
Magnet Link Billboard

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Contents

GitHub Repository Link	ii
Abstract	1
1 Introduction	2
2 Background	4
2.1 Magnet Link	4
2.2 Blockchain	5
3 Architecture	7
3.1 Smart Contract	7
3.1.1 Basic Function	8
3.1.2 Ether Transaction	9
3.1.3 Constraints	9
3.2 Truffle Framework	10
3.3 React Framework	10
4 User Workflow	12
4.1 Upload Seed	12
4.2 Download Seed	13
4.3 Endorse	15
4.4 Check User Seed	16
5 Conclusion	17
6 Future Work	18
6.1 Improvement on Resources Storage	18
6.2 Improvement on Platform Architecture	19
6.3 Improvement on Resource Sharing	20
References	22

GitHub Repository Link

Please [click here to see our work on the GitHub Repository](#). Our GitHub Repository contains the smart contract code, test code, and the code for building the front end of our decentralized application. The whole project is programmed in Solidity, JavaScript, and React.js.

Abstract

File transmission is a significant functionality on the Internet field. This leads numerous file-sharing sites to arise on the network community. The current commonly used technique for file dissemination, which is the Uniform Resource Locator link, suffers from document migration. That means if the owner of the file transfer to document to another location, the other users on the network can no longer have access to that resource via the previous link. This brings the magnet link into discussion, which is a content-based link and independent of the resource location. On this paper, we propose to build a magnet link billboard, which is a peer-to-peer (P2P) platform that shares documents via the scheme of magnet Uniform Resource Identifier (URI). Each document on the platform is considered as a seed. The user can act as a writer and contribute to the magnet link billboard by uploading seeds. Also, the user can become a visitor to the platform by browsing, downloading, or endorsing the seeds on the billboard. Since the blockchain technology is involved in this work, the uploading or downloading history of each user is traceable. The back-end of the magnet link billboard is a smart contract, which guarantees the trustworthy transactions of digital assets and constraints some operations on the online platform.

1 Introduction

As the development of the 5G network is rolling out, transferring digital resources via the Internet is popularizing around the communities. In addition, a recent shift towards remote teaching and online learning is placing more emphasis on document transmission. The most common way to accomplish the dissemination of digital files is utilizing the Uniform Resource Locator link (also known as URL link). But the URL link is location-based and highly depends on the server tracker. In other words, if the owner of the file migrates the document to another location on the network, the previous URL link is no longer referencing to the document, and thus the link is invalid to other users on the Internet, which is considered as a potential drawback of the URL link.

In order to overcome the downside of the URL link, some researchers bring the magnet link to the table. According to [1], the magnet link is in the format of magnet URI scheme and is the standard way for recognizing files by their content, via encrypted hash value rather than the file location. That means the network users is still accessible to the document, even though the owner transfers the file to another location.

Over the years, many scholars have committed to working on the field of magnet link. [2] proves the magnet link is outperforming in terms of data resiliency and security. [3] puts forward a public online platform, and the platform utilizes the magnet link to help network users maintain bookmarks and web quotes they collect from the Internet. [4] suggests integrate distributed hash tables (DHT) into the magnet URI scheme. Incorporated with the decentralized DHT, the magnet link helps the users store and index academic documents. [5] embeds location access information into a persistent identifier, and the magnet link works as a transport container to transfer that information. [6] applies magnet link on the system of personal information management, which helps the administrators in a company easily look up the basic information of employees. [7] implements magnet link in the domain of digital government services, so that the citizens can look through information and download documents from the governmental website.

This paper proposes to build a online billboard, which is fully based on the magnet link. The

magnet link billboard stores and demonstrates all the files on a distributed P2P network, and each file is considered as a seed. In addition to that, the billboard is a platform that encourages the network users to upload and download seeds. The users on the platform also have the rights to endorse the documents, and each user can easily check his/her own uploaded or downloaded seeds. The billboard only accepts digital assets in Ether, hence the blockchain technique is involved in this work.

The rest of the paper is organized as follows: Section 2 describes some background information of this project. Section 3 presents the architecture diagram of the magnet link billboard. Section 4 illustrates the workflow for a user to operate the functionalities on the billboard. Section 5 concludes the paper with a summarized description of the work. Section 6 provides an outlook on the future development on this work.

2 Background

2.1 Magnet Link

The magnet link is another way to store excessive information for accessing resources on network. Magnet URI scheme defines the format of magnet link. The magnet link is useful in numerous contexts and it is fairly handy in P2P file sharing communities. Because each user can generate and distribute the link that refers to the specified document, as long as the user has the file.

Below is the basic format of a magnet link:

magnet :?xt = urn :<btih>:<AccessInformation>

[1] points out the most crucial part is the *xt*, which stands for exact topic. The *xt* is useful when searching and identifying specified files. The *?xt=urn:<btih>* defines a BitTorrent Info Hash, which spawns the *<AccessInformation>* part. The *<AccessInformation>* is the hash value of the content in a document and consists of forty hexadecimal bits. According to Figure 2.1 cited from [2], each document has different hash function values, and the users on a distributed network utilize the *<AccessInformation>* to refer to the file.

