PETAVERSE NETWORK.

A FRAMEWORK FOR INTEROPERABLE, RESILIENT DIGITAL COMPANIONS

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1. A Vision Of The Future

The fundamental goal of the Petaverse Network ("Petaverse") is to define how we think about digital pets. Petaverse wants pets that you adopt now to be just as much a part of your life 30 years in the future. For our digital pets to remain relevant and usable, they need to be able to evolve in real-time at the pace of technology.

Petaverse's creators, Tiny Rebel Labs ("Tiny Rebel"), are laying the groundwork to make that possible. They are taking their learnings from decades of experience in game development (the founders were early at Rockstar Games, & co-founded 2K Games from the ground up) and augmented reality (alongside Aardman as "Fictioneers" on Wallace & Gromit), and combining that with sheer audacious ambition. Their aim is to design an open standard for web3 digital companions who can be with you wherever you want to take them — whichever blockchain, and with an art style of unlimited dimensions flexible to the needs of the experience. Your pet, by your side.

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The future of digital pets will undoubtedly be in mixed reality glasses which will be as much a part of our lives as our smartphones, computers, and smartwatches. One day, the question of how the world survived without them will be pondered unironically. Apple and Qualcomm and others are working on bringing that future forward and it's not as far off as you might think. In fact, Qualcomm chose Tiny Rebel as one of its first partners for Snapdragon Spaces to help accelerate that AR future.

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If AR is coming, and if disrupting the pet experience is the goal, then the resilience of your pet is vital. Petaverse has to be constructed so that, when you buy a digital pet today, it still is relevant decades from tomorrow.

And to be relevant in a way that previous attempts at digital pets have never been able to achieve. Take Nintendogs, for example: while that title sold nearly 25 million copies worldwide, only a handful play that game today. Why would they? The digital pets in Nintendogs are confined to the Nintendo DS, and that is simply old technology in a walled garden. With graphics stuck in that era as well. Imagine if we owned those dogs in a web3 sense — we might still be designing games for those pets today and perhaps even update their graphics too. Our old friends are instead trapped forever on that old device.

Devices are going to continue to become better, faster, and with higher fidelity; and experiences will be designed in a cornucopia of different art styles. Blockchains, too, will continue to evolve and new ones will emerge.

Some insist that designing items intended to cross between experiences is an overzealous web3 pipe dream. Tiny Rebel thinks it is a moral imperative.

Petaverse's digital pets have been designed from the ground up to be resilient to changing technology via blockchain agnosticism and human readable reinterpretable metadata.

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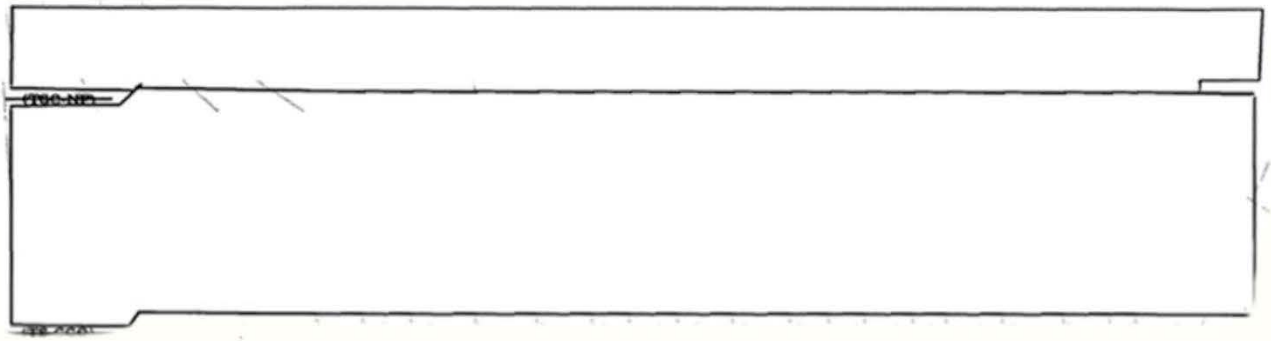
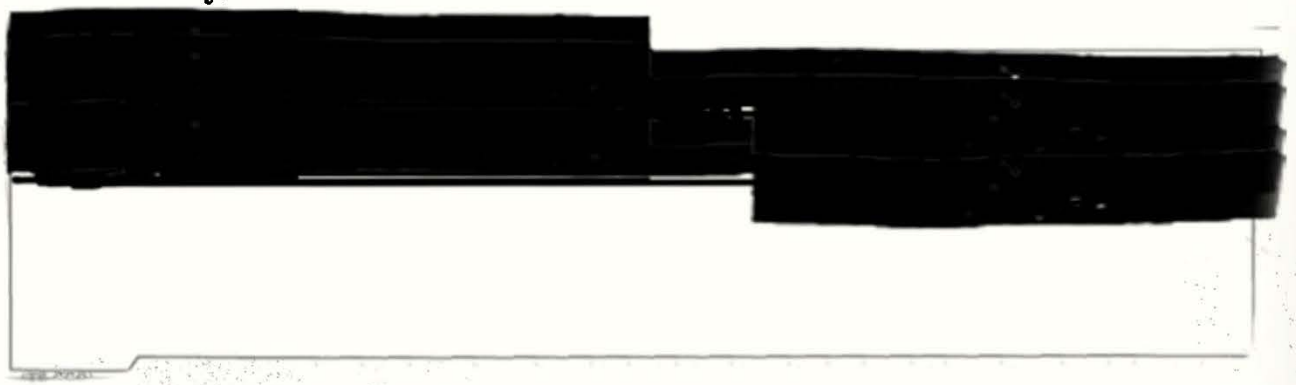
We, as a communal species, are going to want a virtual pet with us as a sidekick in this new, often lonely set of new experiences that continue to emerge from technological development.

