



Digital Credentialing & Career Path Management Framework

Path is a decentralized micro-credential issuing,
smart contract framework for validating
qualifications & experience.

Non Technical White Paper v1.9



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1. Background:

An individual professional seeking a rewarding career path today has little to no control over the record of their education and professional background. Additionally, user controlled resources, resumes and LinkedIn, have no verifiability for employers. The problem is clear, centrally controlled resources for education transcripts and employment histories are failing the digital age of work.

New laws are breaking up the data monopolies of modern internet businesses and mandating power be put back in the hands of users. Clearly the internet needs a protocol where individual users own their education and employment data. This data should only be verified once, by trusted third parties and reputation systems, eliminating market inefficiencies due to individual and improper verification.

There is a great deal of value and rights lost in current employment industry technologies. A protocol that meets the challenges of the changing employment landscape will earn it's value from the efficiency it brings to the market.

Today we have a couple of core methods that we can use to display our educational accolades and work experience; Your resume and LinkedIn profile are two that are most popular.

These can be used to help you in your process of applying for jobs, but with an increase in forged degrees, and also an increase in open courses available online it poses a serious question:

How do we know the people applying for the job has the experience they say they do?

Although it may be unethical, there is nothing to stop you altering the factual content in your resume and your LinkedIn profile.



Due to this there is a rise in checks being processed on new hires, a process that is manual, costly (in time and money) and not a guarantee for data integrity.

On top of this, with new data laws being passed around what data companies can hold about you, there is a real need to put data back in the hands of the owner.



2. Executive Summary:

Path is a decentralized digital certification framework, that certifies education and work experience. The system incentivizes contributors to the system with the use of the PATH utility token (PATH).

Path owners take control back of their data from the institutions, as well as relinquishing data responsibilities from organizations.

As a Path user, you will take your courses (at Universities, Colleges or online etc.) and once complete, that transcript is issued to your Path blockchain by the institution automatically using the Path API.

The Path user then gets their first job, and this experience is also issued to their Path using our APIs. Now both education and work experience are certified.

When the Path user applies for another job, the hiring company can pay a fee in fiat, which allows them to query the user's Path data.

This fiat fee is instantly exchanged for PATH and then distributed to 1. The Path Owner. 2. The company they worked for 3. The university that certified their education.

This token exchange then allows us to reward our users and partners in a way no other model allows. This means that universities, colleges, course providers, companies etc. will all receive a passive income of PATH for automatically issuing certificates for their users.

Whether you're a Path User, certificate issuer, or certificate verifier, each role receives a PATH wallet.

You then have a choice to keep your PATH in your wallet or exchange it back out for fiat.

3. Technical Overview:

Path Protocol - Stakeholders and Real World Counterparts

1. **(C)** Certifiers - data providers
 - a. EDUs and Employers
2. **(K)** Keepers - data storage providers
 - a. EDUs and Employers
 - b. **(D)** Independent Developers
3. **(U)** Path Users - data holders
 - a. Students and Professionals
4. **(S)** Seekers - data requesters
 - a. Employers
 - b. Recruiters
5. **(X)** Exchanges
 - a. EDUs and Employers
 - b. Secondary or OTC Markets
6. **(B)** Blockchain Network
 - a. Decentralized accounts, data mapping and settlement

Adding Certifiers

Certifiers can freely integrate with Path for the benefits of decentralized record keeping. The burden of sealing records and handling inquiries is also alleviated by shifting the ownership to the Path users. Prior to a Certifier adding records and approving new Path users they must be verified. Initially this will be done through the Path Foundation. A decentralized bounty system will be put in place to deterministically select existing Certifiers to verify the identity of new Certifiers and insure the integrity of the network and replace the role of the Path Foundation. Path users will be able to rate Certifiers, adding reputation metadata to their account. Seekers will be provided with a full view of all data related to Certifiers to assure them of record authenticity.

