RefugeeDo
-A Hand to the Deserving.

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Abstract—RefugeeDo is an open source decentralised work commercial centre for exiles, shelters, NGOs and legislatures. We influence blockchain and artificial intelligence to interface around 65.6 million refugees to occupations all over the planet. The abilities and properties of exiles address critical monetary potential for getting nations. Nonetheless, for this to be completely understood, very much planned endeavours by a scope of entertainers and elements are required. Artificial intelligence and Blockchain are two problematic innovations that can possibly change plans of action and affect the general public. Their coordination can prompt Decentralised AI, which empowers examination, choices and self-learning on trusted and shared information put away on the Blockchain. Independent specialists in a multi specialist climate can work together, act and make choices. Decentralised AI can assist with further developing framework execution by handling applicable information, as well as perform equal handling across hubs in view of various goals. This project audits ideas of Blockchain, AI, force of joining these two advancements, and various stages giving these capacities. This Action Plan is a result of our joint undertakings around here. It draws on broad counsels with managers and other people who assume a critical part in advancing the incorporation of refugees in neighbourhood and public work markets. We trust that the Action Plan will be educational and that it will make energy and collaborations among all worried to empower outcasts and others needing global assurance to contribute financially and take an interest all the more completely in their host social orders.

Index Terms—blockchain, artificial intelligence, smart contracts, job marketplace, refugees, decentralized application, dApp, flask, ipfs, sqlite

I. Introduction

Immigrants in general and refugees in particular are at danger for unemployment with unfavourable results on health and social well-being. Prior work has recognized a chain of obstacles stopping employment amongst immigrants and refugees. Around the world, refugee resettlement has been a bigger and more politically prominent question in recent years than at any time since World War II. Referring to the very current issue being faced by the world we all are quite aware of is the Taliban takeover of Afghanistan and the Russia-Ukraine war. This resulted in a lot of citizens moving out of the country and becoming refugees, leading them to more struggle for earning a daily bread for themselves and their families. Refugees are not often legally recognized as workers and yet, many frequently work inside refugee camps, trade and promote items and services to each other and the surrounding community. They may additionally earn coins from humanitarian agencies for short-time jobs, or develop vegetation and make crafts to promote. Refugees who stay in outdoor camps additionally work, albeit commonly without the proper to do so. Most are employed withinside the casual economy, a lot like undocumented immigrants.

Refugees have assorted financial foundations; some are profoundly taught and filled in as designers, clinical specialists or analysts prior to escaping their nation of origin. Others again have not yet finished their schooling or have a couple of long periods of tutoring, if any. This variety of profiles is both a challenge and an opportunity. Information from a 2014 special module of the European Labor Force Survey shows that tertiary-taught refugees in work in Europe were multiple times bound to be in positions beneath their proper capability level than the native-born and two times more likely than other migrants. To lessen this degree of vulnerability for bosses, their inclusion in the plan and execution of abilities appraisal devices is vital, including for the acknowledgment of its outcomes by different managers. [9]The development of online self-assessment tools could also help refugees to identify qualification gaps and available up-skilling support services.

II. Foundations

The catchphrase in today's economy is "Blockchain and Artificial Intelligence(AI)". Learning the basics of these core technologies first, the paper will explain its use in the proposed project.

A. Blockchain

Blockchain is a ”peer-to-peer” decentralised ledger technology, which gives a strategy to record and circulate information about exchanges on dispersed ”peer-to-peer” frameworks with the help of cryptography. The technology is carefully designed and reduces the expenses caused by the third party association while speeding up and reaching. Blockchain technology gives transparency and hence the ability to trace easily. In these times of extreme technical advancements, financial and other global organisations are endangered to mismanagement and duplication. This makes the requirement for blockchain that gives more prominent security and namelessness in transaction systems.

B. Ethereum

Ethereum is a blockchain based cryptocurrency system that expects to give a decentralised broadly useful PC. Its currency is called ether. The programs that run on this decentralised computer are usually referred to as smart-contracts and are consequently implemented through the blockchain approval process that is done by generally full nodes freely. Full nodes are those that download and approve the entire blockchain, these nodes try not to have to trust some other node, since they can approve the entire exchange history.

