Global Challenges Foundation

A (Simplified) Blockchain Approach to Non-Coercive, Decentralized Global Governance

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The submission proposes a decentralized, high efficiency mechanism for collectively identifying global risks and rapidly directing practical responses to combat those risks, utilizing a blockchain platform. The platform is equally accessible to individuals, states and emerging and established NGOs. It is intended to create an idea-to-action marketplace where solutions to pressing global challenges can be proposed, rapidly adopted, funded and then implemented via smart contracts. The blockchain model lacks a standard hierarchy, with all decision making the de facto result of collective action, conducted openly. Financing is provided through a connected cryptocurrency. Once a smart contract seeking a particular action is placed on the blockchain, the request is instantly visible to any other NGO, private individual, government entity or commercial contractor, which may then undertake to fulfill some or all of the contract. The end result is a purpose-built economy which exists to identify and solve large scale problems.

1. Abstract

This paper proposes an alternative to the current global governance model: A decentralized, high efficiency mechanism for collectively identifying global risks and rapidly directing practical responses to combat those risks, utilizing a blockchain platform to allow individuals and emerging and established NGO's to directly confront the world's problems.

Just as the blockchain allows for financial transactions without the use of intermediaries, it also allows for the coordination of direct action on world problems, without the need for a centralized body such as the United Nations. The proposed model is not intended to replace the United Nations. Rather, it is intended to coexist with and work independently of it, creating a marketplace of ideas where solutions to pressing global challenges can be proposed and then rapidly adopted, funded and implemented. The proposed model is founded on the assumption that current deficiencies in world governance are the result of *centralization*, which is only scalable to a certain point. Once a population threshold has been reached, centralization is debilitating, and becomes a natural, organizational enemy of efficiency and decisive action. This paper recognizes that, given world population growth, that point has been reached. Blockchain philosophy and technology is premised on the idea of *decentralization*, and thus presents an appropriate starting point for environments with ever increasing numbers of participants.

The governance model proposed in this paper is, accordingly, influenced by blockchain philosophy, and made possible by blockchain technology. A subset of blockchain technology makes possible the issuance of cryptocurrency and smart contracts. This paper discusses how such platforms can, simultaneously, enable both the discussion of solutions and the funding of those solutions. The proposed model recognizes that such rapidity of action is paramount, given the current global threat environment and potentially catastrophic challenges which have remained unaddressed in the face of endless debate and bureaucratic inaction.

While the governance model proposed here is accessible to existing nation states and governmental bodies, it is equally accessible to private individuals, emerging NGOs and other non-state actors, and designed with such entities in mind. It is a foundational premise of the proposed model that, as world population increases, proportional world power has a dangerous tendency to become more and more concentrated in increasingly tighter circles. To combat this, the proposed model considers inclusion and consideration of *all* interested stakeholder opinions to be core value.

Finally, it is recognized that the model proposed here is a radical departure from existing attempts to describe workable forms of world governance –*i.e.*, it does not contemplate a centralized governing body, nor does it include key individuals, elected or appointed representatives, or any other such traditional institutions or conceits. As such it is necessarily abstract in scope, but it is hoped that the basic form outlined here may spark further discussion and development, and thereby find its way into practical application.

2. Description of the model

Footnotes in this and the following section are identified in brackets as [FN#], and refer to the numbered citations provided in the References section.

INTRODUCTION

I. THE PROBLEM, RESTATED

Modern global governance is broken. Or at least, is in pressing need of an immediate overhaul. The persistent worldwide existence of dire conflict and inequity makes that plain. While modern forms of governance have been very effective in some ways –*e.g.*, the continued avoidance of nuclear holocaust or all-out global war over the last few decades, and a strong general trend towards humanitarianism and egalitarianism –individual governments around the world are, nevertheless, often pockmarked by corruption, self-centeredness and inefficacy. Global governance, as it now exists in the form of the United Nations and other intergovernmental organizations and alliances, is subject to similar criticism: inefficiency, waste, bureaucratic gridlock, partisan infighting and general ineffectiveness, accompanied by a widespread perception (justified or not) of corruption, hidden agendas and exclusion of marginalized voices. These faults and perceptions combine to effectively preclude a meaningful global response to increasingly urgent global problems, including those of particular concern to the Foundation: climate change and environmental damage, armed conflict, impoverishment, and population growth.