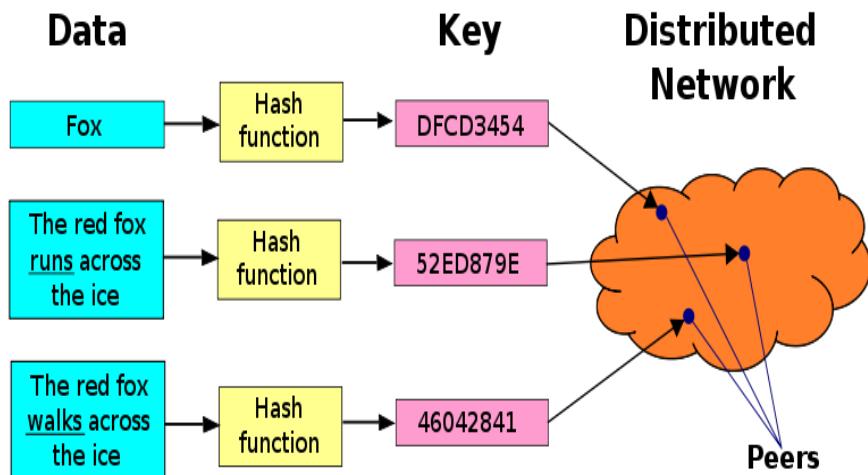


Figure 2.1: Hash function values of each file (from [2])

The advantages of using magnet links are as follows:

- The magnet link is widely supported by a great amount of P2P software, where a central authority or a constantly available host is needless.
- The magnet link is a standard methodology for document dissemination in a large file-sharing community, such as BitTorrent.
- Different from the URL link aforementioned, the magnet link is a content-based link and independent of the file location.

In order to find peers or seeds in a tracker less environment, a magnet link is used in combination of DHT, which has been discussed by [8]. In this way, the user can check the peers of seeds without the need of index servers, even if the original document has been removed. This leads us to implement the blockchain technology on this work.

2.2 Blockchain

According to [9], blockchain is a decentralized ledger tracking of one or more digital assets on a P2P network. In essence, blockchain is a type of database that stores data in blocks and chain those blocks together. Figure 2.2, which is cited from [10], depicts the process of digital asset transaction on the blockchain.

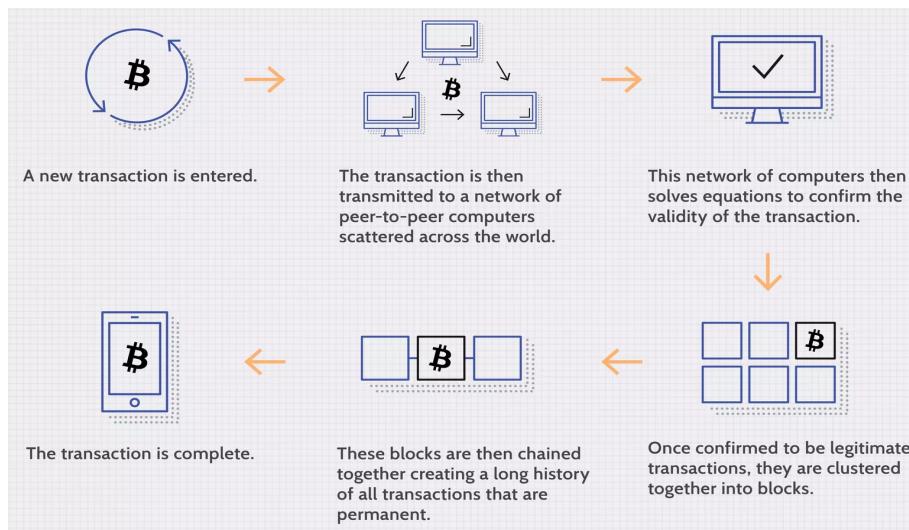


Figure 2.2: Transaction process on blockchain (from [10])

Generally speaking, a blockchain has a smart contract built in. In this project, the smart contract works as the back-end of the magnet link billboard. According to [11], the smart contract permits trustworthy transactions to be carried out without the need for central authorities. Plus, the smart contract render each transaction traceable, transparent, and irreversible, which makes it harder to tamper with the transaction history.

In summary, the reasons for implementing blockchain technology on this work are as follows:

- The blockchain has immutable information storage. Each seed uploaded to the magnet link billboard shall not be easily altered.
- Digital assets transaction is involved in this work. Using blockchain can help build a digital-payment system and efficiently handle the assets in Ether.
- Blockchain is a ledger that records all the transaction histories, which are transparent to the users on the platform.
- The P2P network is a decentralized architecture, so does our project. Utilizing decentralized blockchain helps prevent someone from dominating the platform over the other users.

