
BACHELOR THESIS

Mr.
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**Characteristics of a Design
Template for Modern Boss
Encounters in Action Games
and its Adaptation to
the RTS Genre.**

**An Analysis of Boss Design and
a Prototypical Implementation
in “Iron Harvest”.**

Bremen, 2018

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Implementation in “Iron Harvest”.**

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Bibliography

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Abstract

In many action video game franchises, bosses are an essential part of their core experience. This thesis addresses the question if it is possible to form a boss design template with principles of such action games and how to adapt it to other genres such as real-time strategy. A theoretical background on boss design and its relevant elements helps to define a first rough draft of the template. This template will go through multiple iterations after concluding interviews with industry experts and analyzing boss fights of critically acclaimed action games. After successfully adapting the template, it is used to design a concept for the boss encounter in *Iron Harvest*, a real-time strategy game developed by KING Art Games. The results of working with the template are fruitful and the concept will be used for further development. The addressed question and its hypotheses is being concluded in a final discussion that confirms the prolific formation of a boss design template and its adaptation to other genres.

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List of Abbreviations

DLC: Downloadable Content

MMORPG: Massively Multiplayer Online Role-Playing Game

NPC: Non-Playable Character

RPG: Role-Playing Game

RTS: Real-Time Strategy

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Preface

The following bachelor thesis contributes to the field of game design and looks into the process and theory of designing boss encounters in video games. It was the final assignment for my graduation in the Bachelor of Science program “Mediainformatics and Interactive Entertainment” at the University of Applied Sciences in Mittweida, Germany. It was written as part of my work for *Iron Harvest*, a real-time strategy game developed by the German game studio KING Art Games. In the time of my internship at KING Art Games I sought the opportunity to work on boss content as it was a great challenge to learn and grow as a designer.

The work with my supervisor from university and my team at the studio helped to define the thesis. The problem statement and its research question was formed relatively quickly. But I totally underestimated the scope and challenge of analyzing boss fights and designing a boss encounter from ground up. Nevertheless, I managed to answer the research question within the thesis.

For all of that I need to thank several people that supported me over the course of writing and successfully finishing this thesis.

First of all I want to thank Professor Alexander Marbach for not only supervising my thesis but for guiding me through my whole studies. I am glad to call him a big influence in my carrier and I am even happier to call him friend.

I want to thank my team at KING Art Games and especially our Creative Director Jan Theysen who entrusted me with designing the final boss encounter in *Iron Harvest*. Thanks to Lead Game Designer Maximilian Kiese and the rest of the game design team that always gave me feedback and support when I needed it. Special thanks to Elliott Verbiest and his American English mother tongue for helping me out with some language issues.

Last but not least I want to thank my family and friends. I’m so grateful for their love and support. In particular I am thanking my parents, who supported me in any imaginable way and a very special thanks to Tessa Abraham for all her emotional support and assurances throughout the work on this thesis.

Justin Zwack

Bremen, 2018

1 Introduction

“I am End Boss, greatest of all the Sammer Guys. It is my duty as End Boss to laugh at your feeble party and proclaim your doom. Shall we begin, challenger?”¹

End Boss – Boss in Super Paper Mario



Figure 1: Boss out of Nintendo's Super Paper Mario
// Reference: Nil Tavarez, YouTube Channel (2014)

Since the video game industry's early days, boss battles have been a special part in many games. Most of the time serving as intense and challenging encounters that push players to their limits or as a variation and surprise in gameplay after a long and enduring section. Boss fights and their design have become a good toolset for game designers to shape special encounters that stand out from the rest of the game and will probably be memorized by players.

Especially in the last decade there was a revival of boss design. Many action games made them an integral part of their experience. Critically acclaimed action titles from 2009's *Demon's Souls* (89 Metascore on PlayStation 3), 2011's *Batman: Arkham City* (96 Metascore on PlayStation 3), the complete *Dark Souls* series from 2011, 2014, and 2016 (89-91 Metascore on PlayStation 4), and the recent 2018's *God of War* (94 Metascore on PlayStation 4) all use boss fights to a broader extent and were praised in particular for at least one of their many boss fights if not for all of them.²

¹ See Nintendo, 2007: Super Paper Mario

² See Metacritic, 2018: <www.metacritic.com/game>

1.1 Problem Statement

There are many boss fights in other game genres such as horror or role-playing games which clearly have some similarities in their boss designs to those from action games. But some boss fights cannot follow the same rules or principles based on their design. In real-time strategy games for example, there are several limitations and conflicts with the modern action boss fight as a template.

Therefore, there are several questions that need to be answered:

- Can boss design principles for modern action video games be adapted to other games of different genres such as real-time strategy?
- How is this achievable?
- What are the differences between boss encounters in action and RTS games?
- What are the characteristics of a game design template for boss encounters?
- What are the limitations and consequences of such a template?

1.2 Goals and Contribution

The purpose of the thesis is to gain insight into the adaptation of boss design principles of modern action games to a real-time strategy game and to use this knowledge to prove a game design template with its characteristics, limitations and consequences.

By restricting the work to two distinct genres, the analysis aims to be short and precise, but the result has the potential to be adapted universally. The template, which will be crafted throughout this work, will broach different subjects within game design but will focus more on mechanics and systems. The role in the game's narrative or the visual design, for example, will only be touched upon and will not be discussed in detail.

1.3 Overview of Thesis

Methodology

Different methods will be used to craft a boss design template and validate its adaptation in the real-time strategy game *Iron Harvest* in order to achieve the objective of this thesis.

At first a boss design template will be crafted that resembles an ideal and is based on a few high-level assumptions. The template's points will be described, and first boss design characteristics will be constructed.

This rough draft will be compared and adjusted to real boss designs through an analysis of existing and critically acclaimed boss fights and interviews with industry experts, who worked on boss encounters themselves or who have a peculiar perspective on video game bosses.

An analysis of another boss fight in a real-time strategy game will be conducted and the conclusions drawn therefrom will be used to create another adaptation of the boss template.

This improved template will be used for a prototypical construction of the final boss encounter in the RTS game *Iron Harvest*, which serves as the final test for the template.

At last this implementation will be reflected upon and the gained knowledge will be discussed. This should answer all research questions and offer a conclusion to the thesis.

Layout and Structure

With the aforementioned methods in mind, an overall layout can be constructed.

At first a theoretical background and the explanation of several terms are needed to work from a solid base. In particular elements like design templates for video games need to be well embedded in different design systems.

As for the majority of this work different methods will be used to gain insight into the adaptation of boss design principles. There will be a comparison of an ideal template and already existing boss fights in modern video games. This will be achieved by analyzing boss fights and interviewing industry experts to find a possible adaptation of said template that will be proved through the final encounter in *Iron Harvest*.

Following this, the results will be gathered and evaluated within their context. In particular, the value of such a template and its implementation within the game context of *Iron Harvest* needs evaluation. Any feedback gathered throughout the development will be reflected upon, following by prospects how this could be developed even further.

To conclude the whole thesis, the problem statement, as well as the goal and contribution, will be reflected and discussed based on the gained knowledge.

2 Theoretical Background

In order to understand the context of this thesis, a game design theoretical basis must be provided. General terms for this thesis will be explained in the following, including a short summarization of combat and encounter design. This is used to introduce boss design as the main theme for this thesis. Furthermore, the discussed theoretical knowledge will be used to draft a first template for boss encounters, which will be used as the groundwork for more iteration throughout the whole thesis.

2.1 Explanation of Terms

There are several terms used in game development and especially in game design to describe specific themes, systems or types of design. Some of those terms – those important for the thesis – will be explained in the following.

RTS

RTS is an abbreviation for real-time strategy and is a genre in video games, which can be described through heavily strategic battles happening in an isometric or top-down perspective in real-time. Players need to find and execute the right tactics based on their own current situation and the enemy's strategy. Common gameplay elements are: resource management (e.g. resource gathering, base building, unit production), unit management (e.g. unit movement, combat, map exploration) and special upgrade systems (e.g. research, building and unit upgrades).³ Those gameplay elements lead to either more micro- or more macro-management and “require the ability to split one's attention between simultaneous tasks and situations”⁴. Whereas micro-management means many decisions in a smaller scope and macro focuses on a bigger scope.

For this thesis a final mission and end boss encounter of a classic RTS game will be analyzed to serve as a test case for the boss design template. Furthermore, as a proof of concept the final boss fight in the RTS game Iron Harvest will be designed with the help of the template.

³ See Perry and DeMaria, 2009: 528-530, 562

⁴ See Perry and DeMaria, 2009: 528

Modern Action Games

In this thesis the term “modern action games” is being used by the author to refer to a certain type of video games. The second part “action games” describe video games with a strong focus on combat and action that uses bosses within their enemy and encounter design. This includes action adventures, action RPGs (role-playing games), hack 'n' slash games, and certain shooter games. That list of genres share that action focus and have certain boss principles in common.⁵ The constraint of “modern” games is important to make, as the different genres have changed and evolved over time. In order to focus on a specific time frame, this work describes “modern action games” as games that were published after the release of From Software’s *Demon’s Souls* in 2009 until the year of writing this thesis in 2018. The author chooses *Demon’s Souls* as the beginning of “modern action games” as this franchise has still an enormous influence in the latest boss designs and is critically acclaimed for its boss fights.

Some boss fights of these kinds of games will be analyzed in the thesis in order to prove and iterate the boss design template.

Flow

Flow is a state of optimal experience described by Mihaly Csikszentmihalyi in his work *Flow: The Psychology of Optimal Experience*. This experience can be found in many kinds of actions but is used in games as well. It is a state of full immersion in a medium. By working with different design tools game designers try to set up the gameplay experience in a way to make the player reach that state of mind. The correlation between challenge and skill is a typical adapted system used in games. The difficulty level must be balanced over the progression of the game with the growing skill of the player. A difficulty level that is too high creates anxiety and frustration for the player. A difficulty level that is too low leads to boredom and possible boastfulness.⁶

⁵ See Perry and DeMaria, 2009: 530 - 532, 562

⁶ See Csikszentmihalyi, 1990: 71 - 77

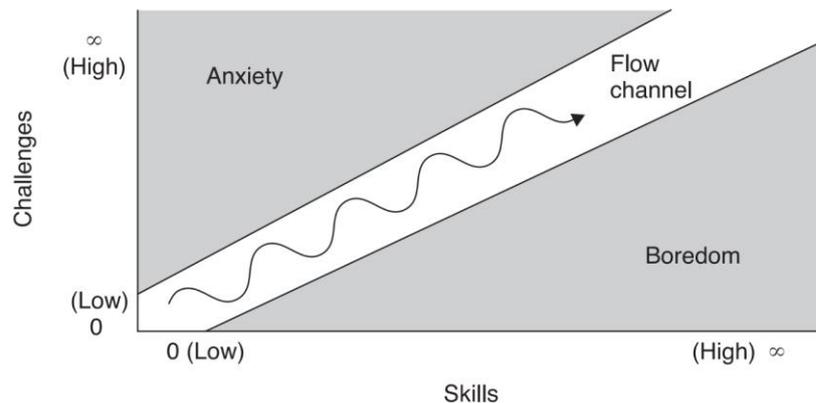


Figure 2: Illustration of Flow
 // Reference: Schell, *The Art of Game Design* (2008)

In the following the conditions of flow by Mihaly Csikszentmihalyi will be listed and described as they were used in the book *Rules of Play* by Katie Salen and Eric Zimmerman. Salen and Zimmerman divided the conditions into effects and prerequisites.

Starting with the effects of flow four different elements can be described as:

- “The Merging of Action and Awareness: [...] a person is so absorbed in the activity, that it becomes ‘spontaneous, almost automatic; they stop being aware of themselves as separate from the actions they are performing.’”
- “Concentration on the Task at Hand”: wherein participants will achieve “a complete focusing of attention on the task at hand, thus leaving no room in the mind for irrelevant information”.
- “The Loss of Self-Consciousness: In flow, the participant’s sense of self becomes subservient to the greater whole of the experience”. The person “becomes part of a system of action greater than what the individual self had been before”.
- “The Transformation of Time: The participant’s sense of time can stretch or shrink.” “Games not only change our perception of time but also offer freedom from its tyranny”.

Furthermore, there are specific prerequisites of flow that are described as:

- “A Challenging Activity that Requires Skills”: Flow “requires active and directed engagement” and is “reported to occur within sequences of activities that are goal-directed and bounded by rules.”

- “Clear Goals and Feedback: These two components evoke the goal-oriented nature of games and the discernable action-outcome sequence necessary for making meaningful choices.”
- “The Paradox of Control: [...] the participant is able to exercise control without completely being in control of the situation.” “Only when a doubtful outcome is at stake, and one is able to influence that outcome, can a person really know whether she is in control.”⁷

As those conditions are completely adaptable to boss fights, flow is important to consider when designing a boss. Especially, as bosses tend to be used as a rise in difficulty and can be a source of frustration if the challenge feels unrelated to the skill of the player. The pacing of difficult and intense moments is vital for invoking a state of flow that lies within the progress or repetition of the boss fight itself.

Affordances and Signifiers

For the communication between the designer and the player affordances and their signifiers are very important. Don Norman brought these two terms to the design world by explaining them in his book *The Design of Everyday Things*.

“An affordance is a relationship between the properties of an object and the capabilities of the agent that determine just how the object could possibly be used.”⁸ In the context of a game, a sword can be carried by the player character. A rope now affords to be cut by the armed player, which could lead to interesting dynamics in gameplay. For that to work, the player must understand what the player character is capable of and how the character works within the game environment and its systems. Therefore, in most games, signifiers are even more important. They are used to directly show the player what actions can be done and how, especially when they are less visible.⁹

By combining the gained knowledge of the game world and its systems with the perceived affordances of an object (and its signifiers) players should know what actions can be performed. If not, then those signifiers might indicate wrong behavior. Additionally, there are different constraints that influence the mental model of a player. Don Norman lists physical, cultural, semantic, and logical constraints which further influence

⁷ See Csikszentmihalyi in Salen and Zimmerman, 2004: 336 - 339

⁸ See Norman, 2013: 11

⁹ See Norman, 2013: 12

the perceived affordance of an object.¹⁰ In particular, games and their specific genres tend to have their own constraints and conventions, which have been learned and established over the years. For instance, most players – primarily those who play shooting games – expect a red barrel to explode when shot at. Another example which is common within video game boss fights are glowing parts of a structure or the boss itself. Without armor, the boss should afford being able to take damage. If this is the case for only a short period of time or only by hitting a specific part, then a designer can make use of this trope to communicate when the player needs to hit which parts in order to progress.

First and foremost, the player needs to understand how the boss fight works and what the player can do to survive or overcome the enemy. Clear communication with easily perceived and consistent systems is one of the requirements for leading the player into a flow state. To summarize: “Affordances determine what actions are possible. Signifiers communicate where the action should take place.”¹¹ Designers can use those signifiers and affordances to communicate with players and guide them through certain elements of a boss encounter.

Risk Reward or Triangularity

Risk Reward or Triangularity describes one of the tools to establish meaningful choices for the player. “[Y]ou are balancing a low risk with a low reward against a high risk for high reward” which Jesse Schell calls “triangularity” and describes it in his book *The Art of Game Design – A Book of Lenses* as a “balanced asymmetric risk”.¹²

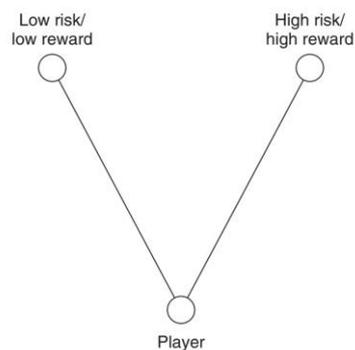


Figure 3: Illustration of Triangularity
// Reference: Schell, *The Art of Game Design* (2008)

¹⁰ See Norman, 2013: 126

¹¹ See Norman, 2013: 14

¹² See Schell, 2008: 181 - 182

Furthermore, Richard A. Epstein wrote in his book *The Theory of Gambling and Statistical Logic*: “The act of making a decision consists of selecting one course of action, or strategy, from among the set of admissible strategies. [...] Decisions can be categorized according to the specific relationship between action and outcome”¹³

Therefore, players always ground their decisions in what the designer wants them to see as the possible outcome. This heavily influences the gameplay in a boss encounter as well. By always thinking about meaningful choices with a clear communication of what risk and reward is behind a certain decision the boss fight becomes more engaging and interesting.

Tradeoff

Another variation of the risk reward tool for meaningful choices are tradeoffs.

They can be described as a specific disadvantage that comes with a corresponding advantage. Either related to different mechanics and systems (this will give you an advantage in A, but a disadvantage in B) or the same mechanic and system, but time related (an advantage which comes with a tradeoff off being in disadvantage before or afterwards).

Just like triangularity, tradeoffs are a good tool to find or form mechanics that add meaningful value to playstyle decisions and can elevate a boss encounter.

Feedback loops (positive & negative)

Feedback loops are a systemic design tool and are used in game design to manipulate the gameplay and its outcome. Salen and Zimmerman summarize cyberneticist J. de Rosnay’s explanation of the two types of feedback loops (positive & negative) in *Rules of Play* as: “Positive feedback loops create an exponential growth or decline; negative feedback loops maintain an equilibrium.”¹⁴

Game designer Marc LeBlanc uses this knowledge of system design and elaborates:

“Negative feedback stabilizes the game” and can extend it. It amplifies late successes. “Positive feedback destabilizes the game” and can conclude the experience. It “magnifies early successes”. Those systems need to be identified by the designer and used

¹³ See Epstein, 1977: 43

¹⁴ See Salen and Zimmerman, 2004: 215

probably or they are establishing behaviors that are not intended. Additionally, as those systems can manipulate the gameplay it may take control away from the player without clear communication of what is happening.¹⁵

This systemic tool can help pace and scale a boss fight. Both actors, the player and the boss, can gain an advantage or disadvantage through feedback loops. Either the encounter or one of its systems will stabilize in order to achieve a tense toe-to-toe fight or destabilize to conclude a specific phase for example.

Feedback

Every important action needs clear and consistent feedback. Therefore, most of the actions in a boss fight need feedback as well. Particularly a boss fight needs to communicate if certain actions are good or bad or if they are working as intended or not. All that feeds into an understanding of how the boss encounter works. Feedback is extremely valuable to confirm or reject assumptions by players, which in addition can be used to show progression or even surprise the player with an unexpected behavior.

As “Feedback—communicating the results of an action—is a well-known concept”¹⁶, this has been further explored and there are several things to consider. First, in a game without any feedback a player would be lost and would not understand any rules or systems. Feedback enables direct communication and can influence the behavior of a player. Too much or not enough feedback can lead to different problems. An overflow of information without prioritization of information leads to stress and a possible higher barrier to entry for the game’s systems (in particular with beginners). Not enough or not informative feedback can lead to the player feeling lost and frustrated. Therefore, feedback should carry valuable information directly bound to the action and be prioritized within a wider context. Likewise, feedback should always be immediately received to connect to the action of the player. Even just a slight delay makes the game feel unresponsive.¹⁷

Pleasure and Fun

There are several ways to define or categorize the pleasure and fun in games. For the purpose of this thesis the most common ones will be listed and described with just a

¹⁵ See Salen and Zimmerman, 2004: 224 - 225

¹⁶ See Norman, 2013: 23

¹⁷ See Norman, 2013: 23 - 25

few words. All of these can be used in boss design to further define what the designer is trying to achieve with the encounter.

Marc LeBlanc in *8 Kinds of Fun*:

- "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"¹⁸

Jesse Schell in *The Art of Game Design*:

- "Anticipation: waiting for it
- Completion: finish something
- Delight in another's misfortune: unjust person suddenly gets their comeuppance (schadenfreude)
- Gift giving: make someone else happy
- Humor: two unconnected things are suddenly united by a paradigm shift
- Possibility: having many choices and knowing you could pick any
- Pride in an accomplishment: pleased satisfaction
- Surprise: at the root of humor, strategy, and problem solving

¹⁸ See LeBlanc, 2018: <<http://algorithmancy.8kindsoffun.com/>>

-
- Thrill: experience terror but feel secure in safety
 - Triumph over adversity: accomplished something that you knew was a long shot (fiero)
 - Wonder: overwhelming feeling of awe and amazement”¹⁹

Michael J. Apter in *A Structural-Phenomenology of Play in Adult Play: A Reversal Theory Approach* – as in *Rules of Play* by Salen and Zimmerman:

- “Exposure to Arousing Stimulation: intense and overwhelming sensation
- Fiction and Narrative: emotional arousal from character identification
- Challenge: difficulties and frustrations arising from competition
- Exploration: moving off the beaten track into new territory
- Negativism: deliberate and provocative rule-breaking
- Cognitive Synergy: imaginative play
- Facing Danger: risk within the ‘protective frame’ of play”²⁰

Roger Caillois in *Defining Play* – as in *Rules of Play* by Salen and Zimmerman:

- “Agon: competition and competitive struggle
- Alea: submission to the fortunes of chance
- Mimicry: role-playing and make-believe play
- Ilinx: vertigo and physical sensation”²¹

Nicole Lazzaro in *The 4 Keys to Fun*:

- “Hard Fun (Fiero): goals, obstacles, strategy

¹⁹ See Schell, 2008: 111 - 112

²⁰ See Salen and Zimmerman, 2004: 335

²¹ See Salen and Zimmerman, 2004: 335

- Easy Fun (Curiosity): exploration, fantasy, creativity
- People Fun (Amusement): communicate, cooperate, compete
- Serious Fun (Excitement): repetition, rhythm, collection”²²

Player Types

Just like the different descriptions of fun and pleasure, the targeted player type helps to define the encounter. The most common categorization of player types can be found in Richard R. Bartle's *Designing Virtual Worlds*:

- “Achievers have fun acting on the virtual world.
- Explorers have fun interacting with the virtual world.
- Socializers have fun interacting with other players.
- Killers have fun acting on other players.”²³

2.2 Combat and Encounter Design

To further discuss the development of a boss fight, combat and encounter design need to be explained. They play a big role in the development cycle of designing such an experience.

Combat Design

Combat design is the ground work for encounter design and describes how players and its threads are interacting with each other. It's about how the player and the enemies can fight depending on various states and situations.

Specific systems are developed, maintained, and iterated upon to make combat possible. This includes weapon- or gadget-based systems as well as non-weapon systems. Furthermore, combat systems are divided into two categories: melee and ranged combat. Gadgets can work as a special case in that regard. A combat designer works with

²² See Lazzaro, 2018: <<http://www.xeodesign.com/research/>>

²³ See Bartle, 2004: 130 - 133

several other departments to create player and enemy mechanics that enable combat systems with character or weapon abilities.