Tiny Rebel wants its digital pet to be something you keep, so that decades from now it can be an heirloom passed down to children and grandchildren. How transformative would it be for grandchildren to be able to play with the same family pet their grandparents used to play with when they were children? How meaningful would it be to have a pet that retains its memories of its time with each owner, and whose "thoughts" and "personality" (how it approaches problem-solving) form one continuous, unbroken chain?



While a digital pet is yours to keep or sell if you choose to, Tiny Rebel hopes it will be a difficult decision — they hope that the myriad of experiences you'll bond with your pet in will make it something you never want to part with.

This is the reason why the team is designing everything with the underlying goal of a digital pet that can truly last. This vision has the power to disrupt traditional pet ownership — not yet, but eventually.



2. Why Digital Pets?

Petaverse's ambition is to create the first pet (an ownable, digital companion packaged as an NFT) with the potential to exist in perpetuity. One of the most common questions that Petaverse's creator, Tiny Rebel, is often asked is: why digital pets?

There are a number of reasons.

First and foremost, pets are a **foundational human experience**, present by our side in every stage of our evolution as a species. It is inconceivable that humanity would not want pets once again by our side as our evolution grows to encompass the metaverse.

Additionally, there are also clear **market-based reasons** why pets make sense at this stage of web3. One possible reason why there is so much speculation in the current NFT market is because, to be candid, there isn't much to do right now outside of speculation. Many new projects are simply iterating on the current ideas in vogue, not advancing the technology. Rather than build the 9,999th digital avatar project, Tiny Rebel is excited by the idea of trailblazing a new kind of NFT project, one that aims to be the next evolution of digital avatars (like pets).

Importantly, in addition to anthropological and market-based rationales, there are also many structural reasons why starting the inevitable interoperability revolution in web3 with digital pets makes a lot of sense over other digital objects (like digital avatars, for example).

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Due to their prior experience spearheading various AAA video games projects, the Tiny Rebel management team is acutely aware that almost all content projects (whether video games, video content, film, television, etc.) are very particular about owning the look, the feel, and the IP of their main characters above almost all other considerations. This is only natural, as it is precisely that ownership that makes a given studio feel like their project is "their project," and not some other studio's.

If this is the case, then it is unlikely that any high-profile developers would be open to the option of replacing their main character's avatar IP property with a completely separate community's digital avatar project (even if interoperability is solved). It simply cuts against the high-profile developer's economic and branding priorities.

Pets, on the other hand, are not nearly as threatening to an outside project as digital avatars.

Pets are positive-sum companions designed to behave as a complimentary additive element to ANY current or future web3 project.

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Pets can easily be re-interpreted to conform to another project's aesthetic and style rather than the other way around. Incorporating a personal pet into a larger experience can go as deep as the developer likes. It could simply be a cosmetic addition to their own main character avatar, or it could be deeply ingrained into the experience — as much as they would like to sample from Petaverse's metadata buffet.

In addition to anthropological, market-based, and structural reasons, it is also vital to note that digital pets will likely be an instrumental killer app for the first real wave of **consumer AR**. Consumer AR will hit the mainstream in the next half decade (give or take), and it desperately needs its own portfolio of transformative experiences for actual market penetration near launch.