Adding Users

Users in Path can be created freely, but must form a relationship with a Certifier in order to receive any records. Certifiers who have completed verification can create a relationship with a User. Personally Identifiable Information (PII) is stored off-chain and encrypted with each Certifier a relationship is formed. The Certifier will maintain the keys for matching identity for the purpose of creating records. Our roadmap is aimed at removing the vulnerability of Certifiers holding keys for the relationship through the use of Zero Knowledge Proofs.

Adding and Retrieving Records



Records are added by verified Certifiers and are encrypted by the certifier. When a Seeker is interested in a record through either an on-chain or off-chain request, the Path user is in control to handle that request. The Path user signals to the Certifier that the record should be made available to the Seeker by calling a function in the smart contract and paying a small fee. The Certifier passes the Key and signals the Keeper, by calling a function and paying a small fee. The Keeper retrieves and sends the encrypted record data. The Seeker can now review the record of the Path User.



Token Economy

The PATH token is a hybrid payment and utility token for the Path Protocol. Payments are straightforward, while utility enables governance of certifiers and guides development of the network. The features of PATH can be summarized in the following tables:

Payments

<u>From</u>	<u>To</u>	<u>Benefit</u>
S	U, B	Access to immutable employment, project and education records
U	C, K, B	Validity and availability of records
C	K, B	Offloading storage availability

Utility

<u>Action</u>	<u>Who</u>	<u>Benefit</u>
Vote	U, C	Control adding new Certifiers and Keepers to the network
Vote	U, D, C	Steer feature development of network
Rate	U	Increase the reputation of Certifiers by User
Hold	U, S, C	Payment and storage rates drop (hedge)

Economic Benefits of Decentralization

There are 3 stakeholders that stand to gain the most from the Path Protocol: Certifiers, Users and Seekers. The types of costs these stakeholders face today are summarized in the following table:

<u>Who</u>	<u>Cost</u>	<u>What</u>
Certifier	Employment	Secure process for handling records and requests
	Physical	Storage and transfer
User	Time	Waiting for records to be transferred
	Time	Contacting previous education inst. and employers
Seeker	Time	Validating references and records (phone calls, etc...)
	Opportunity	Not finding the right fit
	Risk	Fraudulent applications and references, future toxic employee

At the highest level, Path Protocol is about facilitating secure education and employment record handling, while removing the need for trust amongst Users, Certifiers and Seekers. The network stores trusted data,



secured through cryptography and shifts roles to make record handling interactions more efficient. Certifiers need only sign and seal records once, Users own the rights to their data and who accesses it and Seekers can audit the origin, trusting the data is 100% valid. The following table summarizes the features and benefits and Path:

<u>Who</u>	<u>Feature</u>	<u>Benefit</u>
Certifier	User Controlled	Eliminating records departments at educational inst. and employers
	Digital Storage	No more paper records, sealing transcripts / references and storage
User	Ownership	User owns the rights to their records
	Control	Decide who has access and deliver records instantly
Seeker	Provenance	Zero need to check references if provided data is sufficient
	Discovery	Recruiters offer faster fit and can verify on behalf of employer

Certifiers and Keepers

Certifiers may or may not want to reduce the costs associated with the IT burden of a records department, and with the Path Protocol there are options. Certifiers may stick to the role of creating records, encrypting them and sending them to Keepers for safekeeping, who in turn would require a small payment of PATH each time a record is retrieved and sent to a Seeker. Certifiers may also take on the Keeper role and earn the PATH they would otherwise have passed on to the Keepers. Currently we plan to implement our own public, permissionless and incentivized network of Keepers using IPFS, however we are looking into protocols such as Keep.

