

## ABSTRACT

It has been ten years since Satoshi Nakamoto revolutionized the concept of payment system by introducing the global trustless and decentralized digital currency, Bitcoin. It has been a rollercoaster since 2009, hundreds of thousands of new start-ups around the world have attempted to innovate upon blockchain, the uniquely decentralized structure of Bitcoin. Slowly but surely a world built on blockchain has emerged. The biggest promise that the era of blockchain offers is the ability for everyone to trust and build on data systems that are collectively maintained and updated by the entire network as a whole! Trust is no longer a scarce resource! At its core, blockchain technology goes beyond Satoshi Nakamoto's early vision of bitcoin, the revolutionary peer-to-peer transaction protocol. The invention of smart contracts has expanded the capabilities of one-dimensional blockchain platforms to a multi-dimension protocol capable of interacting and processing digital agreements between stakeholders. Thanks to the latter, our idea could be realized.

The biggest problem and opportunity facing talents and organizations today is that the idea of work itself is changing. If we looked beyond the normal 9 to 5 working life, we would see more and more opportunities emerging from organizations delegating specific tasks to outside individuals, what is also known as the gig economy. Examples such as Amazon Mechanical Turk or Fiverr immediately jumped into mind.

While showing competency for simple and clear-cut tasks require little stake or trust. When it comes to showing competency in intricate and complex collaboration between people with different expertise such as starting a tech start-up, we need a trustless system to show the expertise and experience of anyone that can be cheaply accessed and verified became a prerequisite for ubiquitous working on the cloud. We envision that system as ConnectChain.

ConnectChain is an online networking platform that allows individuals to create networks with other professionals, design and confirm a profile that represents their professional and academic credentials and seek working opportunities. It allows companies to post job advertisements and recruit candidates, conduct background checks, and streamline hiring paperwork – all under one roof and within the cost of a pin.

To bring efficiency, transparency, and opportunity to the global workplace, ConnectChain employs a dual-token system: Connect Credit and Trust Credit. Connect Credits will be used by individuals and companies to access and interact with the ConnectChain platform. Connect Credit holders may use these tokens to expand their social and professional networks, post career opportunities, and hire the best talent using Connect Credits. Trust Credits are non-purchasable and non-tradeable tokens that serve to provide a quantifiable metric that measures an individual's academic and professional experiences as well as their technical skills.

By the way of incorporating the artificial intelligence, blockchain technology, and patent-pending security algorithms, ConnectChain aims to seamlessly and cheaply accomplish two simultaneous goals: allow people to follow their passion, and help companies to assemble the perfect team.

## INTRODUCTION

The job-hunting and job-hiring landscapes have dramatically changed in the last 40 years. Previously, newspaper advertisements were the main source of job listings and resumes were presented on paper and delivered by mail or in person. Additionally, finding a job was more about “what you knew” and less about “whom you knew”. The rapid development and expansion of technology, particularly the Internet, has introduced a paradigm shift in the job-seeking process and talent acquisition industry. Today, several business networking platforms and job search engines offer their services to millions of individual users, who seek to join the most reputable organizations and acquire the best talents. As a result, millions of users create online profiles on platforms such as LinkedIn to better showcase themselves and highlight their academic and professional experience. Although technology has made it easier for people to access new employment opportunities and showcase their skills, it has also flooded companies with hundreds of applications for one sole position, making it extremely challenging to discern the best candidates for the job. Furthermore, candidates’ academic and professional information has to be corroborated with third-party background verification systems to ensure that all information provided is truthful; however, this procedure significantly delays the hiring process and may result in significant cost for the company. Despite the latest developments in technology, job hunting and hiring remains slow and expensive.

ConnectChain is a decentralized professional network designed to accelerate the job-hunting and hiring processes and create an environment of trust for the new generation of jobseekers. The ConnectChain platform not only allows individual users to create individual profiles that showcase their skills, but also uses a network-based verification system to ensure that all users are providing accurate and honest information, thus anchoring the blockchain system in verifiable truth. Additionally, our research team has designed patent-pending algorithms useful to measure and provide a quantifiable value based on a user’s education, professional experiences, as well as hard and soft skills. ConnectChain utilizes blockchain technology to safekeep crucial work-related documents such as resumes, hiring forms, licenses, recommendations as well as financial transactions involving Connection Credits. Through our platform, a user will be able to begin and complete his entire journey towards finding a new work opportunity by applying on-site, providing all the required paperwork, and instantly finishing the background verification needed to begin working.

The ConnectChain team has designed this multifeatured platform with the objective of creating a “one-stop” application for all job-hunting and hiring purposes. It is our mission to create an honest and trustworthy digital ecosystem where stakeholders are encouraged to interact freely and genuinely in order to unlock their true potential.

# MARKET ANALYSIS

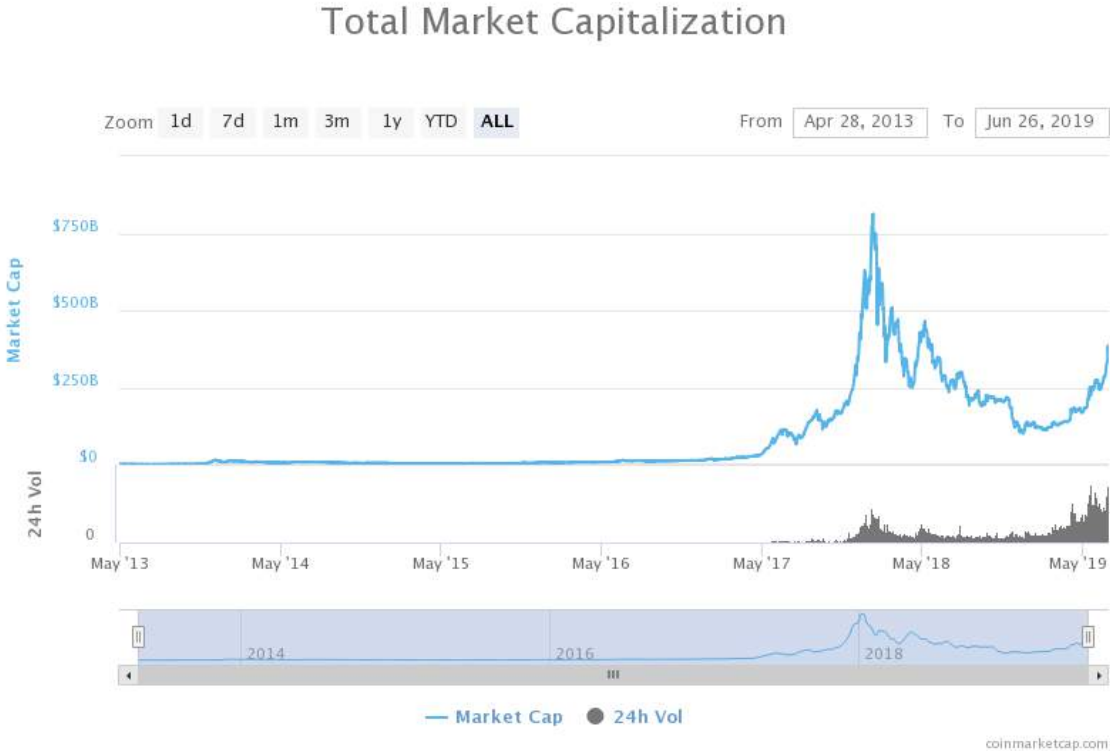
## Market Overview

### THE EVOLUTION OF THE CRYPTOCURRENCY MARKET

Since the creation of Bitcoin in 2009, the cryptocurrency market has always been one of the most volatile asset classes. However, it was not until January of 2018 when the cryptocurrency market reached an all-time high value of \$795 billion, propelling Bitcoin at \$19,891 and Ethereum, the second highest cryptocurrency at \$1,432. In the following years, the market experienced a sharp decline which pushed Bitcoin down to \$3,409, or 83% of its all-time high value.