Encounter Design

Encounter design is part game and part level design. It is about describing how enemies and other threats work within the game environment and especially how, and in which context, encounters happen.

Encounters can vary wildly depending on the used combat systems, the enemies and the level layout itself. The encounter designer works with other level and combat designers to create unique gameplay moments, ranging from a slow stealthy enemy-to-enemy experience to a fast-paced full frontal gunplay.

2.3 Boss Design

Usually bosses in video games are especially challenging encounters – most of the time at the end of a gameplay section, such as at the end of a dungeon. The final boss in a game is called an End Boss and is one of the most intense sections of a game.²⁴ Often the second to last Boss is the most difficult boss and the End Boss is much easier to make the player feel more powerful and let the game end on a high note.^{25 26} Furthermore, there are Mid Bosses or Mini Bosses which can be found throughout the whole game. Some can be avoided on purpose or even missed accidentally; others have to be fought in order to progress.

2.3.1 The Purpose of Boss Encounters

A boss in a video game is not only an obstacle that the player has to overcome. “The boss represents the controlled climax to a particular sequence of gameplay”²⁷ writes James Newman. It is a tool for the designer to control pacing in the structure of the game. Daniel Brewer describes it as a spectacle, a challenge, simply something that blocks the player’s progress, a goal and reward, or narrative end to a chapter.²⁸ Itay

²⁴ See Perry and DeMaria, 2009: 304

²⁵ See Rogers, 2008: <<https://www.gdcvault.com/play/482/How-to-Create-the-Greatest>>

²⁶ See Rogers, 2014: 347

²⁷ See Newman, 2013: 79

²⁸ Brewer, 2016: <<https://www.gdcvault.com/play/1023408/Crafting-AI-for-Epic-Boss>>

Keren lists reward, dazzle, engage and challenge as high-level elements of a boss fight's purpose.²⁹ Additionally, Itay Keren and Luis Barriga talk about how it can be used as a test of skill or a tutorial to learn a skill.³⁰ ³¹ Barriga adds that it is a storytelling device, as you have the chance to give an enemy more personality and describe what the fight is all about.³² Furthermore, there are different types of boss fights being used in various genres aiming on different kinds of fun and pleasures. With Marc LeBlanc's "8 Kinds of Fun" we can see what some games are addressing with their bosses. FromSoftware's *Souls* series for example is focusing on "hard fun" and "fiero", by using really challenging boss encounters that are punishing almost every mistake. MMORPGs (Massive Multiplayer Online Role-Playing Games) like *World of Warcraft* or *Guild Wars 2* have boss fights in so called raids that are focused on teamwork and different roles within that fight which leads to "people fun" and "amusement". The final boss in *Super Meat Boy* is more about repetition and rhythm and therefore aims at "serious fun" and "excitement". But even "easy fun" and "curiosity" can be achieved through exploration and a more creative approach like the boss fight against Mr. Freeze in *Batman: Arkham City*, which focuses on exploring different ways to damage the boss by disabling one way after the other as the player progresses the encounter.³³



Figure 4: Fight against Mr. Freeze in Rocksteady Studios' *Batman: Arkham City*
// Reference: *Batman Arkham Videos*, YouTube Channel (2011)

²⁹ Keren, 2018: <<https://www.gdcvault.com/play/1024921/Boss-Up-Boss-Battle-Design>>

³⁰ Keren, 2018: <<https://www.gdcvault.com/play/1024921/Boss-Up-Boss-Battle-Design>>

³¹ See Barriga, 2003: <<https://www.gdcvault.com/play/1022625/Bossy-Behavior-Patterns-and-Techniques>>

³² See Barriga, 2003: <<https://www.gdcvault.com/play/1022625/Bossy-Behavior-Patterns-and-Techniques>>

³³ See Lazzaro, 2018: <<http://www.xeodesign.com/research/>>

In general, a boss fight can be described as an encounter, which breaks or extends the basic combat systems to craft a unique experience. Therefore, boss design is a special variation of combat and encounter design. It describes how a boss fight plays out, how a boss can be fought against and what mechanics come in play.

2.3.2 The Tools and Systems of Boss Encounters

As a designer, different things can be used as a tool for crafting a boss fight that suits the rest of the game but also elevates the experience to something special and memorable. There are various mechanics and systems that can be used to reach that goal. A few of the most common things will be explained in the following.

Boss (Fight) Phases

Phases are used in boss fights to adjust the intensity and variation in that encounter. This tool works for pacing the difficulty as well as the tension and shapes the overall gameplay. It should not be used to just stretch the boss fight for the sake of a longer encounter but should support a richer experience to the player. Different phases can test different skills, or one teaches what the next tests, or it completely changes the rules for one phase and adds variation.³⁴

A boss phase can be described as a part of the boss fight that differentiates oneself from other parts with a unique behavior of the boss, special abilities only available in that sequence, a specific offensive or defensive pattern, or even a completely new type of gameplay. By dividing boss encounters in different phases, a designer can achieve a more controllable and clear experience. Not only can a boss phase vary the gameplay and surprise the player with new challenges, but it also gives a feeling of progression and rewards the player within steps. Phases are also used to grow the player's knowledge and tactics of a boss fight through repetition, as the players can use their skills and knowledge within a relatively isolated context over and over again.

In particular, the first and last phases of such a fight are really important. At the beginning players have to understand what is going on and distinguish their objectives. Towards the end players should be able to anticipate the outcome and feel rewarded after overcoming that challenge.³⁵

³⁴ Keren, 2018: <<https://www.gdcvault.com/play/1024921/Boss-Up-Boss-Battle-Design>>

³⁵ Keren, 2018: <<https://www.gdcvault.com/play/1024921/Boss-Up-Boss-Battle-Design>>

A clear communication between the boss and the player is key for a successful and enjoyable fight. This includes but is not limited to:

- strongly recognizable patterns with telegraphed actions (and if needed preemptive shadows or similar systems)
- visual and auidial clues and affordance signifiers for the objectives of the player (like glowing weak spots for example)
- audiovisual feedback for player actions and logical reactions of the enemy
- an environment that suits the boss fight and helps the player to understand the fight, including what limits and enables the gameplay within this environment ³⁶

Patterns

Like Scott Rogers wrote in his book *Level Up! The Guide to Great Video Game Design* a boss encounter can be described “as a dance between the enemy and the player” ³⁷. This type of flow can be achieved by using a variation of “offensive and defensive moves for both sides the boss and the player” ³⁸.

Those moves can be arranged and combined into a sequence that can be perceived as either an offensive or defensive pattern based on the effect of the moves. Either they are actively trying to affect the player with damage, knockbacks, stuns or other effects (offensive) or they are reactive or preventive to avoid getting effected by player actions (defensive). On one hand, players should be able to understand these really quickly and use their newly acquired knowledge for the fight. On the other hand, players should be surprised with variations of the order of patterns, an escalated form of one pattern or a complete change in the behavior of the enemy to keep them on their toes.³⁹ This enables multiple possible strategies throughout the fight and pushes the player to try out new ways to play the game by switching strategies or finding new ones while fighting. ⁴⁰

³⁶ Keren, 2018: <<https://www.gdcvault.com/play/1024921/Boss-Up-Boss-Battle-Design>>

³⁷ See Rogers, 2014: 347

³⁸ See Rogers, 2014: 347

³⁹ Rogers, 2008: <<https://www.gdcvault.com/play/482/How-to-Create-the-Greatest>>

⁴⁰ See Perry and DeMaria, 2009: 308

Telegraphing & Preemptive Shadows

To make patterns more readable a designer can make use of different tools. Two of the most common ones are for example telegraphs and preemptive shadows, which basically signify the player an action of an enemy before its effect. This can be achieved with telegraph animations, which are very distinct and unique movements to prepare the action of the boss, but also with other visual and audio feedback, like a specific colored effect with a certain shout for example. Preemptive shadows are UI (user interface) elements that highlight a certain area in the game environment, which will soon get hit by an enemy attack.⁴¹ The following image shows the usage of preemptive shadows as a vital part for communicating with the player. Before a meteor hits the ground a red circle will be displayed on its targeted location.



Figure 5: Preemptive Shadows in Nintendo's Super Mario Galaxy 2
// Reference: Boss Fight Database, YouTube Channel (2017)

Another system that prepares the player to act is a warning directly from a character or through a special ability within the game world; for example, the characters Atreus or Mimir warning the player of an incoming attack by an enemy in the *God of War* game from 2018 or the audiovisual representation of the Spider-Sense in the *Spider-Man* series. All those mechanics ensure that the player has enough time to react to the fight and doesn't get hit out of nowhere. As Keren says in his GDC talk of 2018 "predictability is control"⁴², which allows to establish flow and reduce frustration.

⁴¹ Keren, 2018: <<https://www.gdcvault.com/play/1024921/Boss-Up-Boss-Battle-Design>>

⁴² Keren, 2018: <<https://www.gdcvault.com/play/1024921/Boss-Up-Boss-Battle-Design>>

Vulnerable State and Delta of Chance

Sometimes a boss is especially vulnerable or can only be damaged in a specific state. Scott Rogers calls this a “vulnerable state”⁴³, a window of opportunity for the player to deal damage to the enemy. This state can be part of an attack pattern – for example before or after a heavy attack, as the enemy has to charge for the move or recover afterwards – or even be a complete phase on its own. Furthermore, it is possible that the player has to do something to get the enemy into that state and deal damage in the game’s regular way. Like for example, lure the enemy into a trap, deactivate its shield or counter one of its attacks with the right timing to make an opening.⁴⁴

As the vulnerable state is immensely important for the player to progress in such a boss fight, its visualization is extremely vital as well. This is done by special animations, visual effects and sound effects.

In addition, the vulnerable state is something that supports the concept of “delta of chance”. A concept which Itay Keren describes in his GDC talk *Boss Up: Boss Battle Design Fundamentals and Retrospective* as the change of anticipated failure to anticipated triumph through a challenging peak followed by a foreseeable end with a noticeable easing. This tries to capture that moment, in which the player can act through the window of opportunity and knows of his (probably short term) advantage.⁴⁵

Environment

The environment of a boss encounter can be used in different ways. Just like the aesthetic of the boss itself the aesthetic of the level plays a big part in the narrative of the whole encounter. Specific set pieces can serve not only as an environmental storytelling device but they can also refer to gameplay elements that help the player understand the boss encounter.

Most of the time the environment is specifically designed for the boss encounter, which supports its mechanics and the gameplay vision.⁴⁶ Furthermore, it allows to introduce the boss in a distinct way and foreshadow said mechanics and possible strategies in the right pacing before the player faces the boss in a fight. Even the space before the boss fight’s location has various purposes, including a warning of a fight taking place

⁴³ See Rogers, 2014: 347

⁴⁴ See Perry and DeMaria, 2009: 308

⁴⁵ Keren, 2018: <<https://www.gdcvault.com/play/1024921/Boss-Up-Boss-Battle-Design>>

⁴⁶ Keren, 2018: <<https://www.gdcvault.com/play/1024921/Boss-Up-Boss-Battle-Design>>

ahead (possibility to save the game or refill resources), valuable gameplay knowledge for the fight (prepare strategies), and an intended delay towards the fight (builds anticipation and tension).⁴⁷

Furthermore, the concept of prospect and refuge spatial level design can be applied to a boss fight as well. Offering a small but secure space for players to plan their strategy and evaluating their situation (refuge space) helps communicating what lies ahead. An open battlefield or a specific boss arena where the player is vulnerable for attacks (prospect) is used for tense and challenging gameplay.⁴⁸

As the fight goes on it might be possible to adjust the safe spaces or even reduce the whole area to make it more difficult to avoid the enemy and its attacks. By forcing the player into prospect spaces and denying refuge spaces the tension and challenge rises.⁴⁹ But most “Boss rooms in these games are often entirely devoid of refuges and are pure prospect spaces, so players can have theatrical showdowns with these unique enemies”⁵⁰.



Figure 6: Prospect Space in a Boss Room from Capcom's Mega Man
// Reference: Boss Fight Database, YouTube Channel (2015)

Sometimes a level plays even a bigger role in the strategy to overcome the enemy. It can offer different ways to harm the boss either directly with weapons or through puzzle

⁴⁷ See Totten, 2016: 47

⁴⁸ See Totten, 2016: 211

⁴⁹ Brewer, 2016: <<https://www.gdcvault.com/play/1023408/Crafting-AI-for-Epic-Boss>>

⁵⁰ See Totten, 2016: 220

elements. It might also offer shelter against dangerous attacks or strategic points to use for outmaneuvering the enemy. A common example is a boss character that runs almost blindfolded towards the player character, which can be used to trick it into a natural trap provided in the level (e.g. stone pillars).



*Figure 7: Boss Charges at Player in Insomniac Games' Spider-Man
// Reference: Boss Fight Database, YouTube Channel (2018)*

2.4 First Draft of the Design Template

With all of aforementioned information and additional resources, a first basic design template for a boss encounter can be drafted. But first, a short description of what the design template should consist of and what it is trying to achieve is needed to further define the objective in the context of this thesis.

2.4.1 Objective of the Template

Basically, the template should provide a structured collection of different key points that should help design a boss encounter. With that a designer should be able to analyze, reflect and start their own boss design more easily and a lot faster. It is not intended to serve as a strict guide to the best boss design, but more as a tool to think about when working on certain elements of a boss encounter.

As this thesis is primarily focused on the game design of a boss fight, only some influences of the narrative or the aesthetic should be included in the template. Most of the template will heavily rely on the type of game and on the role of the boss in the context of the game's progression. Therefore, action centered boss fights will serve as a base in this thesis and will be iterated to a more universally applicable version throughout the process of analyzing and adapting the different elements.

2.4.2 Content of the Template

Before heading to the boss itself, a few things need to be taking into account. The game's **genre** can enable and limit a boss encounter in several ways. Knowing what defines the game in its core helps shaping fun encounters. The general **gameplay loop** for the rest of the game is important and should be very clear, so that the boss can be designed with the core of the game in mind. The boss can introduce some new things but should not completely alienate the player. All relevant **player actions** (offensive and defensive) should be considered and noted as they will guide the possibilities of all boss mechanics. If there is already a **story** written around that boss encounter, its characters, or its environment than those could define the boss and its abilities as well. Another impact is the **target audience**, which defines not only the **difficulty** level and duration of an encounter but also some general **expectations** they might have.

For the designer a boss is always fulfilling one or more **roles** in its design. Either the encounter serves as a *tutorial* (the player should learn specific gameplay elements), a *progression blocker* (the player needs to overcome the challenge for story and pacing reasons), a *loot guard* (blocks the way to valuable items or other non-progression-relevant elements), a *narrative extension* (tells a story of its own to extent the world design and storytelling) or just as a *gameplay toy* (lets the player experiment with different systems, features, and new strategies). Those roles are not exclusive and can be combined with each other. Additionally, they are connected to the **objective** of the boss fight, which can be to *test* a known or modified skill, *learn* a complete new skill, add some *variation* in gameplay and pacing, or resolve parts of your *narrative*. Together with the role of the boss different **emotions** and various kinds of **fun** and **pleasure** can be achieved.

There are already a lot of bosses in video games. Therefore, certain **tropes** and **archetypes** of boss fights and their systems can be observed. Those could help to define the encounter by combining certain types or setting the fight apart from others. David Perry and Rusel DeMaria are listing numerous different examples in their book *David Perry on Game Design: A Brainstorming Toolbox*. For instance, the completely uncontrolled "Berzerker" type of boss or a fight with "Critical Systems" that you need to take care of before being able to deal damage to the boss.⁵¹ Other boss battle tropes can be found online, as for example in the video game trope collection by tvtropes.org.⁵² Further-

⁵¹ See Perry and DeMaria, 2009: 306-309

⁵² See TV Tropes, 2018: <<https://tvtropes.org/pmwiki/pmwiki.php/Main/BossBattle>>

more, any inspiration beyond those tropes that helps communicating the design is welcome, like concept art or a movie clip or something completely unrelated to the game.

The next elements are pretty broad, but important nevertheless. The general structure of the boss encounter influences its whole **pacing**. Each and every event or action is resulting in a rise or decline in tension, based on challenge, skill level, and awe of the fight. The pacing will have a climax that is remarkably shaping the overall experience of the fight. By supporting the underlying systems, the **narrative** of the boss fight itself can shape the encounter as well. In many occasions the boss seems to be way more powerful than the player and it is pretty much against all odds that the player might win. Additionally, the **aesthetic** of the boss has a huge impact on what the player expects from the fight. Most of the time video game bosses tend to be way bigger than the player character to make the encounter feel more intimidating and dangerous, so that the player feels even more triumphant once the boss has been defeated.⁵³ As described earlier, the **environment** itself can have several different roles in a fight and needs to be taken care of as well. Its aesthetic is only one part, but especially game-play implications are important for the next elements.

To get more in depth with the template we have to look into different systems, which are commonly being used in boss encounters. As aforementioned, **phases** and the **escalation** over the progress of the encounter are good tools to control the experience. Offensive and defensive **patterns** of the enemy and the player character are essential and define the overall gameplay for that specific boss fight. Within those patterns different moves like **attacks** and their **effects** can be defined. All different kinds of actions by the player have to be defined as well. Those either **deal damage** to the boss or otherwise help to **survive** the fight. Various **windows of opportunity** make the boss fight winnable and therefore enjoyable. This includes a good communicated **vulnerable state** and the **delta of chance** for anticipating triumph. With those elements the player should be able to form at least one **strategy** to overcome the challenge. Lastly, a rather special element is the **coup de grâce**, the final hit to kill the boss. The important thing is: “The last strike of the fight needs to be delivered by the player.”⁵⁴ This is pure satisfaction and pride in an accomplishment after a proper challenge and intense fight. This feeling of fiero and triumph over adversity supports the feeling of completion to the long-anticipated end.

⁵³ See Keren, 2018: <<https://www.gdcvault.com/play/1024921/Boss-Up-Boss-Battle-Design>>

⁵⁴ See Rogers, 2014: 348

2.4.3 Structured Template Draft

For a better overview and an easier approach for further iteration, the whole content can be displayed in a structured list with four higher level headings: constraints, direction, influence, and key elements. Even if those points are connected and depend on each other, the differentiation will help to focus on distinct parts of the boss design.

The designers that would use such a template should be able to question themselves how they would approach different elements. Short descriptions follow after each part.

Constraints:

Genre: *(action adventure, RPG, shooter, platformer, RTS, etc.)*

Gameplay: *(use core loop and player actions for boss mechanics and systems)*

Story: *(detect implications and limits through the game's narrative)*

Target Audience: *(adjust difficulty and expectations to player type and behavior)*

→ Think about what limits the possible gameplay in that boss fight.

Direction:

Roles: *(tutorial, progression blocker, loot guard, narrative extension, gameplay toy)*

Objectives: *(test known/modified/new skill, variate gameplay, resolve narrative)*

Emotions: *(find targeted kinds of fun or pleasure)*

→ Set the main vision of the encounter, every element should lead to.

Influence:

Tropes/Archetypes: *(communicate design through established expectations)*

Pacing: *(rise tension through challenge and awe, cater breaks, create climax)*

Narrative: *(connect to gameplay systems and encounter progression)*

Aesthetic: *(support communication of tropes and abilities in the fight)*

Environment: *(direct focus, tell a story, hint at gameplay, serve as gameplay)*

→ Communicate the encounter's microcosm and support the vision.

Key Elements:

Phases and Escalation: *(adjust intensity, add variation, surprise, communicate)*

Patterns: *(clear and precise, offensive or defensive, describe moves and effects)*

Dealing Damage: *(conceptualize ways to harm the boss or progress in general)*

Surviving: *(draft ways to avoid the boss and its patterns)*

Windows of Opportunity: *(describe vulnerable states, create delta of chance)*

Coup de Grâce: *(let the player perform the critical hit, give meaningful reward)*

→ Show possibilities and guide the player's experience and fun.

2.5 Hypotheses on Boss Design

Now after creating that template different hypotheses about the template and its use can be listed in the following chapter.

First of all with such a template to their disposal, designers should be able to analyze boss encounters and design boss fights themselves more easily. It can be used as a tool for setting up a boss design faster, prove all its elements through a clear and focused structure, and find flaws in its construction. Another and very big hypothesis is that any boss encounter can be deconstructed into the different components of the boss design template. The priorities and value distribution might be different, but they all share the same composition of design elements.

By looking into the different elements of the template more theories can be made.

A boss fight defines itself through an intense and (most of the time) challenging encounter that elevates the core mechanics of the game to something special. A battle without those core mechanics would lose much of its appeal and feel estranged from itself. An encounter can serve different purposes, but they must all lead into at least one of either a role, an objective or a targeted emotion to add a real value to the game.

Clear communication is key for establishing flow within the boss fight. If you would not communicate with the player than even a very easy enemy will be frustrating, either through not knowing what to do or because the player does not feel rewarded with feedback in what has been done. Therefore, gameplay that is easy to communicate and to understand is way better suited for a boss fight than complex systems and mechanics that need to provide way more information for the player. Furthermore, to support the communication clichés and tropes are not a bad thing that should be avoided, but rather played around with. A designer can use them and the expectations that come with them.

The most important setup-element of a boss battle is how the boss gets introduced and what information is communicated through gameplay hints and aesthetics. Another important element is a conscious approach to the encounter, as it is shaping the tension with the player's own pace and offers opportunities to prepare for the fight. If something like this is not possible the player should start in the best position possible, which means for example with full health and loaded weapons or charged abilities.

Throughout the battle there should be noticeable progression with several moments of delta of chance for anticipation. But especially, the last hit – the coup de grâce – is extremely important to make the player feel the accomplishment and heroism. If there is no delta of chance or the crucial hit would be taken away of the player and displayed in a cutscene than the player would not feel as good as with full control over the rewarding final blow.

Phases and patterns are one of the most common used systems in boss fights and they enable the designer to control the pacing and escalation over the progression of the encounter. A boss should always follow a pattern system in some form. This definitely helps readability and enables some small surprises for the player when there are changes to that form.

Mini or mid bosses are not a requirement for an end boss but can help to setup anticipation, tension, and expectation. They also provide an early skill check and can hint to some gameplay elements important for later boss fights. If a game lacks mini or mid bosses it has to provide other ways to learn the basics of the boss mechanics or they need to be really easy to understand in the first moments of the encounter. Likewise, most of the environmental mechanics should be introduced before and can be modified or extended in a boss battle.

Furthermore, by observing the differences in genres it is obvious that there will be challenges to adapt certain aspects of action focused games to the RTS game Iron Harvest. For instance, RTS games cannot rely on quick movements and reflexes, which would influence the speed of attack patterns of a boss. Aesthetic-wise the boss can probably not extent a certain height, if it should still be able to walk through your environment like the rest of your units and still be visible in the limited camera view. The typical system of small weak-spots on the boss as one way to deal damage is only possible if you can properly aim at those. Which means in an RTS game where you can only aim at a unit as a whole, there needs to be another system that provides windows of opportunities and ways to deal damage. The environment will be used in a different and more macro-management focused way, because the core of RTS games like Iron Harvest lays in its strategical gameplay that offers multiple tactics.

