the kinds of enjoyment people can have while playing games. Such lists are useful to remind us of the details of enjoyable gaming.

The most well-known is from Marc LeBlanc (8kindsoffun.com)

Sensation	Game as sense-pleasure
Fantasy	Game as make-believe
Narrative	Game as unfolding story
Challenge	Game as obstacle course
Fellowship	Game as social framework
Discovery	Game as uncharted territory
Expression	Game as soap box
Submission	Game as mindless pastime

At Origins Game Fair 2008, Ian Schreiber (co-author of *Challenges for Game Designers*) gave his version of kinds of fun (enjoyment):

- Exploration
- Social experience
- Collection (collecting things)
- Physical sensation
- Puzzle solving
- Advancement
- Competition

Ask a group of gamers to list ways that people enjoy games, and many of the above will come up in one form or another.

Raph Koster (*Theory of Fun for Game Design*) has brought to gamers' attention research by Mihaly Csikszentmikalyi into "optimal experience." The Chicago-based Czech researcher applies his ideas to life as a whole, in a series of book, but we can apply them to games. Csikszentmikalyi is interested in "the positive aspects of human experience — joy, creativity, the process of total involvement with life I call *flow*" (*Flow: The Psychology of Optimal Experience* [1990], p. xi). For game purposes it amounts to this: people have an optimal experience when they are challenged, but not challenged too much. In other words, if something is too easy, it becomes boring; if it's too hard, it becomes frustrating and causes anxiety. The ideal game experience, then, is to challenge the player at whatever level of ability he has reached, that is, keep increasing the challenge as the player becomes a better player. This keeps players "in the Flow" (see Figure 4 — Flow in Games).

Video games can be particularly good at managing the level of challenge, either through adaptive programming, or via the difficulty setting, or through increasingly difficult levels in games that use levels. In tabletop games, the level of challenge tends to change because your opponents become better players just as you do, or you find better players to play against. In a tabletop role-playing game such as *Dungeons & Dragons*, the referee ("Dungeon Mas-

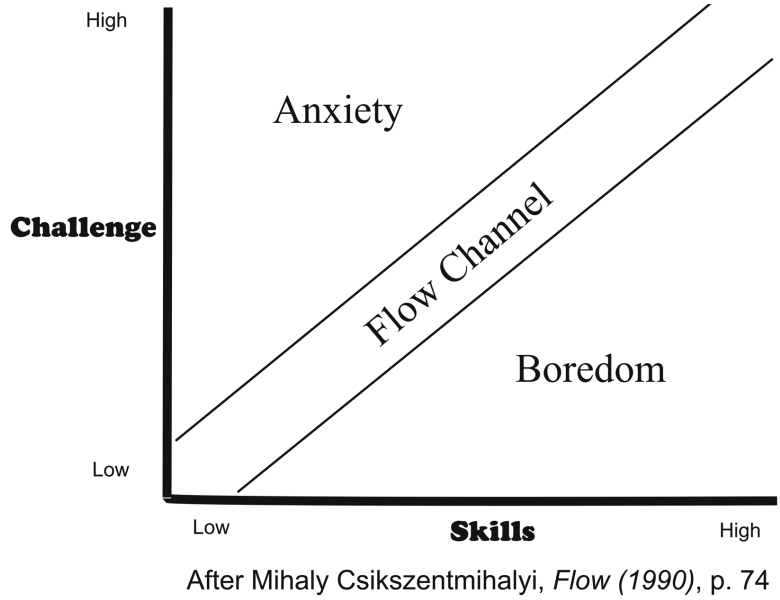

Figure 4 — Flow in Games.

ter") manages the challenge. Novice characters don't meet fire giants but often encounter orcs, while very powerful characters may occasionally go up against an ancient and terrible dragon, but orcs aren't worth bothering with. This is artificial, but it makes the game more enjoyable.

Something Can Be Enjoyable or Challenging to Some, Yet Certainly Not Enjoyable or Challenging to Others

While the above schemes and categories are all useful ways to think about games, game enjoyment often involves a range of factors, with some people at one end of the spectrum, others at the other end, and the majority somewhere toward the middle. Many of these spectra overlap, or are different views of what may be a more fundamental factor. Here's a list of factors additional to what has been listed above:

Role-Fulfillment vs. Emergence (Story Dominant vs. Rules Dominant)

Many people have suggested that video games are "dream fulfillment." "What is the player's dream that I want to help them experience or fulfill?"

says the game designer. Yet in many games the dream, if it is there at all, is quite obscure. What is the dream fulfillment in playing chess or checkers—or any other abstract game, such as *Tetris*? Is there anything personal (other than a desire for immortality?) in controlling a nation for a thousand years, as in *History of the World*, *Age of Empires*, or *Civilization*?

Many video games put the player in the position of an individual, a position the individual is unlikely to experience in the real world (or which they wouldn't want to experience because it's much too dangerous). Living out fantasy is an obvious part of shooters and action games, for example.

This kind of game can also be called "story-dominant": if there's a dream to be fulfilled, it likely involves a story, and the game is an expression of that story, however simple it may be (just as dreams can be simple or complex).

The other end of this spectrum is the "rules-dominant" game, which includes many traditional games such as chess and go. Gameplay emerges out of the rules, not from following a story (and hence this is sometimes called "emergent" gaming). The game has a set of rules and goals, and the course of the game emerges from these in a great variety of ways, depending on the players. Board games and card games tend to be of the rules-dominant type, while many of the popular video game genres, and role-playing games of all types, tend toward the story-dominant type.

We might further say that the rules-dominant games are often for more than two sides, whereas the role-dominant ones tend to have just two sides, the player(s) and the computer (or referee, in the case of classic tabletop role-playing games).

Video games, especially the AAA variety, are much more exercises in role-assumption than are tabletop games. That is, the player is enabled to do something he'd like to imagine he could do, but he can feel that he's "really" doing it in modern AAA games. The feeling of verisimilitude must be there. On the other hand, "casual" video games tend to be more like board games and card games, "rules-dominant" rather than "story-dominant."

Sid Meier recently described what amounts to an "emergent" view of games.

> It's important that the player has the fun in the game," he said, noting that there is a temptation for the designer to steer the gameplay too much. "It's definitely our philosophy to keep the game designer in the background and let the story emerge from players' decisions (*http://www.shacknews.com/featuredarticle.x?id=780).*

The next factor involves other aspects of these two contrasting approaches.

Story/Narrative vs. What Happens Next/Emerging Circumstances

Some game players like to follow along a story, while others hate to be "led around by the nose." Yet they're talking about the same experience. This is usually expressed in the contrast of "linear" games with "sandbox" games.

It is much easier to produce a powerful story through linearity (as in a book or movie), so the strongest (in terms of story, at any rate) of the story-dominant games are linear.

On the other hand, "sandbox" games let the player follow his own path (like playing in a sandbox rather than following a linear trail). The sandbox games will have greater replay value, other things being equal, than the linear games, because in the latter there is only one, or a few, stories. Of course, if the linear game is very long, will people miss a lack of replayability?

Sandbox video games such as *Grand Theft Auto* and *Assassin's Creed* are a return to the older video game style, where specific narrative (linearity) is less important or non-existent.

The role-assumption game isn't necessarily strongly linear/story-dominant. The role-play ancestor of many video games, *Dungeons & Dragons*, can be played either way. The referee can conceive a story and set up an adventure so that players are forced to follow through the story (linear method). Or he can set up an appropriately challenging situation, not trying to predict how the players will approach it and not trying to lead them from a particular point to another, and see what happens (sandbox method). In this case the players make their own story. And each group confronted with the same adventure will contrive a different story. It's easier to do the sandbox in a tabletop RPG than in a video game, because a good human referee is more capable than a computer of adjusting the game as it is played.

Of course, there is story in the emergent style, and there is strategy and tactics in the story style. What seems to be certain is that many players lean strongly to one side or the other, and don't like games of the other type most of the time.

Long-Term Planning vs. Reaction/ Adaptation to Changing Circumstances

Some people like to plan well ahead, to consider the options and choose a "best course" for each. Others like to react to circumstances as they occur, to adapt or improvise. Chess and checkers encourage long-term planning.

Monopoly, thanks to the random move mechanic and more than two players, is more adaptive. More than two players introduces additional uncertainty to any game; uncertainty is at the heart of the adaptive style. Poker involves some improvisation in each hand, but in the long run, the best players may be able to plan their bluffs (and non-bluffs) so as to take advantage of the characteristics and personalities of the other players.

In general, perfect information games encourage planning, while as uncertainty increases, adaptation and finally improvisation becomes more important than planning. For a variety of reasons, improvisation is probably the more common preference among video gamers.

This will be discussed at greater length in the next chapter.

Socializing vs. Competition

Party gamers are the epitome of the socializers. Many "Euro-style" board gamers and "casual" video gamers are of this type, to the point that they refuse to attack someone even when playing in a competitive game. They play games to enjoy being with and interacting with other people of similar interest, and have little interest in "dominating" or beating someone. We don't need to discuss the competitive gamer: we all know people whose main gaming objective is to win, to outdo everyone else.

The availability of a social experience is important. Tabletop board games and card games are generally social experiences, you enjoy playing a game with other people; video games are becoming more social (e.g. MMOs, Wii-style games), but are still predominantly solitary, a player alone with his own thoughts and dreams. What we often call "social games," which are actually social network games, are in fact very solitary, not social. Further, playing online lacks much of the sociability of playing in the same room. Many important cues and aspects of face-to-face camaraderie are lost. All or some of speaking-and-hearing, facial expressions, body language, and sense of smell are not present in online games.

Tabletop RPGs are often very social, as the games are usually cooperative rather than competitive.

Entertainment vs. Challenge

Traditional thinking about games sees them as competitions or challenges, where players play against one another. *Dungeons & Dragons* changed that, as players played against "the badguys," with the "DM" as neutral referee—

it is a cooperative game, though there is still an unending series of challenges. Some video games have gone farther by leaving competition entirely out of it, and reducing challenges. Games have become entertainments, not competitions. (Of course, many family games have been played as entertainments even though they were ostensibly competitions.) Many people pay their 60 bucks (or 20 bucks, or 5 bucks) and want to be entertained, not challenged. Yet there are still competitive players and highly competitive games. The game *Spore* was "too easy" for hardcore players, yet challenging enough for the much larger market of more casual players. Evidently it is an entertainment rather than a challenging, competitive game.

In a sense, any game can be played as an entertainment or as a competition/challenge; but the design will make some much more suitable as one type than as the other. Insofar as people often "don't want to think" when playing games, many video games substitute physical challenges (such as jumping in platformers, or shooting quickly and accurately in many games) for mental challenges. The physical challenges can easily be modified (by time available to complete them) to entertain or to challenge, as the player wishes, via the difficulty level.

Playing against people online tends to be challenging. Playing against people in person tends to be entertainment, perhaps because you are more likely to know the other people involved.

Socializing and entertainment tend to be more important to female players, challenge and competition tend to be more important to males.

Fantasy/Relaxation vs. Urge to Excel ("Gaming Mastery")

A variation of the above is to play a game as fantasy fulfillment, or to play the game to fulfill the urge to excel, to demonstrate "gaming mastery." The latter helps the player feel important, capable, powerful, hence its great attraction to teenagers. A game can often provide both, if only through different difficulty levels.

Unfortunately, the urge to "gaming mastery" taken to extremes results in players willing to cheat, or to behave in unsocial ways that tend to ruin everyone else's enjoyment ("griefers" and others). The explosion of Internet-based gaming communities, and the chance to get "bragging rights" in such communities, have increased the urge to (perceived) mastery.

Most people just don't see the point of excelling in a video game: what does it matter, in the great scheme of life? A player's point of view about this

can change over time, likely moving more toward fantasy and away from mastery as the player becomes older and encounters more real-world challenges and responsibilities. Mastering a game simply becomes less important.

The Journey vs. the Destination

This is partly a generational difference in reaction to games. Older generations want to enjoy the entire game they are playing, even when their main objective is to win. Young people seem to be more interested in the destination, "beating the game," solving the puzzle, than in the journey. Obviously, it's necessary that a game have a sufficient level of challenge that the "destination" player feels he's accomplished something.

This can also be seen as "what happens next" vs. "what is the end." Some people play games (and read novels, and watch movies) to find out what happens next; some are only interested in the final result. They might skip ahead in a novel and just read the end, or skip ahead in a game (often with "cheats") and just play the end.

I once listened to a young man who had already written two books about generational differences say that his generation (Gen Y or Millennials) were quite happy to get a cheat code, go to the last stage of a game, "win" the game, and be satisfied. "I beat the game, didn't I?" I (a Baby Boomer) was astounded. "Why play if you're going to cheat?" He smiled as he said, "we're just gathering the fruits of our research." I shook my head. To this day I cannot understand this emotionally, but I understand intellectually that many gamers feel this way, that the destination is all that matters. And a game designer must be aware of it.

The following is another description of this phenomenon, related to the arcade game *Gauntlet*:

> "The fact that there's no ending [100 levels repeat randomly], however, points out a very important difference between Atari's view on video games and the current perception. Atari saw *Gauntlet* as a process, a game that was played for its own sake and not to reach completion. The adventurers continue forever until their life drains out, their quest ultimately hopeless.
>
> ... in games of *Gauntlet* I've had with other people in the past few years ... their interest tends to survive only until the point where they learn there is no ending. Times have certainly changed" ["Game Design Essentials: 20 Atari Games," by John Harris, *http://www.gamasutra.com/view/feature/3679/game_design_essentials_20_atari_.php?page=20*].

If you're designing a game whose primary target audience is female (e.g., many social network and casual video games), keep in mind that in games

women tend to be more interested in the journey, males more interested in the destination.

We might speculate also that MMOs with level caps — which is typical, because it's very hard to design a game without a level cap — suit the "destination" folks, because there IS a destination, that maximum level. Similarly, RPGs such as *Final Fantasy* are attractive to "destination" people because there is an end to the story. In older RPGs, both the original tabletop ones and some of the older video games, the game is open-ended, there is no particular destination. It's instructive that the latest version of tabletop *Dungeons & Dragons* (4th Edition, June 2008) has a definite end: characters retire, one way or another, when they reach 30th level, and that level is practically reachable, as opposed to a tightly run First Edition game where no human character ever got to a maximum level (and certainly not 30th!).

Classical vs. Romantic and Other Styles of Playing to Win

Many people do not play to win, but those who do often have distinct playing styles that are more suited to one kind of game than another. This is a large topic that is discussed in detail in Chapter 4, Section G.

We'll end this discussion of why people play with one more observation.

Escapism?

Dream-fulfillment is close to "escapism." Like it or not, many games have a strong escapist element, and it seems strongest where dream-fulfillment is strongest. It is especially important to non-adults. Consider, say, a favorite adolescent male pastime, shooter games:

- The player can be the "star," "da man," which is generally unlike the player's real life.
- The player can experience thrills (even death) without risk of being hurt.
- There's always a way to succeed — trial and error can work, because it doesn't matter if you get killed.
- Competition is not only permissible but encouraged.
- There's a structure to everything, most of the uncertainty of real life is not there.
- Young people control what happens, and attitudes can be confrontational, edgy.

For a frustrated teenage male who's been told too often what he can and cannot do, this can be a kind of nirvana. Game designers must be aware of the escapist elements of gaming, even if they're designing a serious game that has few or none of these particular characteristics.

E. The Elements of a Game

It is usually worth your time as a designer to think about lots of ways to categorize games and game playing. Aki Jarvinen's doctoral dissertation, "Games without Frontiers: Theories and Methods for Game Studies and Design," available on the Web in English (PDF downloadable via *http://acta.uta.fi/english/teos.php?id=11046*), painstakingly identifies and describes the elements of games, what games are composed of. Not all games include all nine of his elements. For example, a video game may not include a ruleset as such, but it has mechanics enforced by software, which are the equivalent of rules. Jarvinen implies that a tabletop game does not have an interface, though this is wrong. A tabletop game has an interface, a way for players to manipulate it, and a poor one can ruin the game just as much as a poor interface can ruin a video game.

The dissertation includes a diagram to show general relationships amongst the three categories of the elements. Although these don't necessarily translate into direct action for the designer, Jarvinen's idea is that the designer tries to determine all of these elements as he creates a game design.

There are two systemic elements, the game components and the game environment (such as a board — we're not talking about the environment in the room where the game is played). There are five compound elements, ruleset, game mechanics, theme, interface, and information. And there are two behavioral elements, players and contexts.

Jarvinen further suggests that thinking of ownership of these elements can be illuminating: there are elements of self, elements of other (player), and elements of the system.

Many of these elements, most notably the players, are not fully controlled by the game designer.

F. What Games Actually Amount To

This is an attempt to categorize what players actually DO in games, in simplest terms. This is divided into two parts, first the "system" activities hav-

ing to do with the mechanics of the game, then the "psychological" activities having to do with what the mind of the player is doing in relation to other players.

Remember that one of the best guides to game design is the question, "what is the player going to do?." This is a list of the fundamental things that players do, both mechanically ("systems"), and psychologically when there is more than one player.

Moreover, this is restricted to competitive games, rather than branch out into puzzles and other entertainments that are not games at all, by some definitions. *Wii Fit, Wii Music, Tetris, Katamari Damacy*, and other single-player video "games" that are actually interactive puzzles or toys may not quite fit in, though in most cases they will.

The list includes the general activity, then some of the common variations.

There are many ways to organize this list, to choose subsidiary and not-subsidiary categories. It is certainly not definitive.

Systems

This is what the player does in relation to the systems of the game, not in relation to other players. Where the mechanical systems of the game are concerned, "achieve a particular state" is the generalized version of what the player is doing. Victory points are a generalized way of doing several different things at once. Sometimes the "state" is very simple, as in rock-paper-scissors where you want to make a pattern, such as paper to the opponent's rock. It's better to be more specific than that, though.

1. Get to a particular place or state of affairs (or avoid/leave it).
    - Get there fastest (a race) [player interaction may be missing].
    - Get any of your pieces to some place (*Axis & Allies*, capture enemy capital).
    - Get a special piece somewhere more times than opponent (football, hockey, many other team sports, and all the board and video games derived from them).
    - Get to end of the story (console RPGs).
    - Avoid or get out of a particular place.
    - Connect two or more points (*Hex, Twixt, Attika*, networking games, railroad games). This could also apply to patterns (see number 4, below).
2. Collect something (many card games, many video games) (sometimes economic).

- Find something (exploration) (Easter egg hunt).
- Take something that drops in your lap (draw a card, treasure dropped by defeated monsters).
- Take something from someone else (*Monopoly*, some card games especially trick-taking).
- Build something rather than get it elsewhere (the moon rocket or wonders in computer *Civilization*).
- Don't collect something (*Old Maid*, *Hearts*, etc.).
- Get rid of everything (say, a hand of cards).
- Building/construction games are a complex form of collection that some people might list as a separate category.
- Concentrate on improving your economy rather than on construction as with some economic games; "increase your ability to produce something."

3. Wipe someone or something out (*Risk*, shooters, checkers/draughts, bowling!).
   - Wipe out one thing (the king in chess).
   - Identify who or what you need to wipe out (*Mafia* and any of its variants, such as *Werewolf*, *Bang!/Dodge City*).
   - Avoid being wiped out, including defending some place by preventing an opponent from getting there (Atari *Warlords*, *Tower Defense* games).
4. Create patterns in something (getting to a place could be seen as part of this!).
   - Patterns in piece location (this includes rock-paper-scissors, *Tetris*, many puzzle-games).
   - Patterns only in your pieces (tic-tac-toe), or in yours plus opponent's (rock-paper-scissors).
   - Patterns in relation to the "board" (*Scrabble*, dominoes, *Carcassonne* and other tile-laying games).
   - Patterns of cards (related to sets e.g., Canasta).
   - Patterns in drawings (*Pictionary*) and other representations such as maps.
   - Patterns/positions which are often emphasized in wargames.
5. Recognize patterns in something.
   - Recognize a drawing or other representation (drawing) of something (*Pictionary, Cluzzle*).
6. Change something from one thing to another (could be seen as a subset of collection).
   - Frequently required in economic and construction games.
7. Improve your capabilities (*Munchkin*, most RPGs).
   - This is often subsidiary, a way to achieve something else. Common

in RPGs, vehicle simulations, construction/management simulations, collectible card games. Yet in some games, such as RPGs, this is THE activity, not a means to another end.

8. Survive to keep going. Especially common in arcade games (which are generally unwinnable).

9. Design something (e.g., a warship in a 4X game such as *Master of Orion*).

- Produce new instances of predefined objects (crafting, or "building something" or "creating a film").
- Design objects or processes (e.g., *City of Heroes* "Mission Architect," making choices when generating an RPG character).

10. Calculate probabilities *(Can't Stop, Cloud 9,* craps, and other "press your luck" games).

- Some would say this is a natural and obvious concomitant of many other activities, but in these days of widespread innumeracy, it makes sense to list it separately.

Assessing risk, an intermediate step in most games, often includes probability calculation, but also includes factors that cannot be calculated, such as the intentions of the opposition.

Psychological

Now we have the human/psychological side of what the player does, the interaction with other players. In many ways this is no different than what a general does in warfare. This does not include the fundamental processes necessary to play the game (such as, "understand the rules"), instead we're looking for what the player is doing after he understands the game and game systems, to play the game.

1. Forecasting the intentions of others ("reading" the other player[s]).

2. Persuading other players to do something you want them to do (usually involves negotiation).

3. Disguising one's own intentions (could be a subsidiary of persuasion, of negotiating) (bluffing) poker, *Balderdash*, *Stratego*.

4. Establish personal relationships with other players. This can also be seen as a subsidiary of negotiating, but you often want to do this even if there is no overt negotiation.

5. Discover/deduce information (not quite "collection"). This could just as well be under "system," but often involves some understanding of and communication with other players, so it's placed here.

6. Understand short- and long-term relationships and processes not strictly involved with how to play the game. This is a catch-all category for the kinds of things game-players learn through long experience. If you can get people who very rarely play games to play, you'll find that they sometimes don't see things the way the game players do because they lack this experience.

With that, we're getting into the general understanding of "playing a game," so we'll stop there.

G. The Kinds of Interaction That Occur in Games

In a solo game you're actually interacting with the designer.

In a tabletop or "newer" video game, you're interacting with other people through situations devised by the designer.

Interacting with the Designer (Often Called PvE, Player vs. Environment)

- Playing puzzles
- Talking with NPCs
- Collecting information
- Avoiding obstacles and hazards (which may behave sentiently [with intelligence] or not)
  - Stealth
  - Con them (bluffing)
  - Blast/smash them
  - Clever other methods (e.g., drive cattle in front of you)
  - Dodge/avoid
  - (Cutscenes — but no interactivity)

Interacting with Other People (Part of the Game, Not Something the Game Leads To)

- Negotiation (persuade or dissuade)
- Direct Conflict (PvP, player vs. player)
  - "Beating them to the punch" (in races, collection of objects, as well as in attacking)
  - Kill-crush-destroy opposing entities
  - Physical contests
- Cooperation (typical of group RPGs)

- Trading
- Bidding against or auctioning
- Drafting (selecting the best from a set of useful items, getting something before someone else does)
- Anticipation of what someone else will do (could be tied to "beating them to the punch")
- "Bragging rights"
- Telling bad jokes, charades, drawing pictures, and many other kinds of party game activities
- Acting/pretending (lying) (bluffing)
- Being annoying
- Indirect interaction (you cause forces other than yours to do something to harm another player's) (e.g., via "Event cards")
- Really indirect conflict — You cause forces other than yours to do something to harm other forces that might be helpful to an opponent

In a sense, a great part of interaction with other people could be characterized as "make the right choice before the other person does."

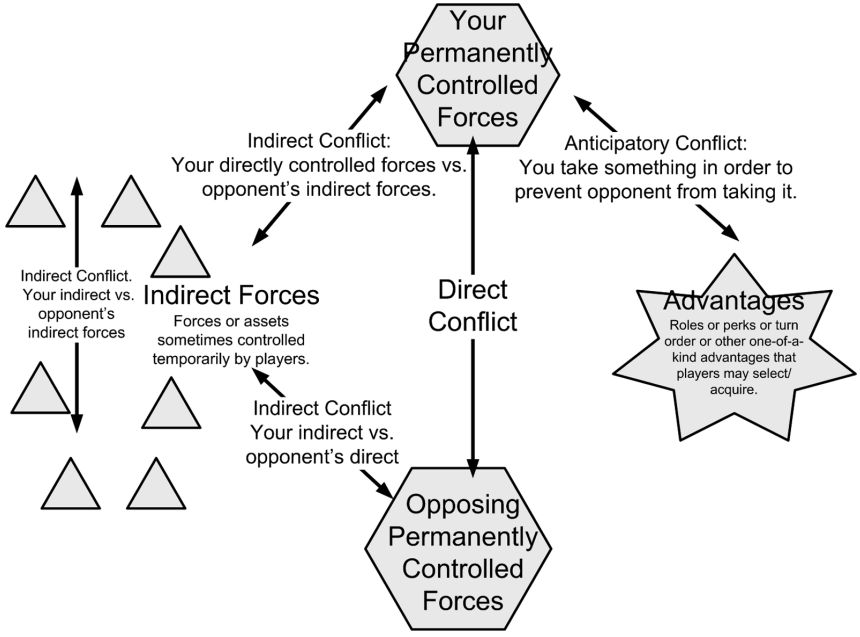

Figure 5 — Conflict, Direct and Indirect Action.

Finally, there's interaction in relation to "yomi," reading the minds of the other players or anticipating what they are going to do. "He's ahead, and I think he's trying to do such-and-such, so I'll do this to thwart him even though it isn't the very best thing I could do for myself."

Figure 5—Conflict, Direct and Indirect Action summarizes kinds of conflict interaction.

H. The Types of Challenges in Games

This is closely related to what games amount to.

Physical Challenges

- Dexterity (platformers, many other video games, *Twister*, caroms)
- Hand-eye coordination (many, many video games, a few tabletop games (*Hungry Hungry Hippos*)
- Gross muscle coordination (sports)
- Something tangible created (drawing, sculpture)

Mental Challenges

- Arranging patterns
- Recognizing patterns
- Persuading other players
- Puzzle-solving (logical challenges)
- Creating something intangible (such as a design) (may also be physical)
- Forecasting
- Persuading
- Disguising
- Calculating probabilities and payoffs

I. Checklist/Reminder List for Gameplay Characteristics

1. What are the challenges the player(s) face?
2. What actions can player(s) take to overcome those challenges?
3. What can players to do affect each other (if game for more than one player)?

4. Is the game replayable many times without becoming "just the same" over and over?
5. Is the game fair?
6. Is there an appropriate mixture for the audience and game type (consider "take that")?
7. What is the "essence" of the game?

Numbers 1, 2 and 3: Remember, the essence of gameplay is interesting non-trivial (1) challenges and (2) actions the players can take to meet those challenges.

In non-electronic games, which usually involve more than one person, another very desirable element is (3) player interaction, specifically, how can a player affect the other players? A good game is rarely "multiplayer solitaire," or a race where players have no influence on the fortunes of other players.

This amounts to: always ask yourself, "What can the player do to influence the outcome of a game?"

4. Replayability. How replayable is the game? If it plays the same way over and over again, players will rapidly lose interest in it.

5. Fairness (balance). Games should be fair. At some point, if a player feels he was gypped by the rules, he's not going to like the game. He or she should feel that he gets what he earned.

6. "Appropriateness." The mixture of strategies and occurrences in a game must be appropriate to the audience. Party games should not require any heavy thinking! And games that are intended to be strategic exercises should not depend heavily on randomness.

For example, in some games there are plays that pretty drastically change circumstances to your benefit or (more often) to others' detriment. These are called "take that" moves. (This often involves playing a card.) If you have a game with lots of "take that" occasions, people may enjoy it as a fun "beer and pretzels" thing, but they won't enjoy it as a strategic challenge. Conversely, if you are designing a strategic game, you probably should leave out the "take that" stuff. In other words, go one way or the other, a "take that" game or one that is not.

Where do you draw the line? Experience and playtesting with a variety of people will tell.

7. Finally, ask yourself, what is the essence of this game? What would characterize it in the minds of players or observers? Is this essence Good, is it desirable?

Practice

This is the most detailed "Practice" section in the book, because in the following chapters we need to make a game and play it in order to go further in the design process. So we need to think a lot more about games. Take your time. A game isn't built in a day.

1. Essence of games. Make a list of games you really like. List the three outstanding reasons why you like the games, each one in turn. Do some of the reasons occur again and again?

Now do the same for games that you really don't like. This time, list three things you do like along with three that you don't like. Do some of these "bad" games nonetheless have some "good" characteristics? This will often be the case; a really good game succeeds not only by having good characteristics, but by avoiding bad ones. At some point you may want to list three things you'd really like in a game you're working on.

2. What is the player going to do? You might find that the things you like about games are often related to what the player does. Try making brief lists again of what the player(s) do in games you really like, and what they do in games you dislike. Then make a list of what you want players to do in a game you're working on.

3. What's going to happen? Another way to look at a game is, "what happens"? A way to approach this in game design is to make a list of events you'd like to have occur in your game. Some of these events may occur many times, some only once, some may not occur in every play of the game. You can make such lists forever if you go into enough detail. Try to end up with a list of 10 to 20 events at roughly the same level of detail ("granularity"). (Those familiar with Systems Analysis will recognize that the Event List is an important part of analysis.)

4. Is it good? Now use the seven characteristics from the last section of this chapter to examine your favorite games. How do they fare? Does this help you see how they could be improved?

At some point you'll want to begin designing a game. Let's suppose you're going to try a tabletop game first, for the reasons discussed earlier in the book. You'll probably want to work on games that, theoretically at least, could be published, and there are other constraints to keep in mind.

Now Figure Out a Game

Design a "hobby game." Hobby games are generally more cerebral than family games such as *Monopoly*, such that children who cannot temporarily

behave like adults aren't likely to like them. They are usually board or card games, but not always. They include some strategy, though they need not be entirely strategic.

1. Don't do drinking games. The game itself is unimportant, an excuse, the point is to drink. Almost anything, then, can serve as a drinking game. There is no challenge or learning in designing such a game. (Yet there are exceptions: I once talked to someone who had designed a drinking game that sold 300,000 copies over nine years.)

2. No trivia games. In trivia games the subject is much more important than the gameplay. The point is to know the answers to the trivia. Once again, there is little game design practice or learning in designing a trivia game.

3. Not party/family games. They are usually so simple as to be simplistic; a party game is more a clever idea than a body of work. Yes, if you have clever ideas and can market the resulting game, you can make money. But trying to do so to practice game design is not effective.

4. Why not games for kids? *Candyland* works great for little kids, but older people recognize it's purely random. There is little skill or learning in designing a purely random game! Even when games for kids include some skill, they are largely random, so that little kids can manage to compete with bigger kids. While there is a skill involved here, it isn't quite the same kind of skill involved with designing games for adults.

In other words, design games that challenge adults.

4

You Must Know Your Audience/Target Market

One of the most important questions you must answer about each game is "who is the audience — and what do they like?"

A big obstacle for a beginning game designer is the common assumption that everyone likes the same kinds of games, and plays the same way that the aspiring designer does. If he loves shooters, he thinks *every*one loves shooters. If he likes strategic games, he assumes *every*one likes them. If he loves puzzles, he supposes *every*one does. If he is a hardcore gamer he thinks everybody's hardcore. He may say he understands the diversity, but emotionally he may not.

We discussed in Chapter 3 the very broad question of why people play games. In this chapter we're approaching things from the game designer's point of view.

A. What Are Game Designers Trying to Achieve?

There are so many possibilities, but no game can achieve all of them.

The two most important questions for a game designer are, "who is the audience" and "what is the player going to do?" The nature of your audience will go far toward determining what kinds of things the player will want to do. When you design a game you may not consciously ask yourself these questions, but you are nonetheless providing answers. And it's quite possible that your initial answers to these questions will change as you develop your game.

When you ask yourself about your audience, in great part you're asking what you want the game to do for the player. There's not just one kind of "game," there are many possibilities. There's not just one kind of gamer, there are children,

teens, adults, males, females, sports fans, hunters (some of the best-selling video games ever are hunting games), intellectuals, artists, romantics, teachers, escapists, people at parties, people at work: this list could go on and on, and those different groups can have radically different reasons for playing a game.

Let's consider some of the great variety of things game designers are trying to achieve. Here's a list, many of them related to some of the others:

These three are related to ways of convincing the player of the "pseudo reality" of the experience:

- Realism
- Verisimilitude
- Suspension of disbelief

These are the general kind of feelings you want to engender in the player:

- Immersion
- Catharsis
- Flow
- Aesthetic

These are related to particular emotions you want the player to feel:

- "Experiences"
- Surprise
- Reward

These are related to a message of some kind delivered to the player:

- Education
- Story-telling
- Historical representation
- "Art"

Experienced designers rarely do only one, but many concentrate on one or a few types. For example, many of my own designs are representations of history — not simulations, because simulation is usually impossible, and the attempt is usually tedious. They are strongly themed. Perhaps not surprisingly, I have a Ph.D. in military history. Many of Reiner Knizia's games are abstract, with mathematical relationships sometimes involved, with an "atmosphere" (often mistakenly called "theme") tacked on, that is, something that doesn't make a difference to how the game is played. His Ph.D. is in a form of Mathematics. (Most designers don't have Ph.D.s, but the degree indicates a strong interest in a topic.)

One of the biggest mistakes you can make, as a professional designer, is

to assume that achieving one of the objectives in this list is the only way to make games, or the only "suitable" way to make games, or the only way worth bothering with. That's similar to the mistake of designing a game just like you would like to play. It is too limiting, it reduces your flexibility. When you start out, go with what you know and like, but recognize how crippling that can be in the long run.

Now for the descriptions of these terms:

These three are related to ways of convincing the player of the "pseudo reality" of the experience:

- Realism
- Verisimilitude
- Suspension of Disbelief

Many designers feel that, whatever else they do, they must convince the player(s) that what's happening in the game could be real (even if it's a science fiction or fantasy game), that in some alternate world it would really be happening. Consequently, they strive very hard to be realistic, or to create an atmosphere of verisimilitude, or to achieve a suspension of disbelief in the players.

Obviously, this is much more often an issue in video games, not in board games or card games. Photo-realistic technology doesn't exist in tabletop games. Yet in some tabletop games, especially role-playing games, the designer still wants to elicit a suspension of disbelief; and some wargame designers have striven for a kind of "realism" for decades.

Realism

> "*A statue of a bear in a city park is not better if it's so lifelike that it starts eating people.*" — Ernest Adams as quoted by Ian Schreiber

In board wargames for decades there has been a dichotomy between "realistic" "simulations" (from the viewpoint of the overall commander) and "good games" (also posed as "realism vs. playability"). It's a rare wargame that can provide both, especially without the help of computer technology. More often, the "realistic" wargame tries to force players to do exactly what happened in history, even though history is so full of chance that what *did* happen is seldom what was most *likely* to happen.

Miniatures ("toy soldiers") players often research minute details of their armies and try to write highly realistic rules sets. Yet the result, because it's a game, rarely bears much resemblance to the real thing.

Shooters are a stronghold of the desire to make things feel real, yet the

way characters behave in most shooters, running (and jumping) around rather than hiding, willing to get killed if they can kill two enemy, is absolutely unrealistic! Games like *Rainbow Six* are more realistic ("true to life"), but much less exciting (though more suspenseful) than run-around shooters.

The extreme of this is what has been called the "techno-fetishist" view, that a game is good simply because the player(s) can be convinced that it's life-like or "real." Oddly, it doesn't have to actually be realistic. You look out of your character's eyes, you hear what they hear with surround sound, and so forth; but what you're doing is ridiculous, because *you're not afraid of dying*. Moreover, death is not only not permanent, it has no sting at all. Such games cannot possibly be realistic, no matter how much blood and gore and beautiful water-effects are involved. That's probably good, because people don't actually want reality, they want a feeling of power within a limited situation that resembles reality. In the end they want not realism but verisimilitude (see below).

Mega Man 9 shows how even a minor fear of death changes a game immensely. See *http://www.gamasutra.com/php-bin/news_index.php?story=21324* "How Mega Man 9 resembles.... Real life?"

No matter how punishing we make the video game, there will be no fear like the fear of dying; and how many would want to play such "fearful" games, anyway, we play games as entertainment surely. Consequently, games that give players a real stake in "staying alive" will continue to be rare.

This does not prevent designers from trying to be "realistic," or from thinking that the techno-fetishist way is the "only" way to make a game.

Verisimilitude

"*1. The quality of appearing to be true or real...*
2. Something that has the appearance of being true or real." — The American Heritage® Dictionary of the English Language, Fourth Edition

"*All that gives verisimilitude to a narrative.*" — Sir Walter Scott

Perhaps all the blood and gore found in many video games is an attempt to provide verisimilitude. The appearance or feel of being true or real is what counts, going back to the idea that a designer is trying to elicit some kind of reaction from or impression on the player.

Here's an example. The physics of ballistics (travel of projectiles through the air) is very complex. Digital computers were originally devised in part to calculate ballistics tables, and before that, analog computers (something like slide rules) were used. An entirely "realistic" game involving shooting would incorporate this physics into the programming. But the cost in slowing the

game down for calculation would be ridiculous. So video game designers use approximations that are good enough to have the appearance of realism. According to *Fundamentals of Game Design*, at one time the military asked creators of a video game how they had incorporated realistic ballistic physics into the game. It turned out it was just a very good guess.

Fans of combat flight sims vary in the level of verisimilitude they desire. In some games the airplanes fly very much like the real world models, and consequently aren't easy to fly. In others, "arcade" flight is used, and the players can easily do all kinds of things with planes that the most skilled pilot could not in the real world. A designer needs to know what will be good enough to give the desired level of verisimilitude.

Willing Suspension of Disbelief

> "*A willingness to suspend one's critical faculties and believe the unbelievable; sacrifice of realism and logic for the sake of enjoyment*" — Webster's New Millennium Dictionary of English, Preview Edition (v 0.9.7)

A willing suspension of disbelief used to be necessary for every novel, but especially for science fiction or fantasy. We know that the story didn't actually happen, and perhaps could not possibly happen, but we are willing to ignore our disbelief in favor of a good story. "Used to be" because modern standards of what is "just too unbelievable" have changed. Thanks to television and decades of increasingly-silly action movies, we'll accept all kinds of ridiculous occurrences and plot holes in movies as long as the action and the characters (in that order) are good.

Many games don't even try for a suspension of disbelief, they just assume that if you play the game, you're willing to suspend. We all know *Monopoly* or *Risk* or *Mario Kart* have nothing to do with reality, yet we play anyway.

Nonetheless, in some kinds of games (techno-fetishist efforts come to mind) the designer wants to avoid anything that reminds the player that he's in a game, that stops his suspension of disbelief. Some kinds of in-game advertisements might do this, for example, because they remind us of the real world instead of the rather-different game world. Long delays such as long load times for the next level can do this.

These are the general kinds of feelings you want to engender in the player

- Immersion
- Catharsis
- Flow
- Aesthetic

Immersion

> *Immersive: "generating a three-dimensional image which appears to surround the user."* — Webster's New Millennium Dictionary of English (second definition)

"Immersion" is a word often used by video gamers. There are many definitions, but it generally means, as used by gamedevs/authors of game design books, "the feeling that you're really there."