Presently, the cryptocurrency market has shown significant improvement, bouncing back to \$320 billion in June 2019. There are over 2,200 cryptocurrencies and 19,000 digital asset exchanges worldwide, as well as over 25 million registered users on Coinbase, the leading digital currency exchange in the United States. With the issuance of Libra, cryptocurrency has crept into serious discussions in the boardrooms of Fortune 500, on the US senate floor and even among the top echelons of the People’s Bank of China. Cryptocurrency is going mainstream, and that also implies the world is ready for the emergence of token incentivized computational social and economic systems.

Table I. Cryptocurrency Global Market, 2009-Present.



### THE STATE OF THE STAFFING AND RECRUITING MARKET

The size of the staffing and recruiting industry market has shown consistent growth in recent years at a national and global scale. According to a market forecast published in 2017, the global staffing industry generated an estimated \$461 billion in revenue worldwide. This number is expected to grow by 6 percent in 2019, with no markets across the world showing signs of decline. Similarly, the staffing, recruiting, and workforce solutions industry makes a vital contribution to the U.S. economy, and provides outstanding job and career opportunities for nearly 17 million employees per year. In the United States – the world’s largest staffing market - growth in total staffing revenue is expected to surpass \$150 billion in 2019.

Table 2. US Revenue Growth, Staffing and Recruiting Industry Market

***US Revenue Growth (\$ Billions), May 2018 Forecast***

	<b>2017</b>	<b>2018P</b>	<b>2019P</b>
<b>Temporary Staffing</b>	123.7	128.1	132.1
<b>Direct Hire / Retained Search</b>	19.1	20.2	21.1
<b>Total Staffing</b>	142.8	148.3	153.2

Source : <https://www2.staffingindustry.com/site/About/Media-Center/Press-Releases/US-Staffing-Market-to-Surpass-150-Billion-in-Revenue>

## **STAFFING AND RECRUITING PRACTICES OVER THE YEARS**

Talent acquisition and hiring processes have drastically changed over the last 40 years. Whereas jobseekers previously relied on classified ads, in-house recruitment, and headhunting agencies, the introduction of technology and the Internet have paved the way for the creation of online job boards, employer career sites, and business networking platforms, which make job-hunting and hiring more accessible to everyone.

The impact of technology on the talent acquisition and job-seeking industry have affected recruiters and candidates alike. For instance, recruiters and hiring managers now have specialized recruiting tools and a wider reach to find talent at a global level and pick from a larger talent pool than ever before. In the United States, the average number of people applying for any given job at any given time is 118, translating into an annual figure of more than 3.5 billion; approximately a fifth of those applicants are called back for an interview. At the same time, it has gotten easier for jobseekers to apply to different positions thanks to the availability of job aggregator sites, which collect job postings from different websites and place them in a searchable engine and database. Today, Indeed, LinkedIn, Glassdoor, Idealist, and SimplyHired are some of the most popular platforms where individuals look for new employment opportunities.

Meanwhile, more and more “jobs” are becoming fragmented. Since the financial crisis, the steady rise of gig platforms such as Fiverr has spoken clearly about the popular mentality to search for the best possible aid for specific work at the best price. Going forward, we would only see this fragmentation of “jobs” to be ever more prevalent, more and more complex working dynamics will emerge as the tools for distant collaboration become ever more capable and the comfort for younger generations to take on a Slashie’s lifestyle rises.

While technology has provided innovative solutions to maximize the efficiency and unlock new possibilities in the job-hunting and hiring processes, it has given rise to new challenges to confront in the future. For instance, as more individuals continue to join business networking platforms, the amount of information that lacks verification continues to grow, creating a network and environment that may not be as genuine or truthful as it was designed. Additionally, as a new generation enters the workforce, it brings with it a set of practices and behaviors that force us to reconsider and shift towards a new paradigm in the industry. Current platforms such as LinkedIn, Idealist, Indeed, and SimplyHired have not been able to create the proper environment for genuine networks to flourish, and does not incentivize job-seekers to portray themselves in an honest manner, and more importantly, people to build reputation on the platform (Number of connections is not reputation!). With this in mind, the ConnectChain team has designed an application that meets the needs of both sides of the evolving job markets. Nonetheless, it is important to first examine the current job-seeking and hiring practices and the inefficiencies behind them.

## Key Challenges

### THE CURRENT WAY OF HIRING

According to the Bureau of Labor Statistics, the unemployment rate in the United States reached approximately 3.8 percent in March, 2019<sup>1</sup>. The number of unemployed Americans dropped by 24 thousand to 6.2 million. The U.S. unemployment rate is now the lowest it has been in nearly 50 years; additionally, payroll employment continued its historic streak of positive job gains, and average weekly wages have continued to rise.

Despite this remarkable feat, the hiring process remains an excruciatingly long and nerve-racking experience for jobseekers and employers alike. One of the main reasons is the fragmentation of jobs. There are much less full-time high-quality jobs and ever more contract works and long-distance task oriented work opportunities. This is not just a prevalent reality for the tech sector, but also for conventional businesses as well. We simply need a better way to signal and very competency. To understand the scope of the issue, we need to first ask two questions. What does an average recruiter go through when looking for an ideal candidate? What obstacles does a candidate undergo when seeking employment?

The following table (Table 3) outlines the typical steps employers and individuals follow when hiring and looking for a job:

Table 3 – Recruitment and job-seeking processes.

<b>Employers</b>	<b>Jobseekers</b>
<b>I. Identify the hiring need</b> – Recruitments provide opportunities to departments to align	<b>I. Use their social networks</b> – Jobseekers utilize their networks to reach out to contacts

<sup>1</sup> <http://www.ncsl.org/research/labor-and-employment/national-employment-monthly-update.aspx>