Path Protocol - Stakeholder Roles and Functions

Figure 1. Stakeholder Roles in the Path Protocol

1. (C) Certifiers
 - a. Encrypt records and store with Keepers
 - b. Map records to user accounts
 - c. Send record encryption keys to Seekers
2. (K) Keepers
 - a. Store and send encrypted records
3. (U) Path Users
 - a. Approve Seeker requests and notify Certifier
4. (S) Seekers
 - a. Request and receive records
5. (X) Exchanges
 - a. Exchange PATH for local currency

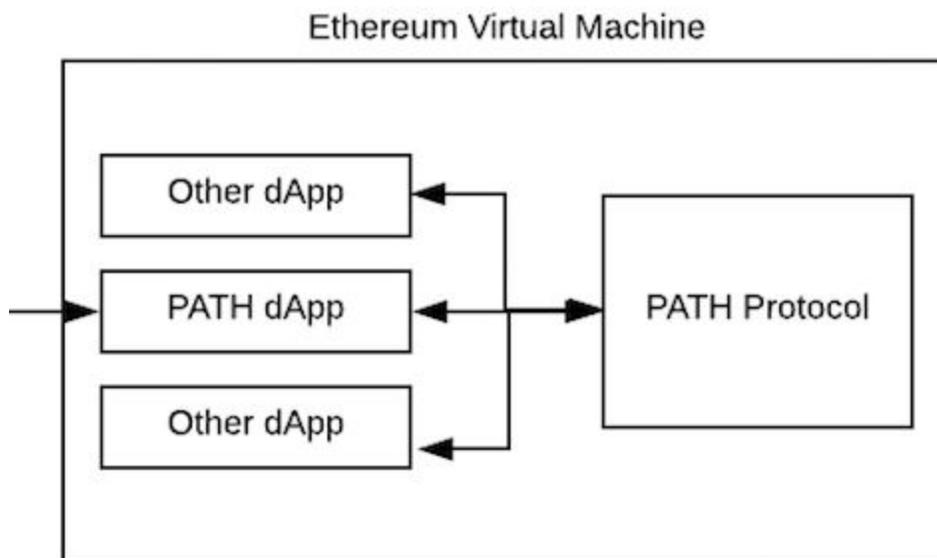
Path Protocol - Payments

Figure 2. Payments in the Path Protocol (blockchain network not pictured)

1. (C) Certifiers
 - a. Use PATH to write records to blockchain network and Keepers (IPFS)
 - b. Earn PATH per request
2. (K) Keepers
 - a. Earn PATH per request
3. (U) Path Users
 - a. Earn PATH per request
 - b. Pay PATH for record retrieval
4. (S) Seekers
 - a. Pay in PATH for records - *Recruiters pay, employers will not
5. (X) Exchanges
 - a. Earn fees exchanging PATH and local currency

PATH Protocol

The PATH Protocol is a fully decentralized open protocol for issuing and verifying credentials on the blockchain implemented as a set of Ethereum smart contracts available for any dApp to integrate with using the PATH utility token. Path Foundation will also be developing an API and application on top of the underlying PATH Protocol (outlined below). Here is a diagram showing the PATH Protocol:





PATH User Roles

- **Path User:** A person on the path, building up their blockchain-based resume, adding certifications as they progress in their education + career.
- **Issuer:** A company or group that will certify professional skills, credentials or employment history for the User.
- **Verifier:** A company or group that wants to run a background check on a Path User and validate their certifications.
- **Service Provider:** A company that provides the APIs, apps, user interfaces or custom integrations on top of the **PATH Protocol**.

PATH Utility Token

500,000,000 PATH tokens will be minted in the token contract and will be distributed during a presale and an open crowd sale. The PATH token is a utility token and will be used for all transactions between the PATH User Roles:

- **PATH** will be used by **Verifiers** when performing a certificate validation, which will be distributed to both the **Path User** and the certificate **Issuers** being validated. This will incentivize both **Path Users** and Issuers to utilize the **PATH Protocol**.
- **PATH** will be used by **Path Users** to authorize and stake Verification requests, which is returned to the **Path User** on successful verification or transferred to the **Verifier** on a failed verification to decentivize fraudulent requests and bad actors.