Techno-fetishists believe that they must make photo-realistic environments to encourage a feeling of immersion in their players. That's why the definition above is quoted, to highlight the relationship with technology. The immersive ideal for them is *The Matrix* or the *Star Trek* Holodeck.

Some players define immersion more broadly as "what I like in video games," then are offended to find most gamers don't like it. So "immersive" more or less becomes a substitute for "good."

Designer Brenda Brathwaite says "What's very immersive to 17–35 year old male players is constant decision making and good feedback." But the great majority of gamers are not 17–35 year old males.

You don't need technology for immersion, as many tabletop *Dungeons & Dragons* players know. You can feel that you're really there even at a table covered with papers, a board of squares, and cardboard counters. It's just easier to create that feeling of immersion with technology, because you need less participation (imagination) from the players.

Catharsis

> "*The purging of the emotions or relieving of emotional tensions, esp. through certain kinds of art, as tragedy or music.*" — Dictionary.com, unabridged (v 1.1)

Catharsis is "getting in the zone," when everything seems to become distant as you effortlessly succeed in the game: the kind of feeling you get when you double your highest *Tetris* score in one sitting. We often talk about this in relation to sporting events, when a shooter in basketball "gets in the zone" and just can't seem to miss, or when a quarterback "gets in the zone" and completes 15 passes in a row.

Often catharsis is seen as a very good thing: "A release of emotional tension, as after an overwhelming experience, *that restores or refreshes the spirit*" (The American Heritage Dictionary of the English Language, fourth edition).

The Flow

"The Flow" is optimal experience, something that is not too easy but not too challenging — "the positive aspects of human experience — joy, creativity, the process of total involvement with life I call flow" (*Flow: The Psychology of Optimal Experience* [1990], p. xi). You can see how this relates to immersion and to catharsis. But you can be in "The Flow" in a tabletop game just as well as in a video game. This was described in Chapter 3.

Aesthetic

1. pertaining to a sense of the beautiful or to the science of aesthetics.
2. having a sense of the beautiful; characterized by a love of beauty.
3. pertaining to, involving, or concerned with pure emotion and sensation as opposed to pure intellectuality. — Dictionary.com Unabridged (v 1.1). Based on the Random House Unabridged Dictionary

This is using "aesthetic" in the sense of the MDA framework of Mechanics, Dynamics, Aesthetics described in Chapter 1. In that sense, it's an umbrella term for what you want the player to see, feel, hear, experience.

The following are related to particular, specific emotions a designer wants the player to feel:

- "Experiences"
- Surprise
- Reward

"Experiences"

"Experiences" are most familiar to hardcore video players (and derive largely from tabletop *Dungeons & Dragons*). An excellent expression of this goal is in "Making Experiences" by Rick Ellis, *PC Gamer* Feb. 2009, p. 84:

> "... what we create are experiences, not 'games.' Chess and Crazy Eights are games, but these types of games won't scare the hell out of you, make you jump in your seat, or make you feel responsible when your sidekick dies."
>
> "... we get to play with your emotions, get you attached to your characters, provide the unexpected, and influence your heart rate. When we do our jobs well, you forget that you are playing a game, and the events in it feel very real and matter to you."
>
> "... are all about: immersion, escapism, and creating emotional believability."

In other words, the designer is trying to engender specific emotions in the players. This desire is often associated with high-technology and a drive

for "realism," though tabletop *Dungeons & Dragons* shows us that you don't need video games to create "experiences."

Surprise

Surprise is simple. Designers such as S. Miyamoto (*Donkey Kong, Zelda*, many Wii games) and R. Knizia (literally hundreds of board and card games) say "we're entertainers." Miyamoto says he tries to surprise players, that is, give them something unexpected or new, something they haven't experienced before.

Reward

Reward is also simple. The designer wants the player to more or less continuously feel rewarded by what happens in the game, so that the player will continue to play. It's expressed in mechanisms as simple as the victory point scoring in every turn that is a feature of many Euro-style board games, or the loot dropped by defeated monsters in an RPG.

These are related to a message of some kind delivered to the player

- Education
- Story-telling
- Historical representation
- "Art"

All of these involve a "message" delivered to the player. The message can enable the player to learn something practical (education), something entertaining (a story), something that helps them learn but is less immediately practical (historical), or something yet harder to define (art).

Education

"Serious games" is the term now used for simulators, training, and classroom games. ("Educational" has poor connotations in the US and UK, especially in connection with games.)

These are games that people can learn from. The "story" is the message people are supposed to learn.

Story-Telling

Games are not as good for story-telling as movies and novels, but can

convey a story in an interactive way not generally available in those media. Movies and novels are a more practical way to convey a story, as a storyteller tells a story, but not as an "experience," not like "you are there."

Historical Representation

These games show what history is like without trying to model how it worked. That is, they tell the story of history in many ways, but do not try to simulate it. As such, the representation can be a simple model that provides interesting challenges; it also can reflect the "chaos of history" rather than wrongly pretend that whatever happened in history was inevitable.

At some point historical representation becomes educational. My historical game *Britannia* was not designed to educate, and has some big handicaps for educational purposes as it is neither quite simple nor short (4–5 hours). But I know people who have successfully used it to teach history in schools.

"Art"

Trees have been killed in the service of the discussion of art in games. Let's just say, people make games that are intended to deliver a message, or entertain in a unique way, and these might be termed art, though in fact all games are art. Art-games, in themselves, are not usually commercial games, but there can be exceptions. Many are playable only once, as there's not much there after you "receive the message."

For example, the simple video game *Passage* is "about life." The game *Train* relies on a twist at the end, and is about inhumanity. *Eine gegen Eine* ("one against one)" is a board game with no rulebook: you learn the game as you open the box and play. But those "messages" can only be delivered to a particular person once, the first time they play.

Having said all this, keep the following in mind. It's important to think about what you're trying to do, but don't get "hung up on it." In the end, if lots of people in your target market play the prototype and like it, you're doing something right. It is too easy get tied up with intermediate objectives and forget the goal, which is to complete games that people want to play.

B. Some Game Playing Styles That Designers Must Take Into Account

Games usually suit particular styles of play.

Sometimes the nature of the traditional video game, a kind of interactive puzzle or interactive movie for one person, obscures all the different things games can be. Since some aspects of these points of view depend heavily on having several human or human-like opponents, many of the examples will be from tabletop games. Even when we limit our vision to competitive gameplay, there are many different styles of game play. You should be aware of some of the major ones.

The first, of course, is that some people, especially many video gamers, prefer interactive puzzle "games" that have no human/psychological component, while other people strongly prefer games involving two or more people in opposition. In fact, "multiplayer" in the tabletop game hobby doesn't mean "more than one player," it means "more than two, and more than two sides." A two-player game provides some human/psychological interaction, but it's the more-than-two-sided games where the human element, not the puzzle-like challenges set by the video game designer, becomes paramount. This is discussed further later in this chapter.

Classical and Romantic

Another difference has been called the "Classical" vs. the "Romantic," following philosophers who have discussed this difference in a variety of contexts (e.g., Nietzsche's Apollonian and Dionysian). A more modern term for the Classical player is "mini-max," someone who tries to maximize his minimum gain (or minimize maximum loss) in every situation — the "perfect player" of mathematical game theory. In game theory terms this player seeks the "strategy that would guarantee the highest minimal expected outcome regardless of the strategy of the opponent" (Wikipedia).

The Classical player tries to know each game inside-out. He wants to learn the best counter to every move his opponent(s) might make. He takes nothing for granted, paying attention to little details which probably won't matter but which in certain cases could be important. The Classical player *does not* avoid taking chances, but he carefully calculates the *consequences* of his risks. He dislikes *unnecessary* risks. He prefers a slow but steady certain win to a quick but only probable win. He tries not to be overcautious, however, for fear of becoming predictable. A maxim among football fans is that

the best teams win by making fewer mistakes, letting the other team beat itself. So it is with the Classical gamer, who concentrates on eliminating errors rather than on discovering brilliant coups.

The idea of managing risk doesn't lend itself to single-player video games that have just one solution. There is no risk to calculate when one invariable strategy is perfect and faultless. Consequently, in these games that involve no chance element (everything is set by the designer), game theory probability calculations for the "perfect strategy" don't come into play. Instead there is what is called a "saddle point" or dominant strategy, a perfect way to play that will win every time. If you make the right moves in, say, arcade *Pac-Man*, you will go all the way through all 255 levels every time without a single death, because there is no random element. (See *Inside Pac-Man*, *http://www.gamasutra.com/view/feature/3938/the_pacman_dossier.php*.)

On the other hand, if the single-player game includes randomness that changes with each play, the player must manage risk. In general, single-player games are going to tend toward the Classical unless the "opposition" approaches a human in complexity.

The Romantic looks for the decisive blow which will cripple his enemy, psychologically if not physically on the playing arena. He wishes to convince his opponent(s) of the inevitability of their defeat; in some cases a player with a still tenable position will resign the game to his Romantic opponent when he has been beaten psychologically. The Romantic is willing to take a dangerous risk in order to disrupt enemy plans and throw the game into a line of play his opponent is unfamiliar with. He looks for opportunities for a big gain, rather than to maximize his minimum gain. A flamboyant, but only probable, win is his goal. He may make mistakes, but he hopes to seize victory rather than wait for the enemy to make mistakes. The Romantic is more likely to try to "get into the head" of his opponent, to divine which strategy the opponent will use and play his own strategy that best counteracts it.

In the standard single player interactive puzzle video game, there is no human opponent to "psyche out" or to fool. Yet some of the more sophisticated modern games are designed to provide a "computer opponent" that behaves in some ways like a human, and clever players figure out ways to take advantage of the programming to "fool" the opponent. When playing a multi-sided game such as *Civilization* or *Warcraft III* against several computer opponents you can find ways to "make the opposition look foolish": in fact, this may be easier than when playing against good human opponents. A political victory in *Civilization*, in effect persuading the computer players to give up, can be seen as a Romantic goal. Further, real-time games tend toward the Romantic

simply because there isn't time for the Classical player to make careful calculations. Under great time-stress some people will still try to play Classically, it will simply be harder for them to do so effectively.

In the single-player video game with no chance element, the Romantic very likely has no opportunity to "take the path less trodden" in order to fool the computer.

Here's a simple comparison of these two types of players. The Classical player, in tic-tac-toe, will always play to the center square when playing second if his opponent doesn't take it — and will always take the center if he moves first. The Romantic may try to fool his opponent into playing badly by making a less-than-optimal play, in order to try for a win rather than accept the otherwise-inevitable draw.

To further generalize, playing against the computer in an unhurried environment tends to encourage the Classical, playing against people tends to encourage the Romantic. However, when the stress of limited time is introduced, it becomes difficult or impossible to play Classically as you have insufficient time to calculate risks or find a dominant strategy, if one is available.

Many good players depend on intuition rather than study and logic to make good moves, yet the moves can be either Classical or Romantic. A Romantic player can also be a very cerebral or intellectual player who happens to prefer the Romantic style. Nonetheless, the Classical player tends to use logic while the Romantic tends to use intuition. Some people would refer to Classical players with derision as "mathematical" players. It is true that Classical players are concerned with odds and expected losses and saddle points (though this alone doesn't identify or qualify a person as a Classical player). Nonetheless, Classical players do quite well in non-mathematical games.

Games sometimes tend to favor one playing style over the other. Chess is clearly a Classical game. Single-player video games are often Classical. Poker tends to favor Romantic play, because so much depends on bluffing. Most shooters (the frenetic kind) are Romantic, while stealth shooters tend to be Classical, as far as you can categorize single-player games. A game like two player *Street Fighter* can be played either way. It seems that the very best players, though, play *Street Fighter* Romantically, somehow reading their opponent's intentions and beating them to the punch, the ultimate in playing the opponent rather than playing the game.

Diplomacy, though without any overt chance factor, is a good game for both Classical and Romantic players. The negotiations and alliance structures give both types plenty to work with. The Classical player tends to be better at tactics and strategy; he prefers long alliances to continuous free-for-all, for

there are too many risks and incalculable factors inherent in a fluid situation. The Romantic tends to prefer the fluid state, and his big weapon is the backstab.

It's hard to say whether an extreme form of Classical play, in a typical one-player video game, would involve rare resort to reloading a saved game, or would involve frequent saves and attempts at all kinds of different tactics to find out which one is best. I tend to be a Classical player, and I prefer the former, but I'm not going to make the mistake of assuming I'm typical!

While "Minimaxers" are usually Classical players, some gamers apply minimax methods to characters or unit mixes, to more or less tactical concerns, but play the overall game Romantically. "Yomi" is David Sirlin's term for reading the opponent's mind; the best Romantic players probably have "Yomi," but this is not necessarily so, and it's possible that a Classical player may be able to read opposing intentions but still relies on attaining the minimum maximum gain.

Nonetheless, you'd expect most Classical players to be mimimaxers, and most Romantic players to rely on Yomi.

Reaction to Chaos and Randomness

But this is only one way of looking at game playing styles. Another is to look at a player's reaction to fluidity and randomness. These three points of view are:

- the "Planner,"
- the "Adapter" (who tends to represent the middle ground) and
- the "Improviser"

The Planner likes to plan ahead-well ahead. He loves it when things he did long ago in a game come together to give him a big success. He is likely, though not certainly, going to prefer a game where much if not all of the information is always available, e.g. chess. He's likely to prefer turn-based rather than real-time games. When it's time for him to make a play, to execute a strategy, he doesn't want to find that the game has changed drastically owing to a recent move by someone else, or because of the nature of the game itself. The Planner will often be a Classical player as well, though this is not necessary.

The "Improviser" does not like to plan ahead. He wants to react to circumstances at the time he makes his play, and he doesn't mind at all if circumstances change drastically between one play and the next, or in a short

time (in a real-time game). Games with limited information availability aren't going to bother him, while games with perfect information aren't likely to be attractive. Such players tend to be Romantic, obviously.

The "Adapter" likes to impose order on chaos, he wants to be able to see ahead a short while in real-time (or a couple turns) and then adapt to changes, that is, arrange to "take control" of what's going on. As you can see, this falls somewhere between the other two.

Once again, some games favor one of the three styles or another. Team video games, if the team actually tries to plan and work together, can be for Adapters. Real-time strategy games may attract Adapters, who can plan ahead some, having gained some information about what's going on. Two multi-sided board games that fit the "Adapter" mindset are *Vinci* and *RoboRally*. *Vinci* is a game with perfect information, and with little overt chance, yet you can't plan far ahead because the rise and fall of empires and random selection of new empire capabilities results in great changes on the Europe-like board in a few turns. *RoboRally* requires players to program movements of their Robot in a violent race through several checkpoints in a bizarrely-dangerous factory. Each player is dealt nine movement cards, and within a time limit must lay five face down to be executed in order one after the other. You can plan a route, but you won't always get the cards you need. Chaos sometimes results from player mistakes, yours and mistakes of others.

Civilization (the original board game or the video game) tends to be a game for the Planner. Card games tend to be for the Improvisers, though some can favor the Adapter. Poker is a game for Improvisers, except that there can be long-term bluffing plans that are characteristic of a Planner.

Diplomacy could attract Planners, Adapters, or Improvisers, depending on how it's played.

In *Tetris*, if you're just reacting to each shape as it appears, you're playing as an Improvisor; if you're trying to calculate which shapes will go where, so that you'll know where to put one when it shows up, you're playing more as an Adaptor. Because of the time stress and uncertainty about what will appear soon, it's virtually impossible to play *Tetris* as a Planner.

Because arcade *Pac-Man* is ultimately predictable, a Planner may have been the first to notice the patterns and find ways to take advantage of them. Insofar as video games tend to conceal a lot of information, they're not fruitful ground for a Planner, rather encouraging Improvisation.

Platformers reward short-range planning of the kind common amongst Adaptors. Some RTS games (the ones that are short on time-stress and long on strategy) are good for Adaptors. Survival Horror games with limited ammu-

nition available are good for Adaptors. But something like *Left4Dead*, with practically unlimited ammo and a Director that increases the challenge as necessary, fits an Improviser point of view.

Depending on circumstances, a Planner or Adaptor should be a good leader in a team deathmatch or capture the flag using maps that are well-known.

Race games can favor any type depending on how much information is known to players when the race begins.

If you're a game designer, you must think about what kind of player your game is going to attract. This directly impacts the choices you make. You cannot attract players of all styles, so what style player do you want to attract? If you make a game intending to attract several types, will you succeed, or will you attract no one? In the end, only playtesting can tell you for sure, but you can make many decisions before playtesting begins.

Role of Chance

People might tend to assume that these playing styles are closely related to the role of chance in the game. But it's not a matter of "how many dice rolls." Some chance can be managed. Tabletop or video *Dungeons & Dragons*, on the face of it, is full of dice rolls or equivalent, but a player can do his best to minimize the number of times he must rely on dice to save his bacon, or he can "go with the flow" and rely on the dice.

If there are few dice rolls or equivalent, and some are very important while many are not, then chance is very hard to manage. If none of them are particularly important, you can manage the risk better. Randomness is largely unmanageable chance. The Planner doesn't like randomness, while the Improvisor won't mind at all. Adapters like some fluidity as a result of what other players do, but don't much like randomness. Classical players tend to hate randomness, while Romantics may welcome it.

In general, games that provide difficulty by requiring quick reactions tend to favor the Improvisor style and make Planning difficult. You don't have time to plan a lot in *Halo* or *Combat Arms*; you can in the "stealth" shooters such as many Red Storm games like *Rainbow Six*. Real-time games tend to be better for Improvisors, turn-based games for Planners. Games with most information hidden from the players make Improvising much easier than Planning, hence the AAA video games that usually use "fog of war" (hidden information, even the map is hidden to begin with) tend to be games for Improvisors more than Planners.

In other words, "traditional" one-player video games tend to favor the Improvisor rather than the Planner. But this will gradually change over time: as the market for video games continues to expand, many new players dislike being time-challenged, they want to relax while they play their games, they want to play a little bit (one turn) at a time. The trend is already obvious in casual and "social network" games.

These are only three spectra of competitive game-playing styles. Remember that there are a great many people who do not play competitively. For example, I know someone whose main pleasure in playing games is in helping someone else win!

FURTHER READING

David Sirlin's book, *Playing to Win: Becoming the Champion* (*http://www.lulu.com/content/205476*) (*http://www.sirlin.net/ptw/*).

C. Differences Between Hardcore and Casual Video Gamers

One of the most important differences amongst video game players is a difference between the hardcore and casual gamer. Here is a list of characteristics that might help define the two types. You need to decide whether your game is for the hardcore, for the casual, or possibly for both if you can pull it off.

Hardcore gamers are likely to play almost every day. Casual gamers may play now and again or may play frequently, this varies a lot. In any case the hardcore will spend a lot more time per week playing, than the casual.

Hardcore gamers play in "long sessions" (several hours). Usually the game takes a long time to finish, and they may play it only once, because they've figured out all the puzzles, or because now they know the story. Casual gamers play in "short sessions" (think "*Bejeweled*").

Often, the game is over quickly, but they play the game many times over the course of weeks or months. But virtually all social network games are casual, yet have no end.

Casual games are often of the "you don't have to concentrate hard on the game" type.

Hardcore games are usually "you have to concentrate or you'll get dead."

(Turn-based strategy games can go either way, often can be played either way. Think *Civilization IV*.)

Hardcore gamers probably don't have a "favorite game" over a long period (years) — because they "finish" games and are done with them. Casual gamers may have a favorite game over a long period, but the "cult of the new" is strong today, so they may move on to new games frequently.

Hardcore gamers are usually competitive (or pseudo-competitive, when comparing scores for single-player games). They see the game as an adversary and want to "beat it." Casual players tend not to be competitive. "Achievements" are of interest to hardcore gamers, rarely to casual players.

Hardcore gamers are often more concerned with "the destination" than with "the journey," though this can extend to casual gamers as well. Casual gamers tend to want to play something that they can enjoy while playing, rather than enjoy only when they've finished ("beat the game"). If a game is "too much like work," they'll stop playing it.

Hardcore gamers are rarely playing "to relax." Casual gamers often play a short session "to relax," then go back to the real world.

I don't know which of these video gamer types is more likely to play tabletop games. The popular board and card games of today tend to be "casual" more than "hardcore" experiences. (This is hobby games such as *Settlers of Catan, Dominion, Carcassonne*, and so forth, not traditional tabletop games.)

FURTHER READING

Gamasutra series on what some kinds of non-hardcore gamers want:

http://www.gamasutra.com/view/feature/3639/what_gamers_want_family_gamers.php
http://www.gamasutra.com/view/feature/3720/what_gamers_want_silver_gamers.php
http://www.gamasutra.com/view/feature/3826/what_gamers_want_missing_gamers.php

D. Video Games and Tabletop Games Are Becoming More Alike — "Convergence"

There's no fundamental natural difference between video games and tabletop games. In chapter 2 I discussed practical differences and similarities in video and tabletop games. Here I want to point out to you a difference in the way these two kinds of games have been designed, and how they're slowly converging to a middle ground.

In most tabletop games, the designer is devising ways for the players to challenge each other in an interesting fashion. In most traditional (one-player) video games, the designer is devising ways to challenge the player through the computer/console. There are challenges in both cases, but the nature of

the challenges is quite different, because even a powerful desktop computer, let alone a smartphone, cannot yet begin to provide the complexity and intelligence of a human.

There are two major components in what we typically call games, the system component and the "human" (psychological) component. In an interactive game, the more players, the more the human side of the game matters, and the less the system part matters.

Traditional one-player video games have no human component, only a system component. They are interactive puzzles, what some people call a "challenge game." Once you figure out the system, meet the challenges, that's all there is, and you probably stop playing the game. You cannot "win" or lose an interactive puzzle any more than you win or lose a traditional puzzle: you only complete it ("beat the game"). One of these "challenge games" is a game as much (or as little) as mountain climbing or white-water canoeing is a game. It is a very different way of looking at things from the traditional tabletop game.

Let me illustrate the difference. In the 2006 film "Casino Royale," James Bond plays poker with, among others, the villain of the film. Bond "reads" his opponent, realizing that when he bluffs he makes a certain gesture. Unfortunately, Bond tells this to an ally, who betrays his confidence, resulting in a crushing loss for Bond when the "enemy" appears to be bluffing, but isn't.

Poker is an epitome of the classic "multi-sided" (more than two separate interests) board or card game: you win by successfully playing the other players, not the game system. The game system is important, because you are unlikely to win if you haven't mastered it, yet lots of people understand the rules of poker very well but aren't good poker players.

In my four-player game *Britannia*, the system is more involved than poker but less than in chess. Players score points at different rates and times. To completely master the system, you need to be able to look at the board at a given time, look at the scores, and recognize who's ahead and who's behind, where points should be scored and where they shouldn't. Players who do attain this mastery of the system will often win games against those who don't, because they have a better idea of what to do, and what to persuade others to do. But when players who have mastered the system play together, the game becomes a matter of playing the players, of predicting what they're going to do, of persuading them to do what will benefit them but also benefit you. The system is important, but so is the "human" or psychological side. Someone who masters both the system and the psychology is a very formidable player.

In chess the system is very complex in play, impossible for humans to

master completely. Modern chess-playing programs are coming close, sometimes defeating the greatest chess masters. Even though the game is only two-sided, thus lacking the mesh of connections of a three- or more sided game, the human/psychological component sometimes comes into play. Danish grandmaster Bent Larsen is well known as a "highly imaginative player, more willing to try unorthodox ideas and to take risks than most of his peers." "His book of 50 Selected Games (1968) is renowned for its pithy annotations which delve into chess psychology and use of rare openings..." (Wikipedia, "Bent Larsen," May 2009). He looks for the Romantic play that would confuse his opponent, some unusual and not-previously-analyzed line of play. Yet because system is more important than psychology in chess, when he came up against the greatest masters of the system such as Fischer and Kasparov, he failed.

In most tabletop games, figuring out the system is straightforward, though in the more-strategic games, some people can never figure it out. And others quit before they figure it out. Many contemporary Euro-style games cater to the latter players, by ensuring that, after one play, most players have (or at least think they have) figured out the system fairly well.

In MMO (Massively Multiplayer Online) circles the system side is often referred to as "PvE" (player vs. environment), and the human side as "PvP" (player vs. player). MMO player vs. "environment," which is to say, player(s) vs. computer, certainly is an "interactive puzzle," challenges posed by the designers of the game. The PvP part of an MMO, or of many other "multi-player" video games, generally involves only two sides at a time, one player or group trying to kill another player or group. Consequently, PvP in an MMO doesn't reflect the interaction and complexity of situations where there are three or more separate competing sides. "Playing the players" really comes to the fore when there are at least three sides, three separate competing interests, and something more at stake than killing one another. As there are more players with separate interests, each player can do relatively less using the system to control the game, and must rely on influencing other players.

Frequently, the skills most needed to complete (not win) a "challenge game" are patience and persistence. Since you can't "lose," and you can't die permanently, you can keep trying until you succeed. (Some games of this type can never be completed, e.g. *Tetris* and many arcade games, but you can satisfactorily master the game.)

The skills needed to win a multi-sided game vary, but the supreme skill is what David Sirlin calls "yomi," an ability to predict what the opponent will do. "Yomi" is the Japanese word for "reading," as in reading the mind of the opponent. Many great generals had "yomi." Sirlin's book "Playing to Win,"

referenced at the end of Section B, about video fighting games is full of the psychology of one human player vs. another.

Another way to look at this is that "challenge games" tend to tell a story, if only the story devised by the designer, where games that include a strong "human" component usually enable the players to make a story as they play. Someone observed that many video game designers may be frustrated storytellers, something you rarely see in a tabletop game designer.

Think about it. A person doesn't play a multi-sided game like *Diplomacy* or *Britannia* five hundred times to figure out the system, or to learn the story the system tells them. In these cases, the story is an abstract version of World War I, or a representational version of a thousand years of British history. They play to enjoy the interaction of the system and the players, to learn how people cope with the system and how they can be persuaded to think or act in certain ways.

What about cooperative games? In tabletop *Dungeons & Dragons* (*D&D*) there's a human component, from both the other players and the referee; even though there's not technically a human "opponent," the opposition is guided by a human. You don't have to have a human opponent to have a "human" component to a game, but you need people. Someday the computer will be able to pretend to be "people" enough that it can provide the human component, but not soon.

Nonetheless, tabletop role-playing games are a meeting-ground for the two "game" types. An RPG such as *Dungeons & Dragons* can be arranged as a story to be followed by the players, or it can be arranged to let the players make their own story from a situation arranged by the referee. Console RPGs tend to emphasize the story to be followed (linear games), while PC RPGs tend to emphasize the situation (open world or "sandbox" games).

We're now seeing a convergence of interactive puzzles and multi-sided games. More video games are multiplayer (though still, rarely more-than-two-sided with humans providing the opposition). More try to create an open world. MMOs such as *Eve Online* provide very human opposition amongst many separate alliances at the macro level.

At the same time many popular "Euro" style board games are close to multi-player solitaire, played by humans but with little direct interaction amongst them, so that the players are mostly figuring out "the system" as they would in a single-player video game. There is even a category dubbed "engine games" where figuring out how the game system works is much more important than reading the other players. The most common kind of interaction,

if any, in many of these games is anticipatory interaction, doing or choosing something to prevent someone else from doing or choosing it.

The future expansion of video games will come from the human side. The challenges in "challenge games" have been made less and less challenging as time goes by, to increase the appeal to a broader market, but at some point you lose many of the "hardcore" gamers when you reduce the level of challenge. We see signs of the future in Wii games intended for more than two separate human interests. Yet online video games can't approach the face-to-face board or card game — you can't see the body language, smell the other players, "feel" them, when you're online. Often you can't even hear them speak. All of this sense-information helps someone more completely gauge/understand the opponents. More video games will be designed to be played in one room by several people in opposition (those Wii games again), and more will be designed for online play with multiple separate opposing human interests.

The contemporary Millennial generation (Gen Y) thrives on social activity, on sharing. They enjoy games with several separate human players, when given a chance to play them. They are not as interested in solitary experiences as Gen Xers have been.

For a designer, this is what to remember: the system isn't necessarily the only part of a game. Some designers concentrate on "challenge games," but others devise games that can attract people to play over and over again because the interaction of players and system is so interesting.

E. Who Plays Games, and What Kinds of Games Do They Play?

Not everyone plays games, and not always the ones you think.

Looking at the entertainment portion of the video game industry, consider the following (from the Entertainment Software Association, 2009).

- About 145 million Americans over the age of six play computer games or video games
- 68% of heads of households play video games
- 37% of heads of households play video games on a mobile or wireless device
- 39 is the average age of a game buyer
- WOMEN age 18 or older represent a significantly greater portion of

the game-playing population (34%) than boys age 17 or younger (18%).
- 40% of gamers are females
- 53% of game players expect to be playing games more or the same amount in the next ten years

Nintendo survey data shows 46 percent of Americans aged 6 to 74 used the Wii console or Nintendo DS handheld system at least once in the past year, with 62 percent of Americans in general using video game consoles.

Video games are not primarily a realm of adolescent and young adult males, though those males often do not want to recognize that. Certainly, the most vocal segment of game players, the realm of the "hardcore," is amongst adolescent and young adult males. But companies that want to sell to the broadest possible market cannot focus on this vocal segment.

Yet the now-common notion that "everyone plays games" is clearly not true. There are more than 310 million Americans. If 68 percent of heads of household play games, then about a third do not, and that might translate to over 100 million people. When we want to talk to someone about a movie we assume that everyone watches movies (even though some do not), but we ask "do you play video games" before talking about them. And particular video games tend to fade away. As Cliff Bleszinski (designer of *Gears of War* among others) says, "People collect their favorite movies on DVD. They'll collect their favorite boardgames. How many collect their favorite video games? Not many: mostly they trade them in for new ones. This is where video games don't measure up: memorability and replayability."

Game types that are "obviously" popular may not be in fact. Shooters may be seen as the face of hardcore gamers: very popular with young, hardcore, male players, but not with older males and not with female players — not even within their own generation, when females are counted. (Check the recent Pew Survey, *http://www.pewinternet.org/Shared-Content/Data-Sets/2008/February-2008-Teen-Gaming-and-Civic-Engagement.aspx*, question K14: shooters were played less by teens [males and females not separated by gender] than any of 12 game categories except survival horror games. The results of this survey are quite eye-opening at times.)

The mass market for tabletop games is very large — most people have played *Monopoly* (over 200 million sold worldwide), checkers, or chess — but the hobby game market is quite small. A few new mass market games are published each year, compared with hundreds of hobby board and card games. A few hobby games, such as *Settlers of Catan*, have sold more than a million

copies, but most sell 10,000 or less. Reiner Knizia's games sell more than $40,000,000 a year, but he has more than 200 published games.

Most hobby tabletop gamers play some video games. Most video gamers have played traditional board and card games, but often not hobby games.

The most important thing for a designer to keep in mind about game players is, their preferences are mostly not like the designer's. You design a game for other people, not for yourself. At least, you do if you want to be a professional.

F. Characteristics of "21st Century" Games

If you are designing for publication, you are not designing a game for you — you are much too unusual to be representative of a large target audience. As a designer you need to be aware of these modern gaming preferences. If the target audience for a game is people 50 and older, their game interests will be quite different from those of the latest generation ("Millennials," born around 1980 and younger). This is going to contrast present-day preferences with those of the 1950s–80s, and you'll see how video games fit these newer preferences.

Here is a list of these 21st century characteristics.

While some of these may not sound very complimentary, reality is what counts, and in the broader game market, this is reality. Hardcore gamers are not typical, and in many ways may not fit into the list. The hardcore is a small part of the overall market. You may want to design games only for the hardcore, but publishers must make money to stay in business, so many of them try to reach beyond that core.

Low Tolerance for Frustration

Many board games of the past included an "opponent loses turn" card. Gamers today often "hate" to lose a turn, and are less likely to play a game with that possibility. Why? 30 years ago "lose turn" was regarded as part of the competition of a game, just another way for an opponent to achieve a goal. Today many people have grown up with video games where they're constantly active, and strongly dislike not being able to do something. In some cases, one of their primary motivations for playing the game is to DO something, and when they lose a turn they cannot do anything.

Further, games are entertainment, for most people. People today are

much less likely to accept frustration as part of their entertainment than they were 30 years ago. "Instant gratification" and "convenience" and the "Easy Button" have changed expectations. People are likely to quit any activity they find frustrating, rather than "fight through it" for the prospect of greater enjoyment later. (Hardcore video gamers are a clear exception.)

Positive Scoring Mechanisms That Reinforce Success or Encourage the Player to Continue

A great many video games use point scoring to determine success, and this has been adopted by tabletop designers. Moreover, how often do you see a game take points away, or run points into the negative? The purpose of points is to immediately reinforce what a player has done, and to encourage the player to continue. In contrast, an old game such as *Monopoly* uses money as a substitute for points, and you lose money almost as often as you gain it. Other old games such as chess and checkers have no reinforcing mechanisms — you lose pieces and rarely gain them.

Disinclination to Plan or Study

Games tend to be more active, more frenetic, than in the past. People want to DO, more than they want to think.

In the video game world, simpler games can include the rules within the game, with minimal reading. More complex games such as *Civilization IV* have manuals, but few players read them, even though those who do read learn enough to become experts long before the players who don't read the manual.

In tabletop games this tendency manifests in a different way. In older games, rules were written to be read thoroughly before play. They were organized to be easily referenced when a player forgot a detail. Now most rules are written in "Sequence of Play" style, on the assumption that the players will try to play the game while reading the rules for the first time. If that's true, then the rules must follow the order in which the players will try to do something in the game. This makes for a poor reference, unfortunately. But the fact is, most tabletop game players want to be taught how to play rather than read the rules, and if no one can teach them, they often try to learn the game as they play.

It's easy to see one of the greatest benefits of video games, no one has to read the rules.

Players Won't Write Things Down

Many tabletop game publishers want nothing that requires written records in a game, and that's a given in video games. The typical mechanism used in tabletop games is a scoring track where a marker indicates the current score for each player.

My board game *Britannia*, originally published in 1986, had always required use of a scoresheet to write down victory points. When the second edition was published in 2006 by Fantasy Flight Games, they did not want to require players to write anything. At first they were going to use a scoring track, but I suggested that in a four to five hour wargame, likely someone would bump the game board or otherwise foul up the scoring. So they decided to include scoring counters in three denominations. As players score, they receive appropriate counters.

Many *Britannia* players, given a choice, will still keep score on a scoresheet. But they're not forced to do so.

Players Won't Do Even Simple Arithmetic

People are now very poor at doing arithmetic in their heads — "new math" and calculators have had a lot to do with this. I've seen intelligent college students count up the dots on two dice one by one rather than quickly make the sum. And I've known intelligent college students who could not figure out the amount of a 10 percent tip at a restaurant (let alone 15 percent).

If this is true, why would people want to do math as part of a game, unless it was specifically a mathematical game? Video games take care of this automatically, of course, but board game designers have had to adjust how they do things.

Players Want a Reduced Number of Plausible Choices, and Not Many Pieces/Items to Deal with

Many popular strategy (war) games of the 60s and 70s involved moving dozens or even hundreds of cardboard pieces each turn. There were many choices, much to think about. This has gone out of style: in a sense we're back to centuries-old traditional games where only one piece is moved at a time. This "piece," in video games, is usually the player's avatar.

This helps avoid "analysis paralysis," where the player has so much to think about that he cannot decide what to do.

This is related to entertainment: fewer people nowadays regard a thinking

game as entertaining. So they want a game of physical challenges, or a game with only a few plausible choices at any given time, perhaps we could even say, a game where intuition (which is quick and easy to use) is just as useful as logic (which frequently is neither quick nor easy).

Not Much "Down Time"

Players are less contented with "waiting for their turn" than in the past. They want to constantly participate in a game. There is much less interest in patience, or in downtime that enables one to plan one's next move.

Board games and card games can achieve downtime reduction with constant trading of resources (*Settlers of Catan*), with simultaneous movement (*Diplomacy*), with small partial plays during an overall turn so that there's less time between each part of a player's turn, or with "interrupts" (such as event cards) that a player can execute while another is playing. Video games are frequently simultaneous, all players playing at the same time, so the problem rarely arises.

No Lookup Tables

Lookup tables, such as dice-roll combat tables, were common in board games of the 60s and 70s. Now, players don't want to look up anything. Often, cards are used to supply the rules/tables needed at a given time. In video games, of course, the computer keeps track of the tables and the rules.

Episodic

People have shorter attention spans, perhaps because there are so many distractions, so many ways to spend one's leisure time. In any case, games tend to be more episodic these days. In video games, the entire concept of "levels" is a way of making a game episodic. The end of each level is a natural point to pause or even to save the game and stop playing for a while. Many board games last a limited number of turns: you don't actually play to completion (where one player dominates), you play for a while and then rely on the score to determine who won. Many card games are naturally episodic, as you play one "hand" after another.

Dice vs. Cards

This is not something strongly related to video games, but is obvious in board games. Many people nowadays do not like dice rolling in games. The

preferred method of introducing a random element is cards. Cards are more manageable than dice, and much nicer to look at as well. Yet there are still many popular games, such as *Risk* and *Axis & Allies*, that are "dicefests." As someone said, when you're using dice you're not putting your ego on the line — you can blame the dice rolls. In video games the action of "dice" (random chance) is hidden away, but it's often there; nonetheless, many players don't like to feel that what happens is affected by chance.

No Player Elimination

In most video games, a player is never eliminated, knocked out of the game; he can go back to his save game, or he simply "respawns." In older tabletop games, players were often eliminated, as they are in *Monopoly*. Of course, in a two player game when one is "eliminated," the game is over; we're talking about games with more than two sides. Today, player elimination in games is quite unusual.

How is this achieved? Players may have an inviolate area to survive in, or the game may simply have a time limit that will be reached before anyone can be eliminated. Moreover, in many cases, the game is designed so that most players have a chance to win at the very end of the game — do you want to continue to play if you have no chance at all? For example, there may be a progressively increasing scoring scale, or some mechanism allowing a "surprise" win. Insofar as the popular "Euro" board games have grown out of family games (some people refer to many of them as "family games on steroids"), it is not surprising that there is no player elimination, as that would leave someone out of the family fun.

Simple; Short

Games tend to be simpler and shorter. "Simpler" is related to a dislike of reading rules. "Short" is a matter of attention span. This sometimes means games rely on intuition rather than logic, as intuition comes quickly, while logic generally requires information-gathering and long thought (sometimes resulting in "analysis paralysis"). Many people simply won't play a long game, or think they won't. (They often find that if the game is satisfying, they'll play two or three hours, at times; but many aren't willing to risk that.)

The trend in video games toward short experiences ("casual" games, social network games), and towards episodic play, reflects these changes. AAA games tend to be much shorter, overall, than 20 or 30 years ago.

Pacifism

This can be quite surprising for hardcore video gamers, who tend to prefer games where things blow up or die. But remember that nearly half of game players are women, and the great majority of female game players are not interested in violence.

It is quite easy to find gamers who will not "attack" other players. Games that are essentially multi-player solitaire are fairly common in the board game world — you can't do anything to harm or much to hinder the other players' situations. "Euro"-aficionados might put this differently, saying that the games use indirect means of influencing other players rather than the direct means common in wargames.