3 Modern Boss Design

Boss encounters has come a long way from the first boss enemies in arcade machines like the iconic barrel throwing ape *Donkey Kong* that kidnapped a woman in the 1981's game of the same name and then later the heavyweight world champion in *Mike Tyson's Punch Out!!* from 1987.

By observing the many iterations of Bowser in the different Mario games for the Nintendo consoles, not only a vast improvement in technology can be noticed but also a change in design. From a very distinct role and simple test of just a few skills to more complex systems and more faceted roles within the game. Just like those games has changed over the years, so did their boss fights.



Figure 8: Comparison of Nintedos Super Mario Bros. from 1985 and Super Mario Odyssey from 2017
// Reference: YTSunny, YouTube Channel (2015); Boss Fight Database, YouTube Channel (2017)

To further see into modern boss design, several industry experts have been interviewed and the contents of those interviews will be summarized and worked with in the next chapters. Additionally, different boss encounters in modern action games will be analyzed to further prove the template and the hypotheses. For that matter, two boss fights will serve as an example and will be deconstructed with the help of the template.

With the resulting information gained through those interviews and analyzing actual boss battles, the template should be adjusted to a better iteration for modern action boss design.

3.1 Interviews about Boss Design

Over the course of this thesis several industry experts have been interviewed about boss encounters and their design. During that time the interviewees have worked on all kinds of boss content at Studios like Sony Santa Monica, ArenaNet and Creative Assembly. They all have valuable experience in developing boss fights and shared their knowledge through answers to several questions, which should help improve the understanding of boss design and the knowledge behind a possible design template. In the following, summarized results of those answers will be presented and contextualize within this thesis. The complete interviews can be read in the Appendix.

3.1.1 Results

Games can be drastically different. Therefore, the questions in the interviews aim to get a rough approximation of what boss encounters might have in common and how the design behind them is constructed. But as Senior Staff Game Designer Denny Yeh said in the beginning of his interview: “There is no one size fits all solution.”⁵⁵ Nevertheless, there are some insights in boss design that stick out.

What defines a boss encounter? What are its characteristics?

Although, it depends on several things like the core gameplay or genre of the game and the purpose of the encounter there are several elements that can help to define a boss encounter. By asking for such a definition or characteristics of a boss encounter interviewee Benjamin Arnold a Content Programmer for boss content in so called fractals and raids gave straight forward elements like having one or more characters that

⁵⁵ See Interview 2, Yeh, 2018: Appendix XIII

are used as the main enemies and most of the time serve as the main target for damage. Additionally, there might be special mechanics used for the boss that feel incorporated into the rest of the game's mechanics.⁵⁶ Furthermore, Elijah Miller a Content Designer described it as an encounter against an enemy that can be defeated through strength or knowledge by using the lessons learned over the course of the game.⁵⁷ Besides other things like a change of pace, a change in difficulty and or duration or just a special environment there is one definition by Byron Miller a Senior Designer that summarized most of the above. "A boss encounter is a combat encounter that stands out from the preceding content in three ways: Difficulty, narrative importance, and experiential spectacle."⁵⁸

What is the purpose of such an encounter?

As seen above the characteristics of a boss fight might depend on the purpose of such a fight. Overall a boss fight often serves as a finale. Therefore, Level Designer Tom Constable sees a boss fight as a satisfying conclusion to the general gameplay loop. Like others in their interviews he names the opportunity to deliver major story beats and rewarding the player with narrative.⁵⁹ Additionally, Yeh mentions the reveal of information, which can be a narrative or gameplay relevant reveal. Furthermore, he adds teaching a new mechanic, testing the mastery over one or more old mechanics as a challenge, and simply to add variation to the gameplay.⁶⁰ Miller E. describes the core purpose of a boss encounter as a gate that challenges the player's skill and knowledge and blocks the player from a specific desire, like level or story progression, any loot, or a relevant milestone moment in the pacing of the whole game.⁶¹

What are the most important setup and aftermath elements of a boss fight?

Preparing and building up to a great payoff are vital and giving players room to ready themselves builds up tension and should telegraph the challenge ahead to avoid feeling unfair.⁶² Literally giving the player room in form of a safe location can give the player an opportunity to observe and plan for their next moves, or to catch their breath after they might have failed to defeat the boss.⁶³ Besides giving narrative context,

⁵⁶ See Interview 3, Arnold, 2018: Appendix XVIII

⁵⁷ See Interview 6, Miller E, 2018: Appendix XXVIII

⁵⁸ See Interview 4, Miller B, 2018: Appendix XXII

⁵⁹ See Interview 1, Constable, 2018: Appendix IX

⁶⁰ See Interview 2, Yeh, 2018: Appendix XIII

⁶¹ See Interview 6, Miller E, 2018: Appendix XXVIII

⁶² See Interview 1, Constable, 2018: Appendix IX

⁶³ See Interview 4, Miller B, 2018: Appendix XXII

Game Designer Anthony Tran adds setting the mood for the fight through the environment and the gameplay beforehand is extremely important before finally introducing the boss.⁶⁴ The boss and the encounter should then revolve around something memorable and exciting. One of the most common things is to alter the appearance of the boss enemy in comparison to regular enemies.⁶⁵ For example by making the boss way bigger than the player or throwing the player off by doing something unexpected, the enemy feels more intimidating and challenging and even more rewarding when the player manages to defeat that enormous threat.

After the boss encounter there should be some downtime for the player to breathe and celebrate their victory. As the finale of many boss fights tend to be chaotic, players need that downtime and should not be exposed to something vitally important when they are not ready to really listen and comprehend.⁶⁶ If the boss is playing a major role or is in other ways relevant for the player, the battle and the outcome should feel important and worthwhile. Therefore, it feels really rewarding to see some change as a result of the boss's death.⁶⁷ Especially, the last parts of a fight tend to be remembered as the core experience in that encounter.⁶⁸ That means the last bit to finally defeat the boss should feel as an extremely satisfying and impactful conclusion of that fight. The player should then be rewarded with a desire. Game Designer Tyler Bearce lists these following things as possible rewards after a boss encounter: further progression, story beats and a cutscene, equipment, in-game currency, experience points for character progression systems or even completely new gameplay features and content.⁶⁹

How is the skill of the player handled in a boss fight?

Yeh states different dependencies like the type of game and its target demographic, but also when the encounter takes place within the game and if it is optional or mandatory to progress.⁷⁰ A designer should understand the current situation of the player including capabilities of the character and the player's skill and knowledge to this point.⁷¹ Especially, the target audience and its different player types are really important and should be thought about when designing a boss. Those should help define

⁶⁴ See Interview 5, Tran, 2018: Appendix XXV

⁶⁵ See Interview 6, Miller E, 2018: Appendix XXVIII

⁶⁶ See Interview 4, Miller B, 2018: Appendix XXII

⁶⁷ See Interview 3, Arnold, 2018: Appendix XVIII

⁶⁸ See Interview 5, Tran, 2018: Appendix XXV

⁶⁹ See Interview 7, Bearce, 2018: Appendix XXXIV - XXXV

⁷⁰ See Interview 2, Yeh, 2018: Appendix XIV

⁷¹ See Interview 6, Miller E, 2018: Appendix XXIX

the desired win rate, which forms the overall difficulty for each player type.⁷² In general, skilled players should feel challenged, but often less skilled players should be able to overcome the obstacle as well.⁷³ Mistakes by a high skilled audience can be punished more or plays a bigger role, than mistakes happening to a more casual and low skilled audience.⁷⁴ The latter should be able “to fail fast and iterate quickly, without having to re-do a bunch of content every time they lose”; additionally, “[p]uzzle like mechanics are often very good at providing challenge for both skilled and unskilled players”.⁷⁵ To provide a satisfying and well-paced challenge that avoids player frustration, dynamic difficulty systems, like a self-adjusting AI, are a great tool for shaping a boss encounter.⁷⁶ Fail-safe mechanics add to that as well, but both should still “maintain the illusion of challenge” to keep up the pacing and tension of the encounter.⁷⁷

In which way do you need to balance or scale a boss fight for the right pacing?

A boss encounter should have a variation in pacing. There should be “periods of high stress and high skill, followed by periods where players can take a breather, with mechanics that are still challenging, but to a lower degree.”⁷⁸ That is where distinct stages and phase transitions come into play. Those allow for controlled pacing that can present progression and telegraph what is next. Furthermore, tools that help control the timing and cadence of a fight help balance the overall length of that encounter. Fixed timers for example allow for a consistent completion time of a mission if something like that is needed.⁷⁹ The overall expected and desired duration determines the general pacing and cadence and with that direct gameplay values.⁸⁰ But as it is often better to scale mechanically than only to adjust values, the boss could add attacks to its arsenal or do a variation of some of its abilities.⁸¹ By further definition of the mechanical escalation and phases, special attributions might influence the pacing and should be listed. This includes windows of opportunities for offensive and defensive moves, an average possible damage output and uptime from the player, as well as a possible damage output by the boss, transition times between phases, and the time for the player to recover

⁷² See Interview 7, Bearce, 2018: Appendix XXXIV - XXXV

⁷³ See Interview 2, Yeh, 2018: Appendix XIV

⁷⁴ See Interview 3, Arnold, 2018: Appendix XVIII

⁷⁵ See Interview 3, Arnold, 2018: Appendix XIX

⁷⁶ See Interview 1, Constable, 2018: Appendix X

⁷⁷ See Interview 7, Bearce, 2018: Appendix XXXV

⁷⁸ See Interview 3, Arnold, 2018: Appendix XIX

⁷⁹ See Interview 1, Constable, 2018: Appendix X

⁸⁰ See Interview 4, Miller B, 2018: Appendix XXIII

⁸¹ See Interview 3, Arnold, 2018: Appendix XIX

after a mistake.⁸² But in the end as Bearce states balancing a boss encounter “is more art than science” and you need to playtest a lot to get to where you want the pacing to be in the final encounter.⁸³

What are the most common mechanics and systems used in boss fights?

Even though Yeh states that it depends on the genre, just like Constable, he lists three mechanics as examples for common features. First, multiple phases, which can be used to prevent repetition and give a sense of progress throughout the encounter. Second, a vulnerable state of the boss, which can be created through another mechanic (e.g. stunning the enemy) and gives the player a period of time to deal some damage and progress. And third, lock and key, which describes the required or advantaged use of new mechanic learned before.⁸⁴ Arnold mentions lock and key as well but in a more literal way, as the player might have to bring an item to a location. He adds even more mechanics, like boss attacks with an area of effect (AoE), an addition of other smaller enemies (add phase), safe zones, blocking of attacks in the right timing, blocking of parts in the environment (area denial), and a window of opportunity to deal the biggest possible amount of damage (burn phase).⁸⁵ Bearce mentions many of the same kind but also the mechanic to remove vulnerability or hit glowing weak spots to do some critical damage. Another great and common mechanic is the way to damage a boss or get it into a vulnerable state by using boss’s own attacks against itself, like for example, through reflecting projectiles or luring the enemy into a trap.⁸⁶ Besides the already mentioned pure offensive burn phase Tran adds several other mechanics: phase transitions that are effective when a certain threshold of time or health has been reached, often one of the last phases is triggered when a low health threshold is reached and the boss enrages to the most challenging part of the encounter, or there are even some mechanics that can instantly kill and forces the player to learn or memorize effects.⁸⁷ Miller E. adds the communication of the progress as an important mechanic. This includes health, recent attacks and damage. The communication of certain moves is vital as well, therefore messaged tells or telegraphs are a common system to warn the player. Skill cycles and targeting systems that allow predictability of the AI’s behavior tie into the theme of distinct stages or phases of an encounter.⁸⁸

⁸² See Interview 5, Tran, 2018: Appendix XXV - XXVI

⁸³ See Interview 7, Bearce, 2018: Appendix XXXV

⁸⁴ See Interview 2, Yeh, 2018: Appendix XIV

⁸⁵ See Interview 3, Arnold, 2018: Appendix XIX

⁸⁶ See Interview 7, Bearce, 2018: Appendix XXXV - XXXVI

⁸⁷ See Interview 5, Tran, 2018: Appendix XXVI

⁸⁸ See Interview 6, Miller E, 2018: Appendix XXIX - XXX

How are mini/mid bosses correlating with the end boss in terms of game design?

This depends on their purpose, but they are an opportunity to test the mastery of the basic mechanics and foreshadow certain gameplay elements that might be relevant in the later more challenging fight against the end boss.⁸⁹ It can prepare the player in terms of skill and knowledge, adjust the pacing for the level by providing peaks for a greater payoff afterwards, or just reveal more narrative around the end boss character or the story in general.⁹⁰ A mid boss can connect several elements of boss-relevant content through the narrative and its theme or the gameplay mechanics.⁹¹

What role has the environment in a boss fight?

As Arnold describes, the aesthetic of an environment “can do much to add to the perceived intensity and ‘epicness’ of the fight”, but the “environment can also be used mechanically”.⁹² In general, it limits the space available for the encounter and constraints or enables certain abilities of the player’s character or the boss itself, like for example breaking the line of sight with the boss through pillars or other environmental assets.⁹³ Throughout the fight the available space can be changed, and specific parts can be blocked. This allows for control over the pacing of the fight.⁹⁴ Even with various environmental mechanics available the environment should not take away the focus from the boss enemy unless it is the boss itself or there is another important reason for it. Rather it should support the boss in its purpose and the designer’s intent.⁹⁵ By giving three examples from the 2018’s *God of War* by Sony’s Santa Monica Studios, Yeh describes different ways the environment is used:

- “Valkyrie – No environmental interaction. The Valkyries are designed to test your combat prowess directly, so they can fight you on a simple flat plane. The size of the arena still makes an impact to the fight, however. [used elements: focus on boss, limited space]
- [The Stranger] – Environment is there to show spectacle. It communicates the destructive potential of two gods fighting it out. It also serves as a wakeup call to players, telling them: ‘This is still a God of War game.’ [used elements: story, perceived intensity]

⁸⁹ See Interview 1, Constable, 2018: Appendix X

⁹⁰ See Interview 2, Yeh, 2018: Appendix XV

⁹¹ See Interview 6, Miller E, 2018: Appendix XXX

⁹² See Interview 3, Arnold, 2018: Appendix XX

⁹³ See Interview 5, Tran, 2018: Appendix XXVI

⁹⁴ See Interview 1, Constable, 2018: Appendix XI

⁹⁵ See Interview 6, Miller E, 2018: Appendix XXX

- Hraezlyr the Dragon – The environment is an integral part of the fight. The player must use the objects from the environment to help damage the boss. This helps reinforce the level mechanics that you just learned before the fight. [used elements: environmental mechanics, learning and testing a skill] “⁹⁶

How do you see the current state of boss design in video games?

Following Yeh, the state of boss design has not changed much. There are good and bad examples.⁹⁷ It comes down to the “conversation between designer and player” and how affordances are communicated to the player.⁹⁸ On the other side there are voices like Arnold’s: “It gets better and better. [Because, d]esigners are learning from each other’s bosses”.⁹⁹ After several years “boss fights have become commonplace and are less exciting as a result”, but games like Dark Souls or Bloodborne changed the perception of such encounters.¹⁰⁰ The acceptance of more challenging mechanics and the value of clear communication of these has been increased.¹⁰¹ The designs of such boss encounters have become way clearer, but many tend to use a safer, more basic design that serves only as a challenge and should break with the standards in order to evolve.¹⁰²

3.1.2 Conclusion

Thanks to all interviewees, this great collection of boss design knowledge will help further define the boss design template. Many answers are backing up several elements of the template and shows the importance of specific points. But it is clear that some of them need to be rearranged or renamed for clearer communication. Nevertheless, those interviews already underline some of the hypotheses and therefore are a great addition to this thesis. Especially the points about ‘designers learning from other designers’ tie perfectly into the goal of this thesis of establishing something boss designers can work with and benefit from.

⁹⁶ See Interview 2, Yeh, 2018: Appendix XV

⁹⁷ See Interview 2, Yeh, 2018: Appendix XVI

⁹⁸ See Interview 4, Miller B, 2018: Appendix XXIV

⁹⁹ See Interview 3, Arnold, 2018: Appendix XX

¹⁰⁰ See Interview 1, Constable, 2018: Appendix XI

¹⁰¹ See Interview 5, Tran, 2018: Appendix XXVI

¹⁰² See Interview 6, Miller E, 2018: Appendix XXXI

3.2 Boss Encounter in Modern Action Games

To further find more relevant points for the template or flaws in its current construction, two boss encounters will be analyzed with the help of the template. The first example is a cinematic boss fight against a big dragon with a focus on environmental mechanics in the 2018's *God of War* and the second is an intense boss battle focusing on phasing in the first DLC (downloadable content) for *Dark Souls III: Ashes of Ariandel*.

3.2.1 God of War (2018) – Dragon Hraezlyr

The *God of War* franchise has a strong history of great cinematic boss encounters. In the latest iteration the player-controlled main character Kratos and his son Atreus are fighting against different monsters set in the Nordic mythology. One of them is a giant electricity using dragon that was hiding inside a mountain cave. The boss fight begins in an elevator scene in a mine and ends up outside on a plateau of the mountain. It is the climax of the mountain level and is used to teach the player about a new way of using the companion's arrow abilities in the game's environment. After the fight the player will use the new feature and climb to the top of the mountain.



Figure 9: Fighting a Dragon in Santa Monica Studio's *God of War*
// Reference: Boss Fight Database, YouTube Channel (2018)

Constraints:

There are different constraints that are limiting the possible gameplay in the boss encounter. Those need to be analyzed first, because the rest will build upon it.

Genre: (*action adventure, RPG, shooter, platformer, RTS, etc.*)

God of War has always been a single-player action game with a strong focus on combat and huge cinematic boss battles. The new game combines the old hack and slay

features with more RPG and adventure elements and systems. The new game from 2018 uses a no cut camera that stays most of the time behind the character and gives more control to the player as compared to the old fixed camera system in the previous games.

Gameplay: (use core loop and player actions for boss mechanics and systems)

It uses melee and ranged combat as its core feature and combines it with environmental puzzles through the usage of the character's weapons or the companion NPC (non-playable character) Atreus. Atreus is fully integrated in the combat as well and supports the player with magical arrow attacks. Most puzzle elements are working with the navigation through the game's space, which includes walking, evading and climbing.

Rewards can be an audio-visual spectacle, story progression, equipment, enhancements, new features, and/or progression system points for unlocking or modifying certain gameplay skills.

The fight focuses on the core combat without the companion and one puzzle element, which introduces a new feature that is embedded in the core gameplay.

Story: (detect implications and limits through the game's narrative)

Not extremely relevant to the main story. But it shows the raw power of such creatures and Kratos himself. Additionally, saving the dwarven armorer Sindri from that dragon, emphasizes on Atreus caring and human attitude and how it affects Kratos, too. This creates opportunities for possible rewards. In this case: besides a new feature for the player, Atreus gets new special arrows and just like in the dramatic principle of *Chekhov's Gun* those are important for an event later in the story.

Atreus arrow attacks have no specific application in the fight and would just add noise to the encounter. Therefore, he stays out of the fight and cares about Sindri, until he helps for an environmental finisher in the end of the fight.

Target Audience: (adjust difficulty and expectations to player type and behavior)

God of War's target audience is based on the last games but opens up to a more mature audience. Players are used to a higher difficulty level in some combat encounters, but the puzzles are always straight forward. Nevertheless, players expect epic and bigger scaled fights. The focused player type can be defined as Bartle's explorer.

As this fight is including a puzzle mechanic the difficulty level is rather low, but the spectacle of the fight rises the perceived tension.

Direction:

Following the statements in several interviews, the most important part of the boss design is its purpose. The role, objective, and carrying emotion of the encounter needs to be set, and every following element of the design should feel intentional based on that.

Roles: *(tutorial, progression blocker, loot guard, narrative extension, gameplay toy)*

The encounter's main role is to show off a big scale fight and entertain with spectacle. But there is more than that, as it serves as a tutorial for a new environmental mechanic. It is part of the main story and mandatory, so it is also a progression blocker. Because the dragon surprises the player, there is not an active decision to approach the boss in the beginning. But after a small introduction in the first part of the fight there is a pause for the player to prepare.

Objectives: *(test known/modified/new skill, variate gameplay, resolve narrative)*

Its main objective is to teach and test the new skill of combining a throwable crystal with electricity for an explosion. Furthermore, it is a big variation in gameplay as it is the biggest enemy to fight in the game and requires new tactics.

Emotions: *(find targeted kinds of fun or pleasure)*

The biggest targeted kind of fun can be described best through LeBlanc's sensation and Schell's thrill. It is a key boss fight that stands out to the rest of the encounters, because of the sheer scale of the fight and the cinematic feel that it has when fighting against that giant dragon. Additionally, there are parts that lead into the pleasure of completion, anticipation, and for the beginning the pleasure of surprise, just because of how the level is structured and paced.

Influence:

After defining the general direction of the fight, we can look deeper into different design pillars that communicate the encounter's microcosm and set the vision for the fight but stays within the already mentioned constraints.

Tropes/Archetypes: *(communicate design through established expectations)*

- David versus Goliath type of fight and spectacle
- Attacking of one exposed body part as a representation for the boss
- Creating a window of opportunity through a special item (puzzle element)
- Boss arena with endless special items relevant for the encounter

- Strong and distinct attacks. Fighting style is a mix of a “Leaper” (uses fast snapping/biting and claw strokes), “Hammer Blows” (attacks are heavy with a strong telegraphing and delay/cooldown), “Phasing” (different moves in distinct phases: physical and electrical set of moves escalating with each phase), “Control and Debuffs” (boss can cancel special item before player’s throw) ¹⁰³
- Gameplay uses “Find the Weakness” (attack the claws first to provoke electricity attacks, throw explosive crystals for more damage), “Keep Moving”/“Stillness Is Death” (lightning strikes with preemptive shadows), “Charge Up” (dragon can charge for heavy electricity attack, player needs to defend or avoid attacks when holding the item), “Clues” (strong use of specific telegraphing animations and effects) ¹⁰⁴

Pacing: (rise tension through challenge and awe, cater breaks, create climax)

As there was a mid-boss fight against a troll before, the tension has been released and is pretty low. It only gets a bit higher as some smaller standard enemies and one bigger Ogre is attacking the player on their way up. As soon as the player defeats the last enemy a short dialogue begins which decreases the tension again, just to rise it dramatically in the next moment as the dragon surprises the player. After fighting off the boss at the elevator it flees, and a small tutorial path opens up. Here is no danger and the player has room and time to learn the new skill that will be used in the next part of the level. Hearing the dragon again and walking towards it, grows the anticipation to fight it. The tension rises, and the player finally fights against the dragon. The tension is being hold up high and finds its climax in the Coup de Grace, the final critical hit to kill the Dragon. The tension releases as the dead dragon falls to the feed of the player. A dialogue begins that rewards the player by unlocking a new feature (electric arrows).

