

# A High-Level-System-Architecture for a Wizard101 Match

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## 1 Introduction

Wizard101 is a multiplayer online game that combines strategy, turn-based combat, and card-based spellcasting. Matches in Wizard101 are not only a form of entertainment but also complex systems that integrate decision-making, resource management, and probability under a structured set of rules. To study such matches from a system perspective, it is valuable to design a high-level system architecture that outlines the core components, interactions, and flows of information during a game.

This paper proposes a system architecture for a Wizard101 match that abstracts away implementation details while focusing on the conceptual structure of how a match operates. By treating each match as an interconnected system of players, spells, resources, and states, we can analyze the game more systematically. Such an approach benefits from technical exploration-such as designing simulations, AI agents, or reasoning frameworks-and game design studies, where clarity of interactions and balance are critical.

The introduction of a high-level architecture also provides a foundation for future extensions, including automated match analysis, simulation-based experimentation, and integration with computational reasoning frameworks. By structuring the match as a system, we gain the ability to model, simulate, and optimize the dynamics of Wizard101 in ways that extend beyond simple gameplay, making it applicable to broader domains such as artificial intelligence research, decision-making systems, and interactive learning environments.

## 2 Overview

In this paper, we present a high-level view of the core components that define the structure and flow of a Wizard101 match. A match is driven by the interaction of player resources, decision-making processes, and post-match analysis. The major components we will examine include:

- Resource Management: Understanding the role of pips as the fundamental resource required to cast spells.

- **Statistical Attributes:** Analyzing key player statistics such as damage, resist, accuracy, critical, block, power pip chance, stun resist, incoming and outgoing healing, archmastery rating, and shadow rating, which influence performance and outcomes.
- **Deck Construction:** Building a deck of spells from a larger collection of approximately 1,000 spells across the seven schools of magic (Life, Death, Myth, Ice, Fire, Storm, and Balance).
- **Spell Operations:** Executing spells during the match, including drawing from the deck, discarding unwanted cards, and casting chosen spells within the constraints of the match timer.
- **Post-Match Analysis:** Reviewing decisions, outcomes, and statistical performance to identify areas for strategic improvement and to refine future play.

This structured breakdown provides a systematic framework for analyzing how Wizard101 matches function, enabling both theoretical study and practical applications such as simulation, AI-driven strategy, and player skill development.

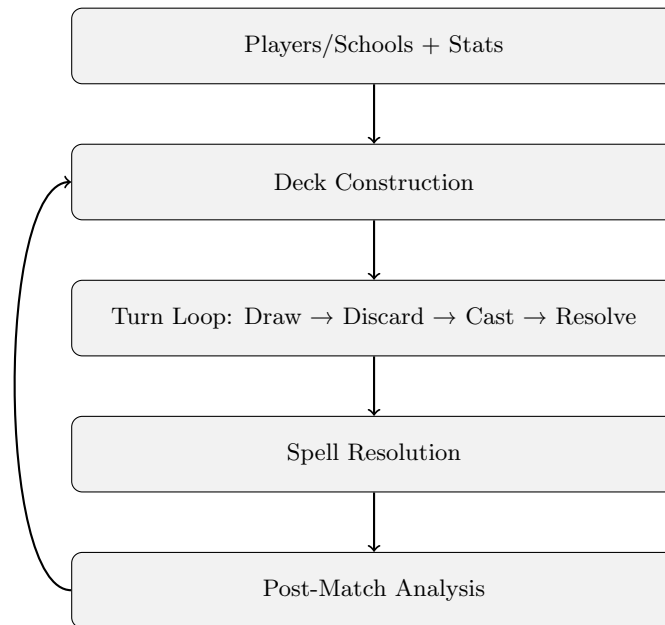


Figure 1: High-level flow: inputs → deck → turn loop → spell resolution → analysis (with feedback).

### 3 Resource Management

Pips are a valuable piece of information that lets the wizard know which spells can be casted given that they meet the pip requirements for it. There are regular pips and power pips and each pip gained for each round is determined by the power pip percentage. For example, if I have a 50% power pip percentage, this means there is a 1/2 chance that I will gain a power pip each turn, otherwise it will be a regular pip. In Wizard101 PvP matches, pips are extremely important to know how to trade hits that let you either combo into a follow up hit or manage them in such a way that you are not in any danger of not being able to defend yourself due to a low amount of pips.

