Register as a tool to fight utility NFT rug pull

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Abstract— **Along with the enormous popularity of NFTs (non-fungible tokens) in the last years came scams and frauds. Rug pull happens when originators of a project raise the capital from the sale of tokens and then do not deliver NFT because they never intended to. This paper is a case study of an attempt to fight utility NFT rug pull. It analysis the NFTsReg project and emphasizes the benefits that interested parties gain from such a project. The results show that introducing a register of utility NFTs and verification of the authenticity of the project and project stuff increases the reliability of the project, and hence adds value for all participants in the process. Additional tools promote building long-term relationship between project owners and investors encouraging the quest for quality utility NFT projects. The sources of financing register are membership fee and a fee for additional services provided by the register chargeable to both investors and project owners.**

Keywords - scam prevention, utility NFT project verification, utility NFT investor, NFTsReg

I. INTRODUCTION

NFT is first introduced in 2017 and gained huge popularity since then. In 2021. the value of all NFT transactions was $17.6 billion, compared to $82.5 million in 2020. Most of this amount, almost $8.5 billion, was spent on collectibles, while utility NFT made more than $530 million. Some analysts predict that the total value of transactions will go up to $80 billion by 2025 [5].

NFT is unique digital representation of a digital or physical asset [14]. It is not fungible, meaning that every token has its unique value, making it impossible to replace two NFTs with each other. They represent a whole unit and cannot be broken into pieces or combined [7]. Through blockchain technology each NFT is registered in a general ledger which gives the possessor of the NFT a rank of the owner [11]. It is based on ERC-721 standard which extends the common interface to ensure uniqueness and thus tokenization of individual assets. In practice, this provides a lot of ideas on how to employ NFT technology in a variety of use cases. Some of them are tokenization of educational certificates, copyright enforcement, supply chain tracking etc [12]. At the present, NFTs are most often used for presentation of ownership of objects such as art, songs, newspaper articles, videos [2], and collectibles

[3]. Despite this kind of prevalence in practice, there are very little peer-reviewed studies in this area [12].

The value of NFT comes from its uniqueness and scarcity. Utility NFT is NFT whose valuation is based on access to some underlying asset and opportunity which they provide to its owner. This means that they have their intrinsic value in addition to the scarcity [13]. Scarcity adds to their attractiveness for collectors and investors [6], while utility part of NFT provides product or service which is of interest to the NFT owner. Scarcity is guaranteed by the Smart Contract algorithm since it can limit the maximum number of tokens available. On the other hand, the connection between token and real asset or service is dependent on trust outside the blockchain [15].

Since the market is not regulated, anybody can create NFT from virtually nothing. Considering the worth of the market, it can be expected that there will be a lot of bad tokens created with the intention of fraud. There are a lot of scam schemes in NFT market: rug pull, pump-and-dump, wash trading, Ponzi scheme, hacking, phishing [4]. This paper deals with rug pull which happens when originator of a NFT project raises the capital from the token sale and then disappears. The important fact is that the originator never had an intention to fulfill their obligation and deliver utility NFT after the project completion. There is simple rug pull, sell rug pull or Smart Contract Trap door rug pull. In reality, in order to execute rug pull several different techniques are executed, usually combined with phishing attacks and pump-and-dump schemes [8].

Investor usually cannot recover his money, nor the fraudster can be caught because these kind of NFT is often anonymous. One such fraud happened in February 2022. when the creators of the Big Daddy Ape Club NFT collection took $1.3 million from investors but delivered no NFT [10]. Another big rug pull happened also in 2022. when creators of Frosties project gone away with $1.1 million of investor's money. It is estimated that the total amount investors lost due to rug pull in 2021. was $2.8 billion [1]. Such development in the market might lead to decrease of the sources of financing and bursting of current bubble, since the investors will abandon risky market. In order to avoid scam, investors must carefully research target projects. Scam project are usually small projects with low

liquidity, small community of overhyped buyers and anonymity of the project ownership [16]. These signs should raise red flag signal for investors. In addition to anonymity, one of the aggravating facts in estimating if the utility NFT project is scam is the lack of the centralized information about issuers of NFT which would make their authentication and validation easier. Because of that, more investigation is required on the side of investor which usually misses important information. Register of utility NFT issuers could reduce validation time and improve the quality of information available to investors [17]. At the same time, the benefits which NFT issuers gain from their projects will increase, since they will be well-suited for investor's requirements.