3 Architecture

We construct the magnet link billboard by writing the following components into smart contract and using truffle framework to migrate the smart contract to the Rinkeby test network. After that we program the front-end framework in React.js to set up the development environment and complete the process of deploying the smart contract at the back-end. This section elaborates on the contents of the smart contract, truffle framework, and front-end framework.

3.1 Smart Contract

The purposes of writing the smart contract are to guarantee the trustworthy ether transactions on the magnet link billboard and constraint some operations on the platform. In addition to that, the smart contract determines the business logic behind the online platform.

[Figure 3.1](#) illustrates the business logic defined by the smart contract.

There are two kinds of users on the magnet link billboard, which are the writer and visitor. The writer contributes to the online platform by uploading seeds, whereas the visitor can browse, download, and endorse seeds on the billboard. Also, each writer or visitor is capable of checking the seeds that he/she has uploaded or downloaded.

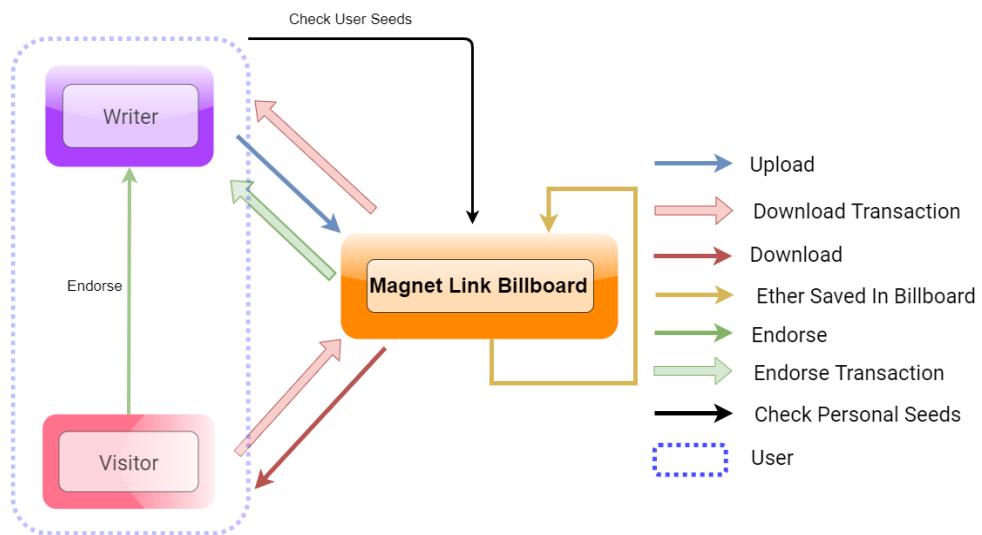


Figure 3.1: Business logic behind the magnet link billboard

3.1.1 Basic Function

Based on the [Figure 3.1](#) above, the magnet link billboard becomes a file-sharing platform and has the following functionalities.

- **Upload Seed:** When uploading a seed, the writer needs to provide basic information of the seed, for example, the seed name, the seed description, the keywords in the seed, the charge amount for downloading the seed, and the link referring to the resource. The default charge amount is zero, but the writer can determine whether others download this seed for free or not. As shown in [Figure 4.2](#), all fields of seed information needs to be filled in. If any part of the information is empty, the writer is not permitted to upload that seed due to the lack of information. When uploading a seed, a writer does not need to spend any ether, except the gas fee.
- **Download Seed:** A visitor on the magnet link billboard can browse seeds for free and download the seeds that do not require ether transactions. When downloading a seed that requires charge amount, a visitor needs to make sure his/her **MetaMask** account has enough ether to make the payment. Otherwise, the downloading request shall be rejected.
- **Endorse Seed:** After downloading a seed, a visitor has the right to endorse the downloaded seed, and the endorse amount shall be shown on the magnet link billboard, which is an indicator on whether the seed link is useful to other users. A visitor can use the endorse amount as a reference when downloading seeds from the platform.
- **Check Personal Seed:** In case of the users forget the link referring to the seed or accidentally close the seed link interface, the billboard helps each user record all the seeds that he/she has uploaded and downloaded on the online platform. Every time a user uploads or downloads a seed, the seed ID shall be recorded in an array mapping to the user account, and the seed link corresponding to the seed ID shall be viewed in the user center.

3.1.2 Ether Transaction

In order to encourage the writer to contribute to the billboard and the visitor to browse this platform, we get digital asset transaction involved into this work. The digital asset in this project refers to the digital money in ether. When a visitor downloads a seed on the billboard, the writer, or say the seed owner, shall receive ninety percents of the charge amount of that seed, whereas the platform saves the rest ten percents of charge amount.