Sharing/Cooperation

The Millennial generation is known to prefer sharing and cooperation more than preceding generations did. Competition is sometimes frowned upon by parents and teachers. We also now have a higher proportion of adult women playing games than in the past, who tend to be less interested in competition and more interested in cooperation.

People are much more interested in games where you build up things, than games in which you tear down an opponent. (Yes, the hardcore video game players are an exception.)

Perhaps the popularity of the Wii and Wii-like games reflects this change. Dislike of player elimination is another indication. The out-and-out pacifism of some players is another symptom.

Much Stronger Visual Orientation

In the age of color television, of computers, of the World Wide Web, this is hardly surprising. Inasmuch as people are less likely to read, they are more likely to be interested in images and good looks. Just as some players will criticize a video game for "outdated graphics," players will criticize board games for "boring bits" (components). One reason why cards are now much more popular, and dice less, in tabletop games is that cards can include colorful, varied, interesting illustrations and brief "flavor text."

I've even heard a teenager say that music "isn't real" until he sees something to go along with hearing the music. Hardly any older person would have that point of view (except, perhaps, for opera lovers).

Uncertainty of Information Is Much More Common

Traditional board games, even commercial ones such as *Monopoly* and *Risk*, have "perfect information" or nearly so. Almost nothing is hidden from the players. On the other hand, card games are a bastion of hidden information. Early video games provided perfect information, as nothing was hidden from the players. Now hidden information ("fog of war") is the norm, thanks to the power of modern processors. In board games, too, the use of cards and upside-down tiles is much more common, introducing uncertainty. Uncertainty is a part of many games, but where dice provided uncertainty in the past, other means such as "fog of war" are now more common.

Player Interaction Without Overt Conflict

In wargames the inevitable conflict results in constant and strong interaction between players. In traditional commercial games not about war, such as *Scrabble* and *Monopoly*, some interaction exists but is not based on violence. Interaction in card games can vary a great deal from one design to another. Modern board games have many ways of encouraging interaction that were uncommon decades ago, such as auctions and trading. Early video games — almost always one player against the computer — technically speaking involved no player interaction at all, though there was plenty of interaction with the computer opposition.

Much of the interaction in video games is still based in warfare and violence. But we have seen an increase in non-violent games, as in *The Sims*, in resource management games such as *Settlers III* and *Puerto Rico*, in casual games such as *Bejeweled*, *Farmville*, and many games made for the Wii. You could argue a case that the "real future" of interactive video entertainment is in games with more than one player and with lots of interaction among players, often of a non-violent nature.

Generational Differences

We have already described many characteristics that differ between generations, now is the time to try to generalize about them. Some people prefer to think that everyone is the same, but employers and researchers have seen that there are definite differences between generations. Entire books have been written about generational differences, this is only a taste that will help you be aware of how differently people think about games.

The "Baby Boomer" generation (before "X") is highly competitive and willing to forego immediate gratification for future reward. They don't need constant encouragement to continue playing, in contrast to much younger people who do expect immediate reward for any accomplishment. "Gen X" (born around 1964 to around 1980) tends to be the generation of the lone hero, in game terms, while "Millennials" or Gen Y (born around 1980 and later) tend to think in terms of sharing and of groups accomplishing tasks. The MMO is the new face of video gaming, then, because it can accommodate both, in the individual adventuring that appeals to "X" and the multi-player raiding that appeals to Millennials. "Social network" games try to promote cooperation, but are for now solitary activities.

As you can see, modern video games reflect most of these changes very well, though early video games often did not. I'd guess that the changes came first, and video games reflect them, but video games have certainly reinforced these differences as they've become part of the national and international consciousness.

Practice

Talk with your family, friends, co-workers, or fellow students about what they like in games, and what they don't like. You'll probably find that there are many different opinions, some of them different from yours.

5

Making a Playable Prototype

The preceding three chapters have discussed a lot that will, in the long run, help you make better games. Now we're back to the practical aspects of game design, the actual construction of a playable game so that we can try it out. We are now at the point where you have thought about the structure of your game, you've written notes about what you want to do, you've made lists of entities in the game, you may have made a list of events that might occur in the game, and you're ready to make a prototype.

Ideally we would like our conception to magically leap forth with no effort. Unfortunately, making a prototype takes time and effort. A paper prototype can take just an hour or two to make, and that's why video game creators often make paper prototypes of their video games. If it's a prototype of a video game it can take anywhere from many hours to many months to make the initial playable prototype. Remember, that's why beginners can learn a lot more from designing tabletop games then from designing video games to begin with.

In any case, you really haven't done anything in game design until you've got a prototype that can be played, and this chapter is about creating such prototypes. You don't need a fancy prototype, and certainly not a "complete" or "perfect" one. Aside from purely abstract games, games are models of some reality, even if it's a fictional reality. No model can approach the complexity of the real thing. Perfectionism is poison here, the objective is to come up with something you can play, because that will tell you far more than any amount of thinking about the particular game.

To make a video game prototype you'll need someone with programming skills, at the very least; though if it's a simple game then it can be made with a game engine like Gamemaker, with no prior programming skills required. If you're using someone else's skills, you'll need to create a document to describe what you want done. Video game studios often make paper proto-

types to test out their ideas because it's so much quicker, and consequently cheaper, than making a video game prototype.

A. What You Need to Know About Making Playable Prototypes

Don't Worry About Prettiness

First, here's a very important point. The purpose of a prototype is to test the gameplay. It is not there to look pretty, it is not there to wow people with visuals, it is not there to be admired by other people. It is there to be played. With very few exceptions an initial prototype is going to be a poor game, a preliminary game that badly needs to be fixed. Why spend a lot of time making it look good when you're going to change it?

Further, if people like to play the game when it looks very plain, many of them will like it even more when it is actually fully produced and looks really nice. While it is possible to design a game with looks uppermost, and perhaps even to have some success in the marketplace because it looks good, isn't it better to design a game that plays well as well?

For a typical AAA video game, many more artists are needed than programmers or designers. Video game studios have found that they can save a lot of money by using a small team to optimize the gameplay of a game and then bring in lots of artists to make it look good. For example, there is an excellent video in the *Civilization IV* "Game of the Year" edition that describes in detail the production process, revealing how few people were involved until the gameplay was settled. This saved a lot of money.

Making a Paper Prototype

When you make a paper prototype concentrate on clarity not prettiness. When you make a video game prototype, use just enough art to hold a place so that it's clear what is represented. I have seen two-dimensional video game prototypes that used simple blocks as placeholders where that was sufficient for clarity; the game played just fine.

There is one caveat. If you depend on volunteer playtesters who don't know that you are a serious and responsible game designer, it may be hard to find people to playtest your game if it doesn't look presentable. On the other hand, initial playtesting will be by yourself and possibly by other people involved in creating the game, and they should be sufficiently interested and

involved that looks don't matter. It's later in the process when you may need a decent looking game in order to find volunteer playtesters.

This must be emphasized. When you're working with prototypes you need to be willing to change, change, change.

Electronic Prototypes

First we need to differentiate the kinds of electronic prototypes. Some prototypes are made as non-playable demonstrations of feasibility, whether for the game studio or for the publisher or other entity providing the funding. It may be a small portion of a larger game, or it may be a 2-D version of what will become a 3-D game. Once this prototype shows that the game is possible, it is discarded and the actual game is created. This kind of prototype may be more a demonstration than a game, and is sometimes called a demo, though this can be confused with the limited version given away for try-out when the game is nearly in stores. The kind of prototype we're talking about here is a playable prototype.

When you make a video game, it's important to have a playable electronic prototype as early in the process as possible. For example, Epic Games had a working prototype of *Unreal Tournament III* within a month of starting the years-long development process, though this was a sequel and likely benefited greatly from the code of the previous version of *Unreal*. (The deluxe version of *Unreal Tournament III* includes a long video about development of the software.)

This approach also matches one of the principles of agile/rapid development of software of any kind, to have a working version to test as early as possible, then add features and modify in light of user testing as you go along.

Video games are computer software, and as such require programming. Programming takes experience and dedication. Lots of people teach themselves programming, but many people are simply not talented in this way. Game engines are shortcuts that reduce the amount of programming required but engines still need a lot of practice and some programming skill.

Gamemaker was discussed in Chapter 2, Section F. People with significant programming experience may prefer to try the free downloadable Unity game engine, or even the free downloadable Unreal III engine developers kit.

But many budding game designers do not have programming skills. If you can recruit programmers to help you in what is a learning experience, not a commercial endeavor, then you'll have to write a video game design document to describe what you want the programmers to do.

B. The Formal Video Game Design Document and How to Write a Good One

It needs to be appropriately thorough, and readable by those who don't want to read it!

> *"One of the things about making games, at least for me, is you start out with a vision of what something can be and you close your eyes and you imagine this thing. A couple of years later, you open your eyes and the thing you created could be wonderful, but it's not like the thing you imagined originally.* Deus Ex *is the one and only time I ever opened my eyes after three years and said 'holy cow, this is what I imagined.'"*— Warren Spector

> *I hope I am not the first person to tell you this, but nobody reads design documents. In fact, when working at larger studios, I made a habit of inserting the line "I will pay $5 to anyone who reads this sentence" into the center of any document over 50 pages. In 10 years of development nobody ever asked for their money. That's a true story. Problematically, the industry has solved this problem by holding meetings. Lots of meetings.*— Christopher Natsuume

> *Although you'll always change those details later in testing and tuning, you have to start with something. In a real sense, the process of writing documents is the process of design, because it is then that you turn abstract concepts into concrete plans. Even if no one reads your document at all, an idea written down is a decision made, a conclusion reached.*— Ernest Adams

What Is It, and What Is It Not?

In the video game world, designers often write long game design documents (GDDs) that describe all aspects of the game. It is a plan for the game. These documents help the team that produces the game know what to do, if those people actually read them. This can be combined into one large document, but is often divided into several more-manageable documents on topics such as a world setting/backstory document, a document about characters if it's a character-rich game, one about the game mechanics, and so forth.

The game design document for the highly-lauded *Deus Ex* (Ion Storm, 2000) is over 114,000 words, longer than this book. Games were simpler that long ago; a similar document for a contemporary game would be significantly longer.

Keep the difference in mind between game production documents and GDDs. Game production documents cover all the details of how the game is put together by a team, not the design of the game. The game design docu-

ment describes in great detail how the game is supposed to work. The game designer is not going to detail the programming plan, nor the budget, nor the hiring/staffing plan, and others; these are concerns of the lead programmer and the producer.

Also keep in mind the difference between a game pitch document and GDDs. The pitch is a marketing document, not instructions to programmers and artists. It describes the game at a very high level, not the details of how it works. It is quite brief. Pitch documents are part of the funding process, often used first within a studio as various conceptions compete to be the next one the studio tries to get approved for funding. Ideally you would complete a game and use the completed game as your pitch, because the proof is in the play, but big video games cost so much to produce that studios cannot complete a game without acquiring funds.

Why Write a Game Design Document?

There is no inherent virtue in game design documents. If video game designers could miraculously create and modify the video game themselves, they wouldn't need a formal game design document. GDDs do help a designer organize his thoughts, but there's a great difference between the notes a designer might write for himself, and what he must write for other people, especially in the minute details. The document is necessary for video games when the designer cannot make the preliminary and ultimately final versions of the game himself. Other people will be making the prototype and the final game (which will be much different than the initial prototype, of course), and they need to be told what to make.

I don't want to discourage you from writing down details of your ideas, but you should only write a formal, and very time-consuming, design document when it is actually needed. I have never heard of a game design document being written for a tabletop game. In tabletop games, one or two people do all the work of making the prototype and arriving at a finished design, which is then produced by the publisher (who adds commissioned artwork). It's counterproductive to write a long, carefully-detailed description of a tabletop game. Spend the time making the prototype and PLAY. So much changes when you play—ought to change, anyway—that much of your initial work will be abandoned.

When you're learning to design video games, you will probably have to make your own video game prototypes because no one else will take the time to do it. Consequently you're unlikely to write long game design documents,

though you'll certainly need notes about what you intend to do before you start creating the software. As a learner you will be much more concerned with how to create video games yourself, as you'll not likely have programmers and artists to help. But if you do have programmer assistance, you'll have to write down what you want them to do.

Unfortunately for those who produce AAA video games, they cannot afford to deviate a great deal from their plan, because they may not have the time to do so. Hence the plan becomes very important.

Yet game design documents are being de-emphasized in some companies because it takes so long to write such detail that the project as a whole is delayed. In these companies the design document is relatively small. Instead, the designers work directly with the programmers, artists, and other production people to help the latter understand what the game is supposed to do. This may be dangerous if there is only one designer, but the larger the video game, the more people participate in or at least understand the design, so that if one of them leaves or becomes incapacitated, the others know what needs to be done. On the other hand there needs to be someone who keeps the group headed in the same direction toward the same goal, whether or not all the parameters are written down.

Hence we have those two apparently-opposing quotes by Adams and Natsuume at the start of this section: it depends on how a particular studio does business.

Further, companies are coming to realize that the best plan does not long survive contact with the enemy, that is, once you start playing the game, you discover you need to make significant changes. Why spend months on a very detailed plan that is going to require much change?

Nonetheless, opinions about the importance of GDDs vary, and many video game design schools spend a lot of time on game design documents. Here are some tips on writing such documents.

First, use visual aids, charts, spreadsheets, diagrams, as much as possible. Most people, especially the younger people who are usually involved in making video games, do their best not to read long documents. Keep in mind that most of the workers on *Deus Ex* would have been Gen Xers, people who grew up before the Internet age and are fairly willing to read long documents. Today, especially for practice games, the workers are likely to be younger Millennials (Gen Y) who do their best not to read long documents. (The acronym "tl;dr," which means "too long; didn't read" expresses the attitude of many Millennials.) The more you can use the "picture worth a thousand words," the more likely that the artists and programmers will actually read the documents.

Second, recognize that video game production is a compromise. Time, technological limitations, and budget won't let you do everything you wanted to do. In any project you try to provide a given level of quality, stay within the budget, and finish on time, but frequently at least one of these three must be sacrificed. Your GDDs must prioritize in some way, to indicate what can be left out, what is less important and what is more important. In some sense you are directing the work of the artists and programmers, and good supervisors always set priorities for their workers.

Third, the documents are not novels, don't expect people to read the whole thing. Organize them so that the production people can read just the parts relevant to their jobs.

Fourth, match the documents to the production team. The more experienced the team is, the less detail you need to put into the documents, because they'll know what to do or think of something good to do.

Fifth, some people feel that using a GDD template is mechanical, but the purpose of a template is to make sure that nothing important is left out.

Further Reading

Chris Taylor, designer of *Total Annihilation* and the *Supreme Commander* games, among others, provides a template for a game design document. Retrieve at *http://www.runawaystudios.com/articles/chris_taylor_gdd.asp*

I obtained the 114,000+ word *Deus Ex* design document from the International Game Developers Association (IGDA) Game Design Special Interest Group (SIG), but I know of no publicly available download for it. You might also want to read Warren Spector's post-mortem at *http://www.gamasutra.com/view/feature/3114/postmortem_ion_storms_deus_ex.php.*

The 47 page game design description for the highly-regarded *Planescape: Torment* is available online in several places, e.g. at *www.rpgwatch.com/files/Files/000208/Torment_Vision_Statement_1997.pdf*. The game title at the time was "Last Rites." This is both hybrid pitch document and limited design document.

C. The Video Game Concept Document

The purpose of a concept document is to sell the idea for a game to your team, company or funding source. You tell the "money-men" just enough to let them visualize what the game will be like, and who it will appeal to. This will be written before any long game design document, in all likelihood.

As such this is not part of game design but part of marketing. Nonetheless

it describes the bare bones of the design, and as such it is as good a way as any to formalize your thoughts when you're attempting to create a video game. Before you write this document you should have thought about your game a great deal and written many notes about it. This is a first attempt at a formal description.

A publisher would much rather see a complete game than a documentary description. Often for a video game it costs too much to produce the complete game, or even a passable demo, so this document is the beginning of a substitute.

The categories included in the game concept vary. Some categories describe what you want the game to do, while a few describe how. Given the brevity of this kind of document, there cannot be a lot of "how."

Title and Tag Line: Titles are often changed during development, nonetheless you want one that is brief, descriptive, and "snappy." A "tag line" is another opportunity to attract players to your game. For example, for the historical game *Britannia* the tag line was "On an anvil of blood and terror they forged the destiny of an island!" The tag line for *Halo* was "Combat Evolved."

Premise (or High Concept): One to two sentences addressing the player directly, describing the mood and unique hook of the game. The premise could be used on posters and on the game's packaging to attract potential buyers. This will often answer the vital question, "what does the player do?"

Genre: Most video games fall neatly into standard categories of challenges.

Target Market: Who is going to play/buy the game.

Platform: Which operating systems/consoles/handhelds/mobile platforms will the game run on?

What Is the Player Going to Do? This is so important that it's here as a separate category. To know who a game will appeal to, you have to know what the player does. To design a game, you have to visualize what the player does.

How Does Someone Win? This again helps indicate who the game will appeal to. A cooperative game where players win collectively will have a different market than a cut-throat competitive game.

Player Motivation: What will drive the player to actually play the game to the end? For example, the player could be driven by a desire to compete, solve puzzles, or explore.

Player Mode: This describes what the player typically sees and does (related to user interface), so it, too, addresses "what does the player do?"

Backstory: What's the setup? What happens before the game begins? Notice that story is often quite unimportant. The potential funding group isn't terrifically interested in your story unless that story is very important to the game. They want to know a little about the story because story helps marketing.

Target Rating: Indicate what the expected ESRB rating for your game will be, and why.

USP (Unique Selling Proposition or Point): What makes your game unique? Why will your audience choose to play your game over your competitors' titles? Your USP is something that makes your title stand out from the others. Why should your game be developed? Why is it special?

Competitive Analysis: Choose about three game titles currently on the market that could be competition for yours, and describe how yours will overcome the competition.

This must all be addressed in a couple of pages; if it's too long, the potential supporter may not read it. There are examples below.

D. Typical Problems When People First Try to Write Video Game Concepts and Design Documents

Remember first that the idea is to think up the details of a video game, then describe it briefly or in detail. Too many people try to make it up as they go along. This doesn't work.

Claiming that you'll have the best story, or best graphics, or best sound, or the best campaign, or the most fun, is meaningless unless you represent a company with a track record of doing just that. *Everyone* thinks their game will have the best <<you name it>>, but the money-men have no particular reason to believe this, and have heard it many, many times. So concentrate on what your game will actually be about, what it will actually look like, what the player will actually do, and hope those details convince the money-people that you have something worth pursuing.

Keep in mind that a video game must sell lots of copies just to break even. Try to consider a broader appeal rather than a very narrow appeal.

Unless you have a detailed picture in your mind of your game, your description is likely to be vague and cliche-ridden. So to return to the original point, you need to have a game you've thought out in mind. You can't do a good job "by the seat of your pants."

FURTHER READING

Virtually every video game design book discusses this kind of document, sometimes at great length with examples.

E. Examples of Video Game Documents

Below are three brief game concept documents that I wrote as examples for students. The third is suitable for a simple 2D game engine such as Gamemaker. Some video game design books also include sample concept documents, for example in Adams' *Fundamentals of Game Design*.

The first concept derives from one of my published board games. It is often possible for a concept to be modified for use in several different formats, such as board game, single-player video game, card game, or multi-sided video game.

Dragons' Rage *High Concept*

Title: *Dragons' Rage*. **Tag Line:** "The Dragons are Coming!"

Premise: Dragons are coming to attack the city. You are the defenders. When played by two, one player is the attacker, and attackers may include giants, wolves, and other creatures.

Genre: One or two player turn-based tactical wargame.

Target Market: Tactical wargame players age 10 and up, both board gamers and video gamers.

Platform: Casual 2D PC game (possibly Wii as well). May work well on mobile platforms.

What Is the Player Going to Do/Player Mode: As the defender of the city, the player will see a map of his forces and the location of the attacking dragons. He will use the mouse to indicate where his forces move. When all have moved, he will click a button to activate attacks. When he has a wizard, he'll be able to choose a spell (and target) for the wizard to use.

In the two-player version, the second player controls the attacking forces, which may include giants, trolls, orcs, and other creatures of terror and of the night. His mode (via hot-seat or network) will be similar to the mode of the defender.

Backstory: We really do not need a story beyond "creatures are attacking the city." There are many possible variations, such as, someone now in the city despoiled the dragons of their eggs, someone recently awoke these sleeping

dragons, the city is prosperous so the rapacious giants, trolls, and orcs have decided to attack, etc.

Target Rating: E10+. A simple game of military action playable by everyone, 10+ because it is a wargame.

Player Motivation: There's always something heroic in "defending civilization against the barbarians." In this case the barbarians are inhuman, and magic is involved in a fantasy setting. The game may remind players of the heroic defense of Helm's Deep and Minas Tirith in *The Lord of the Rings* movies, and may have a connection to the forthcoming Hobbit movies in the "person" of the dragon Smaug and the destruction of the City on the Lake.

Unique Selling Proposition: Aside from the great title, there is no game depicting this specific kind of attack. It will be a short but highly replayable game.

Competitive Analysis: There is no video game depicting this specific kind of attack. The only board game is the 25 years-out-of-print *Dragon Rage* by the same designer (now reissued in new edition, 2011).

Another *Dragon Rage* (*http://en.wikipedia.org/wiki/Dragon_Rage*) is a PS2 game from late 2001. The player is a dragon trying to save the dragon race, hence bears no resemblance to *Dragons' Rage*. As my use of the title "Dragon Rage" (for the board game originally published in 1982 that *Dragons' Rage* derives from) predates this use, I see no problem with use of *Dragons' Rage* as a title.

Goals: A casual game for those interested in warfare, it should be relatively short, but replayable many times. It can be played by two people as well as by one.

(End of *Dragon Rage* concept. That is about 500 words.)

The next is for a massively multiplayer online game, unusual in that players represent nations rather than individuals.

Conquest *High Concept*

Title: *Conquest*. **Tag Line:** "the World is ripe for the picking." (Alternative: "The Rise and Fall of Nations.")

Premise: The War Gods demand that your nation expands. You command its forces. The objective of the game is conquest. Expand your nation enough to score a win. Then try a different nation (or see if your nation can win another time).

Genre: This is a massively multiplayer online game of an unusual subgenre, strategic rather than tactical, turn-based from the player's viewpoint rather than real-time though adjudication will be simultaneous.

Target Market: The game will attract lovers of strategy games (including board games) as opposed to games that require great speed of reaction or games where the player controls large numbers of individual units (RTS) or individual adventurers (*World of Warcraft*, other typical MMOG). The target market is much smaller than the market for *World of Warcraft*, but there's little or no competition in MMOG for this market. The target market is not age specific, though one would expect the game to appeal more to adults than to younger kids who are accustomed to first person shooters and action games. The game can be played at a sedate pace, because it's turn based, and does not require or invite the kind of "WoW addiction" so detrimental to many lives. It is a mature application of the power of computing to games.

Platform: The servers will be PCs, but the game is simple enough to be played from a console or mobile platform. Initial electronic development will be for PC.

Player Mode: Players will see a map of their area and be able to move units and allocate resources. The screen depicts a map area including the player's nation and neighboring nations. He or she can click to send messages to other nations (negotiations). He can move his units, depicted on the map, to defend or attack. He must consider simple economic, social, and cultural circumstances as described on his display.

Backstory: When a player comes into the game he takes over an existing nation in a vast world of hundreds of nations. The objective is to expand his or her nation (or his nation's influence, if he prefers non-military means). As players win, they can play again with the same or another nation, though large nations will tend to fall apart owing to dynastic or catastrophic problems, providing small nations for other players. Sometimes invaders come from the edges of civilization, just as the horse barbarians did historically. The game proceeds indefinitely with the rise and fall of nations, while individual players can win or lose over time.

Target Rating: E10+. A simple game of military (and occasionally economic or cultural) conquest playable by everyone, 10+ because it is a wargame.

Player Motivation: This is a strategy game; you win by clear thought, analysis, and (in most versions) successful negotiation with neighboring nations. It is more chess-like than *Doom*-like. Simple-rules strategy games such as *Risk*, chess, and go are very popular worldwide. This game combines

computer-augmented simplicity and realism (especially fog of war) with an historical feel.

Unique Selling Proposition: There is no massively multiplayer online game that enables players to pursue the goals they've learned and enjoyed in board games such as *Risk*, *Axis & Allies*, and *Diplomacy,* and in simple computer wargames designed for one person vs. the computer. Here you play against other people, with the very important addition of detailed negotiation with other players as an option. Further, play will be at a leisurely pace if desired, accessible to casual players who cannot spend hours a day playing online.

Competitive Analysis: There is no direct competition in the MMOG area. Turn-based strategic computer games such as *Civilization IV* could be seen as resembling this game, but the relationship is complementary rather than competitive. Board games such as *Risk*, *Diplomacy*, *Axis & Allies,* and *Britannia* (the latter designed by the chief designer of *Conquest*) are also complementary rather than competitive. The computer will enable turns to be adjudicated simultaneously, rather than one player after another, a difference from most board games.

This is a game like a much-simplified *Civilization* (the computer game and the older board game) brought to MMOG. It is essentially a board game brought to massive participation, with the inherent advantages of computers (e.g. fog of war). It also offers the possibility of selling one or more board games based on some versions of the computer game. The board games will be created in large part to help prototype some aspects of the computer game. The MMOG will help sell the board games.

Goals: The mood will be similar to the satisfaction and interest of playing strategic board games such as those mentioned above, and many others. In some sense, the player will often be "playing the other players," trying to divine what they will do, trying to convince them to do what he wants them to do.

There will be several different versions of the game to serve different tastes. Play will be adjudicated simultaneously but players will have considerable lengths of time to submit turns. Some versions will play at a much faster pace, some at only a turn a day or even a turn a week. (Players will be able to register turns in advance or even give general orders to be followed, as far as AI allows.) A "no-negotiation" version will be available, but many players will enjoy the game because of the versatility of negotiation. Some versions will use the ancient era (this will be developed first), others gunpowder and perhaps ultimately 20th century and modern weaponry. Some versions will allow players to adopt an historical race (Greeks, Mongols, Persians, etc.)

with inherent advantages and disadvantages to each. A version may enable a player to play several nations at once, as the board game *Britannia* does. Versions can be added over time according to the desires of the players. Programming the game should be relatively simple and graphics will not be the focus.

(End of *Conquest* concept. That is about a thousand words.)

The third one is suitable for a simple engine such as Gamemaker:

The Fury of the Northmen *High Concept*

Title: *Fury of the Northmen*. **Tag Line:** "The Vikings are Coming!"

Premise: You defend medieval Britain against the predations of the Vikings! If you succeed, some of Britain will be saved, and you may be able to counterattack and recapture the remainder. If you fail, Britain becomes a Viking kingdom.

Genre: One or two player turn-based strategic wargame.

Target Market: Strategic wargame players age 12 and up, both board gamers and video gamers.

Platform: Casual 2D PC game using Gamemaker engine.

What Is the Player Going to Do? The player controls the defending forces, some quite mobile, some not, representing several British nations as Vikings raid valuable spots (such as monasteries) and ultimately try to settle parts of the island. He can occasionally offer to pay Danegeld to invading Vikings rather than fight. The better he defends, the stronger his forces will be, but this will also vary with the turn as kings die and new ones take their places.

Player Mode: The player sees a map of Britain. He can use a mouse to move/place his defending forces within constraints (for example, there will actually be several different nations involved). He sees attacking Vikings appear in various places, and his forces can react and try to attack the Vikings before they "disappear" back to the sea. A sidebar tells him how much of his monasteries and valuable land and are still intact.

Backstory: This is a nominally historical game, though the nature of the Viking incursions is such that it will not "follow" history (and in any case we don't have any details). Beginning in 789 AD, the Vikings raided and ultimately settled Britain, conquering much of the coastland as well as northern Scotland, culminating in the conquest by the "Great Army" of northern and eastern England (the "Kingdom of York"), withstood only by King Alfred II (the only English monarch to earn the title "the Great").

Target Rating: ESRB E10+. A simple game of military strategy playable by everyone, 10+ because it's a wargame.

Player Motivation: There's always something heroic about "defending civilization against the barbarians." In this case the barbarians are the ever-popular heathen Vikings.

Unique Selling Proposition: Aside from the great title, there is no game depicting this specific kind of attack. It will be a short but fairly replayable game. And it will be an "educational" game suitable for use in a classroom of British Medieval history.

Competitive Analysis: There is no simple video game depicting this specific kind of attack. Some of the major RTS historical games depict Vikings in various ways, but these games are much broader in scope, much more complex, often beyond the interest of any but RTS fans.

Goals: A casual game for those interested in warfare, it should be relatively short, but replayable many times. It should also give students an idea of what the Viking's attacks on Britain were like.

Possible Future Enhancements: It may be possible to hotseat a Viking player against the defending Briton, but Gamemaker is probably not up to this.

(End of *Fury of the Northmen* concept. That is about 500 words.)

Further Reading

Search online for "game concept document," "game treatment," "game concept document example," and variations.

F. Making Tabletop/Paper Game Prototypes (Physical Details)

Even if you're creating a video game, you can save yourself a lot of time and trouble by first making paper prototypes.

Paper Prototypes

A paper prototype can include a board, cards, pieces, even dice.

Pieces

- Cannibalize old family games, even chess sets.
- Use buttons, saved bottle caps, beads, even differently-colored stones from a driveway.

- Cut smallish (1 inch is nice) squares out of cereal boxes or other food containers, and write on them. These are easier to manipulate in the game than thin paper is. You can also use heavier cardboard, such as board for mounting photos, if you've got it.
- Use the colored glass beads that are sold for flower decorating
- Print your pieces on self-adhesive paper and stick to heavy cardboard (or use normal paper and rubber cement), then cut them out; square pieces are much simpler than round ones
- Use any images you find on the Web for prototypes (not for production), e.g., through Google Images

Experienced tabletop game designers usually have a big collection of game parts that can be used for pieces, including lots of different kinds of dice. These may be pieces scavenged from old published games, which may have been purchased at thrift stores or yard sales, or pieces bought in bulk from school supply stores such as EAI Education online. Experienced designers will have lots of cubes and pawns and plastic or wooden figures such as soldiers and spaceships. If the game is intended to be played with three-dimensional pieces, it's probably a good idea to use three-dimensional pieces in the prototype. A game actually plays a little differently with 3-D pieces them with 2-D because 3-D pieces are easier to pick up and move around.

CARDS

There are different ways to make cards. Some people buy blank 3 × 5 index cards and use them as a cheap substitute to begin with. Some people like to buy cheap playing cards, write the card content on sticky labels such as address labels, and stick the labels on the cards. These decks shuffle much better than the 3 × 5 cards.

Others like to use a word processor and business card templates to type the card content, then print on business card stock or paper, and put the result in sleeves made to protect *Yu-Gi-Oh* and *Magic* cards. The business card stock provides some stiffness to help shuffle the cards, but this can work with heavy paper as well. The sleeves are sold in typical hobby stores, or inexpensively in bulk at online stores such as Dave and Adam's Card World. When you use this sleeve method, it's relatively easy to send a PDF file of the cards to a potential publisher or tester.

The fourth method for making cards is to use specialized free card editing software such as Nandeck or the *Magic: The Gathering* card editing program.

This requires time to learn how these programs work, but you can make much nicer looking cards.

In any case, hand worded or hand-drawn cards are fine to begin with. When you want to have lots of different people playtest the game, computer generated content is easier to read, especially if there is a fair bit of text on the card. (Always remember the "seven line rule": if there's more than seven lines of text on the card the players probably won't read it.)

Leave some white space on the cards for any hand-written corrections and additions.

Boards

Hand-drawn boards are still quite common. You can free-hand draw on any sheet of paper. For playtest purposes, especially solo playtest, a quite small board (one ordinary sheet of paper) may suffice.

I used to save large sheets of paper or cardboard (advertising posters, for example), for this purpose. In general, drawing programs which use vector graphics are better for making boards then bitmap/raster programs (such as *Photoshop*). See Chapter 10 for software to help in making prototypes.

A board of squares is very easy to create with software. Drawing programs like *Illustrator, CorelDraw*, and *Inkscape* can make square grids. Hexagons are more difficult, but there are lots of files in various formats of hexagons available online. CorelDRAW has the great virtue that it can print to whatever size you wish, tiling a board onto 8½ by 11 sheets of paper so that you can print a board that will be quite large when you tape it together.

If your prototype is for a tabletop game rather than a test for a video game, you'll want to spend some time on the board to make sure it's very clear. This may require you to make it look a little bit pretty in the sense of having shading and backgrounds and so on. Potential playtesters look first at the board and 3-D pieces when deciding whether to play the game, so a little prettiness here can help. If the prototype is for a video game and is only going to be played by members of the game studio then prettiness is not necessary.

When a prototype is well along, I use rubber cement to glue the latest paper map to foamboard, which I buy in lots of ten large sheets. Some people use more-expensive posterboard.

In any case, it should take no more than a few hours to make a playable paper prototype.

FURTHER READING

"The Siren Song of the Paper Cutter: Tips and Tricks from the Trenches of Paper Prototyping" *http://www.gamasutra.com/features/20050913/sigman_01.shtml*
Also see Chapter 10.

Practice

Write a video game concept (not design) document. Of course, this first means you must figure out a viable concept for a video game, then write it down. Don't suppose that it will come to you as you write the document. You should have lots of written notes about your game before you start to write the document.

6

How to Work With and Improve the Prototype

You make a prototype so that you can test the game by actually playing it. There is NO substitute. Playtesting gives you the chance to improve the game immensely, but you've got to make that happen.

A. The Purpose of Playtesting

Whether you're working on video games, or you're designing tabletop games as a way of learning game design, constant playtesting to improve the game is the major path to success.

The biggest factor in the playability, the successful gameplay, of a game is not the quality of the ideas, nor the strength of conception, nor the marketing skill, nor the skill of artists or programmers. It's the quality and quantity of playtesting and the resulting improvements made to the game. In the end, if enough people in your target market play the game and enjoy it, then it's "good"; if they don't, then it isn't! While a poor game may *sell* well thanks to marketing and other factors, ideally you want to create a good game to give you the best overall chance of success.

The number of inexperienced people who think they've successfully designed a game, yet haven't playtested it at all, is remarkable. Playtesting is playing the game to find out how it can be improved, and then improving it to try again. The process is both incremental — a little at a time — and iterative, again and again. The playtesting stage is closer to the start of *successful* design, than to the end.

Let's clarify something. This is playtesting to improve gameplay, not testing to squash programming bugs. Some people call the former "fun testing"

and the latter "bug testing." Bug testing is often what video game makers mean when they talk about "testing," and this testing takes place late in the development cycle, when the gameplay and appearance are set in stone (because it's too late to make big changes). This bug testing (misleadingly called "Quality Assurance") is aimed at making sure the game works the way it is supposed to, but does not determine whether the way it's supposed to work is good enough.

"Bug testing" essentially does not exist in tabletop games, although it is important (and often forgotten) to test the production version of a game, as converting the prototype into the published version can introduce its own set of problems. (A small example: the boxes on the Population Track on the 2006 *Britannia* board are inconveniently small; this new version of the board evidently was not actually tested. They are larger on the 2008 printing. There was also an error in the nation turn order on the board, though it was correct in the rules.)

The "natural" way to design a game, as used in tabletop games, was long used in the video game industry, then abandoned, but is coming back into custom. A playable prototype is produced as soon as possible. It is played, revised, played, revised, played, revised, seemingly *forever*, until a stable "good game" has been produced.

The lead designer/programmer of *Unreal Tournament III*, Steve Polge, described how important it was for Epic to be able to playtest within a month of starting, and constantly thereafter. (See the video with the *UT III Ultimate* Edition.) Epic's *Gears of War 2* was playtested something like forty thousand hours (that's the equivalent of 20 people working a normal schedule for an entire year). For *Civilization IV* Firaxis used a team of only 7 or 8 people to make a working prototype as early as possible, then played it constantly throughout the production process. They then added many more to the team for production artwork and polishing. (See their 2006 GDC presentation, available in video form with the *Civilization IV* "Game of the Year" edition.)

The "wannabe" designer's assumption that the first prototype will be just fine as it is, before it's even played, is a product of both ignorance and the tendency to oversimplify the role of game design. If you think that a good idea makes a game, you might be excused for thinking the prototype will be "just fine." As we've observed, the idea is just a starting point.

People in other fields of art and entertainment revise their work often, even if they don't test it on others. Beethoven had notebooks filled with musical ideas and revisions of his work. He actually completed four versions of the overture for his sole opera — Leonora 1, Leonora 2, Leonora 3, and Fidelio,

the one finally used. You can hear the improvements when you listen. I like Leonora 3 best, but this mini-symphony was too monumental to be used as an overture to an opera, so the composer tried another tack for Fidelio. He matched the work to his goals and requirements, something every game designer needs to do, especially when employed to make a particular game.

Ideally, a game designer has the time to do this with every game, but this example is extreme even for Beethoven, and would be extreme for a game designer, to finish three versions of the same general work before settling on a fourth. The difference from games is that Beethoven was producing a passive kind of art, something to be presented to the audience when done rather than to be tested with an audience. Because games are interactive, the only way to modify them sensibly is to ask the "users" what they think and feel.

When you design a game, you try to see in your "mind's eye" how the game is going to work, but until you play it, you simply cannot know what is going to work and what is not. The first few times you play, many things will change (provided, of course, that you're willing to make changes, which is a major characteristic of a successful game designer).

More experienced designers can foresee more weaknesses and eliminate them before reaching the prototype stage. But every designer, regardless of experience, is likely to change the game significantly when it begins to be played.

What you absolutely cannot do is convince yourself that whatever you like is what other people will like, that the way you play is the way other people will play. You are not your audience, you are not typical (or you wouldn't be designing games), you are too close to the game: you cannot rely on yourself.

There is no substitute for extensive playtesting. Your initial prototype is almost certainly going to stink. Get used to it.

B. The Stages of Playtesting

> *"It's not so important who starts the game but who finishes it."*—John Wooden, 10-time NCAA Basketball Champion
>
> "*Nobody is as smart as everybody.*"—Kevin Kelly

Like many other things, the storied "80/20" rule can be applied to game creation. The playtesting and modification process may make as little as a 20 percent difference to the quality of the final game, but that 20 percent is the difference between an indifferent or downright awful game and a good (or better) game. This final 20 percent improvement should take 80 percent of

the time, but it's time well spent, necessarily spent. Playtesting is time-consuming, tweaking rules or programming is time-consuming. Think of all the mediocre or really bad video games you've played: probably the majority of those games failed because of inadequate playtesting, not because there was something wrong with the idea or the initial execution. Companies such as Blizzard, Epic, and Valve, which can playtest as long as necessary, and which aren't afraid to delay a game or say "this game is a bust" and cancel it, are the ones that consistently produce outstanding video games.

There are three stages to playtesting: solo playtesting (also called "alpha"), local playtesting ("beta"), and "blind" or "external" playtesting (often spoken of as part of the "beta" stage). While there are various ways to name these stages, the stages certainly exist, although sometimes video game companies leave out the "external" testing stage.

Solo Testing

It's hardly surprising that video games start with playtesting by the individual(s) making the game. But few tabletop games are meant to be played alone. Yet in solo playtesting of tabletop games, the designer plays the game solitaire, playing all the sides independently as best he can.