It is clear that a live, present, interactive digital pet will be high on that list, and any strong projects that match those criteria will likely receive support from major companies trying to make a name for themselves in AR as a result.

This expectation does not only come from Tiny Rebel's team, however: AR companies themselves clearly recognize this opportunity. It is one of the key reasons why Tiny Rebel was asked by Qualcomm to be one of only 22 partners with early access to its Snapdragon Spaces AR dev kit, alongside names like Unity, Epic Games, Niantic, Lenovo, NTT Docomo, Motorola, and T-Mobile.

But, above all else, Tiny Rebel chose digital pets as an NFT project because it is the only way to deliver on the promise of a digital pet that could truly live forever. Unlike many web3 teams, Tiny Rebel did not start with the idea of building a web3 project and then decide that pets would be the most lucrative angle. Instead, Tiny Rebel started with the vision of a digital pet that could actually live forever, and then iterated on the best possible solution to that problem. And while it is true that, in theory, you can build (and teams have built) platforms that let people own digital pets in web2 without the need of a blockchain... as soon as that company fails to pay its server bill, users' ownership of their pets goes away forever. To Tiny Rebel, this was an unacceptable solution.

By using blockchain, Tiny Rebel's approach to its digital pets ensures that, no matter what happens to itself, users will always have a way to take their pet with them to whatever platform they choose. The only real potential challenge to this solution is the current state of web3, and more specifically its (hopefully) short-term problem with interoperability.

3. The Challenge of Interoperability

As stated above, the goal of the Petaverse is to create the first NFT pet with the potential to exist in perpetuity. Perpetuity, of course, includes the ability for this pet to outlive whatever blockchain it is currently built upon, and have the ability to migrate to theoretical future successor blockchains (or any other possible future innovation that replaces current blockchains).

This is not as simple as it sounds.

That is because, while most web3 projects promise (or at least imply) the idea of ownership of digital objects that can exist forever, the current architecture of web3 is simply not built for it. Currently, web3 is made up of disconnected silos of different blockchains. As a result, ownership of any digital object exists only as long as the life of the blockchain on which it is based.

This problem is just one symptom of a much deeper issue for the current state of web3 — a lack of interoperability. Each blockchain (such as Ethereum, Solana, Cardano, etc.) is its own sandbox, and as of now there is no efficient protocol with which anyone can bring a toy from one playground into another.

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In an ideal world, one might hope that the platforms themselves would work towards bridging this gap. Viewed pragmatically, this is unlikely, as current blockchains are theoretically economically aligned against the very idea of this kind of assistance. Why would a rational platform invest considerable amounts of its scarce resources into building a bridge that takes people out of their platform and into another viral, up-and-coming competitor platform?

If the collective "we" want an actual, functioning metaverse experience, someone must solve the problem of interoperability. Web3's real potential is only available when "we" figure out a framework that lets us unlock the current silos, and lets developers pick and choose to incorporate whatever they want (from wherever they want) into their new projects. A framework that lets all the toys play together in the same toybox.

Tiny Rebel thinks it may have found a potential candidate.

4. Tiny Rebel's Solution

To address the issues of interoperability, Tiny Rebel has developed a metadata-managed "passport" system for its Petaverse NFTs that i) allows external development teams maximal freedom in interpreting its data into their own projects, while also ii) making this data potentially available to any other blockchain or upcoming technology.

This is achieved via a two step process:

The first step was adding an off-chain metadata layer to its NFT pets that is usable by anyone, anywhere who would like to build upon or incorporate Petaverse NFTs into their own projects.

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This works as follows:

On-chain, each Petaverse NFT stores a unique fingerprint ID that serves two functions: a) it contains the physical details of each pet (as each one is unique) so that it can be recreated if ever needed, b) a marker that tracks its "clones" (more on this in a moment).

Off-chain, each pet's metadata layer functions more or less like a universal-access "save file" for each pet that is easily accessible from anywhere, on any blockchain that we support. In addition to the pet's physical data, each pet's metadata also contains personality data like its specific, unique personality traits (e.g. my pet is 'fast but clumsy' while yours is an 'adventurous, arrogant leader'), as well as its elemental and moral alignments. Even the pet's inventory of toys and clothing can be saved there (and thereby also usable on any blockchain we support). This openly queryable metadata is flexible enough to allow its traits to evolve with its experiences - a pet who goes on a game adventure might become a more adventurous pet forever in terms of their exhibited behavior.