In addition to downloading seeds, endorsing seeds is also associated with ether transaction. After downloading a seed from the billboard, a visitor is capable of endorsing that seed. If the visitor decides to endorse that downloaded seed, the seed owner shall obtain a certain amount of bonus, which is around the $\frac{1}{100000000000}$ of the current billboard balance. This purpose of this mechanism is to motivate users to actively upload some valuable seeds.

3.1.3 Constraints

The smart contract also sets up some operation constraints for the users on the billboard. The purpose of these restrictions is to maintain an equitable and objective environment on the online platform. [Figure 3.2](#) depicts the operation constraints on the magnet link billboard.

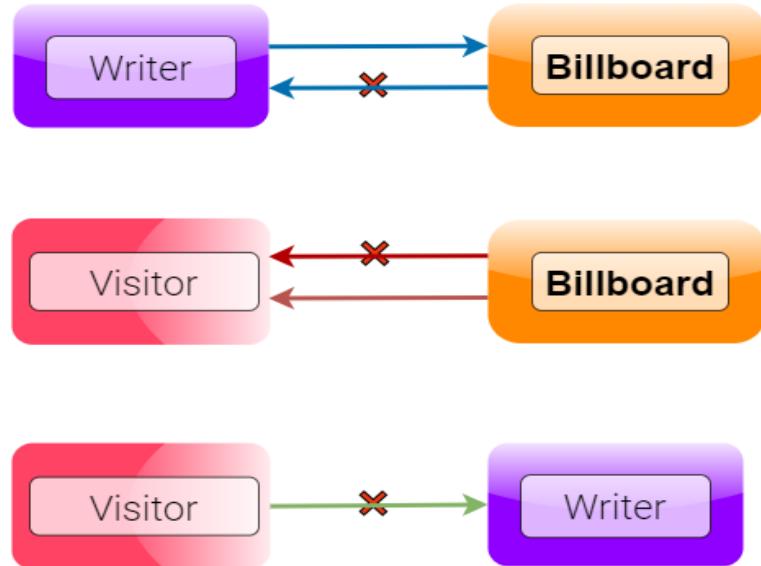


Figure 3.2: Operation constraints on the magnet link billboard

The following three points elaborates on the constraints illustrated on [Figure 3.2](#):

- A user shall not download the seeds that are uploaded by himself/herself. This is to prevent users from maliciously stealing ether from the platform.
- A user shall download every single seed only for once. We can prevent users to pay money for a repeated downloaded file accidentally. If the user wants to review the seed link, he/she shall go to the user center to check his/her personal seeds.
- A user shall only endorse the seeds he/she has downloaded. Otherwise the endorsement transaction shall be rejected. Therefore, the attribute, endorse amount, is more trustworthy and other users can evaluate the content qualities of different link file but with similar description. Limiting the endorse time to once can also prevent click farm.

3.2 Truffle Framework

We implement the truffle framework to write our smart contract, which makes compiling our contract more convenient. In addition, we also write the corresponding test code for our smart contract. This is to further ensure that the contract is deployed without deficiencies on the business logic and encapsulates all the possible scenarios that may happen on a file-sharing system.

In order to further simulate the main blockchain network, the truffle migration allows us to push the smart contract to the Rinkeby test network. The Rinkeby test network is more similar to a real blockchain network than ganache-cli, where a transfer transaction may take some time to complete, while ganache-cli can complete the transaction quickly. Therefore, each user on the magnet link billboard needs to login with his/her own MetaMask account.

3.3 React Framework

In traditional web applications, manipulating the Document Object Model (DOM) is generally a direct method to update information, but we know that DOM updates usually requires more human power. In order to minimize the manipulation on the DOM, React provides a

different and powerful way to update the DOM instead of direct DOM manipulation. That way is the ReactDOM imported from the `react-dom` package, which is an object abstracted by React. The ReactDOM describes what the DOM should look like and how it should be presented. The real DOM is updated through the ReactDOM, and the update of the real DOM is also managed by the ReactDOM.

To build the user interface, we create five React components, which are the `AddressBar`, `MagnetLinkList`, `Upload`, `Download` and `PersonalSeeds` respectively. Each of the component corresponds to a functionality.

- **AddressBar:** Rendering the current user address on the at the top of the user interface.
- **MagentLinkList:** Loading the content of billboard and demonstrating the seeds information on the user interface.
- **Upload:** Rendering the information of an uploaded seed and has a button for a writer to press to complete the upload process.
- **Download:** Rendering the information of a downloaded seed and has a button for a visitor to press to complete the download process. In addition, this component also encapsulates the endorse functionality.
- **PersonalSeeds:** Recording the seed history for each user and demonstrating all the uploaded or downloaded seeds in the format of a table.

4 User Workflow

If a user wants to smoothly complete an operation on the magnet link billboard, he/she shall follow some sequential steps defined by the smart contract and the react framework. This section presents the procedures for the user to complete each operation on the platform, along with some necessary screenshots. [Click here](#) to access to the magnet link billboard.