C. Flask

Flask is a web system. This implies flask gives you with devices, libraries and advances that permit you to assemble a web application. This web application can be web pages, a blog, a wiki or go as an online schedule application or a business site. Flask is a lightweight web application system written in Python furthermore, based on the WSGI tool compartment and Jinja2 format motor. Flask is important for the Categories of the microframework. Miniature structures regularly outline work with next to zero conditions to outside libraries. a) Features of Flask: (I). Coordinated upholds for Unit Testing (ii). Utilises Jinja2 Templating (iii). Upholds for secure cookies (iv). Broad documentation (v). Engine compatibility with Google app (vi). Relaxing solicitation dispatching

D. The InterPlanetary File System (IPFS)

The InterPlanetary File System (IPFS) is a shared dispersed file system that looks to connect all computing devices with a similar system of files. Although IPFS is like the Web, IPFS should have been visible as a solitary BitTorrent swarm, trading objects inside one Git archive. As such, IPFS gives a high throughput content-tended to hinder capacity model, with content-addressed hyperlinks. This frames a summed up Merkle DAG, an information structure whereupon one can fabricate formed file systems, blockchains, and, surprisingly, a Permanent Web. IPFS consolidates a disseminated hashtable, a boosted block trade, and a self-affirming namespace. IPFS has no single weak spot, and hubs don’t have to trust one another.

E. Smart contracts

Blockchain and its related applications like smart contracts have changed the standard and traditional methods of business activities and changed the enterprises. The essential utilisation of blockchain-based advancements should be visible in the monetary areas. Notwithstanding, it has seen a flood of utilisation additionally in the Pharma area, Internet of Things (IoT), public administrations, notoriety framework, and smart contracts. Blockchain can likewise be considered as a public record, and all the exchanges that happen inside the blockchain are put away in the block or the list of records. This chain of record therefore grows as per the new block arrival.

F. How Artificial Intelligence and Blockchain complements each other

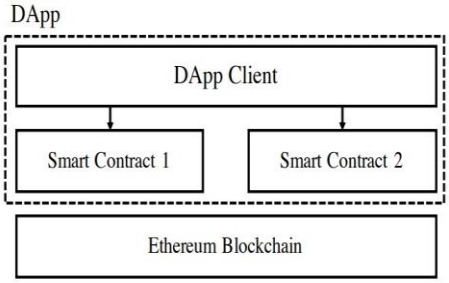
Contrary to the previous literature, we accept that it is important to present a third class of use cases to give an exact classification of the blend possibilities. As Erik Karger in his research [3] correctly talks about [12] Markopoulos et al. describing an approach using AI and blockchain in combination in the human resources management context (Markopoulos et al. 2020). This work’s starting point is the Democratic Teaming Model (DTM) aimed at selecting project personnel democratically. However, this model depends on the many different skills of the team builder, who is the sole decision maker. Markopoulos et al. elaborate how both AI and blockchain hold a promise of potential gains for the DTM. By including expert systems, the organization can obtain recommendations on how teams should be composed. The expert system can use various types of employee data, such as their interests, experiences, or past activities. The blockchain can support this further by securing the data feed and transactions to optimize the analytical output.
Erik also mentions in his paper that [11] Ladia (2020) also addresses the issue of companies unable to share data with one another for privacy reasons. This is a huge disadvantage, because machine learning models benefit from additional training data. This author presents a blockchain-based implementation allowing the training of machine learning models without compromising privacy as a solution. In this approach, the blockchain handles the joint ownership and control of a training machine. This training machine acts as an independent, secure container that receives training data and untrained models as input.

The training machine trains the respective model internally and returns the trained model as output. To ensure maximum safety, the data are not visible to any other party and are automatically deleted after the training process (Ladia 2020). Li et al. (2019) also present an approach based on blockchain and automated machine learning (AutoML) for an open and automated customer service. The starting point here is data collected by IoT devices during customer service. These data can be traded in an open, but secure, way with the blockchain. Hence all things considered, AI and blockchain complement each other, make totally new applications.

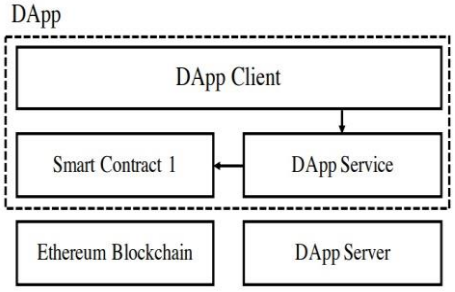
G. Decentralised Applications(dApps) using blockchain

Ethereum blockchain gives computation and storage capabilities by means of the system of smart contracts. Thus, Ethereum DApps can convey smart contracts to utilise the capacities given by Ethereum to execute business rationales. In principle, every one of the cycles and information of a blockchain-based DApp ought to be dealt with and put away on the blockchain for unadulterated decentralisation. In any case, because of the presentation bottleneck of state-of-the-art blockchain systems, current DApps normally execute just pieces of their usefulness on the blockchain. Thus, three sorts of models are taken on by Ethereum DApps by direct, indirect and mixed.