The remainder of the paper is structured as follows: Methodology section outlines the methodological approach taken in this research and states research questions. Chapter Results and implications describe the features, processes and architecture of the project under examination. Finally, chapters Discussion and Conclusion give an overview of the results of the research, point out the main findings and limitations of the research and propose the future direction of the research.

II. METHODOLOGY

With the respect to the goal and the type of the data collected, this research is descriptive and qualitative. The main goal of the research is to explore the project aimed to raise the level of confidence in legitimacy of utility NFT projects. The project which is the subject of this research is still being developed and is expected to be operational soon. This research covers the basic ideas implemented during the project development.

Preliminary research showed that a centralized register was implemented in some other areas of e-business. Literature review shows that there are ideas on how to employ register with the goal of raising information quality, but no case study which deals with the implementation details of such register was found. This indicated the research gap.

This research aims to answer the following research questions:

1. What is the expected benefit of having register of utility NFT projects?
2. What is the structure of the register and how it works?

In order to answer these questions case study was conducted on the project called NFTsReg[1]. It was analyzed based on publicly available data and insight into the project documentation, which included the feasibility study and software documentation.

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[1] NFTsReg is a project aimed to build the register of utility NFT projects found at www.nftsreg.com

III. RESULTS AND IMPLICATIONS

NFTsReg is a register of utility NFT projects whose goal is to raise the level of confidence on investors' side that the project is not fake. This is done by keeping database of records of projects, their owners and team members and their verification. In this process a lot of additional information about NFT is disclosed, which makes investors more confident about the reliability of the project owner and legitimacy of the project.

There are two kinds of stakeholders in the process: project owners and investors. Project owners are interested in registering, disclosing information and being verified because that makes their project more attractive to investors. In order to get verified, project owners are obliged to disclose all information which is relevant to making financial decisions. They are also required to keep that information up to date. This includes the following information:

- project name and description
- project stakeholders
- project roadmap or plan
- links to the project site, Twitter community, and other communities, if they exist
- personal details about project owner and project manager
- personal information, biographies, and even images of the key people engaged in the project
- current status of the project with the obligation to update it whenever important project event happens
- any other information important for the investor to make informed investment decision.

Investors are looking for the opportunity to safely invest their money with profit. In order to do it, they need a lot of information which will remove uncertainty. As a member of the register, investor gets access to the extended set of information of a utility NFT project which is not available to the public. In addition, they can build closer relationship with the project owner and hence obtain insight into project management process.

The purpose of the register is to protect the investors by avoiding anonymity, which is one of the main culprits for rug pull. On the other hand, registered project owners should be able to protect and advance their business interests without disclosing sensitive business and technical information. Investors may obtain such information directly from the project owners, but the register does not participate in that process directly.

In this relation, NFTsReg acts as an independent intermediary whose role is to keep database of records related to the ongoing utility NFT projects, as well as historical record of the owner's performance in the past. Making this information centralized and easily available to the interested parties, NFTsReg adds value in the mediation process. The relationship between three parties included in register is shown in the Fig. 1.
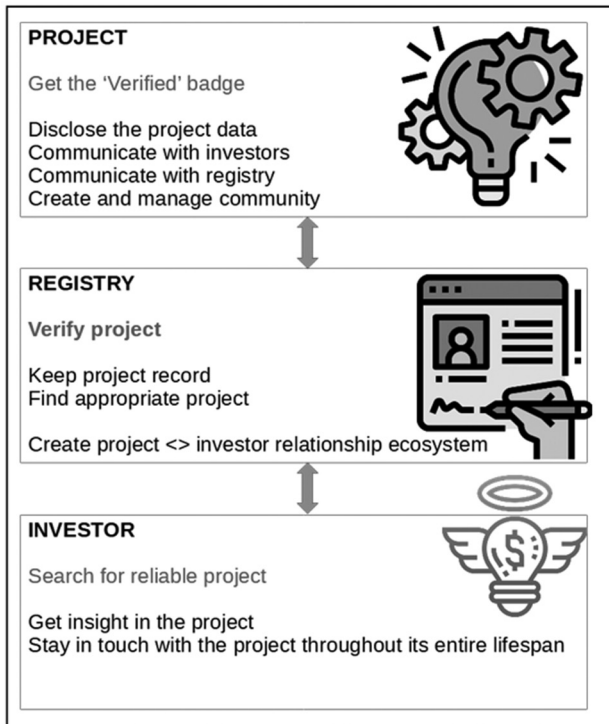
Fig. 1. Processes of NFTsReg register

In the Fig. 1 there are two sides of the process each corresponding to the roles of the register members. The project owner fills in the data about their projects, disclosing all relevant information of the NFT project. This information is available to the investor side of the register through web interface. They can search the projects and make a contact with the selected project owners. Keeping the relationship with project owners enables investors to keep track about progress of the project and gain even deeper insight into the project development, management and its market potential.

