

# **RocketShoes**

## **Whitepaper 2.0**



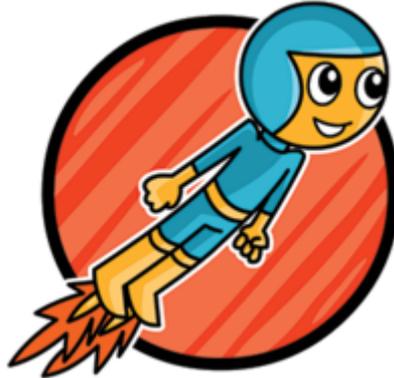
**The world's first decentralised digital asset platform  
for education**

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# RocketShoes



**The world's first decentralised digital asset platform for education**

## INTRODUCTION

The world is full of centralised systems. They have served us well, but we know in our hearts there is a better way. The days of the Learning Management System (LMS) are numbered, and media management solutions are costly, insecure, and often don't let you easily find things when you need them.

The tide has turned on data ownership and privacy. The introduction in May 2018 of the General Data Protection Regulation (GDPR) laws in the EU signals that the days are numbered for centralised educational platforms that do not attend to appropriate data protection of their users. Just as importantly, data breaches and exploitations such as Cambridge Analytica/Facebook and the ANU Hack have produced a watershed moment, turning public opinion towards greater protection of personal data, and away from trusting large companies to aggregate those data safely and in the public interest.

Blockchains have demonstrated how digital currency can be securely transferred without the need for intermediaries. We need new tools that allow digital assets to be created, encrypted, stored, and used in the same way, while still allowing them to be seamlessly integrated into your digital life.

New decentralised technologies like IPFS are making it possible to do this in smart and useful ways. The focus is shifting from learners accessing content inside an LMS to supporting the connections between learners and teachers, learners and their peers, and learner-generated content. Rather than one system to do everything, people are turning their attention to creating a dynamic collection of smart systems that work well together to suit everyone's individual learning journey. In short, what we need is a new kind of open

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educational content platform that can support the decentralised web, and provide key features like assignment submission, discoverability and interoperability at an API level. Enter RocketShoes.

## THE PROBLEM

### **What we have observed...**

Centrally managed database systems are slow, insecure, hard to manage, and prone to degradation over time.

Have you ever noticed that organisations like schools, universities and large organisations have educational content like video, pictures, learning resources, and student work all over the place. Let's face it, in most organisations, the whole area of digital media is a mess. When you need them, digital assets are often stuck inside a system and we don't even know what's in there.

"The people who were building cars in the first car factories were going to work on a horse. YouTube for me is like going to work on a horse to go and build cars." (Andreas Antonopoulos, 2018)

Today, the default storage and retrieval place for video content is often Vimeo or Youtube. However when learners upload content into these services, they lose control over their own data. Ads are injected into videos. The 'fine print' typically grants cloud services a worldwide licence to use content as soon as it is uploaded, and even primary school age students are presumed to understand the terms of service when they are asked to submit a video for an assignment using these services. Takedown notices (whether spurious or not) can make content inaccessible regardless of assessment deadlines.

Commercial media management systems are usually expensive, hard to scale, and siloed, meaning content management becomes a burden for the organisation.

When you accumulate a lot of digital assets as a learner or as someone managing learning content, discovering, finding and managing content is a huge pain. Surprisingly, it is often quite difficult to enable uploading of student-created content into a learning management system (LMS). There are other platforms such as Personal Learning Environments (PLEs) that can be better at doing it, but in the end they are just another container for content that needs to be integrated. In fact we have noticed that it can be such a pain that teachers often avoid getting students to submit their own creative work at all, unless it's something pretty standard, such as an essay.

Most organisations produce a lot of audio-visual content, pictures and documents, but it often gets stuck in a particular system and does not integrate well. Imagine you want to find

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everything on a particular topic, but some of the best stuff is in lectures on your local media management server, and your system doesn't search there. Worse, it may be somewhere outside the organisation, like YouTube or Vimeo, and you have no idea it's even there.