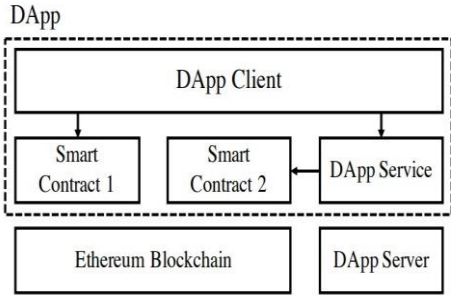
As shown below, for DApps of the direct architecture refer Figure 1a, the client straightforwardly cooperates with smart contracts deployed on Ethereum. DApps of the indirect architecture refer Figure 1b have back-end administrations running on an incorporated server, and the client communicates with smart contracts through the server. DApps of the mixed architecture refer Figure 1c consolidates the going before two designs where the client collaborates with smart contracts both straightforwardly and by implication through a backend server. All the figures are referred from Wu, Kaidong's paper "A first look at blockchain-based decentralized applications." [13]



(a) Direct Architecture [13]



(b) Indirect Architecture [13]



(c) Mixed Architecture [13]

Fig. 1: Three kinds of DApp architectures.

III. METHODS

A. Frontend

For the frontend of the platform will comprise of a UI for

• Login/ SignUp or Registration page •

Respective user pages comprising of :

- Resumes and other personal and additional details
- A job search section
- Past records of the jobs they applied for using the application with details.
- Settings to manually change according to user preferences.
- Report or a feedback section for any inconveniences happening to them.

The scripts and templating engines used for designing the platform are Javascript, Cascading Style Sheets(CSS), HyperText Markup Language (HTML), Bootstrap and Flask for better performances and adaptation to the environment.

B. Backend

The core language used for creating the platform is Python. Python's virtual environment feature helps the other tools to work efficiently and smoothly. Ethereum Smart Contracts is used to create all the smartcontracts for the users. We use DApps of the mixed architecture which

consolidates the going before two designs where the client collaborates with smart contracts both straightforwardly and by implication through a backend server. Refering the below figure will help understand this architecture better.

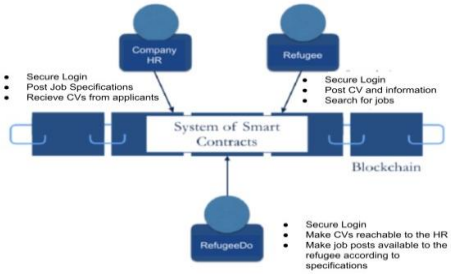


Fig. 2: Working of Decentralized Job market For Refugees using Blockchain and Smart Contracts

C. Deployment and database

1) The InterPlanetary File System (IPFS) :

- Posted positions by managers are put away utilising IPFS to guarantee the originality of the information. While client personality, application of jobs, business focuses, appraisals are completely put away using Ethereum smart contracts to guarantee that the data is carefully designed.
- The blockchain might be a decentralised execution of a distributed ledger that records a gathering of exchanges produced by different clients.
- Ethereum is a famous blockchain that advances the occasion of decentralised applications.
- A Decentralised Autonomous Organisation, a virtual substance overseen by smart contracts and executed during a decentralised way. The utilisation of the Ethereum blockchain suggests that the association state is kept up with by an agreement system in which contracts are wont to execute exchanges, money streams, rules and privileges within the association. After a DAO code is sent, individuals can cooperate through smart contracts and exchanges can be finished utilising Ether/Tezos.

2) SQLite:

- SQLite is an open-source best SQL data set with an integrated relational database management system. A top database requires no arrangement and doesn't need a server or establishment. Notwithstanding its straightforwardness, it contains many regularly utilized information base administration system programming functionalities to be utilized in mobile web development like react native. SQLite is an installed, non clientserver, ACID compliant relational database system. It is reasonable to be installed as a nearby information base in the blockchain hubs.

The figure below expresses the overview of how the refugees and employers are connected to eachother via the platform RefugeeDo provides. As also mentioned earlier above, the provider as well as the employees are gifted points based on their behaviors and/or complaints.