PATH API

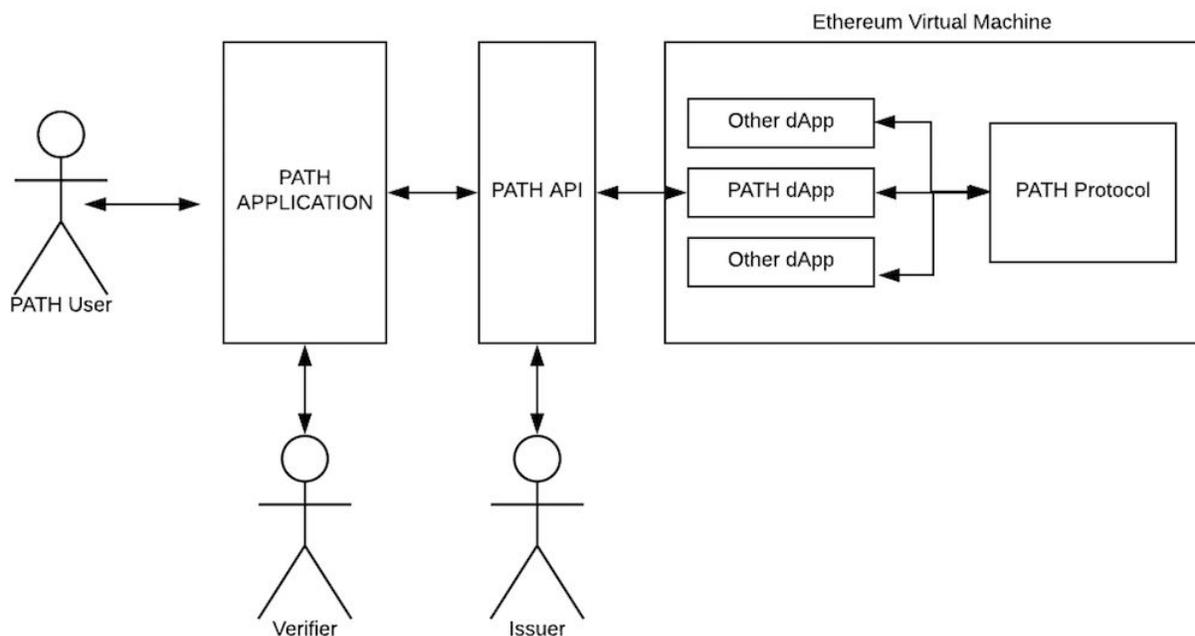
The PATH API will be built on top of the PATH Protocol to provide easy access to the underlying ecosystem. This will be used for rapid application development and integration with existing career management and credentialing platforms allowing for tighter system integration + performant bulk operations. It will also provide an interface to manage encrypted data stored off-chain using IPFS.

PATH Application

The PATH Application will be the primary interface for PATH Users, allowing them to manage their digital credentials, manage their PATH wallet, authorize verification requests and request new certificates from Issuers.

Overall PATH Ecosystem

Together these things look like:



4. Milestones & Project Status:

i. Product:



The Path software is currently in prototype phase. We have built the framework around our business model with consumption and interaction points for all roles involved in Path.

By the token sale, Path will be in Beta stage, with proceeds of the token sale being distributed to building out our development team to create our Path Apps for Android & iOS as well as our Web UI and API for querying and issuing certificates.

As a user of the Path app, you will be able to login with LinkedIn, import your profile and certify your existing experience. Each new user will receive an initial amount of PATH in their wallet for populating data into their Path profile.

Refer to the roadmap for further product milestones coming up in 2018 and beyond.

ii. Business:

The key to a successful business model is to maximise early partnerships to optimize scalability in the marketplace. Path is doing exactly this; as we have different levels of partner (universities, professional certifications, corporate entities) for both certification and consumption of the data, it's our mission to partner with like minded companies in each of these sections.

We are working with 3 large universities worldwide, as well as certification providers and companies to be best placed to scale post launch. Once we have the Alpha product in the hands of our universities and partners, we can then work closely with them to understand the nuances of their existing processes, to best align our integrations and software to provide a standardized approach.

Path was created at the end of 2017, and since then you can see the speed in which we have approached the market and business. Path's CEO has a background in EdTech and startups, and using the experience and network, as well as a team of very skilled developers and strong advisory board; This has allowed Path to achieve a lot in a short space of time.