4.1 Upload Seed

1. Open the magnet link billboard with a web browser.
2. Log in with a **MetaMask** account.
3. Check if the user interface displays all the uploaded files, as shown on [Figure 4.1](#).

The screenshot shows the 'Magnet Link Billboard' interface. At the top, it displays 'Contract Balance: 0.699999999994' and 'Contract Address: 0x5f7081f472a71e4db9099a7d0aad1ec5f7849daD (on Rinkeby)'. Below this, the 'Your Address' is listed as '0x406d617b14ac1afff38980038ab203528dec596b'. There are two buttons: 'PERSONAL SEEDS' (highlighted in orange) and 'UPLOAD NEW SEED'. A table below lists five uploaded seeds:

ID	Name	Keywords	Seed Description	Charge Amount	Endorse Amount
1	Pet Shop Boys - Behaviour (1990) Flac	Audio, FLAC	Album: Behaviour, Artist: Pet Shop Boys	1	1
2	Wolf Spider - Drifting In The Sullen Sea (1991, 2018)	Audio, WMA Lossless	1. Blind Faith 4:53 2. Liberated Woman 5:05 3. Inclined 3:28 4. My Home 4:23 5. Drifting In The Sullen Sea 5:19 6. King Of Animals 4:40 7. Freedom 4:54 8. Black 'N' White Part II 4:20 9. Enterprising Man 2:58 10. Orphanage 5:00 11. Mustapha 2:23	1	0
3	Justin Bieber - Freedom (2021) Mp3 320kbps [PMEDIA]	Music, Justin Bieber	01 Freedom.mp3 02 All She Wrote.mp3 03 We're In This Together.mp3 04 Afraid To Say.mp3 05 Where Do I Fit In.mp3 04 Where You Go I Follow.mp3	0	0
4	Pleasure Activism by Adrienne Maree Brown EPUB	E-books, Adrienne Maree Brown EPUB	How do we make social justice the most pleasurable human experience? How can we awaken within ourselves desires that make it impossible to settle for anything less than a fulfilling life? Author and editor Adrienne Maree Brown finds the answer in something she calls "pleasure activism," a politics of healing and happiness that explodes the dour myth that changing the world is just another form of work. Drawing on the black feminist tradition, she challenges us to rethink the ground rules of activism.	0	0
5	Huang G. Solar Flare Loops.Observations	Textbook, PDF	The theory of MW Emissions of Solar Flaring Loops	0	0

At the bottom, there are buttons for 'Selected Seed ID:', 'DOWNLOAD', 'Seed Name:', 'ENDORSE', and 'Charge Amount: 0'.

Figure 4.1: User interface on magnet link billboard

4. Check if the orange line on the page reveals your account address.
5. Click the button **Upload New Seed**, which is at the right of your account address, to start uploading process.
6. Check if the window depicted on [Figure 4.2](#) pops out

Upload new seed

Please enter the following information to upload the new magnetic link.

Seed Name *	Freedom
Seed Link *	magnet:?xt=urn:btih:7EA28C0EFAD9197B26EF07A785CE5F3C02658B2F&
Key Words *	Justin Bieber
Charge Amount *	0
Seed Description *	Musiq

[CANCEL](#) [UPLOAD](#)

Figure 4.2: Upload interface

- Fill in all the required information of the seed you want to upload.

NOTE: Please note that the default value of charge amount is set to zero. Besides that, the charge amount should be a positive integer.

- Click the UPLOAD button at the bottom right corner to finish uploading.

4.2 Download Seed

- Open the magnet link billboard with a web browser.
- Log in with a **MetaMask** account.
- Browse the seed information published on the billboard for free and select the seed you want to download.
- Check if the color of the selected row turns to green once you click a seed. As shown on [Figure 4.3](#).
- Check if the lower left corner reveals the seed name, seed ID, and charge amount of the row you select. Also shown on [Figure 4.3](#).