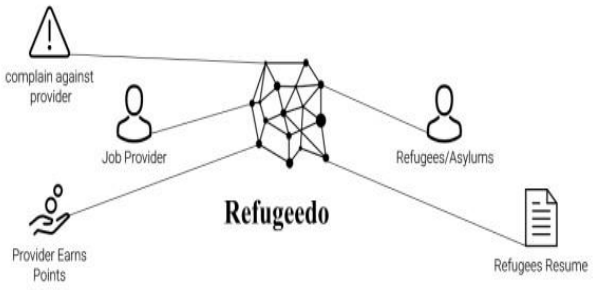


Fig. 3: Overview of the system

IV. RESULTS

The UI of the project looks something like in this flow:

Fig. 4: Registration link on the Home Page

Starting with the welcome page which contains all the ways to register, sign up and login into the application. It also provides information contained in itself for user ease. Lets start reviewing each one:

Fig. 5: Join Us link on the Home Page

A. Forms

- Registration Form: Starting with the registration page; this is a form only for the refugees. It provides the user with a userfriendly interface guiding them to fill up the registration form containing their details. As soon as the user registers, a flash message is displayed notifying the user of their validation. The details are all safe and to provide more security, the passwords that the user enters are all stored in hashed format in the database.

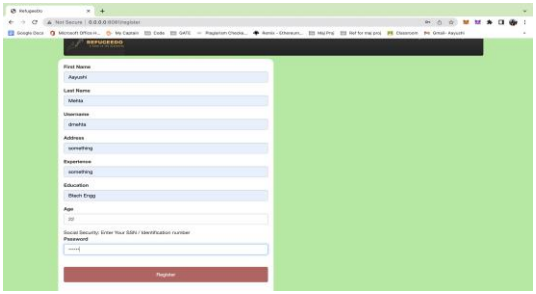


Fig. 6: Register

- Join Us Form: Scrolling down on the home page one can find the 'Join Us' button. This is a section dedicated to only employers which allows them to post jobs and create opportunities for the refugees.

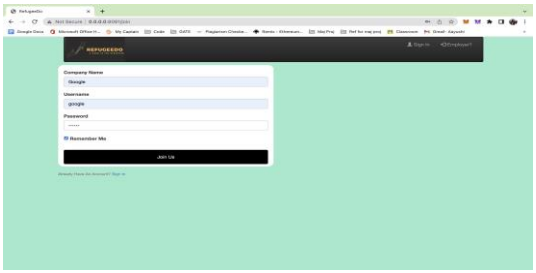


Fig. 7: Join Us Page

- Login/Sign In Form: All the users; refugees or the employers can signin using this form which only requires their username and password.

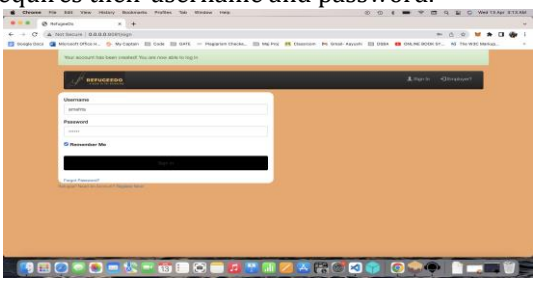


Fig. 8: Login Page

B. User Pages

Starting with the refugee side application.

- Dashboard: The dashboard displays the details about the refugee i.e for an instance the details of the jobs they have completed, etc.

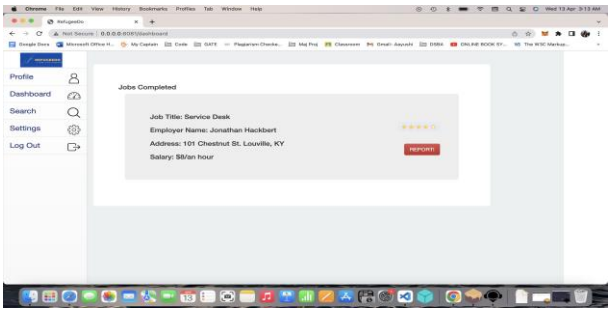


Fig. 9: Dashboard Page

- The job search page is from where the refugees can connect to the jobs. They can choose from whatever job they wish to apply and if their criteria matches they can apply.