One of the main challenges in this sector is sales to education and long sales cycles. This can be the downfall for any company, and very costly. This is



why the business model structure set out by Path allows incentivization to educational institutions, not costly fees. This will give Path a real advantage in onboarding university clients.

iii. Team, Advisors & Partners:

The founding team at Path consists of:

Ross Jones, founder and CEO of Path started his career in recruitment and went on to have various positions throughout the technology industry; Both from a technical and managerial standpoint. Ross has also built companies and teams; the latest in the education space providing learning analytics for online learning. Ross not only started the company with just his co founder and himself, but also pioneered the use of facial expression recognition to understand student engagement.

Ross brings to Path a vast wealth of experience in launching and scaling companies within the education / learning vertical. With this comes a large network and understanding of what is required to successfully launch and sell within this industry.

Jeremy Thompson, founder and CTO of Path, brings to the company a strong history of building and leading high performing software engineering teams with a focus on iterative development and solid DevOps principles across multiple disciplines. Jeremy is a proven leader consistently delivering value to the business through innovation and technology.

Andrey Leybovich, founder and SVP Engineering of Path, is a highly proficient technical leader with over 15 years of applications development and project management experience in pharmaceutical, financial and insurance areas.

The Path advisory board consists of:

Anthony Newman, Purdue University.

Anthony acts as one of Path's education advisors and has key experience to assure the success in scaling the business.

Coming from a technical background in the corporate world, Anthony then transitioned into a role within the Education industry. He is now heading up Business Development for Purdue university, concentrating on



commercializing and scaling their organization. This experience of both industry and education will serve as a valuable asset to the Path team.

Wayne Skipper, Concentric Sky / Badgr.

Wayne has a huge wealth of experience in the digital credentials space; having organically grown his software engineering company Concentric Sky, they have developed countless applications for the education industry. On top of this, Wayne and his team developed the Open Badge framework for Mozilla, which is used worldwide. Wayne subsequently started Badgr, a framework that allows companies to issue badges to people based on experience or learning objectives. With over 10,000 customers using Badgr worldwide, they're a leader in this space. Wayne brings to Path, not only a partnership with Badgr, but also common goals in helping people gain employment through badging.

Brad Nickel, Blacknox Crypto Hodling Co.

Brad has extensive experience across multiple verticals, namely; Product Management, Marketing, startups, business strategy, ICOs and blockchain companies.

The expertise that Brad brings to the business is not just his exhaustive list of skills and experience, but also his vast network from working with many different companies throughout the years.

This will really add to the Path team and help strengthen the development of the product and business as a whole.

Chris Willis, NC State University.

Chris works in Assessments and analytics at North Carolina State university, and has a keen interest in credentialing and blockchain technology. He brings great knowledge from the education side, especially from an assessment side.

5. Roadmap:

i. Product Roadmap:

The product roadmap for Path is extremely exciting and full of great features and additional revenue streams. While you can see a visual representation of the roadmap below, I will provide a more in-depth description here:

