

# Motivations and Philosophy of Coase, Inc.<sup>1</sup>

## Abstract

Magic: The Gathering pioneered along numerous lines. It introduced collectable and customizable game pieces, the mana system, the color wheel, a rich form of creature combat and a supremely flexible underlying rules set allowing complex emergent interactions and for its own components to trump those rules. Early cards continue to enjoy crypto-style growth in value. While there has been much innovation in design of the cards, modern design has favored complex variations on predictable strategies revolving around creature combat and players deploying various ‘good stuff’ at the expense of more varied attack vectors, allowing players to ‘play their cards’. There has also been deliberate failure to innovate in the economic and digital realms for fear of self-disruption. While other games attempt simplified versions of Magic, in an attempt to solve Magic’s problems of too many interaction points and high barriers to entry, none preserve Magic’s strategic depth and complexity, and none attempts to capture the wild and supremely fun feel of early Magic. None seek to create a modern economic system or tournament and competitive system, let alone one that takes advantage of blockchain technologies. As background, we go over the history of Magic and other collectable card games, both physical and digital. We then introduce the design of new economic and competitive systems that greatly enhance player experience while laying the groundwork for lasting collectability, with an auction and marketplace system replacing distribution via randomized packs. We propose its first use case be to build a modern digital experience combining the open-ended possibilities of early Magic and the modern ‘Old School’ format with a new game design that preserves strategic complexity while minimizing interaction points. We also consider other proposed blockchain card games being worked on and contrast them with our designs.

## A Brief History of Magic: Core Gameplay

Magic: The Gathering premiered in 1993. Richard Garfield had been working on games with unique pieces that alter rules and create surprising and creative interactions for several years, with Magic’s direct precursor being his game Cosmic Encounter.<sup>2</sup> Magic took those ideas and combined them with what Magic’s lead designer Mark Rosewater calls Richard’s three great innovations.<sup>3</sup>

First is the concept of the collectable card game. This was brilliant and crucial, but far from the only key element.

The second is the color wheel. Different colors offer players different strengths and resources, customized to the cards they happened to own or chose to trade for. Players must balance reliable access to colored mana and the required space in their deck with their need for flexibility and power. The colors also embody increasingly rich perspectives and philosophies. Magic’s color wheel has been used to gain insight into real world problems.

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<sup>2</sup> Source: <https://magic.wizards.com/en/articles/archive/making-magic/creation-magic-gathering-2013-03-12>

<sup>3</sup> Source: <https://magic.wizards.com/en/articles/archive/making-magic/starting-over-2004-02-20>

The third and least appreciated is Magic's mana-resource system. Rather than proceeding along a predictable trajectory of available power, Magic players rely on lands shuffled into their decks along with spells. Each turn, each land produces power, mana. Players need mana of the correct color and quantity to cast each spell. While this creates some frustration due to drawing atypical numbers or distributions of lands, what players call "mana screw" or "mana flood," it also generates lots of unique situations, experiences and strategic choices. Players have to plan for and respond to random allocations of available mana resources, both temporary and permanent, and a variety of sets of possible spells to spend that mana on and must build their decks around dealing with a variety of possible scenarios.

Magic's mana system, and the choices and situations it generates for players, make the game much richer than otherwise similar competitors. While patterns do repeat, they repeat much less than they would otherwise. Mana issues also offer hope to lesser players, opening a path for a weak player to sometimes defeat a much stronger one. They simultaneously open up additional vectors where better players can gain an advantage.

While it is unlikely that a new modern game, without the advantage of being Grandfathered in, could justify this level of resource uncertainty to players, we believe strongly that key resources need to be unreliable in quantity to maintain strategic variety and complexity. Finding ways to accomplish this is an under-explored space where we believe we have found innovative solutions.

### **History of Magic: Game Evolution**

Magic: The Gathering has continued to evolve, retaining the core elements of both its rules and its pricing structure. Both have stood the test of time.

But the game has mostly failed in its attempts to transition into the digital age. Magic: The Gathering Online was a profitable offering that allows Magic players to collect and play Magic digitally, but never got close to realizing its potential. It represents a tragic missed opportunity by Wizards of the Coast and Hasbro, from its failure to be ported even to Macintosh let alone iOS or Android, to its paranoid insistence on exact duplication of real-world features that don't make sense for the digital age. Recently Wizards has introduced Magic: The Gathering Arena, which is a leap forward on many fronts, but cripples the game with a free-to-play no-trading economic model and greatly restricts the cards and play modes available. See below for details.

Magic started with mostly simple cards, many of which had powerful effects that radically changed the game being played. Often this was in symmetrical ways, with cards in the original set like Winter Orb, Armageddon, Balance and Timetwister. You could attack an opponents' lands with Sinkhole and Ice Storm, their creatures with Wrath of God and Earthquake, or their hand with Mind Twist. There were other cards that offered simple and uniquely powerful and efficient effects, such as the 'power nine' that included Ancestral Recall, Time Walk and Black Lotus. These and other unusually powerful cards were soon restricted to one copy per deck in almost all play.

Today, duplicating such effects ranges from expensive in mana to almost impossible. Wizards decided that its players like to 'play their cards' and experience doing what their decks are designed to do, so they don't want others taking that experience away. It gets easier and easier, and safer and more reliable, for decks to do powerful things that do not interfere with their opponent playing cards.

Other early cards were complex in practice but based upon simple, iconic and unique concepts like Chaos Orb, Raging River and Illusionary Mask. It took many years for Wizards to find rule sets that made these cards work as intended.

Most creatures in early Magic were pathetically weak. Even the best old ones wouldn't make it into any modern competitive decks. Ways to draw extra cards, aside from the anomalous power cards Ancestral Recall and Braingeyser, were painfully expensive and slow. Creating an infinite loop that could draw your whole deck and dominate multiple opponents, or just end the game on the spot, known as 'going off,' was all but impossible without abuse of power cards for many years, at best requiring the assembly of bizarre Rube Goldberg devices. Today, two card combinations that result in instant wins are common and only considered dangerous if neither card is particularly expensive to cast. Three card combinations of otherwise poor cards are mostly considered too weak.

### **History of Magic: Economic System**

Magic cards have always been divided into different rarities. Common cards appear several times as often as uncommon cards, which in turn are several times more common than rare cards. Later, foil copies of cards were introduced. Then mythic rares were introduced, which are several times less common than rares, creating a fourth rarity. There are also five basic lands – Plains, Island, Swamp, Mountain and Forest – that are basic building blocks of the game. Players can get unlimited quantities of generic basic land upon request. Old or cool versions of those basic lands can be valuable.

Magic has always been sold in packs of random cards. Booster packs contain one rare (or sometimes mythic rare) card, several uncommon cards, and a larger number of common cards. In Richard Garfield's original concept, this meant that each player would have a unique pool of cards with which to build decks and learn about other cards only through play.

While that was true in some cases, and unique card pools continue to live on in tournaments and friendly games where players deliberately restrict themselves to a random set of cards, trading, buying and selling soon emerged, far in excess of what Richard anticipated. The market has never been fully efficient or liquid, and transaction costs remain high, but players typically trade for the cards they want if they have sufficient value to offer in return.

Some players enjoy the process of trading, or profit from it. Others loathe it and look for the best way around it. Almost all players invest much time and space in sorting, storing and maintaining their collections. Most cards that are opened are common cards that end up being discarded without use.

This system allows Magic to effectively charge several dollars per random rare card. To maintain a full collection, a player must spend roughly \$2000 per year on new cards, or engage in other activities that win or extract that much value. When put that way, it seems like an outrageous amount of money, yet many players are happy to pay. Many others pay even more.

Dealers, usually linked to gaming stores, have arisen to handle players' needs. Trading with other players remains an option, but the time costs, including the costs of keeping up with market valuations to not be taken advantage of, are prohibitive for many. Players can then choose how much of their unneeded cards to resell, usually at discounts of 25-50% from market value, and what to buy from the dealers. This in turn can help support local gaming stores and motivates the creation of most strategic Magic writing, as the articles are a form of advertising for online sales of individual cards from places like StarCityGames and Channel-Fireball.

Magic is understandably reluctant to risk tinkering with that model. Players have accepted it. It would be easy for alternate revenue models to yield far less per customer, or for those that could yield similar or greater amounts to be seen as unreasonable and greedy. Without the randomness and the extra commons, would consumers accept the existing pricing model? We believe many players would welcome the

change, should the game justify it, but this is certainly a matter of concern. Altering the system would also threaten the revenue models of gaming stores, which play a vital part in the ecosystem of Magic and also other games. Allowing these stores to capture enough of the consumer surplus they generate to remain open, even as hobbyist businesses, is an ongoing problem.

Many believe that Magic's popularity peaked in the 1990s, when it first got media coverage and people started hearing about it, and it has been dead or struggling ever since. This is not the case. Magic has grown over the years and has never been bigger, and its old cards have never been more valuable. Magic's competitive scene continues to expand and intensify, and its local game stores draw bigger crowds.

Despite this success, even bigger success has been repeatedly left on the table through refusal to innovate and adapt to the digital age. Magic Online and Magic Arena are attempts to bring the game onto computers, with some success, but they remain shackled to the past and crippled by Wizards' inability to assemble top quality software engineering teams.

### **History of Magic: Competitive Play**

Magic play ranges from purely casual to professional and intensely competitive. Tournaments range from local tournaments organized by gaming stores to Wizards' own Pro Tour. Local tournaments qualify players for bigger tournaments with better competition and larger prize pools. Players at the professional level earn prize money, and also earn points that help them qualify for additional professional tournaments. Top players meet in the World Championship and can be enshrined in the Hall of Fame.

Tournaments typically have one of a few official formats. Limited tournaments force players to select from and build decks with a randomized pool of initial cards. Constructed tournaments let players use their collections, with up to four copies of each card (and unlimited copies of each of the five basic land cards) subject to restrictions on which sets of cards are allowed and which individual cards are restricted (one copy per deck) or more often banned outright.

Top tournaments typically have their players compete in multiple formats. Sets allowed range from Standard, which is most popular and allows the last two years of cards, to Modern which allows all cards after a fixed date, to occasionally Legacy and even Vintage, which allow cards going back to the very beginning despite severe card availability and balancing issues.

Each year there are four to six top level tournaments, known as Pro Tours, that players must qualify for and that offer prize pools of around \$250,000 USD, and several dozen second tier tournaments open to all, with prize pools of about \$50,000 USD. Magic also runs some tournaments online, including one top-prize-level event each year called the Magic: The Gathering Online Championship. There are also a handful of other tournaments with substantial prize pools, such as the Star City Open circuit of tournaments offered by card shop and strategy website Star City Games.

Unfortunately, while the popularity of the game has increased over time, the prize pools until this past year did not scale to match it, and Wizards has failed to package Magic streams in a way that attracts a wide audience. Top competitors who dedicate themselves to professional play can earn a passable living playing in these tournaments combined with supplementary writing and similar income, but there is only room for a handful of such players each year. Players who sustain competition do so primarily for the love of the game. These and other issues were recently highlighted by Gerry Thompson's protest, where he declined to participate in the World Championships to help bring change to Magic's competitive scene.

The good news is that, although Magic continues to lag behind, there has been great progress this year on both fronts. The recent establishment of the Magic Pro League and the new Mythic Championship circuit have provided \$10 million in prize money. If this is sustained and extended, it will be a great boon to all card games, physical and digital. Play on Magic Arena, in and out of championship play, has begun attracting to Magic a much larger streaming audience.

### **History of Magic: Digital Versions**

Magic: The Gathering Online is, to a fault, a faithful duplication of offline Magic's economic and rules systems. Cards are sold in packs at the same retail price as physical packs, with the same card distributions. The rules systems enforce exactly the same rules as physical Magic.

Trade must be between individual accounts. There is a central authority that tracks all collections. Because of a fear of acknowledging that cards have legal value, there is no marketplace for single cards beyond a place for accounts to talk and meet each other. Event tickets, which cost \$1 to buy from the store and are used to enter events, are used as currency of the realm.

Online cards that are not in demand typically have little or no value. Cards in demand do retain substantial value, but sufficiently little that it remains unclear why any player ever purchases or opens an online booster pack unless doing so is part of a limited tournament or other event.

Tournaments and other competitive play were until recently entirely organized along similar lines to physical tournaments. Recently, Magic Online introduced leagues. Leagues allow players to play individual matches as they fit into their schedules, rewarding players for their overall record. This was a known technology, and a long overdue change universally welcomed by players. Magic Online continues to charge fees for the opportunity to be paired against appropriate opponents, returning only some of those fees to the players as prizes.

There are numerous features that would represent strong incremental improvements to Magic Online, starting with the ability to play on Macintoshes, gaming consoles and portable devices. Key barriers prevent progress. The code base is poor. Wizards fears that if Magic Online were 'too good' it would be bad for physical game sales and store via cannibalization. They are afraid to disrupt their own ecosystem. Finally, Wizards is investing all its digital resources on other projects, including Magic Arena, stranding Magic Online in its current state.

Magic players typically speak of Magic Online as being much less fun than physical Magic: The Gathering, but still an amazing game and far more practical. While there is nothing like looking the opponent in the eye and talking, hanging out with friends old and new, the logistics of playing a digital game are vastly superior. For those with jobs and families, or a desire to play on their own schedule, or a lack of access to quality local players, or a desire to stream, or an aversion to dealing with a physical collection, online play becomes the default method even with its current poor implementation. While Magic play builds excitement for other forms of Magic play, players have to build distinct physical and digital collections, forcing many to choose one realm over the other in which to sustain a collection, or pay double the price.

Rather than fix and improve Magic Online, Wizards has chosen to supplement it (they dare not yet say replace) with Magic: The Gathering Arena. Arena is an attempt to capture the appeal of games like Hearthstone while retaining the core gameplay of Magic: The Gathering. Arena is currently in open beta. Arena successfully speeds up and enhances the flow and experience of playing Magic, creating a superior experience for new players and streamers that even a majority of professionals seem to prefer. This speed

sacrifices strategic complexity and depth on the margins, but this effect is in practice quite small, and most agree that the play is a large step forward.