### **Consider these scenarios:**

1. *Jane is a new Lecturer who wants to set a video assignment for students but can't figure out how to let students upload them.*
2. *Bill is trying to find the best videos his company has on his topic area so he can put together a great presentation to present to the board. Where are they?*
3. *James is a knowledge manager and his users are complaining the media management software is slow and outdated. How can he move to another system?*
4. *Anouk is just a primary school kid when she does her first poster assignment about the blockchain, and it was really good. When she gets to high school she wants to find it again, but it's nowhere to be found. How can she get it back?*

## THE SOLUTION

- Enterprises can manage and author content in a way that is not tied to a particular system.
- A fast, secure, decentralised cloud solution that can integrate with existing and future systems.
- Content is instantly searchable, discoverable, sharable and reusable online and offline.

### **The same scenarios with RocketShoes:**

1. *Jane sets an assignment requiring a 5 minute video and tells students to use RocketShoes to upload it right inside their LMS.*
2. *Everything that Bill's company produces gets uploaded into RocketShoes because it's so easy. And it lets him browse everything right on his phone.*
3. *James has decided to recommend RocketShoes as his organisation's media management solution to make the move from Moodle to D2L easy.*
4. *Anouk has an app on her iPad that knows where all her stuff is, including the assignments she did in primary school. She opens up RocketShoes and types in a couple of words and bingo, there's her interactive blockchain poster! She can even pin it to her new iPad to view offline.*

### ROCKETSHOES PLATFORM

RocketShoes will implement its storage layer via Inter Planetary File System (IPFS), making digital assets available on any IPFS node. IPFS supports object level cryptography, which secures content at an object level.

RocketShoes is an educational platform geared for a learner centric approach, and providing powerful tools to manage content in a decentralised way. For learners, this means that you will be able to produce and keep track of your own learning materials, including assignments, notes, and digital assets. For organisations and institutions it means that very large amounts of content can be managed in a way that is not possible with today's systems, allowing for radically new functionality, for example deep integration with a blockchain for authentication.

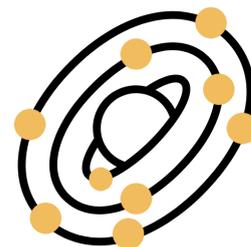
RocketShoes will focus on an API approach, with the aim of making it highly interoperable and extensible. The goal is not to reengineer systems like the LMS, but to integrate with them in a way that makes them both more permeable and more secure, scalable and useful.

What does this mean?

- A platform that uses the best features of the decentralised web: secure, fast, open and searchable.
- Like Github or a Wiki, anything on it is automatically under version control, and can be pinned to your device.
- For enterprises, it will have advanced authoring and media management capabilities that allow content to be gracefully moved from one system to another.
- For learners, it is a platform that gives them control of their own content. With RocketShoes, students will be publishing video from their smartphone and they'll maintain access and ownership of their assignments years after they get their degree. Industry projects can be submitted for assessment but also be used in a real world environment.

### Based on IPFS

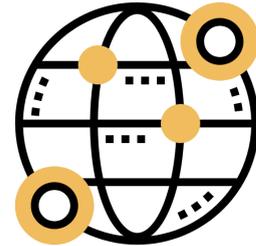
Inter Planetary File System (IPFS) is a completely new peer-to-peer hypermedia protocol designed to build what is known as the distributed or decentralised web (IPFS White Paper, version 2). Key features of IPFS make it extremely useful for the distribution of educational content. In particular, IPFS is designed to be high performance, secure, tamper-resistant and open. Content is stored permanently, and is accessible offline. This paper expands on use cases for of these aspects of IPFS, upon which RocketShoes is based. We are



planning that the platform will later support other similar decentralised technologies as well.

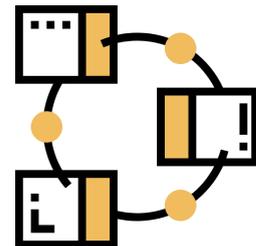
### Full Node or Cloud

RocketShoes will offer a premium, fully supported enterprise solution through the implementation of full nodes on IPFS, allowing guaranteed local network performance and offering the opportunity to earn Filecoin. We will foster a development community to build on the platform by making our source code available under open source licence. We will maintain a stable version of RocketShoes as a common code-base cloud instance, offered free or at low cost for public sector and educational users, and available to learners in the most remote regions of the world. Improvements and desirable features will be crowdsourced via this community. A benefit of IPFS as a storage architecture is that increased take up of the platform increases performance as new nodes are connected.