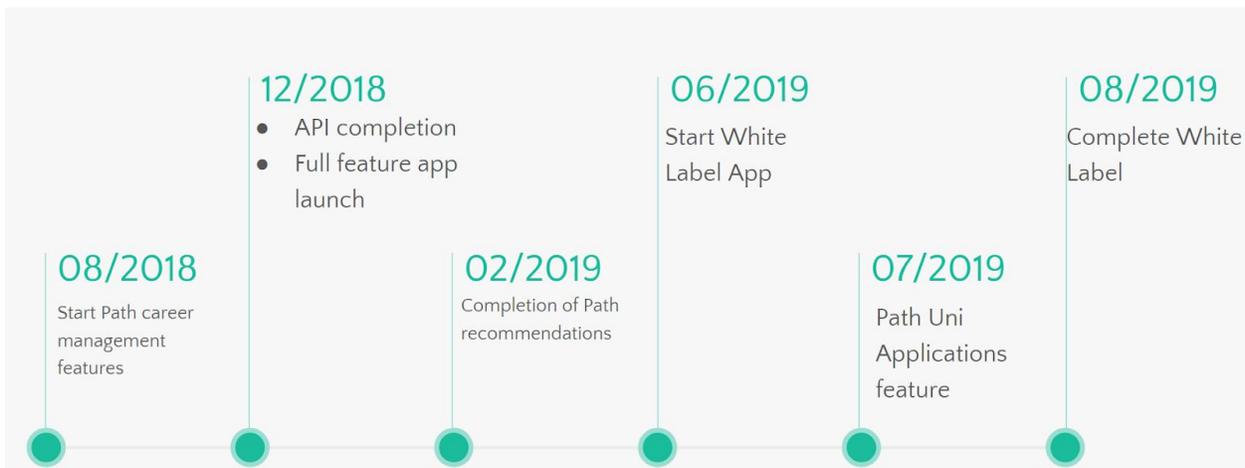
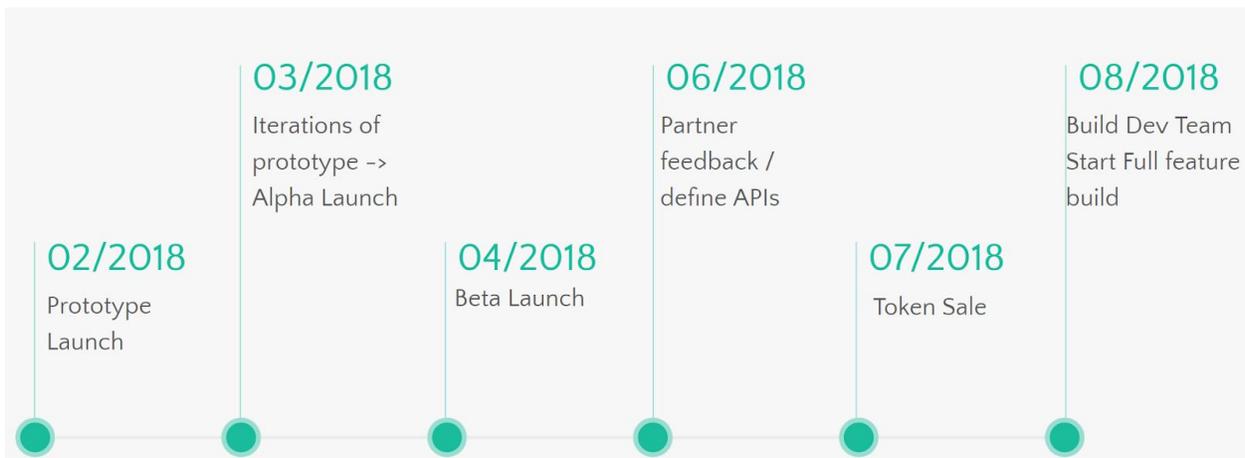
The Path App - While it is very useful to be the owner of your own certified and verified resume, that also earns you money, we want to give more to Path users.

With every Path, you can not only look back, but also go forwards. That's why we are going to build in features to allow users to plan their next move on the career path. Not only plan for them, but using geolocation data, AI and machine learning to recommend courses, competencies and experience they would need to give them the best chance of getting that dream job. This is where we can recommend courses from our partners, for a Path referral fee, which in turn would earn that partner PATH back when that user had their data queried in the future.

Applications - Applying to university and college is also something that involves a lot of process and checking of data. This is an expensive process. Something that Path would easily be able to improve with our system. We are already in talks with a school to try and build this into our system now, so that we are in the position to scale this, once we've launched.

APIs - We want to be able to integrate our APIs into as many existing systems as possible. Companies shouldn't have any headache when adding the Path functionality, or when becoming a certification authority. With that, we plan to build out our APIs and plugin framework to try and cover as many scenarios as we can, for both Education and corporations. While certifying via the API is one use case, our consumption API will allow for companies to use our service as a part of their own. If a company already provides background checks, they can use our API to truly validate that information without the current laborious overhead. This again provides Path with a simple continuous revenue stream via strategic partnerships.