At this stage the designer is trying to get the game to a state where other playtesters have a good likelihood of enjoying it, and ultimately of playing it through to the end. At solo stage the designer might try a portion of the game and then stop because something isn't working, or because he has a better idea. When asking other people to play a game I almost never stop a game in the middle, or try something that might be so bad I'd want to stop, though I know of designers who think nothing of doing this. I have been known to change an obviously screwy rule in mid-game, but that's usually when I'm playing alone, not when others are playing.

Most video games are designed to be played alone, and the designer should play first. If there's a more-than-one-player component, it's usually impossible for the designer to play several sides by himself. If a video game production team has created a paper prototype to test, they'll play it themselves rather than ask others to play.

As I gain more experience with tabletop versions of games, I find myself often using a small computer to write extensive notes as I play a game solo the second or third time. These notes help me later remember how the game works if I haven't written a full set of rules. As with other aspects of game design, you benefit from writing things down.

Local Testing

At the local playtesting stage, people are asked to play the game through. For a video game these are usually employees of the development studio, or friends of the team if the team is quite small. For tabletop games, the designer usually teaches local gamers how to play.

At this point a video game must be more or less fully realized, fully playable, so it can take much longer to reach this stage than for a tabletop game. At the beginning of this local testing for a tabletop game I may not have a full set of rules if the game is fairly complex, I just have notes about how to play, and some of the details are in my head. As local playtesting goes on, I make a rough set of rules, then finally write a full set of rules.

However, if the game is simple, or like others I've designed, I sometimes write a full set of rules before anyone other than myself plays the game. I have to judge how much writing time I'll waste because of major changes in the rules; at some point I'll think it's worth the time to write the full rules because really major changes are unlikely.

The ability to play from notes rather than full rules is a major reason why it is much quicker to design a tabletop game. With an electronic game all the details of the "rules" (the game mechanics) must be settled precisely before the programming of the prototype can be completed. The programming (which enforces the core mechanics of the game) is roughly the equivalent of the rules of the tabletop game.

As the local playtests occur, I write down notes about what I see and hear, and especially about answers to questions that need to be incorporated into the full rules. A video game designer will do the same thing, observing how the game is working and listening to player comments, especially comments about what doesn't work or what is unnecessarily frustrating. When I have a full written set of rules, I usually refer to the rules for detailed questions, to see if the rules cover that question and whether it is easy to find that information. You might be surprised how often the designer of a tabletop game not only doesn't remember the rules, but can't quickly find the relevant rule in the written rules. The former happens because real designers have LOTS of games in mind, so they don't try to remember all the details — they write them down. The latter is a defect of the rules, and must be fixed.

Don't think this is all about finding the fairly obvious flaws in the game. Much of the change resulting from later playtesting is subtle. You're not "breaking the game," you're making usually-small improvements. Even after

the game "works," that is, is not broken, you're trying to find ways to make it work better.

"Blind"/External Testing

The third stage is "blind" testing, where someone who is not involved in developing the game is given the game and must play it without any intervention from the designer. These may be volunteer testers, or may be hired by the video game studio to work at testing. For *Civilization IV* Firaxis recruited people from the *Civilization* fan community to test the game. In some cases it's better to have people who like the type of game you're making, but have no connection with the particular franchise or series. For example, if you're making *Halo V*, you want external testers who are *Halo* fans, but you also want people who like shooters yet for some reason haven't played recent versions of *Halo* much.

There may be people who work at the studio, or people hired by the studio, who observe this testing, but they should absolutely not try to influence the players in any way.

At least one company specializes in setting up external testing for studios that cannot or will not do it themselves. The slides for a presentation at the Triangle Game Conference about this kind of service can be seen at *http://www.slideshare.net/jackalshorns/make-your-games-play-teach-and-socialize-better-usability-playability-techniques-from-the-field*.

For tabletop games blind testing is a big test of the rules, somewhat akin to video game "bug testing." Are the rules clear enough that people can play the game from the rules? What questions do the blind testers come up with, and how can the rules be improved as a result? Unfortunately, nowadays people are often poor rules-readers, so I advocate use of video tutorials to help people learn how to play a game, yet those tutorials are rarely done until the game is "done."

There will *always* be people who misread rules, sometimes willfully. 99 percent clarity of detail is about the best you can get using the English language. Similarly, most video games have many glitches until the first patch is issued several months after the game is released.

Even when you don't intend to alter the effect of the rules or software, rewriting to fix something introduces unintended consequences . Readers who are programmers know that when you change the program to fix a "bug," sometimes another bug results, or an old bug is unmasked. So a remarkable amount of testing is needed.

In the playtesting phase, video games can jump to "blind" testing quickly, because by their very nature these games hide the mechanics/rules from the players, enforcing them through the programming. This is a major advantage of video games over tabletop, that no one needs to read and understand a set of rules.

The most interesting tabletop testing for me occurs when I have let a game "lie fallow" for a year or more. By that time I don't remember much of the rules, so reading them is almost like someone reading them for the first time. I confess I sometimes wonder what the heck I was thinking when I wrote this or that!

A reason why tabletop designers should work on several games at once is to allow this kind of "fallow time" for one design while attending to others.

In the video game world it is difficult to quickly and cheaply make big changes in a prototype. This is one of the problems that all makers of video games face, and a major reason why some video games are not very good. By the time the development studio has a prototype ready for testing outside of the company, it's too late in the schedule to make many of the changes that playtesting reveals are necessary or perhaps only "desirable."

Rules Testing vs. Bug Testing

Software of any kind requires "bug testing," looking for failures in programming that cause the software to not work as desired. The equivalent for a tabletop game is rules testing. There are two parts. First, do the rules cover all possibilities? Second, is that coverage sufficiently specific and concise that almost everyone is going to understand what it means?

C. What to Look For in the Playtesters

Where do you find playtesters? College game clubs, weekly or monthly gamers' meetings, friends (but don't rely only on your family). There are "meetup" groups (meetup.com) and other game groups outside of colleges, organized through the Internet. Do some Internet searching and see what you can find locally.

People who are exclusively video gamers are good for testing board and card games because, if they like and understand the game despite lack of experience and prior interest, there's a good chance it's got something in it. On

the other hand, these are not people who are likely to find strategic flaws in a game, for that you need experienced tabletop gamers. Similarly, people who don't play video games aren't likely to find strategic flaws in them, if recruited as playtesters.

I try to treat playtesters as ordinary game players who have agreed to play a prototype. Sometimes, though, playtesters are formally recruited as unpaid testers and have the "task" of playtesting. And for some video games, playtesters are actually recruited and paid (roughly $8–$10 an hour as months-long temporary employees) to try out a video game. This is entirely impractical for beginning designers, of course.

At some point, a tester can contribute so much to the game that he becomes, in tabletop terms, a developer, the person who is sometimes assigned by a publisher to further test and modify a board game. Having a few regular testers of this sort can be a great boon to a designer.

ORDINARY PLAYERS

Playtesting should be fun. Unfortunately, so many "designers" inflict half-baked, poorly-tested games on playtesters that many gamers are unwilling to playtest prototypes. They assume that "prototype" means "piece of crap." This is another reason to play your game solo to clean up the worst problems, and may be a reason to be sure the first playtesters are people who know you fairly well, rather than strangers.

Further, many ordinary players are strongly attracted by visuals. Video games can be made with place-holder graphics. Levels are usually tested without graphics, to make sure they're fun to play before the "icing" is added. Yet there are many players who reject any video game that doesn't look highly "realistic" or "pretty." Video gamers who are exceptional strategists may be happy to play a video game with primitive graphics.

A typical plain-vanilla tabletop prototype will not attract playtesters, especially a board or cards that are obviously hand-made. For a game that is pretty far along, I put more time into the look of a board for a tabletop game, for example shading it nicely, than I would have done five years ago. I now use computers for maps and cards and play-aids, but my early games were hand-made prototypes because we had no PCs. Yet people accepted hand-made, and it's still the case that older players aren't bothered by hand-made.

When I use cards, I try to put them in attractive and even flashy sleeves to help the "visual impact," even though I rarely put graphics on the cards. Every little bit helps.

Try to find playtesters, for your early stages, who look beyond appearance to how the game plays.

Volunteer Testers

If someone's volunteered to playtest, you can expect them to be both more active and more "ornery," yet more accepting of plain vanilla appearance prototypes. Fantasy Flight Games has a rule that "blind" volunteer playtesters can suggest changes to the game, but then must forget it and play the game according to the current ruleset. Playtesting doesn't do any good if the players are using their own "house rules." This is not usually a problem with video games, as the game programming enforces the rules.

QA Employees

The usual term for paid video game testers, who rarely have fun playtesting. They are expected to play the same game over and over, often the same bit of it to discover programming bugs, and to submit documentation about everything that happens.

Other Ways to Categorize Testers

There are other ways to categorize testers. For example, there are testers you recognize as people who understand games and how they fit together, and testers who only play games but don't think about how they work. The complaints of the second group will often be mechanical or procedural, and must be taken care of, for example, "it's too hard to remember such-and-such," so maybe you need a better record-keeping method, or a player aid, or maybe you need to eliminate some element that causes confusion. (Make sure playtesters understand that if something is difficult to do or understand, it may well be the fault of the game. This may encourage them to express their problems.) The first kind of tester is more likely to see deeper into the game and find more fundamental flaws that require greater changes. Both kinds are essential.

Another differentiation might be between those who immediately see all kinds of ways that they'd change a game to satisfy their likes, and those who more carefully suggest changes to improve the game in a broad sense. The first kind you must be nice to, but you're not likely to accept many of their suggestions. The second kind you want to listen to carefully.

In any case, there will be playtesters that you're willing to ask questions of, "what do you think if I changed this," "would you like it better if that were different, and why?" Other playtesters just won't have much to contribute

when asked these questions, and you'll have to rely on observation of them to get useful information. Many gamers do not think about why they like a game, and if you ask them they may not be able to say much beyond "it's fun," which tells you little (but it's better than "it's not fun!"). Other players may be more able to express why they like a game.

D. What to Look For in the Play of the Game

> *"You tell people what you do for a living, and they're like, 'Oh, you play video games for a living.' No, I play a game that's not as fun as it should be, that's broken, until it's no longer broken. Then I give it to other people to have fun with."*— Cliff Bleszinski (Designer of *Gears of War* etc.)

> *"However beautiful the strategy, you should occasionally look at the results."*— Sir Winston Churchill

When at a playtesting session you should write down anything you want to keep track of. For tabletop games I keep printed copies of the rules at hand so that I can change them, or I write all notes on scrap paper and then, after the game, transfer to computer. For video games you have to write down what you may want to change, and get the software changed later.

Here are some specific factors to monitor when playtesting. They are divided into categories, but you're going to be looking at all of them, to a greater or lesser extent, whenever the game is played.

What You're Doing

> *"In all affairs it's a healthy thing now and then to hang a question mark on the things you have long taken for granted."*— Bertrand Russell

YOU CAN'T BE SATISFIED WITH "IT WORKS"

"It works" is good, and if you've not designed games before you can congratulate yourself. But "it works" won't do for real game design. It's got to work in lots of different circumstances, with lots of different players. One of my prototypes resulted in an interesting abstract game that people seemed to like playing. But I gradually noticed that whoever was in the lead halfway through the game almost always won. That's much less than ideal, so I had to extensively revise the game, even though no player had yet complained about the problem. (Yes, it was a problem; if you know, halfway, who's going to win, why play the rest of the game?)

Outliers

Playtesting follows the usual "bell curve" or "normal curve." Most playtest games will be near the middle, the fairly typical play, and some will be out on the "unlikely" ends of the curve. Consequently, one screwy result doesn't mean you have to overhaul the whole game—You may have just played one of those outliers—but on the other hand you must have rules/mechanics that take into account those wildly varying occurrences. A game that can cope with both the normal and the extraordinary occurrences is what you need.

"Feature Creep"

In any design, whether of a building or of software or of a class or of a car, there's a tendency to gradually add features, or to "enhance" (read, complicate) existing features. The general term for this is "feature creep." It is particularly bad in video games, which are nonetheless released on a strict schedule. Generally these schedules don't leave enough time for the original conception; every feature that's added makes the game more likely to be unfinished.

This is a poison that must be vigorously opposed. Playtesters will suggest additions to the game; don't use them unless you're convinced that the addition is worth more than the complication. (When you're playtesting you can try something to see how it works out, but remember that one try may not give you a good handle on it—the sample space is too small, and the result may be an outlier.)

"Chrome"

This is a term for special rules or entities that give the game a special flavor, but also complicate it. For example, having leaders in a game about history is often "chrome" (though if the main point of the game is the person, rather than the person's nation, this would not be chrome). Each bit of chrome should improve the game more than the added complexity "disimproves" the game.

"Keep It Simple"

"Feature creep" and "Chrome" are inversely related. New features, or more complex features, tend to make the game less simple. Yet once the game is in a fairly healthy state, the guide should be to simplify. As I have quoted before: "A designer knows he has achieved perfection not when there is nothing left to add, but when there is nothing left to take away."

(What about those who don't believe in "Keep It Simpler? Remember that even complex games, video or otherwise, can be reduced to a few simple things that are happening, the "essence." More people play the game because of the essence than because of the "chrome" or "features.")

"THAT'S NOT THE WAY TO PLAY"

Don't get the idea that people won't do something because it's "unsporting" (like "camping" or "turtling"). Some players will do whatever the mechanics allow. (Even if you call the camper names, if he wants to win, he'll camp and the heck with you, "you loser noob!") If you don't want people to camp or turtle, you'll need to design the game so that such strategies are unsuccessful.

During playtesting, look for ways to play that many people might not think of, but that will dominate when used. This is where it's really good to have some excellent players among your playtesters.

WHY USE CHANCE/DICE?

Chance is a perfectly reasonable part of a game, but only if there's a reason to use it. Don't use dice (or, in a computer game, randomization) "just because dice are in games"; in particular, DON'T use dice for movement of pieces unless it really makes sense.

In the real world, movement is generally pretty measurable and predictable. Combat is not nearly as predictable. So use of chance in combat makes much more sense than use of chance in movement. There are lots of ways to do it, varying greatly in how much chance is involved.

COMBAT "ONE ON ONE"

Avoid the "one on one syndrome." Let mass play its part in battle. Don't require fights to be one against one even if there are ten attackers and two defenders. The ten should be able to overwhelm the two, unless there's some terrain or other reason why the ten cannot attack the two at the same time. Having units fight one against one, serially, destroys the advantage of superior numbers, which removes a major reason to maneuver. (Yes, this was a "feature" of the *Civilization* series until version V.)

The purpose of maneuver in wargames, of having maps and boards to move on, is usually to concentrate superior force on a target. If it doesn't matter how many enemy are at the fight, why bother to maneuver? And if superior maneuver doesn't play a part in battle, will it be reduced to mere randomness?

This one-on-one stuff reminds me of the *Iliad*, where the Greek and Trojan heroes would sometimes fight each other one against one while the

rest watched. You hear of it also in China's *Romance of the Three Kingdoms*. It's quite unlikely this has happened much in the real world.

Break Old Habits

Sometimes we do things out of habit. We should be thinking all the time, doing things because it makes sense.

Old habits can really form a straightjacket in video games, because "this is the way this genre does it" can dominate thought. Just because most shooters discourage "camping" doesn't mean yours has to.

Testing my prototype board game *The Rise and Fall of Assyria*, I realized I was letting the "parent game" (*Eurasia*) govern what I did. In *Eurasia* there are two sets of pieces for different empires, and when players get a third empire their oldest is replaced by neutrals. This is a matter of piece limitations. But in *Assyria* each nation has its own set of pieces, so the limitation doesn't exist. Consequently, I could change the rules to allow a player to score for all of his old nations, not just for the two most recent. But I had to recognize that I was going by an old habit, and that wasn't until the third play of *Assyria*.

What the Players Are Doing

User Interface Convenience

This applies to all games, but especially to video games: can the players use the interface to control their game conveniently. How many video games are ruined because it's too fiddly to make the moves the player wants to make? Keep your eyes open for this kind of thing. A poor interface is sometimes the "kiss of death." Employees of the game production studio may learn to cope with the interface, but ordinary consumers will curse the frustration and quit.

There's an example of how a tabletop game interface was improved on the website for this book.

Rules/Mechanics Difficult to Grasp

What do the players find hard to grasp? In my prototype *Age of Colonization* (AoC), players had trouble grasping the difference between movement of units and placement of units. I use the same distinction in an abstract stones-and-hexes prototype, and no one has a problem, showing that context makes a big difference. Even though players "get it" after playing, it might be necessary to change something that's hard to grasp. In AoC I changed the rules extensively to recast/eliminate the distinction, and the problem disappeared.

When people are playtesting a board or card game, after 20–30 minutes,

if I walk away do they still know how to play the game? For all but the most complex games this should be true even at first play.

WHAT DO PLAYERS TEND TO FORGET?

This isn't quite the same thing as what's difficult to grasp. Some options just don't stick in people's minds. Is there anything you can do about it? Is there some play aid to help people remember? In a video game, can you show something on the screen to remind people of the option? Or should you just eliminate the option?

WHAT DO PLAYERS NOT BOTHER TO USE?

Some rules/options exist but no one uses them. If the threat of using them is not making a difference in the game, then perhaps you should eliminate the option. For example, in my hex-and-stones game *Law and Chaos* I originally allowed people to move a piece rather than (typically) place one. This movement happened rarely, as it was usually better to place another piece and increase the number on the board. So I eliminated the possibility, except as an "optional rule."

HORNS OF A DILEMMA

Are there enough plausible decisions in the play to make the players think, but not so many that "analysis paralysis" sets in? Even in a simple game, if a player can do only two of five possible actions in a turn, is there tension here or are the plays obvious? In most games, players should sometimes feel that they want to do lots of things, but the game doesn't allow them to do all of them. That is good for a competitive game, but perhaps not for a party game.

PLAYER INTERACTION

In games with more than one player, do the players have to take the actions of other players into account? Yes, some games are virtually multi-player solitaire, and some players are happy with this. But most players want to be able to affect other players with their moves. What does your target audience want?

How the Game Plays

LENGTH

Is a video game so short that players won't think they've got value for money? Is it so long that the target market will give up before getting to the end (which can be frustrating for the player)? A game is always longer to new players, of course. But if it takes too long for new players, will they play again?

Length is quite dependent on how much players enjoy what is happening in the game. The original board game *Civilization* can take 8 to 12 hours, but those who love the game don't find that time weighs upon them.

Downtime

Downtime is the time people must wait with nothing to do in the game, while someone else is taking a turn. This can be a problem even in a video game that's turn-based. A great advantage of turns is that they give people time to think. But if the game isn't encouraging thought, and players must wait too long, there's a problem. Teens and young adults especially dislike downtime, and will often lose track of the game while doing something else.

Game Balance

For a single-player "interactive puzzle" video game, are the challenges matched by the rewards? Is the game fundamentally too hard or too easy? Ultimately, is it "fair?" Even if a multi-sided game is symmetric (all players start with identical situations), there may be an advantage to playing first (or last). Chess is symmetric except for who moves first, but move-first is a huge advantage, one we've learned to live with.

Dominant Strategy

Look for any dominant strategy ("saddle point"). This is a strategy that is so good that a player who wants to win must pursue it; or a strategy so good that some will pursue it, yet that strategy renders the game less than entertaining. For example, in a Euro-style 4X space game I've designed, one player found that by getting together a sufficiently large force, along with certain technology research, he could completely dominate other players who weren't pursuing the identical strategy. I want the game to offer a variety of ways to success, so I had to change the rules fairly extensively. This is why it is important to have testers who are dynamite game players, so that they'll find these strategies during testing, rather than have someone find it after the game is published. If you're that type of player, so much the better. One reason for repeated playtesting is to that players can discover any dominant strategy. Unfortunately there have been cases where a dominant strategy came to light only after thousands of plays, at which point the game was already published!

Taking It to the Max

Can extreme behavior within the rules break the game? Sure, if someone pursues a bad strategy, they'll lose. The question is, is there some extreme strategy that results in an unfair or unenjoyable game?

ADEQUATE CONTROL

Do the players feel that they can exert a measure of control over what happens in the game? Remember, any (strategic) game is a series of challenges and actions in response to those challenges.

ANALYSIS PARALYSIS

Are there too many things to watch for or keep track of, or too many choices, so players either freeze up or give up on figuring out what is the best thing to do? There are always "deliberate" (slow) players, the question is, is everyone slow or frustrated? You can deliberately design a game to reduce the opportunities for analysis paralysis. Yet some games are inherently so complex in strategy that a clock is needed to limit how long players take to move (chess comes to mind). One of the perceived virtues of real-time video games is that anyone subject to analysis paralysis will soon fall far behind.

"DERIVATIVENESS"

Just because something is done in one game does not mean you can't do it in yours. In fact, there are few original ideas in games. But try not to make your game TOO derivative of another. E.g. there are many deduction games, but if yours has items and people and rooms and questions and is otherwise a whole lot like *Clue* (*Cluedo* in the UK), maybe that's too derivative to be commercially viable.

How the Game Works

STAGES OF PLAY AND PACING

You probably learn this in solo testing, if you do solo testing (which I strongly recommend). Are there identifiable stages in the game, especially ones where the typical run of play changes? E.g., in chess there is the early, middle, and end games. Pieces are deployed in the opening, mix it up in the midgame, and so forth. An exploration game has the expansion period followed by consolidation and then (usually) conflict. As another example, *Britannia* has historical stages, the Roman conquest, then the Anglo-Saxon conquest, then the Viking raids and settlements, and finally the struggle to be king in 1066.

REPLAYABILITY

This may appear to be less important in our "throw-away" age, but almost every excellent game is one you can enjoyably play again and again. Even in interactive puzzle games, there are ways to make the game playable

more than once. Video games tend to become obsolete, but centuries-old board and card games (chess, bridge, go, etc.) can be played repeatedly. Some games have limited replayability because knowledge of the story makes a big difference (e.g., Japanese RPGs), but these are exceptions, not the norm.

Player Interest/Enjoyment

What part(s) of the game seem to be most interesting to the players? I'm not in favor of trying to figure out "fun," because fun comes from the people who are playing more than from the game design itself. And there are many games that I wouldn't call "fun" (including my own *Britannia*) that are nonetheless interesting and even fascinating. What is interesting or enjoyable for players, and how can you provide more of that?

Scale It Down

Can you change the scale of some aspects of the game? This especially involves numbers. If a player earns 50 resource points for occupying a particular location, and the least expensive item you can purchase with those points costs 10, why not divide everything by 10 and have the numbers be 5 and 1? On the other hand, some people just *love* big numbers, provided those numbers are tracked by a computer rather than by the players. So you can make it 50,000 and 10,000, in a video game.

Is There s Way to Combine Two Functions Into One?

Sometimes you can improve play by simplifying, without significantly reducing the choices the player(s) make. Can one thing take care of two questions or combine two decisions?

For example, two of my students designed a simple, not-historically-based tabletop wargame. They collected resources (represented by plastic coins) from "mines" they occupied, then spent that money for new units and to replenish existing units. Each unit consisted of several stackable pieces. This all happened over the course of multiple turns, e.g. collecting from the mines every third turn. The two functions were "collecting resources" and "tracking unit construction."

The setup was also lengthened by handling dozens of coins. I'd already suggested reducing the numbers by simplifying costs. For example, it was gain 50 per mine, spend 200 per infantry or 300 per tank unit, 25 per replacement piece within a unit. Why not divide everything by 25 for 2, 8, 12, 1?

There is some pleasure in handling lots of coins, even if they're plastic.

Yet in a published game this function would be fulfilled by paper money, most likely, to reduce costs. And even "play money" is expensive these days. So after several playtests I finally put my foot down and said, let's do away with physical manifestations of money altogether, and let the individual stackable pieces that made up the units help keep track of money. That is, each turn a player collects from his mines (so no one has to remember it's the "third turn"), all the money is spent immediately for individual pieces, and when enough pieces are accumulated at the base, a new unit can venture forth. This also left pieces to be used to replenish damaged units in the field. The result was that no money was needed. The "collecting resource" function was combined with the "tracking unit construction." .

I asked why there was a turn delay between building a new unit, and moving it. "It represents training and so forth." OK, but in playtests new players often forgot or didn't immediately understand this. And this was a rather abstract wargame, not a realistic one. So in keeping with the idea of simplifying the entire economic cycle, I suggested letting the new unit move immediately. So three functions were combined into one, as the "three turns" tracking was eliminated.

WHO'S KEEPING TRACK?

This especially applies to tabletop games, but can come up in video games. Are the players forced to remember or keep track of things that aren't part of the enjoyment of the game? Some mechanism should make this easy, if it must be done at all. For example, in a tabletop game if something happens only every third turn, there had better be a really simple, more or less foolproof way to keep track of "every third turn." In a video game, the computer had better keep track of it and make it easy for the players to check the current state. The better solution is to find a way to change the rules so that "every third turn" isn't used. For example, can it be something where a third of it happens every turn?

Is there a way to eliminate it, or make it easier to keep track of? This is more common in tabletop games, but in video games, if the player(s) tend to forget to pay attention to something that is important, then it's "hard to keep track of" even though the computer IS keeping track of it.

In general, anything that happens only periodically (every fourth turn, say, in a turn-based game) can be a problem.

COMPONENTS AND PLAY AIDS

Do the physical parts of the game (if any) help play flow smoothly, or does something need to be changed? Is there too much record-keeping? How

can it all be simplified? Is the manual (if any) clear and concise? Are there troubleshooting tips when the game doesn't work right? For tabletop games, a list of frequently-missed or misunderstood rules is important.

Playtesting, for a game designer, is about being aware of what happens, and receptive to changes to make better things happen. It doesn't matter who thinks of the change, what matters is that a solution is found and implemented. Keep your mind in gear!

E. Is the Interface Good?

Especially in video games, the interface between the player(s) and the game is very important. While we'll hope that you have designed a good interface to begin with, where you can really tell is in watching players, and listening to their comments, as they play the game.

Interface questions are included in the previous section, but they need to be reinforced here. If the interface is good, players won't think about how they're manipulating the game as they play, they'll be able to do it "naturally." You don't want players to notice the interface any more than readers of a novel notice how the author has constructed his story, or notice the mechanical aspects of controlling an automobile.

This often means, use the standard interface methods devised for games similar to yours, simply because people are used to those methods. While game designers are often too reluctant to try anything new, this is one aspect of games where new can be bad, simply because it's unfamiliar.

Jakob Nielsen, the guru of Web usability, defines five quality components of usability, which apply to games just as much as to the World Wide Web:

- Learnability — how easy is it to use the first time?
- Efficiency — how quickly can they do what they need to do?
- Memorability — how easy is it to remember what to do?
- Errors — how many errors, of what severity, do users make?
- Satisfaction — how pleasant is it to use?

Consider these points as you watch people play your game.

When Nielsen tests for Web usability, he often asks people to talk about what they're doing as they do it. In games for more than one player I don't do that, as the player might then be giving information to an opponent. It can work for single-player games.

F. Simplifying a Game

Almost always, when I talk with groups of people about game design, I quote Antoine de Saint-Exupéry: "A designer knows he has achieved perfection not when there is nothing left to add, but when there is nothing left to take away."

Recently as I answered questions after a session, someone told me about an RPG he'd designed and tested, that all the testers said was too complex. "How do I simplify it?" he said.

An assumption here is that the testers, by and large, aren't able to say exactly what must be simplified, they just know that currently there's too much.

The following steps are listed in an order beginning with what you can do on your own, to what you can do in conjunction with your playtesters.

First, I said, try to write down the "essence" of the game in a few sentences. This can take some doing, believe me. Ideally you've done it already, but if you had, perhaps you wouldn't be having the too-much-complexity problem to begin with.

There are different ways to characterize the essence of a game, sometimes structurally, sometimes according to what the player does, sometimes in another way or a combination.

Example of Essence (*Britannia*): "On an anvil of blood and terror they forged the destiny of an island!" In this epic wargame four players each control several nations playing at different times with different objectives throughout the Dark Ages history of Great Britain. Romans, Britons and Gaels, Anglo-Saxons, Vikings, Normans — they all play a part in the history of Britain. Combat is resolved with dice. This is a strategic game of achieving objectives, not of conquest, though many invaders conquer much of Britain at different times. 4 to 5 hours for experienced players. "Invade Britain. Rewrite history. Rule."

Then think about the various aspects of the game in relation to that essence. If something doesn't contribute to the essence, can it be removed? Surely, at the least, it can be simplified, abstracted, or combined with something else. Every game (tabletop or video), at bottom, is fairly simple, and your job is to retain its simple heart and remove what doesn't contribute enough to that heart.

Second, make a list of the major features or elements of the game, perhaps 10 to 20 of them. Consider again how they contribute to the essence, and how you can remove or simplify or combine as appropriate.

After you have (in your mind, at this point) removed or simplified what you confidently can, give the list of the (now remaining) features to your playtesters and ask them to decide which could be removed entirely, and which should be simplified. (This may not help much if testers disagree about whether the game is too complex.) Don't ask people to rank each feature in comparison to the others, as that can be quite hard. It's much easier for people to divide a list of choices or items into four parts, in this case from most important down to least important. You might even want to write the features on separate 3 by 5 index cards to make it easy for the playtester to sort them.

Whether you ask playtesters individually or in groups depends on what you think they'll be most comfortable with.

Then consider how you can get rid of the items in the bottom quarter, or even the bottom half if the game is much too complex.

Then playtest the result, of course.

There is a school of thought opposed to "simplification." Designers following this school will add complexity to a game rather than simplify. Usually the game will be an interactive puzzle, or multi-player solitaire, so that most of what the player(s) do is to contend with the system, not with other players. Additional complexity makes the system harder to "solve." This is a common occurrence in video games.

G. What to Do with the Results: Change, Change, Change—Love It or Fail

> *"The most important thing to remember is this: To be ready at any moment to give up what you are for what you might become."*—W.E.B. Du Bois

You must be willing to change your game again and again and again in a search for, not perfection, but something close to it.

Sooner or later the Law of Diminishing Marginal Returns comes into play: the amount of time it will take to identify and successfully implement an improvement will not be worth the value of the improvement.

Furthermore, for many commercial video games there is a schedule, a schedule that often cannot be changed. Then we have a variation of the Law of Diminishing Returns. You have to gauge how much time it will take to make an improvement, against the time left before you must "complete" the game. If it will take two days, and you have more important "fixes" that will take two days, then you may have to leave it as is. This also depends on how critical the problem is, of course.

Possibly the most important skill set of a game designer is the ability to analyze play of prototypes, identify problems, and provide practical solutions to anything that undermines the quality of the game.

Analyze

This involves self-criticism: you must learn to recognize faults even when you are the one responsible for them. The goal is not to "do nothing wrong," it's to "do a lot of things right." If you're only interested in doing nothing wrong, you'll probably end up with bland pablum, an unexciting and uninteresting game. You're better off working to make things go right, and if a few go wrong, that's worth all the right that occurs.

Identify

A game can appear to work pretty well, and still have flaws. The designer must identify those flaws even if no one else has recognized them! Because once the game gets out to the public, the collective minds of many players *will* identify those flaws. "Nobody is as smart as everybody."

I have had games that had not changed significantly in months of play, which I felt were "done," then I recognized I had to make a significant change.

Solve Problems

Everyone can help here, and playtesters who can identify and solve problems are worth treasuring. In video game terms, increasingly everyone on the production team is expected to try to identify problems and propose solutions. This is yet another example of the maxim, "two heads are better than one." It's also a reflection of the "1-10-100 rule" fundamental to participative management schemes such as TQM (Total Quality Management). In any case, the game designer(s) must ultimately be responsible for deciding what solution to pursue. The game designer must be "in charge" yet still cooperate with the rest of the team and keep them feeling that they're contributing to the game.

What to Do with the Feedback

"One of the early lessons to learn in writing is that feedback is good, but must be held at arm's length."— Brandon Sanderson (fantasy novelist who completed Robert Jordan's "Wheel of Time" series)

> "*Most of the letters we'd get were almost a standard form. They were like, 'Dear Sid. I liked your game* Civilization*. Here are the five things I would change to make it a much better game.'*"—Sid Meier about responses to the original *Civilization* video game.

Game design, when taken to completion, is highly interactive. Playtesting sets good games apart from bad, and playtesting is (or should be) interactive.

Brandon Sanderson's admonition is included here because it applies to some extent to game playtesting. Novel authorship is very personal, game design is much more a group effort, even if there is just one designer and many playtesters, certainly when there is a large team creating a video game. You must listen to playtesters, but you have to keep in mind that playtesters each have their own likes and dislikes, and the game designer is the person who must keep in mind the original "vision" of the game and follow it to a conclusion.

On the other hand, game designers must practice not being ego-involved. Playtesting is an invitation to say what is wrong with a game as well as what is right. Comments are about the game, not about you. Playtesting is an invitation to say your game is awful, not that you are awful.

I am very low-key in beta playtesting, preferring to watch reactions of people rather than try to solicit opinions, in part because people often won't say negative things even when asked for feedback. I also try not to play with/against others, as (1) the designer playing in a game tends to skew results and (2) when I play, I do a worse job of playing, and a worse job of evaluating the playtesting, than if I did either alone. As I'm that strange sort of person who enjoys watching games as much as playing (a combination of people-watching and "what happens next?"), I don't need to play.

Playtesters tend to be polite. It's hard to find out what they really think. I am skeptical that a feedback questionnaire will make a difference, though many designers use them. Rather, I sometimes try the "Six Hats" method (devised by Edward de Bono) when playtesting, though I rarely use all six. For example, I'll ask players successively to put on their black hat (the judge), then the red hat (intuition and emotion) to see how they assess a game, and then the yellow hat (the positive side of assessing an idea) to see what they like about a game. With local playtesters I sometimes ask them to think of specific ways to make the game better (the green hat). Use Wikipedia or google "de Bono" or "Six Hats" for more information.

Keep in mind also that people tend to like games they win. When the losers like the game you can be more certain of the value of the feedback!

You don't need to "defend" your game to playtesters. It's your game, not

theirs. They may not like what you want, and they can explain why, but in the end you have to decide what's best.

When it comes down to it, should a designer in playtest stages do what he wants with the mechanics of play, or what the playtesters recommend?

I believe I'm very receptive to what players suggest (or what I see that they would prefer, as they play). If people take the time to play my game, I ought to be receptive, else why bother? Playtesters may be more likely to offer suggestions if they know the designer is receptive to them. They're certainly pleased when they play again and see that I've changed the game because of their suggestion.

A playtester's comment may cause a change in a game, but not quite (or not nearly) the change they thought of. Playtesters point out potential problems, designers are responsible for solutions (though solutions, too, may originate with a playtester). Thank playtesters for suggestions, but remember that the person who best knows the whole game perspective is you.

This is where the "scientific" part of game design comes to the fore. The scientific method involves controlled experimentation toward answering a question, observation of results, new hypotheses, and further experimentation. Wikipedia's description of the scientific method (accessed 14 April 09) can be taken as a guide to what you're doing:

> To be termed scientific, a method of inquiry must be based on gathering observable, empirical and measurable evidence subject to specific principles of reasoning. A scientific method consists of the collection of data through observation and experimentation, and the formulation and testing of hypotheses.

Your data is collected by observing playtesters, or by getting their accounts in writing or orally. Your hypotheses involve ways to make the game work better. You test your changes through more playtesting and see what happens.

Yet scientific method will take you only so far. Experience helps, knowledge of games helps, background knowledge (e.g., of history and physics) helps, analysis and creativity help.

What is obvious to experienced designers is not necessarily obvious to the inexperienced. Unfortunately, it is easy to find "wannabe" designers who have an idea and think they have a "golden egg" that will be a blockbuster game. One reason why this attitude exists is that they don't listen to playtesters, or that their only playtesters are family members who are too nice to say that the game needs changes.

On the other hand, especially in the video game world, many players think they know "the secret," and are willing to expound at length (as shown

by Sid Meier's quote above). There are all kinds of "fanboys" (and girls) who will accost the designer of a well-known, successful video game and tell the designer how it "ought" to have been designed. At some point, no matter how good your game is, you'll encounter such folks. The trick is to find out what the really good game players, and the ones who are willing to study and think about a game, have to say.

There are elements in a game where there are two choices, and one will work as well as the other. Which is used is pretty much arbitrary, or so it seems to the designer. In those cases, it really is wise to choose as the playtesters choose, if only because they'll see that you're listening.

Finally: "Don't Panic." When you're playtesting a game, don't let an odd result in one game bother you too much. If it looks likely to happen again and again, once people know about whatever happened, then you need to fix it. But "whatever happened" may be just an outlier, something very unlikely to happen.

On the other hand, some outliers must be sorted out. Mike Gray, who scouts new games for Hasbro (he was formerly their chief designer), tells a story of a prototype game he presented to Hasbro's game design group for consideration. A stage of the game didn't begin until a 50 percent chance triggered it. As he showed the game, it took 13 times for that chance to come through. This distorted the game, and ruined any chance that it would be considered further. The designer should have recognized the small but real possibility, and included some mechanism that would definitely get the game to the next stage.

H. When/How Do You Know It's Worth Pursuing Further?

Is There "Something in It?"

> "*I have a tendency to hold onto my first version for too long, hoping to perfect it before showing it to people. Never works. The trick is to let go of your pride and realize that first drafts are first drafts. Nobody is expecting a final game.*"—Rob Daviau

At some point during playtesting of a game, the designer must decide if "there's something in it": if the game is really good enough that people might play it, like it, and would buy the finished version of it. There are really two times when this should happen, once during solo playtests (alpha testing), the second time during playtesting by others (beta testing). The "something

in it" point in solo playtesting is an indicator that it's about ready for others to play. The "something in it" point in beta testing comes when observing people playing the game and their reactions during and after playing.

Usually I need to tweak a game quite a bit from its state at the end of solo play, before I can reach the "something in it" stage of beta testing. Sometimes there doesn't seem to be anything in it during beta testing, and I set it aside for further thought. Sometimes I realize, from solo playing, that there isn't "something in it," at least not yet, so I set it aside at that point.

I strongly suspect that novice designers rarely understand these stages. Their egos become involved, and they assume that because they took the time to make the game, and it's their idea, there must be something in it.

So how do you recognize when there's "something in" a game? That's hard to say, unfortunately. Just as Rome wasn't built in a day, you aren't going to figure out in a few weeks whether your game is worthwhile. Surveys or written feedback won't necessarily reveal it. In alpha testing, the "something in it" stage is a gradual realization, coming from observing my own thought processes as I play. My games, almost without exception, are strategy games. When I "see" myself thinking hard about the strategies, and liking the options, then I may think there's something in it.

In my case, in beta testing when spontaneously (without any prompting) people say "I'd buy this game," I know I've got something. However, this is rare, and I don't remember anyone ever saying that about *Britannia*, or *Dragon Rage*, or *Valley of the Four Winds*, but they have all been quite popular. Perhaps better, if people want to play the game again, in this day of the "cult of the new" when hardly anyone plays a game twice in the same session, there may be "something in it."

If you playtest with the same group of people over a long period, and they ask to go back and play again some of the games they played a while ago, maybe there's something in those games.

Sometimes, I'll ask experienced playtesters I know well if there's "something in it" after a game.

Once there's "something in it" the second time, during playtesting by others, are you done? *By no means.* There is still much polishing to do to make the potentially marketable game a GOOD game.