<p>staff skill sets to initiatives and goals, and for departmental and individual growth. Proper planning and evaluation of the need will lead to hiring the right person for the role and team.</p>	<p>who work in their professional fields. To do this, they use methods such as meeting face-to-face and social networking websites.</p>
<p>2. <b>Advertise the job post</b> – This step involves attracting job seekers to the organization. There are broadly two sources used to attract candidates: internal and external. Internal recruitment involves informing hired staff about an available position that may be suitable to their interests and skillset. External recruitment involves advertising the job on internet job boards, career fairs, social media, professional conferences, and campus recruiting, among others.</p>	<p>2. <b>Look for job opportunities</b> – Most individuals apply to jobs online. Websites such as Indeed.com, Google Jobs, Glassdoor, and LinkedIn are currently the most visited by individuals when seeking job opportunities.</p>
<p>3. <b>Build up a pool of candidates</b> – Allow a certain period of time to receive applications from qualified candidates that may be suitable for the job.</p>	<p>3. <b>Apply for a job</b> – Candidates customize their resume, cover letter, references, and other supplementary documentation to best present themselves for each job, oftentimes spending a vast amount of time</p>
<p>4. <b>Review applications</b> – Select a hiring committee to review candidates resumes, experiences, cover letters, and supplementary documentation required to screen individuals suitable for the job. During this phase, usually 2-6 candidates are short-listed for a telephone interview.</p>	<p>4. <b>Receive a job interview request and interview for the job</b> - Candidates must wait an undetermined period of time before hearing back from a potential employer for a phone interview. This step may sometimes take weeks, even months.</p>
<p>5. <b>Telephone Screening (1<sup>st</sup> Interview)</b> – A telephone interview is often an effective way for a company to screen many candidates quickly and cost-effectively, without having to invest the same level of time and resources needed for face-to-face interviews. Telephone interviews (and increasingly, Skype interviews) are usually straightforward, since the aim is to eliminate weaker candidates, rather than to test stronger ones.</p>	<p>5. <b>Pass skills/aptitude tests</b> – After successfully passing a phone interview, candidates are shortlisted and must often pass a test to prove their competencies. This test may usually take 2-4 hours to finish, however, logistic issues may delay this process.</p>
<p>6. <b>Skills/Aptitude Tests</b> - Tests and other selection methods such as requesting work or writing samples and presentations are additional tools used to assess candidates.</p>	<p>6. <b>Provide references.</b> Candidates send customized references to every employer, depending on the position they applied and the type of recommendation they need. Recruiters may take up to two weeks to contact a candidate's references; similarly, a candidate's reference may take an additional week to respond to the organization's HR staff, further causing time delays in the process.</p>
<p>7. <b>Face-to-face interview (2<sup>nd</sup> Interview)</b> – The interview is the single most important step in the selection process. It is the opportunity for the employer and prospective employee to learn more about each other and validate information</p>	<p>8. <b>Receive offer letter.</b> Candidates receive the final offer letter. Additional days must be taken into account for salary negotiations.</p>

provided by both. By following these interviewing guidelines, you will ensure you have conducted a thorough interview process and have all necessary data to properly evaluate skills and abilities.	
<b>8. Contact references for short-listed candidates</b> - The purpose of a reference check is to obtain information about a candidate's behavior and work performance from prior employers that could be critical to your decision, regardless of their skills, knowledge, and abilities.	<b>9. Pass background check and provide additional documentation.</b> Even after a candidate signs the offer letter, he/she is subject to a background check, and may have to provide any additional documentation such as proof of salary and employment before onboarding.
<b>9. Make an offer to the selected candidate</b> – The company provide an offer letter to the candidate, who usually has one to two weeks to reply.	
<b>10. Conduct background checks</b> – Recruiters use background check to review a person's commercial, criminal, and (occasionally) financial records. Typically, an employer will contract with an outside vendor who specializes in background checks.	
<b>11. Hire candidate</b> – The candidate is hired and ready to begin work.	

Are these practices efficient for future job market? How long does each of these steps and processes take? Can these processes be improved for both parties? In the following section, we will examine the inefficiencies in contemporary hiring and job-seeking practices.

**INEFFICIENCIES IN THE RECRUITMENT PROCESSES**

**Long hiring times.** A 2015 study of “hiring delays” published by Glassdoor revealed big differences in the time it takes to hire across the country, industries, and jobs. Moreover, it showed that interview processes have gotten much longer in recent years<sup>2</sup>. In fact, Glassdoor found that people in the Washington, D.C. district have the slowest hiring processes compared to job seekers in other cities across the country. Researchers at the company stated it takes 33.2 days on average to land a job in the District, compared to an average nationwide is 23.8 days.

The industry with the slowest interviews is the Government, at 53.8 days — more than twice the U.S. average. It is followed by Aerospace & Defense (32.6 days), Energy & Utilities (28.8 days), Biotech & Pharmaceuticals (28.1 days) and the Nonprofit sector (25.2 days). The fast-growing Internet & Tech industry ranks near the middle of all sectors, at 24.4 days. Meanwhile, the industry with the shortest interview processes is Restaurants & Bars at just 10.2 days. They are followed by several other industries that rely heavily on lower-skilled roles with skills that can be quickly and easily screened for in interviews: Private Security (11.6 days), Supermarkets (12.3 days), Automotive (12.7 days) and Beauty & Fitness (13.2 days).<sup>3</sup>

<sup>2</sup> <https://www.glassdoor.com/research/time-to-hire-in-25-countries/>  
<sup>3</sup> <https://www.glassdoor.com/research/time-to-hire-in-25-countries/>

*“Job candidates could undergo several extra steps that lengthen the overall interview process, including additional written and verbal exams or background checks to secure various levels of security clearances, among other requirements.”*

*Dr. Andrew Chamberlain, Chief Economist -  
Glassdoor*

Although companies are not fully responsible for hiring delays, individual company policies seem to play an important role in the length of job interview durations. Company factors such as the number and type of interview “screens” used by hiring managers are the biggest contributors to time delays in hiring practices. Long interview processes are costly for employers and jobseekers alike – employers lose time and resources as well as productivity while workers forego their salaries and give up other opportunities. Furthermore, these burdensome processes may not only be wasteful, but also result in losing top candidates to other competitors. It needs to be not only as fast as an instance, but also different.

**Recruitment Hiring Practices.** According to a 2017 article by LinkedIn, recruiters spend approximately six seconds reading a resume<sup>4</sup>. Currently, most recruiters use applicant tracking systems (ATS), which is a software that detects certain key words on a resume and helps human resource staff process the increasingly high number of applications they receive. In fact, on average, each corporate job listing attracts 250 resumes. Of those candidates, only four to six will receive a call for an interview, and only one will get the job<sup>5</sup>. One of the most important features of a resume/CV talent acquisition managers look for is how well organized and formatted the resume is, how relevant the applicant’s prior experiences and achievements are in relation to the job requirement, how much of an impact the applicant has made on his/her former jobs, and how coherent the applicant’s entire career history is.

Recruiters simply do not have enough time to evaluate each resume to fully understand a candidate’s potentials and strengths, and perhaps with good reason since they must swift through hundreds of CV’s before selecting a few candidates that will make it to the next round. Yet if a resume was supposed to contain the most important information about a candidate, should recruiters not be spending more time on it? The truth is that the importance and relevance of a resume has slowly decreased and could no longer be an effective tool for people on both sides of the job market to discover the good fit. In times where there is no shortage of candidates who have on their resumes’ excellent experiences and qualifications, there is a greater need for candidates to stand out from the competition. For this, ConnectChain has designed an evidence-based verification and matching engine to represent the potential value of an applicant and help recruiters to compare high-quality candidates in a more efficient manner.

**Resume Fraud.** Machiavellianism, moral identity, conscientiousness, emotional stability, and agreeableness are all contributing causes of resume fraud. Needless to say, resume fraud is a widely prevalent phenomenon that greatly hinders the development of a better hiring and job-seeking system. In addition, resume fraud is a good predictive indicator for reduced job performance and increased workplace deviance beyond deceptive interviewing behavior (CA

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<sup>4</sup> <https://www.linkedin.com/pulse/six-seconds-average-time-spent-reading-resume-andrew-j-friedman/>

<sup>5</sup> <https://zety.com/blog/hr-statistics>



Henle 2017)<sup>6</sup>. Unfortunately, resume fraud is rarely studied despite the negative impact it can have on job-related outcomes. According to a national survey by CareerBuilder which included more than 2,500 U.S. employers and 221 human resource managers, 75 percent of recruiters spotted inaccuracies on resumes in 2017<sup>7</sup>.

Resume frauds represent a potential loss of financial resources and productivity for employers and applicants alike. The damage to a person's reputation that misleading information may cause is immeasurable, affecting him/herself, the company, the recruiter, and other potential candidates who are better qualified for the job. Mechanisms need to be designed to incentivize both parties to provide genuine and **verifiable** information. ConnectChain seeks to create a system that will encourage the contribution of genuine information with the aid of carefully designed and continuously improved token economics. This system will eventually evolve to enable instantaneous matching of applicants and companies as well as proof of verification of their respective expertise and career identity.