What is not a step forward are access to cards and the economic model. Arena uses and expands upon the free-to-play system pioneered by Hearthstone, where players are given daily quests that pay gold, and earn gold for winning games, and can use that gold to enter events or buy packs. There is also a premium currency, gems, that can be won in events or purchased; dual currencies are a sure sign of unfriendly, Skinner-box style design. We address the severe problems with such models in the section that discusses free to play economies.

A long time ago, the software company Microprose was allowed to make a digital Magic game. It offered two distinct modes. The adventure mode, Shandalar, had the player travel around an overworld map playing against AI opponents for ante (the winner permanently confiscated the top card of the losers' deck) and completing quests and dungeons, with the goal being to assemble an overpowered deck (and presumably complete some final quest or story, not that anyone cared about that). This game is still beloved and cries out for a remake. The second mode, Duels of the Planeswalkers, allowed players to play against each other with whatever cards they wanted from a limited, older card pool.

Wizards later created a mostly single player experience, also called Duels of the Planeswalkers. The Duels series allowed players to play against AI opponents and unlock cards from a limited card pool, along fixed paths, rather than the dynamic flow of Shandalar. Players could also pay large amounts to unlock cards faster. The AI was poor, but game play was still fun, and eventually the unlocked decks could be played against other humans in online play. These games were put out once a year for several years, but were ultimately discontinued. If desired, one could play online against humans.

In addition to legally sanctioned versions, Magic players have also used simple software such as Apprentice, Magic Workstation or Cockatrice to play against each other online, without a rules engine. These programs merely enable players to shuffle and manipulate cards of their choice, free of charge, and rely on players to enforce the rules. Wizards has periodically taken legal action against such programs, but they are typically open source and difficult to fully shut down. Similar systems allow the play of other card games as well, often out of print older games.

### **Non-Digital Competitors**

The initial game exceeded all expectations and went on to spawn the entire category of tradable card games. Early competitors often focused on building from existing intellectual properties such as Dungeons & Dragons, Star Trek: The Next Generation and Vampire: The Masquerade. Many were quite good in their own right and brought lots of new ideas, but they did not have the same room for unique experiences or the depth of design. Economic models were all copied directly from Magic, often with even rarer cards to force players to buy more packs. Most of these games failed to endure.

Later competitors built upon more of Magic's key foundations and/or took the time to build richer new systems, and some of the better (or better marketed) ones them do survive to this day.

Magic creator Richard Garfield went on to create several high-quality collectable card games for Wizards of the Coast based on existing fantasy and science fiction worlds, including Jyhad: The Eternal Struggle (later renamed to Vampire), Netrunner and Battletech. Netrunner would later become the living card game Android: Netrunner, where players pay for complete sets of cards rather than booster packs. This model has also been used for other fan-loved games including Legend of the Five Rings. Decipher's

games based upon Star Wars and Star Trek were highly successful for a while, as was Upper Deck's super hero game Vs, which included elite Marvel and DC superheroes under license.

The most successful collectable card games other than Magic, in terms of card sales, were Pokemon and Yu-Gi-Oh. Both game designs were bastardized versions of Magic, both used extreme rarity and steadily increasing card power to drive sales, and both used Saturday morning kids' cartoons to acquire players. Pokemon was an adaptation of the popular Nintendo video game franchise, whereas Yu-Gi-Oh had a companion cartoon that was created to sell cards in the most unsubtle ways you can imagine. The first episode even included explicit discussion of the power of rare cards.<sup>4</sup> Wizards' attempt to build a similar but better game, Duelmasters, was a much stronger design. It was large hit in Japan but never succeeded elsewhere.

### **Digital Competitors: Four Key Players**

For a long time, Magic Online did not face serious digital competition.

This changed in 2014 with the release of Blizzard's Hearthstone. Set in the Warcraft universe and based on a simplified variation of Magic's rules, Hearthstone was incredibly successful. By 2015, Hearthstone had an estimated \$20 million in revenues per month. By April 2016 it had more than 50 million unique players.

Hearthstone is fundamentally a simplified version of Magic. Mana is provided in steadily increasing amounts automatically. Players choose from one of nine classes, and can play cards of that class plus the universal cards, rather than having to worry about colors. Creatures can attack other creatures, damage persists between turns and players are strictly limited to seven creatures in play at once, keeping boards simple.

Hearthstone has many advantages over Magic. It is far easier to learn and get into. Barriers to entry are low. Hearthstone is much easier to follow and understand, and looks cooler than Magic. The implementation is first rate on all fronts and looks, sounds and plays great. It is available on all devices including mobile phones. Its tournaments have superior prize support, better production values and larger audiences. A number of streamers make a living playing Hearthstone, including former Magic pros Brian Kibler and Stanislav Cifka. They'd both rather be playing Magic, but the audiences dictate otherwise.

Hearthstone is a free-to-play game. Players are given automatic access to a set of basic cards and can earn additional free cards by winning matches and completing daily quests. It is possible to maintain at least one competitive level deck through daily play without any purchases, but it is quite the grind to do so, and has become more difficult over time. If one wishes to keep pace without grinding for rewards, the cost is hundreds of dollars per year.

Hearthstone's economy isolates each player. Gold is earned through play and can be used to purchase packs or to enter competitions in the Arena, which has better returns than pack purchases. Cards one does not want, including extra copies, can be 'dusted' to earn the dust resource, and the dust resource can be used to create cards the player wants at fixed rates. The 'exchange rate' on these cards is poor, forcing players to pick carefully which cards to create, and locking players into their choices for a long time. Alternatively, players can spend large amounts of money to buy packs and improve their collections.

Hex is important only for legal reasons. Hex copied Magic's rules extremely closely, and Wizards sued to stop the game. A settlement was reached that allowed the game to proceed. The terms of this settlement

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<sup>4</sup> Source: <https://ygo-transcript.livejournal.com/1490.html>

are unknown. Hex originally intended to innovate in a number of areas, but ended up not doing so, instead creating a profoundly unexciting clone of Magic's core elements.

Eternal is a Magic variant created by a number of top-level Magic: The Gathering professional players. Eternal is important because it proves that a game very similar to Magic, preserving much of Magic's strategic complexity, card design philosophy and underlying rules structure, can be combined with a modern-day interface to create a rich game experience on a smartphone. It also proves that this can be done without adverse legal or other action being taken by Wizards of the Coast. They did not merely fail to sue to stop Eternal: they continue to hire and work with those deeply involved in the game.

Eternal does a far superior job than either Magic: The Gathering Online or Magic: The Gathering Arena of offering a great player experience throughout. It also, like Hearthstone, takes some advantage of its digital-only format to offer mechanics that would not work with physical cards. Some important game mechanics are sacrificed to make the game play faster and more intuitively, and so the game can work on a condensed screen. Interactive mechanics that would slow the game down exist but are minimized in scope, and the rules regarding starting hands ensure that players are able to have a good mix of lands and spells in most games. Players get to reliably do lots of powerful things. One might call it smooth, easy Magic.

Eternal copies Hearthstone's economic model, with players destroying unwanted and surplus cards to gain 'shiftstone' that is spent to create desired cards. Eternal's rewards are more generous than Hearthstone's, with a mostly full collection being attainable with consistent play. This creates a better free-to-play experience at the expense of lower motivation for players to invest money in the game.

Valve's Artifact, the latest collectable card game from Richard Garfield, premiered in late 2018. It is an adaptation of the popular MOBA game and e-sport Defense of the Ancients 2 (DOTA 2). DOTA 2 is a crazily complex game with a notoriously steep learning curve, and Artifact uses that and the details of DOTA 2's play and world to build an incredibly complex but highly engaging, skill-testing and rewarding game experience.

Artifact cards, like Magic cards, are originally available mostly in booster packs. They then become digital objects tradable exclusively via the Steam marketplace. Holdings are tracked by their central authority, and all transactions must take place on their platform. Steam takes a large cut of every transaction. It was good to see Valve take the step of acknowledging that their cards are rare digital objects with monetary value, despite these limitations.

Alas, Artifact failed to retain a base of players, and looks to be a failure. It was criticized on many levels. It was far too complex and difficult to teach, and the players were not as forgiving here as they are of DOTA 2. It was launched without any outer loop at all to tie in players. It was so skill testing that worse players essentially never won, despite large amounts of apparent randomness. The economic model, while fairly generous to players, was not messaged well, and was perceived to be much less player friendly than it was. With so many critical failures, one cannot untangle which were crucial and which were tangential.

In addition to these four games, the genre is rapidly expanding. Digital games of note include Gwent: The Witcher Card Game, Duelyst, SolForge, Shadowverse and The Elder Scrolls: Legends.

### **Blockchain-Based Competitors**

There are also several products in the blockchain space in varying stages of development, including Gods Unchained, Baeond and Skyweaver. Baeond's core game play shares elements with the excellent non-collectable games Ascension and Dominion, while Gods Unchained and Skyweaver are variations on

Hearthstone. At this stage one must reserve judgment on the game play in these games, beyond noting their general nature, and the poor track record of Hearthstone variations to provide strategic depth.

The team behind Baeond places a large emphasis on blockchain citizenship and player governance, issues we believe are not of interest to most potential players, and so far has proposed a business model and economy incompatible with the realities of blockchain we discuss later in the paper, such as the possibility of bot players.

Skyweaver intends to abandon packs, but without a robust model such as ours for what replaces them, intending to tell cards 'in the market.' This represents a style of blockchain evangelism where problems solve themselves via the miracle of blockchain technology and community, rather than by hard work building off the possibilities created by technological innovation. One cannot outsource such key game components without great sacrifice and must think in detail far ahead.

Gods Unchained appears to be using a pack-based business model with more levels of premium cards and other practices designed to maximize revenue gained from those seeking rarity for its own sake. As a prime example, they printed a total of three (3) copies of mythic titans. This alone renders the game incompatible with fair competitive play, if they are not later banned.

We wish all competitors with great games to have great success. This is not a competition for a fixed pool of players. The success of one game is good for all games, provided the games are good. Whether or not great games have been created, time will tell.

### **Economic Discussion: Free to Play**

Games of all kinds, including card games, have moved increasingly towards the free-to-play model. Mobile consumers especially are increasingly reluctant to pay up front for games. This forces game developers to offer free base products, and then make their money on in-app purchases and other optional buys within the game.

There are several models of how to go about doing this.

The unlock model is to offer some of the game free of charge, then allow the rest to be unlocked with one-time payments. This harkens back to the old days of shareware, demos and trial versions. Card games could be said to natively use this model, as you pay for each card once and then own it forever. This sometimes is combined with a subscription model.

The friendly model is to offer the full play experience free of charge. Players then are given the opportunity to purchase chromatic upgrades that do not impact game play. Valve, for example, does this with games such as Counterstrike and DOTA 2, and recently Fortnite has enjoyed great success with this model. Counterstrike makes money selling hats, DOTA selling alternate versions of various things, Fortnite on selling useless but sweet dance moves. Players are often happy to help support the games that have brought them such joy.

The unfriendly model is to give players timed in-game abilities and/or rewards, such that playing the game too frequently or for too long becomes unrewarding or even impossible, then offer to speed things up in exchange for money. Alas, most of the more successful mobile games, and most games one sees advertised on mobile, follow this pattern. The proper attitude towards this business model is expressed by

the South Park episode “Freemium Isn’t Free,” and is explained in detail in Richard Garfield’s excellent 2016 treatise *A Game Player’s Manifesto*.<sup>5</sup>

A few big whales that spend obscene amounts of money constitute all of your profits, so your systems are designed towards recruiting, trapping and exploiting the whales, no matter what it does to the experience of other players. Profit is made by making the game unfun to get some people to pay huge amounts to make it less unfun, with the fundamental operating principle being the Skinner Box. Most, or often more than all, of the utility of the game is ruined. The exploitation of whales prevents ‘normal’ players from paying reasonable amounts in exchange for a better experience, so smart players learn never to spend money on such games at all.

Players who are not convertible to whale status are bribed with daily or otherwise timed rewards into playing more, and more often, than they would find fun. By slowly having rewards unlock that would otherwise have to be purchased, players are given the idea that they are being paid to play the game and end up ‘grinding’ for efficient unlocks rather than doing what they would enjoy. Players are effectively converted into drone workers and used to form a player base that provides opponents for others. Even professional players such as the author can instinctively feel the pull of such systems, and notice that they are pushing instinctive buttons that hack into human brains. These systems are unfriendly and should be considered harmful. Games with these systems ideally should be avoided. Alas, the best game designs today mostly embrace such systems, because they work at hooking players, making avoidance difficult.

The flip side argument is that maximizing the efficiency and speed of your opportunities and rewards, when subject to these time-based restrictions, can constitute an interesting optimization problem in its own right that creates player engagement. To some extent this is the case. We have even seen games without in-game purchases, such as *Dragon Age: Inquisition* and *Bravely Default*, make time-delay mechanics integral to how they work. This leads to players leaving game systems plugged in all day or overnight, unavailable to be used in other ways, to allow the clock to tick. While there is doubtless some engagement here, this likely represents a perverse failing grounded in Goodhart’s Law. Companies noticed that these systems increased hours played or similar KPIs and didn’t stop to properly ask why.

These tricks are also combined with random lottery-style rewards, often referred to as ‘loot boxes.’ These have become notorious for their abuse of customers in games such as *Star Wars: Battlefronts*, and several countries, led by Belgium, are quite reasonably acting to render them illegal. Booster packs are the original real-world loot boxes.

Free to play economies such as *Hearthstone*, *Eternal* and *Magic Arena* seek to utilize the psychological tricks and reward mechanisms of daily quests and rewards combined with random output of packs and allow whales to spend hundreds or thousands of dollars on cards that cannot then be sold. The daily rewards come for free, which means those rewards would crash the market for similar cards or other assets if they were made saleable. But not giving out useful rewards for periodic play would be a severe loss for customer engagement, so we will be under huge pressure to find a way to do that within the confines of a crypto-based open market economy.