White Labelled App for Companies - A common issue that businesses face is supporting employees with their career development internally. This has led to a decrease in time an employee will stay with a company dramatically. Being able to offer a company their version of the app to use with their employees will mean that they can connect to their own HR/ Learning management systems and support the development of the employee with the help of the Path App. This could be offered as an annual license fee on a per user basis.



ii. Business Roadmap:

Due to the multifaceted aspect of Path, the business roadmap needs to be strategically aligned to match this. That is why Path will have several layers of partnerships, as well as sales / account management.



Path can be broken down into:

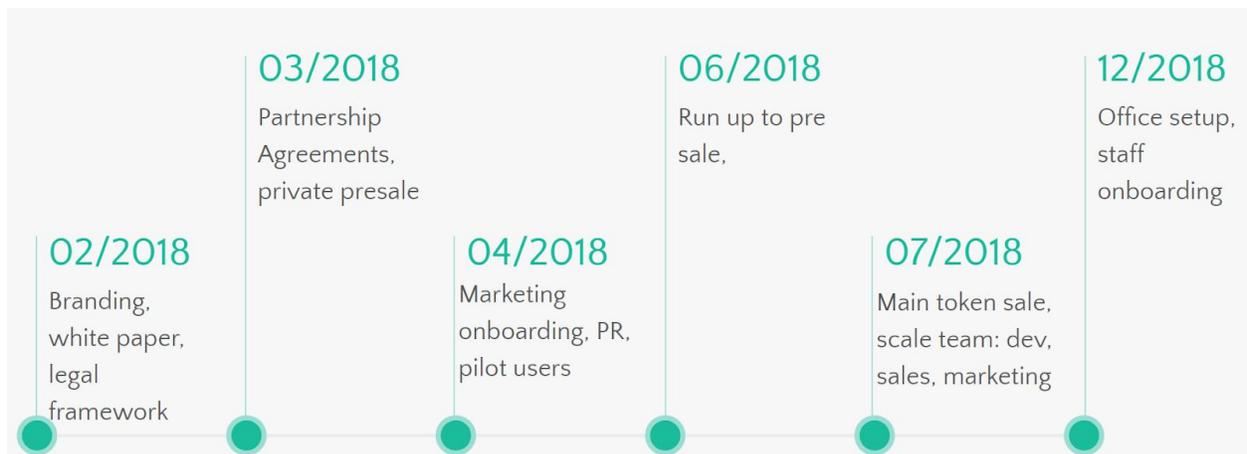
- Education (universities/Colleges)
- Professional Certifications (microsoft, cisco etc.)
- Massively Open Online Courses (udemy, udacity, edx etc.)
- Corporations (certifying exp. & internal trainings)
- Path Users (tied in which each aspect of above)
- Data Querying Parties (any company who wants to run a check)

Each of the above layers requires strategic partnerships, which will allow us to overlap layers in acquiring users, certifying bodies, and in turn querying parties too. This is why we have been concentrating on acquiring partners at each level of our business.

Going forward we will concentrate our post token sale sales and marketing efforts to build out the relationships in this areas.

To do this we will leverage the network we have internally and through our advisors, as well as adopting a location based scaling effort.

We also need to ensure we scale our technology teams out to meet our roadmap requirement and have sufficient support for our customers, so our outline business roadmap looks like:





6. Business Model:

When it comes to understanding the Path business model, you need to again look at the 3 main roles within the Path framework:

- The Path Owner
- The Certificate Issuer
- The Verifying Company

Our revenue is driven by the Verifying Companies paying a fee in fiat, to access the data of someone's Path.

The fee is then converted to PATH and distributed to Path, the Path Owner and the Certifying Bodies on that user's Path. The % split for this fee structure is:

- The Path Owner: 20%
- Path: 60%
- All previous Certifying Bodies on user's Path 20% split (Heavier weighting on split to latest certifiers on the user's Path, sliding scale back to the oldest)

This would be offered at a rate of \$199 for a single query transaction, or alternatively as a recurring monthly subscription for companies doing multiple checks:

- \$495 per month up to 10 checks
- \$995 per month unlimited checks.