**Different channels of communication.** When applying for a job, a person normally applies through the company's website, which contains a list of all the jobs available in that organization. However, when receiving a job offer, this message is communicated via e-mail or phone call. Supporting documents and skills/aptitude tests may also be communicated via different human resource staff, adding more layers and channels of communication. Last, candidates must submit documentation to a third-party background service provider who is not affiliated with the company or the individual seeking the job. In brief, there are many different channels and stakeholders a candidate must interact with during the hiring procedure, often causing time delays, confusion, logistics issues, and inefficiencies in the interview process. To stop these inefficiencies at their root, ConnectChain was designed to become the central routing station of communication between employers and candidates. Through ConnectChain, a recruiter can readily view a candidate's resume, send them aptitude or skills tests, receive supporting documentation, and immediately verify a candidate's legitimate professional experiences and academic credentials at high granularity.

## INEFFICIENCIES IN THE JOB APPLICATION PROCESS

Candidates undergo a similar process as recruiters when seeking employment, with a few significant differences given the nature of these roles. Generally, people begin by reaching out to their networks to see if there is an opportunity available. The value of a network in the job-hunting process cannot be underestimated; yet in spite of its utility, there do not seem to be many efficient channels that offer an individual the ability to create and expand the reach of their job search campaign in an efficient and honest way. Current avenues are not efficient due to the absence of critical features such as monitoring the progress of users' profile evolution, taking down barriers that do not encourage people to interact in an honest way, and improve the transparency of people's experiences and competencies.

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<sup>6</sup> <https://experts.umn.edu/en/publications/assessing-intentional-resume-deception-development-and-nomologica>

<sup>7</sup> <https://www.cnbc.com/2017/09/13/75-percent-of-human-resource-managers-have-caught-a-resume-lie.html>

Platforms like LinkedIn do not allow people to verify the legitimacy of their respective background and history, therefore it cannot provide the necessary trust for companies to quickly find and decide on a match and immediately start collaboration.

Second, candidates waste a tremendous amount of time applying to jobs through different companies' websites. During the process, a person must fill out each company's form through their own portals (often after many attempts because of timeout or lag), causing an enormous amount of time wasted as opposed to having one standardized form where a candidate can provide all the information companies need. These delays are further lengthened when, in many occasions, jobs are taken down or turn out to be outdated due to a lack of monitoring on behalf of the platform. Additionally, candidates wait up to three to four weeks to hear back from a job opportunity due to a lack of valuable tools that can help recruiters discern qualified from non-qualified candidates more quickly. All of these factors add up not only to a clear sign that the status quo in job-seeking and hiring processes is outdated, but also the need for an efficient solution to eliminate these challenges for jobseekers and recruiters alike.

After examining the current state of the job-hiring and hunting market, the evidence points out that technology may have once provided its users more exposure to opportunities, but has sacrificed integrity, efficiency and precision in acquiring work opportunities. These contemporary issues need modern solutions, and in time a new paradigm of work. The following section will describe the three main solutions and services the ConnectChain platform has created to minimize inefficiencies and greatly improve accessibility to ideal matches for all users on both sides of the job market.

## Competitor Overview

The contemporary social networking and job-seeking services space has several key competitors that have solid reputation in the industry but lack the technology and modern services ConnectChain offers. Among these established providers are LinkedIn, Indeed, Glassdoor, and Fiverr, who cater to professionals and temporary workers seeking employment. In this section, we analyze our competitors' strengths and efficiencies, ultimately designing a side-by-side table for comparison.

**LinkedIn.** Founded on 2002, LinkedIn is one of the leading companies in the world of social networking and employment-oriented service providers. As of March 2019, LinkedIn had 610 million registered members across 200 countries. Available on mobile phone and via browsers, LinkedIn allows individual users and organizations to create profiles and networks to interact with each other. Furthermore, the platform has extensive job listings, where recruiters can advertise available positions for hire and potential candidates can apply via LinkedIn. Interactions on the platform allow members to join professional groups and like-minded people, give and receive recommendations as well as endorse people's skills, and read news and online content. However, LinkedIn has many challenges and disadvantages that do not allow them to increase traffic and become a trustworthy platform where people continuously interact. Despite all the above mentioned features, LinkedIn continues to offer its users an "average" experience. In a platform designed to connect, people rarely do so due to certain features the platform has, such

as receiving a notification every time another user sees your profile. For instance, 58 percent of respondents surveyed in a LendEdu study signaled that they only view another person's profile "only if it is absolutely necessary", while a fifth of them never look at other people's LinkedIn profiles solely because of this feature<sup>8</sup>. There is a fundamental irony in a business networking website that deters its own users from connecting - this irony is only aggravated when this disadvantage causes people to lose out on potential networking opportunities.

**Indeed.** Indeed, is a worldwide employment-related search engine for job listings founded in November 2004. Indeed, is currently available in over 60 countries and 28 languages; the company connects millions of people to new job opportunities free of charge and has over 7,000 employees working across the world. In 2010, Indeed.com passed Monster.com to become the highest-traffic job website in the United States, attracting over 250 million unique visitors every month and adding 9.8 jobs per second globally. Indeed offers a clean interface with an advanced search option with built-in Boolean, similar to what headhunters and recruiters use. The search engine allows a user to look for jobs by salary and geographic radius; additionally, Indeed has a job alert function that sends notifications to its users to let them know when interesting jobs are available to apply. The interface also offers job trends, job postings per capita, market competition, and other statistics figures designed to help job-seekers and educate them about companies and industries. Similar to LinkedIn, Indeed has a database of resumes, and users can upload their CV so that is searchable by employers. Although Indeed has done a magnificent in gathering millions of job posts under their search engine, the company has missed a crucial point in the job-acquisition process: the importance of networking. A 2016 report by LinkedIn stated that 70 percent of those hired had a connection within the company where they began working. Furthermore, 80 percent of professionals consider professional networking to be important to career success. In fact, 61 percent of professionals agreed that regular online interaction with their professional network can lead the way into possible job opportunities<sup>9</sup>.

This evidence is irrefutable: the importance of networking, especially via online platforms is fundamental in these new times. Online tools have become just as important as real-life interactions to present ourselves in a professional, and more importantly, honest manner. With ConnectChain, that vision will become a reality.

**Glassdoor.** Glassdoor is a website founded in 2007 where current and former employees anonymously review companies and their management. Over time, the company has expanded its services to offer individuals the ability to research salary information, advertise job listings, and include features helpful to its members undergoing interviews, such as information about interview questions and benefits at a certain company. Unlike previous competitors, Glassdoor offers services more oriented towards companies and recruiters rather than job-seeking individuals. Employer branding services allows organization to make great first impression of themselves by allowing them to respond to employee reviews; other services help companies understand candidate demographics, profile monitoring services, and benchmark employer brand against competitors. Furthermore, it helps recruiters meet their recruitment targets, find great talent who tend to stay at their job longer, and reduce human resources staffs' time reviewing

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<sup>8</sup> <https://lendedu.com/blog/drawbacks-deceptions-linkedin/>

<sup>9</sup> <https://news.linkedin.com/2017/6/eighty-percent-of-professionals-consider-networking-important-to-career-success>

applications. Unfortunately, its heavy emphasis on employer-related services does not allow Glassdoor to fully maximize its own potential, as it largely ignores the other “half” of the equation that enables the connection between companies and people looking for employment. The difference ConnectChain makes is that it offers services for both parties – our vision is to become the most popular business networking and recruitment application by revolutionizing the industry through our unique and innovative features.