II. A PROPOSED SOLUTION
A. The Blockchain

This paper proposes an alternative to the current global governance model: A decentralized, high efficiency mechanism for collectively identifying global risks and rapidly directing practical responses to combat those risks, utilizing blockchain philosophy and technology.

A *blockchain* is a digital, cryptographically secure, publically accessible online record of transactions. [FN 1, 2] As the term is most frequently used today, "blockchain" in this context generally refers to the operating framework undergirding bitcoin, other cryptocurrencies, and related applications such as the Ethereum smart contract system. In such cases, a blockchain, implemented over a transparent, decentralized network of computers around the world, is used to facilitate and administer various kinds of financial and accounting transactions, in a way that eliminates intermediaries and their attendant inefficiencies. For example, the exchange of a digital currency such as bitcoin between two parties can be accomplished instantaneously, and without the need for (and transaction costs and security risks inherent to) a centralized clearinghouse such as a bank or credit card processor.

Bitcoin and other cryptocurrencies are presently the subject of fevered media interest and speculation by investors, and there is some ongoing controversy over whether such digital currencies have long term viability or are simply fads. What is not controversial however, and what has been widely heralded from many public and private sectors is that the underlying *blockchain* concept itself is revolutionary and represents a viable development similar in significance to the Internet, or the Renaissance era accounting concepts which form the backbone of modern finance.

Blockchain principles and technology are being adopted by private sector entities such as banks and manufacturers to eliminate inefficiencies in finance and supply chain management, and are, for example, currently being explored by the food-assistance branch of the United Nations, The World Food Programme, to make humanitarian assistance efforts more responsive, more efficient and more secure [FN3].

B. Blockchain Philosophies and Principles

That blockchain *technologies* can be applied to address pressing worldwide dilemmas is no longer novel, and some efforts to do so using such technology are already underway. This paper goes beyond recognizing technical applications, and proposes that, in addition to utilizing the technological advances which the blockchain makes possible, a global form of governance based on blockchain *philosophy and principles* be implemented. Blockchain applications, despite their revolutionary potential, were not made possible by any technological breakthrough –the requisite technological capabilities are minimal, and have existed almost as long as the commercial Internet. Rather, the ingenuity of the blockchain is found simply in the application of various core philosophies and principles to what was, essentially, basic accounting practice that had existed for centuries. In the abstract, these core blockchain philosophies and principles include:

Decentralization Elimination of Intermediaries Transparency and trust Non-coercion Radical inclusion Incentivizing long-term thinking

Just as the application of these principles revolutionized the age-old practice of accounting, so too can they revolutionize and improve the practice of global governance, as discussed below.

APPLICATION OF BLOCKCHAIN PRINCIPLES TO GLOBAL GOVERNANCE

III. PHILOSOPHICAL COMPONENTS OF THE MODEL
A. Elimination of a Centralized Decision-Making Body

As mentioned earlier, current global governance is impeded by a number of institutional challenges, so entrenched as to be considered almost inherent to multinational attempts at collective governance: inefficiency, waste, bureaucratic gridlock, partisan infighting and general ineffectiveness, as well as the perception of corruption, hidden agendas and the exclusion of marginalized voices. These obstacles are not so much the byproduct of attempts at collective governance as they are characteristics of any large, centralized, top-heavy bureaucracy which seeks to facilitate such an endeavor. In this context, the centralized agency has been, for the last 70+ years, the United Nations. The criticisms to which the U.N. is subject are not unique to that organization; they are commonly levied at most, if not all, large institutions (public or private) with expansive mandates. Proceeding without such an institution, presuming it is possible to do so, eliminates the impediments which necessarily come with the institution. This is the foremost core principle of the blockchain: *decentralization* of the subject process. Accordingly, the governance model proposed here begins with the core assumption that, utilizing blockchain technology, collective governance can be undertaken without the need for a monolithic, centralized overseeing body such as the U.N. To be clear, this model does not call for the elimination of the U.N. Instead, it is proposing a new framework which can work independently of it, one

with no physical headquarters and no administrative staff. It takes the form of a blockchain, and utilizes the blockchain structure for identifying areas of concern, facilitating discussion and consensus, raising funds, and directing action.