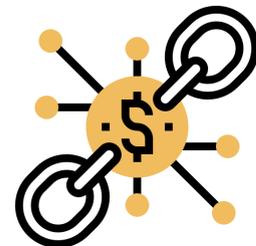
### Blockchain

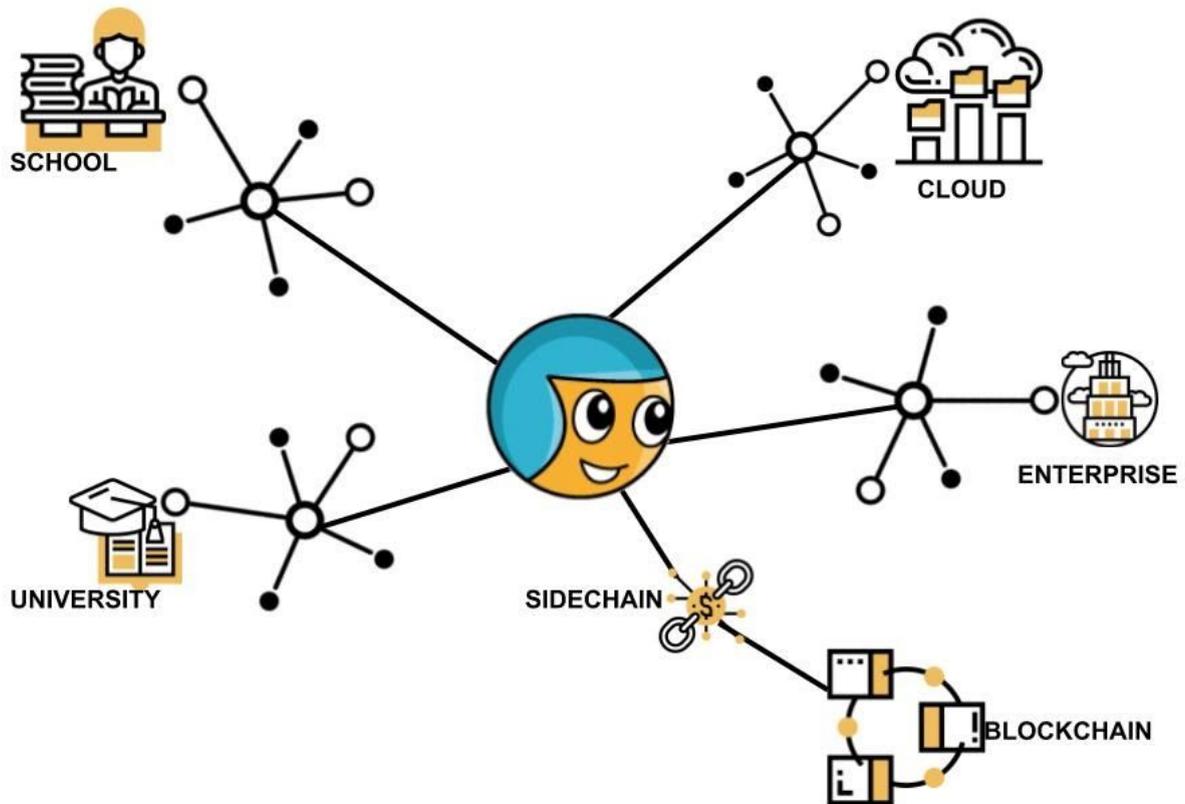
A blockchain is a decentralized, distributed, and frequently public, digital ledger that is used to record transactions across many computers so that any involved record cannot be altered retroactively. Integrating with the blockchain is a critical step to developing the functionality of RocketShoes into areas requiring trustless transactions. Certain core areas of functionality are submission of assignments, grading, microcredentials, and voting.