### 4 Statistical Attributes

Let's discuss some of the key attributes: damage, resist, accuracy, critical, block, stun resist, incoming outgoing and healing, power pip chance, archmastery rating, and shadow rating. To start off, the damage is a multiplier used for damage-based spells that increases the amount of damage the spell does. The resist is the reduced amount of damage a spell deals to their opponent. The accuracy is the percentage of the spell cast added to the accuracy, leading to a wizard to either fizzle or cast their spell successfully. The critical is a small damage multiplier to help the damage spells deal more in damage. The block is a small reduction multiplier that cause the spells to deal less damage. The stun resist is the percent chance or probability that a player does not get stunned by a stun spell. The incoming outgoing and healing are the percentages for how much a heal will increase to a single player and to all allies on the team. The power pip chance is the percentage that a player will receive a power pip for each round. The archmastery rating is a number to change to other color pips (life, death, myth, ice, fire, storm, balance), and be able to use that color pip as part of casting a spell. Lastly, the shadow rating is a number that defines the ability to get shadow pips and use them to cast shadow enhanced spells. All these attributes as part of the stats information are important to get a foundationl understanding of how they work as all of these parts play a role during a match.

### 5 Deck Construction

In Wizard101 PvP, deck construction serves as a core container of strategic knowledge and directly influences the outcome of a match. A well-prepared deck ensures that the selected spells align with a player's overarching strategy and can be reliably accessed during play. The efficiency with which a player discards, draws, and casts spells determines how effectively the deck can be cycled and, ultimately, the likelihood of achieving the desired outcome.

At a high level, deck construction consists of two components: the main deck and the treasure card (TC) deck. For max-level PvP, the main deck typically

supports up to 64 cards, while the TC deck holds 35–40 cards, though these values may vary at lower levels.

Deck construction is also subject to school-specific card limits. For instance, a balance deck may permit a maximum of eight balance cards, while some decks restrict players to six universal cards drawn from any school. These limitations enforce balance in deck building and require players to make deliberate trade-offs between versatility and specialization.

Be sure to review the spells added to your deck based on their description, the pips, the name, pip chance, and school. A good resource to review a list of spells according to their school at the Wizard101 website listed here.

Balance School Spells

Ice School Spells

Fire School Spells

Storm School Spells

Life School Spells

Myth School Spells

Death School Spells

It is good to refer to the spell documentation of each school and experiment in Wizard101 matches to either test out the spells, see how they could fit in your deck, and explore the use cases of the spell in a match. There will be future research papers that go into this, but it is also a good idea to explore on your own and eventually come up with a deck that you are comfortable doing PvP with.

## 6 Spell Operations

The previous section introduced deck construction and the knowledge required to prepare an effective PvP deck. In this section, we examine how the discard, draw, and cast mechanics operate within a turn-based match.

A turn-based match is a system in which players act sequentially: on a given turn, one player has the opportunity to cast a card while also being able to discard or draw. The opposing player, during their off-turn, may not cast but can still discard and draw. This structure ensures fairness, giving each player the chance to react to their opponent's moves by refining their hand before committing to a play.

Historically, Wizard101 PvP did not use a turn-based structure. Both teams could cast simultaneously, which required extensive domain knowledge to pre-

dict opponents' actions. While this system sometimes produced chaotic or unexpected plays, it limited strategic depth. The adoption of turn-based match-making addressed these limitations by allowing players to make more deliberate, informed decisions.

Within this framework:

Discarding refers to removing cards from the hand to cycle toward more relevant options. Effective discarding depends on anticipating the opponent's strategy, which is often tied to their school and deck type.

Drawing allows a player to access new cards from the TC deck. The challenge is to maintain a balance between discarding and drawing in order to optimize available resources.

Casting is the act of selecting and playing a card, whether from the main deck or TC deck. Successful casting relies on both situational awareness (the state of the match) and broader meta-knowledge of prevailing strategies.

By combining these three mechanics, players can dynamically adapt their deck in real time, maintaining flexibility while pursuing a strategy that maximizes their chances of winning.

## 7 Post-Match Analysis

After completion of a match, this is a time to reflect on the match outcome and how to improve better for future matches. Some adjustments that might happen after the match may be tweaking your deck by adding more cards, removing certain cards, or playing around with different gear sets. There are a variety of possibilities for the different options you may choose for better outcomes in future matches. By repeating this process a good number of times after playing several matches, you will likely see steady progress in your pvp gameplay and will be satisfied with the outcome you are looking for.