Narrative: (connect to gameplay systems and encounter progression)

- Small story snippets in the level before, that hint towards the boss
- Pause before the real fight is used for tutorial and preparation
- Transition to the outside is needed to present the dragon and its powers
- Small variations and escalation through phases adjust the pacing

¹⁰³ See Perry and DeMaria, 2009: 306-307

¹⁰⁴ See Perry and DeMaria, 2009: 308-309

Aesthetic: *(support communication of tropes and abilities in the fight)*

- Intimidating appearance (red glowing eyes, enormous size, impact effects)
- Big claws and sharp teeth for attacks
- Thin but strong body for fast and powerful movement
- Electricity flowing through the whole body (glowing yellow)
- Glowing weak spots to indicate where to hit when vulnerable

Environment: *(direct focus, tell a story, hint at gameplay, serve as gameplay)*

- In the beginning focus on the claw of the dragon (1st hint at gameplay)
- After introduction of boss, tutorial for item usage (2nd hint at gameplay)
- Items and the functionality are embedded in the environment
- Space gets narrowed with each set of phases for rising tension

Key Elements:

Finally, all the key elements of the boss encounter will be analyzed. Those elements hint at different gameplay possibilities and guide the player's experience and fun.

Phases and Escalation: *(adjust intensity, add variation, surprise, communicate)*

At the elevator:

- Surprise the player
- Real fight has not yet started
- Gives preview of attacks
- Teaches way to deal damage (attacking claws)

Transition (opens up new path)

Environmental tutorial:

- Pauses the boss gameplay
- Explains way to do more damage when the window of opportunity opens (throwing explosive crystals at electricity)
- Preparation of current setup for the real fight

Transition (opportunity to deal some damage beforehand)

Then the real fight begins which can be represented by an A, B, C structure that gets repeated 4 times and escalates after each set. A set is concluded with a phase transition, in which the boss goes to another position (which makes the combat space smaller with each transition). This happens through gameplay and his claws can damage the player. Only in the last phase transition, there is a cutscene and no gameplay transition. The other exception is that the first set skips phase A and starts directly with B.

Phase A:

- Physical attacks (more time than location based, damage, knockback)
- Resting claws serve as targets to deal damage after boss's attack

Phase B: (after health threshold reached)

- Electrical attacks (more location than time based, damage over time)
- Using crystals when boss charges or uses an electrical attack (risk reward of aiming and throwing the item with the right timing at the boss while avoiding getting hit by its attacks)

Phase C: (after two hits with the crystals, not a health threshold)

- Vulnerable state (boss lies on ground, weak spot visible)
- Burn phase (boss is not attacking anymore)
- Give health if needed

Patterns: *(clear and precise, offensive or defensive, describe moves and effects)*

The dragon Hraezlyr has no observable patterns, but more distinct sets of singular attacks that are activated either at random or through a special condition. The damage, speed and amount of attacks depends on the selected difficulty level.

Shared attacks:

- Pull the player (gets activated when the player is far away)

Physical patterns (Phase A):

- Escalation level 1:
 - o Claw strike
 - o Double claw stomp with a shock wave
 - o Single or multiple bite (when standing at or attacking a claw)
- Escalation level 2:
 - o All above

- Claw swipe
- Escalation level 3:
 - All above
 - Multiple stomps with both claws
 - Side stomp (transition to phase B)

Electrical patterns (Phase B):

- Escalation level 1:
 - Casting lightning strikes
- Escalation level 2:
 - Straight electricity beam
 - Scream (cooldown for attacks)
- Escalation level 3 repeats level 2
- Escalation level 4:
 - Zic-Zac electricity beam
 - Casting lightning strikes (more than in escalation level 1)

Dealing Damage: *(conceptualize ways to harm the boss or progress in general)*

- Hit the dragon's claws when they are on the ground
- Hit the dragon's head when the dragon collapses
- Throw shatter crystals at the dragon when it is affected by electricity

Surviving: *(draft ways to avoid the boss and its patterns)*

- Shock waves can be blocked, but you can lose the equipped shatter crystal
- Attacks have clear telegraphing animations to signify them
- Electrical attacks have additional effects and preemptive shadows
- Additional idle animation for the dragon to give the player some rest
- Spawn more health items when the boss is in its vulnerable state
- Attacks that give the impression of damage through knockback and effects, but do not that much damage to the player

Windows of Opportunity: *(describe vulnerable states, create delta of chance)*

In this fight there are several windows of opportunity that allow to deal damage to the boss. First off, the player can hit the dragon's claws for a short period of time after the boss attacked with them. The other one is its head. But in order to deal damage to its head, the player needs to throw a shatter crystal against the dragon when it is affected by its electricity. Therefore, the first one is opening regular by the boss itself and the second one can only be achieved by the player.



Figure 10: Glowing Weak Spot in Vulnerable State from Santa Monica Studio's God of War (2018)
// Reference: Boss Fight Database, YouTube Channel (2018)

In the last escalation stage of the boss you can attack the claws anytime even when the dragon is in the electrical phase. This can lead to a problem, as the player can attack the dragon's claws forever but is not progressing, because the phase transition is not based on a health threshold but on the number of successful thrown crystals.

Coup de Grâce: *(let the player perform the critical hit, give meaningful reward)*

The last part of the fight is starting with a prompt to press the button to command Atreus to shoot down a crane. In a cinematic scene the dragon gets pushed towards an enormous shatter crystal and by repetitively pressing a button the player manages to ram the crystal into the dragon's neck. A dramatic cutscene follows, in which Kratos is sent flying and lands on another plateau and the dragon's head falls directly on to the player, only nearly missing Kratos.

This picks up again on the main mechanic of the fight (the explosive shatter crystals) and uses it for a satisfying and impactful fall of the dragon. As a reward the player somewhat gains the dragon's ability. Atreus can now shoot electrical arrows that let crystals explode.

3.2.2 Dark Souls 3 (DLC 1) – Sister Friede and Father Ariandel

The *Souls* games had such an impact to the games industry that sometimes you can even find souls-like as a genre term. With its devastating combat and extreme difficulty, it influenced many other third person action games. Besides the critically acclaimed level design, the boss encounters are a key component of the Souls games. Developer FromSoftware added more content to *Dark Souls 3* via DLC. The first addon (*Ashes of Ariandel*) included a boss fight that was also mentioned in one of the interviews held for this thesis. It is the fight against Sister Friede and Father Ariandel. It's a combination of a typical single boss encounter of *Dark Souls* and the dual boss encounter that can be found a few times as well. The characters are deeply integrated into the complex story of *Dark Souls* and through the fight itself the player gives them a dramatic end to their relationship and personal story arcs.



Figure 11: Fighting Father and Daughter in FromSoftware's *Dark Souls III: Ashes of Ariandel*
// Reference: Boss Fight Database, YouTube Channel (2016)

Constraints:

Again, before everything else the limitations of the possible gameplay for the fight needs to be defined and thought through.

Genre: (*action adventure, RPG, shooter, platformer, RTS, etc.*)

Dark Souls 3 is an action RPG like its predecessors, and has a strong focus on difficult encounters with high payoff, where the core gameplay skills need to be mastered in order to proceed. If players die, progression is lost to some degree. Souls (a resource) need to be recollected and some enemies need to be encountered again. One of the most important elements of the game is the precision that can be perceived in any mechanic. Especially, the controls are direct, and the player is always in full control.

Gameplay: (use core loop and player actions for boss mechanics and systems)

The precise combat system is used in every boss fight. There are different strategies and ways to play in an encounter, but the core elements of the combat system are the basic movement, attacks, blocking, evasion, and the management of your resources, which includes health and stamina as the most important values that control the pacing of a fight. Additionally, different equipment with several effects are playing a major role in a fight as well. Therefore, a player needs to prepare before a difficult encounter.

Sister Friede is a very fast boss and her Father is slow but can be way deadlier. All core gameplay skills will be tested and especially orientation plays a big role.

Story: (detect implications and limits through the game's narrative)

The theme of sorrow is dragging through the whole fight and tells the story of the relationship between father and daughter. The resurrection through fire is another theme that is very present in the gameplay, as after Friede dies and her father screams in pain she gets resurrected.

Target Audience: (adjust difficulty and expectations to player type and behavior)

Just like the other *Souls* games, *Dark Souls 3's* target audience seeks foremost Lazzaro's hard fun. They are up for a challenge and want to test their skills and development in difficult encounters. In *Souls* games players are used to be defeated several times and understand it as part of the game. They can be seen as a mix of Bartle's achievers and explorers. As the fight takes place in the DLC, the players have already played the main game and managed to defeat several bosses. Therefore, this encounter can be very difficult. Notably, multiple phases should add variation in the difficulty.

Direction:

The direction or the purpose of the fight describes what should be achieved with the boss design. This needs to be determined for this boss, as well.

Roles: (tutorial, progression blocker, loot guard, narrative extension, gameplay toy)

Just like many bosses in *Souls* games, this encounter must be actively approached, as you need to talk to Father Ariandel to trigger the fight. Therefore, it serves as an additional challenge. It takes the role as loot guard and narrative extension, because you get rewarded with an item that you can use to craft Sister Friede's powerful scythe and you will learn more about those characters and their stories.

Objectives: *(test known/modified/new skill, variate gameplay, resolve narrative)*

The main objective to this encounter is to test the already known skills and the preparation of the player for a long and difficult fight. It adds to the narrative of the main game and gives more context to the main character's role in this world.

Emotions: *(find targeted kinds of fun or pleasure)*

As already mentioned Lazzaro's hard fun describes what the game in general is trying to achieve with its difficult yet fair encounters. This boss fight against Sister Friede and her father focuses on LeBlanc's challenge and narrative. The dramatic relationship behind those two figures allows for the pleasure of an unfolding story. Schell's description of fiero as triumph over adversity matches to this encounter as well, because the fight is a long and enduring fight with three difficult phases. Especially, the last phase surprises the player and after another tense fight the pleased satisfaction gives the player pride in an accomplishment.

Influence:

More influences on the design will be explained in the following. The following sections set the main vision and communicate the encounter's microcosm.

Tropes/Archetypes: *(communicate design through established expectations)*

- Contrasting double boss (small and big, fast and slow, ice and fire)
- Resurrection of one boss to lengthen the fight (more engagement)
- Boss arena with huge boss presented in the middle (for 2nd phase)
- Two different fighting styles are used:
 - o Sister Friede uses a mix of "Standoff Melee" (she fights with one than two scythes), "Leaper" (leaps towards player), "Spells" (attacks have an ice alignment), "Phasing" (escalating through additional moves), and sometimes "Stealth" (vanishes for surprise attack or heal).¹⁰⁵

¹⁰⁵ See Perry and DeMaria, 2009: 306-307

- Father Ariandel uses a mix of “Basic Melee” (he fights with a giant fire bowl in his hands), “Spells” (can spit fire), and “Bull Rush” (rushes towards the player while stomping his bowl to the ground).¹⁰⁶
- Gameplay uses “Multitasking” (second phase with two bosses), “Morphology” (Friede transforms in the third phase), and like the rest in Dark Souls “Tradeoff” (attacks create different openings that need to be abused), “Keep Moving”/“Stillness Is Death” (player needs to avoid attacks, while managing stamina), “Clues” (strong use of specific telegraphing animations and effects)¹⁰⁷

Pacing: (rise tension through challenge and awe, cater breaks, create climax)

The pacing starts really low as you go downstairs and Father Ariandel will be revealed sitting at the end of a hallway talking in sorrow. Nothing happens until you go towards him and talk to him. With a cutscene his daughter Friede is being introduced as the enemy you will have to fight. The tension rises slightly as calm music starts playing and the first phase begins. The player will learn her basic movement and patterns. When the player manages to defeat her, a second cutscene follows. Her father screams in pain and goes berserk. As he sets the room to fire and resurrects Friede the tension rises. The music is getting way more dramatic as the second phase begins. Fighting against both at the same time rises the engagement of the player. If the player manages to defeat them, Father Ariandel bursts into flames and the music stops. The player will be rewarded with an item and the tension releases, as you might think it is over. With the voice of Father Ariandel in the back his daughter gets resurrected a third time and enters the fight with a dramatically animated leap attack. The intense music from before has started again and the tension rises to its peak. The intensity stays up high and goes even higher with the last bits of health left. When the player finally defeats her again and the confirming text on the screen shows up all build up tension is released in a great payoff for the player.

Narrative: (connect to gameplay systems and encounter progression)

- Sister Friede is a character that was introduced as no threat before
- Intense cutscene of Father Ariandel rises the tension and engagement

¹⁰⁶ See Perry and DeMaria, 2009: 306-307

¹⁰⁷ See Perry and DeMaria, 2009: 308-309

- Set up for surprising third phase
- Links to the story of fire and the resurrection of the player

Aesthetic: (support communication of tropes and abilities in the fight)

- Father Ariandel changing from crying to rage
- Visual contrast highlights gameplay differences between the two
- Ariandel is big and slow (he even has still his chair on him)
- Setting everything to fire supports the narrative and pacing

Environment: (direct focus, tell a story, hint at gameplay, serve as gameplay)

- Changes through phase transition in cutscene
- Hallway structure in the first phase directs the focus to Father Ariandel
- Narrow place while fighting Sister Friede the first time, pushes the player into combat, forced to learn her patterns
- Hallway structures get destroyed for the second phase to enable a bigger fight against both at the same time
- Used to moving through the bigger space, a faster more agile Friede is fighting against you in the third and final phase

Key Elements:

To show how the boss encounter works, several key elements guide the player's experience and understanding of the fight. Those elements will be listed in the following.

Phases and Escalation: (adjust intensity, add variation, surprise, communicate)

- Close combat against Sister Friede alone (timing and observation)
- More hectic fight against slow but area of effect focused Father Ariandel and fast versatile Friede at the same time (control and space awareness)
- Final fight against Blackflame Friede, an even more agile and stronger version of her with more area of effect moves (timing and movement intense)

Patterns: (clear and precise, offensive or defensive, describe moves and effects)

In this fight there are several different attack-moves and patterns. Those need to be studied and understood in order to find openings to deal damage or know when to

evade. Sister Friede is way more complex than her father and her move set changes throughout the phases. The first one shows most of her abilities and the player can get to know them. In the second phase she uses less abilities and those that get used are not completely new to the player, as they are modified versions of known moves. This is intended to give the player more room to get away and care about Father Ariandel as well. In the fast phase Blackflame Friede gets stronger, more health, and new set of attacks with some new moves and some modified versions.

Basic moves of Sister Friede:

- Leap (offensive move to close the gap to the player)
- Slice Combo (up to three attacks with variation in sets)
- Evade one big step back or small one to the side (defensive move to reposition when getting hit by the player; most of the time after two hits maximum)

First phase Friede:

- Stance change
 - o Double swirl
 - o Ground drag for uppercut leap
 - o Jump attack with ice AoE (Area of Effect)
- Vanish for stealth attack, charging for uppercut leap
- Evasion leap with scythe hit and straight ice AoE, following a jump attack
- Ice attacks give affects the player with a status change (frostbitten) and areas explode after few seconds

Second phase Friede:

- After her vanish she tries to heal instead of attacking
- Evasion leap with scythe hit and a broad ice AoE attack instead of the straight one from before
- Long ice AoE trail towards the player (stance change as a new telegraph)

Father Ariandel:

- Four stomps with his fire bowl (first three fast, last with a pause)
- Rush towards the player with four hits of the fire bowl
- Spitting fire from the bowl
- Swipe with bowl

- Three stomps with the fire bowl (two fast, last is charged and has fire AoE)
- Emptying lava of bowl for a fire AoE attack

Blackflame Friede:

- Basic combo will be enhanced (faster and stronger attacks but still pauses)
- Jump attack with big blackflame AoE
- Rush towards player with grab (very strong, special visual hint)
- Leap towards the player leaving an ice trail AoE behind
- After vanishing she consecutively sends two long ice trails towards the player, following a strong blackflame wave with direct damage on hit
- Single small blackflame trail slightly chasing the player (direct damage)
- Swirling blackflame combo (stronger version of double swirl from earlier)
- Jumping leap attack with ice AoE (stance change as a new telegraph)



Figure 12: Blackflame Friede's Leap-Attack in FromSoftware's Dark Souls III: Ashes of Ariandel
// Reference: Boss Fight Database, YouTube Channel (2016)

Dealing Damage: (conceptualize ways to harm the boss or progress in general)

- Observing attack patterns and using windows of opportunity
- Attack Friede between her moves
- Attack Ariandel from the sides or his back
- Both have one shared health bar in the second phase, which lets you choose who to focus and allows for switching between them without penalty

Surviving: *(draft ways to avoid the boss and its patterns)*

- Avoid attacks by blocking or evasion
- Visual clues and clear patterns should give just enough time to react
- Stop Friede before her stealth attack (visual/sound clues of her location)
- Stop Friede from healing both in the second phase (location of glowing orb)
- More space when fighting against both (room to breathe, heal and refocus)

Windows of Opportunity: *(describe vulnerable states, create delta of chance)*

- Deeply connected with attacks and hit zones (extremely skill-related)
- Stopping Friede's stealth attack or healing is rewarded with free attacks
- Distance between both bosses in the second phase allows for focusing on one boss for a short period of time to deal some damage
- Father Ariandel has much longer cool down times after his attack

Coup de Grâce: *(let the player perform the critical hit, give meaningful reward)*

The last bit of a health bar in a Souls game can still be very challenging to deplete. Often a player tends to lose concentration, or the tension is so high that more mistakes can happen when you play too risky or even too safe. Additionally, bosses in Souls games need more tries to be defeated, which adds to the buildup for the moment of finally defeating the boss. With Sister Friede there is another layer of anticipating the confirming win message, as she already got resurrected twice in this boss fight. There is no need for a cutscene after the final phase. It would even have a negative effect, as it would not communicate an ending of Friede. The player will be rewarded with an item that can be combined to craft Friede's scythe, which has unique attacks and effects. Additionally, the item reveals more information about Friede's character.

3.2.3 Boss Design Principles in Action Games

As seen in the analysis of both encounters, there are elements that share a bigger focus in the encounter. Those principles will be listed in the following:

- Aesthetics
 - o The visual design utilizes tropes and clichés
 - o Big enemies are presented as particularly intimidating
 - o The visual design of a boss signifies its abilities
- Focus
 - o The player mainly focuses on the boss and its moves
 - o Spatial awareness is important
 - o It is all about avoiding attacks and finding openings
- Test of Skill and Knowledge
 - o The player's movement and combat skills are being tested
 - o Knowledge over the enemy can be gained through observation
- Predictability
 - o Clearly telegraphed animations are being used for different moves
 - o The player needs to memorize several moves and their effects
 - o Prediction helps to see windows of opportunity
- Phasing
 - o The encounter is controlled and paced by various phases
 - o The difficulty varies between the phases
 - o The tension and spectacle of the fight rises with each phase
- End
 - o Extremely powerful ending
 - o The player has full control over the coup de grâce
 - o Feeling of relief and accomplishment

3.3 Conclusion and Iteration on Boss Design Template

After studying all the information from the interviews and directly working with the boss design template for a deep analysis of two encounters in third person action games, the gained knowledge should help to further define and iterate on the template and its elements.

3.3.1 Conclusion and Changes

Especially the interviews help to find flaws in the terminology and design language of the template. But it also underlines most points. They help to further define specific sections and their content. By using the template as a help to analyze specific games, the practical purpose can be tested on a higher and more detailed level. It also draws attention to a needed restructuring of several sections in the current template. The application on modern action games works and allows to define elements that are more valuable in this genre/gameplay. This includes in particular timing and reaction.

Terminology:

- Purpose as a term is a better fit for the current term “direction”. With the current content the description should be adjusted, too. It does not directly set the main vision, but the high-level goal what the designer wants to achieve.
- You don’t look for “influences” to your fight but rather for pillars that build the base of that encounter. Therefore, that term needs to change as well. Those pillars set the main vision. They support and communicate the high-level goal.
- To further iterate the template, the gameplay constraint can be renamed as core mechanics which define the gameplay and the genre.
- The different items under the term “key elements” describe the components of a boss encounter and should therefore be renamed.
- The term of “emotions” does not fit that well into the purpose of an encounter and can be replaced with aimed experience, which includes emotions but should focus on the core experience and what to expect from the mechanics.

Restructuring:

- There is no need of an extra section for genre as it gets defined by the core gameplay mechanics.
- There could be story constraints, but they seem not that relevant compared to the narrative of the encounter itself. This means story and narrative can be combined into one point and be used as a pillar. A new generic section can be added to include more possible constraints of different kinds.
- The usage of roles and objectives have to be reconsidered, as there are some elements that overlap, and some are missing. We can combine them into one and call them mechanical intent.
- The term of tropes or archetypes could lead to using more tropes than necessary or imply wrong or even bad properties to the overall design. In general, it is about communicating the high-level gameplay, which can still utilize tropes and boss fight examples. A simple term like that makes it easier to understand and use within the context of the template.
- The section about the environment can be placed at key mechanics as it supports or uses pillars rather than being one by itself.
- Patterns in action games rely heavily on sets of attacks and other moves. Those can be listed in different ways and may extent over several pages. For an actual boss design in an action game, all kinds of properties for an attack should be listed. This includes: hit range, hit box, area of effect, movement behavior, movement speed, effects, block affordance, and damage (over time). Those patterns focus especially on timing and reaction of the player (extremely visible in the Dark Souls boss encounter). Unfortunately, this detailed list would have extended the scope of the analysis for this thesis.
- Because of its importance, an extra point about the reward of the encounter should be added to the key mechanics. Than Coupe de Gracé can focus on the ending of the fight only.

3.3.2 Iterated Boss Design Template

The changes from above can now be applied to the boss design template:

Constraints:

Core Mechanics: *(use core loop and player actions for boss mechanics and systems)*

Target Audience: *(adjust difficulty and expectations to player type and behavior)*

Others: *(list everything else that could constrain the encounter, e.g. a time limit)*

→ Think about what limits the possible gameplay in that boss fight.

Purpose:

Mechanical Intent: *(block progress, test skill, varyate gameplay, resolve narrative, etc.)*

Aimed Experience: *(find what stands out, list the targeted kinds of fun and pleasure)*

→ Define the goals of the encounter and what you want to achieve with it.