### Sidechain

A sidechain is a discrete blockchain with a two way link to the main blockchain, offering extended functionality. Transactions on sidechains are 'pegged' to transactions on the main chain, enabling assets to be exchanged between the main blockchain and the sidechain. The sidechain is therefore able to square the ledger by syncing with the main chain at certain intervals. A rate at which assets are being exchanged between the main blockchain (parent) and the sidechain (child) is predetermined, and can occur on the basis of a measure of time or a number of transactions. For RocketShoes, the incorporation of a sidechain means both scalability and cost-effectiveness, and the ability to rapidly authenticate high amounts of data.





### Have you done this before?

Nobody has done exactly this before, that's why we are. However, we do have lots of experience with the following:

- Development of blockchain and decentralised technologies in corporate and education settings.
- Training on blockchain and decentralised technologies.
- Innovating with educational technologies on a large scale.
- Building entire platforms from scratch, including an enterprise media management system.
- Blockchain innovations in schools (K-12).
- Large-scale change management.

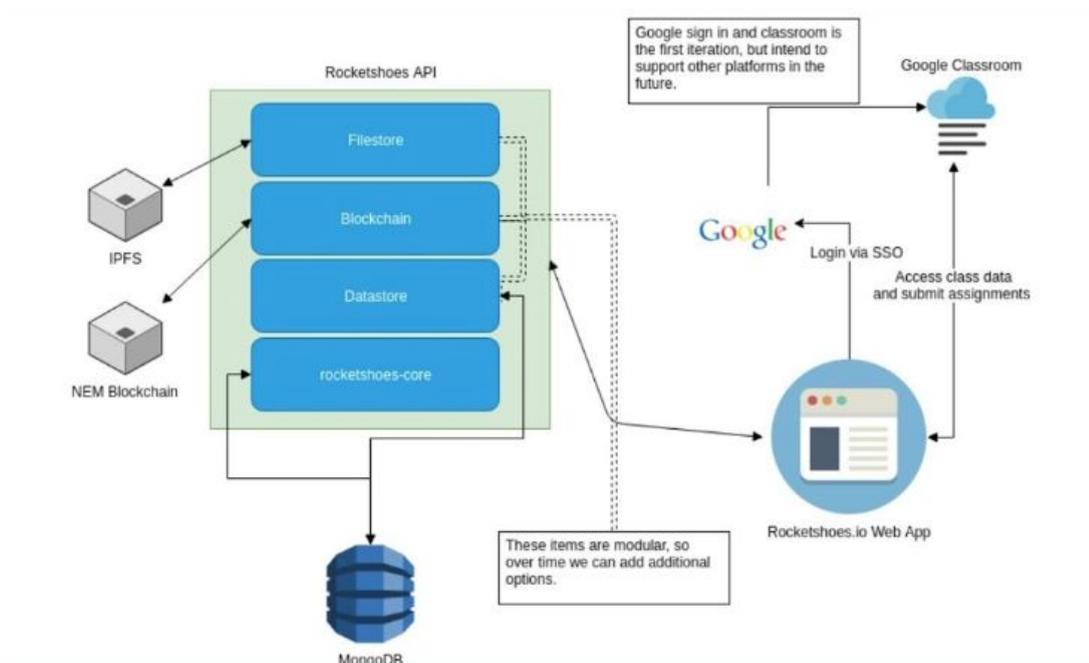
### What makes RocketShoes unique?

- A purpose-built platform built from the ground up to suit education and corporate training contexts, with careful consideration for the kinds of functionality this entails, including transcoding of large volumes of data, control of permissions, inclusion of metadata, curriculum design and mapping, and personalised learning.
- Built to support all kinds of different media, from video and audio to documents and spreadsheets.
- The platform is designed as an educational content and media management system rather than simply a generic public video hosting platform, as there are already many of these kinds of services.
- Integrates with the blockchain to create the opportunity for new functionality applied in educational contexts that require trustless transactions. These include time-stamps for assessment, awarding and tracking grades and micro-credentials, voting systems, mentoring, educational credit systems and many more.
- RocketShoes is part of a much larger vision that will turn the LMS inside-out placing learners at the centre, focusing on a model of Learning Relationship Management instead of managing data in centralised systems.
- “Educational technology should be designed for, and go first, into the remotest areas” (Sugata Mitra, 2006). RocketShoes makes this a reality, as being based on a storage layer that is decentralised means that high latency and low bandwidth internet connections do not prevent publishing, sharing and accessing educational content.
- “We need an education that enhances individual strengths” (Professor Yong Zhao, 2014) - RocketShoes enables learners to take ownership of their learning and have agency over their content to follow their passions over their entire learning journey.