**Fiverr.** Fiverr is an online marketplace for freelance services founded in 2010. The platform allows freelancers to offer their services to customers across the world; in 2012, over three million services were listed on Fiverr. Generally, the marketplace is geared towards services such as writing and translation, digital marketing, video and animation, programming and tech, and graphics and design. The platform has three levels of freelancers who have varying job completion statuses and ratings, as well as different rates, depending on their experience, performance reviews, and skill levels. Clients can look for services through the search engine, which offers users the ability to filter providers by rating and price. Additionally, the site offers security measures that protect users’ personal details as well as communication channels, ensuring clients and freelancers can interact privately and that all project details remain between the buyer and seller. However, Fiverr also has drawbacks that prevent it from being more trusted among customers. First, although freelancers have a profile accompanied by small descriptions of themselves, it is much more difficult to tell whether these individuals have legitimate experience in the services they are seeking to provide. In other words, they often lack the academic and professional certifications needed to perform the services they offer. As a result, it makes it very hard for customers to trust these freelancers with their work given that there are no guarantees that the seller has the experience needed for the task. Second, Fiverr is very limited in the services that it offers, resulting in less traffic flow and transactions between buyers and sellers. In contrast, ConnectChain’s authentication of credentials and background checks will verify every user on the platform’s experiences to create a high level of trust where companies feel safe to hire a qualified person. Our team’s collaboration with institutions and universities will facilitate authentication services and ensure that members are verified and ready to work.

The following table summarizes the unique features of every company abovementioned and can be used to compare ConnectChain’s services relative to the current service providers:

Table 4 ConnectChain and current social networking and job-seeking online platforms.

	LinkedIn	Indeed	ConnectChain	Glassdoor	Fiverr
Create profiles	✓	✓	✓	✓	✓
Job Listings	✓	✓	✓	✓	
Ability to apply through application	✓	✓	✓	✓	
Network interacting features	✓		✓		
Available on Web browser and phone	✓	✓	✓	✓	✓

Membership Subscription	✓		✓		✓
Individual Rating Score			✓		
All-in-one streamline application process			✓		
Authenticated and legitimate profiles			✓		

## OUR SOLUTIONS

Our platform aims to become the “one-stop shop” of business networking and job-hiring platforms, where individuals can connect, apply for job opportunities, and process all hiring paperwork under one roof. To accomplish this, we present three customized solutions: the Connection Credits, the Trust Credit Rating System, and the Built-in Background Verification System.

**Connect Credits.** The ConnectChain team has created digital tokens that allow users in the platform to enjoy the different features of our app – these are called Connect Credits. Connect Credits allow individual users to build their professional and social network by sending connection requests or apply to new job opportunities. Similarly, recruiters can use Connect Credits to contact potential candidates, gain a more granular view of candidates’ experiences and competencies, and post job advertisements and even special work contracts. Connect Credits can be purchased with cryptocurrencies or fiat via debit/credit cards. Additionally, users may receive Connect Credits as rewards for verifying other users’ information or performing tasks that help to grow and maintain a safe, honest, and genuine network.

**Trust Credit Rating System – a revolutionary way to measure a candidate’s professional value.** Our team has designed a patent-pending mathematical algorithm capable of quantifying users’ personal attributes, professional experiences, and academic credentials. This research-based algorithm uses artificial intelligence to remain precise despite any changes in the users’ profile or background. Moreover, it evaluates the most important aspects of a candidate to assign them a rating score that companies and recruiters can use as a comparative indicator to recruit the highest-quality candidates. This score will ensure the right candidates are matched with the appropriate companies and will drastically reduce recruiters’ time when reviewing hundreds of applications and comparing potential candidates for the job.

**Built-in Background Verification System – a mechanism to encourage transparency and honesty.** Under the ConnectChain app, employers and potential candidates no longer have to apply via the company’s website, communicate via e-mail, and submit paperwork to a third-party background services provider. Our efficient platform offers all of these services in one: individuals will be able to store their resume and documents in their profile, apply to many jobs

in a faster manner, and communicate with recruiters via our messaging services. We will seek to integrate our platform with popular job application portal APIs. Furthermore, because we prioritize the authenticity and accuracy of information, we will ensure that each professional and academic credential listed in individuals' profiles can be validated and authenticated. Our close collaboration with schools and institutions, as well as a token-based validation system for individuals will make this feature possible. This special feature is one of ConnectChain's strongest benefits, intended to drastically reduce time, simplify the hiring process, and minimize financial resources and time delay.

In addition to these three solutions, ConnectChain's users will enjoy the following benefits as a direct result of our network verification systems and environment of trust:

**Honest and Trustworthy Profiles.** As stated in the previous paragraph, trustable information is the cornerstone of ConnectChain. To encourage users to describe their experiences accurately, we have designed a token-based system that awards "connect credits" (please see our technical section to understand more on this token system) to users who provide true information and authenticate their networks' credentials. These credits are necessary to access our platform – they can be used to send connection requests, view different profiles, and apply to work opportunities. In turn, our platform seeks to create an even-level playfield for everyone by rewarding those who remain transparent and honest. Furthermore, an honest environment is what allows individuals to truly connect with employers and find their perfect place in their desired field.

**Authentic job opportunities.** Using a report-based mechanism and a team of dedicated quality-control staff, our platform will be constantly monitored to ensure that all positions listed on our platform are legitimate and safe to apply. Our team has the resources, training, and capacity to respond immediately to any potential scam that may harm the platform's reputation or its users.

## THE TEAM

The ConnectChain core team is headquartered in Washington, D.C. Our team is composed of experienced innovators and entrepreneurs who are passionate about finding blockchain-based solutions to today's most pressing challenges. Our personnel is composed of the following people:

- ❖ Gustavo Castillo is the CEO. Mr. Castillo is responsible for business development in US market as well as the non-technical sections of the operation management activities and ensuring that all projects go according to the workplan established. Gustavo has over five years of experience in project management and evaluation. Mr. Castillo received his master's degree in international development from Georgetown University.
- ❖ Vino is the CTO and Founder of ConnectChain. As senior developer, Mr. Vino spearheads the development of the ConnectChain application and manages a team of three junior developers to bring the application to fruition. Vino is an accomplished software engineer

with over four years of experience. Mr. Tang received his master's degree in Computer Science from George Washington University.

- ❖ Frank Wang is the Chief Strategy Officer. Frank is responsible for providing technical support and managing the company's strategic processes. Furthermore, Mr. Wang's responsibilities include identifying growth opportunities, collaborate in the design of technical and non-technical workplans, and ensure these activities are successfully implemented. During his previous roles, Mr. Wang was the marketing and community lead for X-Order, and co-founder of the RiZing Global venture fundraising platform as well as FinTech4Good. He also has experience working at HSBC Private Bank. Mr. Wang holds a master's degree in finance from Johns Hopkins University.