More generally, it is vital that players see playing more of your game as creating value, rather than seeing it as destroying value. *Magic Online* charges players for the chance to play *Magic* in any but the most casual form, allowing only very strong players to return a profit from prizes. This is on top of paying for one’s cards. Thus, while the games are fun, there is a strong discouragement and feel-bad from the need

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<sup>5</sup> Source: <https://www.facebook.com/notes/richard-garfield/a-game-players-manifesto/1049168888532667>

to continuously pay. Magic Arena joins Hearthstone and Eternal in doing the opposite, rewarding players for playing in the default mode and then having those credits pay for special events.

One downside of this system is that most players will spend most of their time doing the less fun thing, because it is being directly rewarded, rather than the more fun thing that costs money. We would like to reverse this, and reward players for engaging in the most fun play patterns available to them. Playing in limited events should not be a special treat reward for a week of grinding games one does not enjoy. Limited should be the default way many players enjoy collectable card games and they shouldn't have to pay USD\$10 every few hours to do it. Artifact got this right by offering unlimited free drafts with an initial USD\$20 purchase, but the choice was only made several days in and the related messaging was muddled.

### **Strategic and Economic Discussion: Dust to Dust**

Magic Arena, Hearthstone and Eternal, along with most other games that do not allow trading, solve the card access problem via dust-like systems. Players are continuously awarded dust as they open packs and gain other rewards. That dust can then be used to create cards of their choice. Magic Arena substitutes a wildcard system, where players are not given flexibility to create cards of the rarity of their choice and are not allowed to destroy unwanted cards to gain resources.

Arena's changes are likely positive developments. They reduce the problem of regret. When one spends dust, that both cuts off other possibilities you could have created, and it is not refunded to you if you later naturally find more copies of the card you've spent heavily to create. When you create a card of less than maximal rarity, both problems become worse, as you are more likely to find necessary copies naturally and you are now cut off from the cards you'll need most later on.

The wildcard system also does not fundamentally solve is the problem of commitment. Players play a long time, or pay substantial money, to earn the right to create cards. They are then stuck with those cards for life. Investing in a narrow card that only works in a special strategy, or a fun strategy, or might work in a speculative strategy, is expensive. Your long-term prospects for being competitive and having fun are much stronger if you create the strongest and most widely applicable cards in the game, which cost the same amount of dust as other quirkier options.

This all results in players being strongly rewarded for not taking risks, and all creating the same cards and playing the same proven strategies. Online websites and forums tell players the best builds and best cards to create, and players mostly create those cards and play those decks. This is the opposite of how a market would work. In a market, if everyone wanted the same card, its price would go up, and the price of unwanted cards would go down, encouraging creativity. Paper Magic has long benefited from players seeking to play 'budget' decks in this fashion, as which cards are 'budget' cards is self-balancing. Instead, these dust-based systems encourage conformity.

Even when you know what you eventually want, players periodically acquire cards at random, risking rendering previously created cards redundant. Players are tempted to postpone using their hard-won resources, sticking with what they already have to retain optionality and avoid future feel-bad moments.

What dust systems did help discover and remind us of is that building up from a limited card pool over a longer period, as opposed to playing limited-card-pool events that last a day or limited-card-pool leagues that don't let you determine what cards you will own, constitutes a fun and interesting puzzle for collectable card games. We should embrace and learn from that, without needing one long (and therefore

risk averse) such trip to be the bulk of most players' experiences. We should support play modes where players build up isolated collections over time and compete against one another on that playing field.

### **Economic Discussion: Brave New World**

The booster pack is the foundation of the Magic economy. All collectable card games to date, whether or not their cards are tradable, have copied the randomized pack format.

We argue that in a crypto-based game, randomized card distributions are unnecessary, except for temporary virtual packs created for 'limited' play modes such as sealed deck and booster draft. The inefficiencies of the physical game economy, and the inefficiencies introduced in most digital games by making the cards non-tradable, justify retaining randomized packs by providing players with unique situations and the experience of organically growing their collections in ways that create new and interesting situations. It genuinely matters what cards are opened, taking each player down a unique path, which meaningfully differentiates packs from a lottery.

Those experiences are great. We want to duplicate them on many scales and timeframes, from traditional limited formats like draft, sealed deck and mini-master up through semi-constructed formats with much larger pools, with varying degrees of randomness attached. Inside those contexts, packs are great and should be offered. Everything from a revival of Team Rochester draft, to a modern Shandalar, to a card-based version of the free-for-all format of Fortnite deserves a chance to shine.

The other context where packs make sense is the joy of discovery. New players who are not familiar with what the game has to offer use the serendipity of random packs to explore, and the random element provides excitement and fun.

Outside those contexts, packs don't make sense. Players who have already opened hundreds of packs often end up thinking of opening packs as a chore, even before issues of sorting and trading the resulting cards. We don't need to impose this system on them. The cards being fully tradable digital objects with a well-functioning smooth and efficient marketplace (along with an auto-open button) mitigates this burden, but also makes the mismatch obvious.

Each card has a monetary value. If I can freely exchange the card for XTZ tokens (also known as money) and then use the XTZ tokens to buy the cards I want, then what happens when I open a pack? Opening a pack exchanges tokens for cards, which I then sell back for tokens. It's nothing but a lottery, which can either make or lose me tokens (aka money) but has no impact on my collection, and it does not give me a unique set of cards with which to build decks or the experience of incrementally improving my card access.

Lotteries can be profitable businesses, but too much of them is not great for people. We want people to play games and pay money because they have good experiences, not because humans have a glitch that makes them vulnerable to being hacked. We also don't want to flood most players and the market with far more copies of all commons (and most uncommons) than anyone wants to disguise the essential transaction taking place.

If the cost of translating cards into money is high, both in time and trouble and also in lost value, then opening a pack will often mean I'll hold onto what I find. The physical frictions mean that most commons and even uncommons I open won't be sold or given away at all, merely destroyed, so those cards effectively retain value even when supply exceeds demand even at a zero price. The same goes for games such as Hearthstone where players cannot trade and must use dust-based systems.

Opening packs is an exciting experience when you don't have any cards and transaction costs are high. As you get more cards, and you open more and more packs with similar contents, it becomes less exciting, until you're not even looking at any of the non-rare cards, and finally you are only checking for a few special cards that are rare, or are rarer than rare. Many a Magic player has spent hours opening and sorting boxes of booster packs. Many a Hearthstone player has spent a bunch of time clicking to open booster packs knowing most cards are destined to become dust.

Magic Online has a crippled marketplace, forcing players to trade in pairs, but that market is still reasonably efficient due to a lack of transaction fees and the use of automated 'bot' accounts. This is sufficient to stop smart players from opening or buying booster packs when not required to do so by events and tournaments, but sufficiently annoying and time consuming to greatly detract from the customer experience and to keep a large percentage of cards sitting in people's account doing nothing. The bid/ask spread isn't what motivates players to assemble and keep extensive collections. What motivates them is not wanting to have to constantly navigate the interface to acquire the cards they need when they need them, and then sell those cards afterwards.

When we put all the cards on the blockchain as rare digital objects, these frictions will be competed down almost to zero. Even if we don't supply a well-functioning marketplace and integrate it into the game and its software, if our game is successful, others will happily create such a marketplace. Much better to embrace this, integrate efficient and easy to use markets into the design of the economic system, and structure the game around those decisions.

Buying and selling cards can and should be not only very cheap in terms of cost and bid/ask spread, it should be seamless, quick and easy. It should be so seamless, quick and easy that players don't even have to notice that this is what they are doing or think about the existence of a marketplace. We can offer that to the players.

This will result in less ownership of cards. Fewer players will choose to build and maintain collections, less copies of cards will become stranded in players' accounts and lost, and less copies of each card will be sold. Good! Forcing players to buy and keep things they do not want or need is not the right way to raise revenue. Forcing players to worry about collection management to enjoy a TCG drives many players and potential players away.

Investing in a collection should be a choice. Players should do so because they want to securely own part of the game, and secure it for future use, or to allow those cards to be uniquely theirs and become uniquely enriched through play (which we will offer), or to guard against future price increases. Players should do so because they want to speculate or trade, if that is something they enjoy and/or profit from. We want to give players the opportunity to speculate on the future demand for individual cards and for the game itself, if and only if that's what they want to do.

To that end, we propose a new economic system, run via smart contracts, based upon initial card auctions followed by tight and easy-to-use markets for the sale, purchase and renting of cards on demand.

### **The Auction System**

All numbers in this section (and the remainder of this paper) are realistic guesses, but subject to change as things are fine tuned.

A few weeks before a card or set is released, a spoiler is released to the public. This spoiler shows the art and sound on each card, what each card does in the game, and what rarity each card has been assigned.

Each card is assigned a bonding curve, with each potential quantity of cards determining a unique increasing price. Rarer cards have curves with lower quantities leading to a given price, perhaps in a ratio similar to 27:9:3:1 for common, uncommon, rare and legendary cards, but cards of different rarities are otherwise treated identically. When each card is released, the curve for the new card is scaled to the game's popularity, but curves for old cards are left unchanged. Note that we need less copies of each card to satisfy a player base of a given size than Magic did, so it is less scary to make cards potentially scarce.

An auction then takes place to sell the initial cards. Any game account and/or crypto address may now submit any number of bids to purchase any number of copies of each card in the set. Any crypto address or registered player may submit a bid of any size and price. We then determine how many copies can be sold such that the market will clear at a price at or below the bonding curve and the price associated with that quantity. Since the curve is increasing, the auction is guaranteed to clear. That number of cards are initially printed at their corresponding price and sold to the highest bidders. Other bids are returned.

After the auction, cards are issued to the winners of the auction. Each card is numbered according to the size of the submitted bid, so the highest bidder for each card (otherwise identical and guaranteed to be functionally identical) pays the same price as all other winning bids, and receives the copy labeled #1, to encourage card collectability, history and uniqueness.

A smart contract is created for each card to create a marketplace and to buy/destroy and sell/create copies of the cards. The initial buy price will be the auction price, and the initial sell price will be 0.25% above the auction price. If a card is sent to this address, the card is destroyed and XTZ is sent in return. If XTZ is sent, a new card is created, given a number equal to the lowest number not yet assigned, and sent in return.

The market prices are then adjusted logarithmically with the number of copies of the card that now exist, such that each 100% increase in the initial supply doubles the price. Decreases in supply below the initial amount cut the price in linear fashion, with a 25% drop in supply dropping prices by half, and a 50% drop in supply decreasing the buy price is allowed to drop to 0 XTZ, with a minimum sale price of 0.05 XTZ, at which point players are permitted to play with the card without owning it until the price rises; see the section on rentals, below. The card can still be purchased and can potentially regain value.

Thus, if there are 10,000 initial copies at an initial auction price of 10 XTZ, when there are 20,000 copies the price will be 20 XTZ, when there are 30,000 copies the price will be 40 XTZ, and when there are 40,000 copies the price will be 80 XTZ. If there only remain 7,500 copies the price will be 5 XTZ, and if there are 4,000 copies the price will be 0.05 XTZ and the card becomes free to use. This ensures that players are rewarded with profits if demand goes up for cards they purchase, and to easily speculate on the future value of cards, while allowing the supply to adjust to meet the demands of the game. In order to always be able to meet potential demands, these contracts will need to retain half the auction proceeds and most of the proceeds of sales beyond the auction, but return all baking profits and any profits from back-and-forth trading to Coase, Inc.

After two years, cards will rotate out of Standard format play, and are considered to be 'out of print.' We adjust the bonding curve accordingly. Each year thereafter, adjusted on a continuous basis, card prices adjust 50% faster when a card is created or destroyed, up to a maximum of a 0.1% change in price per copy created or destroyed. This ensures true scarcity for older cards, while still giving players access to an efficient and well-functioning marketplace and frees up most of the XTZ initially locked in the smart contracts.

Cards need not be released together as sets. There will doubtless be an initial set that serves as a baseline, and cards need to be assigned into groups by time of release to allow players to know which cards are permitted in any given event, and to form virtual booster packs for limited purposes, there are advantages to staggered release of new cards.

Thus, perhaps on each day one new card is released (or perhaps two or three new cards) and a daily auction is held, and (after the initial two-year period) the card released two years ago is retired from Standard-format play and its contract price begins to slowly move more rapidly when trades occur. Under this system, new cards are known to the public a few weeks prior to their release, and players learn of each day's new card reveal along with a card release and initial auction. If daily changes are too disruptive, rotations out could be less frequent, and perhaps releases bunched to weekly or bi-weekly as well. What needs to be avoided is months-long periods without substantive change, as games tend to stagnate and lose momentum and player interest during these times.

### **The Gaming Coin: Should We Have an Internal Currency?**

A key question is whether or not Tezos Games should use an internal currency as an additional layer of speculation, value storage and value capture, with the currently purchasable in XTZ, or our games should simply use XTZ directly.

We have strongly concluded that the answer is no. This section explains our thinking.

It is important to be explicit about how we view this decision and why we are making the choice to not have a coin. We will refer to a potential currency as Mana, with the ticker MTG.

There are key advantages to both approaches.

MTG coin would allow us to better insulate against changes in exchange rates and the value of money and would provide a method for players and speculators to buy into the game without committing to the holding of individual cards. It matches the pattern of many games having a unique premium currency to allow players to draw a distinction between funds dedicated to the game and their other funds. This increases average amount spent. By returning MTG rather than XTZ when cards are sold back, we avoid having to lock away large amounts of funds. We thus avoid a run on the bank if players view the game as being at risk of failure. We would also gain the profits you get when you literally print money, on top of our profits from printing cards and running the game's infrastructure.