Pillars:

Gameplay: *(communicate high-level design, combine gameplay concepts)*

Pacing: *(rise tension through challenge and awe, cater breaks, create climax)*

Narrative: *(connect to gameplay systems and encounter progression)*

Aesthetic: *(support communication of tropes and abilities in the fight)*

→ Set the main vision of the fight and how you communicate the goals.

Components:

Environment: *(direct focus, tell a story, hint at gameplay, serve as gameplay)*

Phases and Escalation: *(adjust intensity, add variation, surprise, communicate)*

Patterns: *(clear and precise, offensive or defensive, describe moves and effects)*

Dealing Damage: *(conceptualize ways to harm the boss or progress in general)*

Surviving: *(draft ways to avoid the boss and its patterns)*

Windows of Opportunity: *(describe vulnerable states, create delta of chance)*

Coup de Grâce: *(let the player perform the critical hit, please satisfaction)*

Reward: *(give meaningful desire, narrative, loot, feature, etc.)*

→ Show possibilities and guide the player's experience and fun.

4 Boss Design for Iron Harvest

The created boss design template has been designed with action focused games in mind and was tested by analyzing third person action games, in which the player controls one character dealing damage to the boss or dodging its attacks. To further test the template, it will be adapted to a completely different genre with other core mechanics. The upcoming real-time strategy game *Iron Harvest* by KING Art Games will serve as an example for this thesis, as a boss will be crafted with the created boss template. But before using it as a design foundation, the template will be tested by analyzing a boss encounter in another RTS game to find any issues of adapting the template.

4.1 Boss Encounters in RTS Games

For the template's adaptation to boss encounters in real-time strategy games, the main distinctions between them and the prior specified action games need to be considered. With that in mind, the template can then be used for an analysis of a boss encounter in an RTS game.

4.1.1 Major Differences to Modern Action Games

In comparison to modern action games, boss encounters in real-time strategy games are not that common and show considerable differences. There are several major distinctions, including the general focus on objectives, the basic controls, and the player's point of view.

Most boss fights in RTS games can be assigned to one of two major types of encounters. First and more common, an encounter that focuses on a big scaled fight with many units on both sides. The encounter is centered on building a strategy and the macro-management of units and resources. The boss plays only a smaller role in the fight or joins the fight only at a specific time. The second type is a micromanagement-focused encounter, in which the player controls only few units most of which are special hero units. This allows for more unique content and a direct focus on the boss, that is the center piece of the fight. The latter has more in common with boss battles in modern action games than the first one but is also less focused on the typical gameplay of the rest of the game.

In contrast to action games, small mistakes like wrong timing or false movement are not completely devastating in strategy games. They allow for a more high-level judgement. The controls over timing and movement are one of the major differences. In action games the player has direct control and therefore, can be punished for mistakes

when the player acted to slow after a telegraphed warning. Strategy games involve distinct movement too, but it is way slower and less direct, because it is controlled through commands issued by mouse clicks. This means the telegraphed warnings have to be way clearer, longer, and easier to react to.

The player's point of view is another difference worth mentioning. In RTS games your view is very limited and allows to see the battlefield and the boss only from specific angles and distances. The first- or third-person perspective in many action games allows players to look directly at the boss and its attacks. Telegraphing animations are easier to read from afar and can help to comprehend and react. Additionally, the enemy looks more intimidating in a fully controlled first or third person perspective, as the boss does not need to follow specific metrics to fit on one screen. Furthermore, the size of the boss depends on its movement behavior as well, which can be more limited in RTS games due to the rather slow paced combat.

4.1.2 Warcraft III: Reign of Chaos – Twilight of the Gods

The final mission in *Warcraft III: Reign of Chaos* is not a typical boss fight when you compare it with boss fights from modern action games. But it is a well-received final mission in strategy games and a good test for the boss design template. Even though the boss, a demon named Archimonde, is staying in the background for most of the time, his presence and his waves of undead enemies make up for a good fight to end the single-player campaign.



Figure 13: Fighting off Waves of Enemies in Blizzard Entertainment's *Warcraft III: Reign of Chaos*
// Reference: Scribe, YouTube Channel (2018)

In this boss encounter players need to defend waves of enemies for 45 minutes to delay Archimonde's arrival at the top of mount Hyjal, where he wants to destroy the valuable Tree of Life. The fight resembles the last stand of all three factions against the undead. The player controls the night elves but will be supported by AI-controlled human and orc units at their own bases. Defending those bases as long as the player can is key to succeed, but it is inevitable that those bases will be destroyed by the undead at some point. The decision of when to retreat is vital.

Constraints:

Core Mechanics: (use core loop and player actions for boss mechanics and systems)

As a classic real-time strategy game *Warcraft III: Reign of Chaos* includes mechanics of unit and resource management, building of structures, and different upgrade systems. Over the course of a match the player commands a big army of several different units with distinct abilities and properties. It is always a back and forth of losing units in a fight and producing new ones for the next fight. Players need to build a unit composition that fits the current situation. A strategy needs to be formed and adjusted throughout the match. Decisions are driven by short-, mid-, and in particular long-term objectives.

Target Audience: (adjust difficulty and expectations to player type and behavior)

Reign of Chaos is the third iteration of *Warcraft*, which means it is focusing on the same community that played its predecessors. The audience expects a rich story in the single-player campaign that is driven by different heroes and their world. A total of four factions with several units in each faction builds the foundation for big and strategic fights that allow for interesting combinations of units and playstyles. *Warcraft's* focus in the single-player missions is story, therefore the challenge throughout the campaign is not very high. The final mission however is the climax of the game. It is way more difficult, because of the duration of the encounter and the strong enemy waves.

Others: (list everything else that could constrain the encounter, e.g. a time limit)

The mission is inevitable condemned to fail, as the enemy's attacks become stronger with each wave. The game's final boss Archimonde and his undead units reach their destination sooner or later. The player can only buy enough time that magical wisps gather to defend the tree of life.

Purpose:

Mechanical Intent: *(block progress, test skill, variate gameplay, resolve narrative, etc.)*

The final mission intents many things on a mechanical level. The biggest intent is to give a final test of defensive skill and endurance, which serves as the grand final in the development of the player's skill and as a preparation for long and exhaustive fights in multi-player matches. It is the last barrier that blocks the player from completing the game and concluding the narrative.

Aimed Experience: *(find what stands out, list the targeted kinds of fun and pleasure)*

The experience is aimed to be a dramatic last stand kind of fight. The players know they cannot win against the enemy in a direct confrontation. The factions of humans, orcs, and night elves have to work together to stand against the common enemy of the undead for as long as they can. The player needs to feel the constant threat and the overwhelming power of the undead and their leader.

The encounter is playing directly into LeBlanc's fantasy and narrative fun, as it is about make-believe of holding your ground long enough while the story inevitable progresses. LeBlanc's challenge fun ties into the same idea of fighting against each wave of enemies that get stronger over the course of the game. As the players see the units of a wave the first time, they experience Schell's pleasure of surprise. Each wave coming in while the timer is going down, supports Schell's pleasure of anticipation and the completion for the campaign. By successful finishing such a long story mission, players feel the pride in their accomplishment.

Pillars:

Gameplay: *(communicate high-level design, combine gameplay concepts)*

- Final mission with all factions on the battlefield
- Joining forces with other factions to fight against one common enemy
- Defensive mission type, focusing on holding ground for as long as possible
- Constant threat through inevitable waves of enemies
- Waves with special units that serve as mini bosses
- Boss stays in the back until the last 30 seconds and lets his minions fight

- Archimonde can be perceived as a “Summoner”, as just until the very end he sends waves of enemies at the player. Only in the end he joins the actual fight with “Basic Melee” attacks.¹⁰⁸
- The gameplay makes heavy use of “Periodic Waves” of hostile units, “Delegation” of the boss over its minions, and the concept of a “Survival Test” with a countdown.¹⁰⁹ The boss forces the player to retreat and regroup.

Pacing: (rise tension through challenge and awe, cater breaks, create climax)

After a briefing of the mission, the level begins at the first of three bases, the AI-controlled human base. The player has one minute to position units and build a strategy for expanding and upgrading. The first wave of enemies consists of only a few weaker units that can be defended easily. Each new wave is then getting more difficult and the tension rises to a point when the player needs to decide to retreat to the next base or risk sacrificing units for holding the base longer. The retreat releases the tension, as the players can now rebuild their units and defense at the next base, while the enemy is destroying the current base. A cutscene follows and the remaining enemy units die. A new enemy base has been setup and the waves start again. The new set of waves begins with an easy wave comparable to the very first, however the difficulty ramps up after that first assault. After the second base is destroyed as well, the final base will be attacked in the same manner. The waves are now way stronger and in the last 30 seconds the boss himself joins the fight for the climax.

Depending on how long the player lasts at each base and how many units and structures the player possesses, it can feel very tense or completely controllable. But clear communication is needed for the player, because of the long duration of the mission.

Narrative: (connect to gameplay systems and encounter progression)

- Structure of waves highlights the overwhelming force
- Archimonde and his minions destroy base after base, which adds to the feeling of the last stand of humans, orcs, and night elves.
- Background information through dialogs between the heroes and the boss

¹⁰⁸ See Perry and DeMaria, 2009: 306-307

¹⁰⁹ See Perry and DeMaria, 2009: 308-309

Aesthetic: (support communication of tropes and abilities in the fight)

- The visual design of enemy units helps to set priorities in waves
- Mini bosses are unique and attract the attention in their waves
- Archimonde is bigger than other units to look more intimidating

Components:

Environment: (direct focus, tell a story, hint at gameplay, serve as gameplay)

- Bases are set to the foot of the mountain leading towards the world tree
- Clear points of interest with guiding ways for small exploration
- The Tree of Life is always visible for the player at the top of the map highlighting its importance and giving context of what needs to be defended
- Player makes use of wisps that come for the tree

Bases:

- The first base (AI-controlled human base):
 - o Only one choke point, from where the enemy can attack
 - o Two armed towers for the base's defense that should be used by the player to control the waves
 - o Human units support the player in fighting off waves
- The second base (AI-controlled orc base):
 - o Two near chokepoints
 - o Trees near the base that can be used as reinforcement through a special skill by one of the hero units
 - o Mines have been pre-set by the orcs, for the first waves
 - o Orc units support the player in fighting off waves
- The third and final base (player-controlled night elf base)
 - o Two distinct chokepoints, which both get used by the enemy
 - o More trees for reinforcements (special skill)
 - o Player should have had enough time to upgrade and expand the base
 - o Height disadvantage for the enemy (25% chance to miss their target), which allows for more or stronger units without getting too difficult

Phases and Escalation: *(adjust intensity, add variation, surprise, communicate)*

The final fight is structured by the three bases. Each base has their own escalation of difficulty through the growing waves of enemy units.

- The first phase (at the AI-controlled human base):
 - o Focus on building a strategy by extending and upgrading
 - o Player starts with high level structures that allow to build almost any unit
 - o Strong defensive position with two towers for constant damage
 - o Human units are supporting but are not very strong
 - o Sending units from the players' base takes time because of the distance
 - o Peak in difficulty with a mini boss and a strong wave
- The second phase (at the AI-controlled orc base):
 - o Better fortification with more orc structures
 - o Stronger AI units that support by taking damage or buff player units
 - o Nearer to player's base for rallying new units to the front line
 - o Better defense allows for more and stronger enemy units
 - o Peak in difficulty with a mini boss and a stronger wave
- The third phase (at the player-controlled night elf base)
 - o No supporting AI controlled allies left
 - o Player had enough time to extend and upgrade the last base
 - o Direct unit reinforcement and constructing of buildings
 - o World Tree is way more visible because of the gathering of the wisps
- The fourth and final phase (the last 30 seconds)
 - o The hardest wave of enemies
 - o Archimonde, the boss, finally joins the fight at the frontline
 - o Because of his stats, Archimonde is almost impossible to defeat
 - o Climax of the fight for the last seconds to count down



Figure 14: Archimonde Joining the Fight in Blizzard Entertainment's Warcraft III: Reign of Chaos
// Reference: Scribe, YouTube Channel (2018)

Patterns: (clear and precise, offensive or defensive, describe moves and effects)

As the boss joins the fight only in the last 30 seconds, his moves are not that important, yet should add to the feeling of overwhelming power. However, Archimonde is designed like almost any other unit except for his enormous amount of health and strong attacks against single enemies. He does not have attack patterns but distinct abilities such as a basic melee attack or summoning of other units to fight against the player.

Dealing Damage: (conceptualize ways to harm the boss or progress in general)

Just like with any other enemy unit in the game, players can attack the boss with their own units. For most of the time Archimonde stays at his base, where he can be attacked but is heavily guarded with structures and other units. Although the player could deal damage to the boss, it is not very effective sheer to the amount of health. But dealing damage to the boss is not the objective for the player. It is surviving the waves.

Surviving: (draft ways to avoid the boss and its patterns)

Surviving all waves and holding ground for as long as possible is the main task of the encounter. Players are responsible for managing their units and resources but there are some things that are designed to help the player survive. For example, the first wave at each base consists of weaker units and the pauses between the waves are longer in the beginning, which gives players time to rebuild their unit composition and structures. Making use of the environment is helping the player as well, this includes weapon towers or simple height advantages. The AI-controlled units are another tool for the player to survive, as they allow for more control over the enemy waves.

Windows of Opportunity: (describe vulnerable states, create delta of chance)

There are not any vulnerable states, but there are windows of opportunity to retreat and rebuild the player's units. Before the enemy's units start attacking they gather at some point on the map. Therefore, the player can already see the units and estimate the chances of surviving the wave. Those pauses between waves and the time the enemy needs to destroy a base are vital for the surviving of the player, as the player can rebuild and adjust the strategy if needed. Furthermore, if the player defends long enough the outcome can be estimated by perceiving how much time is left. This creates a delta of chance and supports the anticipation for the win.

Coup de Grâce: (let the player perform the critical hit, please satisfaction)

The player is not dealing much damage when fighting against the boss in the last 30 seconds and won't defeat him. But the boss will be attacked by magical wisps at the Tree of Life. The final attack is however not issued by the player, but by a hero in a cut scene. This is less pleasing as players might feel not responsible for the final blow, even though they made it possible by defending long enough.

Reward: (give meaningful desire, narrative, loot, feature, etc.)

Without the rewarding finish by coup de grâce, the player gets rewarded nevertheless. After a short dialog by the survived heroes a very cinematic and visual pleasing cutscene follows, which blizzard is known for. This ends the game and by showing the credits the player feels the accomplishment for this long and exhausting fight.



Figure 15: Defeateing Archimonde in a Cutscene in Blizzard Entertainment's Warcraft III: Reign of Chaos
// Reference: Scribe, YouTube Channel (2018)

4.2 Conclusion and Adaptation to RTS Games

As there are points that conflict with or add new things to the template, the gained knowledge from the analysis needs to be concluded. These results should help to work on the final iteration of the template and the adaptation to other genres.

This is the last step of preparation before using the template to design the final boss encounter for the RTS game Iron Harvest.

4.2.1 Conclusion of the Analysis

The analysis of a completely different type of boss fight tests various elements of the template in new ways which allows for further iteration. Besides many elements that are easy to adapt, there are a few points that need to be considered for the template.

Some moves of boss characters are clearly not part of a certain pattern, but rather are single skills that are not structured in a specific order. Therefore, the term “pattern” should change in the template. By looking at fighting games the term “moveset” is often used to describe the collection of a character’s moves, including offensive, defensive and utility moves. This can also be applied to the enemy in a boss encounter. Furthermore, the different actors in the encounter should be added as a new element to the components section. Designers can list all relevant characters and communicate their role in the boss encounter. In the case of an RTS game such as *Warcraft III* or *Iron Harvest*, units shape an encounter and the way how it can be played. Especially, due to the core gameplay of RTS games, waves of enemy units are pretty common. Those additional enemies give more strategical depth for macro- and micro-management. In retrospective this would have been useful for the boss fight analysis of Sister Friede and Father Ariandel as well.

By using the template as a structure for a design analysis, flaws get exposed and can be reworked. As an example, some elements of *Warcraft III*’s final mission can be adjusted in accordance with the template to achieve a more boss-focused encounter. Those things are only theoretical and there are probably several reasons why the encounter is designed that way. Nevertheless, a few examples follow that show how the template could help to find such parts in a boss design.

In general the encounter focuses on the core gameplay through sending waves of enemies, which works for the overall experience but comes in short on the boss itself. The boss Archimonde was designed like any other unit, only bigger and with higher stats, and only joins the fight in the last seconds. This reduces his effect on the player, as his role in the narrative does not match his gameplay. The gameplay of directly fighting with him could support the purpose and pillars way more to fit with the rest of

the mission. The ending of the mission does not let the player have the coup de grâce. The boss will be defeated in a cutscene, which makes the player feel less successful. Any way of letting the player actively be part of the rewarding end of the plan would boost the feeling of cleverness and accomplishment. But through this analysis it is clear that the coup de grâce is not that easy to orchestrate in a scenario of multiple units fighting against each other and should be highlighted or even separated for the final blow. However, a game should always try to allow the player to land the final hit even if it is just a command to fire an attack or maybe in the example of Warcraft III place wisps in the right places.

4.2.2 Comparison to Principles of Action Boss Fights

By comparing it with the aforementioned principles of action boss fights it is noticeable that several elements work in the same ways but there are some conflicting points.

The aesthetics of the boss destroying base after base are supporting the theme and uses the cliché of burned and dead land under the boss and his bases. Archimonde is bigger than other units but is not really intimidating. His abilities are not well signified through his appearance but his abilities aren't that special either. This works way better with all the different units that clearly signify their abilities.

The focus is one of the conflicting points, as the player has to focus on more enemies and it is not all about avoiding attacks or the spatial awareness. The player's objective is to confront the enemy waves and hold against them. But being aware of the waves and the player's current situation is comparable with action boss fights, especially by looking how both handle risk.

Both test skills and knowledge. But whereas action games test the micro-management of the control over the character, RTS games test the macro-management and analytical knowledge for strategic decisions.

As the boss in Warcraft III's final mission is not participating in the whole fight the point about predictability should be adapted to the whole encounter and not only the boss. The different waves get clearly telegraphed as the different units gather before starting their attack. The player will even get visual and audial warnings through the heroes and the minimap. The timeframe of such a telegraph is way bigger as in action games which creates a window of opportunity to react and send more reinforcement or retreat if necessary.

The phasing in this mission controls and paces the encounter by its waves and the different locations. The difficulty varies and the tension rises throughout the whole fight.

On one side the end to this mission gives the player a feeling of relief and accomplishment just like action games, which is especially because of the length of the fight and

the wave structure. On the other side the ending could have been even more than that, as the player does not get the control over the coup de grâce, which would allow for a more powerful feeling in the end.

4.2.3 Improved Boss Design Template

Now more changes can be applied to the boss design template, including iterations of some descriptions behind elements to draft another improved iteration of the template:

Constraints:

Core Mechanics: *(analyze the core loop and player actions, decide on the focus)*

Target Audience: *(adjust difficulty to the player type, know and use their expectations)*

Others: *(list everything else constraining the encounter, e.g. scope, story, and time)*

- Think about what limits the possible gameplay in that boss fight.

Purpose:

Mechanical Intent: *(block progress, test skill, varyate gameplay, resolve narrative, etc.)*

Aimed Experience: *(find what stands out, list the targeted kinds of fun and pleasure)*

- Define the goals of the encounter and what you want to achieve with it.

Pillars:

Gameplay: *(communicate high-level design, combine gameplay concepts)*

Pacing: *(rise tension through challenge and awe, cater breaks, create climax)*

Narrative: *(list elements connecting to gameplay and progression)*

Aesthetic: *(support communication, set rules, use established expectations)*

- Set the main vision of the fight and how you communicate the goals.

Components:

Actors: *(list relevant actors, describe their role in the encounter)*

Environment: *(direct focus, tell a story, hint at gameplay, serve as gameplay)*

Phases and Escalation: *(adjust intensity, add variation, surprise, communicate)*

Moveset: *(clear and precise, offensive or defensive, describe patterns and effects)*

Dealing Damage: *(conceptualize ways to harm the boss or progress in general)*

Surviving: *(draft ways to avoid the boss and its moves)*

Windows of Opportunity: *(describe vulnerable states, create delta of chance)*

Coup de Grâce: *(describe the end, utilize the critical hit, please satisfaction)*

Reward: *(give meaningful desire, narrative, loot, feature, etc.)*

- Show possibilities and guide the player's experience and fun.

4.3 Designing the Boss in Iron Harvest

As a final proof of concept, the design template is used to help design the end boss of *Iron Harvest*. The boss design is constructed by following all the points from the template and conceptualizing the encounter. As this is being done in a studio environment several elements are discussed, documented and iterated through several stages.

4.3.1 Using the Template for Designing the Boss

Iron Harvest is an RTS game developed by KING Art Games that is set in the world of 1920+, an alternate diesel punk reality created by artist Jakub Różalski. Infantry squads and powerful mechs from different factions fight each other on the battlefield. There are three single-player campaigns, one for each playable faction, and every story leads to Nikola Tesla's factory, which serves as the environment for the last encounter. The player faces an enormous mech powered by Tesla's latest technology that will fire a huge bomb when fully charged with energy. This final boss encounter aims to be a mix of micro- and macro-management focusing on engaging phases that test and extend previous gameplay elements. It sets up a final spectacular experience to end the campaign on a high-note.



Figure 16: Jakub Różalski's Concept Art for KING Art Games' *Iron Harvest*
// Reference: KING Art Games, *Iron Harvest Homepage* (2018)

Constraints:

Core Mechanics: *(analyze the core loop and player actions, decide on the focus)*

The gameplay in *Iron Harvest* is particularly focusing on unit management and strategy building. The macro-management of how players are using their units is essential, but the micro-management of special abilities and the infantry's cover system are important

as well. Offering multiple objectives and several ways to achieve distinct goals is desirable but should not stand in conflict with a clearly communicated objective. Additionally, resource management and building of structures is part of the core as well, especially in conjunction with the producing of units. The final boss fight however, should focus on unit management and building a strategy. A more straight-forward approach with simply communicated objectives helps to guide the player's focus.

Target Audience: *(adjust difficulty to the player type, know and use their expectations)*

Set in the alternate history world of Jakub Różalski's 1920+ many fans of his want to see his world come to life in *Iron Harvest*. Those and strategy fans of games like Relic Entertainment's *Company of Heroes* series are the target audience. In particular because of the fictive world of diesel punk mechs set in a desperate time after the First World War, the audience wants to see a dramatic single-player campaign that explores more of that world and sets itself apart from other RTS games. Although, such games can have higher difficulty levels the last fight should rather show more spectacle than being extremely hard to overcome. Additional objectives for a second playthrough or a special challenge map after finishing the game could add even more value for players of Bartle's achievers type but in the first playthrough Bartle's explorers are focused.