Where things become really difficult is that when you're working for a studio or publisher, required to make a particular game, you're unlikely to be able to decide there's not something in it. You'll have to try to make it be good, without the time to start over. That's why so many video games of the past have been duds, the lack of time available to do the game right. It's why

Epic, Valve, and Blizzard games are almost always very good, because they are so successful financially that they don't have to adhere to a strict schedule.

Fortunately, when you're learning how to design games, you should be able to take the time needed, and if necessary you can "cancel" a game and start again.

I. When Is It "Done"?

> *"When I am working on a problem I never think about beauty. I only think about how to solve the problem. But when I have finished, if the solution is not beautiful, I know it is wrong."*— Buckminster Fuller

You'll never really finish, but sooner or later you'll have to stop.

Ideally, you'd like everyone who might play a game to playtest it—"no one is as smart as everyone"—but for many reasons this isn't practical or sensible.

The easy answer for big-time video games is "it's done when it's scheduled to be released." But we've all encountered published games that clearly needed more time, more polish.

How much playtesting is enough? A game is never finished, that is, there's always some way to improve it. But at some time the Law of Diminishing Marginal Returns sets in. The improvement that can be made by another playtest or ten isn't worth the time and effort involved. Then it's playtested enough ... for now.

You know to stop when the game is played again and again and nothing seems to need changing. If it's a tabletop game, then you keep finding that you change nothing in the rules, nothing in the components, nothing in the board or cards or what-have-you. If it's a video game, you make no changes to the mechanics, to the programming or the art or other components such as sound. I call this "getting a game to settle." Yet the first time you think, "I might be done," you almost certainly aren't.

You've tested and modified your game for "ages," and finally it seems to have settled. That's the initial incline which then becomes a level "plateau." If this "plateau" isn't high enough (good enough), put the game aside for a year or two and come back to it with a fresh mind. If you think it is good enough, soon after, or six months later, or when a publisher tries the game, "something happens," and you find a way to significantly improve the game, or find a flaw that must be fixed. This requires some more testing, resulting in a new incline until you get to a new plateau. This may happen several

times until the game is actually published — and even then, you may change it further afterward, say in a second edition. (See Figure 11— You're Never Really Done on this book's website for a visual illustration of this sequence.)

The video game *Gears of War 2* was playtested for something like 40,000 hours! This is extraordinary even for a video game. I very much doubt that any tabletop game has ever been playtested so much before initial publication, though many later editions benefit from hundreds of thousands or even millions of hours of play. Typically a tabletop game should be playtested many dozens of times.

Even after a game is published, it can be improved. That's one reason why patches are issued for video games: sometimes the patch fixes a bug, but sometimes it subtly alters the way the game is played, the mechanics themselves. Expansions may do the same for tabletop games, or "living rules" (the rules are posted online and changed as needed), or a second edition. While the second edition of a board game is sometimes worse than the original, that's an error of the people who do the second edition. If the original designer does the second edition, as I did with *Britannia*, he has the opportunity to benefit from the experience of thousands of players, to improve the game. And a publisher may make a much easier-to-use physical package, as with the second edition of my game *Dragon Rage*.

Finally, keep in mind that a publisher may wish to make changes in your "finished" game. It's not hard to find game designers who can tell tales of their games "ruined" by the requirements (or unilateral changes) of a publisher. When I revised *Britannia*, in part I was fixing many details that had been fouled up by previous publishers, partly through sheer misunderstanding. On the other hand, a publisher took a small part of a complex game that was submitted to them and turned it into *Apples to Apples*, which has sold millions of copies.

J. Playtesting Questionnaires

Some designers use formal questionnaires during playtesting, or forms on which to comment. I prefer to watch and listen, and to write my comments and notes to myself either on paper (the rules, if a tabletop game) or type them on a small computer. I routinely track who was playing, date, the time taken to play, what variation/version of the game was being played, and any notable occurrences. Some designers have paper forms they use to track information about the test, others do not. The important thing is to get this infor-

mation onto a computer and carefully back it up (including off-site backup). Paper questionnaires and forms can be lost all too easily.

For blind testing, forms may help the player(s) record their impressions to pass them on to you. Unfortunately, questionnaires and forms can put people off. Ideally, you should speak with the blind testers after they play, because talking is more information-rich than writing, but if they've forgotten some of their impressions and ideas by then, you've lost vital information.

Here is a list of some of the questions I've seen on questionnaires. Some are yes-no questions, some require a measured response, some ask for significant thought/input from the playtester. You have to judge what is suitable for the people who are playtesting your game.

- What examples should be added to help clarify the rules?
- What tutorials should be added to help you learn to play?
- What games do you especially like? [Don't ask for favorite games, as video gamers, especially, often have difficulty naming favorite games.]
- Did you like it? If so, how do you compare this with other games you like
- What game does this remind you of, if any?
- How much chance do you like in games? How does this game compare?
- What are your favorite types of games?
- What did you most like about the game?
- What did you least like about the game?
- (For blind testers) How often or how long did you play the game?
- If you could do one thing to improve the game, what would that be?
- If you could take one thing out of the game, what would that be?

Practice

Make a prototype of a game you've thought of, if you haven't already, and play it. Several times. Be sure to write notes about how it goes and how you can improve the game. There is no substitute for testing.

7

Designing Levels (Stages, Scenarios) for Video (and Tabletop) Games

Entire books have been written about level design, though much of the material in these books describes how to manipulate a specific level editor such as *Unreal III*.

A. What Are You Doing When You Make a Level?

While the standard name for our topic in this chapter is "levels," they could just as well be called missions, adventures, scenarios, stages, or other names that indicate an episodic experience of the game. They're called levels because that's what they were called in *Dungeons & Dragons* (*D&D*), and video games with episodic content owe a great deal to *Dungeons & Dragons*.

There's confusion among beginners about what level designers do. The first thing to say, of course, is "it depends"—depends on what the company expects the level designer to do, and what is "farmed out" to someone else. It's clearer in the case of games where a beginning designer is doing it all himself.

Lots of different kinds of video games have "levels"—RPGs, platformers, action, adventure, shooters, RTS campaigns, puzzlers, and more. In some games the levels are where quests are acted out, and a section below lists most categories of quests.

Fundamentally, level design is a limited, concentrated form of game design. The core mechanics of the game are already determined. The level designer is using them to create an episode that will have good gameplay, that will entertain in various ways. Gameplay involves challenges and actions to meet those challenges. This involves goals, ways to achieve the goals, paths

(such as corridors and rooms or mountain passes), appearances, and behavior of NPCs (non-player controlled characters) and opposition (sometimes involving scripts to do better than the more-generalized game AI/computerized opponent can do on its own).

In games where levels are used, it's in the levels where the game succeeds or fails.

In *Dungeons & Dragons* the Dungeon Master (DM) starts with the core mechanics of *Dungeons & Dragons* and fleshes out adventures. The adventure, analogous to a video game level, usually involves a goal of some kind, if only to "wipe out the badguys." The DM may have particular methods in mind whereby the players can achieve the goal, or he may simply set up a situation and trust the players to creatively find ways to achieve the goal. In level design, playtesting will show whether creativity can prevail; in home-made *Dungeons & Dragons* adventures there is no playtesting, so the DM must be more careful. But *Dungeons & Dragons* adventures that are commercially published are certainly playtested.

A published *Dungeons & Dragons* adventure includes all—well, most—of the information a DM needs to run the adventure. The video game level includes everything needed for the player(s) to play the adventure—er, level.

So the video game level designer must specify and perhaps place (though probably not make) the graphics, map out all the paths and alternatives the player(s) can pursue, place the opposition (monsters or otherwise), script the conversations, specify the goal and how player(s) find out what that goal is, specify exceptions to the normal core mechanics, and all the other things that are required for the "adventure" episode.

Level design is *not* art, *not* programming, *not* sound. Though all those contribute to a successful level, they are not the creators/determinators of success of a "level." Once again, level design is a limited form of game design, and that's why it's included in this book.

The rules/core mechanics of the overall game are already determined, but what you do with the rules is the level design. You add the terrain, architecture, environment limitations, *and* opposition. In other words, the obstacles, the challenges, for the specific instance of playing the game, are what you devise. Just as in a game as a whole, the question is "what will the player(s) *do*"? They're most likely not there to admire your pretty layout and architecture, they want to *do* something.

Typically there is an increasing difficulty with each level, just as in an old-style *Dungeons & Dragons* dungeon. Recalling the idea of "The Flow," the purpose is to keep increasing the challenge as the player(s) are more able to meet challenges.

Levels originate in much the same manner as games as a whole. The origin can be a trap, an image, a building, a vehicle, a natural or semi-natural place. There can be constraints, e.g., a level without gravity in a game where gravity is the norm, or a level full of fog.

In general, for video games the level designer writes a level design document describing everything about the level. This helps the artists and programmers make it. As with any game, you'll add and subtract things as you go along, especially after people start to play the level.

In some cases, level editor software exists in the game (e.g., in *Unreal Tournament III* or *Neverwinter Nights*) that enables a designer to create much of the visuals of the level as well. Otherwise, the designer will use something like Google Sketchup to create the bare architecture/layout of the level. (This is the equivalent of drawing the dungeon maps in tabletop *Dungeons & Dragons*.)

The level design document must be clear and comprehensive, much as a game design document. Identify it (title page and so forth), proofread it, keep track of versions, provide an overview and a list of major features, characters, monsters. Once again, if you are the only person creating the level then you don't need to write a level design document though you do need to write down the details of what you intend to do.

Several books about video game level design are available. The best free, brief advice about the details of designing levels that I know of is referenced in "Further reading" toward the end of this chapter.

Many players prefer that episodes "make sense," both in the situation and the player motivation; but that doesn't stop people from populating "dungeons" with lots of creatures that have no visible means of acquiring food or getting rid of wastes. This is something like the entire fast-action shooter genre, where people run around shooting in ways no real person would (not for long, anyway), but it's accepted nonetheless.

On the other hand there are lots of games where the whole business doesn't make sense but people expect that and so are happy with the result.

B. The Process of Creating a Level

Creating a level is much like creating a game on a smaller scale, but some priorities are different, and the parent game imposes an additional set of constraints. Your level must fit into and be compatible with the parent game, so the mechanics of play are already set.

You should know how the level fits into the other levels that are part of

the game. Don't make the first level first. Create other levels skipping the intermediate ones, beginning with the second, and when you feel you understand the game very well, go back and make the first level. The cliche "you only have one chance to make a good impression" sometimes applies, and the first level makes your impression with the player.

However, keep in mind that in many video games, the first level is a tutorial. While the impression it makes is important, the first "real" level, actually the second in order, is the make-or-break point. If the first is a tutorial, make the odd-numbered levels beginning with the third, then come back to #1 and #2.

If your game is a "sandbox" where players have some freedom in the order in which they play levels, try to make sure there's one they must play at the start, and make that your best effort.

When you have some idea of how the level fits into the overall scheme, decide if the level will be strategic or tactical (which usually follows from the overall game, but not always).

There are many definitions of strategic and tactical; for this purpose consider that a tactical level involves action of individuals/monsters aimed toward winning a battle, while strategic involves larger units and actions aimed toward winning a war rather than winning a battle. Tactical might involve a building or complex of buildings, strategic involves a large city or even a nation. The presentation below divides considerations into tactical and strategic.

Next select the overall origins (reasons to exist) of the adventure and what points to consider (we have a list of the possibilities).

Next you'll consider what is the immediate situation, what are the characters, what is the plot or context. Not every level has a story that the players must follow, but if it does you'll need to think about the story of the level.

There are more specific questions to answer in a level, compared with designing an entire game, as follows.

- What obstacles/opposition will be in the level?
- What skills/capabilities will be required of the player's forces if there is an individual player character or small force.
- What loot will be in the level, or more broadly, what will the rewards of the level be (which is related to the story, sometimes)?
- What will the layout/terrain be like?
- What will the mood and environment be (the latter is closely related to terrain)?

In the next sections will consider many of these questions in turn.

C. Points to Consider When Originating a Level

The origination of a level is much like the origination of a game, so you might want to go back to Chapter 2 to read about that. As with games as a whole, if you work at getting ideas for levels you'll get a lot more than if you just wait for ideas to come to you.

Tactical Level Checklist

ORIGINS (A HOOK, A GIMMICK)

- A building
- A trap
- A location (e.g., volcano)
- Weapons
- An environment (no gravity, underwater)
- "Experience" level of the character(s) (can they fly? how many times can they be hit?)
- A particular bit of loot
- Connected vs. standalone (are there predecessors/successors?)

WHAT TO CONSIDER

- The objective (narrative constraints)
  1. Exploring
  2. Getting to a particular place
  3. Acquiring a particular thing
  4. Killing certain things
  5. Delivering something somewhere
  6. Rescuing someone
  7. Escorting someone
- Time constraints
- The map
- Structures
- Natural obstacles/terrain
- "Living" opposition
  1. Unintelligent
  2. Animal
  3. Intelligent
- Distances
- Special attack or defense capability
- Critical locations (chokepoints)
- Channelization (by obstacles, by natural features, by opposition)

- Diplomatic constraints
- Opposition cooperation with each other
- Available information
- Scenario ending

D. What Is the Situation, What Are the Characters, What Is the Plot or Context?

In general a level designer has two paths to follow. In one the designer sets up a situation and lets the players work out how to deal with it. At the other extreme the designer has a specific plot/story in mind and wants (to make) the players follow it.

The overall scheme of the progression of the levels may determine what you're doing in the specific level. Some video games are very story driven (linear), some are not (sandbox). Sometimes a game is mainly intended to be played online, person against person or group against group. In that case levels included in the game constitute a campaign that gives a single player something to do and also introduces him or her to all the tactical and strategic possibilities of the game.

You can't really proceed until you know what you're going to do. You can make a decision and if that turns out to be wrong then you can change what you're doing. Once again the nature of the game as a whole may help determine this for you.

E. What Kinds of Obstacles Might Be in a Level?

- Enemies
    1. Monsters ("unnatural")
    2. Animals ("natural")
    3. People
        a. Ordinary (townspeople)
        b. Special/superior/like the players, supranormal
        c. Aliens (SF)
    4. Plants
        a. as barriers
        b. as dangers
- Traps (Traps involve a trigger, and then a result. May be magical, mechanical, technological. How easy is it to detect? How can it be disarmed?)

1. Trap-doors
2. Lures/ambushes
3. Things that harm you directly ("kill")
    a. Lasers
    b. Spikes
    c. "Guillotine"
    d. Monofilaments
    e. Rising water
    f. Rolling/falling boulders
4. Things that leave you stranded ("restrain")
    a. Pits
5. Things that fool you
    a. Illusions
    b. Hidden/concealed/secret
6. Triggers
    a. Pressure plate (mechanical)
    b. Magical triggers
    c. Trip wires
    d. "Sensors" (movement) (heat) (CO2)
    e. Levers

- Puzzles
    1. One-way door
    2. Physical puzzles that can be solved
        a. Put something in the right place (jigsaw)
        b. "Get yourself out of the room" (MacGyver-style puzzles)
        c. Sliding things
        d. Combination locks
        e. Twist something some way
    3. Time sensitive (certain time allowed to accomplish, or can only be done at a certain time of day or year)
    4. Word puzzles
        a. Audible (LOTR Moria)
        b. Riddle
        c. Puns
    5. Narrative puzzles
    6. Rescue something/prevent it from being harmed (often time limit)
    7. Morality puzzles
- "Terrain"— Tactical
    1. That which cannot be overcome (without special items)
        a. Walls and other blockages that cannot be overcome
        b. Places with no oxygen (outer space)
        c. Places of no gravity
    2. That which can be overcome/bypassed

a. Fissure/chasm that you have to get across ("gaps")
b. Cliffs to be overpassed
c. Water
d. Quicksand
e. Caves
f. Hills
g. Darkness
h. Fog
i. Rain
j. Lightning
k. Dangerous plants (thorns, man-eaters)

- "Terrain"—Strategic (logistics and ability to move)
  1. Deserts
  2. Cities
  3. Deep dark forest/jungle
  4. Distance
  5. Oceans, lakes, rivers

F. Kinds of Quests

Quests provide direction and meaning for the players of the game within the context of the game. The quests we're talking about here are activities undertaken by a player to achieve a goal against some opposition. We are not trying to list all the possibilities for romantic/literary narrative quests such as the Quest for the Golden Fleece. While the game as a whole may be about such a romantic/narrative quest, the individual levels will be much more mundane.

In general, many quests involve causing a change in someone else's circumstances—from moving them from one place to another, to killing them, to saving them, to delivering their baby! Many others involve causing a change to some object or place, for example burning down a building, or retrieving an item.

- *Kill*
  1. monsters
  2. boss
  3. non-monster creatures
- *Destroy (or build/repair)*
  1. a machine
  2. a building or even a city
  3. a natural location

- *Discover*
    1. Explore and make a map
    2. Acquire certain information
- Race (get somewhere by a certain time)
- Manufacture/craft/hybridize
- Fetch something (includes rescuing someone)
- Delivery ("FedEx")
    1. Escort someone
- Bodyguard/guard a place/thing
- *Improve yourself*
    1. Leveling up
    2. Improve your skill in some area
- Complete a story
- Relationship/team building quest

FURTHER READING

At least one book has been written specifically about quests: *Quests: Design, Theory, and History in Games and Narratives* by Jeff Howard.

G. "Bosses"

Video game players expect that a level will reach a climax in a battle with a "boss." This is not necessary, but it does tend to happen. The boss is usually some kind of monster. "The Law of Bosses" states that a boss is the only example of that kind of monster in the world. In other words, it should be unique in some way, not just a higher powered version of a typical monster.

Here are a few guidelines for boss battles. While the boss should not be merely a powered up version of an ordinary monster or previous boss, it should not be so different that nothing the player has learned helps him in the encounter. If the boss is invincible except for one thing then the encounter is a puzzle not a battle. There should be more than one way to beat a boss. Because bosses are unique, battles with them should not be repetitious.

If there is a key to a boss's vulnerability it should make sense. Once again, if it's a *non sequitur* (does not follow from anything else) then it is a puzzle (and a poor one). Bosses should not heal themselves, and once dead they should stay dead except in very interesting circumstances.

The rules/mechanics of the game should not change during a boss battle.

The most general rule here is "be fair." Bosses should be tough without pulling a fast one on the players.

H. Some Level Design Do's and Don'ts

First, recognize that levels cannot always be intense affairs. Highs feel much higher when there are some lows for comparison. In the case of levels these low points would be times at which there is no immediate evident danger. If you try to make your level 100 percent constant action and danger you may end up boring the player! (This advice applies to games as a whole, too.)

Mazes are likely to feel, and be, boring and stupid. Use them sparingly.

Time pressure is often a way to make something more difficult. But the extreme "you must figure this out in 60 seconds or you die" should generally be avoided.

Darkness, fog, and other limits on movement and sight should be used sparingly. People playing games that use action levels want to *do* something, not grope around.

Avoid operative links between things that are widely separated. For example, a lever in a room should not open something half a mile away. Typically such a lever will be quite near the device it governs. Don't set up a situation where a player will be unable to progress because he didn't pick up some item, or learn some bit of information, several hours ago.

Don't use up all of your new/unusual features in the first few levels. Spread them out across the lot. Try not to overuse a particular game feature in any level.

If a level is wildly atypical, make it optional, not mandatory. Presumably, the players like the "typical" level, and might not like something very different.

Do not set the player up to fail. Players want to enjoy the game. The game is not there to let you enjoy gloating over the failure of the players! In particular, don't put hazards into a level that can only be discovered by dying!

A bad tutorial can ruin the player's experience before he gets going. If the player will experience the levels in a particular order (a linear game), you can use earlier ones to help build up suspense in later ones.

Let the player have some control, don't make the mission into a movie.

Once again, players want to *do* something. Don't use fancy movement requirements (e.g. character must stand exactly "here"). That's almost as bad as mazes.

Reasons for Existence

- Why is this happening? What are the players motivations? Don't "make" them do it, give them a reason to do it.
- Have logical outcomes.
- Traps should have a reason for existing. Randomly placed traps feel random.

In video games the "reasonable" rule is sometimes ignored, with useful items just lying around to be picked up. This is one of those video game conventions, everyone accepts it without thinking about it.

Course of Events

- Give information out a little at a time, not all at once.
- Avoid Deus Ex Machina ("God out of the machine," something that happens out of the blue to save the players).
- Avoid death-by-exploration. There should be a reasonable way for players to avoid death, they shouldn't have to die to know there's a danger.
- Don't guide/walk-with/direct the player
- Let players do things, don't show them things (as in a cutscene, e.g.)—let them be an active participant. Telling them is even worse than showing them.
- When players gain a new skill or tool, don't require its use in deadly circumstances; let them learn to use it in not-particularly-threatening situations.

Impressions (the "Aesthetic" Part of MDA)

- Let the player feel like a hero (or a bad-ass). Don't treat him like a slave or minion. Don't have some NPC (non-player character) save the day, that's the player's job.
- Offer something rather than withhold something. Provide opportunities.
- Don't let the player feel like a delivery boy.
- Trust the player, don't railroad him. Give him a chance to see what's coming, and don't force him from one thing to another.
- When you give a player freedom to choose, don't penalize him by closing off all possibilities for the choice not taken right now.
- Don't take (apparent) control away from the players.

- Don't give players a choice if it doesn't matter in the end.
- Let players feel like they earned their rewards.
- Player patrols are boring.
- Once you begin to make the player(s) fearful, it must be continually reinforced, or it will dissipate.
- If players don't spend enough time with NPCs, they won't care what happens to the NPC no matter what you try to do to motivate them.

And most of all, avoid "grinding," doing the same (fairly easy) thing over and over to achieve some benefit.

I. Document Editing Advice

Here's brief advice about how to be sure your level (mission) design documents are up to professional standard, if someone else is doing the programming and art. (Much of this advice applies to game design documents as well.)

The Process

- Don't expect everything to come to you at once. Leave room for additions (in maps, in the course of events). "To be determined" is OK in early drafts.
- As with games in general, don't worry about prettiness. The environment artists will provide that.
- Give missions names, not numbers. Give events names as well. When numbering locations on the map, leave extra numbers between each so that you can add more later.
- Forget what you may think is a cool idea if it requires special code or art—it's unlikely to be worth it the time and expense.
- Consider all the possible exceptions. Players rarely do what you expect them to do.
- When you put a number on the map, state what's there, not what you hope will happen there.
- Assume the worst case scenario. And provide for it.
- Players are there to do things, not to look at pretty environments.
- Provide reference images (photos, drawings if you're an artist) to show the artists what your level ought to look like. But don't be disappointed if they think of something cooler looking—it's their job.

Due Diligence

- Proofread your document. Be sure the spelling and grammar are standard.
- Include information about the origin of the document: date, copyright, confidentiality.
- Use indents, bullets, and so forth to help differentiate one part from another.
- Write in active, not passive, voice.
- Be clear when assigning quests — highlight in some way.
- Remember that the document may be printed, and format accordingly.
- Avoid pronouns, use titles/names for characters, NPCs, monsters

Make Yourself Clear

- Provide an overview. Where does the level fit in the game, where do the players come from and where are they going?
- Include a list of major features, NPCs, items, and events, perhaps even an "executive summary."
- Be specific.
- When you refer to something that occurred earlier in your plan, provide a context, not merely a reference ("if the player has killed the guards at #19" rather than "if #19 achieved")

FURTHER READING

Brenda Brathwaite's blog contains lots of excellent level creation advice, the best I have seen online, e.g.

http://bbrathwaite.wordpress.com/?s=level+docs
http://bbrathwaite.wordpress.com/2009/04/26/rpg-level-design-or-musings-on-5-and-expensive-graph-paper/
http://bbrathwaite.wordpress.com/2010/09/05/tabletop-rpgs-and-level-editors/

J. Brief Examples of Level Design Documents

Level design documents as a whole are too long to include in this book. Here are some brief examples of some parts of such documents.

Fantasy Game Level Overview

This is a "situation" level rather than a "story" level. The players confront an obstacle and must overcome it.

This is a straightforward combat situation, the players must slaughter the monsters in order to make the "world" safe.

This is the lair of an unusual insect-like monster, the "phraint" (part of *Dungeons & Dragons*'s large pantheon of monsters). Phraints roam the plains. They resemble man-size praying mantises. They throw frisbee-like boomerang weapons with razor-sharp edges (often of obsidian). They can travel by prodigious leaps.

Player's Focus: But in this case, the player party is attacking the lair of the phraints, having eliminated many of the monsters in combat on the plains. The lair is dug into the underground.

There are two main entrances and one small (one-person at a time) side door. There are guards "up top" and guards at the main entrances. The side door is locked to those outside.

The lair includes an area for the "queen," an area for the handlers and attendants of the queen, an area where the young are raised, and areas where the adult phraints live.

Level Objective: Slaughter phraints. All of them.

Characters: This is designed for a party of 6–9 characters of experience level 6–7.

Nature of Opposition/Obstacles: Phraints

Architecture Style: "Holes dug in the dirt"

Environment: Plains and then underground passages and chambers

Mood: Grim determination

Emotion: The usual combat emotions

Pacing: Rather than one continuous battle, this will involve episodes. The monsters will take time to cooperate/communicate/concentrate forces.

Lighting: Underground, not much natural light available

End of level overview example.

Campaign Level Design Document

This document describes a series of levels for a generic fantasy role-playing game that emphasizes combat more than "role-playing" and story, an "American" RPG rather than a Japanese one. (It assumes a game something like early *Dungeons & Dragons*.) It is one that allows for a party of characters

rather than a single individual, whether there is one player or more controlling them. *Neverwinter Nights* might do, or many other games of this type going back to *Baldur's Gate*.

A "campaign" in this context is a series of interconnected levels that lead players to some kind of conclusion (as much as an FRGP ever concludes).

Overview

The party of characters seeks adventure in a frontier area dominated by the legendary "Skystone Castle," a long-abandoned fortress built on a huge rock said to have come down from the sky. They arrive by ship in the port town of Tonilda. If successful they will ultimately become some of the principal heroes of Good in the area, working with the High Cleric to explore Skystone, eradicate the mysterious Phraints, and defeat the northern invasion.

When players choose Good avatars, this is the campaign they will be presented with. If they choose other avatars, then they'll be unlikely to support the Bishop and High Cleric.

These episodes culminate in fights with unusually strong enemy groups, but there is not always a "boss" monster much stronger than the rest. This is typical of *Dungeons & Dragons*.

Parts 1–6 ("Newcomers in Tonilda" to "Explore the Crest of Skystone") will be played in order.

1. "Newcomers in Tonilda." First level (novice) characters start here. This stage enables players to become familiar with Tonilda and environs. The Baron, who ruled Tonilda, has recently disappeared. Fighting has broken out amongst religious factions in the town. The characters find themselves drawn into good deeds on the city streets, culminating in a fight with undead (skeletons and zombies) who seem to now dominate the Baron's castle. The undead may be the Baron's own former soldiers. The party is observed (perhaps aided) by representatives of the leader of the Good faction in Tonilda, who invite them to the temple.

This stage will reflect the excitement of new adventurers, and the mystery of the collapse of the government of the city.

2. "Meet the Bishop." 2nd level characters. The characters meet Bishop Spandu Nabisco, head of local Good worshippers, and become some of his main supporters — because he intends to bring order back to the city. The characters engage in a number of missions which help them rise in level. They

become acquainted with the local sympathetic higher-level wizard by helping him defend his tower (which is outside the town walls).

The mood of this stage will be recognition of the long-term job to be done, and subordination to the good of the community as a whole!

3. "Assault the Evil Temple." 3rd-4th level characters. After various skirmishes and realignments in the city, and with the Baron widely regarded as deceased [in a second campaign players try to find out what happened to him], the Bishop decides to attack and destroy the Temple in the "Evil Quarter" of town. Our Heroes are the main instrument of the attack.

This is a military stage, an attack on a defended building occupied by enemy priests, soldiers, and undead, including one non-standard monster, the grave guardian (animated armor floating above graves).

4. "Consult with the High Cleric." 4th-5th level characters. Following the successful defeat and clean-up of opposition in Tonilda, which the Bishop now rules, the players travel north to visit the High Cleric Jon Coristo. "JC" and his minions are based in a castle midway between Tonilda and Skystone. The characters, along with JC's three loyal followers (two dwarf fighters and a magic-user), become his stalwart instruments in the struggle to bring peace to the plains north of Tonilda.

Exploration and information-gathering inform this stage.

5. "Explore Skystone Castle's Environs." 5th level characters. JC sends the goodguys north to explore (and clean up) the area around Skystone Castle. The Castle has been occupied for generations by a variety of nasty types, there are no farming or herding settlements north of JC's stronghold.

This stage has exploration, mapping and slaughter of nasty creatures.

6. "Explore the Crest of Skystone." 6th level characters. Now the party, having reported to JC, sets out for the top of the Skystone, where the outerworks of the ancient fortress can still be seen. (Most of a fortress in a world of magic and fireballs is below ground, of course.) They explore, clean up the area, and find one or more ways downward. They explore the parts of the "dungeon" that were originally part of the fortress. They report back to JC rather than go further down, into areas delved after the fortress fell.

This stage involves exploration and mapping, and slaughter of nasty creatures. Players may learn more about the history of Skystone Castle, which will probably play no part in the current campaign but may have some importance in future campaigns.

The following (7–10, "The Invaders" through "Delve the Depths"), can be played in any order, though this is the "most desirable" order. For these adventures the characters need to be about 6th–8th level.

7. "The Invaders." Tonilda's anarchy has attracted attention. From the far north, forces of Evil are gathering to attack Tonilda, but first they must go past Skystone and the High Cleric's Hold. The party devotes considerable time to patrols and intelligence-gathering expeditions around Skystone and to parts further north, resulting in several encounters, at one point including over a hundred enemy "soldiers" (kobolds, orcs, gnolls) with ogre leaders.

Exploration, intelligence-gathering, and "bloodying the nose of the enemy" are the purpose at this stage.

8. "The Unknown Monsters." When patrolling near the mountain range from which the invaders issue, the party encounters a lair/burrow of strange monsters, all quite large, some cat-like, one slug-like, that seem to spit lightning or other dangerous breath-like weapons from their mouths. They are quite formidable in melee as well.

More of these monsters are encountered, accompanied by typical enemy soldiers (orcs, gnolls), sometimes covered by kobolds riding giant dragonflies.

This stage exploits fear, both fear of the unknown and fear of such strange and formidable beasts.

9. "Encounters with Phraints and Scouts." Fireball/lightningbolt capability, and flying capability, very desirable.

As the players scout the grasslands to the north and east for signs of enemy activity, they encounter, more than once, the mysterious phraints. These human-sized, insect-like creatures roam the grasslands in groups of up to a half dozen. They use crystal throwing-discs, often thrown as they jump high into the air to get a better perspective. They are expert at hiding within the tall grass. Fortunately, they do not use magic items.

The players also encounter the northern enemy scouts, kobolds armed with poison-dart crossbows and riding giant dragonflies. These creatures render travel in the plains very dangerous, so that most travel is at night; if the party has the right equipment (fireballs, flying capability) they can defeat the scouts and travel during the day.

10. "Delve the Depths of Skystone." Characters explore deep within the Skystone. There are no clues here about the phraints, the "lightning monsters," or the invasion, just a variety of opposition typical of "old-time dungeons."

11. "Attacking the Phraint Lair." Having encountered phraints several times in their travels about the plains surrounding Tonilda, the party now are

asked by the High Cleric to attack the phraint lair that has been discovered by others. This is an underground burrow inhabited by warriors, workers, and the Queen. It is a long slog, with the characters required to pull back more than once to rest and recuperate because there are so many phraints. At one point, powerful extra-planar monsters mysteriously appear and attack the party. Who are these guys? They are actually minions of the northern invaders, who have been secretly working with the phraints, and who have responded to a magical call for help.

12. "The Assault on the High Cleric's Hold." The party helps defend JC's stronghold against a force including many of the lightning-monsters. The enemy attempt to quickly build ramps to the top of the walls, and use lightning to blast gates. This is more an assault than a siege.

13. "Defeating the Invasion." This is a pitched battle involving the forces of the High Cleric and the Bishop, with the player characters being leaders amongst the "army" of a few hundred. They fight an invading force of typical evil soldiers with leaders. In the ideal world, the battle will end with the High Cleric frying the evil leader with a Flame Strike, while the player characters defeat the sub-leaders, often in single combat.

The mood here is of "the final battle" variety, the "last confrontation." All of the local forces of the defense are here, and MUST win or risk being overrun.

At this point, the northern invaders defeated, the main phraint threat eradicated, the party has "won the day" for all that is Good and right. But there are further campaigns to be played: where do the strange catlike and sluglike monsters come from (a moon, as it turns out, transported in space-faring magical ships!)? Are there more phraints further afield? Who were the extraplanar monsters? When do they attack the enemy in their northern strongholds in the Lands of Chaos far to the north? A goodguy's work is never done...

Further Reading

Some detailed level design documents can be found on Jennifer Canada's web site: *http://www.jennifern.net/documents.html*.

Practice

Write a description of a level, whether for an existing game or for one you're designing. Ask other people to read it and talk about what they think of it.

8

Some Specific Video Game Issues and Genres

A. Life Is Different for a Full-Time Video Game Designer Compared with a Freelance Game Designer

Just as there are some practical differences between video game design and tabletop game design (see Chapter 1), there are differences in the full-time profession of video game designer and the freelance or part-time video or tabletop game designer.

Many video game designers work full time for a studio that produces video games to be published by another company, the publisher. They work on salary (no overtime compensation) and frequently work more than 40 hours a week. On average they are paid about the same as artists, and a lot less than programmers working at the same company. In contrast, most "indie" (independent) video and most tabletop game designers are freelancers who design games part-time.

The full-time game designer is rarely paid royalties. He does his "work for hire" because he is a full-time employee of the studio; the studio earns royalties, and the game designer might receive a bonus if the game does very well. Indie video game designers often work for little or no pay, in the hope that a self-published game will "make it big" on Xbox Live, Playstation Network, or a mobile platform such as iPad, iPhone, or Android smartphones. They earn part of sales. Because the tabletop game industry is much smaller in revenues, with the game budgets in the tens of thousands of dollars instead of in the tens of millions, few people can make a living designing tabletop games. There are few tabletop game publishers who can afford to have game designers on staff (e.g., Hasbro). Consequently, tabletop game publishing is

more like book publishing, where the game designer is an independent person who is paid royalties by the publisher.

The most successful video game designers are very well paid, into six figures, while a few very successful tabletop game designers are millionaires.

While the full-time video game designer is paid even if the game sells poorly, it's not unusual for video game studios to go out of business. This can be true even if the game they just finished sells well, if the studio has not been able to line up the next game.

The above is about game designers, but it's much more common for someone with relatively little experience to be a level designer rather than a video game designer. If a level designer does a poor job, more experienced people may help sort it out, and the game as a whole won't fail even if one level is weak. Studios are reluctant to entrust budgets of tens of millions of dollars to inexperienced people. Consequently a video game designer is usually a person who has already worked in the video game industry for years, whether as a level designer, a producer, or a programmer, or even as an artist though a transition from artist to game designer is rare. Furthermore, when someone becomes a full-time game designer he or she is usually a subordinate to a lead designer, and works on a small part of the game.

There are many casual game companies and independent game studios that may be willing to risk use of an inexperienced game designer, but these companies are much less stable than the larger studios. And the "indies" often are not paid until and unless one of their games becomes a success.

In a great many cases, the full-time game designer does not work on the game he wants to work on, he works on the game that the studio decides the studio needs to work on. In contrast, the freelance game designer can design whatever game he wants. But if he can't license that game to a publisher or if it does not sell well then he makes little or no money.

The big video games are usually designed by groups of people, with multiple designers and with many contributions from the other people in the production team. In contrast, board and card games are usually designed by one person, perhaps with input from a second "developer," and with suggestions from some playtesters. The designer of a tabletop game will in most cases have from 80 percent to 99 percent influence on the content of the published game. I estimate that the lead designer of a AAA list video game is closer to 25 percent influence. When a tabletop designer says "that's MY game" he (usually) really means it. When someone says of a big-time video game "that's my game," he (usually) ought to say "that's our game." When a video game person says "I have six shipped titles," that usually means they

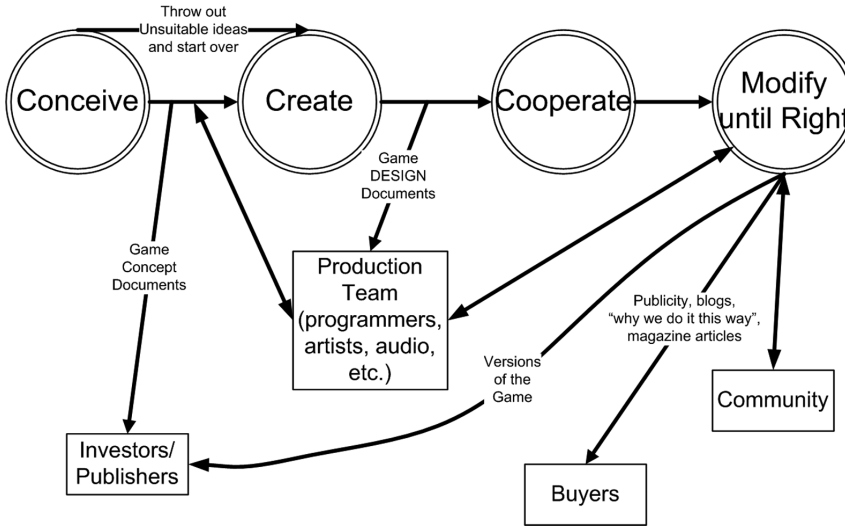

Figure 6 — What Video Game Designers Do at Big Studios.

made small contributions to six published games. Of course, for much smaller video games we can still have a situation where one person has great influence over the outcome.

Because large groups are usually involved in producing big video games, a designer's job involves much more cooperation and communication than if he is designing a tabletop game. A tabletop game designer makes his prototype; a video game designer, unless he's a skilled programmer making a small game, must rely on other people to make a prototype. He has to describe what's in his head to the programmers and artists and sound people so that they can produce the software. Initially this description is in the form of a video game design document, although much of it involves face-to-face discussion. When the video game designer understands programming well he'll probably communicate better with the programmers.

For the big-company picture, see Figure 6 — What Video Game Designers Do at Big Studios.

B. What You Must Know About Video Game Genres

Each genre poses a different set of challenges.

Some books devote dozens or hundreds of pages to video game genres.

We would be remiss not to mention them at all, but briefly because this information is so widely available. A few genres have their own sections later in the book.

Video game genres are differentiated by the types of challenges, not the settings. So we can have shooters and RTS games that are both in fantasy settings. Although the video game industry is not very old, players have come to expect games to fit particular genres, so one of the major ways to determine the audience of your game is to decide which genre it will be.

Type: Shooters

Essence: Shoot things and blow things up while running around (or, in stealth shooters, while sneaking around).

Examples: *Doom, Quake, Halo, Call of Duty, Rainbow Six*.

Who Plays? Appeals mostly to males, especially teens and twenty-somethings.