In addition to the core team members, ConnectChain also has four token-holding advisors who will reserve the rights to involve more advisors in the future for technology or marketing development purposes. These are:

- ❖ Dr. Neil Wasserman – Technology Advisor. Dr. Wasserman was instrumental in the design of the ConnectChain platform. As an advisor, Dr. Wasserman holds 1.4 percent of the total token shares, which will be unlocked in future.
- ❖ Ji Zhang – Strategy Advisor. Ms. Zhang significantly contributed in the business model design and other financial operations. Ms. Zhang will also hold 1.4 percent of the total token shares, aimed to be unlocked in the future.
- ❖ Tianbo (Billy) Huang – Marketing Advisor, US. Mr. Huang has allowed the Connectchain team to design and launch the company's marketing campaign in the United States. Mr. Huang will hold 1.4 percent of the total token shares, set to be unlocked in the future.
- ❖ Miao (Jenny) Yang – Marketing Advisor, China. Ms. Yang is an instrumental player in the launch of the company's marketing campaign in the Chinese market; her responsibilities also include community management, particularly through digital channels. Ms. Yang holds 2 percent of the token shares, set to be unlocked in the future.

## TOKENOMICS

### Connect Credits Tokens (CCTN) and the Blockchain

Connectchain Inc. is introducing an Ethereum ERC-20 cryptographic token called Connect Credits (CCTN). CCTN will act as a general-purpose mechanism of transacting in information verification. Connect credit will be the unit which denominates transactions for the services in

the CCTN-enabled Connectchain ecosystem. It will be a token can be division, allowing for granular pricing.

## **CCTN Operations**

### **INITIAL BALANCE**

CCTN will be airdropped to any common users who pass the verification proceeds on Connectchain platform users as they can start the verification processes. Meanwhile, CCTN will also be purchasable by companies and exchanges, or potential master nodes who facilitate the exchange between CCTN and fiat currency on behalf of companies and exchanges. In this way, companies and exchanges are free to deal with only local currency if they chose to do so.

### **TRUST INDEX SYSTEM**

The trust index contains different levels of information, and we continue to expand the content of this information set by introducing artificial intelligence technology. The Trust Index was designed with reference to part of the design of the US Personal Credit Score (FICO Points). The credit index can help companies find candidates that may otherwise be overlooked, help individuals find the right company, and even serve as a risk control aid indicator for financial institutions in the future.

The traditional financial credit rating method has a very big flaw. If a person forgets to repay a few times or temporarily encounters difficulties and cannot repay on time, that person will be marked with a credit failure label, which may hinder their opportunity to obtain credit in the future, thus falling into a vicious circle. The letter is based on the predicted rating of the user's real background data, such as education record, work history, interpersonal relationships, legal integrity, using text analysis artificial intelligence algorithm to accurately classify users, find benchmarks, and predict a person's future potential. The sum of these factors will be used to calculate the comprehensive computing potential. Through the relational integration system, we can obtain a comprehensive database of highly reliable background data at a lower cost, which is the premise that the trust index system can play a role.

The traditional design method uses a preset model to calculate the weight of each index. However, the weight ratio of this method is a sample, the data set is limited, and the weight of each index should be dynamically changing, which should lead to constant changes in the value of each weight. When calculating the benchmarks and weights, we introduced artificial intelligence algorithms to allow the model to continuously optimize itself. The initial weight of each indicator is 10%. When the platform is continuously improved, the data is obtained, and the artificial intelligence algorithm is continuously involved in the weight ratio and benchmark improvement. The model user data is found as the benchmark of each indicator, and each indicator is found. The right weight. According to preliminary estimates, this index has initial value when the number of users reaches 10,000 or more and has practical value when the number of users reaches 500,000 or more.

## **Mathematic Model of the Trust Index System**



Assuming there are two groups of users, group A ‘Good Users’ and group B, ‘Bad Users’, we built a mathematic model based on these two groups:

- i. The more the Trust Credits Number  $T$  are, the more possibility that user can be ‘Good User’, vice versa.
- ii. ‘Good User’ sample  $T_g$  obey Gaussian distribution  $N(\bar{T}_g, \sigma_g^2)$ , the  $\bar{T}_g$  is the average number of the ‘Good User’, the  $\sigma_g^2$  is the variance, the probability density function should be the  $f_g(T)$ .
- iii. ‘Bad User’ sample  $T_b$  obey Gaussian distribution  $N(\bar{T}_b, \sigma_b^2)$ , the  $\bar{T}_b$  is the average number of the ‘Bad User’, the  $\sigma_b^2$  is the variance, the probability density function should be the  $f_b(T)$ .
- iv.  $P(g | T)$ : the possibility of ‘Good user’ when user’s trust credit is  $T$ ;  $P(b | T)$ : the possibility of ‘Bad user’ when user’s trust credit is  $T$ ;
- v.  $odds(T) = \frac{P(g | T)}{P(b | T)}$ , when the trust credit number is  $T$ , the corresponding likelihood ratio.
- vi. The mathematic model has  $p$  input variables, for each box the number should be  $q_1, q_2, q_3, \dots, q_p$ . In each box, the weight can be as following, For simple, the number  $p$  input variable should be

$$w_{p1}, w_{p2}, \dots, w_{pq_p}$$

Note as,  $w = (w_{11}, \dots, w_{1q_1}, \dots, w_{21}, \dots, w_{pq_p})$ ; So  $T = \sum_{i=1}^p q_i$

- vii. ‘Good user’ sample number is  $m$ , note as  $g^{(1)}, \dots, g^{(m)}$  the ‘Bad user’ sample  $n$ , note as  $b^{(1)}, \dots, b^{(n)}$ .

$$g^{(r)} = (g_{11}^{(r)}, \dots, g_{1q_1}^{(r)}, \dots, g_{p1}^{(r)}, \dots, g_{pq_1}^{(r)})^T \quad (1 \leq r \leq m)$$

$$b^{(r)} = (b_{11}^{(r)}, \dots, b_{1q_1}^{(r)}, \dots, b_{p1}^{(r)}, \dots, b_{pq_1}^{(r)})^T \quad (1 \leq r \leq n)$$

- viii. The ‘Good User’ density function

$$P_g = m / (m + n)$$

And the ‘Bad Users’ density function

$$P_b = n / (m + n)$$

To distinguish group A and group B users, the average trust credit of group A and group B users should have a dilemma, but the variance should be as less as possible. So, the destination function should be:

$$\max \frac{2(\bar{T}_g - \bar{T}_b)^2}{\sigma_g^2 + \sigma_b^2}$$

By using Bayesian law, we can get two limitations of the destination function,

$$P(g | T) = \frac{p_g \cdot f_g(T)}{p_g \cdot f_g(T) + p_b \cdot f_b(T)}$$

$$P(b | T) = \frac{p_{b \cdot f_b(T)}}{p_{g \cdot f_g(T)} + p_{b \cdot f_b(T)}}$$

Also,  $\ln(\text{odds}(T)) = \ln\left(\frac{p_g}{p_b}\right) + \ln\left(\frac{f_g(T)}{f_b(T)}\right)$

$$T = \ln\left(\frac{f_g(T)}{f_b(T)}\right)$$

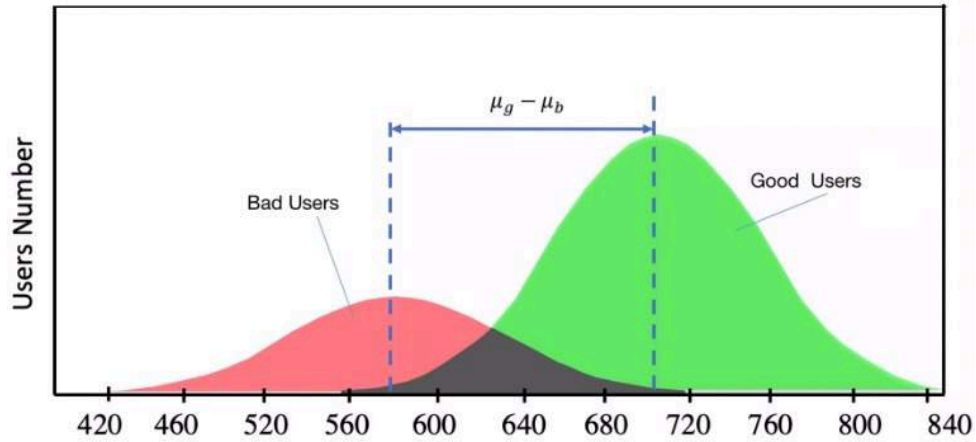
We can now conclude that the relationship of the T with  $P(g | T)$  and  $P(b | T)$ . The model we are using now can sum up as

$$\begin{aligned} & \max(\bar{T}_g - \bar{T}_b) \\ \text{s. t. } & \begin{cases} \sigma_g^2 - \sigma_b^2 = 0 \\ \bar{T}_g - \bar{T}_b = \sigma_g^2 x^2 \\ \bar{T}_g + \bar{T}_b = 0 \end{cases} \end{aligned}$$