Others: *(list everything else constraining the encounter, e.g. scope, story, and time)*

As discussed in several meetings with the team resource management and producing units should not be included in the fight, as that might reduce focus on the boss or create other design challenges. Another constraint is the story. The three factions join forces in desperate times to fight against a powerful mech invented by the famous scientist Nikola Tesla. This theme of alliance and bonding against an overwhelming threat has been set before and builds the foundation for the design.

Purpose:

Mechanical Intent: *(block progress, test skill, variate gameplay, resolve narrative, etc.)*

On a mechanical level the boss fight is about testing the players' skill of using and managing their units – especially the hero units. The player will be able to control different units and use his knowledge and fight experience. As it is the last mission in the campaign the encounter is the last progress block to resolve the narrative around all factions. Additionally, one of Tesla's units can be controlled by the player to give another possibility for special boss mechanics and a new toy to play with.

Aimed Experience: (find what stands out, list the targeted kinds of fun and pleasure)

The boss fight should feel dramatic and intense, especially towards the end of the encounter. It does not need to be extremely difficult but should challenge players to some degree to allow for flow and good build up. The fight should highlight the joined force of all factions and display the urgency to destroy the huge mech before it can fire its bomb. The success of preventing the explosion needs to feel like a close call and a great payoff. Players should experience Schell's pleasure of completion and pride in an accomplishment. But before that reward, players should feel the experience of Apter's facing danger or Schell's thrill and surprise in the gameplay. The encounter ranges from Lazzaro's hard fun of fiero with specific goals, enemies as obstacles, and different strategies, to serious fun of excitement with repetition, and rhythm through a clear phasing system.

Pillars:

Gameplay: (communicate high-level design, combine gameplay concepts)

- Final mission with all three factions controlled by the player
- Fight as a joined force against one common enemy
- Urgency and pressure through progress made by the boss
- Race of defeating the mech before it gathers enough energy for the bomb
- Distinct phases and windows of opportunity
- Constant but controlled threats through waves of enemies
- Clear telegraphed moves and distinct modes of vulnerability
- The encounter can most likely be described by Perry's "Phasing" for the clear visualization of when the boss is vulnerable and when it is not. The mech needs to use "Big Ranged Weapons" as well as "Basic Melee", as the boss should be able to attack the player in different ways. The effects of those moves can range from "Hammer Blows" that deal severe damage to "Control and Debuffs" that deal no damage but force players to use their units in different ways. This can be supported by "Passive Damage" like electric fields.¹¹⁰
- The major gameplay system is a "Countdown", as the mech is gathering energy until it has enough for the bomb or the player manages to defeat it in

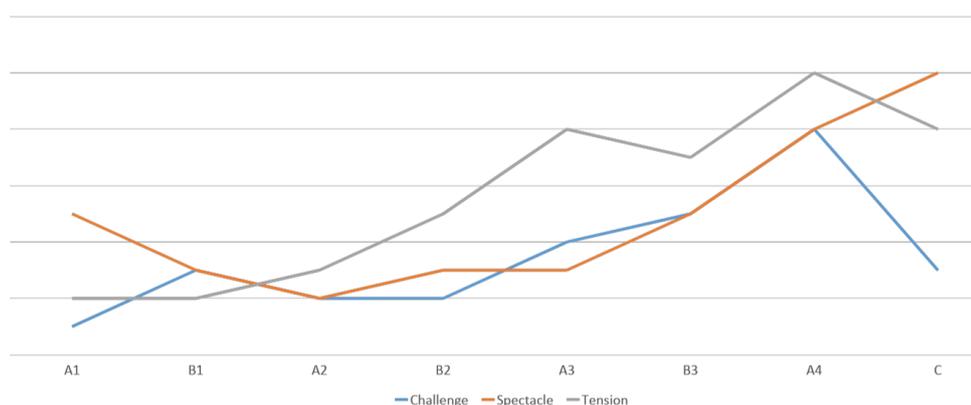
¹¹⁰ See Perry and DeMaria, 2009: 306-307

time. In order to achieve this, the player needs to “Find the Weakness” or the window of opportunity when it is vulnerable. The encounter makes heavy use of “Periodic Waves” and the “Delegation” of hostile units. There are elements of a “Survival Test” when the player needs to fight until reinforcement is on their way. By reaching a certain health threshold of the boss, the mechs stats and abilities changes and resemble a “Berserker” type. ¹¹¹

Pacing: (rise tension through challenge and awe, cater breaks, create climax)

By revealing the huge mech in a cutscene the encounter begins with an intense surprise and anticipation to fight. The purpose of the first part of the fight is to teach some of the special elements for the rest of the encounter and is therefore not very difficult. As soon as the player understands the basics the tension rises. The boss will get to its next destination and a number of Tesla’s units will attack the player. With that classic type of encounter the difficulty can increase without demanding too much of the player. From then on, the known gameplay elements escalate with each new phase and the tension rises until the player manages to reach a special health threshold. As the climax of the fight, the mechs stats and attacks change and it charges faster. The boss then starts to load the bomb even if it has not gathered enough energy. This should stress the player and set the highest urgency to inflict enough damage to finally defeat the boss. The tension releases as the mech explodes and the player survives.

Challenge / Spectacle / Tension Curves



*Figure 17: Pacing Graph for the Final Boss Fight in KING Art Games' Iron Harvest
// Reference: KING Art Games, Author's Illustration (2018)*

¹¹¹ See Perry and DeMaria, 2009: 308-309

Narrative: *(list elements connecting to gameplay and progression)*

- The mech needs to load its system for the bomb but becomes vulnerable while gathering energy. This gives urgency and opens windows of opportunity.
- The race against the time drives the encounter and highlights the need of teamwork between the different factions in a desperate time
- Tesla's new technology is powerful and dangerous. The enemy waves and escalating abilities of the boss support the feeling of an overwhelming threat.

Aesthetic: *(support communication, set rules, use established expectations)*

- The boss is way bigger than regular units (but is constrained by the limited camera view and the size of the map)
- The appearances of Tesla's units signify an electrical affinity
- The behavior of the boss needs to be telegraphed early
- The visual difference of vulnerability to invulnerability must be clear
- Visual tropes like glowing weak points fits the theme of Tesla's electricity
- In its last phases the appearance changes to depict the stats change
- Explosions and destroying of objects support the intensity and spectacle

Components:

Actors: *(list relevant actors, describe their role in the encounter)*

A list of the characters that are involved in the fight, sets the foundation for all interactions between them. Especially, in an RTS game such as Iron Harvest many different units can be involved.

Enemies:

- A huge mech invented by Nikola Tesla (working title "T-Mech")
 - o Serving as the boss in the final encounter
 - o Has vulnerable and invulnerable states
 - o Moves from one power supply to another to charge a bomb
 - o Moveset depending on phase

- A small mech unit of Tesla's
 - o Simple melee focused units that are fast and agile but easy to destroy
 - o Acts as a squad of several mechs
 - o Allowing the player to feel powerful by destroying several units at once
- A big mech unit of Tesla's
 - o Stronger, sturdier, but slower mech that has ranged weapons
 - o Can repair the boss through a special ability
 - o Forcing the player to make decisions based on priority and situation

Allies:

- Reinforcement
 - o Can be obtained by the player at specific locations
 - o Can come to help through scripted events
 - o Can get controlled by AI or the Player
 - o Helping the player by strengthen the army
- Tesla's exoskeleton unit
 - o Can be obtained by the player at specific locations
 - o Can get controlled by the player
 - o Serving as a new toy to play with that is useful for electrical mechanics

Player Characters:

- Hero units from all three factions
 - o Rewarding the player with the ability to use several heroes at once
- Several units from all three factions
 - o Testing the knowledge of different units and the skill controlling them

Environment: *(direct focus, tell a story, hint at gameplay, serve as gameplay)*

The environment is important to create opportunities for an intense but fair encounter. Together with the different phases the environment can control the course of the game and its pacing. It also allows for multiple approaches and strategies in a fight.

- Different spots of energy supplies for the boss allow variation in the environment of each vulnerable state

- Energy supplies serve as a window of opportunity to deal damage
- The structure of the map directs the focus towards points of interest:
 - o Power supplies (destination of the boss)
 - o Opportunities to reinforce with units from one of the three factions
 - o Fortifications (bunker, nests etc.) as strategic points of defense or attack
 - o Obstacles or enemy structures such as factories or electrical barriers
- The map extends the story and reveals more about Tesla's background

Phases and Escalation: (*adjust intensity, add variation, surprise, communicate*)

To control the pacing of the boss fight and show progression to the player different phases will be used for the encounter. The encounter consists of several escalating phases all based on a repeating A-B system. Those parts can be described as two behavior types. Each type has a basic behavior that gets modified for each escalation level or phase over the course of the boss encounter. This allows the player to get a general understanding of what to expect of each phase. Bigger twists surprise the players and force them to react.

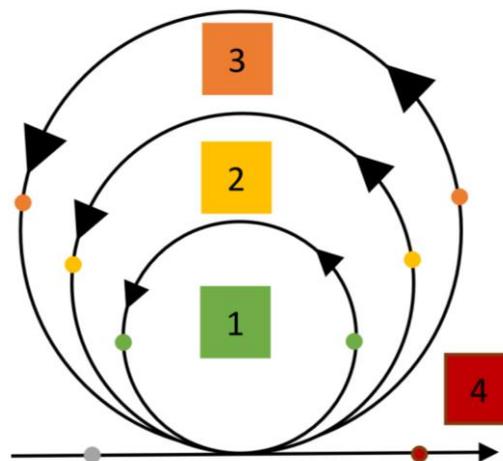


Figure 18: Illustration of the Phasing System in KING Art Games' Iron Harvest
 // Reference: KING Art Games, Author's Illustration (2018)

- A) The boss gathers energy at the supply (starts when supply reached)
 - o Boss is static and vulnerable
 - o Player gets attacked by boss (exception in the last phase)
 - o Specific target and objective
 - o Micro-management focused

- B) The boss walks towards the next supply (starts after getting damaged)
 - o Boss is moving and invulnerable (exceptions in late phases)
 - o Player gets attacked by other units
 - o Player chooses own objectives and strategies
 - o Macro-management focused

A new phase is triggered by a threshold of the boss's health-points and only after the mech ended a phase and can start with the next behavior type.

Phase 1:

- A1:
 - o The enormous mech starts to boot up and absorbs energy at the supply
 - o After some damage was dealt on the boss, small factories rise and spawn numbers of small Tesla units, that come in waves at the player
- B1:
 - o The boss breaks through a wall and walks to next energy supply location
 - o Arena-like battlefield opens up
 - o More of Tesla's units (including small and bigger mechs)
 - o Tesla's exoskeleton is available on the map as a new playable unit

Phase 2: (triggered at 80% of health points)

- A2:
 - o The boss stays at the energy supply to absorb energy
 - o The boss attacks player units with AoE attacks, using long telegraph animations and preemptive shadows
- B2: Escalating by modifying B1
 - o The boss walks to the next energy supply location
 - o Behavior like B1 but escalating with:
 - The bigger mech units start repairing the boss through an ability
 - Other Tesla units escort them on their way to the boss

Phase 3: (triggered at 50% of health points)

- A3: Escalating by combining A1 and A2
 - o The boss stays at the energy supply to absorb energy
 - o The boss attacks different places at once affecting player and Tesla units with AoE attacks, using long telegraph animations and preemptive shadows
 - o Additional unit factories rise that spawn more Tesla units in waves
- B3: Escalating by modifying B2 and showing progress
 - o The boss walks a bit slower to the next energy supply location
 - o Behavior like B2 but escalating with:
 - More repair mech units spawning from different directions and escorted by other Tesla units
 - Boss shows signs of being damaged
 - Boss can fall to the ground, leaving an electrical area (shock trap; loses energy) and serves as a window of opportunity to catch up

Phase 4: (triggered at 20% of health points)

- A4: Escalating by modifying A3 and showing progress
 - o The boss stays at the energy supply to absorb energy
 - o Behavior like A3 but escalating with:
 - Rising of additional factories that spawn Tesla units in waves
 - Attacks of the boss are stronger
 - Additional electrical attack (doesn't affect units made by Tesla)
 - Absorbing of energy is faster

Phase 5: (triggered at 10% of health points)

- The boss moves to the bomb to load it with the remaining energy
- More spectacle and build up for the payoff through:
 - o Small explosions that destroy parts of the mech, including its weapons
 - o Lightning strikes that destroy all remaining factories and Tesla units; some player units can get targeted and be damaged as well
- When the boss arrives at the bomb it abandons any armor and weapon; it is completely vulnerable to the player's attacks

Moveset: *(clear and precise, offensive or defensive, describe patterns and effects)*

The following moves need to be predictable and must be telegraphed with animation, effects and sounds. The player should know what will happen and should get a chance to react to it. AoE attacks can be used to force players to reposition their units, but should be announced with a preemptive shadow. Furthermore, those attacks should only be used occasionally as they increase the micro-management. The difficulty should never come from trying to understand what is happening.

- Behavior A (absorbing energy):
 - o Melee AoE attack, if player's units are nearby; low damage in front of boss, big knockback (unlocked in phase 1)
 - o Spawning Tesla's units through factories (only in phase 1 and 4)
 - o Ranged AoE attack, sending rockets into groups of player units; big damage at one bigger spot, small knockback (unlocked in phase 2)
 - o Multiple ranged AoE attacks, sending rockets on different spots at once; low damage at multiple spots, small knockback (unlocked in phase 3)
 - o Electrical ranged AoE attack, ineffective on Tesla's units, very effective on infantry squads, aims mostly at mechs due to their metallic nature; low damage, targeted at one spot, no knockback, but stun duration relative to armor-type (unlocked in phase 4)

- Behavior B (walking to the next supply):
 - o Tesla's bigger units join the fight after the smaller ones got already introduced in the first part of the phase (unlocked in phase 1)
 - o Those bigger units start repairing the mech (unlocked in phase 2)
 - o Boss falls to the ground leaving a shocktrap behind, an electrical AoE field with low damage, no knockback, and stun duration relative to armor-type (only in phase 3)
 - o Special lightning strikes that destroy Tesla's units with one hit and inflict heavy damage on player's units (only in phase 5)

Dealing Damage: *(conceptualize ways to harm the boss or progress in general)*

Those mechanics need to be explained in the first phase. A simpler version could be introduced even before that mission and bridge the analogy to this mechanic. Additionally, the boss can only be targeted as a whole, there is no system that allows for aiming at specific parts, like in many boss fights from shooter games.

- The player can attack energy supplies to let them explode when the boss tries to charge its bomb
- Direct attacks when the boss is in a vulnerable state

Surviving: *(draft ways to avoid the boss and its patterns)*

To know how to survive is equally important for the player as to know how to deal damage to the boss. There should be ways for the player to recover and reposition in order to catch up afterwards. Furthermore, players can be supported by the designer to keep them alive. They do not have to be punished for small mistakes, when the encounter focuses on creating a spectacular experience.

- Reinforcements can be obtained by the player at certain locations
- Needed reinforcements to balance the fight in favor for the player can be spawned and adjusted through scripts
- Player can obtain a special Tesla unit (Walker)
- Hero units can support each other and revive a fallen hero unit
- Remaining enemies in the last phase get destroyed, so the player can fully concentrate on the boss and enjoy the last seconds without distractions, creating room for the coup de grâce

Windows of Opportunity: *(describe vulnerable states, create delta of chance)*

Normally, the boss is invulnerable to attacks by the player. But there are windows of opportunity, in which the boss is vulnerable and can be attacked by the player's units. Even though the weak spot system from shooter games will not be used to aim at specific parts but the visualization of an open weak spots should be used to communicate the vulnerable state.

- Explosions of energy supplies set the boss to a vulnerable state
- If the boss reaches a certain phase it can stumble and fall
- In the last phase the boss is completely vulnerable until the end

Coup de Grâce: *(describe the end, utilize the critical hit, please satisfaction)*

Players need to have the full control over the coup de grâce and be able to destroy the mech by themselves. But as the end should not last very long because of the narrative's urgency regarding the bomb, the player should want to end it quickly. The whole build up leads to this moment and the player feels the final delta of chance to defeat the boss and finish the mission.

- Complete focus on the boss, as there are no other enemies left
- The boss is vulnerable and does not attack or defend itself
- The rising energy level of the bomb creates the urgency to kill the boss
- The player can attack with every unit left and anticipate the explosion

Reward: *(give meaningful desire, narrative, loot, feature, etc.)*

As this is the final mission the desire for the player is to experience a strong and meaningful conclusion to the whole campaign. Just like the coup de grâce, the following cutscene is very important to end the experience on a high note.

- The big mech explodes in pieces
- The final cutscene follows and the campaign ends
- The statistics will only be shown afterwards and should not interrupt the story
- A more challenging version of the fight has been unlocked
- Different meta game elements for the multi-player have been unlocked

4.3.2 Elaborating the Concept

With the help of the template, the constraints, purpose, pillars, and components of the boss encounter have been constructed. As intended by working through the template, rough ideas and basic elements of an encounter can become an elaborated concept with a solid foundation that gets approved by the rest of the team at KING Art Games.

But as it is just one part of the process in designing the boss, the concept of the final boss encounter in Iron Harvest needs to be elaborated and more details of the design need to be refined. But as more iterations and details would definitely exceed the scope of this thesis, a short summary of further steps in the process should be sufficient for further conclusions.

The complete sequence of phases and relevant elements of the fight needs to be clearly communicated through documentation. This helps to guide the following development and iterations. In the case of Iron Harvest schematics in the design document and a presentation for the course of events helps visualizing the encounter before working on an actual prototype. In addition, a first draft of the encounter's environment supports that visualization and sets the foundation for the rough level blockout in the game's engine. Before defining every single detail in the boss encounter a basic prototype with simple scripting allows to proof the concept that was designed with the help of the template. The prototype can be created step by step through this concept. By testing the prototype the encounter can be evaluated, adjusted, and iterated to improve it.



Figure 19: 2D Map Layout for the Final Mission's Prototype in KING Art Games' Iron Harvest
// Reference: KING Art Games, Author's Illustration (2018)

5 Results

By reviewing the work with the design template, the benefits of such a concept can be noted. It is important to see its values in the context of its development cycle in a game's production, but also in the context of the game itself. Furthermore, prospects can be made of what the next steps are to complete the boss design in Iron Harvest's final mission and what could be done with the template itself.

5.1 Benefits

The boss design template brings many benefits to the process of designing a boss encounter. But it can also elevate the encounter's quality. The template aims to serve the designer as well as the player, as it improves the process and the result.

First of all, it lists all major elements that make up a boss encounter, which makes it hard to forget or miss something relevant. It should not be seen as a strict set of rules but rather as a tool that assists designers throughout the whole boss design process. It helps designers to think about all the different elements and what they want to achieve with the boss. The structure of the template allows to design the boss from high-level to small detail, which makes it easier to work within the constraints and the vision for the encounter. In addition, the structure helps to talk about certain elements in a team, as constraints can come from different disciplines such as animation or tech. Using the same set of terms for boss encounters can improve discussions between designers and reduce misconceptions. Overall, the design of such an encounter can be approached way faster with the established design template. Additionally, it is easier to analyze the different parts of a boss to find flaws or strengths in the design.

By removing these flaws and refining the strengths the encounter will feel more consistent and will offer a far better experience for the player. The constraints prevent the encounter from feeling alienating because of the mechanics or a disconnection with the story and characters and the pillars should set and communicate a clear vision. For that vision the designer uses the different components to not only support the encounter's pillars but to guide the player's experience. That combination of constraints, purpose, pillars and components establishes the elements of fun and pleasure that rewards the player and makes the encounter memorable.

5.2 Prospects

The design for the final boss fight in Iron Harvest is not completed, but the concept has a solid foundation because of the template. The next steps to finalize the encounter for the release of the game will be listed. Additionally, the design template's prospects will follow.

The boss design in Iron Harvest will be elaborated with the prototype and the concept will probably go through several iterations. There are already some flaws in the concept that need to be discussed with the team to find solutions. For example is the producing of units such a relevant core mechanic that it should be included in the boss fight. First internal tests should give enough feedback for the concept and give prospects of how the public reception of the boss encounter could look like after the game's release.

The templates next steps should be analyzing more bosses of other genres and discuss the results with other experienced designers to refine elements and descriptions if needed. Furthermore, typical examples for specific genres can be gathered and shared together with the boss design template and its design approach. This would hopefully help designers to further develop, discuss, analyze, and improve the boss design in video games.



Figure 20: 3D Environment for the Final Mission's Prototype in KING Art Games' Iron Harvest
// Reference: KING Art Games, Author's Illustration (2018)

6 Conclusion

By looking back at the beginning, the problem statement can now be reevaluated by answering the different research questions. Moreover, the goals set at the start can be compared with what has been achieved. With those points as a foundation the thesis can be concluded through a final discussion of the results of this work.

6.1 Problem Statement

The research questions formed in the beginning will be listed again, but it is now possible to answer these questions because of the knowledge gained throughout this thesis.

Can boss design principles for modern action video games be adapted to other games of different genres such as real-time strategy?

Yes, boss design principles for modern action video games can be adapted to other games of different genres. As seen by the analysis of boss encounters, modern action games can share many high level principles and even smaller details with other genres like RTS games.

How is this achievable?

By dividing and disassembling the boss encounter in its different parts, a more abstract version of the encounter can be formed. Those elements can be detached from their genre-relevant context as they work on another level of design. This can be observed in the many iterations of the template after the analysis of boss fights and the interviews with other game developers.

What are the differences between boss encounters in action and RTS games?

The biggest difference between boss encounters in action and RTS games is the focus of the player. In action games it is way more common to have a narrow focus on a few enemies or even just one dangerous threat such as a single boss. Whereas it is the complete opposite in the core gameplay of RTS games. Most RTS games offer big fights with many units fighting each other at the same time. The focus and attention of the player is being split by several elements of the encounter. In addition to that, the indirect control of issuing commands to specific units slows the combat's pacing. In

action games the direct control is relevant to be able to quickly react to moves of the boss. The analysis of boss encounters in different genres show that different skills are being focused and tested through such an encounter. In action games it is often about quick reflexes and the micro-management of the character's movement and abilities. Yet in RTS games it is more about the macro-management of several units and the ability to adjust a strategy.

What are the characteristics of a game design template for boss encounters?

As seen in the interviews with industry experts clear communication is important for designing a boss. The template should provide a clear structure and terms that communicate their intent. Because the design for a boss really depends heavily on the game itself the template needs to enable an abstract approach that can be adapted to different games and genres. It should not only be simple to understand and work with, it needs to benefit the process of designing a boss and rise the quality of those designs. The boss design template created throughout this thesis tries to achieve all that.