On top of this, through API integration and strategic partnerships with companies, we will be offering our data to supplement the company's own offering. This would either be leveraged through a subscription model, or per call basis.

As outlined in our Road Map, we also plan to offer Path Owners the ability to plan their next move and offer partner companies recommendations for referral fees. This would also allow us to not just take a referral fee from courses offered, but also if we supplemented in real jobs users could apply for, we could take a fee cut there, too.



Also outlined in the Road Map was the white label app for companies, and although the license model hasn't been defined as yet, it's another stream that we are planning on utilizing.

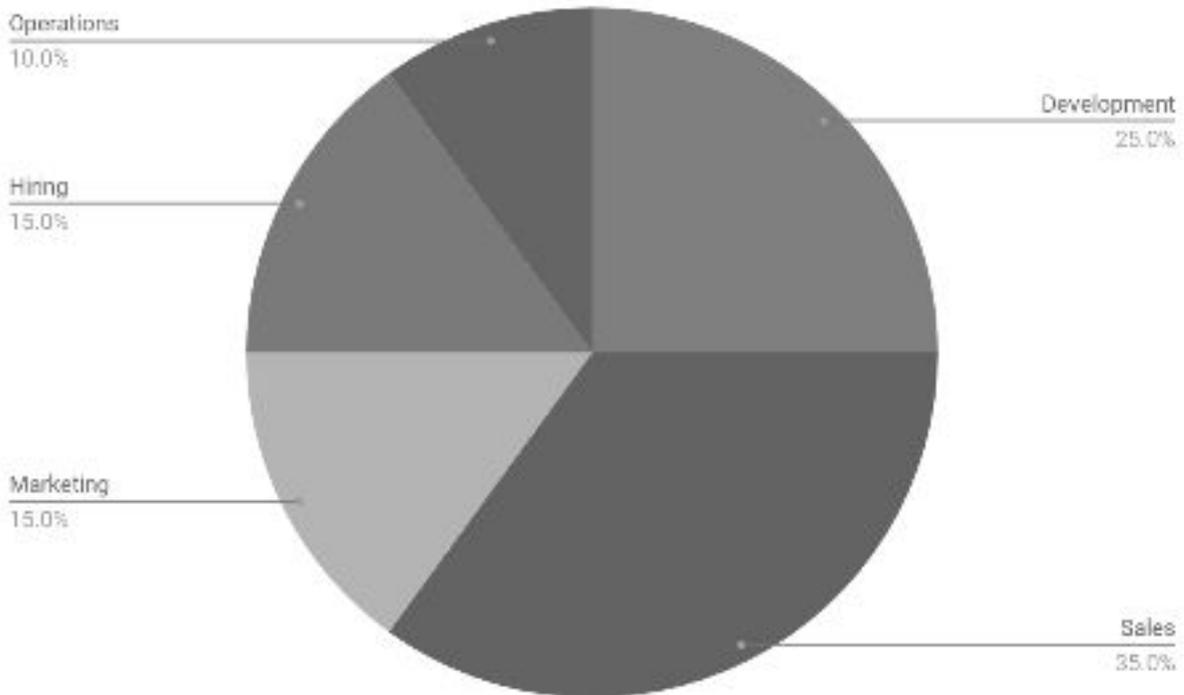
7. Token Allocation:

Our token allocation is documented as follows:

Token Allocation	Percentage	No.Tokens
Founders	15	75,000,000
Advisors	5	25,000,000
App Population	25	125,000,000
Pre Sale	15	75,000,000
Main Sale	35	175,000,000
Open Source	5	25,000,000
Total	100%	500,000,000

8. Budget Allocation:

The proceeds of the Path Coin token sale will be distributed across the following activities.



While hiring looks low, the hiring for specifics in Sales, Development and Marketing are covered under the respective sections.

Sales covers the largest amount due to the nature of the business as previously outlined in this document.

Further information on the use of funds are also outlined in the business and product roadmaps. The building of partnerships and scaling our user base is paramount to our business and as such takes a high priority in our activities and also our budget.

For further information on the Path token sale please contact info@pathfoundation.io