Salient Characteristics: A genre with a principal activity of shooting at enemies and blowing stuff up. May be first person (you see what the eyes of your avatar see, so you don't see yourself) or third person (you see your avatar as well as his or her surroundings). Character customization through personal characteristics, appearance (third person only), skills, and character class or profession. A great variety of useful weapons that may either be found or purchased. Often unlimited "lives" through respawning. A variety of team games such as "capture the flag." Most shooters offer online play.

Type: Real-time strategy (RTS)

Essence: collect resources, build buildings to make units, overwhelm enemies, all done really fast.

Examples: *WarCraft II, StarCraft, Total Annihilation, Command & Conquer* series

Who Plays? Because quick (and violent) play is required to be successful—*StarCraft* players talk about "200 actions per minute"—RTS tends to appeal to young males.

Salient Characteristics: A genre involving command of a large force, requiring collection of resources and construction of factories and units, that is played in real-time (as opposed to turn-based). Good strategy or tactics can sometimes overcome fast manipulation of forces. Players often start with a single unit that can build structures to mine or create resources that can be used to build additional structures. Players tend to establish a base and then attack other players' bases.

A typical game is either a fantasy or futuristic/science fiction, but can

also be historically based. Attacks tend to come in distinct waves as a group rushes at the enemy base. Players will often have hundreds of units at one time. Many games emphasize micromanagement of economy and tactics in battles. Technological development is often important, or some other kind of research.

Type: Turn-based strategy

Essence: collect resources, build buildings to make units, overwhelm enemies.

Examples: *Civilization* series, *Age of Wonders* series, *Heroes of Might and Magic* series

Who Plays? People interested in strategy but not interested in 200 actions per minute. Turn-based games give you time to think.

Salient Characteristics: The description for RTS applies here, the difference is in the speed (and stress level).

Type: Adventure and action-adventure

Essence: Solve variety of puzzles to reach an eventual goal.

Examples: *Zork, Kings Quest, Grim Fandango, Myst.*

Who Plays? Appeals less to the action-crowd, but attracts all kinds of gamers.

Salient Characteristics: Puzzles. Mystery. *Myst* succeeded partly because it looked so good. In early days these games involved wandering about without much story. Now they are usually very story oriented. Action adventure games add activity to the puzzle solving, sometimes something like a platformer.

Type: 4X game (explore, expand, exploit, exterminate)

Essence: In a science-fiction setting, explore, expand, exploit, exterminate.

Examples: *Master of Orion II, Sins of a Solar Empire*.

Who Plays? Strategy gamers. Some of these games are real-time, some are turn-based.

Salient Characteristics: A player usually begins on a single planet in a futuristic setting. Faster than light spaceship technology allows him to explore the galaxy, establish and build up colonies, exploit the resources of his planets, conduct technological research, and finally build up a fleet with which to defeat other expanding powers, conquering or destroying their colonies.

Type: Vehicle simulations

Essence: Drive it or fly it like the real thing.

Examples: *Microsoft Flight Simulator, Gran Turismo*.

Who Plays? A specialized form of wish fulfillment for people who would like to drive fast cars or aircraft.

Salient Characteristics: Within the genre games vary in how well they simulate the vehicle. Sometimes the race or the mission (fighter/bomber simulations) is more important than how you control the craft, sometimes the control and reactions of the vehicle are very realistic.

Type: Platformers

Essence: Run, jump, climb.

Examples: *Donkey Kong, Tomb Raider*.

Who Plays? One of the early video game genres, these games require coordination but are not as intense as shooters, having a puzzle aspect to successful completion of a level.

Salient Characteristics: The principal activity is running, leaping, climbing, and jumping, often from one platform (like a ledge, but sometimes in the middle of the air) to another. Sometimes the platforms move. Sometimes shooting or otherwise defeating enemies is involved.

Type: Sports simulations

Essence: You are the coach — or even the individual player.

Examples: *Madden* series, various 2K series.

Who Plays? Sports fans.

Salient Characteristics: A game that simulates some sport, usually a team sport such as football or basketball. Many of the games go beyond the playing of individual games to offer season modes, general manager modes where you trade players and draft players, to career modes where you become a player who starts as a novice, and try to become a star.

Type: Role-playing game. These are discussed in detail in Section F, Chapter 9.

Type: Simulations

Essence: It seems so real!

Examples: *The Sims*, *Rollercoaster Tycoon*.

Who Plays? People interested in building and manipulating.

Salient Characteristics: These games are more or less intended to model the subject, whether it's an individual or family (the Sims), an economic situation, a theme park, a colony, or something else.

Type: Fighting games
Essence: Mano-a-mano, one player fighting against another.
Examples: *Street Fighter, Mortal Kombat*.
Who Plays? Young people, people happy with the requirement for quick thinking and reactions.
Salient Characteristics: A selection of fighters have many different characteristics, some of them quite magical, and signature moves. Among top class players the ability to "read" your opponent, to anticipate what he or she will try to do, is the difference between winning and losing.

Type: Survival horror
Essence: Run away! But occasionally blast your way through.
Examples: *Resident Evil* series*, Left 4 Dead, Silent Hill* series.
Who Plays? Insofar as these sometimes resemble shooters, young males, but the opportunities for stealth and cleverness attract other people who otherwise like horror stories.
Salient Characteristics: The player' s avatar must survive in a horrific setting, for example a zombie apocalypse or a haunted mansion. This sometimes involves getting together a group, sometimes it's purely individual. It's noteworthy that this genre is characterized as much by the theme as by particular kinds of challenges.

C. Stories, Narratives, and "Sandboxes"

One of the bigger mistakes beginning game designers can make is to focus on story rather than gameplay. While there are games where story is paramount, for example the Japanese-style console RPGs such as the *Final Fantasy* series, these are exceptions. Moreover, it's quite difficult for beginners to design story driven games that they can actually make and try out.

Story in a game often has little to do with gameplay. John Carmack (*Doom, Quake*) is quoted as saying "Story in a game is like a story in a porn movie. It's expected to be there, but it's not that important." Another version of the same sentiment: story in a game is like story in a porn movie, it's an excuse to get to the action.

The heart of a novel is characterization, though there's more to it than that (plot, dramatic tension, etc.). The heart of a game is gameplay, though there's more to it than that (interface, appearance, sometimes story, etc.) The heart of an interactive puzzle (such as many one-player video games) is challenge, though there's more to it than that.

Trying to use a game primarily to tell a story is like trying to use a spreadsheet program as a word processor. You can do it, but it's awkward.

Story can be important when the game is an interactive puzzle, because story can provide clues to the solution. Furthermore, while the means to the solution may be quite repetitive (as in "shoot things and blow stuff up"), the story points toward the ultimate goal, providing a context for the activity. Even if there's a sameness to the activity (as in many *Final Fantasy* games), there's progression through the story.

Nonetheless, let's reiterate that concentrating on story, instead of gameplay/challenge, is usually a mistake. Most gamers want to play a game, want to DO something, rather than to be told a story. They want to make their own story, not follow someone else's story. Yet story is becoming more important, as video games become more "immersive," more about "fulfilling a dream." The dream usually involves some kind of story.

There are many books, including some game design books, that discuss at great length the topics of story-telling and how to construct narrative. To keep this book small, we cannot do it here, because it's a minor part of most games, especially the kind that learners can design and play.

Practically speaking, there's another reason for game designers to devote little energy to story. When story is important in a AAA game, studios often hire professional story-writers rather than rely on the game designers to write the story.

If story is the most important thing to you, you may be better off preparing to become a game story writer, not a game designer.

Further Reading

"Games, Storytelling, and Breaking the String" *http://www.electronicbookreview.com/thread/firstperson/storyish*

D. World-Building

On the other hand, the setting of a game can be important, especially role-playing games of both types and many kinds of video games. The setting is the "atmosphere" if not the "theme" of the game. The setting has a lot to do with how well the game sells, though it doesn't always have much to do with how it plays.

So "world-building," putting together that setting, has become quite important in some kinds of games. Once again, there are entire books about creating worlds; to keep this book a reasonable size, we'll only offer this brief advice:

You can't make a fully-realistic world, it's just too much work; so make one that "feels" real, that enables the player to suspend his disbelief, and get on with making the game.

With respect to the nature of the world and its mysteries, remember that if players treat the game as an interactive puzzle, similar to most single-player video games, then they'll be frustrated if there are mysteries they cannot solve, because solving everything is how you end the experience of a puzzle.

If they treat the game that uses this world setting as a single story, then they'll also want all the loose ends tied up but will understand that the designer may leave things unexplained "for the sequel."

If they treat the game as a world to roam in, then closed doors will be fine, because every real world has closed doors, no one can live long enough to try them all even if there is a way through.

E. The Interface

We briefly discussed the interface in Chapter 6, but it's so important there is more to say. As more games are played on portable platforms, interface becomes more important. Nor will an interface designed for a big monitor and handheld controller or keyboard work well on the small screen and form factor of a phone.

All games have an interface, whether it's pressing a button or moving a joystick, or manipulating cards and pieces. A poor interface can ruin a game; if you've played many video games you've surely been frustrated when the game made it hard for you to tell it what you wanted to do, a failure of the interface. We'd all like to just think what we want the game to do, and have it act accordingly, but that remains an aim for the Matrix/Star Trek holodeck future.

For a AAA game there might be a designer or two who only work on the game interface. People who are learning to design games cannot devote all their time to interface but it is still an important topic.

Jakob Nielsen is the long-time guru of usability for commercial websites. (His partner is Don Norman, who wrote *The Design of Everyday Things*, a classic book which is recommended reading.) Much of what Nielsen writes about making easy-to-use websites also applies very closely to designing good games. Every few weeks he publishes a new article. Anyone who wants to be a good game designer should read his material. You can begin with *http://www.useit.com/alertbox/design-diversity-process.html*

Nielsen identifies ten general principles — Rules of thumb — for Web user interface design. We'll summarize these in relation to game interface.

1. "Visibility of system status." Users should be able to look at the game and know what's going on (as far as they ought to know, of course — information about the opposition may be hidden). When they do something they should be able to see the result, usually immediately.

2. "Match between system and the real world." The game should use words, phrases, and concepts easily understood by the user. We know that you shouldn't ask five-year-olds to do complex math or understand "big words." But every target audience has its characteristics that the game needs to accommodate. Furthermore, information should be presented in a logical order.

3. "User control and freedom." Give users a way to bail out when they make a mistake in using an interface — not a game mistake but a game *manipulation* mistake. Allow undo and redo in video games.

4. "Consistency and standards." Follow platform conventions. People expect things to work a certain way, and if you do it another way that may interfere with their enjoyment of the game. This is one place where doing it the standard way is almost always a good thing.

5. "Error prevention." Design games so that users are unlikely to make mistakes. Good error messages are important but design that avoids mistakes is better.

6. "Recognition rather than recall." Don't make the user memorize things or keep track of things, let the game do it. Instructions should be easy to find if they're not visible.

7. "Flexibility and efficiency of use." Allow expert users to install shortcuts, such as remapping keys and joysticks on a controller. Don't expect the new user to use obscure commands.

8. "Aesthetic and minimalist design." Don't provide irrelevant information. Don't require two actions where one action will do.

9. "Help users recognize, diagnose, and recover from errors." When a user does something wrong, describe exactly what the problem is and suggest a solution

10. "Help and documentation." The ideal game does not require the user to learn any rules, but this is rarely practical. Help and documentation (such as rules for tabletop games) should be easy to search.

See *http://www.useit.com/papers/heuristic/heuristic_list.html*.

Ernest Adams provides a list of user interface/usability no-no's, summarized below.

The term "camera" in games refers to the angle and direction of the view shown on the screen. Camera problems include poor or nonexistent camera controls, games that seize control of the camera at inconvenient times, and camera angles where the player cannot play (often because he can't see what's going on).

Controls that cannot be configured or can only be configured badly are another problem, as are configurations that cannot be saved.

Every game should have a pause feature and a way to save at any time. "Save points" are a manifestation of a time when game consoles were insufficiently powerful to save at any time. There's no reason to limit saves now. You should also be able to have multiple saved games so that your only save isn't just before you die helplessly.

Uninterruptible cut scenes or cinematics are one of the biggest No-Nos in video games, just as is music that you can't turn off.

F. Too Much Like Work

> (About *World of Warcraft*): "*Finally, gaming had hit its ultimate low — a game so tedious you'd actually pay someone else to play it for you.*" — Gameinformer, Nov. 2010
>
> *"I don't want to be challenged by my entertainment, here's my 60 bucks, entertain me or go away. Hard core gamers want to be challenged and emerge as bad ass gamers, but that isn't fun for me."* (This quote is highly expurgated.) — *God of War* creator David Jaffe

Ideally, games should be enjoyable. In the video game world we now have games that are "a grind," "tedious," or "too much like work," but people play them anyway for their own reasons, often so that they can brag about "beating the game" or "capping out" in experience levels.

These games are usually defective because there is no challenge and no interest introduced by human opposition.

While you someday may be involved in design of an MMO or social network game that suffers from being "too much like work" yet succeeds for other reasons, this is not a desirable goal!

There are also games that may be *too* challenging to some players, especially people who have physical limitations and people who want to see a story without being challenged by it. Sometimes games may contain sequences that simply don't interest a player — for example, some players despise formal puzzles, while others hate "twitch" episodes requiring frenetic movement.

Hard core game players are accustomed to being challenged. Viewers of movies, which are passive experiences, are rarely challenged. Readers of novels,

which are not interactive, nonetheless must work at it to read and visualize, so it isn't surprising to me that more of the young people I'm familiar with (college students) play video games than read novels.

What can video game designers do to accommodate those who don't want to be challenged by their games, who may only be interested in the story they're being told, who won't play games that are "too much like work"?

Reduce the focus on challenge, don't pose a game as success or failure. We've gone quite a way in this direction already. In the original arcade games when you lost all of your lives, you were done and your money was gone. Now, on home game devices we now have unlimited respawning and saved games. We see evidence of "easification" all over the video game map. Some games now help you aim your gun, some automatically heal you when you save, and so forth. Social network games like *Farmville* are very, very easy to play. There is essentially no challenge at all. The worst failure you have in *Farmville* is failing to harvest crops before they wither.

Different levels of difficulty are now the rule in video games, and this is occasionally taken farther. A few games have a mode in which the game plays for the player, an "autopilot" so that a player doesn't have to try to overcome challenges if he or she doesn't want to. The player can choose when to use autopilot; those who want a challenge can ignore autopilot and play on harder difficulty levels.

Sooner or later games will have the "undo" (Ctrl-Z) feature common in office applications, so that when a player makes a big mistake he can just undo a few actions and try again.

"Bad-ass gamers" sneer at autopilot and undo, but they're there to allow people to do less "work" while playing the game. Games should be enjoyable, not a grind.

G. Products vs. Services, Retail vs. Free

This book is not about the business side of game design, about intellectual property protection, licensing, and marketing. Nonetheless, there's a fundamental change in how the video game industry works that needs to be described because it has such a strong effect on design.

The traditional way to market commercial games is to create a game that sounds and looks like it will be good to play (via screenshots and demos), so that people can be persuaded to spend money to buy that game. (It also helps if it turns out to be good to play, over and over again, after the consumer

buys it, as that improves word of mouth sales.) The game is a product. It is usually sold in retail stores, but now games are also sold online, sometimes via digital downloads rather than traditionally printed and manufactured games.

The newer way to market commercial games is called "free to play" (F2P) or freemium. These games are set up online, using exclusive sites, aggregator sites, and social network sites such as Facebook, where people can play them at no cost. The task of the publisher is to create a game sufficiently interesting to convince players to try it out, and sufficiently engaging that they'll come back to play, and then to find ways to extract funds from about two percent of the players who will pay real money for functional or cosmetic advantages.

An interim or intermediate version of marketing is the game that must be bought, yet then requires a subscription to play, such as most of the original MMOs such as *Everquest*. But over time, most people balk at the idea of paying a subscription to play, hence many former subscription games are becoming "free to play."

There is a fundamental divide here. In the traditional case the focus is on entertaining games, or at least games that are entertaining initially. In the free to play (and also the subscription) cases the focus is on "sticky" games that people will come back to repeatedly, followed by ways to persuade people to spend money. The difference is that the subscriptions are paid up front, while in free-to-play games the money is usually spent on "virtual goods" that can be used in the game for various purposes. Some virtual goods are merely cosmetic, for example clothing for an avatar, and do not make a difference to gameplay. Some are functional, that is they help you succeed in the game. This could be a magic sword or a speedup in constructing a building, for example.

In the extreme this free to play mentality leads to design of games that are "addictive" rather than entertaining. Think of how many people pay monthly to play *World of Warcraft*, yet say it's "a grind" or "like work." In some sense all games take advantage of psychological characteristics of players, but the psychological characteristics that must be addressed in order to extract funds from players of a free to play game are widely regarded as less admirable, sometimes downright venal or egotistical, compared to the psychological characteristics that are involved in whether a game is purely entertaining.

In other words, game designers become designers of revenue generation, rather than designers of entertainment. You can make an argument that the best way to generate revenue is to make an entertaining game. However, a successful free to play game might persuade one to three percent of the people who try it, to actually spend money in it. This tends to skew the design away

from entertainment toward two common people characteristics of the 21st century, instant gratification and convenience. Players who want instant gratification are more willing to pay real money to progress in the game than players who have learned that sometimes putting off a benefit until later is better in the long run. Hence games may be made deliberately frustrating, so that people will spend money to relieve the frustration. This is quite different from design of traditional "product" games, where the designer works hard to avoid unnecessarily frustrating the players.

Frustration is a necessary consequence of opposition to your will, which is present in most games. What happens in free-to-play games is that frustration is a deliberate design decision separate from the opposition, rather than part of the opposition the game provides. One panelist at a conference suggested that social network game design is all about creating "pain points" so that people will get fed up and pay to bypass the "pain points." For example, a player may have limited "energy" required to do most any task. When the energy runs out, the only way to replenish it immediately is to spend real money. Otherwise, the player must spend a (frustrating) long wait.

Further, many people have become accustomed to spending money for convenience as opposed to necessity, and in some cases what used to be merely convenient is now widely regarded as necessary. My standard example here is people who won't make up a lunch at home and take it to work or school; rather they'll go out and buy fast food which is both much more expensive and much less healthy, as well as more time-consuming. That's regarded as more convenient. That's the same kind of attitude that the revenue generation techniques take advantage of.

So we have games that are now services rather than products. Free to play games are less risky for the developer than traditional games, because you can put one online when it's "30% done" and let initial users playtest it. If it proves to be popular, you put lots of effort into improving the game. If it turns out to be a dud, you stop development. The more popular the game, the more effort you put into improving the service.

Fortunately for those learning to design games, designing online games of any kind will be more difficult and time-consuming than an inexperienced person should attempt.

H. Is Creativity Important in Video Game Design?

> *"All children are artists. The problem is how to remain an artist once he grows up."* — Pablo Picasso

> *"The key question isn't 'What fosters creativity?' But it is why in God's name isn't everyone creative? Where was the human potential lost? How was it crippled? I think therefore a good question might be not why do people create? But why do people not create or innovate? We have got to abandon that sense of amazement in the face of creativity, as if it were a miracle if anybody created anything."*— Abraham Maslow

> "*Before you think outside the box, check inside the box first.*"— Mark Rosewater

Some people have a talent for designing games, some don't. Inborn talent may make the difference between a decent game and a really good one, though this can be debated. Nonetheless, it is a craft that can be learned, not something that only a few lucky individuals can do. The necessary creativity is in most of us, we just need to bring it out (or bring it back, in Picasso and Maslow's terms). But it's execution that counts in game design, not creativity.

Adams and Rollings in *Game Design Fundamentals* estimate "innovation by the game designer contributes no more than 5 percent to the fun of the game." It's very important, but it's not the major part of the job. Including stage (level) design they increase the influence of imagination to 14 percent. I prefer a modified form of Thomas Edison's dictum, amounting to "success is 10 percent inspiration and 90 percent perspiration."

The "sexy" part of game design is the conception and elaboration of an idea that may turn into an enjoyable game. But "sexy" in game design is like "sexy" in a marriage, it can only make a difference at the beginning, sooner or later there has to be a lot more there. Just as the people in a marriage must meld together in their minds, work together to succeed, be productive together, the game designer must take his designs all the way to the finish, working hard to succeed, being productive, finishing the job.

Many so-called game designers want the equivalent of a "convenient girlfriend/boyfriend" relationship, the most fun parts without the work that makes it last. They want the sexy part without the deeper, more productive part. You can try to do this, but you'll end up with a lot of half done (and usually half-baked) "games" that never have a chance of being published, unless you self-publish them.

Creativity is important, but not nearly as important as overall execution and a willingness to stick with it until the end, when you're bloody well sick of the game but it still needs that final polishing.

9

Designing Specific Types of Games

A. Multi-Sided Games

Humans, not computers.

Most video games, and most video game players, rarely encounter video games where there are more than two sides. (And for most video games, when there are two sides, one side is usually "the computer" rather than a human). "Multiplayer" in video games means two or more players, but rarely more than two sides. "Multiplayer" in tabletop games means more than two players and more than two separate sides. As a beginning game designer, when you design games to be played by several sides, you'll run into unique problems.

The following doesn't apply to games with two sides (separate interests), because in that case there's no doubt about which opponent you attack. In games with more than two sides one of the big questions for a player is, who do I try to hinder, who do I try to help? How do I know who my target should be (assuming I'm interested in winning the game)? There are extremes to this. At one extreme no one wants to be the person clearly "in front," and on the other extreme the game is essentially multi-sided solitaire.

Keep in mind that we're not talking about a race. The simplest form of game is the race. Virtually any activity can be turned into a race (who can do it most quickly), and races can accommodate almost any number of players. Yet in a typical race there is not much you can do to hinder the opponents — it is often a case of multi-sided solitaire.

This section describes some of the pitfalls (some people call them flaws, some do not) that can arise in multi-sided conflict games. There are various relationships here, and this is not going to cover "everything" because that would take too much space, nor for that matter has anyone sorted out all of

these relationships. These problems may not arise in games where one side is a person and the other sides are computer-controlled, because computers cannot play games as well, as cleverly, and as subtly, as people can.

Several problems named by board gamers can occur when there are three or more sides in a game. When there is an extreme either way (e.g., it's too easy to turtle, or too hard) then the quality of the game is diminished. Many of these are much more likely to occur when the victory condition amounts to "wipe out the opposition," so we'll talk about alternative victory conditions.

Here are the well-known "problems":

1. Turtling occurs when a player sits back and builds up strength while others expend theirs. This can often be seen in multi-player online RTS games. When there are more than two sides, a player can hang back, building up bases and technology, while he lets other players slaughter one another's forces. Then he comes out and cleans up the remainder.

A general solution is to use a different victory condition. E.g., capture of certain locations as the means of victory forces players to come out of their shells. Giving points or other advantages for destroying the opposition also encourages aggression rather than turtling.

Another solution is to provide economic incentives to be aggressive. This often involves capturing economically valuable areas, so that a successful aggressive player can build up forces faster than the turtle.

If there is a short enough time limit on the game, then there won't be time for a turtle to passively gain a significant advantage.

"Camping" in shooters is a form of turtling.

2. Leader bashing tends to happen in games without much hidden information, that is, it must be clear who the leader is. Then the other players gang up on the leader. ("Of course," many would say, why wouldn't one try to weaken the leader?) If it isn't clear who the leader is, this is less likely to occur. If it is hard for some players, at least, to affect the leader in any given situation, then there will be less leader bashing, as those players will distract the ones who can affect the leader. Many "geographical" games, such as historical wargames, have a built-in limitation thanks to position: for example, in a game of European warfare, the Turkish player can rarely attack the English player.

On the other hand, there must be some way to "pull back" the leader, or the game can become boring as the leader gets further ahead with no way to stop him.

3. Sandbagging is often a consequence of "excessive" leader bashing. A

player will try to get himself in second or third place, rather than first, so that when the first place player is bashed, the sandbagger can swoop in for the win. Timing, obviously, is quite important here.

The solution to sandbagging is to reduce leader bashing to a reasonable level.

4. Kingmaking is a consequence of what R. Wayne Schmittberger calls the "petty diplomacy problem" in his book *New Rules for Classic Games*. Where there are three interests, and one recognizes that they/he cannot win the game, that loser may be able to determine which of the other two wins. Even if the game is being played by more than three, it will often come down to three major interests. More generally, if a losing player can with considerable success determine who wins, you have kingmaking in play.

One way to avoid this is to structure the game so that a player cannot be sure he is going to lose until it's too late for him to become a kingmaker. Of course, some players believe kingmaking is the "wrong way to play," that every player should try to win no matter what. But designers cannot rely on players to be self-governing in this way.

Another way to avoid kingmaking is to make it too hard for a player to use all his capability against another to prevent that other from winning. As a simple example, in a race it's usually hard for a losing player to have much effect on the leading players.

These are "flaws" only when taken to an extreme. Every strategy game will allow a little bit of each of these as tactics/strategies intended to win the game, but too much of any of them becomes an impediment to entertaining play. If designers keep these flaws in mind as they conceive and flesh out their multi-sided games they can usually avoid the extremes. If they try to tack on multi-sides later, they're likely to be faced with big changes.

Now here are some alternatives to a victory condition of "kill everyone else." These help mitigate some of the problems we've been discussing. These are:

1. Economies. Players receive more assets as the game progresses, in accordance with some rules relating to locations or resources, not merely to a table of additional appearances ("order of battle"). If a player plays well, he will earn more new assets than if he plays badly.

In a zero-sum game, each player's gain is another player's loss. The classic game *Diplomacy* is the best example of this. There are 34 "supply center" locations on the board. A player gets one unit (army or fleet) per center. If a player

takes another's center, the first is going to increase his forces, while the second will lose forces, at the next building period.

2. Points. Players earn points for certain events or achievements. This could be capture of certain locations, destruction of enemy assets, holding certain places at given times, and so forth. In a wargame, a player could be wiped out, yet if he's done enough beforehand he can still have the most points to win the game. In general, where points are concerned the game does not continue until all but one player is wiped out. Either there will be a time limit or a point limit.

For example, in my "light wargame" *Britannia*, players receive points for holding areas, occupying areas during a certain period, for dominating regions (king of England), for forcing nations to submit, and occasionally for killing enemy units. A nation may be wiped out in the course of the game, but each player controls several, and the points that defunct nation earned still count. Points are based on historical performance, and are accumulated at different paces, so the current score is not a good gauge of who is actually winning the game.

3. Missions. This is a form of points because the mission involves completion of particular goals. A player may win when he has completed a set of missions, and the missions may be hidden from other players, so no one really knows who is "ahead." In 2008 a new edition of the classic (but flawed) game *Risk* was issued that uses missions to counteract many of the multi-sided game flaws discussed above.

FURTHER READING

My much longer description of problems in three player games is the first chapter of the book *Tabletop: Analog Game Design*, ETC Press, electronic copies free to download: *http://www.feedbooks.com/userbook/22317/tabletop-analog-game-design*

B. Social Network Games

These games are played through social networks such as Facebook, MySpace, and perhaps even Twitter. They are very simple, are playable in short time bites, and are designed to bring players back day after day. Virtually always they are free to play, with a variety of ways to monetize the play. They are primarily ways to pass the time — time-killers if you will. In what they do for the player, they are a more-active and sometimes more expensive version of card Solitaire.

Social network games are very popular. At one time there were more people playing *Farmville* than were registered on Twitter. *World of Warcraft* has more than 11 million players but *Farmville* has had many times that number. A great many of the players are women, and a great many are beyond their 35th birthdays. The games are played as part of the daily routine of going to Facebook or another social media network to check on friends.

These "games" tend to be very simple puzzles with no opposition. They often give advantage to players who can recruit their friends to play and help them out, thus introducing more players to the game. They can be very much "grind" games, where you do the same thing over and over again for gradual advantages. But with social network games, over and over again is one day to the next in short sessions, not repeatedly in the same session.

Social network games are usually very simple puzzles where the solution is obvious, but where you need to do it just about every day with considerable repetition in order to succeed long-term. A lot of game playing is habit, and what your friends are playing. Solitaire (cards or video) has very little to recommend it, yet some people play incessantly, and the same can be said about many social network games.

There is a great divide amongst video game designers about the morality of these games. They seem to be designed to take advantage of human weakness, becoming more a matter of habit than enjoyment. Often people play to keep what they have rather than to gain something, thus the daily return to make sure that things are okay. Ultimately, many of them seem to be trickery to persuade people to keep playing a game, rather than offering them something that they can enjoy. It is managing ways to make money, not designing entertainment.

There's great potential for games played over social networks to approach the camaraderie and socialization of tabletop games. Unfortunately, this is not being explored: they are presently anything but social, rather they are solitary, and you don't play with friends, you use friends distantly as a means to an end.

C. MMOs (Massively Multiplayer Online Games)

Examples: *World of Warcraft, Everquest, EVE Online, Star Wars the Old Republic*.

The key to MMOs is persistence. You play a character in some fictional or historical setting, and you continue to play that character possibly for

months or even years. In some games, what the players do affects the setting (the players have what is called "agency"); in others the setting is the same for every player as they go through the game. Most games can be played solo but the more dangerous challenges require large groups of players to succeed. Some MMOs have a monthly fee, others can be played for free.

MMOs are very expensive to produce because there is so much content to create as well as a need for a big Internet infrastructure. Characters are often highly customizable, right down to hair color and clothing.

MMOs appeal to a broad spectrum but it's probably teens and young adults without family responsibilities who have the time to play as much as many people like to play. Unfortunately, many MMOs are identified/dominated by "the grind." The player's character tends to do the same thing, or something very much the same as they have been doing, again and again and again in order to obtain more capabilities through experience points, skills, and loot.

Beginning designers are most unlikely to be involved with MMOs because they are so expensive to make.

D. Casual/"Short Experience"/Mobile Games

Examples: *Bejeweled, Tetris, Angry Birds, Plants Versus Zombies*.

Casual games are short, simple video games, often puzzle-like. They are often played on phones or other mobile devices, as well as on personal computers.

Casual video games tend to be played by a somewhat older demographic than other video games, and much more by females than males. Casual game players are rarely interested in "beating the game," and are often not concerned about winning. They play games to relax, not to prove that they are "bad ass gamers." Most social network games are extreme examples of casual games.

Casual games need to provide a satisfying short experience, which often means the game must be short; if not there must be obvious stopping points were you can save the game. Objectives must be especially clear, so that the player knows what to do without having to think about it. Casual games usually use two-dimensional graphics rather than three-dimensional because the player is not concerned about photo-realism.

Casual video games are a good place for designers to start their commercial efforts, after they've learned the ropes.

E. "Serious" Games (Education and Training)

Examples: *Mavis Beacon Teaches Typing, Flight Simulator, Math Blaster,* training simulations of all kinds.

Brian Winn's definition is "games with a purpose beyond entertainment." A common definition is "games for learning or training," because this is the most common purpose, but there are many other kinds of serious games, such as advergames (advertising). The word "educational" has achieved remarkably poor connotations in the USA and UK, so video game people in particular use the term "serious" instead. And with use of that term they have included training software and any other kind of game that has a non-entertainment purpose. The most important *goal* is that the "message," that which is supposed to be learned, gets across to the player.

Some serious games are simulations, such as pilot training software. In many cases the level of realism required for a simulation is not necessary.

A very important, and frequently ignored, *design characteristic* of serious games is that they must be enjoyable to play. If they're not then people are being forced to play, and that's never likely to work well. Serious games are different from most other games insofar as the story is the most important thing. In this case the "story" is the message the player is supposed to receive, the information or skill they are supposed to learn.

Another important aspect is that there are two ways to go about educational games. One is the puzzle, where when the player has solved the puzzle they have had the opportunity to learn the right steps to do something. Unfortunately, this is much more suitable to training than to education. Training often involves learning something by rote, as in a puzzle. Education involves understanding.

The second method is to design a game where, through repeated plays, a player can gradually see what behaviors and activities bring success and what do not. The things that bring success in the game should be things that bring success in the problem/solution that the serious game is trying to teach. For example, a game design game should emphasize repeated playtesting and modification. I have several times attempted to design a game about designing games, and have always rejected the puzzle method because game design is about understanding. I finally adapted a successful card game designed for entertainment as a "game design game."

Also keep in mind that a video game may not be the best way to teach. For example, many K12 classes do not have easy access to personal computers. And some games will have more impact when six students are sitting around

a table interacting with each other rather than if they individually manipulate computers.

F. RPGs (Role-Playing Games)

Examples: *Dungeons & Dragons (D&D),* many *Final Fantasy, Neverwinter Nights, Traveler, Elder Scrolls* series*, World of Warcraft (WoW).*

Commercial RPGs originated with tabletop *Dungeons & Dragons*. Many characteristics of video game types, not just RPGs, derive from *Dungeons & Dragons*.

Players take on the role of a character in a game-story, for example of a ranger or hobbit in something like *The Lord of the Rings*, or as a detective in something like *The Maltese Falcon*. As they play they accumulate loot and increase their capabilities through levels (earned by experience points) or skills.

Computer RPGs made in Japan for game consoles especially appeal to female gamers. American-style RPGs (computer and tabletop) are heavily male-dominated. Players tend to be young people with lots of leisure time available, as RPGs take lots of playing time. Long tabletop campaigns often involve the same group of friends, of whatever age, as RPGs can be very social events. (I met my wife through *Dungeons & Dragons* many years ago, for example, and the other three participants ultimately married one another, or one of the others' best friends.) MMORPGs such as *World of Warcraft* can become very "addictive," people spending six or more hours a day playing the game.

Usually several characters join together in a group to "adventure." These characters may be different players, or one player may control all the characters. Adventures often involve exploration, whether of a dungeon or of some other location. The computer, or a human referee, controls the opposition. Characters usually earn experience points (xp) for successful actions, and can expend those xp to increase capabilities or characteristics. They can gain skills, gain spell-casting ability, improve their ability to take damage (hit points), improve their attacks, and so forth. Adventures sometimes are story-driven, sometimes present a situation that lets the players try to do as they wish.

Is a video game an RPG because a character is rising in levels? No. It depends on the principal activity. *Bioshock* is a shooter, even though the avatar gains levels. *Warcraft III* is an RTS, even though the heroes of each player go up in

levels. The "real" RPGs focus on a single character and his or her efforts to rise in levels and gain skills; frequently there is no ending or "winning condition."

The tabletop RPG market is highly saturated with both professional and free (usually in PDF form) material. Consequently, many RPG rules sets, adventures, and rules supplements are purchased and read but never played, and some are free. There tends to be much more narrative in these books (especially adventures) than in the 1970s, to attract those buyers who aren't likely to actually play. RPGs are much more story-driven than typical games.

Beginning designers who want to emphasize story should think about designing tabletop RPGs.

G. CCG/TCG (Collectible/Tradeable Card Games)

Examples: *Magic: The Gathering, Yu-Gi-Oh, Pokémon,* and *Legend of the Five Rings*.

While most collectible card games are played on the tabletop, there are computerized versions as well (the cards you buy are virtual). Trying to design a collectible/trading card game is probably a waste of time. A publisher needs a couple million dollars to launch such a game, spent in promotion, in free decks of cards to get people started, and in organized play (tournaments). A video version is less expensive because digital giveaways cost virtually nothing, but most of the video versions simulate successful tabletop games. The games are also complex and the design side never ends, because the main purpose is to continuously change the game in order to persuade people to buy new cards.

Players purchase randomly arranged sets of cards in order to make decks that they use to play against one another, usually in a two player game. A game session itself is relatively short; much of the interest in the game comes from the meta-game of building specialized decks of cards to take advantage of the special powers of cards. Cards are typically sold in anonymous packs, that is, you buy a set of cards and don't know which cards you are getting. Cards are usually one of four types, common, uncommon, rare, and very rare. A market will often develop offering the hard-to-find cards for sometimes exorbitant prices. Players almost always put their cards in plastic sleeves in order to avoid wear and preserve their resale value.

Many of the cards break the rules temporarily by virtue of some special power. Roughly speaking, the less common the card the more powerful it can be. But it's sometimes combinations of cards that become devastating.

The manufacturers continue to create new cards that gradually render some of the old cards useless. Sometimes old cards are retired (no longer usable in tournaments) because they have proven to be too powerful. Occasionally the rules for the entire game may be changed. Designers say that if a deck of the same type dominates in tournaments from one year to the next, then they have failed.

In general a CCG should be a quite simple game. The game should have vanilla, run-of-the-mill cards as the basis of play, rather than be dominated by the rule breaking cards.

This kind of game is very popular with high school and college aged males. "Organized play," that is, local tournaments with prizes, and winners advancing to regional and international and ultimately worldwide tournaments, is a common characteristic of support of CCGs.

There are other kinds of collectible games such as collectible chips or collectible chess-like pieces, and some collectible card games don't actually have cards that you can hold in your hand because they are done purely in online video.

It is possible to design non-collectible commercial boxed card games that stand on their own yet use some of the principles of CCGs (sometimes called Living Card Games). These games are more practical for beginning designers, as they are both limited in scope and not subject to the very high marketing costs of CCGs.

10

Reference Lists and Resources

Because this is a collection of reference lists and resources, it is not designed to be read from start to finish; the individual sections are not directly related to one another. Many sections are a starter list, intended to help you get going again when you meet the game design equivalent of "writer's block."

A. List of Possibilities in Each of the Nine Structural Sub-Systems of Games

If this book were longer it might include an attempt to list all game mechanics. As it is, it includes a list of many of the common choices used in games in each of our nine structural subsystems discussed in Chapter 1. Much of this can be related back to what games amount to (Chapter 3, section F).

1. Theme-Atmosphere/History/Story/Emotion/Image. Everything in the world, everything you can think of, are your choices here. At any particular time some settings will be more popular than others. Fantasy themes are "down" as this book goes to press, while modern warfare is quite popular in video games. The market for tabletop RPGs of all kinds is depressed now, but seven or eight years ago it was hot.

There are lots of opportunities to "think outside the box" in this subsystem. Video game genres tend to encourage use of the same old themes and stories; an unusual theme or story can lead to an unusual game, and while unusual games are risky, the ones that succeed can succeed very well.

2. Player Interaction rules
    - Solitaire, one player
        a. opposition run by set mechanics enforced by programming
    - Cooperative/collaborative game

    a. opposition run by set mechanics/programming
    b. with a "traitor" possible (*Shadows over Camelot, Battlestar Galactica*)
- Competitive
    a. two sides, one player per side
    b. more than two sides
    c. more than two players but only two sides
    d. two sides with more than one player per side, only one player wins
    e. two sides with players controlling forces on both sides, best player on winning side wins the overall game
- Negotiation
    a. not allowed
    b. allowed only in public (other players can hear/read it)
    c. allowed privately
    d. allowed but time limited
    e. no binding deals
    f. binding deals (cannot "backstab")
    g. governed by card play!
- Trading
    a. cards or equivalent capabilities
    b. roles or other opportunities to act distinctively from other players
- Outside-the-game considerations (monetary bribes, for example)
- Outright cheating (*Diplomacy* encourages this in the rules, for example to remove an opposing army when no one is looking)

3. Objective/victory Conditions
- Gain a physical position/reach a location
    a. Get troops off the board at certain location
    b. Take certain city (*Axis & Allies*, old AH board games such as *Stalingrad*)
    c. Capture territory (go) (*Carcassonne* and other tile games)
    d. Achieve an abstract pattern (tic-tac-toe, *Tetris*, sequence)
- Destroy something
    a. Check/take (king in chess, a planet in a space wargame)
    b. Capture entire force (checkers/draughts) (old *Risk*)
    c. Capture certain number of units (*Battle Cry*)
- Accumulate something (Card games tend to be about collecting objects [tricks] or achieving positions [on the table]. Auction/bidding games tend to be about accumulating objects, as are many social network games.)
    a. Money (*Monopoly*)
    b. "Answers," parts of a puzzle
    c. Objects, such as sets of cards
- Run out of something
    a. Cards
    b. Dominoes
    c. Your own pieces (*Blokus*)

- Deduce something
  a. *Clue*/*Cluedo*
  b. *Battleship*, more or less
- Collect something (related to achieving a physical position and to sets)
- Hidden or variable for each player (*Careers*)
- Miscellaneous (achieve something other than position?)
  a. Rock-paper-scissors (but even that is "achieve a pattern")

Scoring Points

Scoring victory points is a form of some other victory condition(s), a way of tallying/accounting for the true objective. To complete a mission (as with the old mission cards in *Risk*) is a form of victory points — where there's only one point to score. Many arcade games use points accumulation.