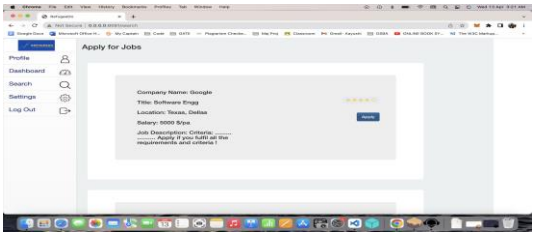


Fig. 10: Job Search Page

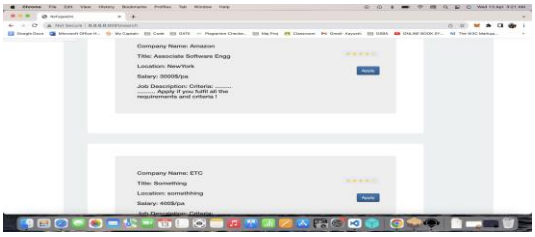


Fig. 11: Job Search Page

NOTE: These are the jobs that the employers posted through the application only! After an application of the job, the user is notified of their successful application making them rest assured.

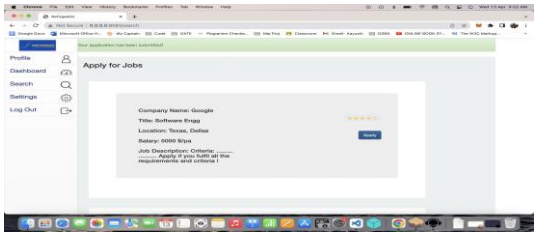


Fig. 12: Application Successfully Submitted

- Settings: The settings page allows users to make basic changes if required. This page remains same for both (refugees and employers).

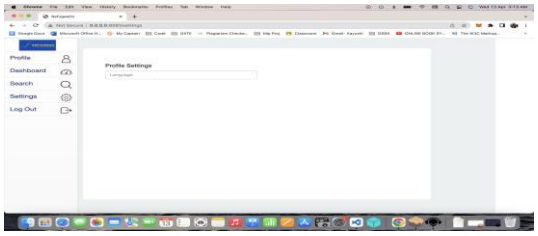


Fig. 13: Settings Page

Now going through the employer side of the application:

- Profile Page: This is a basic profile page for the user.

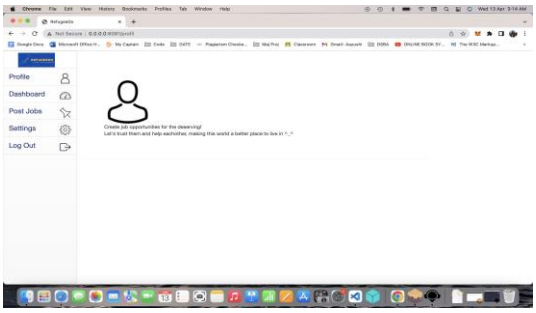


Fig. 14: Employer's Profile Page

- Dashboard: The dashboard displays the points recieved as an employer and the number of jobs they have provided uptil then.

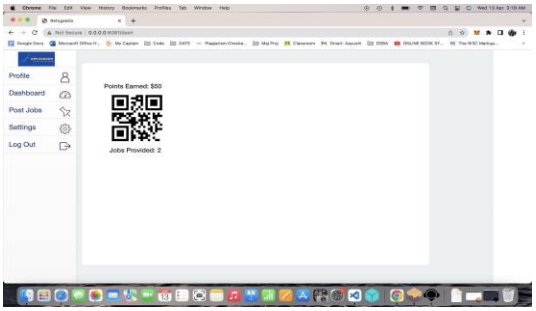


Fig. 15: Dashboard Page

- Post Jobs: This is the section which is very important for the refugees. As without the posted jobs they won't be able to join any companies. This is a form which the employers need to fill up the details with. They need to provide details of their organisation and about the job posting as well in the job description section. A success message is flashed with every successful postings.