Magnet Link Billboard

Contract Balance: 0.699999999994			Contract Address: 0x6f7081f472A71E4Db9099a7d0Aa1ec5F7849daD (on Rinkeby)		
Your Address:0x4060617814act1tf38980038Ab203528Dec5968			PERSONAL SEEDS		UPLOAD NEW SEED
ID	Name	Keywords	Seed Description	Charge Amount	Endorse Amount
1	Pet Shop Boys - Behaviour (1990) Flac	Audio, FLAC	Album: Behaviour, Artist: Pet Shop Boys	1	1
2	Wolf Spider - Drifting In The Sullen Sea (1991, 2018)	Audio, WMA Lossless	1. Blind Faith 4:53 2. Liberated Woman 5:05 3. Inclined 3:28 4. My Home 4:23 5. Drifting In The Sullen Sea 5:19 6. King Of Animals 4:40 7. Freedom 4:54 8. Black 'N' White Part II 4:20 9. Enterprising Man 2:58 10. Orphanage 5:00 11. Mustapha 2:23	1	0
3	Justin Bieber - Freedom (2021) Mp3 320kbps [PMEDIA]	Music, Justin Bieber	01 Freedom.mp3 02 All She Wrote.mp3 03 We're In This Together.mp3 Afraid To Say.mp3 05 Where Do I Fit In.mp3 04 Where You Go I Follow.mp3	0	0
4	Pleasure Activism by Adrienne Maree Brown EPUB	E-books, Adrienne Maree Brown EPUB	How do we make social justice the most pleasurable human experience? How can we awaken within ourselves desires that make it impossible to settle for anything less than a fulfilling life? Author and editor Adrienne Maree Brown finds the answer in something she calls "pleasure activism," a politics of healing and happiness that explodes the dour myth that changing the world is just another form of work. Drawing on the black feminist tradition, she challenges us to rethink the ground rules of activism.	0	0
5	Huang G. Solar Flare Loops.Observations	Textbook, PDF	The theory of MW Emissions of Solar Flaring Loops	0	0

< 1 2 >

Selected Seed ID: 3

[DOWNLOAD](#)

Seed Name: Justin Bieber - Freedom (2021) Mp3 320kbps [PMEDIA]

[ENDORSE](#)

Charge Amount: 0

Figure 4.3: Select seed to download

6. Click the **DOWNLOAD** button to start downloading the selected seed.
7. Check if the web page pops up a **MetaMask** window for entering sufficient amount of ether.
8. Check if the web page prompts up the seed link automatically after finishing the download process. As depicted on [Figure 4.4](#).

Magnet Link Billboard

Contract Balance: 0.699999999994			Contract Address: 0x6f7081f472A71E4Db9099a7d0Aa1ec5F7849daD (on Rinkeby)		
Your Address:0xLe0265bef7ff1049dc2894e0bc58cbc5a5ce2fa			PERSONAL SEEDS		UPLOAD NEW SEED
ID	Name	Keywords	Seed Description	Charge Amount	Endorse Amount
1	Pet Shop Boys - Behaviour (1990) Flac	Audio, FLAC	Album: Behaviour, Artist: Pet Shop Boys	1	1
<p>Your link is: magnet:?xt=urn:btih:7EA8C0FA09197B26EFO7A7BCE5FC0245B2164 dnp:justin%20bieber%20-%20freedom%202021%20mp3%20320kbps%20%20PMEDIA%5D%20%E2%AD%90&tr=udp%3A%2F%2Ftracker.coppersurfer.tk%3A6969%2Fannounce&tr=udp%3A%2F%2Ftracker.openbittorrent.com%3A6969%2Fannounce&tr=udp%3A%2F%2Ftracker.operatrackr.org%3A1337&tr=udp%3A%2F%2Ftracker.leechers-paradise.org%3A6969%2Fannounce&tr=udp%3A%2F%2F47.ip-51-68-199.eu%3A6969%2Fannounce</p>					
OK					
4	Pleasure Activism by Adrienne Maree Brown EPUB	E-books, Adrienne Maree Brown EPUB	How do we make social justice the most pleasurable human experience? How can we awaken within ourselves desires that make it impossible to settle for anything less than a fulfilling life? Author and editor Adrienne Maree Brown finds the answer in something she calls "pleasure activism," a politics of healing and happiness that explodes the dour myth that changing the world is just another form of work. Drawing on the black feminist tradition, she challenges us to rethink the ground rules of activism.	0	0
5	Huang G. Solar Flare Loops.Observations	Textbook, PDF	The theory of MW Emissions of Solar Flaring Loops	0	0

< 1 2 >

Selected Seed ID: 3

Seed Name: Justin Bieber - Freedom (2021) Mp3 320kbps [PMEDIA]

Charge Amount: 0

Figure 4.4: Prompting seed link

NOTE: The smart contract at the back-end checks the ownership of selected files. If you are the owner of the download files, the download operation shall be shut off. Plus, the smart contract also counts the number of times you download a seed from the platform. If you try to download the same seed more than once, the web page shall pop up an alert, as shown on [Figure 4.5](#), and shut off the operation as well.