B. Open Participation of Global Stakeholders

The United Nations is comprised of 193 sovereign member states. In contrast, the proposed model posits an environment in which an unlimited number of Non-Governmental Organizations, philanthropies, foundations, humanitarian agencies, environmental and public policy groups –all referred to here collectively as "NGOs" –as well as private individuals have access to a specialized blockchain. All of the activity on the blockchain is public. This foundational premise satisfies two other core blockchain principles: Openness to all who wish to participate, as well as transparency of all activity. Adherence to these principles eliminates two of the complaints often made regarding current forms of large scale governance: that the system excludes some participants, or that it has hidden or undeclared intentions and therefore cannot be trusted.

IV. APPLICATION OF THE PHILOSOPHICAL COMPONENTS

The components identified above work as follows:

A. A Purpose-Built Blockchain is Created

Using existing, open-source code a blockchain application is created which includes mechanisms to verify and facilitate the performance of contracts, and which provides for the issuance of its own internal cryptocurrency (i.e., a blockchain-based application similar to the existing Ethereum smart contract system [FN4]). The underlying architecture, while complex, is not difficult or expensive to implement and make public –hundreds of public blockchain platforms currently exist, almost all of which were launched without significant financial backing. For purposes of the proposed model, however, it is contemplated the subject blockchain will be sponsored and/or publically endorsed by an existing, well-recognized public interest organization. This helps ensure that the blockchain will receive sufficient exposure to attract initial stakeholder participants, whether established NGO's or private individuals who may not otherwise have had an opportunity for such participation. Once the blockchain is launched, its maintenance and upkeep is largely an open source, ad hoc and voluntary endeavor, with minimal cost and overhead due to its distributed, non-centralized nature. The entity which performs this function may also initially back the blockchain's currency, if it has the resources and inclination to do so. This is not necessary however, as all existing cryptocurrencies which have achieved viability have done so organically, and without outside backing or collateralization.

B. Stakeholders Identify and Propose Actions to Take on Global Issues

With the blockchain architecture in place, stakeholder participants can announce problems which are in need of solutions, through the issuance of Ethereum-style smart contracts on the blockchain's "idea market." The blockchain's internal cryptocurrency –i.e., a digital token similar in operation to bitcoin -is linked to every such smart contract, and includes a proposed amount to be paid to anyone who takes action on the contract (i.e., executes a task which address the targeted problem).

Notably, and unlike with the United Nations, the decision makers in the proposed model are not limited to nation states. Full participation is available to NGO's,

foundations and private individuals alike. This structure is intended to reflect that global challenges and their solutions do not necessarily (or even usually) line up neatly with geographic borders, and that non-state actors are less constricted by those boundaries.

C. Action is Taken on Pressing Global Issues
Currently, global governance proceeds like this when a global challenge appears:

Someone –typically, scientists or other concerned observers with some expertise in the subject area –notices a problem. The person or party which identified the problem seeks to bring attention to it. This is achieved through the use of intermediaries, i.e., publication in academic journals; the issuance of press releases to the media; appeals to celebrities who command the public spotlight, etc. Once sufficient attention has been given to the problem –and *only* if that attention is received –the issue makes it onto the agenda of an intergovernmental entity, such as the U.N. The issue is then debated by various nations states, all of whom proceed from a position of non-transparent self-interest: Is there really a problem? If so, is it dire? If so, how should it be addressed?

If a consensus is reached with respect to the existence of the issue and a potential solution, the state actors then debate even further: Who should bear the cost? How should the project be implemented? The process is frustrating and maddeningly familiar. At best, the problem is eventually addressed, but only after much delay, and making numerous concessions to various parties. At worst, the issue remains unaddressed or only partially addressed, mired in debate and obstructed by national and corporate self-interests.