Variations of victory points as objectives:

- Accumulate points as you play (many video games, *History of the World*, many Euro-style games such as *Settlers of Catan*)
- Score at end of set time/rounds
- Multiple point methods vs. single point method
- Reach a given number of points rather than play a set time/# of Rounds
- Choose your own objectives amongst three or more options (*Careers*)

Generation Y/Millennials want instant feedback, so accumulating points throughout the game has become common. *Monopoly* is a form of destroying something (the opponents' funds), actually, though accumulation of money generally amounts to same thing

4. "Data Storage" (Information Management)

Game Boards

In video games there is usually a board in the sense of a grid that regulates movement, but it is rarely visible. *Civilization* (computer version) lets you show the grid or hide it, but it still governs movement. Many video games use very small areas, possibly down to the individual pixel level, as the spaces on the board, with "units" covering many "spaces" instead of one, e.g. in arcade *Pac-Man*.

Hexagons: "traditional" Avalon Hill style wargames, *Civilization V*

Offset Bricks, a Subset of Hexagon: Usually the bricks are square, rather than elongated as they are in a building. Bricks look different but function identically to hexagons.

Squares: Very traditional, chess, *Dungeons & Dragons* dungeons, *Stratego*, *Civilization* (computer game) through version IV.

Square boards distort diagonal movement (1.41 times the distance of an orthogonal move). In some games, diagonal movement is counted as "one and a half" moves, or is not allowed at all. Hexagons have less distortion, though there is still some. Perhaps that's why *Civilization V* has switched from squares to hexagons.

Areas: *Britannia*-like games, *Diplomacy, Risk, Europa Universalis*. Looks like a pattern of counties, states, or countries on a map.

Connectivity: Squares or circles connected by lines, overlaying an actual map. May represent roads and cities. *Masters of Orion II, We the People, Currents of Space, Rome: Total War*. Gives the designer the most control over where the player(s) can go.

"Path": Adopted name for games where you follow a path, as in *Monopoly* or *Game of Life* or *Candyland*. The individual areas are usually rectangles.

Concentric Circles: Usually divided into sections. Rarely used.

Spiral: Divided into sections. Rarely used.

Geomorphic Boards: "tiles," usually square but sometimes hexagonal, are laid down to create a board that is different each time; the tiles themselves may have squares, hexes, connectivity, or even areas. Enables a different board with each play.

Is there an "ideal" board size? No. But many tabletop game boards have relatively few locations. Chess and checkers, 64; *Risk*, 42; *Britannia* 37 (plus five seas); *Diplomacy* 73 (34 supply centers). The *Axis & Allies* board keeps getting bigger in newer editions. Go has 361 locations. *Civilization* (computer version) has thousands.

Ratios important in map games:

Ratio of movement speed to "size" of the map (number of separate locations as well as "distance" across the board). Time/turns needed to get across the board. If the typical movement speed lets a unit get across the board in two moves, then in that sense it's a small board. The *Stratego* board is fairly small in absolute terms (92 squares), but quite large in comparison with the speed of most units (one square per move).

Ratio of eliminations to introduction of new pieces.

Ratio of movement speed to number of pieces (both present number and future number)

Location of important places in relation to board as a whole. (For example, if two players start at opposite corners, and the only important place [say

the victory objective] is in the center, the other two corners probably won't be used.)

Game Pieces

Video games don't have tangible pieces, but the look of a piece, especially a player's avatar, is very important. And players want to be able to customize the look of their avatars.

For tabletop versions:

3D pieces such as figures are best when you want to move them around (as in chess), but flat(ter) pieces are OK if you just place them and leave them there (as in *Tigris and Euphrat* and many other tile-laying games, or as in go).

3D pieces are more prone to being knocked and jostled around than flat pieces. If the game has a lot of pieces then flat pieces are more practical (and more fit in the box).

Some people want their 3D pieces to look like real objects, hence the figures that look like soldiers and horsemen, or tanks and battleships (*Axis & Allies*). Some seem to be as content with wooden or plastic blocks or cylinders, or glass beads, or stylized wooden pieces.

Colored plastic chips don't quite count as 3D, though they are not cardboard counters. At least one of my games, *Law & Chaos*, originated as an attempt to design a game using glass beads (which many gamers like, but which are not practical in large numbers because they drive up the shipping weight of a game).

Peter Morrison, designer and publisher of *Viktory II*, ran a piece color survey on BoardgameGeek. The order of preference was: Blue, Green, Red, Yellow, Black, Purple, Orange, Gray, White, Brown.

Keep in mind that color-blind people (5 percent of the population) cannot differentiate red and green, or less commonly blue and yellow, and sometimes other color combinations can be difficult.

Other Information Storage

Layouts. Sheets of paper with numbered locations so that players can keep track of information by placing a piece on the appropriate number. The video game equivalent is the various information in a "Heads Up Display" or as revealed by menus.

Cards. Cards can have rules on them, as well as other game information. Some cards have two uses, and the player must decide which to choose,

sacrificing the other. Cards are a common way to provide variety in board games.

Paper (and pencil):

- Scoresheets
- Play money

The computer stores lots of data, of course. The trick is to make that data easily accessible to the player. You may have encountered a video game where finding something in your inventory is a big pain. How people retrieve information is just as important as how it's stored.

5. Sequencing
    - Take turns
        a. Same order each round
        b. Same order but new first player each round. (For example, representing each player as a number, the order would be 1 2 3 4 2 3 4 1 3 4 1 2 4 1 2 3 and repeat.)
        c. Players control several nations, player order is by nation, not by player
        d. Divided into "phases," each phase completed by every player before next phase starts
        e. Random order each round
        f. "Seize" or bid for order of play
        g. Order determined by points accumulated so far
        h. Initiative
            -By dice roll/random
            -In accordance with the nature of the action being executed
    - Simultaneous turn-based (most common in video games)
    - Play anytime (not same as simultaneous. Simultaneous is more organized/orderly)
    - Interruption (allows someone to interrupt the normal [usually turn-based] sequence)
    - Real-time
6. Movement/Placement
    - Move single piece whenever you wish (shooters, etc.)
    - Move/place one piece
        a. Most traditional board games such as go
        b. Some card games including CCG
    - Move (place) all pieces (most wargames)
    - Move whichever pieces are able to move. Some card games, play all the cards you can play (Canasta, *Bang!*)
    - Action points system (each action costs points from a limited pool)
    - Action cards/card driven
    - Chits (form of card driven), dice-driven (*Lord of the Rings*)
    - Pay to play
    - Event Cards

7. Information Availability
    - All information available (typical of traditional board games such as chess, checkers, tic-tac-toe)
    - Virtually no information about opposition available (kriegspiel chess). We are close to this in many card games, e.g. five card draw poker, and in many older video strategy games
    - "Fog of War" (about locations or assets). Very common in video games because the computer can secretly keep track of where things are.
    - Dice rolls are a form of uncertainty
    - Simultaneous/real-time movement creates uncertainty
    - An opponent creates uncertainty, and more than one opponent can lead to great uncertainty.
8. Conflict Resolution/Interaction of Game Entities
    - None (or — not allowed to cause conflict) (tic-tac-toe)
    - Bidding/auction
        a. Silent
        b. By rounds
    - Displacement elimination (take a piece by moving into its location)
        a. Chess
        b. Checkers (jumping is a form of displacement)
    - Surround or other pattern (can see checkers jump as a form of this)
        a. Go
        b. *Carcassonne* (scoring rather than conflict)
    - Adjacent conflict (wargames) often with dice or cards, sometimes with "combat tables"
    - Action at a distance (artillery, ship combats)
    - Trick-taking ("highest" wins, many variations)
    - "Odds" — The strength of the piece makes a difference (strength makes no difference in chess, pawn can take queen)
    - Capture vs. eliminate
        a. Captured unit may be recovered/reused in some games, eliminated can be rebuilt in many
        b. Captured can even be used by the captor (card games)
        c. In some games, when it's gone, it's gone
    - "Bump" other piece to another location (as opposed to back into a pool)
        a. Backgammon/pachesi
        b. Some family games
        c. Some card games
    - Resource comparison (another form of "highest," but not confined to one card/piece) (*Tigris and Euphrates*)
    - Often shoot from a distance at a target (shooters, RTS)

9. Economy/Resource Acquisition/Conversion (There Can Be Combinations of These Methods)
   - None (or unlimited pool of pieces)
     a. Tic-tac-toe
     b. Go
   - Pool of pieces/cards (possibly including those that have been eliminated) to choose from:
     a. Dominoes
     b. Block games (wargames)
     c. Many card games
     d. CCG — player can customize his pool (he puts his deck together)
   - Resource economy. Something affords the player resources (territory, buildings, "resource centers") — may be something they can take from others (many games are resource management exercises, in the end)
     a. "Increase Points" in *Britannia*-like games
     b. Resource points in *Axis & Allies*
     c. *Risk*: ownership of regions provides extra armies
     d. *Monopoly*: passing Go; also getting money from players as rent
     e. *Diplomacy*: supply centers
     f. *Die Macher*: funds
   - Prerequisites to using resources
     a. Buildings (as in *Warcraft II* and many RTS video games)
     b. "Industrial centers"
     c. Cities or supply centers (certain fixed locations)
   - Special resources/actions
     a. Collect and turn in set of cards (*Risk*) or other items ("wood and gold")
     b. Special cards ("Event Cards") e.g., "Take card from opponent's hand" card
     c. Promote a pawn (chess)
     d. "King" a piece (checkers)
     e. "Lands" in *Magic: The Gathering* must be "tapped" when using spells
   - Supply lines (unit must have unblocked access to a resource location)
     a. Mostly in wargames, and often not in those
     b. Trade routes
   - Pay maintenance to continue to have the piece (rather rare)
   - Limitations on number of pieces
     a. You can't promote a piece unless it is "dead" (chess)
     b. Cannot have more pieces than the piece mix provided in the game (quite common)

B. Some Books About Game Design

No book, certainly not one this short, can answer all questions about game design. There are dozens of books about game design and related topics. Most of them are exclusively about video game design, a few just about the tabletop, and the book you're reading is unique because we use tabletop games to help us learn to design video games.

Books about video game design often don't say much about the game design process, being more about analyzing games or about larger issues of the nature of "play" rather than about designing games.

This short list includes books that I think are particularly worthwhile. While not all of them are still in print, you can often buy used books through the big online booksellers.

Fundamentals of Game Design (2nd edition). Ernest Adams. New Riders 2009. Paperback, 700 pages (plus online additions). Written as a textbook, with all that implies. Attempts to be exhaustive/comprehensive. I have used a previous edition as a textbook in classes. Unfortunately, the book is so long that college students tend not to read it.

Rules of Play: Game Design Fundamentals. Eric Zimmerman and Katie Salen. MIT Press, 2003. Pasteboard, 688 pages. While this book is very often recommended, it is too academic for many readers. The first 80 pages are about defining what a game is, and at the end of it, I'm not sure if you've learned much that helps you actually design games.

The Gamemaker's Apprentice: Game Development for Beginners. Jacob Habgood, Mark Overmars, Phil Wilson. Apress, 2006. Full color paperback, 336 pages. The game design advice is excellent, though the primary purpose is to help you learn how to use Gamemaker, a simple free engine for making 2D games. Using this book, people with no prior game production skills can create clones of classic 2D games like *Space Invaders, Galaga,* and *Pac-Man*. Overmars is the creator of Gamemaker. Habgood and others have also written *The Game Maker's Companion* (Apress 2010).

Challenges for Game Designers. Brenda Brathwaite and Ian Schreiber. Charles River Media, 2008. Paperback 352 pages. The exercises in this book do not require programming or art skills, hence are ideal for beginning game designers.

Theory of Fun for Game Design, by Raph Koster. Paraglyph Press, 2004. "Does for games what Understanding Comics did for sequential art" (Cory Doctorow). In a book that is visual as well as textual Koster builds on the theory of "flow" discussed in Chapter 2 of this book.

Game Design: Principles, practice, and techniques—The ultimate guide for the aspiring game designer. Jim Thompson, Barnaby Berbank-Green, Nic Cusworth. Wiley, 2007. Full color paperback, 192 pages including brief index and glossary.

This is a very good book, particularly for teens, though it isn't a book about game design, it is about game production, how video games are made. It is written primarily by a teacher, and makes strong use of color and illustrations. Each topic is covered in just two facing pages, usually.

In this book there is almost no recognition — in common with most other books about video games — That you can plan everything about a game down to a "T," but you won't really know whether you've got something good until you have played a prototype.

Break Into the Game Industry: How to Get a Job Making Video Games by Ernest Adams. McGraw-Hill Osborne Media; 2003. Paperback, 352 pages. I used this as a textbook in my Intro to Gaming Class, and was very pleased with the quality of advice. Read it if you're interested in making video games as a career. A new book on the same topic by Brenda Brathwaite and Ian Schreiber should be worth looking at.

Chris Crawford on Game Design by Chris Crawford. New Riders, 2003. I listened to Crawford speak at a convention about thirty years ago, and listened to him again in 2004 at a teachers' conference. He is a man of strong opinions and unusual ideas, one of the early computer game creators.

New Rules for Classic Games by R. Wayne Schmittberger. Wiley, 1992. 245 page trade paperback, does just what it says, showing how you can easily alter traditional games.

The Game Inventor's Guidebook: How to Invent and Sell Board Games, Card Games, Role-Playing Games, & Everything in Between! Brian Tinsman. Morgan James, 2008. Paperback, 263 pages. While this is aimed at tabletop games, much of the advice applies to indie video games as well. It is a book about how to market your design, not about game design itself, so it addresses topics not addressed in the book you're reading.

Paid to Play: The Business of Game Design by Keith A. Meyers. Self-published through iUniverse, Inc. 2008. 89 pages 9" by 6" (yes, a very small book). About $20. Also, there is another book of the same name, except different subtitle, about video games. Don't get confused.

As the subtitle indicates, this book is not about how to design a game but about the process that game design is a part of, where you start with ideas and end up with a published game, whether licensed to a publisher or self published.

The author has worked in the game industry for more than 20 years, sometimes for publishers, sometimes for retailers, now for himself as a designer. I first encountered him through a newsletter he used to publish for game inventors.

That word "inventors" is important because he talks primarily about the toy and game industry (where designers are often called inventors) rather than about the hobby game industry. In particular the games that he talks about are very simple, and that may be why he feels he can wait until the game is essentially set before he writes the rules.

Understanding Comics: The Invisible Art, by Scott McLoud. Harper Paperbacks, 1994. This fascinating book explains so much about how people understand visuals, and how stories are told through visuals, that it is often recommended to anyone who wants to create video games. The book itself tells its story visually as a comic book, not through typical text.

C. Classic Games an Aspiring Game Designer Should Know

Much of good game design is built on what has gone before. If you want to be a game designer you ought to be familiar with some of the seminal games of the tabletop and video game industries. There are lots of lists of such games; here's mine. Video games and tabletop games are separated, but a game designer of either type really ought to know most of them.

"Know the game" doesn't mean you need to play it, although there are many people who would say yes you do. Some people have the notion that you cannot know a game unless you have played. Yet I've seen many cases where somebody played a game once and still has no clue what it's really about. I learn more about games from watching people play, reading the rules/manual, talking with people who play the game a lot, and reading comments at online sites such as Gamasutra and BoardGameGeek/Videogamegeek. However you do it, you should understand the essentials of the game and why it's important to the development of games.

As such, the list doesn't necessarily include the first game to have certain characteristics, because that game may not have succeeded in the marketplace, whereas a successor is much more well-known. For example, *The Sims* is much more well-known than its predecessor *Little Computer People*. And *Dungeons & Dragons* is far better known than the few role-playing games that preceded it. Moreover, not all of these games are excellent games, but they have had a strong effect on gaming, for example *Monopoly*.

The alphabetical order entries include approximate year of origin and sometimes the platform and games of the same type that had great impact on gaming.

Video Games

Video games have become such a big industry over the years, bigger than the film industry, that we could list dozens of important games. The "right" number for this list is an arbitrary selection. Many of these are games that made a new genre stand out.

Where games are listed in parentheses they are possible substitutes similar to the first one but usually more recent.

Civilization series. (1991, DOS) The epitome of turn-based strategy games. The player begins with a single settler and plays into the modern age and beyond. Wins can be through military conquest, culture, technology. Only in recent versions, however, could you play against other people instead of against computer-controlled settlers.

Colossal Cave/Adventure/Zork. (1976, PDP 11 and many others) These were the original text-based adventure games, where you had to guess at the right syntax to get something done and where logic took a back seat.

Dance, Dance Revolution. (1998, arcade and many others). Founder of the dance genre.

Donkey Kong and *Mario* series (*Sonic* series, *Prince of Persia*, *Tomb Raider* series). (1981, arcade and Nintendo platforms) The little Italian plumber was one of the first recognizable characters in games. *Donkey Kong* founded the platformer genre.

Doom (*Wolfenstein, Quake, Team Fortress, Halo*). (1993, DOS). Wildly popular shooter that looked 3-D but was still two-dimensional.

Fallout (III) series. (1997, Windows). Role-playing games that are not fantasy but post apocalyptic.

Farmville. (2009, Facebook). The player manages a farm. The social network game that really launched the platform, though not the first (and it is itself reported to be a clone of *Farm Town*). Probably the most-played video game ever.

Final Fantasy VII (and series). (1997, PlayStation). The most famous story- and character-driven games.

Grand Theft Auto series. (1997, many platforms). A game famous both for being a "sandbox" or open world game where players were not required to follow a linear story, and a game that is regarded in many quarters

as morally reprehensible because the players can run people over and kill police.

Guitar Hero (*Rock Band*). (2005, many platforms). A relatively new genre that was massively popular for a while, and is an example of a game that lets players act out their dreams, in this case of being a rock star.

Half-Life (*Half-Life 2*). (1998, Windows and many others). This game went so far beyond the normal boundaries of shooters, survival horror, and adventure that it has become legendary.

Katamari Damacy. (2004, PlayStation 2). This is actually a toy rather than a puzzle or game. Some people play it as a contest, demonstrating how unusual video "games" can be. The player controls a sticky ball that he rolls, which gradually accumulates things as it gets larger. This may not sound like much, but people love to play.

King's Quest (*Escape from Monkey Island, Grim Fandango*). (1984, DOS). Graphic adventure games. For most people these are much more engaging, and more complex, than text-based adventures, because the clues can be more complex and can be visual.

Madden Football series. (1988, Apple II and now most platforms). The quintessential modern sports video game, named after the Super Bowl winning football coach and color commentator.

Master of Orion II (*Sins of a Solar Empire*). (1996, DOS and Windows). A premier example of a 4X game (eXplore, eXpand, eXploit, and eXterminate). Colonization, war, and technology in outer space.

Microsoft Flight Simulator series. (1982, DOS). The original vehicle simulation.

Myst series. (1993). An example of a game whose strong appeal was its graphics. An adventure game that appealed so strongly to women that for several years it was the best selling video game ever.

NetHack/Rogue. (1980, DOS). Free dungeon crawl games done entirely with ASCII graphics (using symbols that are part of the standard alphabet plus character sets built into the computer). Despite having no true graphics it's a very engaging game that people love even today, another example of how enjoyable video games need not use fancy graphics.

Pac-Man. (1980, Arcade). Perhaps the first game with a recognizable (though not human-like) "character." Also the first game (assisted by *Ms. Pac-Man*) that appealed strongly to females. More than a decade after its appearance in arcades this game was finally "beaten" as someone played through all 255 levels, eating all the ghosts, not losing a single life.

Pong. (1972, Arcade). Two paddles, and a ball going back and forth.

Unlike most early video games it could (in some versions) be one person against another rather than only one person against the computer. This was the game that started the video arcade craze in the early 1980s. Its simplicity did not prevent people from playing it for hours. A game designer should always remember: complexity is not necessarily good.

Populous (*Black and White*). (1989, DOS, Atari ST, and Amiga). Original "god" game. Each player is a god trying to gain followers and take followers away from the opponents in a variety of ways, many of them violent.

Resident Evil series. (1996, Sony platforms). These are outstanding examples of the survival horror genre, and perhaps its notoriety is aided by a series of successful movies. (Most movies based on video games are pretty bad.)

Space Invaders. (1978, Arcade, 1980, Atari 2600). In some sense the original shooter. This game, along with *Pong*, introduced many people to electronic gaming.

Street Fighter series (*Mortal Kombat*). Most long lasting of the mano-a-mano fighting games.

Super Smash Brothers. (1998, Nintendo platforms). A not-so-serious brawling game that incorporates characters from many other games, one of its hallmarks.

Tetris (*Bejeweled, Peggle*). (1986, many platforms). An interactive puzzle that can be a real catharsis, played for decades in many different versions all over the world. As differently shaped blocks fall down the screen the player must move and rotate them to end up in the most advantageous position.

Thief: The Dark Project (*Thief II, Rainbow Six*). (1998, Windows). This started a genre of games something like shooters except that you succeed through stealth rather than by acting like Arnold Schwarzenegger in the movie *Commando*.

Total Annihilation (*Command & Conquer, WarCraft II*). (1997, Windows). One of the great early RTS (real-time strategy) games, though not the first.

World of Warcraft (*Everquest, Ultima Online*). (2004, Windows and Mac). This MMO is listed rather than an early one because of its massive financial success. In most respects it's just another role-playing game, but one played by millions online.

Zelda series. (1993, Nintendo platforms). This Nintendo flagship game is an early example of a video game with role-playing elements.

Tabletop Games

Blokus. A completely abstract game that has nonetheless become very popular with families, and one that uses no dice or other random elements.

Bridge (Traditional). Very popular trick taking and bidding game. Requires four players in two partnerships.

Carcassonne. The most popular tile laying game. (Dominoes, also a tile laying game, isn't listed because *Carcassonne* is so much better known amongst hobby gamers.) Represents towns and roads and farmers' fields.

Chess. (Medieval or older) This very old game is so widespread that if you don't know how to play you should learn.

Cosmic Encounter. A game dominated by special powers unique to each player. Vaguely represents an interstellar war.

Craps. (Traditional) This very simple gambling dice game is listed because you should understand the probabilities involved. And that you should always bet against the shooter.

Diplomacy. (1959) The quintessential game of negotiation and backstabbing for seven players. One of the more intense tabletop games, sometimes leading to broken friendships. Somewhat abstractly represents World War I.

Dungeons & Dragons. (1974) This fantasy game is the founder of the tabletop role-playing game genre. A large proportion of video game methods and conventions derive from *Dungeons & Dragons*. There are four quite different editions of *Dungeons & Dragons*, and familiarity with other tabletop role-playing games serves just as well.

Go. (Ancient) An East Asian game of great depth, probably older than chess. The strategy of surrounding the opposition is also quite unlike most Western games.

Magic: The Gathering. The original and still most popular collectible card game (CCG). Game shop owners will tell you that they bought their houses with the profits from selling *Magic*.

Monopoly. This is actually a weakly designed game, but because many people play with their families they have fond thoughts about playing *Monopoly*. They didn't actually enjoy the game much, they enjoyed the company.

Pandemic. A recently published cooperative game. Players are attempting to stamp out epidemics before the world is overwhelmed.

Poker. (Traditional) The premier bluffing game. Has seen a recent renaissance in the form of Texas hold 'em.

Puerto Rico. This very cerebral game has been called a symbolic classic of modern board games.

Risk. (1959) A very popular conquest game dominated by dice and often played by families.

Scrabble. A cerebral crossword board game dating from around World War II.

Settlers of Catan. Simple game of trading and settlement that has become one of the gateway board games and spawned a raft of variations.

Tactics II/Stalingrad/Afrika Korps/Waterloo/Gettysburg. (1959–65) These are the early Avalon Hill wargames that showed people you could make a game that appeared to reflect history fairly well, as well as a game that was actually strategic and not a lot of dice rolling (though dice are still used to reflect the uncertainty of combat).

FURTHER READING

Hobby Games: The 100 Best and *Family Games: The 100 Best*, both edited by James Lowder.

D. Software for Video Game Production

This is divided into two sections: software that might be used by people just beginning to make video games, and then a list of software used by professionals.

The ideal would be that you would imagine what your game is like and it would suddenly be there on the screen, but that's not going to happen. A video game is software, and software requires computer programming. Beginners cannot, practically, create games for consoles because specialized kits are required, and the console makers don't sell them to "just anybody." So beginners almost always start with PC games.

An exception is Microsoft's XNA, a form of the C# Express programming language, which allows creation of games that run on the XBox 360 as well as the PC.

Much of the software listed in this section is free to download, because professional software can be very expensive.

Gamemaker. *Gamemaker* (Lite version free from yoyogames.com, Pro version $40 activation) enables drag-and-drop programming of relatively simple 2D arcade-style games. It includes a scripting language for advanced use, and you can see the scripts it makes as you use the drag-and-drop interface to make a game. It excels at 2D action games such as those that were hits in the 80s, e.g., *Pac-Man*, *Space Invaders*, *Asteroids*, *Galaga*, or an elaborate *Super-*

Breakout are relatively easy to mimic, and you can even get something like *Zelda* on a limited basis. It is not appropriate for extensive RPGs, board games, modern-style shooters, or RTS.

Support for mouse and joystick are included. I strongly recommend the book *Gamemaker's Apprentice* as a way to learn the program. Just about anyone who likes video games can learn about game production with this program and the book, seeing how programming, art, sound, and design work together. The Pro version is needed for more complex games, but the Lite version is fine for most purposes.

CorelDraw, Adobe Illustrator. Professional drawing programs. These are vector graphic packages that are more powerful for drawing than bit-map software such as Photoshop. They are used to draw in two dimensions, though as with any drawing a skilled artist can draw something that looks three dimensional.

Inkscape. This free program does the same kinds of things as CorelDraw/Illustrator *http://inkscape.org/*

Photoshop. The professional bit-map software. Used for creating textures and 2D sprite graphics such as those used in Gamemaker.

Gimp. This free program is an equivalent of PhotoShop for creating or editing bit-mapped images.

A vector graphics program such as CorelDRAW or Adobe Illustrator, or the free downloadable program Inkscape, is better for most purposes than a bitmap/raster program such as Photoshop. Vector graphics are defined by formulas which make changing the size very easy to do and also make for small files because the program only stores the formulas. Bitmap programs keep track of the location of every dot. This makes for very large files in some cases, and can also make it difficult to change size.

Blender. This is free 3-D modeling software. It is difficult to learn; fortunately, you're not likely to be doing much 3-D work as a beginning game designer. 3D modeling is used for 3D video games and movies.

Torque. This is a game engine has often been used for small commercial games. It has lost favor as Unity gains popularity.

Unity. This slick 3-D game engine is the number one choice for people making small commercial games.

Google Sketchup. Sketchup easily lets you make simple 3-D diagrams. It is often used by level designers to mock up indoor levels. *http://sketchup.google.com/download/gsu.html*

Level Creation Practice: get a version of *Unreal Tournament III* that includes the level editor software. The deluxe version also includes 20 hours

of tutorial videos for the editor. If you like fantasy, try *Neverwinter Nights I*'s editor. Both of these games can be purchased, new, for $10 at time of this writing.

There are many other powerful scenario editors in games such as *Civilization, Spore, Little Big Planet*, and *Sins of a Solar Empire*, and as time passes new games with good editors will be released.

Software commonly used by video game studio professionals (keep in mind that this can change from one year to the next):

3d Modeling: 3ds Max, Maya; Z-Brush, Blender. Some of these have free trial downloads. 3D modeling is particularly difficult to learn on your own.

Programming: C++ is the most commonly used language, distantly followed by C#. Java is often used for cell phone games. Microsoft Visual Studio is the commonly used programming package.

Game Engines: Unreal III engine; Gamebryo is no longer supported. For independent developers, Unity.

Levels: Google Sketchup, Unreal III editor (if Unreal Engine is being used to make the game).

Bit-Map Graphics: Photoshop, Gimp.

Databases/Lists: Excel. (There are expensive specialized databases associated with tracking versions of software, as well.)

FURTHER READING

"Game engines" in Wikipedia.

E. Software for Tabletop/Paper Game Production

We can divide the software you might use into four categories: database, word processing, card making, and graphic components including maps.

Database. You need databases for two reasons, first to keep track of your ideas and notes, and second to keep track of tables that might be included in the game. I use a venerable but expensive program called Info Select, a text database program that makes it very easy to find specific information. Microsoft One-Note is a more well-known example. But you can use word processing files if you really want to. A spreadsheet program such as Microsoft Excel or the spreadsheet contained in the Open Office suite will serve. Whatever it is, it must be searchable.

Word Processing. Any good word processor will serve. Microsoft Word

(part of Office) is adequate; I prefer WordPerfect, which seems to work better with business card formats that I use to make game cards. Open Office is a free (downloadable) program that works a lot like Microsoft Office. Potential publishers will want to see things in Word format or as PDFs.

Even if you want to self publish your game you probably don't need a desktop publishing program. This depends partly on your skills with the computer.

Open Office: *http://download.openoffice.org/*

Card Making. Some use WordPerfect and the Avery business card label form for simple cards, though it can be frustrating when graphics are involved. There are several free downloadable programs designed to let you make fancy cards such as those found in collectible card games. Nandeck is powerful but difficult to learn. Magic Set Editor, designed for *Magic: The Gathering*, is also popular and perhaps easier to use.

http://www.nand.it/nandeck/

http://magicseteditor.sourceforge.net/download

Maps and Other Graphic Components. CorelDRAW is especially good for maps because it can easily tile the printing on normal sheets of paper so that you can tape a large board together. But CorelDRAW is awkward for shading areas, so when you want to make a board look particularly good you'll probably export to Photoshop for the shading and then import back into CorelDRAW.

At least one publisher uses ProFantasy Campaign Cartographer software to make his published maps. This is inexpensive software designed for people to make maps of their fantasy RPG campaigns. *http://www.profantasy.com/* Another program of this type, with a free version available, is Hexographer, *http://www.hexographer.com*, and there are others.

Microsoft Visio is designed to create diagrams. Unless you have access to it through MSDN-Academic Alliance then this expensive program is probably not worth the cost. Microsoft PowerPoint or the OpenOffice equivalent can do credibly well but is not nearly as powerful or easy to manipulate as Visio.

F. Sources of Pieces for Tabletop/Paper Games

You may be able to cannibalize old games, and some people check thrift shops and yard/garage/boot sales just to purchase old games in order to use the pieces.

Rolco Games may be the only American company that actually produces small plastic pieces for games for sale to individuals. *http://www.rolcogames.com/*. In the UK try Plastics for Games : *http://www.p4g.co.uk/us/us_index.asp*.

Wooden pieces tend to come from Europe. Try *http://www.meeplepeople.com/products.php?cat=44* or do a search for sources. Wood tends to cost more than plastic. See also *http://www.spielmaterial.de/english5/*

EAI Education and other school supply companies market many plastic and even wooden items that can be used for game pieces, as well as all kinds of dice including blank ones. These can often be purchased in bulk. I buy plastic blocks and stackable pieces by the thousand, for example. Many of these are listed as "manipulatives" or under "math." *http://www.eaieducation.com/*

You can buy blank cardboard counters, often used in wargames, from some game publishers. EAI sells one inch plastic squares in two thicknesses and four colors. You can also use counter templates from graphics programs or even spreadsheets to print counters onto paper, then glue the paper to cardboard to be cut out.

Your local tabletop game shop, if you have one, may sell some useful items, certainly dice.

G. Online Resources (Websites, Files, Forums)

Gamasutra. Despite the unfortunate cutesy name, this is the primary site for video game industry professionals. You can learn a lot about the video game industry just by reading the news articles. It also hosts many blogs, among them my "expert blog." *http://gamasutra.com/*

GameCareerGuide. This is the primary site for people who want to get into the game industry. The archives go back many years, just as for Gamasutra. *http://www.gamecareerguide.com/*

GameDevNet. An alternative to Gamasutra. Pretty strongly programmer-oriented. *http://www.gamedev.net/*

Boardgamegeek, a general online community for board games, has a game design forum with many interesting discussions going back years. There is a lot of unhelpful chit-chat as well. Recently they have started *http://videogamegeek.com/*, doing the same for video games, and *http://rpggeek.com/*, for RPGs. *http://www.boardgamegeek.com/*

Dozens of blogs discuss game design. Start with the following, or just do a Google search:

Gamasutra "expert" blogs. *http://gamasutra.com/blogs/expert/*

PulsipherBoardgameDesign. *http://pulsiphergamedesign.blogspot.com/*

Teaching Game Design (Ian Schreiber). *http://teachingdesign.blogspot.com/*

The Boardgame Designers Forum is an online discussion group that can be useful for many purposes. *http://bgdf.com/*

Gamedesign-l Yahoo Group. Founded in 2000 for video game design, nearly 10,000 messages. *http://games.groups.yahoo.com/group/gamedesign-l/*

Yahoo Groups Board Game Design often involves questions by novice designers. There is a lot about self-publishing. The archives are all there, so read all those old discussions and messages. *http://games.groups.yahoo.com/group/BoardGameDesign/*

USENET rec.game.design is often overrun with SPAM. *http://groups.google.com/group/rec.games.design/topics?pli=1*

The IGDA has a useful Web site, though not focused on game design. They also offer an example game curriculum (list of categories and subjects). Look at the game design section: *http://wiki.igda.org/index.php/Game_Education_SIG/Curriculum.*

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Glossary for Game Designers

This glossary is written specifically for game designers, which means it has many entries that apply to game design but not game marketing or video game production. Furthermore, it covers both video games and tabletop games. "Computer games" and "video games" are used interchangeably to refer to PC, console, and handheld gaming.)

AAA list games— These are video games that are advertised frequently and sold in a great variety of non-game stores such as Best Buy and Walmart. Their budgets are generally $20 million or more (much more for MMO's). The most successful ones sell many millions of copies. The most successful pay-to-play MMO peaked at over 11 million subscribers.

Abstract— Bearing no relation to/connection with the real world. Checkers, go, and chess are abstract. (Chess is supposed to have reflected actual warfare at some distant date, but that reflection has been lost over time.) Although *Monopoly* really has nothing to do with the real world, it is intended to represent real estate dealings and is not regarded as an abstract game.

Accessibility— An accessible game is easy to learn to play, though not necessarily easy to master. Chess is an accessible game that is hard to master. Video games are often accessible, as players don't even need to read rules to play.

Adapter (a player type)— The adapter is in between the planner and improviser. He or she likes things to change a fair bit from time to time or moment to moment, but still wants to be able to plan ahead a few turns or a few minutes as the case may be.

Adventure Game— Originally text only, these video games emphasize puzzle solving to achieve some story goal. Examples: *Zork, Myst, Grim Fandango, Monkey Island*.

Agent— In game usage, an agent is a middleman between game creators and game publishers who helps arrange a deal and takes a percentage of the revenue. Similar to an agent for book authors, except that most successful authors use agents, while most freelance game designers do not.

AI (Artificial Intelligence)— A video game can be ruined by weak "artificial intelligence" because the computer opponent(s) will present no challenge and no resemblance to human players. A solitaire tabletop game provides a computer opponent of sorts, but it cannot be sophisticated enough to properly be called an AI.

Analog— Something that has a continuously changing range of values or measurements, as opposed to digital where there are discrete values that jump from one to

another. A slide rule, a device used by engineers before electronic calculators existed, is an analog computer. This is also used at times to mean "non-electronic" games, as opposed to "digital" (electronic) games.

Analysis Paralysis— A player presented with too many decisions, or too many plausible choices for a decision, may effectively "freeze up" and do nothing for quite a while. In a turn-based game analysis paralysis slows down the game for everyone, and can be quite unpleasant for the "paralyzed" person. Many games, consequently, are designed to avoid this situation of too many decisions or too many plausible choices.

Anticipatory Conflict— This kind of conflict is even less direct than indirect conflict. It occurs when one player makes a choice, commonly a selection of something, in order to prevent another player from making that choice — deliberately anticipating the other player's intentions.

ARGs (Alternate Reality Games)— Games that intrude into the real world in some significant way, for example one of the early commercial ARGs emailed players and even placed phone calls to them in the real world *as part of the game*.

Art— Games are "art" in the broad sense, but the players don't care. People who are not hardcore video gamers, and often not video gamers at all, often think of video games as "works of the hands" (which Dr. John Sharp calls mechanical arts) rather than "works of the mind" (which Sharp calls liberal arts). The latter gets a lot more respect as "art" from the general populace. Anyone who understands games realizes that they are works of the mind, but most non-gamers don't understand games, tending to lump them in with "kids' stuff."

A few games may be "high art." In that sense, "Art is about changing the world; entertainment is about leisure" (Ian Bogost). Some players may care about that.

Asymmetric— In games, starting positions that are not identical. Historical war simulations are asymmetric.

Atmosphere— A story or history that a game ostensibly represents, so that the game may provide a feel for the story, but it actually has no effect on how the game plays or how it's constructed. This is as opposed to a theme which does have an effect on how the game plays and how it's constructed. The game *Monopoly* is so far removed from the real world that now that we would say it has an atmosphere rather than a theme.

Auction or Bidding Game— A game in which a principal mechanism sees players bidding against one another to achieve some end. Bidding could be for purchasing goods, it could be for securing a particular order of play, or it could be for some other purpose.

Avatar— Something, usually some form of an electronic character but possibly just a token, that represents the player of the game within the game. Avatars are very common in video games but can also be seen in board games, for example the tokens in *Monopoly*. A game becomes more personal and probably more involving when you can see yourself, especially if "you" can be killed.

Balance— See "play balance."

Bell Curve— Also called a normal or Gaussian curve. This curve represents a probability distribution where some events (near the top of the curve) are much more likely than others (near the ends). Rolling two dice repeatedly and summing the result gives a bell curve. Game designers must understand simple probabilities such as this.

Beta (Beta-Test)— The term often used to refer to the game that is still in play testing stage. Sometimes we also talk about alpha testing which comes before the beta-

testing. In that case, beta testing usually involves people who are not active in creating the game.

Blind-testing— A form of playtesting where the designer is not involved, so that the players are playing a game just as though they had bought it and taken it out of the box. For tabletop games this is the ultimate test of the clarity and completeness of the rules.

Books— There are dozens of books about game design. Most of them are about video game design, written by people who have been involved in video game production, and actually say little about the process of game design, devoting much space to analysis of games and to marketing of video games. There are also a few academically derived books about games, where you can see such things as 80 pages devoted to defining what "game" means.

