

Legal Applications of Mars-based Governance

Joshua Habka

MGT5134 - Commercial Enterprise In Space



What Is The Blockchain?



It is a decentralized, open network. This is what Bitcoin is built on.



It allows for Smart Contracts, autonomous programs ran in certain conditions



Data can be stored on the blockchain, using IPFS



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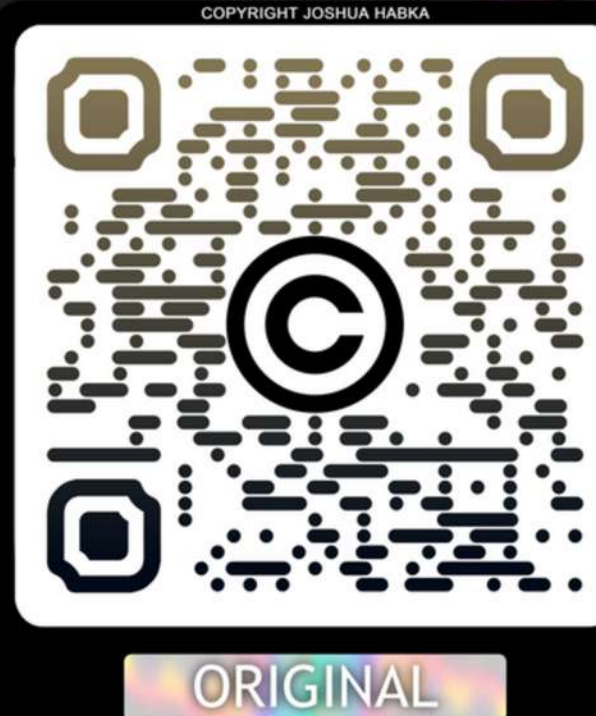
Now. What Is A DAO?

No absolute authority

Decentralized Autonomous Organizations(DAOs) are like computer programs which govern specific actions based on inputs and thresholds(these are the previously defined smart contracts).

Immutable

Once deployed to a blockchain, a DAO will only operate under the predisposed rules provided; this is commonly done by votes. DAOs are also open-source, meaning the functions of the DAO can be seen by anyone.



Benefits of DAOs over traditional government

Automatic Actions

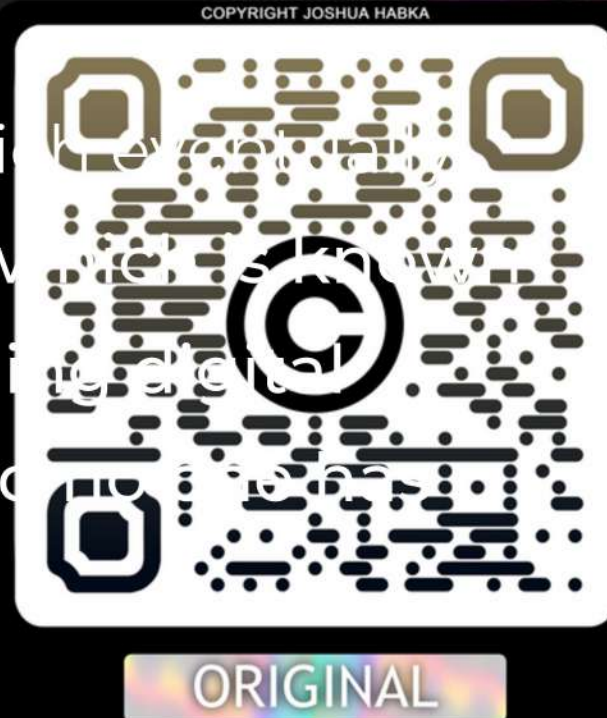
Reduces time for actions or processes to be complete and cuts out the middleman; following for more efficient allocation of talent.

Reduced Cost

DAOs reduce the cost of operating a governmental system in various areas including employees, equipment, and more. This allows funds to be better allocated.

Improved Security

Government agencies have been one of the most impacted groups of cyberattacks, which impacts citizens through economic or political effects. DAOs operate on the blockchain, which is known for its nearly unhackable security based on mathematical hashes and self-confirming digital signatures. Trillions of dollars have been through the blockchain for over a decade and no one has hacked the blockchain technology itself.



Benefits of DAOs over traditional government

Structure Flexibility

As DAOs act as computer programs on the blockchain in the backend, they allow for the flexibility and customization of the type of government structure, with all the benefits of security.

