The Chain-Oriented Programming

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Abstract—**People have explored a number of blockchain applications and use-cases in the last few years; however, this paper focuses on one of the use-cases of the blockchain that has never been explored before: programming on the blockchain. This approach (or technique), referring to it as "the blockchain-oriented programming" or simply "chain-oriented programming", can be considered as a new approach for programming which effectively uses the blockchain to manage the overall structure and design of the code of a program, by splitting the code of a program across the blockchain, which would be publicly accessible by everyone because of its existence on the public ledger. Several benefits of this approach, including the transparency, security, easy-to-modify structuring, linking of multiple codes, forking/cloning of the code are discussed in the paper. Moreover, the long-term feasibility of this approach is also discussed in the paper.**

I. INTRODUCTION

The blockchain is well-known for its characteristics of immutability, decentralization, and overall cryptographically-secure infrastructure. If the programming is done on a blockchain, it can squeeze the advantages of these characteristics, and interestingly, it can show (and provide) some other benefits of a blockchain as well which have not been thought before. For example, using the blockchain as a "chain for programming", creating a sort of linked-list for the code. If we think even beyond that, on a large scale, such programming structure can replace popular mass-programming platforms and software development hosting services like Github as well, because of its decentralized characteristics. Because of friendliness of "Bitcoin Satoshi Vision (BSV)" with data storage and handling, due to its bigger block sizes, this programming approach will use the BSV chain to upload/link the code. Technically, the approach is possible on all public ledgers, such as bitcoin core or BTC; however, that will only unnecessarily increase the cost of the approach. With BSV, it's much easier to upload the code (and other data) and access it with its transaction identity.

Suppose that at Github, "developer A" wants to add some sort of code and "developer B" wants to use it as well as further extend or edit (or commit) it. At Github, in this case, the developer B will clone/fork the code, and then modify it. However, if we look at this scenario from the perspective of chain-oriented approach, the developer A will have to publicly provide the transaction ID of the BSV chain, which should contain the code; the developer B will then either use that transaction ID as the complete code, or if it requires any sort of modification, then the developer B will copy the data of the provided transaction ID and modify it, as the "modification doesn't work" in the case of the public ledger. Moreover, instead of cloning like in the case of Github, the developers may simply repeatedly use the transaction ID of

the code whenever the usage of that specific code is required in the run.

II. WORKING OF THE APPROACH AS A "LINKED LIST"

The chain-oriented approach can work as a linked list. For example, if developer A, let's say Alice, develops a code that generates an address for Ethereum blockchain, and on the other hand, if developer B, let's say Bob, wants to developer a code that generates an address for Bitcoin blockchain, then Bob may use a part of Alice's code. With the use of chain-oriented programming approach, this scenario can graphically be illustrated as the following:
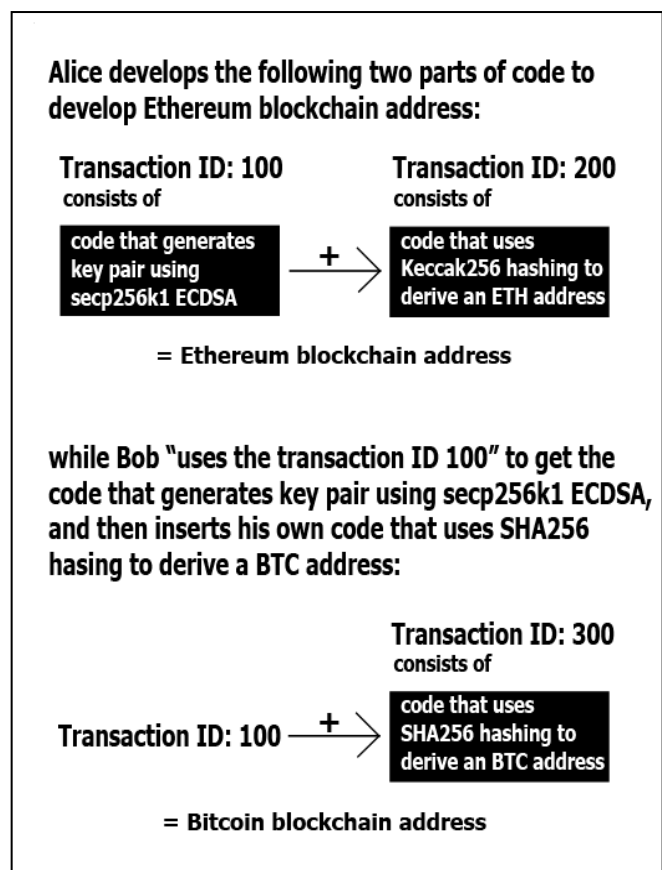
III. THE SECURITY