Although the centralization of the information produces the value for both parties, the key process which NFTsReg provide is the verification of the project. In addition, NFTsReg makes periodical audits of the information ensuring that the data is up to date. This strengthening of the legitimacy of project is done in several ways:

- contacting project owners in person through video meetings
- verifying facts about the project using machine learning tools and publicly available tools such as Token Sniffer[2], Rug Doctor[3], Etherscan[4], Binance Smart Chain Explorer[5] and others., which help detecting rug pull by doing automatic audit of token by analyzing their smart contract, holders and liquidity in search for common signs of malicious behavior, by maintaining the list of known scams and by enabling tracking of transactions made with token
- analyzing the history record of the project owners if any

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[2] https://tokensniffer.com
[3] https://rugdoc.io
[4] https://etherscan.io
[5] https://www.bscscan.com

in the database
- checking if the asset underlying utility NFT really exists
- exploring and analyzing the content and activity of the communities created around the project
- using information about key project personal collected from the investors in the past
- forcing the disclosure of information about the project upon investors request
- using other available information.

Upon successful verification, both project and its stakeholders will get a badge 'Verified' which is the highest status meaning that the project owner is reliable, and the project is a legitimate utility NFT project. Permanent monitoring and periodical checkups made by NFTsReg should contribute to the reliability of the data disclosed. If, during the monitoring process irregularities appear, NFTsReg will inform the interested parties and lower the status of the project or project stakeholders.

From the technical point of view, NFTsReg consists of two software layers. This structure is accompanied by human team responsible for contacting project owners and verifying their information in person. Fig. 2 shows the architecture of NFTsReg.
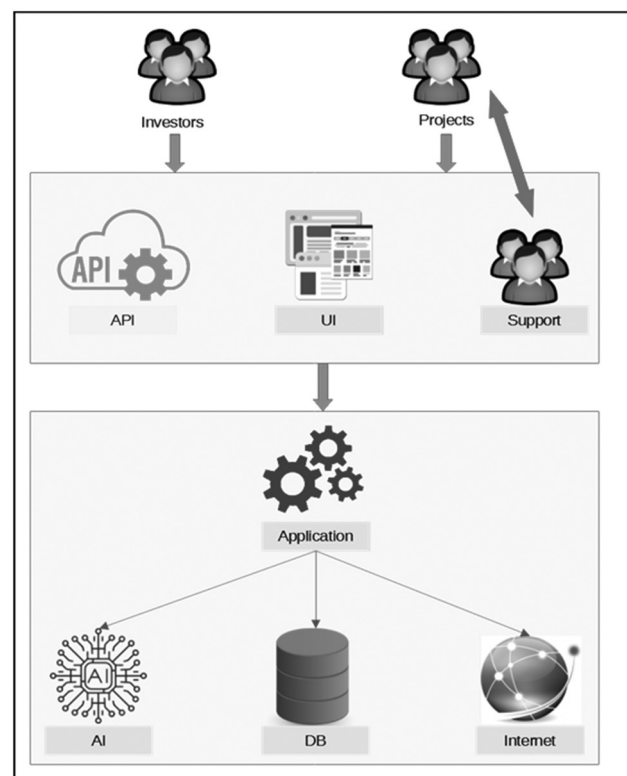

Fig. 2. The architecture of NFTsReg register

Top layer of NFTsReg is responsible for interaction between users and the register. This function is accomplished using standard web technologies which enable users to enter required information and get the search results. Important part of this layer is a subsystem responsible for communication between project owners and investors. Tools for direct communication between two parties are aimed

to raise the level of trust between them. Another important component is API through which NFTsReg delivers information to the users and the network of registered project sites as well. This is particularly useful for the delivery of verification badge to the project site. The badge serves as a prove that the project has been verified and the owners are not fake. From the perspective of NFTsReg the badge also offers means for reaching public and thus gaining new utility NFT projects and investors. Investors can subscribe to the services for dispatching news about project updates and upcoming projects. Allowing investors to follow particular person enables them to closely monitor their activity and build long term relationship with the most trusted of them. All of these are aimed at providing investors and project owners with platform which will provide all tools to enjoy the benefits of project-investors ecosystem.