Scalability

DAOs can operate in a low cost, low resource environment and scale with population or existing infrastructure compared to the capital and resources needed for a traditional government to fully operate.

True Democracy

Anyone can form a DAO and since DAOs are open source, people can collectively decide on what they supports their goals and contribute their own assets into an asset pool and vote on actions.

DAO



How A Decentralized Government Benefits Economy

Capital Distribution Transparency

As DAOs act as computer programs on the blockchain in the backend, they allow for the flexibility and customization of the type of government structure, with all the benefits of security.

Easier Public/Commercial Partnership

Government partnerships with the commercial space industry has shown significant signs of success on Earth.

A DAO-powered government is able to reduce administrative repetitive tasks through the use of automated smart contracts on the blockchain, making it easier to distribute contracts, grants, and other financial resources.



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Benefits of DAOs for the economy

Accelerated Innovation

Since DAOs are mainly autonomous systems, actions can be performed immediately once certain conditions are met. This can make it faster to transfer money to startups, distribute shares, and more!

Cash Flow Transparency

Building a financial system on a public network (like Bitcoin or ERC20 (Ethereum)) allows for transparent auditing on fund allocation and spending on both private, public, and government entities by associating wallet addresses with identities using the InterPlanetary File System and the blockchain open ledger.



Limitations of DAOs over traditional government

Scalable Network Need

The blockchain requires many computers to authenticate and authorize transactions, smart contract functions, and cryptographic functions.

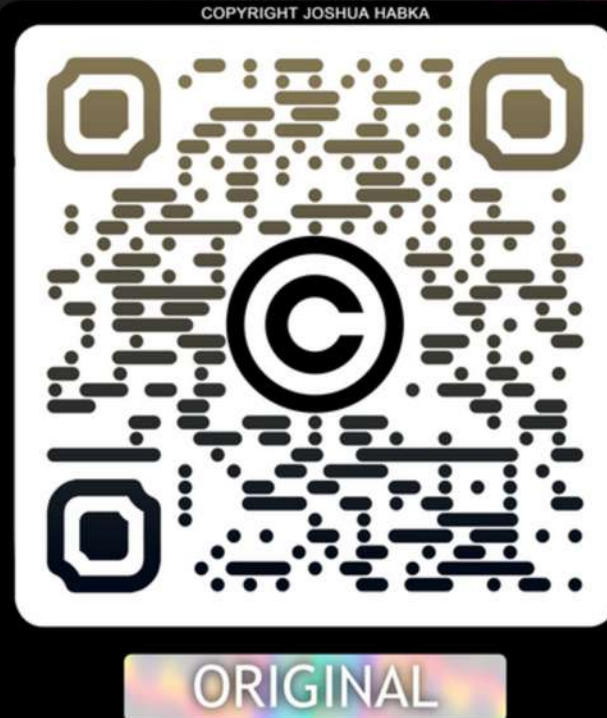
However, infrastructure can be scaled with population of a colony.



Increased Conflict Likelihood

As DAOs take minimal resources and capital to create, they can scale easily and lead to DAOs which may serve with malicious intent as it's easier for resources to be allocated toward

conflict.