The decisive argument against MTG is that the game does not require it, and it overcomplicates matters, introducing friction and risk. It would look to potential players like the money grab that most coins in fact are. Forcing players to first purchase MTG could become a barrier to player engagement and acquisition, while automating the exchange rate in a smart contract complicates further and opens up an attack vulnerability. Auctions in particular work better if players can bid in XTZ and have the XTZ returned to them if they do not win. Prizes and other rewards can be paid in XTZ. A new currency could also be seen as a money grab, which could lead to that impression regarding the game's other systems. It mechanically also tends to encourage systems that on prioritize extracting funds from players rather than providing them with strong experiences. MTG takes away from the focus on the game and puts that focus on economics, whereas ideally the economics would mostly be invisible.

Another issue is that while MTG allows us to pay and award currency without the need to reserve funds, and to avoid those prices becoming destabilized too easily by outside forces, it would be a fundamentally fungible asset. That means both that players can and will constantly exchange XTZ and MTG (and BTC and USD), whether or not we enable or encourage this ourselves, and that paying out MTG is not

functionally different from paying out XTZ. This means that if we want to offer rewards to players that are in an important sense not money and not redeemable or saleable, that process would require its own medium of account that is not fungible, which the potential MTG coin would not provide – we would still need RNT, discussed below.

The rest of this paper, including the auction section, assumes the game will not contain its own fungible currency. While this leaves a potentially huge source of revenue on the table, we believe that the game is better without it, and the value creation that would not be partially captured by MTG will instead be fully captured by XTZ.

### **The Rental and Free-to-Play Systems: Collections Should Be Optional**

In a traditional tradable card game, players are forced to interact with the marketplace explicitly and directly in order to sell unwanted cards and to purchase desired cards. If a player wants to play with a card even once, or experiment with a new deck, the player must purchase the required cards first. If a player wants to get any value from extra or unwanted cards, they must take the steps to sell them.

Often these games will include less-painful ways to get the bulk of this value. It is industry standard to allow players to sell/destroy all ‘extra’ copies of cards that are not required for tournament play. In Magic Online, this means creating a trading binder, selecting the part of your collection that includes only copies of cards beyond the fourth, then adding those cards to your binder, then trading with a bot to turn those cards into tickets. In Hearthstone, you click on a button and it will show what you can safely dust (with the one slight catch that there are occasional opportunities to get a better deal, so if you don’t need the dust yet you should wait). Another button performs the operation. In both cases, doing anything much more optimized than this would require a much larger time investment.

For physical card games, keeping one’s collection organized and sorted optimally remains an unsolved problem. Players spend large amounts of time on solutions that are not very good and accept this because there are no better alternatives if they want to play the game. Others don’t have collections, not because of cost in money but because of cost in time and pay transaction costs as needed rather than pay sorting and storage costs.

For digital games, sorting is a mostly solved problem, but players hold large collections they don’t really want. They hold them because the game imposes large frictions to players who do not hold such a collection. For tradable card games that means large transaction costs in time and money when interacting with the market. For non-tradable card games, there is always a huge spread between the value of a card when destroyed, and the cost of creating the card directly, with the minimum ratio typically being 4:1.

A sufficiently efficient marketplace allows players to buy what they want, when they want it, and sell it back once they are finished. There is no need for the players to even understand that this is what is economically happening. Players should be able to choose what cards they want for their deck, play their games, and have the game take care of all card management, buying and selling for them. In exchange for the use of these cards, the players pay a tiny amount in rental fees. Those players who wish to do so are free to purchase cards, either cards they want to play with or cards they expect to go up in value and collect (some of) those rental fees.

To encourage players to take the plunge and build collections, we offer rewards, both in rental fees and in the ability to enhance and customize the appearance of cards through repeated play.

If a player wishes to acquire cards on a temporary basis via rental, the system will offer three options. A player can rent specific cards from other players, they can rent specific cards from the marketplace, or they can rent cards in general from the marketplace.

To rent a card from the marketplace, the player agrees to buy a newly created card from the marketplace for the buy price and agrees to destroy it at a later date for its sell price. The player pays the full bid-ask spread (projected to be 0.25% of card value), locking in both prices. The resulting card is available for three days of play. If a player chooses to continuously rent a card for an entire year, they would pay about 30% of that card's value, likely less since they would not pay for any periods where the card was not in use.

Note that while the card is being rented, the additional copy is considered to exist, increasing the card's base price accordingly. Cards can thus become expensive even if few players choose to own them.

When available, the card can be rented from other players instead. Players can offer cards for rent, and in exchange for a 25% additional fee the game will automatically route borrowers to card owners if they are offering, net of fees, cheaper rent than the marketplace bid-ask spread. Renters are free to specify a minimum or fixed price, but by default they offer the card at 'market price' and the rental price will adjust with supply and demand until the market clears. If the resulting price is above the marketplace bid-ask spread, all players renting cards get the marketplace bid-ask spread as their rental price, and any remaining demand is filled by the marketplace.

For many cards, supply will greatly exceed demand. In those cases, we shall allow the rental fee to go to zero, and the cards will be freely available to all. We also allow this to happen automatically for all cards where the marketplace buy price has dropped to zero. It is expected that a large percentage of all cards will fall into the free-to-rent category, including most commons, giving new players a variety of cards to choose from without the need to deposit funds. Any cards necessary for play, the equivalent of Magic's basic lands, will also always have at least one free version available.

Players can always reclaim rented cards before the period is over, but if they do so they forfeit the full rental fee. In that case, the marketplace will rent a different copy of the card for the remainder of the period, so the renting player does not lose access.

The third option is to allow players to rent cards in general, and freely move between cards and decks. Instead of paying for each card individually, a player buys the right to play with decks up to a specified combined value. As long as the unowned cards in any deck played by that player combine to less than that amount, they rent all the required cards as needed for no additional charge. Buying this option will not be more expensive than buying an individual deck, but you will be charged the full amount whether or not it is in use.

Under our current model, this third option is also the source of our non-tradable reward currency, which we will refer to as Rent (RNT). Players who complete daily quests or win tournaments will earn RNT. RNT increases the universal rental threshold for the associated address and inflates at the start of each month. RNT is not exchangeable for any permanent asset so that permanent assets retain value; see the discussion of bots, proof of play and proof of skill. This is in addition to other rewards that players earn, including Elo ratings, collection rewards such as card customization, and qualification points.

One risk in the system is that players might build decks that are free or cheap to rent, only to discover that prices have increased, forcing them to choose between paying more and abandoning their deck, and thus

creating a poor experience. Reminding them that they could have instead purchased the cards permanently is unlikely to provide much comfort.

To prevent this from being too nasty a surprise, we allow players to lock in costs until month end. When renting a particular card, a player can commit to renting it until month end and pay no more than the current marketplace price per three-day period. When renting cards in general, if a player plays a deck in a ranked tournament or in ladder play, that deck is protected for the remainder of the month and its price cannot increase.

If players wish to protect themselves for longer, or bet on their deck's success driving up prices, they are welcome to purchase cards and then sell them back later. If cards are an appreciating asset, as we intend them to be outside of the impact of rotation events, this will be better than paying rental fees no matter the period of time in question but does require locking up more funds.

We will also consider whether it makes sense to allow players to purchase cards 'on margin' by borrowing against the value of their collection.

Since many cards will be free to use, including all necessary core cards that function similarly to Magic's basic lands, the free to play experience will allow players to use large percentages of all available cards. By supporting a format that consists only of zero-cost decks (see discussion of formats, below) we provide such players with a level playing field while deciding whether to take the plunge and pay to unlock more of the game experience.

A more basic risk with this design is that it may not be motivating to players. It might prove highly motivating and a great fit as an outer loop, it might be motivating but prevent collections from forming, or it might not be motivating at all or prove too complex or unintuitive. Until we put this in front of players in a beta test, it is impossible to know. If it does not resonate with players, the game and its other systems work without it.

### **Collection Rewards: Make Your Mark and Earn Your Foils**

Players of collectable card games often invest considerable time, money and effort into not only building the strongest deck possible, but also to customizing the appearance of that deck. You can buy a perfectly legal to use Black Lotus for a few thousand dollars but getting a mint condition black-bordered Black Lotus will cost a lot more. A near-perfect Alpha Black Lotus recently sold at auction for \$160,000. Foil cards often have huge markups from non-foil versions despite being effectively marked and thus questionable in high-level play. Foil versions in Magic Online sell at a premium. Hearthstone offers golden cards that are given out randomly or can be created for massive amounts of dust, and many players love them. Collectively these are known as premium cards.

Players in these games randomly acquire a few premium cards from packs and as prizes or rewards. Some players choose to spend large amounts of money, or large amounts of in-game reward, on getting premium copies of cards they frequently play. What that says to other players is that this player is willing to spend a lot of money to make their deck shiny.

It would be much cooler if shiny cards instead said to other players that the card had been forged that way over time, through hard fought battle.

Our cards will never begin their lives as premium offerings, beyond being able to purchase low-numbered cards in the initial auction. If you want your card to shine, win games with it. As the card and you prove their worth, the card will accumulate a record of its deeds, stored on the blockchain. When milestones are

reached and triggered, the card can then optionally be modified to reflect those accomplishments, including gaining several levels of premium or shiny general look, and icons that reflect the particular accomplishments.

For example, if a card is used to win or do well in a major tournament, that tournament will grant all such cards an icon, unique to that tournament, that will permanently mark them. Every point of damage dealt, every creature killed, every game won will also be tracked and rewarded, with some probability of yielding an upgrade. Different cards will care about different accomplishments – a card that deals damage might track damage dealt or targets killed, while an aggressive character might care how many times it attacked. This will allow players to build value through play without having to give away anything that is fungible for money, making playing games a positive sum economic activity.

Unfortunately, we need to impose some restriction on what play counts. If we reward play, that play must be legitimate rather than virtual games played by bot systems. Thus, one can only accumulate card experiences in tournaments requiring entry fees and open to the public, or in other sanctioned matches against players with sufficiently high Elo ratings. This is a special case of the general bot problem, and the need for what we call proof of play and proof of skill.

### **Proof of Play, Proof of Skill, Swarm of Bots**

It is industry standard to reward players for playing your game, to encourage engagement, drawing in and retaining those players. Players provide proof of play, similar to Bitcoin's proof of work, and are able to mine a daily (block) reward. Magic Online suffers greatly in that it charges you for playing matches, rather than rewarding you.

Daily rewards are proven to be highly motivating, so much so that there could be reasonable concerns that they are not entirely healthy or ethical. Games like Hearthstone and Eternal rely on daily quests, plus rewards for winning matches, to allow players to play the games for free should players prefer to do that. This has positive side effects, especially as players first explore the game, as players are encouraged to try out a variety of decks and strategies in order to fulfill quest requirements. It also has negative effects, as players often feel forced to do things they do not find fun.

These daily rewards almost always go hand in hand with game assets being non-tradable. The reasoning behind this is obvious. If a game gives players rewards and those rewards are tradable, then those rewards can be sold for money. That causes bots to be created, and players create additional accounts with which to earn rewards. Any game that gives rewards that have monetary value, such as the gold in World of Warcraft, will inevitably have problems with bots and with players creating multiple accounts as commercial enterprises.

We welcome players using our game as a way to make money, and even welcome the use of bots and other automation, but we want those profiting to do so in a way that enriches the experience of other players, rather than being disruptive. We certainly don't want our system to be vulnerable to a money pump where bots are able to play each other, or play continuously despite a very low win percentage, and earn rewards. Those rewards would then be created in abundance, and their value would quickly decline to zero, destroying the rewards for real players. If those rewards cost the system real money, they would even bankrupt the system.

Games often fight this problem by banning players using bots, or who engage in other disruptive or exploitative practices. If Blizzard catches you using a bot in World of Warcraft or in Hearthstone, they

ban your account, confiscating your digital goods. We cannot do this, as the whole point of blockchain is that your cards are fully yours.

Games also respond when challenges and rewards are exploited at scale by modifying the rules. We do have some power here, but less than a non-crypto game. Aside from what powers we explicitly reserve for ourselves, ideally requiring the consent of the players as described below, we are committing to what our cards do and much of how our system will work. If errors are made, even coding errors, they may not be easy to roll back, and cards once awarded cannot be confiscated.

Thus, we have a trilemma: We want players to own all their assets and be free to transfer them. We want players to get rewards for playing. We want the value of rewards and our assets to not be captured by bots and/or humans effectively engaged in repetitive menial tasks.

We can accomplish any two of these three things at once easily, but all three at once is difficult.

Three simple ways of stating the problem:

If we give players ownership of all their stuff and give them rewards for playing, and the bots can play such that they get any amount of reward, they get all rewards available to them, in unlimited quantities.

If we let the bots get limitless rewards, and let the rewards transfer, the rewards lose all value.

If we let the bots get limitless rewards and the rewards retain value, they must not be subject to a market since that would drive the price to zero.

We want to give out rewards on the basis of ‘proof of play’, with or without also requiring ‘proof of skill,’ but we want to limit how many rewards each person can get daily and we want to require that the play be done by humans. This is similar to the problem of proof of work, except that we ask the impossible. Bitcoin does not have the option of requiring humans rather than computers to solve its math equations, or to limit the mining reward given to one person or group. It would appear we are stuck – we have no control over how many accounts players have, or whether humans are making their decisions.

How do we get out of this puzzle?

Option 1: We could drop the requirement that all assets be free to transfer.

Cards that are purchased from the marketplace must be fully owned digital objects, but that does not mean that you can’t award players non-transferrable rewards.

Chrome rewards will likely be partly non-transferrable, representing the card’s link to its owner. Thus, if a card is traded to a different address, some aspects of its records could ‘reset.’

Rewards could be given out that it would not make sense to transfer, such as rating points and positions on ladders, records of accomplishments, and entries into tournaments, either waving fees or waving other requirements to qualify. These rewards don’t solve the problem of drawing in the casual player, and if they can be ‘mined’ without skill then even strong players will be tempted to turn their accounts over to bots for such mining to take place. But it is far less risky than rewarding fungible assets, and the associated losses for the account reputation might have sufficient downsides to discourage bot activity.