The best part of using blockchain for any purpose is the cryptographically secure mechanism of the blockchain, which makes your use of blockchain provably secure. Having your data on a decentralized platform is much better than having it on a single server whose failure might prove to be disastrous; the possibility of owning your own node to further secure the ecosystem makes you feel more comfortable; the immutability (and unpredictably) features of the chain assures that any of your uploaded data will not get

modified or deleted. With all of these advantages, the chain-oriented approach can be labeled as "the most secure open-source programming". More importantly, since the acquisition of Github by Microsoft, we've seen a number of emerging cases where the user was forced to abandon the Github account because of being in one of the sanctioned countries,[1] while with the help of the chain-oriented approach, no one could stop anybody from uploading the code publicly on the blockchain.

IV. FEASIBILITY OF THE APPROACH

Even though the chain-oriented approach if done of the BSV chain, requires a little amount of BSV, but it's very much possible to afford it considering the fact that the blockchain platforms like BSV require (as low as) a fraction of a dollar worth of BSV to upload up-to 1000 lines to the blockchain. To study more of this, the contributions of the top contributors of the Github platform were observed and it was found that:

- the average contributions, per day, by the most active contributors, consisted of about 2000 lines of code each week, which would cost around only about two bucks a week, which is a relatively low cost.

Moreover, many people have a few concerns regarding the alarming increase in the chain size of BSV. However, the following graphs can prove that such an ecosystem is not really inefficient if we compare the increasing price efficiency of a "gigabyte" over time with the increase in the overall chain size of BSV:

Figure showing the fall of cost of a gigabyte over time

Figure showing the increase in blockchain size of BSV on a linear scale
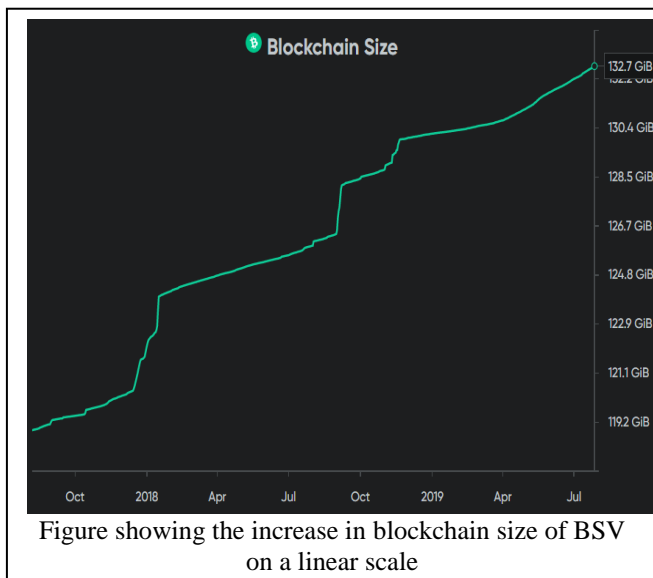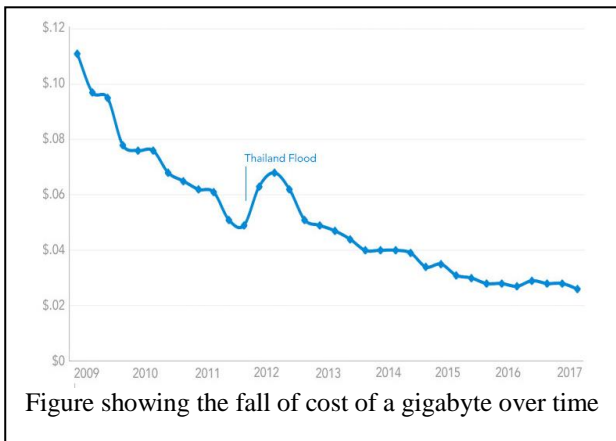
LIMITATIONS

To be added later.

CONCLUSION

To be added later.

REFERENCES

To be

added

later