Actually, two group of the users will not be in same number, so we can delete the limitation  $\sigma_g^2 - \sigma_b^2 = 0$ , and we should let the weight of each box less than some throttles.

So, the final limitations are here, K is the throttle. This can be showed in Picture 1.

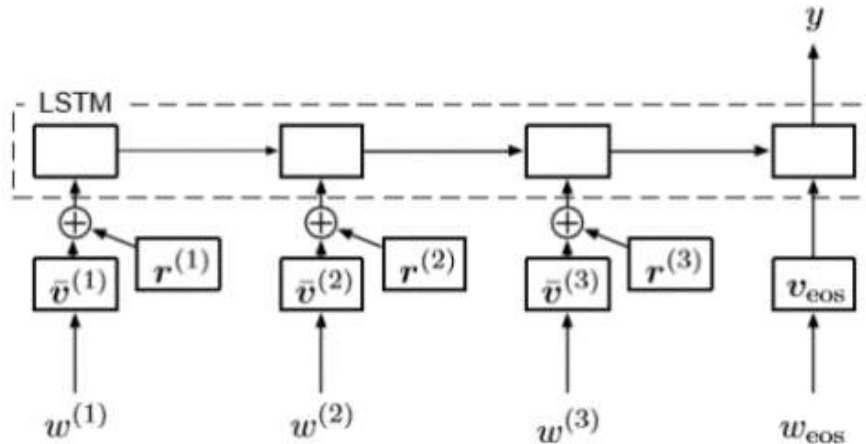
$$\begin{aligned} & \max(\bar{T}_g - \bar{T}_b) \\ \text{s. t. } & \begin{cases} \frac{\sum_{i=1}^p \sum_{j=1}^p w_{ij}^2}{A} \leq K \\ \bar{T}_g - \bar{T}_b = (\sigma_g^2 + \sigma_b^2)/2 \\ \bar{T}_g + \bar{T}_b = 0 \end{cases} \end{aligned}$$



Picture 1. Evolved mathematic model of trust credit

After the number of users surpasses 2,000, machine learning algorithm will be introduced into the user graph, which will greatly help the user classification. We will use adversarial training methods for semi-supervised text classification [1].

As the weight function above shows, we normally give users value based on past experience, but in our platform, we give that to the algorithms. We have ten initial weights, all of equal importance. These include: user's education, working experience, past activities, and relationship networks.



Picture 2. The model with perturbed embeddings

## Bonus-malus systems (BMS) System and Blockchain

In insurance, a bonus-malus system (BMS) is a system that adjusts the premium paid by a customer according to their individual claim history.[2]

Bonus is usually a discount in the premium which is given on the renewal of the policy if no claim is made in the previous year. Malus is an increase in the premium if there is a claim in the previous year. Bonus-malus systems are very common in vehicle insurance. This system is also called a no-claim discount (NCD) or no-claims bonus in Great Britain and Australia.

The fundamental principle of BMS is that the higher the claim frequency of a policyholder, the higher the insurance costs that on average are charged to the policyholder. This principle is also valid in an insurance arrangement consisting of a high maximum deductible which is common to all policyholders.

As the Bonus-malus systems is well performed in the car insurance industry, we have acquired a patent in United States (in state of patent pending) to link the BMS system with the blockchain technology.

Here we define two types of initial bonus in our system: one the registration bonus and the other the invitation bonus. After the registration process is done and after getting other users verification invitation, the user can get some CCTN. In order to send a verification request, the user needs to spend almost the same amount of CCTN. The user's information and the behaviors on the ConnectChain platform will be recorded and sent to the Trust Credits system. To avoid high gas cost during storage, IPFS will be included into the storage system. During every invitation

request, 0.1% of the CCTN will be used to maintain the CCTN network. These funds will be accumulated into a sperate CCTN pool. Every quarter, the holder of the CCTN can have rights to vote whether or not to burn all CCTN in the cost pool.

The bonus is based on the trust index system; the users and companies get high rate in the Trust Credits system will get a discount rate to buy the CCTN. The users/companies considered as “bad users”, will need to pay more to buy the Connection Tokens.

## **Implementation Considerations**

### **CONNECTCHAIN WALLETS**

We plan to distribute ConnectChain platform to mass market and common users, not only to cryptocurrency enthusiasts, our focus is on simplicity and usability. Our wallets are closely integrated with the expressed utilities of our platform.

### **INITIAL DISBURSEMENT**

The first available use-case for CCTN will be Connect Credits system in the ConnectChain platform. As a new service takes time to be proven by market, we may pursue a growth hacking strategy that includes tactics such as airdropping the first batch of users with promotional quantities of CCTN, or chatbot distribution to communities.

### **USE CASE DIVERSIFICATION**

We expect that thousands of users will accumulate small quantities of CCTN from providing verification processes within each another. The users can be able to spend their CCTN in ConnectChain platform or they can choose to sell that on exchangers. The companies and the financial institutes need to buy CCTN in order to use our verification and trust index services.