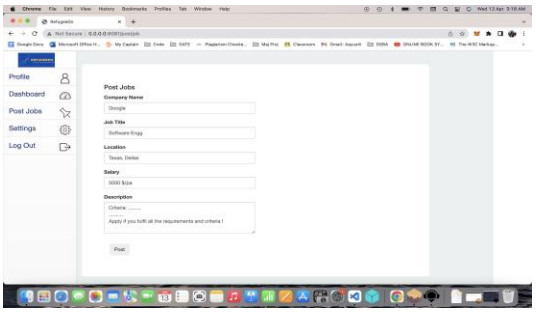


Fig. 16: Post Jobs Page

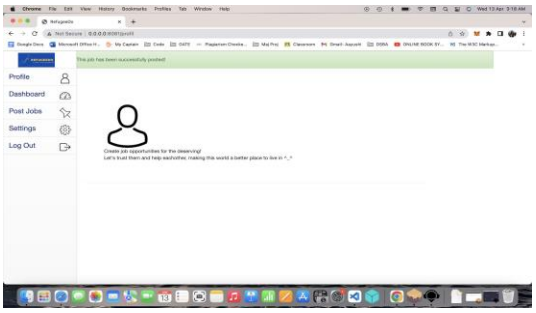


Fig. 17: Job Successfully Posted

Using these forms and UI of the application, refugees and employers can both be rest assured of their credentials as they are stored in an IPFS system, also all the passwords are encrypted in a hashed format to reduce threats and other issues.

V. Conclusion

Joblessness among refugees is viewed by certain researchers as an issue of abilities. Helping refugees in their work looking for process in the gig market requires a center more extensive than seeing business records and securing and filling position opportunities. Our discoveries recommend the deficiencies of result based assistance arrangement, which was viewed by members as for the most part insufficient. In any case, they tracked down the administrations helpful in creating interpersonal organizations, in any event, when these administrations didn't straightforwardly lead them to work. Specialist organizations faired better in the perspective on these refugees in their handiness past business preparing than they did corresponding to their particular reason: helping individuals to secure positions. We can, accordingly, infer that specialist organizations and outcast work searchers don't meet in their separate objectives. What's more, the application RefugeeDo is tied in with destroying those lacks of concern and imperfections in the framework by interfacing the refugees and the employers straightforwardly to one another by means of the dapp. Consequently, blockchain technology gives straightforwardness and subsequently the capacity to effortlessly follow. In these seasons of outrageous specialized headways, monetary and other worldwide associations are jeopardized to bungle and duplication. RefugeeDo use IPFS and Smart contracts. Posted positions by employers are put away utilizing IPFS to guarantee the character of the data. while exile character, utilization of occupations, business focuses, evaluations are completely put away utilizing Ethereum smart contract to guarantee that the data is carefully designed. So lets conclude this by saying and trying to stop the involvement of third parties between these innocent souls by using the technology which awaits us.

References

[1] Ali Alkhajeh. Blockchain and Smart Contracts: The Need for Better Education. Rochester Institute of Technology, 2020.

[2] Roberto M Fernandez. Creating connections for the disadvantaged: Networks and labor market intermediaries at the hiring interface. 2010.

[3] Erik Karger. Combining blockchain and artificial intelligence-literature review and state of the art. In ICIS, 2020.

[4] RYA G. KUEWOR. Refugee camps are micro economies becoming cryptocurrency hubs. 2021.

[5] Rya G. Kuewor. Why financial inclusion is key to integrating and empowering refugees. 2021.

[6] Matteo Nardini, Sven Helmer, Nabil El Ioini, and Claus Pahl. A blockchainbased decentralized electronic marketplace for computing resources. SN Computer Science, 1(5):1–24, 2020.

[7] Nishara Nizamuddin, Haya R Hasan, and Khaled Salah. Ipfs-blockchainbased authenticity of online publications. In International Conference on Blockchain, pages 199–212. Springer, 2018.

[8] United Nations Conference on Trade and Development. Policy guide on entrepreneurship for migrants and refugees. 2018.

[9] Mirko Zichichi, Michele Contu, Stefano Ferretti, and Gabriele D'Angelo. Likestarter: a smart-contract based social dao for crowdfunding. In IEEE INFOCOM 2019-IEEE Conference on Computer Communications Workshops(INFOCOM WKSHPS), pages 313–318. IEEE, 2019.

[10] UNHCR-OECD. Engaging with employers in the hiring of refugees. 2018

[11] Ladia, Aman. "Privacy centric collaborative machine learning model training via blockchain." International Congress on Blockchain and Applications. Springer, Cham, 2019.

[12] Markopoulos, Evangelos, et al. "Artificial intelligence and blockchain technology adaptation for human resources democratic ergonomization on team management." International Conference on Human Systems Engineering and Design: Future Trends and Applications. Springer, Cham, 2019.

[13] Wu, Kaidong, et al. "A first look at blockchain-based decentralized applications." Software: Practice and Experience 51.10 (2021): 20332050.