In contrast to the familiar scenario described above, the proposed model begins by eschewing a large, centralized body and, instead, allowing the relevant parties to interact via a blockchain. Under this model, a global challenge is confronted like this:

Someone –a scientist, an NGO, or perhaps a member of an affected community –notices a problem of global import. That party puts notice of the problem on the blockchain, in the form of a "smart contract." The contract provides for the automatic payment (in the blockchain's cryptocurrency) when someone takes a prescribed action towards solving the problem. Third parties worldwide –journalists, vendors, service providers and other contractors –search the blockchain for smart contracts which they can fulfill. The profit motive incentivizes these parties to move quickly.

V. ILLUSTRATIVE EXAMPLES
Suppose a small NGO is on the scene in an impoverished and remote location which has just experienced severe flooding and a resultant cholera outbreak. If water purification equipment and medical supplies are not received quickly, the outbreak threatens to spread and become a regional pandemic. Today, such a concern might be addressed by the NGO putting out a call for assistance. It might make an appeal to the U.N., the World Health Organization or the Red Cross. In any case, the NGO is seeking needed personnel and supplies through an intermediary organization, which must raise funds for those things, and then contend with the logistics of finding and delivering people and equipment. Doing so will require a further number of intermediary parties: manufacturers of water

decontamination equipment, pharmaceutical suppliers, transport companies, etc. Involvement of each such intermediaries increases delay, cost and opportunity for error. Nevertheless, this is how such occurrences are typically addressed today, and even relatively manageable global challenges, like the cholera outbreak in this example, can find their solutions quickly bogged down by logistical and bureaucratic quagmires. Larger, potentially catastrophic global challenges such as climate change are subject to even greater institutional resistance, and languish unaddressed in the face of endless debate and indecision.

In contrast, under the proposed model, the same hypothetical would first be addressed by an interested party –an NGO, in this case –placing a smart contract on the blockchain. This particular NGO is concerned with clean drinking water, and so the contract may seek storage tanks and purifications kits, or perhaps procurement of nursing personnel. Whatever good or service might be needed to handle the situation, once a contract seeking it is placed on the blockchain, the request is instantly visible to any other NGO, private individual, government entity or commercial contractor, which may then undertake to fulfill some or all of the contract. At all times, due to the design inherent to any blockchain, the status of the contract and any transactions related to it are visible to all. Anyone who can fulfill any part of the contract, whether a volunteer nurse or a commercial vendor wishing to sell water purification kits, deals directly with the self-executing contract, and is incentivized to perform rapidly since payment is instantaneous with performance. In this way, all unnecessary intermediaries to the transaction are eliminated, and costs and opportunity for error are reduced.

The same efficiencies and forthrightness of purpose offered by the proposed model can be applied to larger, potentially catastrophic global risks as well. For example, with respect to climate change, contracts can be proposed and accepted with respect to any action which addresses the problem –anything from large scale investment in renewable energy to funding research on climate mirrors. The reverse is also true: contracts can be issued which seek to prevent or limit behaviors (e.g., reduction of carbon emissions by a manufacturer), with payment or punishment (the latter reflected by a diminishment in value of the offending party's stake in the accompanying cryptocurrency) instantly reflecting behavior.

In this manner, activities which are currently separate and discreet, with a concomitant drag on efficiency, are combined into components of a single overarching intention. Under the current system of international governance the following constitute separate acts: identification of a global challenge; discussion about the risk it poses; and discussion about how to mitigate the risk, if it is deemed worthy of addressing. Only once each of those interactions has taken place is action even contemplated. This is unacceptable when a risk is both imminent and potentially catastrophic. Under the proposed model, action is immediately available. Discussion of the problem, and funding of the action are essentially the same activity, with increased funding indicating approval of the solution, and an absence of funding equating to skepticism. In contrast to the current system however, in which meaningful funding of a solution (or even its approval) is monopolized by nation states, the proposed model allows for funding (and thus approval of a concept) to be conducted directly and collectively, by anyone from international NGOs to concerned citizens.

3. Motivation

The assessment areas specified by the Foundation are addressed below:

1. CORE VALUES
Decisions within the governance model must be guided by the good of all humankind and by respect for the equal value of all human beings.