### Co-Development

Leveraging decentralised technologies opens up a significant range of capabilities for enterprises, as well as users, that will be unfamiliar and even sometimes difficult to comprehend; it represents a quantum leap forward in many ways. For this reason the front end design needs to be as familiar as reasonably possible, while providing functionality that is entirely new. We believe this means that the client development aspect of the project is even more critical than usual, which is why we have focused so much energy into this aspect.

## Google Classroom Build



RocketShoes has currently integrated Google Single Sign On with [Google Classroom](#) and has been designed in a modular form, enabling additional APIs to be added and providing opportunities for new functionality to be applied. RocketShoes sweeps files from the [Google Classroom](#) into IPFS instead of a centrally managed database. Google Classroom is a free web service, developed by Google for schools, that aims to simplify creating, distributing, and grading assignments in a paperless way. The primary purpose of Google Classroom is to streamline the process of sharing files between teachers and students.

### Pilot Program(s)

It is important that RocketShoes is developed with a strong customer focus. We have conducted a number of successful trials for both the Digital Asset Wallet (MVP, Milestone 1) and Teacher Tools (Milestone 2). Feedback from these trials has improved the user experience and guides future milestone goals.

#### **Wooranna Park Primary School**

Students have uploaded everything from fully functional self created RTS games to 3D printed sustainable housing into their personal learning wallets, connecting to both the LMS (Google Classroom) and IPFS. Wooranna Park Primary School in Melbourne, Australia, is a 21st Century Elementary School with a mission “to provide students with a learning environment that recognises children learn best when engaged with real world, authentic tasks, involving problem solving and collaboration with peers on interdisciplinary, research based project work, where the teacher’s role includes that of coach and facilitator and where students are empowered to take responsibility for their learning.” The school “believes that children are born with all of their senses ready to make meaning of their world; that they come to school with knowledge and experiences. They are autonomous learners, ready to explore the world around them; and that an interdisciplinary, authentic, negotiated and collaborative curriculum is essential to their development.”

#### **Charles Sturt University**

In 2019, students and staff enrolled in the subject *INF537 Digital Futures Colloquium* tested the capabilities of the RocketShoes student and teacher tools. This subject introduces industry experts, exemplary practitioners and thought leaders through a series of seminar presentations designed to provide insights into the impact of knowledge networks, collaboration and innovation in digital cultures of learning. Each seminar provides the stimulus to identify and reflect critically on topics that have implications for a student’s own professional development, professional practice and scholarly interest. This subject is the capstone experience providing the opportunity to undertake a study, media project, or article for publication to demonstrate knowledge and skills gained from the course.

#### **Monash University**

Monash University and RocketShoes together developed a new model of education applicable to any discipline based on Legal Tech Studio, a subject offered by the Monash Law School in the Juris Doctor. Using this model, students are empowered to walk their own paths, where students have the freedom to work on their own projects. Using RocketShows allows students and industry mentors to work on ideas collaboratively that can be stored and timestamped securely in a digital wallet to solve the problem of shared Intellectual Property (IP) and allowing them to showcase their work later by opening the wallet up to fellow students with complementary skills from any university or college in the world, or to investors outside the universities who might be willing to nurture the latest talent.

## Founders

The RocketShoes core team has vast experience in leading digital innovation, transformation and strategy as well as technical and pedagogic knowledge. The founders, Matt and Kieran, have more than 35 years of experience in educational organisations and understand the needs required by the content management systems. Matt was the Director of Educational Innovation at Latrobe University prior to founding RocketShoes, and previously a Research Associate at the Centre for Applied Research in Educational Technologies at the University of Cambridge. Kieran is a qualified Network Engineer, certified Cloud Migration Architect, and Educational Technologist, with certifications from Google, Microsoft and Cisco and a Degree in Network Engineering.



Founder and CEO Matt Riddle is an expert in educational innovation with a career spanning over 25 years. Matt's focus is improving learners' lives using emerging educational technologies and learning space design (physical and virtual). Previous roles include acting Pro Vice-Chancellor and Director of Educational Innovation at La Trobe University, and Research Associate at the Centre for Applied Research in Educational Technologies at the University of Cambridge.