Through several iterations of the boss design template its elements can now be listed. Those elements are vital for designing a boss encounter and makes the template a valuable tool for designers. The elements of a boss fight can be constructed under four major themes: the constraints (that reflect the limits of the possible gameplay for the boss fight), the purpose (that defines what the designers want to achieve), the pillars (that set the main vision and communicate the goals), and the components (that show possibilities and guide the player's experience and fun). Each part consists of multiple elements:

- Constraints: Core Mechanics, Target Audience, Others
- Purpose: Mechanical Intent, Aimed Experience
- Pillars: Gameplay, Pacing, Narrative, Aesthetic
- Components: Actors, Environment, Phases and Escalation, Moveset, Dealing Damage, Surviving, Windows of Opportunity, Coup de Grace, Reward

The complete template can be found at the beginning of the appendix.

What are the limitations and consequences of such a template?

Such a template has different limitations and consequences. The biggest limit lies in its structure. As intended the template is abstract and high-level, but as a consequence this requires work on every element. It does not offer an ideal boss encounter that is already done and can be copied. Yet it does offer a guideline that should help to find a boss design that suits the game. The template cannot help to find the special twist or uniqueness in the encounter, but it sets up a solid foundation that designers can work with to find these themselves. Therefore, the biggest consequence of the template is that it is important to always reflect on the content of your boss encounter and search for ways to improve it after building a foundation.

6.2 Goals and Contribution

The purpose of the thesis was to gain insight into the adaptation of boss design principles of modern action games to a real-time strategy game and to use this knowledge to prove a game design template with its characteristics, limitations and consequences.

By creating a design template through analyzing boss encounters and holding interviews with industry experts. The author gained enormous insight into this whole field of game design. The different elements of bosses in modern action games got deconstructed and adapted for the template. Throughout the several iterations and the work with the thesis, the template's characteristics, limitations and consequences have been established and can be confirmed.

Even though the work focused on action games and the real-time strategy genre, the final template can be used within many different games or genres. As mentioned in the beginning of this work the narrative or visual aspects of such an encounter have only been touched upon, as more would have exceeded the scope of the thesis. Nevertheless, those are still relevant and part of the final template.

6.3 Concluding Discussion

To finally conclude the whole thesis, the work can be reflected by the author.

The two major hypotheses can be confirmed. The boss design template can be used as a tool that helps to set up a boss design, prove its elements, and find flaws in its construction when analyzing an encounter. This shows as well that any boss encounter can be deconstructed into the elements listed by the template.

The more specific hypotheses can be reflected by the complete methodology and the final application of the templates theory. Starting with the definition of a boss fight, Byron Miller can be quoted again: “A boss encounter is a combat encounter that stands out from the preceding content in three ways: Difficulty, narrative importance, and experiential spectacle.”¹¹² As an additional small correction, a boss fight is heavily influenced by its constraints and purpose. Every component of the encounter should support at least one pillar of the fight to ensure a great experience for the player.

Several interviewees confirmed that communication is really important for a boss fight and it is a major part for establishing flow within the encounter. A simple systems helps to get the player engaged more easily and a complex system is not needed as seen in the analyzed *God of War* boss fight. As found on several occasions boss designs make use of clichés and tropes as they can communicate really fast and help players as a reference for setting their expectations. Therefore it can be approved, they are not a bad thing but more a tool that can be used if necessary. By reflecting the boss encounter analyses, it is proven that the introduction of the boss and what is being communicated is vital for the understanding of the player’s situation and objectives. An active approach towards a boss is very powerful, but a cinematic scripted event has its benefits, too. Time for preparation before a fight is helpful for the player but is not mandatory and therefore falsified, as it clearly depends on the aimed experience the designer wants to create. The final delta of chance and the coup de grâce are important to finish the experience and, as already established, the player should be able to land the critical hit or actively defeat the boss in another way. This last bit of control in the final moments of the encounter establishes a bigger payoff. In most cases, the player should feel in control and there are different elements that support this. The readability and predictability of offensive and defensive moves by the boss are essential to establish “a dance between the enemy and the player”¹¹³. As endorsed in the interviews and the analyses, phases, patterns and the telegraphing of moves are a great way to communicate the next steps of the boss. The designer controls the pacing and escalation over the progression of the encounter. But to correct the hypothesis the moves of a boss does not have to follow a pattern, they just need to communicate what they do. As learned through the interview mini or mid bosses can fulfill several purposes just like other bosses. Their mechanics are in particular serving as a preparation for its connected boss, because special mechanics should be taught before or right in the beginning of the boss encounter, so the player has enough time to understand them.

¹¹² See Interview 4, Miller B, 2018: Appendix XXII

¹¹³ See Rogers, 2014: 347

Looking back at the template's adaptation to boss encounters in RTS games and how the different principles and elements have been implemented into the concept of Iron Harvest, it can be confirmed that there are challenges to adapt specific details, but by analyzing what those elements want to achieve it was possible to adapt them in a way that supports the core gameplay while still achieving the same goals.

Overall, the thesis was a success and the template is definitely a help for designing boss encounters. Both methods of gaining knowledge from existing boss fights and industry experts helped the author and the work itself. The work with the template was great as it can be used as a tool to analyze an encounter and also give guidelines and a structure for designing one. But as the boss concept for Iron Harvest needed to be worked on before the final template has been completely formulated, the concept had to go through several iterations that could not be included in the thesis, because of the limited scope. Furthermore, finding a working format for the template was not an easy task. But with the goal of a clearly structured template, a good solution has been found that fits everything in four major points and does not exceed a page. The template will definitely be used by the author and more abstract systems will be tested to improve the workflow with it. The template in its current form can easily be shared with other game designers to help improve the state of boss design itself and the development of boss encounters as well.

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Appendix

Final Boss Design Template:

Constraints:

Core Mechanics: *(analyze the core loop and player actions, decide on the focus)*

Target Audience: *(adjust difficulty to the player type, know and use their expectations)*

Others: *(list everything else constraining the encounter, e.g. scope, story, and time)*

- Think about what limits the possible gameplay in that boss fight.

Purpose:

Mechanical Intent: *(block progress, test skill, variate gameplay, resolve narrative, etc.)*

Aimed Experience: *(find what stands out, list the targeted kinds of fun and pleasure)*

- Define the goals of the encounter and what you want to achieve with it.

Pillars:

Gameplay: *(communicate high-level design, combine gameplay concepts)*

Pacing: *(rise tension through challenge and awe, cater breaks, create climax)*

Narrative: *(list elements connecting to gameplay and progression)*

Aesthetic: *(support communication, set rules, use established expectations)*

- Set the main vision of the fight and how you communicate the goals.

Components:

Actors: *(list relevant actors, describe their role in the encounter)*

Environment: *(direct focus, tell a story, hint at gameplay, serve as gameplay)*

Phases and Escalation: *(adjust intensity, add variation, surprise, communicate)*

Moveset: *(clear and precise, offensive or defensive, describe patterns and effects)*

Dealing Damage: *(conceptualize ways to harm the boss or progress in general)*

Surviving: *(draft ways to avoid the boss and its moves)*

Windows of Opportunity: *(describe vulnerable states, create delta of chance)*

Coup de Grâce: *(describe the end, utilize the critical hit, please satisfaction)*

Reward: *(give meaningful desire, narrative, loot, feature, etc.)*

- Show possibilities and guide the player's experience and fun.

Interviews:**Interview 1: Tom Constable – Level Designer at Creative Assembly (16.09.18)***A) Basics*What defines a boss encounter? What are its characteristics?

This can of course vary depending on genre, but generally boss encounters are designed to challenge the player's mastery of the mechanics. Frequently used as a finale and serving as the ultimate challenge the player faces. Boss encounters can also serve as a change of pace for the player, providing a break regular gameplay. It can also be a useful vessel for delivering narrative.

What is the purpose of a boss fight?

In my opinion the key purpose of a boss fight is to serve as a finale to the game or as a suitable end to a chapter. Its core purpose generally is to complete the overall gameplay loop in a satisfying way. Players will need to draw all their mechanical knowledge to defeat the boss and, in most cases, will be the toughest encounter they've faced, which should result in a satisfying victory once defeated. It can also serve as a key area to deliver major story beats and can reward the player with narrative.

What are the most important setup and aftermath elements of such an encounter?

I believe the build-up and payoff is vitally important in a boss fight. It's important to have an appropriate build-up to allow players room to ready themselves for the fight ahead, while also building tension for the upcoming fight. Giving clear telegraphing of the challenge the boss poses is an important element. This ensures the boss can be challenging but avoids feeling unfair.

Once the player defeats the boss it's a key time to give a chance for players to breath and reward them for overcoming the odds. Common rewards are cutscenes or story beats.

B) In Depth

How is the skill of the player handled in a boss fight?

As previously mentioned the goal is to provide a satisfying challenge for the player that is designed to test their skills. This can cause complications with players of differing skills levels. In the case of Halo Wars 2, there was a script that dynamically adjusted the enemy AI. This was designed to provide the player with a well-paced challenge. The goal here was to avoid player frustration by constantly restarting the mission. Instead allowing the player a little breathing room to re-build their forces and increasing the challenge as necessary. The ideal condition here would be that all players complete the mission first time but were on the brink of failing. This was also handled through the difficulty setting where AI compositions were adjusted, and more resources were provided. Ultimately the experience for each player should remain the same and much of the level design process was spent playtesting this to ensure this balance.

In which way do you need to balance or scale a boss fight for the right pacing?

In Halo Wars 2, the aim was to embed the boss fight into a more traditional RTS mission. This allowed for the balance and correct pace. The key part to this was giving the boss very distinct stages. For example, once you dealt damage to the boss it would retreat and forced the player back into the surrounding level. This allowed room for pacing by showing the player damage had been dealt and telegraphing how much was left to deal. Once the boss retreated a countdown was started, this fed into a narrative beat but also ensured measured pacing having a fixed time limit to return to dealing damage to the boss. Having fixed timers also allowed for a consistent mission completion time which is important to gauge pacing as part of the overall experience.

What are the most common mechanics and systems used in boss fights?

This is dependent on genre but typically the player is faced with a challenge or puzzle to overcome. The mechanic used will be specific to the game and genre. For example, Halo Wars 2 being an RTS, the goal was to challenge the players by taking everything they'd learnt to that point and challenging their mastery of those systems.

How are mini or mid bosses correlating with the end boss in terms of game design?

If mini-bosses are used before a final boss, this can be the perfect opportunity to foreshadow certain elements of the final boss fight. This may only be a small element of the fight but this will ensure that the player has a mastery of the basics mechanics before increasing the challenge in the finale. For example, a mini-boss style unit was used in prior missions, however where the player had previously fought a single unit,

the final boss increased the challenge to fight the same unit, while also trying to defeat the main boss.

What role has the environment in a boss fight?

This can again be dependent on the goal of the boss fight. In the case of the boss fight in Halo Wars 2, the boss was intentionally embedded into the environment. The intention here was to allow the boss to block certain sections of the environment and allow for pacing and interesting level design. Utilizing the environment where possible helps the boss feel more grounded. It is especially important to take advantage of the environment with boss fights especially if the game has core mechanics that are movement based.

C) Personal:

In which capacity have you been working on boss encounters and their design?

My professional experience has come from working on the Halo Wars 2: Awakening the Nightmare expansion which featured a boss fight in the final mission. I was working throughout with the senior designers to design the boss encounter.

How do you see the current state of boss design in video games?

This is a really great question and something I considered when designing the boss fight. My personal opinion is that boss fights have become commonplace and are less exciting as a result. However, games like Dark Souls/Bloodborne are still working to re-define how we perceive boss fights in a positive way.

Personally, my aim was to try and incorporate the boss fight into the overall mission and make them feel more integrated into the overall gameplay experience. Overall, I'm excited to see how the design of boss fights evolve and adapt to continue to engage and surprise players.

What are common mistakes in boss design?

Difficulty is something that I feel can be badly managed. Typically, the difficulty is highest in boss fights, but it's a very difficult balance to strike. Unfortunately, this balance is not always struck and boss fights can become frustrating and feel unfair. I'd specifically identify that this frustration comes from poor telegraphing of mechanics and fails to communicate how the player needs to overcome the challenge.

What would be your advice for designing a boss and its encounter?

Have a clear set of goals.

Documentation is hugely important, especially when working as part of a team. Ensure each stage of the boss fight is planned out in detail and that it is successfully testing the mechanics you require.

Playtesting is also very important to stress. Get players testing your encounter as soon as it's playable, this can be in a simple placeholder at first to prove out the concept. Record or watch the playtests, you're looking to learn if players understand how to overcome the challenges and that the experience you want from the boss fight is playing out as you expected. There will no doubt be areas players struggle with initially. Make iterations and playtest again.

Can you name any resources that were helpful for developing a boss fight?

Doing research on similar style of boss fight can really help to avoid falling into common problems. This will be very specific to your style of boss fight. Watch or ideally play as many boss fights as you can. Breakdown what works, what doesn't and try and apply it to your own levels.

A useful resource was Mark Browns breakdown of Cuphead Boss fights <https://youtu.be/F8T6UI4aHTI>

What is your favorite boss encounter in a video game?

It's hard to choose a favorite but Shadow of the Colossus has an excellent approach to boss design. Special mentions for God of War and Cuphead which both have great boss design from my perspective.

Interview 2: Denny Yeh – Senior Staff Game Designer at Sony Santa Monica (21.09.18)*A) Basics*What defines a boss encounter? What are its characteristics?

It depends on what the purpose of the boss encounter is. Some better questions to ask would be:

- What kind of game are we making? What kind of gameplay does our game excel at?
- What is this boss encounter trying to accomplish for our game? Is it telling a story? Is it teaching the player some game mechanic?

Depending on the answer to these questions, we can then start constructing our boss fight. There is no one size fits all solution.

What is the purpose of a boss fight?

Again, it depends. See the previous question. Some common goals for boss fights in many games include:

- To tell a specific story beat, or reveal information in an interactive way
- To teach the player a new game mechanic
- To test the player's mastery over an old game mechanic (usually one that was introduced in the level the boss exists in)
- To challenge the player
- To add some variety to an otherwise monotonous gameplay loop

The boss fight needs to cater to the needs of the game, not vice versa. The worst thing you can do is just insert a boss fight in a game without thinking about the bigger picture.

What are the most important setup and aftermath elements of such an encounter?

It depends.

*B) In Depth*How is the skill of the player handled in a boss fight?

It depends. Some better questions to ask:

- What kind of game are we making? What is our target demographic?
- When does this fight take place? Is it early in the game? Late in the game?
- Is this fight critical to progression or is it optional? If players get stuck here, will they be unable to experience the rest of the game?

You usually want the boss to handle all types of players well. Skilled players need to feel challenged, while less skilled players still need to be able to get through it.

In which way do you need to balance or scale a boss fight for the right pacing?

See previous answer.

What are the most common mechanics and systems used in boss fights?

- Multiple phases – These usually serve to make sure the fight doesn't get repetitive. Gives the player a sense of progress in an otherwise long fight.
- Vulnerable State – Bosses are usually pretty strong defensively. Most fights allow the player to stun the boss in some way to get a period of free damage against them.
- Lock and Key – Bosses usually interact heavily with the new mechanic that was introduced in the level. For example, if you got a bow, the boss will usually require you to use the bow to defeat him in some way.

Keep in mind these are just some common themes. Not all bosses should do all or any of these things. It depends.

How are mini or mid bosses correlating with the end boss in terms of game design?

It depends on why you want mini or mid bosses in the game.

- Are they preparing you for the final boss?
- Are they related story-wise to the final boss? Do they give you extra lore?
- Are they just there to break up level pacing with no connection to the boss?

What role has the environment in a boss fight?

Again, it depends. Here are examples from God of War:

- Valkyrie – No environmental interaction. The Valkyries are designed to test your combat prowess directly, so they can fight you on a simple flat plane. The size of the arena still makes an impact to the fight, however.
- Baldur – Environment is there to show spectacle. It communicates the destructive potential of two gods fighting it out. It also serves as a wakeup call to players, telling them: “This is still a God of War game.”
- Hraezlyr the Dragon – The environment is an integral part of the fight. The player must use the objects from the environment to help damage the boss. This helps reinforce the level mechanics that you just learned before the fight.

As you can see, all 3 of these fights serve a different purpose. They use the environment as much or as little as they need to.

C) Personal:

In which capacity have you been working on boss encounters and their design?

I've been working on boss fights for over 10 years now.

How do you see the current state of boss design in video games?

It's like it always has been. There are some excellent boss fights and some not so great boss fights.

Some games rely heavily on the strength of their boss fights. They're the highlights of the game that the player can look forward to.

Some games don't have the mechanics to support great boss fights, and that's okay.

What are common mistakes in boss design?

What might be a mistake in one game could be the right answer in another.

If the game has a strong focus on combat, usually you'll want to have the boss fights take advantage of this (For example, don't have a boss fight that relies entirely on puzzle gimmicks).

If the game is very puzzle focused, usually the boss fights should take the same approach.

What would be your advice for designing a boss and its encounter?

Think about what its purpose is. What do you want to teach the player?

Make sure there isn't a long stretch of the fight where you're doing the same thing (this is where different phases come in handy).

Can you name any resources that were helpful for developing a boss fight?

Just play a lot of games and analyze what was good and bad about every aspect of them. Think about everything critically and ask yourself "Why did they add this mechanic to the boss fight here? What could they have done to make it better? Why didn't they do that?"

What is your favorite boss encounter in a video game?

Magus from Chrono Trigger.

Additional notes:

Just remember there is no one answer for what a boss fight needs to be. It's just another tool for serving the needs of whatever game you're making.

Good luck! If you'd like something more to read, you can check out my blog post on the making of Baldur:

<https://godofwar.playstation.com/stories/behind-scenes-fighting-god>

Interview 3: Benjamin Arnold – Content Programmer (Fractals/Raids) at ArenaNet (08.10.18)*A) Basics*What defines a boss encounter? What are its characteristics?

A "Boss" encounter usually contains one or more "Boss" creatures, which can be any creature, but serves as the primary antagonist and usually the primary damage target, but not as a rule.

A boss encounter, like all encounters, will have some kind of "mechanics" preferably unique, that players are intended to perform in order to succeed. Usually these unique mechanics will mesh well with the core mechanics of the game.

What is the purpose of a boss fight?

A boss fight provides a climax, in terms of story and often in terms of challenge. A boss fight should feel important, and when succeeded, should feel rewarding.

What are the most important setup and aftermath elements of such an encounter?

Building tension is very important. Leading up to the boss, there should usually be smaller encounters teaching some of the core mechanics of the fight, as well as some rising action in terms of challenge and introduction of the story, so that when players reach the boss, there is a large payoff.

Depending on the importance of the boss and the relevance to the story, the aftermath may contain nothing very important. Some loot perhaps, and players move on to the next challenge. If the boss is important to the story in some way, the death of the boss should also feel important. Something should change as a result of the boss's defeat, making it feel worthwhile.

*B) In Depth*How is the skill of the player handled in a boss fight?

This depends on who the target audience is. A hardcore audience will be expected to play with a high degree of skill, and thus should be punished harshly for mistakes. A more casual audience should still feel challenged but should not be heavily punished.

Allow them to fail fast and iterate quickly, without having to re-do a bunch of content every time they lose.

Puzzle like mechanics are often very good at providing challenge for both skilled and unskilled players, but you have to be wary of making a puzzle that unskilled players cannot figure out, possibly resulting in them quitting your game. You don't want to hold their hands with obvious dialogue hints, but having clues that themselves are small puzzles, as breadcrumbs to the solution, is always good.

In which way do you need to balance or scale a boss fight for the right pacing?

This is difficult to quantify, but in general you want the pacing to ebb and flow a bit. You want periods of high stress and high skill, followed by periods where players can take a breather, with mechanics that are still challenging, but to a lower degree. Scaling the fight entirely depends on the difficulty level of the fight. At the absolute highest difficulties, there is no need for an ebb in pacing, it can be stressful and incredibly challenging the entire time.

It is often very rewarding to see difficulty scaling done mechanically instead of numerically. Basically, instead of just making things do more damage, add a new skill, or make an old skill do something more interesting.

What are the most common mechanics and systems used in boss fights?

AoE attacks, additional small creatures to kill, "stand in the bubble", timed blocks, area denial (fire pools), lock and key (bring this thing to this spot), and burn phases are pretty common mechanical examples.

How are mini or mid bosses correlating with the end boss in terms of game design?

Mid bosses should serve to elevate the final boss, by providing the rising action needed for a big payoff. They often will have some subset of the mechanics present in the final fight, but with lesser challenge. They should also be relevant to the final boss in story, perhaps as henchmen, so they can serve to build up the final boss as the main antagonist.

What role has the environment in a boss fight?

The environment is very important. Something as simple as changing an environment zone over time to get more visually intense can do much to add to the perceived intensity and "epicness" of the fight. The environment can also be used mechanically, for example if you have a fight in a jungle, a mechanic could be to lasso trees and shake off some coconuts to drop them on foes.

*C) Personal:*In which capacity have you been working on boss encounters and their design?

I participate in the initial brainstorming for all the bosses, but usually I own the main design of one boss in a raid wing or fractal, including the write-up, implementation, partial narrative, and code support.

How do you see the current state of boss design in video games?

It gets better and better. Designers are learning from each other's bosses, and new tech and art styles have really taken things to the next level.

What are common mistakes in boss design?

Too much AoE spam or visual noise can be exhausting.

Mechanics that do not mesh well for satisfying gameplay result in bad dynamics.

Heavy reliance on randomness is often not fun. It can work in certain games or encounters but dying to random chance just feels awful.

A lack of escalation in an encounter makes the end of the fight feel unsatisfying.

Re-use of old mechanics with no uniqueness results in a bland boss.

What would be your advice for designing a boss and its encounter?

Start with figuring out the sort of narrative you want; do you want to fight a pirate captain? A dragon? Then you can start to figure out an aesthetic that fits that boss. For a dragon, maybe the core theme or aesthetic is "raging inferno". With your aesthetic in

mind, you can brainstorm mechanics that fit this aesthetic, then prototype it on tabletop or in script to see how the mechanics work together. Make sure your boss meshes well with the play style of your game.

Can you name any resources that were helpful for developing a boss fight?

The best resources are often other games, and other designers. But Extra Credits on YouTube has some good stuff for general game design. I honestly don't do a lot of research... I'm the kind of guy who likes to come up with things on his own and think way outside the box, which is admittedly not the best approach for most people.

What is your favorite boss encounter in a video game?