The cleanest solution would be that cards and currency won via quests, daily rewards and such, or rewarded for playing and winning matches, be fully non-transferrable. In this plan, accounts contain cards and currency that is freely tradable, and other cards and currency that are not tradable. Non-tradable assets are permanently tied to your crypto address. As discussed in the rental section, the awarding of non-

transferrable rental credits, usable only in the marketplace, is a clean way to draw a distinction between permanent, fully owned and transferrable cards on the one hand, and awarded rental credits on the other.

We would like to avoid or minimize the quantity of non-transferrable assets. In scenarios where we can solve the problem of proof of play, it would be great to let saleable assets be ‘mined’ through play. But in cases where this is not possible, non-saleable assets offer a compromise. With that compromise come all the other issues that are a consequence of not allowing a marketplace. How easily do we want such assets to be able to be transformed via the game marketplace? Likely a non-zero amount, but at a discount rate similar to other games without marketplaces. Awarding rental credits helps minimize this issue.

Option 2: We could offer only rewards that are positive-sum beyond a threshold level of skill

Requiring true proof of play, with a minimum level of proof of skill, prevents bots from getting rewards. The solution would need to be bulletproof for play skill sufficiently below threshold, cutting insufficiently skillful players off from any possibility of reward.

There are two plausible solutions to this problem.

The most bulletproof method is to require staking. If we charge sufficient entry fees and deny players control over who their opponents shall be, then positive sum interactions are negative sum for players sufficiently below the average skill level. If interactions are positive sum, as they should be given the accumulation of card experience, our matching system will need to be robust to collusion between bot accounts. Otherwise bots could fill the tournament queue, and face only each other.

Elo ratings offer the other solution and are also the best-known solution to avoiding fake tournaments between bots. The details of how Elo works will be discussed in the competition section. For now, assume Elo is a method to approximate observed player skill, calculated based on past opponents’ ratings and one’s win-loss record. Alternatively, if designed to be safe to playing too many games, ladders that require sufficiently strong win rates to climb can serve the same purpose.

If players are rewarded for their position on a monthly ladder or for their Elo rating, then only a bot or player capable of winning often enough can claim those rewards. In theory there is a non-zero chance that even a very poor bot could put together a win streak sufficient to fool the system temporarily, but the cost of running the bot and the cards it requires should be good enough to guard against that if we are careful. We can choose how careful we want to be.

Under this system, in addition to periodic rewards for high standing, players and bots below a minimum threshold can’t earn most or all rewards. This risks being very unfriendly to players who are unable to play above this threshold, and we would want to take card value into account when evaluating minimum skill levels in constructed play. A player on a tight budget can safely be held to a lower standard.

If players need to put something at risk in order to be eligible for rewards, then that also guards against insufficiently skillful players and bots. This too is punishing for poor players, since they can be hard for such criteria to distinguish from bots.

At the extreme case, we could make rewards come only from zero-sum or even negative-sum interactions. Your opponents’ loss is your gain, and vice versa. This is an extreme solution, and destroys the essential experience of the daily reward, but it definitely works to shut out bots.

Option 3: We could accept that bots will capture some rewards

Is failure an option? What if we accepted that many players will create multiple accounts or even bot accounts and use them to farm rewards. What would happen?

Some players value 'not buying cards' or otherwise earning their way to victory as opposed to buying it, but this will inevitably be a niche activity. Not many players will voluntarily accept this handicap in a world where a tiny amount of marketplace activity will save large amounts of time.

The market value of any rewards that can be claimed by bots, through automated accounts, will drop to the cost of operating those accounts, plus the cost of market activity. It is safe to assume that these costs will be very close to zero for sellers. It is not initially obvious that they will be close to zero for buyers, but our principle of making market operations as frictionless as possible ensures that this will be the case, and it is not something we are willing to sacrifice here. Standing in the way will only force inconvenience on our players.

When we pay bots and grinders to play games, we are buying a service. They become our game's miners, submitting their proof of work. What that gets us is the participation of large quantities of bot accounts and/or human grinders, at the cost of minimizing the value of the (tradable) rewards given to other players and flooding the market for all related cards and assets. There are two ways, in some combination, to make that deal worthwhile. Path one is to limit the assets involved. Path two is to force the activity we create to make the game a better experience for the players, rather than a worse one.

Limiting rewarded assets to non-tradable assets is discussed above under option 1. If the assets are tradable, in theory everything tradable is fungible, but assets whose price drops essentially to zero don't buy you much. So, what assets could we isolate in this way?

Cards below a certain rarity are already intended to be long-term free, so offering them as prizes in essentially unlimited quantities may be acceptable. We can mark the free cards in some way to encourage other versions to continue to hold value. These rewards might still be exciting to new players, especially free-to-play players who have not set up crypto wallets and thus cannot access even very low-cost market assets but would be mostly useless to accounts that are paying.

Note that this conflicts directly with the rental card plan. If we offer free rentals on all cards that are offered as rewards, those rewards are worthless, and the existence of the extra copies ensures that the card will be free to rent. If we went down this route, we would need to impose minimum rental prices. Effectively, we'd be gating playing with the commons and requiring players to either grind or pay a small fee to unlock this game play.

Rental credits that are tradable, but usable only in the game marketplace could be seen as a distinct asset we could reasonably give away to our 'miners.' If we wish to limit our liability, the rental credits (or any other similar reward) could be awarded on a per-day basis divided among all players, creating a competition among the miners to claim them. For our players, this likely creates a poor experience, as all we are doing is forcing them to trade for an additional currency to do what they would have done anyway, and regular players will not get the rewards almost ever.

These are general arguments against similar creations of additional currencies as trivial barriers, and against limiting total reward size.

Now let us consider path two. If we can ensure that even automated grinders provide a valuable service to our players, we should be willing to provide valuable goods in exchange. At a minimum, we could give a size-per-day limited reward. What do the bots do for us?

Accounts will need to acquire and hold, or rent and pay for, cards with which to play, but by assumption those costs are more than paid for, or else the grinders wouldn't be profitable.

The value that accounts provide comes from providing opponents for real players. Matching times, and quality of opponent matching, are key determinants of the success of all games. If I request a match and reliably find one within a few seconds, one which is of an appropriate skill level, of the type I wanted, that is a very good experience. If I have to wait for minutes, that will drive me away. Every additional game played by any player puts more players in the queue, allowing for faster and more precise matching. It also allows us to expand the number of formats (sets of allowable cards or methods for creating special pools of cards to build from, different rules and/or different tournament structures) we can offer while still offering players matches in a timely fashion.

That is valuable, provided we don't already have more than enough players, but only if the grinders provide quality opposition.

The worst possible game experience is an opponent who is painfully slow, wasting your time. We don't have to worry about that with grinders, especially bots, since they don't need to think too hard and derive no benefit from wasting time. In theory a bot's strategy could be to play so slowly that an opponent gives up rather than spend forever playing a single game, but players don't give in to such tactics.

The next worst possible experience is an opponent who plays aimlessly, perhaps fully randomly as that is the easiest bot to program. If a game makes the error of rewarding losses but does not allow concession or punishes those who concede too often, this becomes a risk. A few free wins are fun, but this quickly becomes tiresome.

The worst non-time-wasting experience is an opponent who gives up without playing, either right away (which is not so bad, since your time was barely wasted), or once your strategy becomes clear. In Hearthstone, a considerable number of matches at lower levels involve opponents that concede on the first turn. This could be because players are intentionally trying to lower their ranking to get easier opponents with which to complete quests and earn gold. It could also be because some grinders, whether or not they are bots, have bad (or too slow to play, or simply not fun) matchups against certain heroes, so when they see you've chosen one of those heroes they simply give up.

You've now had all your time in the queue and loading the game wasted, with no fun to show for it.

In real time, as long as it remains rare, this experience is not so bad, because you get credit for the win, but sprinkling these free wins into the distribution forces the game to balance its rewards accordingly, while fewer real games are played, so in the end all 'real' players are worse off. If it was the default, the game would collapse.

What we want is grinders or bots that can play a reasonable game using a diversity of strategies that opponents find challenging and fun, at least at some skill level, up to the point where players at such skill levels can reliably find quality opponents. Those are worth the rewards they earn. However, even if such bots are indeed programmed, which would likely be an exciting development in AI technology, we would quickly have more of them than we need, creating a monotonous player experience.

Another objection is, if bot opponents are needed to provide timely matching, why not do this ourselves, or via AI prizes and contests?

By doing or commissioning the AI ourselves, we can provide opponents when they are needed, while avoiding polluting the player pool when they are not needed. When a player spends too long in the queue,

with continuous rising probability, an AI opponent is supplied instead. We can ensure that players face a variety of bots, rather than repeatedly facing the most successful ones, and ensure that the bots are built with the player experience in mind and scaled to enemy skill levels, rather than only having bots that purely maximize win percentage.

Letting the outside world build bots is a way to get higher quality play, but that is an outcome best created by offering bot tournaments and other prizes for quality play, rather than daily rewards or grinding rewards. We can and will provide such contests to get players to build quality bots/AI for the game, whether or not we decide to use them as opponents intermixed with human players.

Thus, we can safely conclude that Option 3 is not a productive path on its own. We must choose some combination of Option 1 and Option 2, which means at a minimum that players below a fixed skill level will only be able to earn non-transferrable assets. That seems like the natural solution, with the necessary skill level being that of the stronger bot players. Our use of the RNT currency, which rewards players with rental credits that decay slowly over time, is our attempt to solve this problem.

### **Tournament and Organized Play Discussion**

Organized or official play of card games, as opposed to casual play where players find each other on their own, tends to take place in one of three similar forms: Tournaments, Leagues and Ladders.

Those forms are supplemented by ranking systems. The big divide in ranking systems is between zero-sum ranking systems, for which the gold standard are chess-style Elo rankings, and cumulative points systems that reward success but do not punish failure.

Elo Ratings are used by FIDE and the USCF in Chess and were used historically in Magic. In this system, each match is zero sum. Based on the difference between the ratings of the two players, a win probability for each player is assumed. By default, a player 400 or more points stronger than their opponent is assumed by the model to almost always win. This assumption can and should be changed to account for the random elements in card games. When the match is over, ratings are adjusted such that if the system's estimate of each player's chance of winning was accurate, the expected move for each player would be zero.

New players in Chess begin with provisional ratings, where each game gives them an implied rating of their opponents' rating plus or minus 400 depending on whether they won the match (or if there was a draw, equal to their opponents' rating), then those are averaged to get the new players' starting rating. Magic did not copy this system, perhaps because the system is discouraging for new players, and possibly because it would have allowed for exploitation and collusion when players have control over matches or mostly play locally. A new player can be allowed to win matches to give them a high initial rating, then when they later perform at their natural level, those extra points are distributed among other local players.

Any asymmetrical point award has this risk. We will thus force new players to start at a fixed rating. Magic started players at 1600, and we will likely start all players at 2000 so that ratings would translate appropriately when compared to Chess Elo ratings. While the average rated chess player has approximately a 1600 rating, the random element in Magic means that ratings have a narrower range, and a player who reliably beats the average tournament player should be assigned a master style rank and title.

Elo ratings can be used to pair players against opponents of similar skill levels. Elo ratings can be used to pair opponents in tournaments, similarly to how tennis players are paired in Grand Slams, to maximize tournament excitement and the performance of the best players. They can also be used to determine qualifications or other prizes, the awarding of titles, or simply for pride.

Most importantly, Elo provides proof of play. Elo tracks meaningful success in winning matches. By tying positive-sum rewards to the maintenance of minimum Elo ratings, we can guard against players not taking games seriously, or using uncompetitive bot strategies. More aggressive versions of this might make all of your rewards scale to your Elo rating, making every rated game have something worth fighting for. A danger for games offering rewards for proof of play is that it is easier and faster to offer that proof against weaker opponents than stronger opponents. If the same rewards are offered no matter the skill level of the opposition, players are rewarded for sabotaging their ratings and rankings, rather than for maximizing them. Any rewards given out should scale sufficiently to avoid this problem.

Tournaments gather together players at a specified time, and usually either charge a fee to enter or require the player to qualify in some way. Most use either fixed constructed decks, draft or sealed decks, or a combination thereof, and 'Swiss' style pairings. With Swiss pairings, each round, players are paired against other players with a similar win/loss record, ensuring that matches are fair, and incentives are symmetrical. Usually there is at some point a cutoff where the top players are then placed into a single elimination bracket to determine the winner. Other tournaments use single or double elimination, or round robin, or occasionally other formats and variations.

After the tournament, prizes are awarded, including cash, cards and entry into other tournaments.

Leagues and other similar queues are essentially asynchronous tournaments. A fee is usually charged for entry. Players are free to request a match whenever they wish and play against other players with similar records who requested a match at the same time. In other less strict leagues, players find each other and agree to play. After a set number of matches or a set number of wins or losses, players are typically awarded prizes based on their number of wins and are then free to enter the league again. Those prizes often include points towards qualification for tournaments, or free entry into additional events, as well as cash and cards. When the league 'season' is complete, those who have the overall best records will get prizes, and sometimes qualify for a tournament to determine an overall winner.

There are additional variations, but most compact events boil down to reframed versions of one of these two models. Mechanically, the key differences between a tournament and a league are the asynchronous nature of leagues and the resulting ability to enter most leagues multiple times.

When the number of players is small, tournaments are necessary to ensure opponents are found. Tournaments are scheduled to provide a coordination point where many players agree to play the same format at the same time. Tournaments are also often provided on demand, with players entering a queue and a tournament beginning when the required number of players are available, typically eight.

Magic Online initially paired its players primarily via eight player on-demand tournaments, later introducing leagues. The improvement in player experience was dramatic.

Queuing for a tournament had previously meant making a three-hour commitment, half of which typically would involve waiting for other matches to finish, and half of which finished after the completion of one match. If one did not have large blocks of flexible free time, this was a showstopper for many would-be players, and even those with lots of time were forced into copious amounts of hurry-up-and-wait.