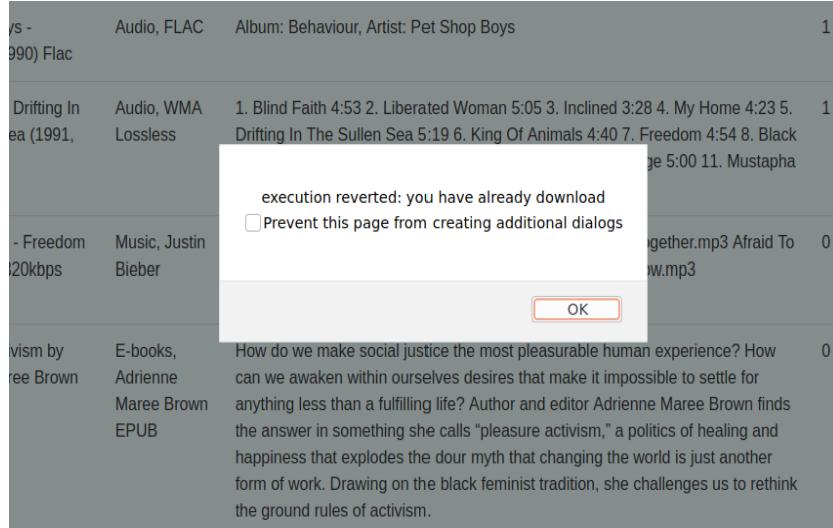


Figure 4.5: Alert window for downloading the same seed multiple times

4.3 Endorse

1. Open the magnet link billboard with a web browser.
2. Select the seed you want to endorse.
3. Click on the ENDORSE button.

NOTE: You are expected to endorse the seeds you have downloaded only, as defined on the smart contract. What is more, you are supposed to endorse the same seed only for once. If you try to endorse a seed more than once, you shall see an alert window pops out, as shown on [Figure 4.6](#), and the endorse operation shall be terminated as well.

1	Pet Shop Boys - Behaviour (1990) Flac	Audio, FLAC	Album: Behaviour, Artist: Pet Shop Boys	1	1
2	Wolf Spider - The Sullen Sea (2018)		execution reverted: Only can endorse downloaded torrent files; or you have already endorsed	0	
3	Justin Bieber - Freedom (2021) Mp3 320kbps [PMEDIA]			1	
4	Pleasure Activism by Adrienne Maree Brown	E-books, Adrienne	How do we make social justice the most pleasurable human experience? How can we awaken within ourselves desires that make it impossible to settle for	0	0

Figure 4.6: Alert window for endorsing the same seed multiple times

4.4 Check User Seed

1. Open the magnet link billboard with a web browser.
2. Click on the PERSONAL SEEDS button on the right of your account address.
3. Check if the web page prompts out the table as depicted on Figure 4.7

Personal Seeds		
Seed Id	Name	
3	Justin Bieber - Freedom (2021) Mp3 320kbps [PMEDIA]	
5	Huang G. Solar Flare Loops.Observations	xt=urn:btih:7DD6A1462246867ABAD2A47BC9F
6	Quirk T. Excel 2019 for Environmental Sciences	xt=urn:btih:32E0B943183A07FCBA0A9FA0349A
7	Djirdeh H. Fullstack Vue. The Complete Guide to Vue.js	

CANCEL

Figure 4.7: Check personal seeds

5 Conclusion

In this paper, we propose to build a file-trading platform based on magnet link. We implement the back-end in a smart contract and program the front-end with some React components. The user interface of the platform illustrates the account address of the current user, all uploaded link files, and several functionality buttons. The user can download, upload and endorse magnet link files by following some sequential steps. After uploading a link file and general description, only the general description can be viewed by the public. The user shall get the link when he/she confirms the transaction. In order to motivate users to actively upload meaningful files and contribute to the platform, we bring the digital asset transaction into the billboard. The owner of the file shall get rewards if some other users download or endorse his/her uploaded seed. To make the ether transaction and uploading/downloading history become transparent and traceable, we also apply the blockchain technology on this work.

However, due to the opaque of the resource content, there is a high possibility of click fraud. For example, the attacker may upload a useless link file and charge huge amount of money. To prevent that, the total endorse amount is used to indicate whether the resources is trustworthy or not.

On the other hand, the decentralized application can be improved on several perspectives to make the system more reliable and user-friendly. User stickiness is another key point need to be developed. In addition, we can add more subsections for different digital resources trade. The proposed plan is illustrated in the upcoming section.

6 Future Work

This section lists out and explains the future improvements on the magnet link billboard. First and foremost, we will modify the algorithm of magnet link file storage, which enables the advanced search functionality. Secondly, to prevent the ether of users from being wasted, we will build a feedback system where the users can rate the resources they have downloaded. Additionally, users can upload a shortcut of information as a trailer to advertise their uploading seed.

As for the platform architecture, membership mechanism with benefits will be implemented. To reduce the cost of attracting users, issuing tokens can be a potential option. Our decentralized application can also become a Non-fungible tokens (NFT) trade platform, and we encourage users to create and upload their own resources, such as artwork, music and vlog.

6.1 Improvement on Resources Storage

In the current version of our platform, the user can only select the link file by browsing all listed files. We have added a page breaking in our front-end implementation, but the file selection can still be fairly time-consuming. To improve the user experience, we can add more attributes on the magnet link structure. The smart contract will store the keywords of the uploaded file. When the writer uploads a seed, he/she can choose a resource category according to the contents of the seed. As a result, once a user try to find a seed file, he/she can narrow down the search domain by selecting different keywords and categories simultaneously.