I didn't play it, but visually and thematically, Sister Friede from Dark Souls is just... awesome. The pacing shifts drastically in each phase, and it just keeps getting more intense both visually and mechanically. It is a beautiful fight

<https://www.youtube.com/watch?v=0KeKFc0xGr8>

Admittedly I haven't played all the Dark Souls games and I'm sure there's better fights out there, but this one gave me chills and I remember it.

Additional notes:

Make sure to have lots of people of varying skill levels playtest your boss and give critical feedback :)

Interview 4: Byron Miller – Senior Designer at ArenaNet (08.10.18)

A) Basics

What defines a boss encounter? What are its characteristics?

A boss encounter is a combat encounter that stands out from the preceding content in three ways: Difficulty, narrative importance, and experiential spectacle.

What is the purpose of a boss fight?

The purpose of a boss fight is providing players with a series of mechanical challenges or puzzles that require them to problem solve, cooperate, and adapt to the escalating danger that the encounter presents.

What are the most important setup and aftermath elements of such an encounter?

Before a boss fight, it's important that players are provided with a safe place from which to observe and plan, as well as catch their breath if they've failed to defeat the boss. From an experiential point of view, boss fights should have narrative context to why the encounter exists, why the boss – or bosses – are present in the environment, and why the player must overcome them.

In the aftermath of a boss encounter, it's important to provide some down time to allow players to celebrate. Some narrative can be introduced here, but because the aftermaths of boss encounters are sometimes chaotic, it's best not to have anything critically important be revealed to players until they're ready to hear it.

B) In Depth

How is the skill of the player handled in a boss fight?

Boss fights should be products of the mechanical systems available to players. In order to test player skills, it's important to make informed decisions about what you want players to do.

Mechanically, players need to damage the boss while avoiding or mitigating damage done to them by the boss. Damaging a boss is a test of mastery of player abilities, and of understanding boss weaknesses. Avoiding or mitigating damage is a mix of player mastery and understanding and identifying patterns of attack that a boss performs.

In which way do you need to balance or scale a boss fight for the right pacing?

Deciding about how long you want your encounter to be is probably the first step towards balancing your encounter. Length is a huge determining factor in pacing, health values, and cadence of a boss fight. Knowing the lowest acceptable average damage-per-second value you expect out of a party is the next step in determining balance for a boss fight. This allows you to determine a rough health value for your boss (or bosses). After average DPS, you need to determine how much time your boss is forcing players to abandon dealing damage in favor of surviving. After that it becomes a matter of recognizing how often your boss is actually dealing damage to players. Testing out encounters with a party of dedicated testers or players, before it goes live, can give you all sorts of great information about pacing. Trial-by-fire can expose elements of your design that are very difficult to identify on paper.

What are the most common mechanics and systems used in boss fights?

The most common mechanic/system in a boss fight is aggro: the player-character the boss wants to kill first and foremost. Most boss fights have some form of aggro, because aggro allows players to enforce predictability in a digestible way. "I have aggro on the boss, therefore the boss will follow me as I navigate the arena. Using this I can move the boss around to avoid hazards or other dangerous things in the encounter."

How are mini or mid bosses correlating with the end boss in terms of game design?

Mini/mid bosses are typically narrative stepping stones that advance the story or plot of the dungeon. They can sometimes preview mechanics that a final boss will use, although this isn't usually the case.

What role has the environment in a boss fight?

Environment is just another mechanic in a boss fight, at its core. Sometimes that mechanic is complex (Moving platforms, zero gravity areas, alternate dimensions, etc) but usually the environment is simply the limited space in which the boss and players fight.

C) Personal:

In which capacity have you been working on boss encounters and their design?

I've built several boss encounters in Guild Wars 2. This includes designing the entirety of the encounter on paper, scripting and debugging the skills and mechanics the bosses utilize, and balancing/polishing the encounter for ship.

How do you see the current state of boss design in video games?

Boss design will always be a conversation between designer and player, and the language will be the shared understanding of the abilities and capabilities of the players participating in the conversation. A boss design lives and dies on this understanding and trust. Not knowing the limitations of your audience means a boss is unfair or too easy.

What are common mistakes in boss design?

See above. (Current state of boss design question)

What would be your advice for designing a boss and its encounter?

Choose one thing you want your players to feel clever about solving, then ask them to solve it in several different ways or put up roadblocks towards solving it that cause them to think differently.

Can you name any resources that were helpful for developing a boss fight?

YouTube. My goodness I can't underscore enough how valuable it is to be able to watch boss fights and dissect them without having to go into a hundred different games and master them.

What is your favorite boss encounter in a video game?

Razorgore the Untamed from Blackwing Lair in World of Warcraft.

Interview 5: Anthony Tran – Game Designer at ArenaNet (08.10.18)*A) Basics*What defines a boss encounter? What are its characteristics?

The mechanical challenges and lessons presented, the theme and lore told through aesthetics, and the core experience embedded within the player afterwards.

What is the purpose of a boss fight?

To test and challenge a player, and pay off a prior series of events.

What are the most important setup and aftermath elements of such an encounter?

Mood. A boss can appear as early as the tutorial level, or be the final encounter, but it all ultimately depends on the mood one is trying to establish. Setting the mood properly, then introducing the boss is the most important setup element.

The aftermath is about the core experience the player walks away with - what will they remember most? This is often established through the escalation and finale of the encounter.

*B) In Depth*How is the skill of the player handled in a boss fight?

Player skill is to be tested and challenged in a boss fight. That said, it is a game between designer and player - we (designers) present a challenge and ask the player to find a way to overcome it. It should be a fair and winnable game, but also demand the player to learn through trial and error.

In which way do you need to balance or scale a boss fight for the right pacing?

When balancing and scaling a boss fight for pacing, the following factors are often considered: windows of opportunity (when can the player be on the offensive, vs defensive), DPS/damage uptime (how long can the player maintain the offensive), mechanical escalation and phase transitions (when and how does the fight get harder),

damage output (how much damage does the boss do - i.e. how many mistakes can the player make?), recovery opportunities (can the player recover from their mistakes?)

What are the most common mechanics and systems used in boss fights?

Phase transitions (with time, or more commonly health thresholds), (in MMO raiding) the holy trinity (tank, dps, healer), enrage (at some threshold, the boss escalates to a peak), burn phases (moments of pure offense), puzzles + instant kill mechanics (force players to learn a mechanic/puzzle by killing them if they fail)

How are mini or mid bosses correlating with the end boss in terms of game design?

Mini/Mid-bosses can often be used to teach the basics of a mechanic which may be seen later with the final boss. That said, mini-bosses can also be a unique entity that is a minor checkpoint for players. For example, a mini-boss might be a DPS (damage per second) check before a final boss.

Alternatively, a mini-boss might just tell a bit of narrative before the final boss fight that simply adds to the mood before the finale.

What role has the environment in a boss fight?

The environment can simply be the arena in which players are constrained during the fight, or it can have interact-able objects with which the player must use to defeat the boss. For example, pillars can be used for line-of-sight mechanics; or, power stations might need to be charged in order to defeat the boss. The environment does not have to be particularly extravagant, but it should be intentional.

C) Personal:

In which capacity have you been working on boss encounters and their design?

I have been designing dungeon and raid boss encounters for MMOs for ~5 years.

How do you see the current state of boss design in video games?

I think there has been a greater emphasis on boss design, and the acceptance of more challenging mechanics. That said, there is also a much greater emphasis on communicating and messaging mechanics clearly, so that players understand clearly and feel that they were given a fair chance.

What are common mistakes in boss design?

Not planning/designing what the player is expected to do. Often times, designers have cool ideas for boss attacks, but do not plan for the tactics and strategies of the player. As said before, encounter design is a game between designer and player - this game involves moves on both sides. As a designer, one must be able to predict and plan for the player's moves.

What would be your advice for designing a boss and its encounter?

Design the counter-play for the boss. i.e. how does the player defeat the boss? what are they doing each step of the way? And when you decide upon those actions, force the player to do those things. Often times, players will find ways around the mechanics - it is the designer's responsibility to recognize and mitigate those ways as appropriate. And iterate. Iterate fast. Fail fast. The faster you do that, the faster you'll reach good design.

Can you name any resources that were helpful for developing a boss fight?

Understand the game for which you are designing the encounter. Play the game and know what player behavior is for that game.

Play/Watch similar games and learn how other developers handle certain design and challenges.

What is your favorite boss encounter in a video game?

Something something, Dark Souls~

Additional notes:

Consider what the 'memorable moment' from the encounter is. Players will walk away with one particular memory / note / aesthetic about the encounter. Consider this and design around it.

Interview 6: Elijah Miller – Content Designer at ArenaNet (09.10.18)*A) Basics*What defines a boss encounter? What are its characteristics?

When you think of a boss a player tends to think of a threat that looms over the protagonist preventing progression until defeated through feats of wit or strength. The expectation is that the encounter can be completed and is more challenging than the content leading up to the boss. The encounter should usually draw from the lessons learned leading up to this point in the game and should tie into the theme, setting, and/or story somehow.

This is a pretty generic answer though, much like any antagonist seen in movies or novels a boss encounter can be practically any challenge that the players must overcome.

What is the purpose of a boss fight?

In most cases, bosses are simply a gate that bars the players from something they desire. For this reason, they tend to be balanced to test the player's skill and knowledge of the content they are playing leading up to the encounter in order to get through the gate. The carrot or "desire" can be anything but tends to be level progression, story advancement, loot, etc.

What are the most important setup and aftermath elements of such an encounter?

It is usually important to teach some elements of the encounter to the players before reaching the boss. Mario would be a pretty bad game if the player couldn't kill any enemies by jumping on them until reaching Bowser. Of course, like any rule this can be bent or broken when being intentionally designed that way.

Another aspect for setting up a boss is to try to find something memorable and exciting for the boss to revolve around. There are many ways to do this but here are a few thoughts: I think the most common, and easily executed, method is to simply making the boss larger and/or look different than standard enemies and the player's character. Another way you see developers doing this is by pitting players against something unexpected. The Division has a perfect example of this with the helicopter boss. There are many ways to do this but hopefully you can see where I am going here.

Aftermath – awarding progression of some sort. This can be story, allowing further progression in the game, and/or rewards, such as giving loot to improve the player's character.

B) In Depth

How is the skill of the player handled in a boss fight?

A designer should know character capabilities (abilities, gear, options, etc.), have an expected skill bar set for players (knowledge, reflexes, character familiarity, etc.), and a desired encounter difficulty (easy, medium, hard, etc.) before starting to design a boss. This is all important to understand so the designer will be able to accurately gauge how much of a hurdle the boss will be once implemented into the game. In most cases the designer wants to have a challenging encounter but not push into something that will frustrate the average players.

In which way do you need to balance or scale a boss fight for the right pacing?

The best answer to this is to find the fun for the game being developed. Each game has a different difficult gauge that should be consistent for the game being made. As a designer you will want to adjust the pacing of the encounter to meet the player expectations for the encounter. When playing the encounter if something feels too tough, too long, too short, too easy, etc. then you should take note and consider adjusting the balance until it is a fun for the target audience.

What are the most common mechanics and systems used in boss fights?

- Health or some way to display progress – Most bosses have health pools or some way for players to see their progress toward winning the boss encounter.
- UI – Some way to display and record the attacks, damage, remaining health, etc.
- Aggro – Some sort of targeting system, for MMOs and RPGs this is usually some sort of hate formula that determines what the boss decides to target.
- Skill cycle – Some sort of system or cycle for determine what skill the boss will use next.

- Messaged tells – This plays into the skill cycle but is important enough to call attention to it. If the boss attacks are supposed to be avoided be sure to have messaged tells for the attacks, this can be effects, animation, voice, text, etc. This is basically messaging to warn players how they should react to an incoming attack.

The list goes on, but without specifics I am going to cut it off here.

How are mini or mid bosses correlating with the end boss in terms of game design?

There isn't a hard rule here as it really depends on the game. While, arguably, some of the best boss designs incorporate a mid-boss into the end-boss encounter in some way, such as tying the content together through the story, theme, and/or gameplay mechanics. This isn't always required for an interesting and immersive mid-boss encounter.

What role has the environment in a boss fight?

Again, this depends on the encounter and the game it is being built for. In a text or turn based RPG game the environment is usually little more than a backdrop. In a turn-based Strategy-RPG will usually have the environment become cover or have hazards in the play space. In a more action-based game the environment could be incorporated into the boss encounter (See the last boss in the latest GW2 raid wing – Mythwright Gambit) or even be the boss encounter itself (See –WoW Spine of Deathwing raid).

The environment should support the boss encounter but shouldn't be the focus unless it is the boss itself or specifically designed to take the focus away from the boss for some reason.

C) Personal:

In which capacity have you been working on boss encounters and their design?

I have worked on pretty much all spectrums of boss content here at ArenaNet. I have worked on living world (Shadow of the Mad King, Winter's Day, Dragon Bash, Escape/Battle for Lion's Arch, Draconis Mons, etc.), xpac [expansion] content, story instances, dungeons, and many of the fractal's bosses.

How do you see the current state of boss design in video games?

Player expectations of bosses is pretty set these days, give us something challenging to destroy... Many games do this part right, but I think most of them don't do enough to break from the standard "safe" boss mold or successfully examine bosses in other games to see how much cleaner modern boss designs are, especially when compared to some of the outdated boss design concepts they end up using.

So, as a whole, I think the state of boss design is in a good place but should continue to evolve. Designers should always be playing as many games as possible and examine the newer boss designs, especially in games that have content similar to theirs, and think of ways to innovate on those designs.

What are common mistakes in boss design?

This will vary greatly depending on the game, but here are some that I have been running into recently.

Failing to find the fun in the encounter. This is pretty hard to nail down, but when playing the encounter determine what is fun and stripping out the cheap and or tedious elements. Fighting a boss should be engaging and probably shouldn't have unexpected one-shot mechanics or feel like a slog.

Which leads right into relying on large hit point pools to be the main distinguishing "mechanic" for bosses. Yes, I am specifically going to point at most of Destiny's and Division's bosses as an example of what you shouldn't do when designing bosses. These games have great systems, but then many of the "dungeon" bosses ending up feeling extremely similar. They have large health pools with a few cycled attacks which are designed to force the players behind cover.

Repetitious gameplay. Having a boss that you will fight for several minutes that only alternates between one or two skills, or doesn't require players to change their playstyle, ends up feeling monotonous. So, try to do things which encourage players to change how they are playing the encounter. This can be simple things like adding or changing skills used at certain health thresholds or having phase transition attacks. Just be sure to analyze if the encounter is becoming repetitious and if so do something to diversify it.

What would be your advice for designing a boss and its encounter?

I think everyone has heard this before, but don't be afraid to fail. When something doesn't work out quite right learn from the experience and do better the next time around.

Play games, analyze other boss designs (both good and bad). There is nothing better than getting in and experiencing bosses encounter for yourself. Watching a video is good, but you can't experience the challenge and/or frustration for yourself when watching someone else play the encounter.

Get other people to play your boss encounter and be appreciative of the feedback. It is hard to receive negative criticism but getting the feedback early allows you to reflect on the design and find ways to improve the encounter. It takes most designers years to figure this one out and it is what distinguishes the difference between new designers when compared to vets.

Give feedback. You will likely be a part of a team so don't just stew on feedback, both positive and negative. Speak up and let your team know what you think to help the encounter be the best it can be.

Don't punish the player. When designing a boss, it is easy to get caught up in the boss vs player mentality but remember the end goal should be to design an entertaining experience for the players, you aren't trying to outright slaughter or frustrate them. So even when you are building a boss using proven mechanics try to think if there are ways to improve upon them to make the experience better for the players.

Use random wisely. Random skills, hazards in the play space, effects, etc. can make the encounter look and feel more hectic but random is random and, to me, it doesn't ever feel good to failing due to some random element. So, when building an encounter and setting up something that happens randomly be sure it is necessary and not something that could be scripted into a predictable sequence.

Can you name any resources that were helpful for developing a boss fight?

Most of these are going to sound obvious, but here are the top three.

Your friends and colleagues. We can't play everything, it is impossible, so talking with friends and colleagues about games they are passionate about and digging through their favorite encounters as well as using them as sounding boards to bounce your ideas off of is a huge resource to tap into. So, don't overlook using them!

YouTube. You can quickly find existing boss encounters to refresh your memory on playing them or find new encounters that you haven't played before to draw inspiration from. Not to mention there are a lot of great design analyst channels for example Mark Brown – Boss Key series or various GDC talks.

Excel. Yup, that's right Excel. List attacks and values, do the math to make sure the math is where you want it to be for the boss. Also, keeping a journal (Excel or OneNote both work well for this) of bosses in other games could be helpful when looking for ideas when designing a new encounter.

What is your favorite boss encounter in a video game?

There are several answers to this, but for diversity I will give you the most memorable old school encounter. The dragon in Dragon's Lair. This isn't a favorite for complex boss mechanics, but it is a favorite because it was a memorable accomplishment and definitely a challenge to get up to that point to complete the story. Playing the game was a joy because the graphics were above and beyond what other arcade games looked like, so it felt like you were playing a cartoon. Additionally, as an arcade title very few players had the patience, or quarters, to beat the game so when I would play through it there were always other players gathered around murmuring and chattering excitedly at the aspect of seeing the ending. So the combination of story, challenge, graphics, spectacle, and just social encouragement is something I don't think you can find very often anymore. That being said, the game doesn't age well. It was a punishing quarter gobble that could be broken down into a Simon Says, or point and click game so would be something that wouldn't come close to today's boss design standards. It is a good example of how design has evolved, for the better.

Runner up to this are raid bosses in games like EQ or WoW. In WoW there were bosses with good mechanics, great spectacle, and proper loot. One clear favorite from WoW was the Karazhan raid. I enjoyed almost every encounter in this raid, but the Opera House stands out above the others for me. The boss mechanics weren't overly complex, but you fought one of three themed encounters that were challenging, yet whimsical and entertaining.

Interview 7: Tyler Bearce – Game Designer at ArenaNet (10.10.18)*A) Basics*What defines a boss encounter? What are its characteristics?

There is usually narrative, and/or gameplay buildup. The environment changes to be a 'boss room', which is often a large, flat, uniform play space with a massive, unique named enemy in the center. The difficulty and duration of the encounter is usually noticeably longer than the encounters leading up to this moment. Often there are cinematics, flashy FX and big set pieces to make the encounter extra impactful.

What is the purpose of a boss fight?

They create milestone moments in a game's pacing.

What are the most important setup and aftermath elements of such an encounter?

I largely covered this in the 'what defines a boss encounter' section.

Setup:

- A gradual escalation of difficulty, mechanics, art. (Killing trash mobs in a dungeon)
- Until reaching a 'boss room', which is often a large, flat, uniform play space with a massive, unique named enemy in the center.
- Perhaps you'll get some dialog or cinematics upon reaching the boss, to further setup the moment.

Aftermath:

- The boss is usually defeated in some satisfying way. Perhaps with some dialog or cinematics to make the conclusion more impactful.

- The player receives rewards for completing the encounter. This can be things like new equipment, achievements, in-game currency, unlocking a new feature or piece of content, leveling up, etc.

B) In Depth

How is the skill of the player handled in a boss fight?

You first determine your target audience, and what sort of win rate you are comfortable with and then tune the fight to match that difficulty as best you can. For instance, you might decide it's a boss that you want all of your players to beat, and beat on their first try (often tutorial boss). In this case we'd design the boss encounter to be impossible to fail, with hints or fail-safe mechanics to guarantee a win to even the worst players, all the while trying to maintain the illusion of challenge. Or you might decide the encounter should only be beaten by your top 1% of players, and only after many attempts. In this case, you make the boss really, really, difficult, so much that it seems totally unfair, a boss that you can't even beat yourself, but one that at least theoretically should be beatable. If it turns out players can't beat the boss after all, well many games can just release a patch to reduce the difficulty at a later date.

In which way do you need to balance or scale a boss fight for the right pacing?

This is more art than science. You and your play testers play through the encounter a number of times. You record the length of time it takes to beat the encounter for each attempt, you compare that to other encounters in your game. You make a judgement call if a fight seems too long, or too short. The simple way to change an encounter's duration is to add or reduce boss hit points. But you may find that you need to add or remove whole boss mechanics, or phases of the fight.

What are the most common mechanics and systems used in boss fights?

- The boss is invulnerable, do some mechanic to remove his invulnerability!
- The boss is almost invulnerable, but he has some glowing weak points, hit those for massive damage!
- The boss summons additional minions for you to deal with.
- The boss does large area attacks that you need to move out of.

- The boss does attacks that can harm himself. Reflect the missiles back at the boss. Lure the boss into his time bombs. Trick the boss into ramming a pillar.

How are mini or mid bosses correlating with the end boss in terms of game design?

The mid bosses are more interesting than standard encounters, but less interesting than final encounters. This goes into all aspects of design: the duration of the encounter, the difficulty of the encounter, the number of new art assets, the number of mechanics, the amount of cinematic moments, the amount of dialog, the environment size and complexity, etc.

What role has the environment in a boss fight?

The environment should be used to help facilitate your design goals for the encounter. The same boss encounter can feel very different if you are fighting the boss in a narrow corridor instead of a big open field. Or if it has good lighting or poor lighting, or if there are obstacles or if there are none. A boss encounter only benefits from having a complimentary environment. It's like pairing the right wine with your dinner. Or so I hear, I don't really drink wine.

C) Personal:

In which capacity have you been working on boss encounters and their design?

I've worked on designing open-world PvP and PvE bosses as well as instanced Raid bosses.

How do you see the current state of boss design in video games?

We are getting better at messaging boss mechanics, but this is leading to a certain sameness across games. Move out of the red ring!

What are common mistakes in boss design?

Not fully accounting for potential exploits. Often designers have a specific idea of how players are going to solve an encounter, and that might blind them to potential alternate solutions, especially those that may trivialize the encounter.

What would be your advice for designing a boss and its encounter?

Avoid designing a boss that's more fun for the designer than the player. It's easy to get caught up in all the hoops you can make a player jump through, or tricks you can pull on them to increase the difficulty, but sometimes you have to take a step back and ask yourself if you'd actually want to play through this boss encounter? Is it actually fun, or is it just arbitrarily difficult?

Can you name any resources that were helpful for developing a boss fight?

https://www.gamasutra.com/view/feature/134503/boss_battle_design_and_structure.php?print=1

What is your favorite boss encounter in a video game?

No idea, I'm bad at picking favorites. I think too hard! I'd have to spend a few weeks making a list of every game I've ever played, and a list of all the bosses in each of those games, and from there pair down the list into maybe a top 100, and gradually ween that down to a single favorite.

Declaration of Authorship

I hereby declare that the thesis submitted is my unaided work. All direct or indirect sources are acknowledged as references.

This paper was not previously presented to another examination board and has not been published.

Justin Zwack

Bremen, 2018

Justin Zwack