Entering a Magic Online league now involves very little wasted time. Instead of having to wait first for a full eight players and later for a round to complete, players need only find one appropriate opponent. Almost half the time this happens right away, as another player is already waiting, and the remaining times the wait is typically two minutes or less, often only a few seconds. Even more important is allowing players to play without having to clear three-hour blocks of time they might end up not using. Each match

takes a maximum of one hour, and players can play matches on demand one at a time as their schedules permit and as they are feeling up for a game.

Leagues are the superior system for every day play of popular play formats. Our games will use leagues as our primary paid play pattern, but tournaments still have their place even when they are not in-person gatherings. One important tournament purpose is when they carry large prizes and are showcases for the game, high-level competition and streaming coverage. Another is providing support for less popular format types, including new experiments. Tournaments provide a way for users to promote new format ideas and experiments in a decentralized fashion without having to build a big enough player base for a league.

We will organize periodic major tournaments with large prize pools, both in terms of cash and in terms of additional in-game rewards, both non-transferrable achievements and transferrable digital objects. We will continuously run experimental tournaments with different deck construction rules sets and tournament structures. We will also provide built-in support, both technical support and prize support, for users to organize their own tournaments with a wide range of customized rules. A portion of all net card sales (sales minus repurchases) not less than 10% will be dedicated to subsidizing tournament and league prize support.

Note that tournaments can and will be improved by not forcing all players to await the outcome of the last match each round before they are allowed to continue play. The system can in most cases pair players without knowing the outcome of irrelevant matches, and (for example) allow second round matches to begin before the first round is finished. Due to the length of matches being correlated with other factors such as deck choice, it is an open question how 'league-like' we can pair opponents before tournament integrity is compromised, but the answer is a non-zero amount.

By charging entry and awarding prizes, leagues and tournaments accomplish two key goals. First, they solve the nothing-at-stake problem. When players play fully casually, players will often concede quickly or otherwise not take the game seriously, destroying their opponents' experience. With entry fees and prizes, players will do this far less, and when it does happen opponents are compensated because winning is worth something. Second, by isolating their matches, leagues and tournaments allow players to experiment with new formats, decks and strategies with a strict cap on their risk. All you can lose is your entry fee.

Elo ratings break down this wall. This can cripple creativity and exploration, as players are afraid to risk their ratings. Chess has severe problems with players being overly concerned about their ratings, often sitting out tournaments or saving interesting explorations for unranked play. Magic had the same problem when Elo ratings determined qualification for major events. Many players would seek to qualify via rating, seeking out tournaments where they could expect to gain points, avoiding tournaments and matches that put their rating at risk, and even suspending their play for weeks or months at a time to preserve high ratings. This is a shame. Players who would enjoy playing do not play and other players have a smaller player base to play against. By driving down creativity and experimentation, we take away exactly the players that would enhance the play experience for others.

As an innovation we suggest allowing players to choose at the onset of a league or tournament, whether they wish to put their rating at risk. If they do not wish to do so, their games will be unrated, or only rated as a group where those who defeated the player get points from those who lost to the player, preserving the zero-sum nature of Elo ratings, if and where this feature proves defensible against exploitation, and where entry fees are sufficient to maintain players' incentives to take games seriously. If the matching

system is sufficiently robust that we do not fear collusion at all, we can instead give players shadow 'casual' ratings that are used for them in these matches, purely for the purpose of rating their opponents.

Elo is contrasted with positive-sum systems that reward quantity of play. Elo rewards quantity only insofar as it allows players' ratings to approach their true level of skill. Cumulative systems range from those primarily rewarding achievement to those primarily awarding games played.

At one extreme, we have systems that award points only for playing and doing well in a limited number of major events, especially events requiring qualification. Magic's Pro Points system is a good example of this. Players in Grand Prix and higher-level events earn Pro Tour points, and each players' point total is based on their accomplishments in the past twelve months. Skipping major events is a severe handicap, and qualifying for all of them, especially the World Championship and World Magic Cup, is a major advantage. Recently, to avoid forcing top players to travel to too many events, Wizards capped the number of Grand Prix tournaments players can count points from, a change many players welcomed.

At the other extreme is Magic's Planeswalker Points system. Playing in a round of a tournament earns each player Planeswalker Points. Players earn points for each win, but also earn participation points and often bonus points simply by showing up. Event multipliers ensure that playing in larger events is a more efficient way to earn points, but mostly points are earned by showing up. Thus, they serve to encourage 'grinding' away and playing lots of events, rather than identifying skilled players.

Ladders are another popular ranking and competition mechanism. They are an alternative way to pair, rank and award players. Ladders form the core of competition in games such as Hearthstone and Eternal.

In a ladder, players are given a rank, with new players given the lowest possible ranking. During each competitive period, typically one month, players can play as often as they like and are matched against players with similar rankings. The winner of each match gains ranking points. If the loser is ranked low enough, typically no points are lost. If the loser is ranked in the middle, typically points are lost, but in expectation less points are lost by the loser than are gained by the winner. If the loser is sufficiently highly ranked, the loser usually loses as many points, or almost as many points, as the winner wins. Often the ladder includes 'floors' which, once a player achieves them, prevent the player from falling below that rank, including the transition from 'normal' rankings to the top-tier rankings ('Legend', 'Master' or similar) where players are provided a strict ordering rather than being divided into tiers.

At the end of the month or other period, prizes are awarded, sometimes including qualifications for events or credits towards such qualification, and positions on the ladder are partially or entirely reset.

Players being able to also play 'unranked' matches mitigates this somewhat, but in games that use ladders unranked games tend to be more difficult to find and have a high tendency to be poor experiences. Opponents concede or take a long time, or take things not very seriously at all, and real opponents are of highly unpredictable skill levels. Such games tend to be neither fun nor good test data for whether a strategy would succeed on the ladder or in tournaments. In some cases, such as Magic Arena, such games are entirely unavailable. A good solution for some players is to play against their friends in these spots, but realistically that is usually not possible.

Having leagues and tournaments that are isolated from one's permanent reputation, but with enough incentive that almost all present take things seriously, is therefore vital.

If the ladder is emphasized, players are pushed to grind very large numbers of matches in order to achieve the highest possible rank in each period. Often players will do this with little or no incentive beyond their

numerical rank. Ladders are proven to be inherently highly motivating, and typically card rewards and qualifications are also offered for strong performance.

The key advantage and disadvantage of ladders is that they reward players for playing lots of matches.

Ladders bad because those players can end up playing more games than they would like, and not enjoying themselves, eventually burning out. It is also bad because if players mostly are playing ladder games to maximize their finish on the ladder, then they are maximizing for that rather than other things. Like with Elo ratings, such ladder players will end up sacrificing exploration and diversity in order to maximize win percentage, and also, they will seek to maximize speed of play in a way that can be both unbalancing and bad for diversity of experience. Finally, it is bad because games played on ladders don't contribute to getting critical mass for other forms of play.

Ladders are good because people play lots more games, and this means lots of opponents for ladder games, and people wanting to play more games is strong evidence players are highly engaged.

Players want a variety of experiences, and to play a variety of game formats. While games have a precarious number of players, it is necessary to steer them into a small number of places to ensure opponents can be found.

Once the threshold is crossed, we gain the ability to support increasing diversity of formats and structures. We will still want to steer players by default into basic and easily understood modes but give the community broad choice to find the fun, and support all their explorations enthusiastically via visibility, technical aid and prize support.

### **Organized Play: Strategies and Innovations**

We will focus organized play along three paths.

First, we will create the best centrally organized versions of leagues, daily and weekly tournaments, and ladders we can come up with.

Leagues and tournaments will be positive-sum, with the average market value of tradable rewards at least equal to entry fees, plus the potential to earn rating points, qualifications and card experience. Tournament play will be as supported and player-friendly as is compatible with tournament integrity and protection from exploitation. If tournaments can be provided on demand, they must be zero-sum or worse, or else bots will flood the queue. Since card experience needs to be available, that means that on demand tournaments must be negative-sum, providing profits that can be used for larger tournament prize support. Leagues and scheduled large tournaments can safely be positive-sum, as long as there is a cap on total size and/or sufficient front loading of prizes to protect against bots entering in sufficient numbers to mostly face each other.

We will also offer monthly ladders, because they are industry standard and players have proven to like them and offer prizes for doing well. Ladders are also valuable because they provide a rewarded place to play and get opposition at an appropriate skill level without having to incrementally pay. However, tradable prizes that we want to hold value will only be available beyond the skill level we believe is held by the strongest bots.

Second, we will expand what formats and structures are used in tournaments. Expanding this format to allow players to have card pools that mutate and grow throughout the event and have some control over their matchups and fate in other ways, would help capture what people love about games like Fortnite or Slay the Spire. We think this is a strong place for innovation and have big plans. This is a place where

being freed from physical limitations, and reliable verification from the blockchain, can pay huge benefits.

Third, we will have world-class professional tournaments and competition. Current anticipation is that a portion of all net sales, with a guaranteed minimum, is put into a prize pool together with all entry fees for qualifier tournaments and all net profits from on-demand tournaments. Qualifiers and smaller ('Grand Prix' style) events can be held weekly, major tournaments everyone to two months, and then a yearly World Championships.

Finally, we will use the decentralized nature of the blockchain to foster innovation and customization to the desires of the players. We will also allow players to set up their own tournaments, leagues and ladders, with their choice of formats, structures and prizes, and provide positive-sum prize support for them automatically, including credits towards major tournament qualification. The more popular formats and styles will then be integrated into our centrally organized play.

Any player can create an event at any time.

When they do so, they put down a deposit of XTZ to form a guaranteed prize pool, and the event is automatically incorporated into listings of future events. All entry fees are returned to the creator of the event. Depending on what details are selected, and how much interest there is in the event, the games become rated, card experience will be gained, and the game will automatically provide supplementary prize support via smart contract to reward the resulting proofs of play and skill.

In addition to the lure of guaranteed prize pools to draw players to underserved tournaments, we will also support tournament and event creation via dominant assurance contracts.<sup>6</sup>

In order to qualify for supplementary prize support or for being listed prominently in our event listings, the event must welcome competition.

Events must be announced well in advance, to allow other players to prepare, both in terms of scheduling and being ready for the format selected. Fully generic tournaments require little notice, stranger ones require more.

Entry must be open to the public, subject to allowed qualification requirements – you are permitted to schedule one tournament that only admits those who qualify in another or via a points system in other events, provided the entire system gives players sufficient notice, or it can use Elo ratings, general qualifier points or other generic systems of merit. The event must not hit its player cap before the public has had a reasonable chance to enter – you are welcome to cap the event's size, but if you do and the cap is hit by having all your friends enter, we can't supplement the pool.

An exception is for events at physical locations, what Wizards of the Coast calls local gaming stores (LGS). If players play together in person, that is something we want to encourage. Physical verification can then serve as an alternative proof of play, allowing those involved to play each other in a positive-sum fashion as a way to support local gaming. Maximums will be determined by the need to defend against exploitation.

For formats, in terms of cards permitted, we will allow almost any constructed format players desire.

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<sup>6</sup> For an introduction: [https://en.wikipedia.org/wiki/Assurance\\_contract](https://en.wikipedia.org/wiki/Assurance_contract)

Any combination of sets may be permitted, including letting players choose which sets to build from as in Magic's 'block party' format.

Any combination of cards can be restricted to one copy per deck or banned outright, or cards can have combined restrictions, to prevent use of disliked combinations or piling on of too many similar redundant cards. If desired, some, most or all cards can be allowed in smaller, larger or unlimited quantities.

Point systems are allowed. Deck size minimums can be changed. Some of the game rules may even be flexible. If the players are engaging in limited play (draft or sealed deck) then any rules for the creation of virtual booster packs are permitted. This encourages players to experiment with what would happen if particular cards were banned or unbanned, or to be more creative and create unique challenges for other players. More out-of-the-box proposals can be voted on by the community.

A maximally wide variety of limited formats will be supported, including new designs from the players. Sealed deck, mini-master, Cube draft, booster draft, Rochester draft, Winston draft, Rotisserie draft and any other format considered fair will be supported and encouraged. Packs can be custom designed as needed, and either purchased or rented. With full verification via the blockchain, events can support ante or other ways to modify decks during the tournament. The player base will be able to certify additional formats via vote of proof of stake; see the section on community management.

The round structure can be anything from single elimination to full round robin. Team play is allowed and encouraged. Again, new structures and rules can be proposed, and voted on by the community.

Same goes for prize distribution, including unique or creative prizes. The creator can also charge whatever they wish for the entry fee. Fees are by default returned to the creator until they have gotten back 100% of their initial deposit, which they can choose to wave. After that, the tournament structure determines how much of the additional funds are returned to them versus added to the prize pool, but events that keep too large a percentage of entry fees will not be eligible for prominent listing or supplementary funding.

Success in terms of supplementary prize support will be judged based upon the number of entrants, and their overall skill level as measured by Elo and success in tournaments, leagues and major events, all of which is recorded on the blockchain, and by vote of the community to reward innovations and those events that prove fun. Based upon success level, non-tradable prizes such as qualification points will be rewarded, and card experience will be earned. For sufficiently big successes, additional XTZ will be added directly to the prize pool, subject to a global cap on percentage of net revenue spent in this way. If the cap is reached or exceeded, such rewards will be scaled down automatically.

## **Formats**

Our intention is to support three constructed formats at launch, with more added later as players innovate and as cards age out of our primary formats.

The default mode, Standard, will include all cards created in the past two years.

The affordable mode, 'Hundred-Dollar Standard,' will include the same card pool, but with the restriction that the total cost of all your cards, as measured on the first of the current month, cannot exceed \$100 (this threshold amount is of course subject to change as we learn more). This will ensure that the game is affordable and will introduce an additional element of automatic balance. If a deck proves too good, its price will increase, and players will have to choose alternate cards to include in that deck. If a deck proves poor, it will become cheaper, and can now include more powerful options.

The free mode, 'Free Standard', includes all cards that are free to access, so players who do not wish to pay money can still play constructed events.

For limited, we will experiment to see which formats players love the most, since we do not want to fracture the early player base too much with too many formats. Anticipation is that draft formats will dominate, with a combination of something similar to Magic's booster draft, and something similar to cube draft where more powerful cards are available more often.