It is important to note here that Tiny Rebel is not only creating metadata tags that it plans to use at launch, it is also including tags that it thinks other outside developers might find valuable in their projects (such as these elemental affinities, moral alignments, etc.).

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Additionally, it is also important to note that the categories listed above are only a partial list of possible fields available at launch. Tiny Rebel plans to add other fields over time in order to more perfectly capture the essence of the pet in question. One example the team is already working to include is a digital record of important experiences and key events that an individual NFT has experienced, so that ultimately that NFT can incorporate queryable past "memories" into possible future experiences and use cases.

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Once Petaverse's off-chain metadata was established, **the second step** in achieving interoperability was to use its "clone" metadata information on each NFT as a "passport"-style system in order to enable interoperability across blockchains without confusing the issue of digital ownership.

When an owner requests to port one of their NFTs from its original blockchain for use on a separate blockchain, Petaverse makes a non-transferable clone of that digital object on that separate platform. Just like a passport, the metadata for that particular NFT is "stamped" with a record of its clone creation (when this occurred, for what platform, etc.) As a result, it is impossible to try to sell a clone and pass it off as the original token. Moreover, because these clones are created from and mediated by the off-chain metadata, clone management is not restricted by the limitations of on-chain bandwidth — clones can query their own metadata at the same time without concerns of read-write speed, gas fees, and other limitations to copious on-chain data. Owners get the benefits of replicated data across different blockchains without the ownership headaches that unregulated cloning would generate. If an owner sells its original NFT to another buyer, all of those clones (or "passport stamps") immediately get revoked in order that the new owner can do what they see fit with their digital property.

This is not the only positive side benefit from the clone + passport system: Tiny Rebel has also planned this feature for other important potential use cases. One such example is offering owners the opportunity to gift clones of their pets to family members who may temporarily be physically apart from the actual owners (like a parent giving a clone of a pet to a child going to college, for example). This means that, in addition to the benefits of the system already mentioned (enabling interoperability, simultaneously maintaining the non-duplicatable nature of owning a digital asset), Petaverse NFTs are also not locked to a single theoretical location, either (whether that location is physical or digital).

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cc: Mr. [redacted]

5. How It Works

The easiest way to demonstrate how this process works is through Petaverse's own planned experiences.

At launch, Petaverse will have one marquee experience for its inaugural NFT owners (the 'Meme-o-Tron', a web GL, mobile &/or AR experience where you can experiment with your pet in your own environment), and another experience in early alpha to be released shortly after ('Petaverse Spaces', a VR application designed for relaxation and reduction of cognitive load with your pet at your side).

In both cases, the metadata use case for each experience is relatively straightforward: each application will query your pet NFT's metadata in order to replicate a model of your exact pet in the experience. Importantly, this protocol does not just work for experiences developed internally by Tiny Rebel: it works for any developer who wants to build. The whole idea of open, queryable metadata by developers is to give external development teams maximal freedom in interpreting Petaverse NFT data into their own projects.

Petaverse's design is built around **open data**, queryable by all external developers — it's up to developers to choose what to do with it. Tiny Rebel is literally giving away its code in order to make implementation by other teams as easy as possible. The team wants to give developers the tools to interpret their data any way they choose for their own ends in their own projects. Tiny Rebel wants to maximize collaboration. The team wants to incentivize developers to incorporate and remix using their content, not control it.

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Importantly, this unlocked, interpretable data model offers outside developers complete free reign to interpret Petaverse metadata fields to whatever is most appropriate for their specific project. As an example, pet personality and elemental alignment data could be interpreted a number of different ways depending on the outside project.

- Creators of a kart racing game that wanted to include the option of having your pet as a potential character choice could have the game's AI use a pet's personality and elemental alignment data to determine your character's speed and drift, even the weaponry of your kart.
- Creators of a weekly digital cartoon strip that wanted the option to personalize your reading experience could use a pet's personality metadata to help the project's AI determine which pets are mapped on to which roles in the comic (talkative vs. quiet characters, bold or funny characters vs. depressed or anxious characters, etc.)
- Creators of a new MMO that want a quick way to populate their world with animals can use Petaverse's metadata, assets, and personality traits to quickly assemble an entire world full of animals with individual characteristics and behaviors.
- [redacted]

And while the **implementation** of Petaverse's proposed metadata + passport protocol is novel, it is important to note that its **fundamental building blocks** are simple, time-tested, <u>and trusted</u>. Just like all major projects of note, Petaverse adopts the ERC-721 standard for all its NFTs. Additionally, Petaverse's metadata layer + off-chain storage system takes inspiration from Cryptokitties + the Kittyverse, which have already proven how effective this approach can be. The only difference is the scale and size of use cases: because Petaverse has the potential to contain much more (and increasing) metadata (including personality data, alignment data, important experience data, etc.), Petaverse offers a broader spectrum of potential use cases. On top of that, Petaverse's core Unity-based tech stack ("Petacore") will be available for use by everyone, <u>free of charge</u>.