The proposed model adheres to and furthers the core values identified by the Foundation because, by design, the blockchain's core principle support those values. The proposed model, like any blockchain, is premised on transparent operation and open and equal access for all who wish to participate. Unlike current forms of governance, the blockchain model does not recognize any form of hierarchy. Decision making is collective and conducted openly, by design. Selfish and unsalutary interests cannot thrive when any action which would otherwise be taken to further such ends is readily identifiable, and can be readily countered if attempted.

2. DECISION-MAKING CAPACITY
Decision-making within the governance model must generally be possible without crippling delays that prevent the challenges from being adequately addressed (e.g. due to parties exercising powers of veto).

This is perhaps the strongest aspect of the proposed model: All bureaucracy and institutional inefficiencies are removed. The very act of acknowledging a global challenge, by placing a smart contract on the blockchain is, in effect, a concrete step towards its solution.

3. EFFECTIVENESS
The governance model must be capable of handling the global challenges and risks and include means to ensure implementation of decisions.

By design, the smart contracts placed on the blockchain are self-executing, i.e., payment is automatic at the time of performance. This design provides a natural self-incentive for contracting parties to implement the decisions reflected in contract.

4. RESOURCES AND FINANCING
The governance model must have sufficient human and material resources at its disposal, and these resources must be financed in an equitable manner.

Given the nature of cryptocurrencies, the proposed blockchain-based model is largely self-financing. The current United Nations budget is approximately $5.4 billion. [FN5]. In contrast, the current market cap for bitcoin is over $70 billion. The market cap for Ethereum, which was launched just over two years ago, is over $28 billion. Both of the latter two valuations were achieved without any form of outside collateral backing or institutional goodwill. Accordingly, it is realistic to assume that the cryptocurrency attached to the proposed model's blockchain will quickly attain a similar market cap –even more so if it is backed by tangible or otherwise identifiable collateral and goodwill.

5. TRUST AND INSIGHT
The trust enjoyed by a successful governance model and its institutions relies on transparency and considerable insight into power structures and decision-making.

As discussed elsewhere in this paper, transparency is a foundational blockchain principle, and built into its design. All transactions, and all parties and interactions relating to those transactions, are visible to any observer.

6. FLEXIBILITY
In order to be able to fulfil its objectives effectively, a successful governance model must contain mechanisms that allow for revisions and improvements to be made to its structure and components.

A blockchain is just an accountability structure –it can be utilized for any purpose in which transparency and accountability are paramount. The proposed model's blockchain structure simply provides for the placement and fulfillment of smart contracts. The subject of those contracts is open-ended.

7. PROTECTION AGAINST THE ABUSE OF POWER
A control system must be in place to take action if the organization should overstep its mandate, e.g. by unduly interfering with the internal affairs of nation-states or favouring the special interests of individuals, groups, organizations, states or groups of states.

The proposed model's blockchain is largely self-policing because, like all blockchains, the interactions which take place on it are transparent. Accordingly, there is no space where groups, individuals or organizations could covertly conspire to foment something of an abusive nature. Their actions would be visible, and when their intentions became apparent, they could be effectively vetoed by a majority of the participants.

If, however, a portion of the collective participants engaged in conduct which was only belatedly recognized by the collective as a whole as being abusive, blockchain design contains mechanisms for corrective action. For example, early in the implementation of the Ethereum platform, malicious actors conspired to usurp approximately $50 million of the platform's cryptocurrency. Once they learned what was underway, a majority of participants on the platform objected, and the objectionable transaction was, for all practical purposes, reversed. Such failsafe mechanisms can be built into any blockchain platform.

8. ACCOUNTABILITY
It is a fundamental requirement of a successful governance model that it performs the tasks it has been charged with, and the governance model must include the power to hold the decision-makers accountable for their actions.

Under the proposed model, all participants, whether international NGOs or private individuals, are decision makers, and all participants' decisions (i.e., transactions) are public record. Any participant can choose not to interact or stake other participants whose prior history warrants such exclusion. Conversely, participants can choose to seek out and back the contracts of those whose public blockchain record shows their activities to have been collectively beneficial.