Co-Founder Kieran Nolan is an International Speaker, CoderDojo Mentor, Blockchain Expert, and Educational Technologist at Wooranna Park Primary School. He is driven by three tenets: innovation, disruption, and lifelong learning. He has over a decade of industry experience specialising in education, technology, and blockchain applications. His work with WPPS, The Blockchain Centre and RocketShoes has garnered media attention from The George Lucas Foundation, Bitcoin.com, The Age, and Australian Teacher Magazine.

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- Antonopolous, A. (2018) [Wooranna Park Primary School - Andreas Antonopoulos Interview](#)

Release Version 1 — feedback welcome

## Appendix 1: Lean Business Model Canvas

<p><b>Compelling Problem</b></p> <ul style="list-style-type: none"> <li>Digital assets in education don't have appropriate data protection (GDPR)</li> <li>Media stored all over the place is hard to manage</li> <li>Learners often can't submit A/V content</li> <li>Organisations gets stuck with media in a system and can't use it or move it out</li> </ul> <p><b>Alternatives</b></p> <ul style="list-style-type: none"> <li>Cloud storage platforms (Dropbox, Box, etc.)</li> <li>Public AV channels (Youtube, Vimeo etc)</li> <li>Enterprise AV management vendors (Echo, Brightcove etc.)</li> <li>None are secure and decentralised</li> </ul>	<p><b>Solution</b></p> <ul style="list-style-type: none"> <li>Secure decentralised cloud solution with data sovereignty for content authors</li> <li>Manage and author educational content in a platform agnostic way</li> <li>Content is searchable, discoverable, sharable and reusable online and offline</li> </ul>	<p><b>Unique Value Proposition</b></p> <ul style="list-style-type: none"> <li>Next-generation, fast and secure platform</li> <li>Designed to integrate with existing platforms</li> <li>Our team has successfully built similar enterprise ready platforms</li> <li>We have a high level of experience and well established connections in education</li> </ul>	<p><b>Unfair Advantage</b></p> <ul style="list-style-type: none"> <li>First to market</li> <li>Combined 45+ years of technical knowledge, leadership and decision-making experience in educational technology</li> <li>Partnerships with industry leaders</li> </ul>	<p><b>Customer Segments</b></p> <ul style="list-style-type: none"> <li>Universities</li> <li>VET</li> <li>Corporate Education and Training</li> <li>K-12</li> </ul> <p><b>First (Early Adopter) Segments:</b></p> <ul style="list-style-type: none"> <li>K-12</li> <li>University / HEP</li> <li>Corporate entity</li> </ul>			
<p><b>Cost Structure</b></p> <ul style="list-style-type: none"> <li>Interview 20-30 customers</li> <li>Complete UX Design</li> <li>White Paper</li> <li>Startup cost</li> <li>Build platform</li> </ul>		<p><b>Revenue Streams</b></p> <table border="0"> <tr> <td> <p><b>Type:</b></p> <ul style="list-style-type: none"> <li>Subscription fees on platform and support (B2B)</li> <li>Full node establishment (B2B)</li> <li>Micropayments (on transactions, B2C)</li> </ul> </td> <td> <p><b>Fixed Pricing:</b></p> <ul style="list-style-type: none"> <li>Enterprise (B2B) subscription bands</li> </ul> </td> <td> <p><b>Dynamic Pricing:</b></p> <ul style="list-style-type: none"> <li>Yield management</li> <li>Education real-time marketplace</li> </ul> </td> </tr> </table>			<p><b>Type:</b></p> <ul style="list-style-type: none"> <li>Subscription fees on platform and support (B2B)</li> <li>Full node establishment (B2B)</li> <li>Micropayments (on transactions, B2C)</li> </ul>	<p><b>Fixed Pricing:</b></p> <ul style="list-style-type: none"> <li>Enterprise (B2B) subscription bands</li> </ul>	<p><b>Dynamic Pricing:</b></p> <ul style="list-style-type: none"> <li>Yield management</li> <li>Education real-time marketplace</li> </ul>
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