6. Ideals, Oversight, & Governance

Tiny Rebel's goal with its Petaverse project (and community) is to grow it to be too large for any one studio to handle its oversight. Creating digital versions of all pets (real and imaginary) that people might want and keeping them updated, is a massive undertaking.

At the same time, the team recognizes that it is simply impossible to try to decentralize everything upon inception: there are key pieces of web3 infrastructure required that simply haven't developed enough yet. In the intervening period, Tiny Rebel refuses to compromise on Petaverse's user experience.

A good example of Tiny Rebel's approach to these issues is its management of Petaverse's metadata. As mentioned previously, there are a number of reasons why it does not make sense for all of the metadata of Petaverse's NFTs to be stored on chain (the metadata is simply too large, read/write speeds are too slow, Tiny Rebel wants it accessible to all clones simultaneously, etc.) As a result, the project's current architecture is to store a very rich set of metadata off-chain, with a fingerprint of the physical data stored on-chain. While the project's ultimate goal is for this off-chain metadata storage to be decentralized, currently there is no economically feasible or functionally practical solution to do so. Since Tiny Rebel does not want to delay the project indefinitely until that technology is invented (nor do they want to destroy the user experience at launch with some unworkable patchwork of a fix), the project is forced to centralize off-chain storage for the time being, while moving as quickly as the project can towards transitioning metadata storage to be as decentralized, antifragile, and as community-based as possible.

This operating principle extends to the entire project: a commitment to move as quickly towards decentralization and independence (while simultaneously upholding a standard of user experience) as soon as technologically feasible. The team's long term vision is for Petaverse Network to be a hyperstructure, run on a set of immutable smart contracts, by and for the benefit of the community.

As a component of that goal, Tiny Rebel is committed to establishing a DAO ("The Petaverse Foundation") of Petaverse NFT owners. In the short term, until this is established, Tiny Rebel commits to regular engagement with the community around future development plans. Upon the establishment of the Petaverse Foundation, Tiny Rebel plans to begin to migrate governance where viable and appropriate, to the DAO. In the long term, the DAO will also receive a percentage of funds generated from the project, as well as vote on matters that are key to the community. This includes helping to decide on which community projects, project goals, and experiences to pursue, as well as where to spend community resources. This also includes which pets to focus on next.

7. Owner/End User License Agreement Terms

Once Tiny Rebel sells you an NFT, you own that NFT forever (unless you sell it to someone else). Do whatever you want with it. It's your property. That's it.

8. Pet Breeding

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9. Upcoming Projects

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10. Concluding Thoughts

Tiny Rebel did not start with the idea of building a web3 project, and then decided that pets would be the most lucrative angle. Instead, Tiny Rebel challenged itself with a simple goal: to create a digital pet that could truly exist forever.

From there, the team iterated on the best possible answer to that problem — and it quickly became apparent that a blockchain-based solution was the quickest path to achieving this vision. Since the start of 2021, Tiny Rebel has been building a product and a community it strongly believes in.

Additionally, as a part of this process, Tiny Rebel has developed a protocol for interoperability that offers a truly unique mix of utility and stability — a combination that marks it as one of the first real candidates for a potential standard of interoperable, persistent digital objects in the metaverse. This innovation is important, and may have larger repercussions outside this one project to the web3 community as a whole. This is because, while the collective "we" say that we "own" digital objects in the metaverse, more often than not **we do not.** We are simply renting them.

This is because we in actuality have limited rights to the objects we "own," as our ownership relies on projects and platforms and blockchains on which they are based. If these mediators choose or are forced to shut down for any reason, so do the objects we "own."

Until now...

Petaverse is different because Petaverse has a solution to the problem of object permanence that is bigger than any single platform, even a single blockchain. In the old days, video game save files were restricted to a specific cartridge and a specific console. Petaverse offers a protocol to port the "save file" of your digital pet forever, to any future platform or future technology.

If this protocol works for digital pets, it could be the solution to the interoperability problem for **all digital objects** in the metaverse — from apparel, to accessories, to objects, to avatars, and more.