Bottom layer is comprised of software components which enable NFTsReg to deliver the answers to user requests and support the process of verification. Its main parts are application layer and database where the records are stored. Very important part of the application layer is the connection to machine learning services used for validation of project information. These services can provide analysis of the collected data, or some other important information. For example, one such service is Twitter's software which confirms account authenticity.

Special part of the register is a team responsible for manual verification of the data. Although most of the information can be verified from the combination of data obtained from internet and machine learning algorithm, face-to-face interaction between register and project owners can bring key additional value to the register. On the other hand, this puts more responsibility to honest and diligent work of the human component of the register.

Employing human team for verification raises the costs of the register. Looking at the benefits provided, it is reasonable to expect that the members of the registers are willing to pay for its services. That is why NFTsReg plans to earn income from both project owners and investors in the form of:

- membership fee which both sides will pay on the monthly basis
- charge for regular project audit collected from the investors and
- fee for extraordinary information or audit activities required from investors.

IV. DISCUSSION

The goal of the NFTsReg project is to raise the confidence level of investors to the legitimacy of utility NFT project. At the same time, the greater transparency of the projects is achieved, which benefits to the project owners too. Reducing the investor's fear from the fraud will inevitably raise the probabilities for getting finance for new projects and raise the price of the existing ones.

NFTsReg accomplishes these tasks by creating centralized database of utility NFT projects and verifying project owners. The register is built as a platform around the database offering additional services which provide benefits to both sides in the process. In addition to standard functionalities expected from the similar software, NFTsReg offers tools for building relationship between project owners and investors.

The architecture of NFTsReg has two main components. Front-end layer enables interested parties to communicate with the register and with each other. Back-end layer consists of software and human component. Software layer contains database and programs which manage the data, while human components give additional assurance to investors that the data in the database is reliable and up to date. The NFTsReg team is responsible for face-to-face verification of the utility NFT project's stuff, as well as assurance that the underlying asset really exists.

Searching the internet, it is possible to find several similar solutions in other areas aimed at the same goal. One of them is CrypTalk[6] which is built with the idea of preventing fake projects, profiles and communication channels in the area of crypto social messaging. Others like Token Sniffer and Rug Doctor check the blockchain in search for suspicious activity. The tools like Etherscan enable investors to search the blockchain themselves. NFTsReg strives to make the best of these available tools by helping investors to avoid possibly hard and technically demanding task. NFTsReg contributes to research process by providing another layer of audit and, in addition, by providing tools for building long term relationship between investors and project owner.

The main stakeholders and their benefits of using the proposed solution are shown in the table 1 [9].

In addition to the benefits to the stakeholders there are benefits general to the market. Centralized register of utility NFT projects plays stabilizing role on the market. Knowing that there is verified utility NFT project and a mechanism to permanently monitor its development will by itself act discouraging to the scammers. At the same time, it will attract the investors who want safe investment and honest project owners who need investing for their promising idea. This can inspire a new development in the market which otherwise, if lacking confidence and the trust of investors, can vanish under the pressure of fraudsters.

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[6] https://www.cryptalk.app

Table 1. Stakeholder benefits

Stakeholder	Benefit
Project owners	Gaining investors' trust
	Easier raising of funds
	Connecting to the investors community built around the register
	Protection of the business
	Creation of greater interest for the project
	Helps building brand identity
Investors	Increase the level of trust to the utility NFT project
	Gain insight into projects in one place
	Get historical information on project owners and team members
	Get independent validation of project owners and team members
	Learn project ratings from the community
	Identify and build long term relationship with prosperous and successful project owners

V. CONCLUSION

The results of this case study suggest that there is a potential for this kind of idea to lower the rate of rug pulls in the utility NFT market. Disclosing information about the projects reduces the chances for fraudsters. Centralization of the information enables potential investors to easily obtain information about their intended investments. Facilitating the relationship between project owners and investors raise the level of trust and stability of the market.

The architecture of the system is flexible and enables creation of different business models. Among others, it is possible to expand the project by adding different modules which will utilize additional functionalities, creating full project-investor ecosystem.

One case study cannot provide definite conclusion on the effects of the proposed validation method. Besides, the NFTsReg project is in its starting phase, so there is no data to prove that this kind of solution can have major influence on reducing the scam rate. More projects like this should be kept track of during the longer period of time in order to generate enough data to make definitive conclusion.

In the future, if the NFT market continues to grow as it did in the last 4 years, we can expect to see new scam schemes together with existing ones. In that scenario, new defensive mechanisms will be needed. In that sense, this research presents one small step in the ongoing struggle. In addition, exploring the full ecosystem for managing project owner - investor relations can contribute to further development of the utility NFTs market.

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