Also, we notice that our platform is lack of monitoring the quality of the uploaded seed links. Since our platform does not check the content of the seed link, there may be a inconsistency between the description of the seed and its content, This spawns a possible drawback, which is the seeds, whose contents are illegal or breaching the copyright, may be sneaking into the platform. To address this problem, we will build a rating and feedback system. The paid money will not transferred to the seed owner directly, and certain amount of money

will be saved into the smart contract waiting for users to check the quality of resource. If the resources received too many low ratings and reports, the platform will notice platform to check the link files. Once the outlaw and poor ratings are confirmed, the seed owner will be penalized and the users who have download or endorsed that seed will get refund. Furthermore, to prevent the user from downloading the wrong file accidentally, we will allow the writer to upload a separate trailer to advertise the resources.

Another potential solution to address that drawback is implementing deep-learning based classifier to identify the seed with legal contents and illegal contents. The classifier needs to be trained with a data set that encapsulates the hash function values of both legal and illegal contents. Once the deep learning model is well trained, we can implement the classifier into the magnet link billboard. In this way, if the classifier recognizes the uploading seed contains illegal contents, the classifier will inform the platform to shut off the uploading operation. This can maintain the seeds on the magnet link billboard to be adhering to the law.

Last but not least, we also think about introducing a trustworthy supervisor into the platform. The supervisor is capable of checking the seed contents regularly. Once the supervisor finds out a seed contains some contents that are illegal or breaching the copyright, the platform will receive a report from the supervisor and penalize or even blacklist the owner of that seed accordingly. But honestly speaking, none of the above three approaches is fully promising, some more comprehensive and thorough research needs to be conducted in the near future.

6.2 Improvement on Platform Architecture

Apart from the resources storage algorithm, the platform architecture may need to be improved as well. Instead of utilizing the digital assets in ether, the tokens issued by our platform can be considered as an alternative. Issuing tokens can also increase the customer stickiness, because we can set up several methods to promote user using our platform. For instance, we can allow user to get free tokens by daily check-in, invite friends, or make comments on the download seed.

Collaborating with token technique, we will introduce membership account. It will have free

downloading times as well as extra bonus when receiving endorsement. In addition, issuing tokens can also reduce our promotion cost.

Recently, the NFT becomes popular in the art collection field, and the public is keen on buying and discussing NFT artworks. [Figure 6.1](#) depicts one of the most famous NFT artworks that the artist takes one photo everyday from 2007 and combines them together. It sells 63 million dollars in an auction.

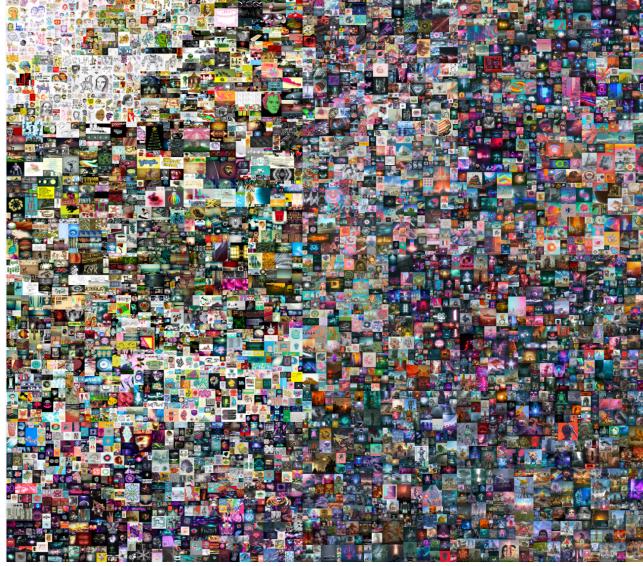


Figure 6.1: NFT artwork (from [12])

Inspired from the auction event mentioned above, we plan to have an updated platform that encourages the users to upload their original and creative works. On that new platform, all the users are capable of evaluating, commenting, or even auctioning on those uploaded works.

6.3 Improvement on Resource Sharing

The current version of resource sharing is achieved by directly uploading the seed link of the resource. However, if the user has the files that he/she wants to share without the corresponding seed link, it will be difficult to accomplish resource sharing.

Some existing approaches to convert files into magnet links are about converting the files into torrent files through some applications, such as BitComet, and then using other applications,

like Torrent to Magnet, to convert torrent files into magnetic links. In addition to this method, some users prefer to upload files to a cloud disk and then download them in the form of a magnet link. In this way, users can also gain the corresponding magnet links of the files. But these two methods are slightly cumbersome.

Therefore, we envisage the introduction of third-party software on the basis of this platform to provide the function of converting files into magnetic links. In this way, a more efficient resource sharing mechanism will be realized, and the user experience will also be improved to a certain extent.

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