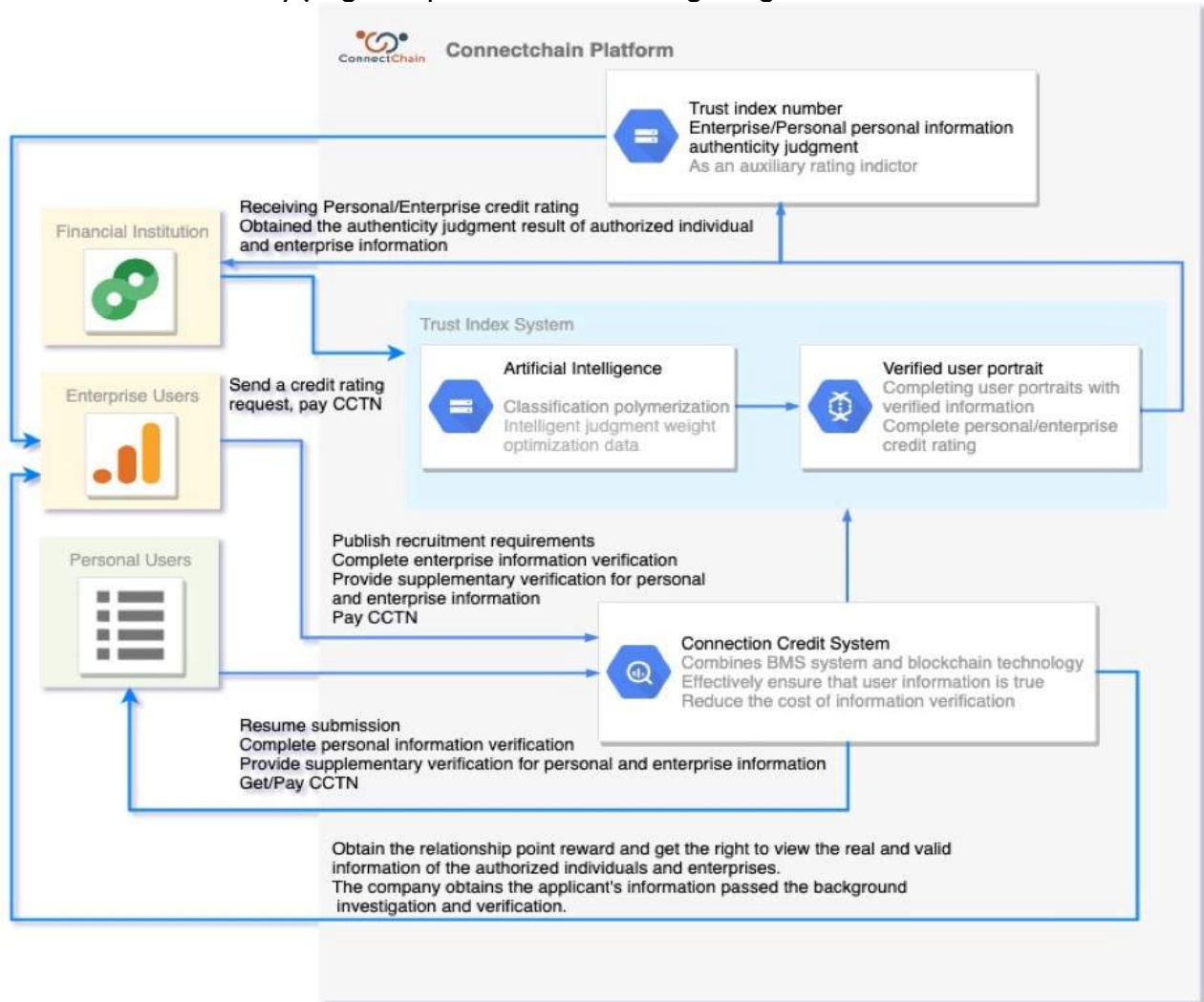
However, this is only the start of the ConnectChain story. We believe the value of the token lies in the rights and services it can give access to. In due course, we expect to publicize some new abilities for users to earn and spend tokens, and buid partnerships to increase the number of services our token holders can gain access to in order to accelerate the acceptance of our verification and trust index platform. The companies can have a low-cost way to do the verification for their applicants, can have easier way to do verification on the companies they need to cooperate with.

We expect to eventually establish a sustainable token economic cycle, as the following picture 3 described, in which the CCTN primarily by the common people and real-world enterprise users. The use of CCTN ecosystem can lead to Trust Index, an index can play a role as an auxiliary index for enterprise/personal credit rating. These can be useful for financial institutes.

Individual users can send their resume, complete their personal information, and send verification request to other users. This process costs CCTN. When users receive requests to help other users to do the verifications, they can get CCTN after completion. The enterprises

and financial institutes which need to view a lot information need to buy CCTN directly or through proxy in order to gain access to verification details

CCTN will be the oracle between the real world and the blockchain, it will help to solve the information authenticity judgment problem from the beginning.



Picture 3. CCTN Token Economy Model

## TOKEN DISTRIBUTION

- Less than 8% of the token will be released in the beginning.
- 0.13% of the token will be airdropped.
- 0.32% of the token will be sold to investors before listing to any markets.
- 92% of the token will belong to the community.

- In order to increase the value of the CCTN token, the community will vote in every year February for whether or not decrease the amount of the token.

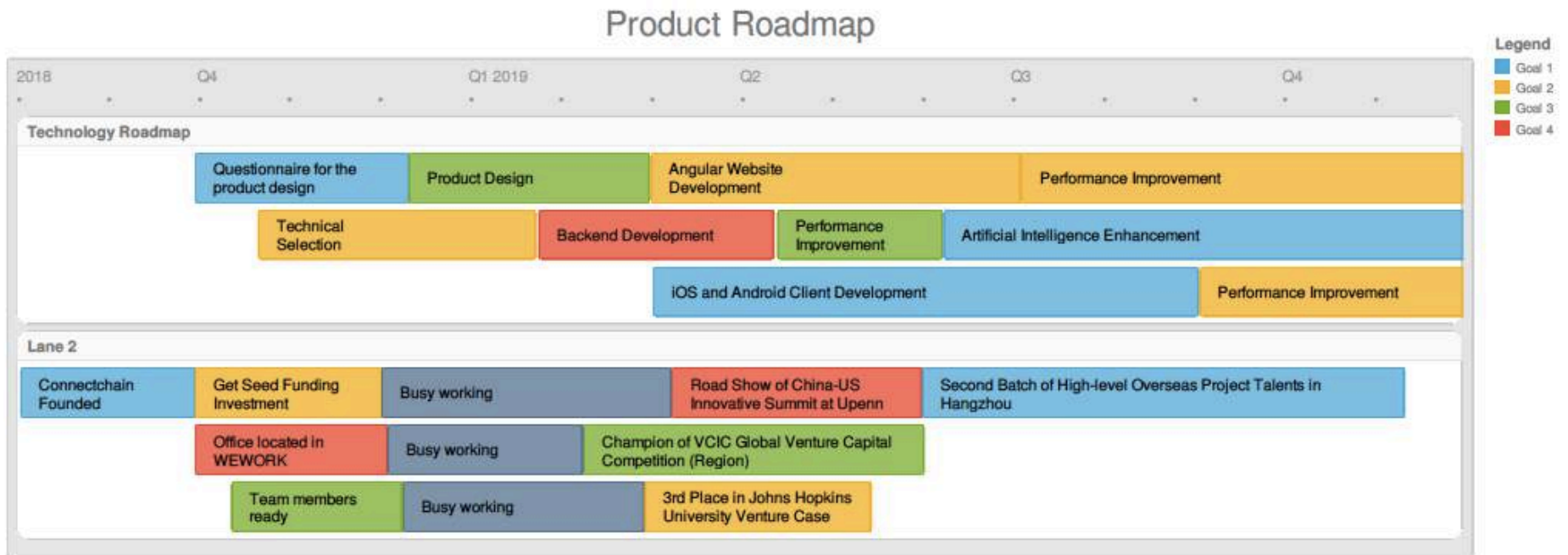
In year 2020, our community decide to decrease half of the token locked token volume. That means, 46% of the all token amount will be sent to address zero. This action will take place in 2.17 0:00 UTC.

#### COVID-19 Update:

Due to current difficulties in the hiring market globally, and our desire to expanding the usages of CCTN. We are going to E-commerce now; the first batch of the goods will be PPEs (Personal protective equipment). We know the factories making PPEs and we have customers in carrier companies, we will provide good quality and low-price PPEs to people in the USA. And we will give profit to our CCTN holders.

The profit will be used as buy back the tokens from the market, and that amount will be destroyed.

# PRODUCT ROADMAP



## REFERENCES

- [1] Dunbar, R. I. M. (1992). "Neocortex size as a constraint on group size in primates". *Journal of Human Evolution*. 22 (6): 469–493. doi:10.1016/0047-2484(92)90081-J
- [2] Yizhe Zhang, Zhe Gan, etc.,. (2017). "Adversarial Feature Matching for Text Generation". ICLR 2017, arXiv:1706.03850v3 [stat.ML]