We will also work to develop league-style options, battle royale style formats, roguelike experiences, and ways to play against an AI.

### **Community Voice**

The Magic community has an exceedingly high level of engagement with Magic's creators. They provide tons of feedback to help improve the game and getting lots of detailed insights from the game's creators on how they go about making the game the best it can be.

Going a step beyond this, we will be giving players direct voice in the game's development, and in many other decisions. The community will vote via proof of stake.

Once markets exist for all cards, each crypto address and its associated player/owner will have a collection of cards that has a known quantity of each card, and a known XTZ value. All games played and accomplishments achieved are also recorded. Players will be given a voice in community decisions based on a combination of what they own and what they have accomplished, as appropriate to the current decision.

An example would be the banning of a card. At any time, any player can propose a card to be banned in Standard (or another future) format by posting a bond. The players then vote, with votes proportional to their ownership of the card, and other players hold a second vote based on their ownership of all cards in Standard and their accomplishments in the game. For the ban to succeed, it must get a supermajority of both votes. Reversal of a ban works the same way.

This ban then applies to generic events and our larger tournaments, but players own their cards and are free to use them. If players disagree with the ban decision, they are permitted to hold their own tournaments where particular cards are banned, restricted or made fully legal, or impose other similar rules.

One could go further than this. Baeond proposes to give players full ownership of the game and the unique blockchain they create for the game to exist upon, as well as the full right to make new cards and sets. While the move is admirable and an experiment that will yield valuable results, we believe this to be a serious error even if the bot networks are somehow prevented from seizing control of their blockchain and voting system. Players do not have the expertise, or the perspective or necessary time, to figure out what the right long-term answers are.

Magic players have improved steadily on this through decades of education but are still nowhere near ready to take the helm. The key to our compromise is that we allow players to exert a veto over decisions that would endanger their investments and value propositions, so they can be confident in the long-term value of investment in the game, or their ability to play strategies they love. We believe that Magic players would have, upon request, given consent for every necessary ban and change made in the last decade.

We also do not currently intend to require permission via vote before reprinting cards from previous sets, if we think the card would be a good fit for the current Standard format and/or limited environment. Often additional printings have caused past cards to rise rather than fall in value, as the card is now available for Standard play. However, because we have a marketplace that reveals the value of the cards, we will offer a different protection. When we announce we will print a card anew, including copies with different artwork or a different name but that are functionally identical, we will give all existing owners the opportunity to sell the card back to the marketplace at the current market price, in unlimited quantities, for a fixed period. Thus, if they feel their investment will lose value, they can avoid that loss.

Alternate artwork and other promotional features that don't have a direct game impact are decisions that can and should be primarily based on the voice of the community. When we hold major tournaments, we can give the community a large share in deciding the locations, formats, tournament structures and payouts, subject to a budget.

Magic has held several "you make the card" events where, with guidance and restrictions, the public was allowed to create new cards. We will embrace this, and do such things periodically, with the design team making sure nothing gets too far out of hand.

Not every decision can or should be entrusted to the players or collectors, but many can and should be. Those mentioned here are but a taste, and it is our intent to regularly poll the players on decisions where their input is valued.

### **Mechanical Discussion: What Makes Magic Great and What Holds Magic Back**

If a game isn't great, no economic or tournament system will make it great. Players won't have fun and the game will fail, as countless others have in the past. In an ideal world we would purchase or license Magic: The Gathering itself, but as great an opportunity as it would be if we had the scale to take advantage of it (Hasbro's market cap is approximately USD\$12.5 billion, requiring an ICO similar in size to the record set by EOS), for now let us assume that a leveraged buyout of Hasbro is not in the cards.

Magic has endured, despite massive costs and disadvantages, because for many it offers the best game experience around. How do we identify and embrace what makes Magic great?

Different players have different answers to what in Magic they enjoy. Wizards has identified three central archetypical players they call Johnny (likes to be creative), Timmy (likes to do big powerful things), Spike (likes to win). They later expanded this to include Vorthos (likes high quality flavor) and Mel (likes high quality design and mechanics, and the interplay of different card designs). Most players combine several of these elements. Players also like to play a variety of different types of strategies, from quick aggressive decks to slower decks that stop the opponents' threats and then take control of the game, 'midrange' decks that do powerful things without being dedicated to either an aggressive or defensive role, and combination-based decks that seek to assemble powerful engines. In his book *Next Level Deckbuilding*, Patrick Chapin identified a full wheel of sixteen distinct deck types, each of which takes many forms.

This flexibility and unpredictability of Magic's game play is central to Magic's success. Cards are not only allowed to mechanically overrule the rules of the game. Cards are allowed to radically alter the game's progression. A spell can unpredictably upend the flow of play, and players are not forced down the same paths continuously. Even when straightforward decks pursuing simple goals play each other, unique situations continuously arise.

Magic's mana system, and the degree Magic forces players to engage with and react to it, is key to this.

Magic begins with only two basic restrictions on players. Players start with seven cards and draw one additional card per turn and are only allowed to play one land each turn. By default, this means players will start with one mana on turn one, two mana on turn two and so forth, as the game progresses from mana as a limited resource in the early game to an abundant resource in the late game.

Many games, including most collectable card games, lock in a game progression and resource structure that is hard to alter in substantive ways, which in turn greatly restricts variety of game experiences and the ability to put players in unique situations. While games can be short or long, most have a clear beginning, middle and end game.

An easy way to see this is to compare the mana systems of Magic, Eternal and Hearthstone.

Magic forces players to choose how many cards in their deck will be sources of mana and/or sources of particular colors of mana, and how many of those will be lands versus temporary mana sources or permanent sources that can be deployed without using up your one land you can play in a turn, which allows you to accelerate your mana. You can also use your lands to do a variety of other things, as many have powerful abilities beyond providing mana, and many cards key off of or target the particular lands you or your opponent have. This forces Magic players to balance various risks and opportunities and plan for and respond to unique situations. The more you want your deck to do, the more colored and/or total mana you want available, and the quicker and more reliably you want to do it, the more spots in your deck you'll have to spend to make that happen.

Magic players can also interfere with the opponents' land and mana base, using cards that make spells more expensive like Sphere of Resistance or Nether Void, by destroying individual lands with spells like Stone Rain or Sinkhole, or even lands like Wasteland and Strip Mine, by destroying most or all lands with spells like Armageddon or Balance, by preventing lands from untapping (meaning they cannot be reused in future turns) via cards like Winter Orb and Back to Basics.

Formats allowing older cards, such as Legacy and Vintage, preserve this state where lands and mana are a highly endangered resource. Modern and especially Standard still force players to balance costs, risks and opportunities in their own mana bases, but allow players to treat their lands as mostly safe. This was a deliberate change in Magic design that made the game less unique. We'd like to embrace the old attitude and allow attacks on mana bases to be a central part of the game.

Eternal keeps much of Magic's system, retaining many of its advantages, but makes crucial changes.

Mana requirements and lands are simplified. Rather than spending colored mana each time a spell is cast, which can result in limitations on what spells can be simultaneously cast and choices about what colored mana to keep available for later in a turn, Eternal uses a threshold mechanic. If you have two blue (which they call 'Primal') influence, you can freely cast spells that require two blue mana, but not cards that require three. Once gained, influence is in practice never lost. Lands (which they call 'power') provides one power/mana per turn, and spells are cast by drawing power from this pool. Power/land cards don't offer alternate or additional abilities once they are in play. These changes greatly speed up and simplify game play, allowing players to focus on spells.

Another key change is that Eternal uses a much more generous 'mulligan' rule than Magic. In Magic, if you dislike your initial seven cards, you can trade them in for six cards, which can in turn be exchanged for five and so forth. If you do this at least once, you get to look at your top card of your deck and choose whether to put it on the bottom. Mulligans cost you a card each time, so they are not taken lightly, and players often must handle having insufficient mana sources to work with. In Eternal, if you dislike your

initial seven cards, you can mulligan one time, redrawing a second hand of seven cards that is guaranteed to have between two and four power/land cards in it. To prevent abuse of this system, all decks must include at least 25 power/land cards out of 75. Most Eternal decks play close to or exactly this minimum number of power/land cards.

This minimizes the number of short and unfun games where one player's deck fails to do anything, at the expense of further reducing game variety and player choice. Eternal players do not need to worry much about how their deck will function on only one, two or three power sources, they usually have no issues with sources of influence/color, and their mana bases mostly build themselves.

Hearthstone further simplifies matters by removing color requirements and land cards from the game entirely. Colors in Hearthstone are replaced by character classes (Warrior, Priest, Thief and so on). Each deck has a class and can play only cards of that class plus generic cards that any class can play. Each turn, players are provided an additional mana crystal, so there will always be three mana on turn three, eight mana on turn eight and so on, up to a maximum of ten. There are a few ways to accelerate this process available to the Druid class, but mostly mana is a fixed element, and players don't have to worry about drawing too few or too many mana-providing cards.

Other games will often choose points along this spectrum, and occasionally will innovate with new systems.

Versus (Upper Deck's superhero card game) and some other games allow any card to be played face down as a land, with some types also then able to be turned face up later to gain an effect. This is effectively a lighter punishment for those who draw a poor number of lands – either you must play your least useful cards as lands that gain you no additional benefit, or you can be stranded with surplus land cards that do little or nothing. It also allows players to choose between spells, enhancing card selection and thus player choice. However, because players can now search for key cards and dispose of cards they don't need, games are even more likely to all look alike.

Netrunner is a great example of an alternative costing system that creates great tension and game play, but that together with other design choices forces structure on the game such that the game has limited scope. Netrunner gives players three or four actions per turn. In a pinch, they can be used to draw cards or gain bits (which are that game's money/mana). It is much more efficient to do both of these things via using appropriate cards, so all good decks are full of ways to do this, and action efficiency is the name of the game.

We continue to experiment with a way to balance the need to avoid too many dead games and feel-bad moments with the need for varied resource bases that create unique puzzles for players to navigate. Our current system combines multiple innovations and will not be discussed here in detail, but its core concept is that players build resources each turn based on what types of things they have attempted to do on their last turn, and are permitted to attempt things they lack the resources to do, probably failing and losing the card, in order to build towards what they need. This creates tension over development of the proper factional resources, even as total resources expand at a predictable rate.

Magic is also unique by giving as little forced structure as possible to the game and its progression in other ways. Different Magic games play radically differently.

Magic games begin with no cards in play and fresh hands of seven cards. That allows the game to start out simple and then grow more complex. Magic games are capable of great complexity and often get

quite complex in practice, with the game even being proven to be Turing-complete.<sup>7</sup> Players can have dozens of cards in play at once developing the game along lots of different angles. A key skill is to determine which of those angles will determine the outcome of the game, and to focus on what matters. Other game systems limit this process in various ways, including ensuring that any reasonably sized set of cards leads to them blowing up either the enemy player or at least a bunch of other permanents. In Magic that is fully optional, with complex boards often prolonging the game further by favoring the defender over the attacker.

There can even be devilishly complex sets of spells being cast at one time, as Magic allows unlimited interruptions of an attempt to cast a spell, using a stack and resolving the resulting spells one at a time.

Compare this to Hearthstone, which has a hard cap on the number of minions in play (seven), sharp limitations on what other cards can be in play, fixed mana development, no play on the opponents' turn, severe restrictions on surprises players can create for an opponent, and a relevant hand size limit. The space of possible situations in Hearthstone is effectively compact.

Magic also allows interaction between the players at almost every point in the turn. In order to simulate Magic's actual rules, players of Magic Online are required to create 'stops' that indicate when they should be asked whether they wish to take action. Those stops must balance the need to not lose a key opportunity, the need to avoid giving away information on their ability to interact, and the need to not spend too much time. Partly to avoid abuse of this system, Magic Online players have chess clocks that offer them a fixed amount of time per match, which is usually not necessary for other card games.

More recent Magic still has much of this flexibility but has also lost much of it due to choices made in modern Magic design and development. Magic has become much less of a blank slate on which radical things can happen, and more of a conventional game in which players do progressively more powerful things and compare them to see whose was more powerful. The cards have also become more complex, especially the most powerful cards.

Creatures and creature combat have become more and more important, as has the new Planeswalker card type. Cards costing four or five mana are able to grant their owners an additional card each turn or other effects that quickly run away with games. This is so prevalent that cards costing four or more mana that do not do this are usually so weak as to be useless.

Even in Standard, creatures that cost two mana often do three or more damage to the enemy each turn, and more expensive creatures scale to match their costs. Since players die once they have taken twenty damage, this severely limits players' room to maneuver. Players in the Standard format must choose efficient, flexible and powerful haymakers and throw them at each other. Players in the Modern format will often attempt to win the game on turn four or even three. Legacy and Vintage are not creature focused but are even faster.

A new format called Old School is a response by some players to recapture what made the old Magic great and is now missing from the game, along with a heavy dose of nostalgia and a chance to bring out some sweet old school artwork. Old school limits players to the first two years of Magic's existence: The first base set, plus the expansions Arabian Knights, Antiquities, Legends, The Dark and (depending on which version is being played) Fallen Empires.

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<sup>7</sup> Source: <https://www.toothycat.net/~hologram/Turing/HowItWorks.html>

The old cards make for a very different game play experience. A wide variety of strategies are available once players are freed from worrying about game-ending combos or being put 'on the clock' quickly by too-efficient creatures. New strategies continue to be found, with a counter available for everything. Having various iconic highly efficient cards available in various colors, and the lack of lots of almost-as-good second tier cards to replace them, forces players into hard and interesting choices. Mana bases are unreliable and under attack, as players are tempted to reach for more of the best cards, forcing players to plan, balance and adapt. Tempo still matters, but players need not be obsessed with spending all their mana each turn. The effects combine in interesting ways, but they are simple. Cards don't have lots of little quirks built into them.