Borrowing— Virtually every game designer borrows ideas from other games by other game designers. Sometimes they don't borrow but appear to because they've had the same ideas that many other people have had. Virtually all games are built upon what has come before, so don't worry if you find yourself borrowing an idea from here, and an idea from there.

Camping— In video game shooters, staying in one well-concealed, easily-defended place in order to shoot lots of competitors without being vulnerable. This is often regarded as "unsporting" if not unmanly, yet if players can succeed by doing this, some of them will. The more general expression of this is "turtling."

Cards— As a tool in the game designer' s toolbox, cards provide potentially colorful but normally hidden information. Games using a standard 52 card playing card deck are typically games of hidden information, as opposed to traditional board games which are typically games of perfect information. Event cards in board games can provide a great deal of variety and replayability. Video games can incorporate the equivalent of event cards, but rarely do.

Card-driven Game (CDG)— A two-player wargame in which play is dominated by cards representing historical events, and enabling a player to do certain things. Without the right card(s) a player may not be able to attack at all. Each player has a hand, and the deck may be shared, or there may be a separate deck for each player. (This structure varies occasionally, of course, e.g. more than two players.)

Casual Game— Video games that provide a short, episodic experience, and which people play to relax rather than to "beat the game" or prove that they're bad-ass gamers, are usually called casual games. Versions of solitaire played with playing cards are casual games. Casual video games are much less expensive to make, and usually less expensive to buy, than AAA games.

CCGs (Collectible Card Games)— Players purchase randomly selected sets of cards and sometimes trade cards in order to construct decks that they use to play against one another, usually in a two player game. Many of the cards break the standard rules of the game temporarily by virtue of some special power. The manufacturers continue to create new cards that gradually render some of the old cards useless or pointless. Sometimes older cards are banned because they have proven to be too powerful. A game session itself is relatively short; much of the interest in the game comes from the meta-game of building specialized decks of cards to take advantage of the special powers of specific cards.

Challenges— Many games are a series of challenges, which may be physical or mental.

Single player video games are challenges devised by the designer and posed by the computer. Typical tabletop games are devised by the designer to enable players to challenge one another. In every case there must be some action a player can take to meet the challenge. Some people would go so far as to define a game as a series of challenges and actions.

Chaos— The more chaotic the game is, the more it changes from turn to turn or from minute to minute, whether this change is caused by other players or by non-player factors including sheer randomness. The more chaotic the game is, the more it suits the improviser player type; the less chaotic, the more it suits the planner type.

Character Class— In role-playing games, the profession of a character that helps define what he or she can and cannot do.

Chrome— Additional rules, often accompanied by pieces or cards, that add to the atmosphere of a game or help implement the theme. At the same time "chrome" makes the game more complex. Leader pieces and leader rules in a wargame can be a form of chrome. Insofar as the computer keeps track of details, it's more practical to add chrome to video games than to tabletop games.

Cinematic— A movie inserted into a video game to help advance the narrative. Now largely displaced by cut scenes.

Clarity— An important characteristic of any game, but especially of game rules, is that they must be clear to the player. If players don't understand what to do or don't know why they do it then they're less likely to play the game correctly and they're less likely to enjoy it. While video games have no written rules, the mechanics of the rules are enforced in the software, and if these are not clear then the game will be less enjoyable.

Classical (Player Style)— This player tries to know each game inside-out. He wants to learn the best counter to every move his opponent(s) might make. He takes nothing for granted, paying attention to little details which probably won't matter but which in certain cases could be important. The Classical player *does not* avoid taking chances, but he carefully calculates the *consequences* of his risks. He dislikes *unnecessary* risks. He prefers a slow but steady certain win to a quick but only probable win. The Classical gamer concentrates on eliminating errors rather than on discovering brilliant coups.

Collectible Games— While collectible card games are common, there are other kinds of collectible games using collectible chips or collectible chess-like pieces, or some other item. Some collectible card games don't actually have cards that you can hold in your hand because they are done purely in online video.

(Another meaning of "collectible" refers to the interests of people who like to collect games about certain subjects. The game is not regarded as collectible unless all the components, even the cardboard left over after cardboard pieces are punched out, are still with the game.)

Commercial Viability— Many novices design a game which is practically unmarketable, that is, is not commercially viable because very few people will buy it regardless of how good the game is to play. This is frequently because the game uses components that are easily found at home. E.g., it's really hard to sell a game that uses only a standard deck of cards, or a game that uses a standard chess set. The rules are going to become available to people online in some way, so if the components are easily available at home most people aren't going to buy the game, they'll just

use what they have at home. Yet there are a few commercial games that derive closely from traditional card games but change components slightly (*Sequence, Wizard*).

Complexity— While some designers of video games may argue that complexity contributes to a feeling of authenticity or immersion, many other designers would say that complexity is undesirable. This is certainly true in most tabletop games. Frequently a novice game designer will make things unnecessarily complex. A major objective of most game designers is to remove complexity that is not necessary to the quality of the game. But someone who is designing an interactive puzzle, as are many video games, may believe that complexity contributes to the challenges of the puzzle. Of course, a game with poor programming, or poorly written rules, may be perceived as more complex than it ought to be.

Contest— Any activity that can be timed, that one person can do faster than another, can be turned into a contest, but contests are not necessarily games and often are not. People who type like crazy for 10 minutes and whoever typed the most words "wins" are engaged in a contest. It is a competition, but not a game — there is no aspect of game design to this contest.

A race is usually much like a contest except that all participants are on the same field of play at the same time and may at least slightly affect one another. Also, there may be some aspects of game design to a race, which is a reason why NASCAR, Formula 1, etc. keep tweaking the rules.

Convergence— This word has many applications, but in the realm of games it refers to the way that video games are coming more to resemble tabletop games and tabletop games are coming more to resemble video games. For example, some video games are now designed for multiple sides where people play against other people, whereas some board games have become much like multiplayer solitaire, more like puzzles than games.

Cooperative Games— The primary purpose in a cooperative game is for all of the players to collectively beat the game. Occasionally there is a traitor and the traitor is against the other players. These games are much easier to do with the computer than on the tabletop thanks to the power of the computer to provide opposition, but the advantage of the tabletop version is that all the players are sitting around the table, making cooperation simple. Technically, in a "collaborative" game, players may suggest specific plays to one another and the game amounts to one side of several players against the game (*Pandemic*). In the (rare) truly cooperative game the players are independent agents who must cooperate in order to win, but only one actually wins. Games with a traitor begin to resemble this form.

Copyright— Law that protects a particular expression in words or pictures. Others cannot legally copy that expression, but they can use the ideas expressed, because game ideas cannot be copyrighted. Artwork, photographs, and other visual means of expression can be copyrighted. The law has changed so that now a person has copyright in whatever they create as soon as they create it.

Creativity— Creativity is an important but small component of game design. Most of the work involved in the game is fairly straightforward thinking and problem-solving. This is not to say that it's easy, but it does not involve a great deal of creativity. Novice game designers often have a confused idea that game design is all about creativity, which is very far from the truth.

Cut Scene— A video created using the game program rather than a separate video

editor, and inserted into the game to advance the story. As computers and game software have become more powerful cut-scenes have replaced more expensive cinematics.

Deadline— The date by which something needs to be done (see milestone).

Development (1)— In the world at large, development in relation to computers means computer programming. In the video game industry development refers to all of the tasks that the game creators accomplish. The term game creator rather than game developer is better as it makes absolutely clear that programming is not the principal activity in video game creation.

Development (2)— In the tabletop game world a developer is someone assigned by the prospective publisher of a game to further modify and refine a game after it is received from the designer. The developer may function like an editor of a book, or he may in effect be a co-designer of the game.

Depth— This generally applies to games where thinking is a major activity if not the major activity of the players. A game with little depth is easy to play well, whereas a game with a lot of depth requires a lot of experience and study to play well. Chess has a lot of depth. *Monopoly* and most other traditional family games have very little depth.

Design Document— If the video game has passed beyond the pitch and game concept/treatment stages to actual pre-production, then the designer(s) will write fairly long documents describing all the details of the game, so that artists, programmers, sound people, and others can actually make the game. Ideally these people read the game design document, but in practice they often don't and simply ask the designer. Ideally the document is revised to reflect changes in the game, but often this doesn't happen. Game studios are moving away from very long game design documents because they delay the game production as a whole.

Dicefest— A game dominated by dice rolling — lots of dice. Examples: *Risk, Axis & Allies, Yahtzee,* some role-playing games. Oddly enough, there's not a similar term for games with many chance elements that are not dice, for example cards.

Digital— Something that has discrete values that jump directly from one to the next as opposed to analog where values are a continuously changing range of possibilities. Dice are, technically, digital.

But we must concede that most people equate "digital" with "electronic," just as they equate "computer" with electronic even though analog computers (such as slide rules and artillery ballistics calculators) preceded electronic computers.

Direct Conflict— This occurs when one player does something with the forces he controls for most or all of the game that immediately affects forces that another player controls for most or all of the game.

Dominant Strategy— A general course of action that, if followed, consistently gives you as good a chance to win a game as possible. A solution to a puzzle is the dominant strategy. Good games (as opposed to puzzles) should not have dominant strategies. A dominant strategy in five player *Monopoly* is to buy every property you land on, and never agree to a trade that gives someone a monopoly unless you get a better monopoly.

Downtime— Time when a player is not actually participating in the game, as in between one turn and the next. This is uncommon in video games where simultaneous play is the norm. In modern games a lot of downtime is generally regarded as a flaw.

Drafting game— A game where a principal mechanism is choosing a role or other

function or item before someone else chooses it—like drafting college players for professional sports teams in the US, or for fantasy sports leagues.

Education—It is not necessary to have a degree of any kind to work in the game industry. Probably this will no longer be true by 2025. What the game industry wants is educated people, but not educated in the sense of having degrees, rather educated in the sense that they want to learn and are always willing to learn more. These people will look up a word when they don't know it, they'll find out how to do something when they don't know how, which may involve teaching themselves how to do it. They won't whine "I haven't been trained to do that." The game industry has no place for slackers or people who expect to have their hands held.

ESRB Ratings—Video games are rated by the Entertainment Software Rating Board, an industry self-regulation body. Ratings include, EC (Early Childhood), E (Everyone), E10+ (Everyone 10 and older), T (Teen), M (Mature), and AO (Adults Only). Designers need to recognize which category they're aiming for. *http://www.esrb.org/*

Euro Game—There are so many different definitions of "Euro game" that any attempt to characterize the entire category is likely to lead to sometimes strident disagreement. A very broad category of board and card games first made popular in Europe that de-emphasize winning and tend to avoid direct conflict in favor of indirect and anticipatory conflict. Some Euro games have been characterized as multiplayer solitaire because there is so little interaction between the players. Another well-known definition is simply "family games on steroids."

Experience—Especially in the video game industry, game design improves with the experience of the designer. In the tabletop game industry it's possible for someone to design just one game but come up with a classic, such as *Blokus* or *Pictionary*. In general though, experience helps make game designers better designers.

Family Game—A game that is sufficiently accessible and transparent, usually lacking depth, that groups of adults and younger children can play together. There are usually mechanisms of some sort that make it possible for Junior to win occasionally, or for mom and dad to let Junior win without appearing to do so. Many of the traditional games people know, such as *Monopoly, Sorry*, the *Game of Life*, and so on, are family games.

Filler game—A fairly short and easy-to-play game, though not necessarily one that lacks depth, that can accommodate a range of numbers of players so that it can be played while waiting for other players to show up, or after some players have left the gaming session.

Fluidity—Extent to which the game circumstances change over time. In a highly fluid turn-based game, at each turn the player will be faced with a significantly different situation. This makes it difficult to plan ahead, putting a premium on improvisation. See chaos.

Fog of War—In real warfare leaders rarely know exactly where the enemy is, how many there are, or what their capabilities or intentions are. This is the "fog of war." In traditional board games most of this information is obvious to the opponent. In card games most of this information is hidden from the players. In typical computer games the computer hides most of this information from the players.

Game—A play activity with both rules and goals and some semblance of intelligent opposition. Many things that we call games are more properly called puzzles, for example the card game *Solitaire* and the video game *Tetris*.

Game Design—A combination of problem-solving and creativity used to create the framework, structure, and mechanics of games. In video games, game design also involves a great deal of communication with the people who actually make the software. Making and marketing the game is not part of game design, though very important to the success of a commercial game. Game design has little to do with visual arts and nothing to do with computer programming.

Game Development—See "development."

Gameplay—Gameplay is the heart of any game. What happens? What does the player DO? Is it interesting or enjoyable (or both)?

Game Production—The entire process of creating/making a game, from beginning to distribution. Most of this process involves programming and art. Sometimes confused with game design, which is technically a subset of game production.

Game Concept/Treatment—A description of the game or game concept, one to several pages long, designed to interest those with funding (often publishers) so that they will support the game. There may be a shorter concept document and a longer treatment document that generally are used after a successful "pitch."

Gamy or Gamey—A play or strategy in the game that seems to take advantage of the rules without following the spirit of the game or the theme of the game. In some circles this is perfectly acceptable, in other circles this is frowned upon. See "rules lawyer."

Gaussian Curve—See bell curve.

Genre—The subcategory of games with fairly well-defined methods and appeal to players. In tabletop games this usually refers to the general structure, for example card game, board game, role-playing game. In video games this usually refers to the types of challenges in the game. First-person shooters are a genre, as are real-time strategy games and platformers.

Graphics—The visual aspects of a game, particularly art. Graphics are important to selling a game, but the best games are enjoyable even if the graphics are very simple. For most players graphics are very much subordinate to gameplay. Successful tabletop game prototypes rarely have high quality graphics. Video gamers may be more graphically oriented than tabletop gamers. See also "prettiness."

Hardcore Gamers—People for whom playing a game is an end in itself, who are ego-involved in their game activities, and who (sometimes) feel they are better than other people in some way because they're gamers. They usually spend a great many hours playing video games. To some extent we could use the word "fanatics" as a substitute.

Hobby Games—Board and card games designed for game enthusiasts who like to play games designed for adults, not for kids. (Adult in the sense of mature and responsible, not in the sense of pornographic.) Some hobby games are wargames, but most are not.

Hotseat—A video game technique in which players take turns sitting at one computer, making their moves. Now that local area networks are very common, this is rarely used.

Ideas—Every game involves ideas, but specific ideas are not as important as how those ideas are put together. A new idea is very rare, in games or in anything else. An idea that is new to you is probably one that dozens if not hundreds of people have thought of before. It may have been used in games many times before, you just

don't know those people and those games. In other words "ideas are a dime a dozen," and nobody pays for game ideas, they pay for the execution of ideas in games. Novice game designers often have the notion that they can come up with a great idea and someone else will make the game for them and they'll make tons of money from it. Nothing could be further from the truth. (Occasionally someone will pay for a toy idea, but usually they want to see a working version of it.)

IGDA (International Game Developers' Association)— Principal organization for video game creators ("developers").

Immersion— Feeling like you're really into the game, as though you're really "there" in the atmosphere or theme of the game. Often, hardcore video gamers and many role-playing gamers feel that immersion is very desirable, while players of abstract games may not expect any such thing (though they can become very absorbed in a game).

Improviser (player type)— An improviser likes a game where circumstances change quite noticeably if not drastically between the times he can act, so that he has to improvise what he does as he goes along. There is little opportunity for planning ahead in such a game. This is the opposite of the planner player type. Example: in some respects poker is a game for improvisers, though in other respects there is a long term view and long-term plans are possible.

Incremental— Something that changes slightly each time as it is done many times. In programming, incrementing a variable often involves adding one to it each time it is used. In game design you incrementally modify your game in order to make it better in light of playtesting results.

Indie (Independent game developer)— Video games and game developers not funded by a mainstream game publisher, or not funded at all.

Indirect Conflict— This occurs when one player's directly controlled forces affect another player's indirectly controlled forces or capabilities, or vice versa. One or both players may only temporarily have indirect control of the indirect forces. For example, one player of a civilized nation causes barbarian invaders to attack another civilized nation controlled by another player. The barbarians are the indirectly controlled force. A common example is use of an Event Card that causes some harm to another player's forces (famine, confusion, and so forth).

Intellectual Property (IP)— Identifiable characters or stories that can be owned by an individual, company, or institution, and hence cannot be used by others without paying for a license. Some intellectual property, for example *Lord of the Rings*, *Star Wars*, or Mickey Mouse, is very valuable. Ownership is generally characterized by copyright or trademark, much more rarely by patents.

Iterative— Something that is repeated over and over, probably with small changes. Game creation and especially play testing is iterative.

Kingmaking— If a player believes he no longer has a chance to win, but is then able to decide which other player wins (by virtue of how he plays), this is said to be king-making. Applies only in games with more than two players.

LARP (Live Action Role-Playing)— Players actually dress up in a LARP and possibly use props like padded swords or Nerf guns. While some regard this as juvenile, the players are usually adults. Non-violent LARPs may be something like a mystery dinner or weekend improvisational theater. LARPs are games, not historical re-enactments.

Leader Bashing— Ganging up on the leader in a game to try to prevent him from

winning. This is a natural way to play, but if the design makes it too easy, the game suffers severely, as players try to lurk in second or third place in order to jump into first at the end of the game after others bash the leader.

Level Design— Many video games have multiple levels — stages, missions, or episodes of play. These are often designed by subordinate game designers called level designers. This has nothing to do with visual art although some level designers may provide concept art. It is much more common in video games that the level designer writes scripts, small programs, to help individualize the level, than that he creates graphics.

Levels— This term is used in many ways dating back to original tabletop *Dungeons & Dragons*, where level could refer to the experience level of the character or to the level of a dungeon, which roughly translated to the difficulty level for adventurers in that part of the dungeon (difficulty level matches to experience level). In video games, level usually means a stage or episode or mission that a player completes on the way to completing the entire game. Any game using character levels will often be perceived as a role-playing game, though some are not actually RPGs.

Marketing— A game can be excellent to play but not sell very well if there is a marketing failure. Or the game just may be difficult to market, as most abstract games are. Timing has a lot to do with this. A game that could sell very well two years from now, or two years ago, might be a failure today.

In the video game industry there is very little respect between game creators and the marketers. The creators feel that the marketers don't understand the game and are only interested in "flash and trash," in a soulless feature list. Often the senior producer of a video game project spends a lot of time fending off unreasonable requests from Marketing to change the game.

MDA (Mechanics, Dynamics, Aesthetics)— A common way of looking at game design. The mechanics (rules of the game) interact with the player(s) in dynamic ways, making some impression on the player (feelings, thoughts). Some games originate with mechanics, some with aesthetics (what you want the player to feel), some with dynamics (what you want the player to be doing).

Mechanism or Mechanic— Game rules (or game programming for video games) generally describe methods by which the game moves forward, and these methods are the mechanics of the game. For example, rolling two dice and moving your token the sum of the roll around the board is a game mechanic (*Monopoly*). Moving one piece on an 8 × 8 square board according to the movement capability of the piece is a mechanic in chess. In video games mechanics result in challenges that players take actions (such as moving a joystick or pressing a button) to overcome.

Metagame— The game above or beyond the game, the game that takes place between games. Much of the interest of collectible card games is the metagame as players try to collect the right set of cards to make a deck that is very difficult to beat. Sometimes metagame considerations influence how someone plays, for example they don't want to offend their spouse who is also playing, or they know that such and such opponent is a frequent liar in games and use that information to make decisions within the game.

Milestone— The contractual date at which certain elements of a game should have reached a defined state. If a video game studio misses the milestone, at best they will not get paid, at worst the game will be canceled.

Miniatures Game—A form of gaming using a tabletop and dozens of small metal or plastic painted figures and vehicles representing units of troops. The minis are generally required to be in groups to form coherent units. (Skirmish games may use miniatures, as well, but figures represent individuals, not units.)

Minimax Strategy—Playing to minimize your maximum loss (or maximize your minimum gain). This is the mathematical game theory ideal of how one should play a game. You assume that the opposition is a perfect player or players and act accordingly, which may involve using chance to decide exactly which particular strategy should be used because there is no certain best strategy. Hence "Yomi," reading the intentions of the other players, is not part of minimax.

MMOs (Massively Multiplayer Online) Games—The key to MMOs is persistence and numbers. You play a character in some fictional or historical setting along with thousands of other players, and you continue to play that character for months or even years. In some games, what the players do affects the setting; in others the setting is the same for every player as they go through the game. Most games can be played solo but the more dangerous challenges require large groups of players to succeed. Some MMO's have a monthly fee, others can be played for free.

MUDs (Multi-User Dungeons)—This is perhaps the original form of online game, text adventures played through a server. In other respects they resemble small MMOs.

Non-digital Games—Another term for tabletop or non-electronic games. Strictly speaking, many tabletop games are digital rather than analog insofar as they involve strictly discrete numbers rather than continuously changing ranges.

Non-electronic Games—A less mellifluous term for tabletop games or "non-digital games." Technically, non-electronic is broader than tabletop but for practical purposes they amount to the same thing. See "analog," "digital."

Normal Curve—See bell curve.

Novice/Newbie/Noob/Noobie—Someone with little or no experience in the game being played, or possibly in game playing in general.

NPC (Non Player Character)—This term applies specifically to characters in role-playing games that are controlled by the referee or game master. It can also represent all the forces that the game designer controls and the players do not.

Organized—As in organizing your game design efforts. If you're only designing one game you might get away with being disorganized. If you want to be a professional, you'll be working on many games at the same time except when there's one video game actually in production that consumes most of your time. You will have to organize your ideas, your thoughts, your testing, or you'll lose a lot of important data and information.

Organized Play—Tournaments and other contests run by or supported by the publisher of a game in order to encourage play. This is just about necessary to the success of collectible card games.

Party Game—A game well-suited to use at parties, where people like to play games that help elicit laughter, that are easy to learn to play, and that don't require concentration. The game usually accommodates a wide range of numbers of players. *Apples to Apples* is an example.

Patent—A strong form of protection of specific kinds of intellectual property that costs thousands of dollars. A patent is supposed to apply to a particular expression

of an idea in some kind of device/invention, but the US patent office has become very erratic in its application of the law. Successful commercial games are almost never patented, and most game patents are faintly ridiculous to experienced gamers. A sure hallmark of a novice game designer is that he or she gets a patent for their game (which has often not been playtested thoroughly). Software tools made during the production of a video game are sometimes patented.

PBM/PBEM (Play by Mail/Play by E-mail)— Some tabletop games can be played by ordinary mail or email, with the assistance of various aids such as Cyberboard and Vassal for mapping or dice rolling. Play-by-mail chess and *Diplomacy*, for example, have existed for decades. This is not the same as a game having an electronic, online version.

Perfect Information— In games of perfect information the only data hidden from an opponent is a player's intentions. Chess, go, checkers, and many other traditional board games are perfect information games.

Perfectionism— The intention that everything should be perfect when one finishes a job or project. Often a perfectionist ends up taking a very long time in order to make sure everything is perfect. Game designers cannot be perfectionists, for a game is never "done." At some point you recognize that additional improvements will not be worth the time required, or you reach a deadline that you cannot get around.

Petty Diplomacy Problem— As named and described by R. Wayne Schmittberger, this is a situation, usually in the three player game, where a player who feels he cannot win can decide which other player wins through his actions. See kingmaking.

Pharming— In MMOs, playing the game repetitively (for example, wait for a monster to spawn, kill it, wait for it to spawn again, kill it) so that you can build up levels or loot, then sell the account to someone else for actual money. As a designer you should ask yourself, if it's possible to easily do this, isn't there something wrong with the game?

Planner (Player Type)— A planner likes a game where circumstances don't change much between his opportunities to play, so that he can plan well ahead. He also likes games with perfect information or nearly so because that helps him be able to plan ahead. Chess is a game for planners.

Platform— The specific systems (and operating systems) that a video game can run on. For example, many games run on Xbox 360 and PS3 only.

Platformer— Video game genre in which a principal activity is running, leaping, and jumping, often from one platform (like a ledge, but sometimes in the middle of the air) to another. Sometimes the platforms move.

Play Balance— A balanced game is one that is "fair." Each player should have an equal chance of winning even in asymmetric games, that is, games with unequal starting positions. When the "game" is for one player, as in many single player video games, a balanced game is one where the reward is commensurate with the skill and effort exerted by the player. It's instructive to note that chess is not a well-balanced game, because whoever plays first has a much better chance to win, even though the positions are otherwise symmetric.

If a game is not transparent, many one-time players may suppose it is poorly balanced even though more experienced players recognize that balance is excellent.

Player Interaction— When the action of one player immediately affects at least one other player's situation then there is player interaction. Good games usually, but not always, have a high degree of player interaction. Some people would say that player interaction is the whole point of games.

Playtesters— People who play an unfinished game in order to find ways to improve it. It is not necessary for the playtesters to be experienced players, or to even care about improving the game, as long as the designer can observe what needs to be improved. Nonetheless, a playtester who understands games and how games are designed can be very valuable to a designer.

Playtest/Playtesting— Playing a prototype of a game to try to find ways to improve it. Sometimes play testing in video games is used to work out the bugs in the game; proper play testing is intended to improve the design of the game, not just to make sure that it works exactly as it was designed to work.

Pitch— A brief, usually oral, description or presentation of a game or game concept designed to elicit support from people who have funding (usually publishers), to persuade them to support or publish the game. An "elevator pitch" is the two sentence version of this, the kind of thing you could say to someone during an elevator ride or just in passing. A successful pitch is often followed by a longer written game concept/treatment.

Power-up— In video games, some item or other element that can be picked up that confers a usually temporary increase in capability of a player character.

Prettiness— Many people like pretty-looking games, but prettiness has virtually nothing to do with player interaction or good gameplay. Many novice designers spend a lot of time making their prototype pretty. This not only wastes time, it can discourage the designer from changing the game because he or she has put so much work into making it pretty. In video games, successful studios add the prettiness to the game after they've put in sufficiently good gameplay. Publishers of tabletop games will supply their own prettiness, and do not expect it from the designer.

Probability— The likelihood that something will happen; this can often be calculated, for example that seven will be the sum of the roll of two dice on average one time out of six (6/36). Someone who cannot calculate probabilities is often at a disadvantage in games and certainly in game design.

Prototype— An unfinished version of a game suitable to be playtested and modified.

Publishers— Companies that manufacture and distribute games. These operate much like book publishers, except that sometimes the creators of the game are full-time employees of the larger publishers such as EA, Activision, and Hasbro.

Puzzle— There are many definitions for this, hinging on rules, solutions, and opposition. A puzzle is an activity, sometimes incorrectly called a game, where there is a goal and no semblance of intelligent opposition. While some puzzles have rules, they are more like guidelines or conventions; if you don't follow them, so what? Of course, an electronic form of a puzzle can enforce its rules. (Think the card game *Solitaire* in its many forms.)

Formal puzzles have a unique solution, and once you've solved the puzzle there is little point in playing further. Many single player video games are interactive puzzles, some with a single solution where there's no random factor, some (which include randomization to avoid complete predictability) with "optimal ways to do things"— dominant strategies and tactics. Games, in contrast, cannot have "solu-

tions" or a dominant strategy because of the unpredictable and infinitely-varying influence of the opponent(s).

Quest— A mission offered or assigned to a character or group in a game, especially role-playing games. Completing the request usually yields some reward.

Race— The more general meaning of the word race would be working to achieve something before anyone else can. We'll confine the term "race" to an attempt to arrive at a location before others who are attempting the same thing at the same time in the same place, with some small opportunity to hinder opponents. For example a horse race, a Formula One or NASCAR race, a sprint race in Olympic track and field. (The high jump or polevault are contests, not races.)

Random— Occurrences in a game over which none of the players have any control, generally governed by luck/chance such as a card draw or roll of dice.

Real-time— Continuous play without turns, so that there is never a pause in the action. This is typical of video games.

Real-Time Strategy Game (RTS)— A genre involving command of a large force, involving collection of resources and construction of factories and units, that is played in real-time (as opposed to turn-based).

Replayability— Tabletop games are ordinarily designed so that they can be played many times, over and over, and still be enjoyable. There are exceptions on the tabletop, and often video games are designed to be played just once or a few times (hence you "beat the game"). For the players, obviously, a highly replayable game is a good thing.

Resource Management— Collection and allocation of various goods in order to create other goods or factories or some other commodity. Some games are primarily resource management games. Many economic games include resource management, of course.

Romantic (Player Style)— The romantic looks for the decisive blow which will cripple his enemy, psychologically if not physically, on the playing arena. He wishes to convince his opponent(s) of the inevitability of their defeat; in some cases a player with a still tenable position will resign the game to his romantic opponent when he has been beaten psychologically. The romantic is willing to take a dangerous risk in order to disrupt enemy plans and throw the game into a line of play his opponent is unfamiliar with. He looks for opportunities for a big gain, rather than to maximize his minimum gain. A flamboyant, but only probable, win is his goal. The romantic is more likely to try to "get into the head" of his opponent (Yomi), to divine which strategy the opponent will use and play his own strategy that best counteracts it.

RPGs (Role-Playing Games)— Players take on a role, usually of some person in the milieu of the game. This is a matter of imagination, not of physical action as in LARPs. In some RPGs a person pretends that he is the character and plays as if he were in that situation, doing whatever he or she might want to do. In others the player is expected to be an actor and do what the character would do in a particular situation.

Rules— All games have rules. In video games rules are expressed through the mechanics of the game as enforced by the software. In tabletop games there are actually written rules that the players must understand. One reason why video games have become so popular is that no one has to read the rules.

Rules Lawyer— A player who wants the rules of the game to be absolutely enforced, but who is often thought to be looking for unearned advantages through manipulation of the rules. Occasionally you may encounter a person who goes one beyond this, usually based on the very odd and essentially impractical notion that if rules don't say you cannot do something, you can do it.

Sandbagging— Pretending to be less capable or in a worse position than you really are. This is particularly useful in games with more than two players, so that you are less likely to be subject to leader bashing or kingmaking. An important difference between sandbagging and turtling is that the sandbagger may be "lying low," while the turtle may not care whether other people can tell that he's turtling. Further, the sandbagger is participating normally in the game, while the turtle is trying to stay out of the way and avoid harm.

Sandbox— This video game term describes a game where players are free to do more or less as they please rather than follow a linear story. This is a recent development in video games as computers have become more powerful and more able to handle more details and options.

Science— Game designers use a form of the scientific method. As they playtest and modify their games, they analyze what is not working well, hypothesize what might fix the problem, and then experiment through further play to see if their hypothesis is correct. Their "control" in this case is how the game worked without the changes.

Video game programmers who have been through computer science education sometimes think of themselves as scientists or engineers.

Self Published— A game published by the designer, usually resulting in financial loss. Some well-known tabletop game publishing companies began as self-publishing entities. Self-publishing is easier for video games thanks to electronic distribution through Xbox Live, Steam, and similar avenues. At worst you can set up your own website and distribute your video game through it.

Service Mark— This is a legal protection of some written or oral phrase that helps identify a company that provides a service rather than a product. Trademarks protect titles and identifiers of products, service marks protect taglines and catchphrases of services.

Shooter— A video game genre with a principal activity of shooting at enemies and blowing stuff up. May be first person (you see what the eyes of your avatar see, so you don't see yourself) or third person (you see your avatar as well as his or her surroundings).

Simplicity— Arguably, games ought to be simple, as the typical objective of a game as opposed to a puzzle is to have the players play the other players. Adding complexity to the system is often unnecessary. Even video games that appear to be quite complex can be reduced to a simple essence: the obvious case is a shooter, which amounts to "shoot things and blow things up." "Simplistic" ("characterized by extreme simplicity; naive") is something quite different from simple/simplicity.

Simulation (also, "Sim")— A game or training exercise or software that is intended to represent significant aspects of some reality — it "simulates" a part of reality, especially certain behaviors. Vehicle "sims" are intended to allow the player to drive a vehicle just as he would the real thing, with the vehicles (ideally) behaving as they would in real life. The computer game *The Sims* simulates human behavior.

Skirmish Games— Tactical games, usually for two players, that usually use small

numbers of miniatures, e.g. *Heroscape*. The miniatures generally can act individually rather than in required units.

Social (Network) Games— This relatively new category of games is played on social networks such as Facebook and MySpace. They are at the extreme of casual games. Most amount to very simple puzzles. They are very, very easy to play successfully but designed to force players to come back day after day to maintain what they've acquired. They are usually free to play but have options enabling the creators to make money.

Solo (Solitaire)— Playing a game by yourself, playing all the sides. Most tabletop game designers play their prototypes solo before they ever ask someone else to play. This enables them to catch the biggest problems and fix them so that other people can enjoy the game more. Video games are generally played solo by their creators once a prototype is available.

Solitaire Game— A solitaire game is one designed to be played by just one person. Often it is actually an interactive puzzle rather than a game.

Spawn— Initial appearance of something, usually a monster, in video games, When a character-avatar is killed it usually re-spawns (reappears) somewhere. Monsters may continuously spawn at a "spawning point."

Story-Driven Game— A game intended to be played primarily to "see" the story. *Final Fantasy* games are an example, as are some kinds of role-playing games.

Styles of Play— There are many, many different styles of play in game land. Many people do not even play to win a game, having many other motivations. But some styles of competitive play can be identified and are included in this glossary.

Studio— A group of people who have come together, usually formally in a company, to create video games, is usually called a studio. Some studios are also publishers, but most pass the finished game to a publisher to actually distribute and sell. In that respect studios are much like authors of books.

Strategic— Strategy involves long-range plans and things that occur to affect the war, well before a battle takes place.

"Supposed to Be"— As in "the way it's supposed to be played." Never assume people will play a game the way you want it to be played; assume they will play it the way the rules/software allow them to play. E.g., if you don't want people to "camp" in a shooter video game then you have to figure out how to make that, if not impossible, then impractical. As long as camping allows a player to be successful some players are going to do it.

Symmetric— In games, starting positions for all players that are identical. This is unlikely to happen in a simulation.

Tabletop Games— My preferred term for what are sometimes called non-electronic or non-digital games: games that are not video games.

Tactical— Tactics involve what you do while a battle is taking place and just before, as opposed to strategy which applies to the war as a whole.

Teamwork— Tabletop games can be created without a lot of teamwork; video games almost always require teamwork, especially the AAA list games that involve more than 100 people working on the game at a time. Tabletop game design focuses on the game; video game design often focuses on having the team work together toward a common goal.

Techno-fetishism— A defect of some game designs that focuses so much on technol-

ogy that the gameplay is sometimes forgotten. Often this is done in the name of "immersion" (see next entry).

Technological Immersion— The ideal of technological immersion is the Star Trek holodeck, where you could be playing a game and feel exactly as though you were really there. Video game makers often try to use technology to achieve this end. It is possible to have immersion without technology, for example in a tabletop role-playing game. It just requires more imagination from the players.

Theme— A story or history that a game is attempting to represent. The theme should actually mold what happens in the game and how it happens, as opposed to an "atmosphere" which provides the appearance of something but has no substantial effect on how the game plays.

Tile-laying Game— Tiles are fairly large, usually square or hexagonal, cardboard game pieces that are laid on the table in a connected manner according to a set of rules. More expensive materials may be used, as in the original tile laying games, *Mahjongg* and *Dominos*. *Carcassonne* is the preeminent modern example.

Toy— Something that you play with that has no rules or goals, you just do whatever you want with it, making it up as you go along.

Traditional Games— Traditional games are games that have been around for decades that most people know of even if they haven't played. Chess and go are two of the oldest; more recently we've had commercial traditional games like *Monopoly, Clue, Game of Life*, and *Sorry*.

Train/Railroad Game— A game in which either trains are preeminent, or where laying out a network of railroads is preeminent.

Trademark— A form of intellectual property protection that applies to titles and names of companies. The simple form merely involves adding the letters TM in superscript after the title or name, which costs nothing. The stronger form of protection, registered trademark, is represented by the letter R in a circle: ®. Trademark registration costs several hundred dollars.

Transparency— In a game where there are better and worse ways to play, a transparent game will reveal the "secret" of good play to a player by the end of the first game played. The player will think he knows what to do to win the game. It may turn out it's a little more complicated than he thinks, but often times it is in fact pretty clear what to do even though it may be hard to do it well. A game that is not transparent, such as chess, requires many plays before the player even realizes some of the possible strategies available.

Trial and Error— Video games are made so that a person using trial and error, which amounts to guessing what to do next, can succeed because they can keep going back to their save point until they guess right. In tabletop games if you use trial and error you'll probably lose the game; you can't lose a video game if you're the only player. Much of the difference comes from the fact that many single player video games are a form of interactive puzzle. Puzzles that have solutions are perhaps more amenable to use of trial and error than games where there are intelligent opponents.

Trick-taking— In cards, a game such as bridge in which players take turns playing one card each, usually with one suit designated trump (any trump card defeats any non-trump card) Usually players must play the same suit as the first card of the "trick," if they can. The highest card takes the "trick."

Turn-based— Dividing the action into player turns that usually follow one on another. Typical of board and card games. Rarely seen in AAA list video games.

Turtling— In a game with more than two players, it may be to a player's advantage to "stand aside" and not participate in conflict, waiting for the others to exhaust themselves so that the Turtle can then move in and win the game. Some games make turtling easy, while others effectively prevent this by design. "Camping" is the shooter form of turtling.

Unpredictable— Some random factors in a game may be unpredictable while others can be predicted through the use of probability. For example, although dice are often used in combat in tabletop games, it is possible to predict outcomes in some ways and so have some control over what happens next. Other occurrences may be caused by factors that the players cannot use to calculate probability, or there may be so many different possibilities that a probability calculation is of little use.

User Interface— The means by which the player interacts with the game. Typically we speak of user interfaces in connection with video games, but tabletop games have a user interface as well, which can include dice, tables, player layouts, boards, cards, and so forth. The best game in the world can be ruined by a poor user interface. If it's hard for the players to take actions in the game, or to figure out what's happening, then they're likely to be frustrated.

Virtual Reality— Use of technology to create a realistic semblance of something, with the Star Trek holodeck serving as the ultimate goal. A typical virtual-reality application allows you to "walk" through a building or natural setting as seen on a screen or screens that may even surround you. We are still a long way from the holodeck.

Volatility— The extent in a game to which your arrangements (and plans) are not subject to change caused by circumstances or by other players. The more volatile the game, the greater influence circumstances and players can have on your situation.

Wargame— A game representing a war, usually a two-sided battle or a larger war which might have more than two sides. Direct conflict is almost always present in wargames.

"Yomi"— David Sirlin coined this term which means "reading" in Japanese, to represent the way that some game players can seemingly read the minds and intentions of their opponents and act accordingly even before the opponent acts. Obviously, someone who can do this successfully ought to be a great game player.

Zero-sum— A situation where one player can only gain by taking away from another, so that one player's gain is another player's loss. *The sum of the whole does not change.* Games that are purely zero-sum approach triviality, so we have to look at major aspects, usually involving unit acquisition and loss. Even then, most games are not zero-sum, though in a two player game it really doesn't make a difference because whatever you can do to improve your situation naturally harms the other player's situation. The classic zero-sum game is *Diplomacy*, where there are 34 supply centers and each unit must have a supply center to exist. The only way to gain more units is to take supply centers, and consequently units, away from someone else. Even here, though, a unit may be temporarily destroyed as a result of tactical operations.

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