One could go on, but the marketplace speaks louder than any argument I could make. Demand for the Old School experience is so high that cards from early Magic have gained greatly in value since the format has been created. Players spend thousands or even tens of thousands of dollars to create the decks they desire, or even to (literally) trade white-bordered cards for otherwise identical black-bordered versions. The format will likely endure for quite a long time.

This is not in spite of the 'mistake' cards that we would never print today, but rather with the aid of those errors. Recent mistakes have enabled too-reliable, too-powerful linear strategies that suffocate the metagame. Old 'mistakes' were building blocks that can be used as players desire. Those building blocks were not always well-balanced, and some needed to be restricted or even banned to be sure, but Magic is remarkably self-balancing when there is an answer to every question, advantages don't snowball as easily, and the cards don't force players down particular paths.

This transition was an explicit evolution of Magic design, with the deliberate decision to think carefully about how cards will interact, first within a 'block' of related sets and later within every two-year period. This ensures that players are given the tools for the strategies that cards push players towards, but by doing this intentionally, it makes it that much harder to do anything else.

Another key problem is that Magic stopped producing 'hate' cards that severely punish players for playing particular card types, strategies or colors. There are still cards that are better against some strategies than others, but few true 'silver bullets' that invalidate entire decks if unanswered. This is a mistake, opening the door to decks that take over entire metagames. The Modern format is a great example of how good hate cards allow the game to adjust and keep the new hotness in check, which is especially important in a crypto-based game as our commitments to players make it far harder to fix our mistakes. There should be no strategy that does not live in fear of at least one inexpensive and accessible answer.

None of this means that, even if it were possible, we would want to copy all or most of the exact cards from 1993 and 1994. We have learned much since then, and with a new digital-only game we will have wide expanses of new design space to create new simple but powerful cards, from small to world-altering effects. We will be able to reimagine what various things should cost, which effects we want to highlight, how to divide the color pie anew and more. But we also shouldn't shrink from giving players unique and intentionally overpowered tools, confident that the variance is something our game can handle. No matter what form our final game takes, its rules and structure will have key changes from Magic's template. It will be adapted to suit the IP that the game is based upon, whether original or licensed. It will eliminate the need for so many interaction points between players, and for Magic's semi-hidden convoluted rules that have resulted from needing to make all the old cards function properly at the same time.

Having a few 'overpowered' cards that provide a great value for the price, but which cannot in themselves run away with the game, tempts players to employ a variety of effect types and strategies. Players have to

balance between the cards that do the things they want most, and cards too powerful to pass up, and are constantly tempted to stretch their mana bases to extra colors.

In fact, as a potential mechanic, it is proposed that we give a special status to such cards. This mechanic's development name is "power," after Magic's Power Nine cards. The mechanic works this way:

*Power (This card does not count towards the minimum number of cards your deck must contain.)*

If we were looking at early Magic, this need not refer only to rare cards. Consider Lightning Bolt, Mana Drain and Demonic Tutor. Each gives you a temptation to get them into your deck, and rewards you for choosing the appropriate color. You can get more similar things, but they'll be noticeably worse.

This does several desirable things.

It adds a downside to playing the card. Each power card makes your deck larger and more inconsistent, especially taxing players' mana bases.

It allows players who acquire a new power card to have a pure feel-good moment, allowing them to add the new card to their deck without removing an existing card.

It also reserves space in decks for non-power cards, ensuring that decks do not all end up looking the same. Vintage, where Magic' power cards can be played, suffers because players have so little space to customize their decks.

Finally, it allows formats to automatically restrict (only allow one copy of) or ban outright power cards, should players desire to do that.

### **Card and Game Complexity**

Complexity creep is a time bomb threatening Magic's health. Each year, Magic must innovate. Each year, it needs new card names, new card abilities, new mechanics, new themes and decks. Magic has sustained itself for a quarter century despite rapid card printings, but its cards grow steadily more complex each year.

By starting over fresh, we give ourselves a chance to wipe that slate clean. We should be unafraid to do the simple things that work and are fun, even if similar things have been done before. If we wind up with many cards and decks that have close parallels in Magic's history, but which are fun for all, we should welcome that, so long as they are not the only options.

### **Four Key Areas Where We Must Improve on What Came Before**

To succeed against simpler and smoother games like Hearthstone, a game with the strategic complexity of Magic needs to address four critical non-economic problems. These problems do not have great known solutions. The costs can be mitigated, methods of which will be discussed below, but the problems are a necessary by-product of the strategic depth and core gameplay of Magic's systems. A key focus of development of the system will be to find the least-bad ways to mitigate these issues. It is probable that superior solutions to some of these problems exist, and we hope we will find them.

The four deal breaker issues are: Magic needs to further reduce (non-economic) barriers to entry, it needs to become more watchable, it needs a better solution to implementing player interaction, and it needs to be playable on a phone.

While we can point in the direction of better answers to these problems and can certainly do far better than Magic currently does, these remain the strongest barriers to the success of a game that retains the core of Magic's superior game play. Mitigating complexity creep helps with all of these issues, which is why it is not listed as a fifth problem in its own right.

### **Reduce Barriers to Entry**

Magic is notoriously bad at onboarding new players. A quality tutorial is the first place to look. Eternal, which must teach most of the same material to introduce new players, makes a stronger attempt than Magic on this front, but it is still a painfully slow process. Magic Arena's tutorial is a vast improvement over past attempts to solve this problem, but still throws you into the deep end right afterwards.

Magic experimented in the past with Portal, a set with somewhat simplified rules and cards, as a way to onboard new players. A simplified version of the game, with a reduced (and possibly supplemented) card pool, seems like an excellent place to begin the search and to allow the creation of a stronger AI opponent to practice against. Duels of the Planeswalkers, Wizards' single player standalone game, also effectively took this approach, if anything not taking it far enough, and is considered by many the most successful introduction to the game so far. We should seek to build upon this template but acknowledge that this will be an inherent disadvantage for a game with such high complexity.

Base set Magic draft, such as with the current base set M19, offers a relatively good on-ramp to limited and is underrated as a play experience. Without the need to create physical cards, limited formats can be crafted even more carefully for the new player. Current plans also include creating entire competitive formats where more complex mechanics and interactions are not allowed and designing cards with that in mind. One idea we will experiment with is for the more complex cards to not be banned in such events, but rather to do a simpler version of the more complex thing they normally do.

Mentor programs are another area that merits further exploration. Since new players may or may not be new or unique players, we can't give out saleable prizes, but there are other ways to reward those who help new players along, especially if the new players are spending money on things only of value to new players.

### **Improve Watchability**

Magic needs to become more watchable. Addressing this would help address barriers to entry, and vice versa, as watching Magic is a means to learn Magic, and lack of understanding what is going on is the biggest problem with watchability.

Magic's complexity and interactivity can make watchability difficult. Complicated stacks and interactions can be very hard to follow, as can knowing where you are in the turn. These can be overcome, but Magic does not currently make it easy. Even professionals can find broadcasts hard to follow, and limited formats are all but impossible if you haven't memorized the cards including their pictures.

Going to exclusive digital play is a great start. Matches played on Magic Online, despite it not being optimized at all as a spectator platform, are far easier to follow than games of physical Magic. With digital play and smart presentation, it becomes automatic to see the cards in players' hands and be able to learn what they are if one does not know.

Hearthstone already implemented a feature on Twitch that allows moving the cursor over a card to show a full-size version of that card, a feature Magic desperately needs to copy and expand upon. Magic Arena is largely about making the game look cooler and become more watchable by copying the feel of

Hearthstone, and Eternal also copies a lot of similar features. Arena's graphical representations of what is going on are a long-overdue addition. It currently does its best to hide the details of effects on the stack from the viewer and even from players, which hopefully will be fixed. Building in strong replay features should allow games on delay to flow smoother and show the decisions of both players. Reducing the complexity of the cards would make things easier to follow.

The quality of Magic commentary and event coverage can of course bear much improvement. They are far below industry standard.

The worry is that all of this only offers incremental improvement. This will always be an area of relative disadvantage for more complex games versus simpler games. However, far more complex games have succeeded as e-sports. If Defense of the Ancients 2 and League of Legends can draw massive audiences, and be explained and presented well, failure to do so for Magic: The Gathering must largely represent a failure of implementation.

### **Improve Interactions**

There are three essential approaches to the interaction problem. We can reduce how much the cards interact, change the rules to limit interaction, or change the interface to make interaction play smoother.

Taking either of the first two approaches is risky, especially the second one. Player interaction is at the heart of Magic's superior game play experience. Reducing interaction would speed up the game, and make it play much smoother and makes it easier to play and follow, but at the risk of its strategic depth.

Eternal uses both the first and third approaches. There is some interaction on the opponents' turn but not much. The game only pauses to consult other players when they can meaningfully respond to what is happening. This results in it being obvious to the opponent when you are holding a card that could be cast, such as Lightning Bolt (in Eternal this is named Torch), making the revealing of this information part of strategic game play. It also means that the game will constantly pause if you have such a spell.

It is Eternal's cards that primarily limit its interactivity, rather than its essentially unchanged rules. There is no reason Eternal's rules and implementation couldn't handle much larger, more common and more intricate decisions and effect stacks, but the cards do not lend themselves to this happening. This has both the good and bad effects one would expect. The game is faster, smoother and easier to follow, but less interesting.

Some games such as Hearthstone take the second approach. Hearthstone allows no player choices during the opponents' turn. You can play cards called 'secrets' that turn face up and trigger when things happen, but during your opponents' turn your job is to sit back and watch. Rather than choosing how your creatures defend against the opponent, the attacker mostly determines what they will attack and how. This too works as you would expect. The game plays much smoother, as your turn need not wait for your opponent to see if they wish to do anything, and the board is usually kept straightforward and simple.

The cost of this in strategic depth, however, is high, and we can't make that much sacrifice while retaining what makes Magic, Magic. Hearthstone and its various imitators can continue to explore their own space, but it does not seriously compete with what we are up to.

A little bit of tuning of the rules and reducing the incentive the cards give to delay everything until the last possible moment, will help reduce the problem in practice. The bulk of gains we believe will come from reimagining the interface and building upon the innovations made by Eternal.

Magic Arena by default copies Eternal's behavior of only checking with players when they have the ability to interact. It will even pass on your main phase after you play your land, if you don't have a castable spell, which seems aggressive. There's also a toggle that you can use to pass all the way to the end of turn, which is your way out if you have an always-useable ability making things take forever.

If you want more control, you can insert stops manually each turn. A stop is a player telling the game that at a particular point in the turn, the player should be asked whether they wish to respond.

Magic Online's solution is to embrace stops. Different players and decks use different stops, and adjust them during games, to balance speeding up the game, not giving away information and not missing opportunities. This is a level of complexity that many players would prefer not to have to worry about.

The plethora of possible stops highlights that Magic offers far more opportunities for interaction than are necessary for the vast majority of play. How often does a Magic player do something in their opponents' second or even first main phase when the active player passes? Almost never. With stops it matters little, since no one will put a stop in such places, but without stops we need to usually auto-skip in such spots.

That still does not solve the problem that when a player might plausibly stop other players' spells or respond to those spells with spells or with on-board abilities, as is common in Magic, players at least must pause for each spell cast. The problem is inherent in the mechanic of letting players react to and stop each other's spells, which Magic can ill afford to sacrifice. Decisions often depend on the success of previous actions, or on information gained and cards drawn from previous actions, so it would be a big and limiting change to the game to have a player forced to declare a full set of actions before giving the opponent a chance to respond. It is also poor to force players to choose between the game proceeding at a reasonable pace and giving away potentially important information. Players will (rightfully) feel obligated to play correctly, maximizing their chances of winning, so we must make the choice for them.

One thing we can offer, in cases where the only new information gained is what response if any the opponent will take, is to allow players to queue actions. I can cast a creature spell, then declare my intent to attack with my creatures. If my opponent responds to the creature spell, my attack never takes place, and I am free to choose a different one instead. We can even give access to random information, such as the top of your library, and rerandomize that information if the opponent chooses to respond, although that needs to be tested as players may dislike it.

One could create a stack implementation that improves upon Arena's implementation.

These types of adjustments will help somewhat, but still fall in the realm of mitigation of the problem.

Our current solution is 80/20 the problem by altering the turn order and allowing a variety of face down cards with triggers that cause them to be cast. By attacking at the end of one's turn, with the blocking taking place at the start of the other players' turn, we can allow fully featured combat without forcing interaction on another players' turn. To preserve the ability to interact with the opponent, players can play cards face down if they choose, and select triggers that will cause those cards to be cast during other players' turn or use them in the future on their own turn instead. This does not preserve full interactivity, but it prevents the plethora of interaction points while keeping much of the complexity and creating lots of innovative new design space to explore.

## **Playable on a Phone**

Finally, it is 2019. The game must be fully playable on a phone. Eternal proves that this is practical. Eternal does make compromises to allow this, limiting the maximum number of creatures per player and hiding lands away in the corner. Eternal's compromised mana system helps a lot here as well.

What would happen if we did not make these compromises?

In complex games, players would need to scroll between the main board and a secondary board or accept very small icons. But this would be a very small percentage of games that even came to that, and in those games exact tapping of mana is unlikely to matter much, so hiding the lands away would mostly be fine.

Eternal's touch screen interface works fine, so that aspect won't be a problem either.

A few years ago, skepticism of a game as complex as Magic's playability on a phone would have been warranted. Today, no such excuses need be permitted.

## **Conclusion**

Magic has been the world's best game for 25 years, but it has failed to capitalize properly on its digital opportunities and has no interest in the crypto realm at all despite the obviously amazing fit. This presents an opportunity to us to do what they refuse to do and take the tradable card game into the new crypto era. Magic already is several different games, as lead designer Mark Rosewater often remarks – each different format is a different game that shares a common rule set. We can use our new design space to innovate on what has come before, and free ourselves and especially the game's economy from the tyrannies imposed by the physical model and the need to cling to copying it. A new set of such formats, with a new set of cards, and an innovative rule set that improves the flow of play and shakes up old patterns, would be the ideal place to invent the future of tradable card games and collectables.