Example I. Resource Allocation

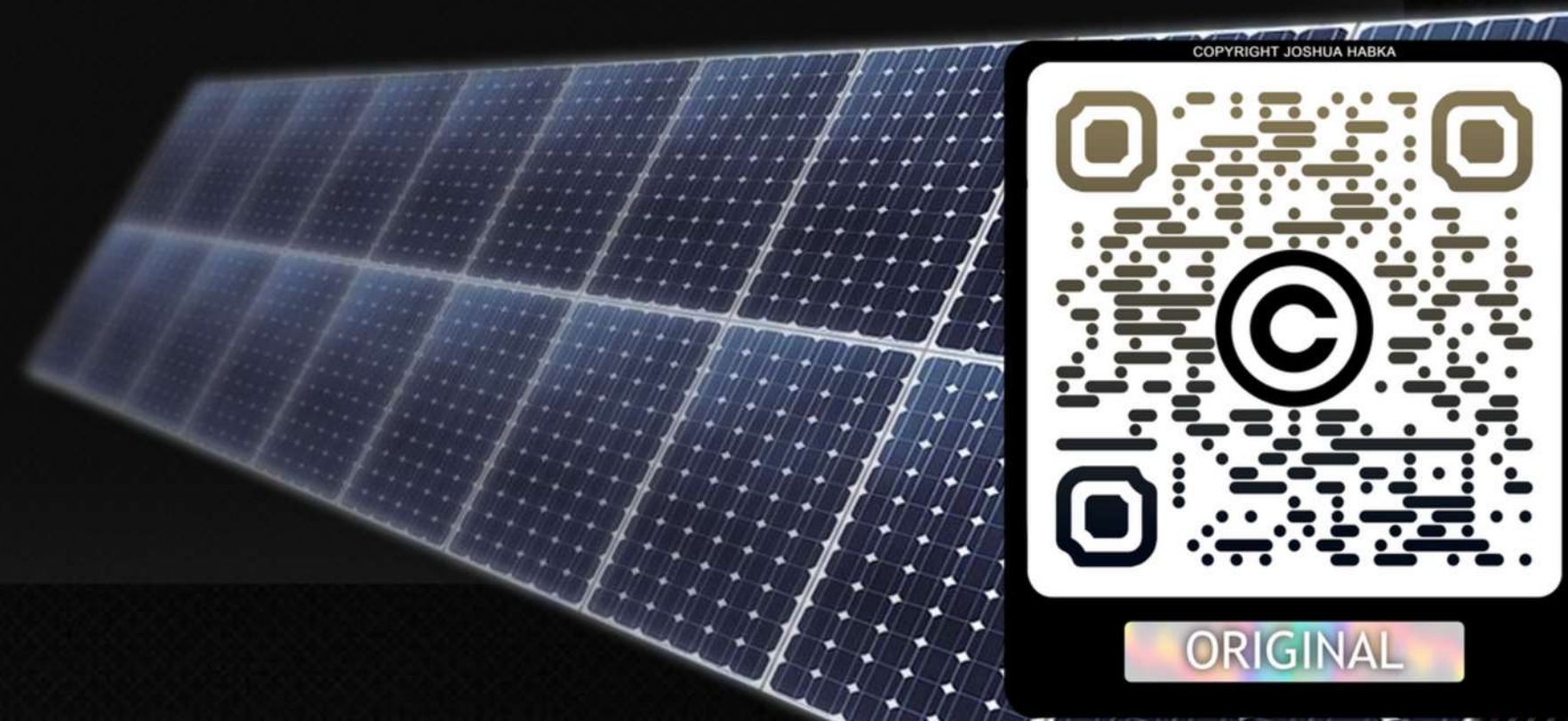
Imagine you are on a city on Mars and there is an event hosted by MarsDAO where multiple startups get to pitch a new solar panel manufacturing process. The startups are listed below.

A = MarsSolar

B = SolaRed

C =

ManuMars



Example I. Resource Allocation

There are 500 attendees who are watching the pitches made by each startup. Following the pitches, the attendees vote on their favorite pitch for the grant.

Each attendee opens an app and selects the startup they want to receive the grant. These are logged as “VOTE” functions on the blockchain.



Example I. Resource Allocation

The votes are as follows:

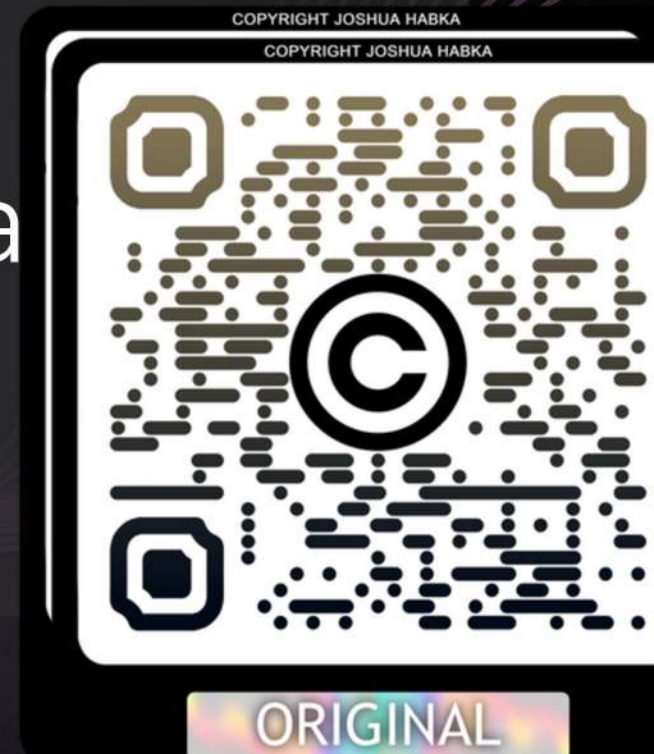
A = 368 votes, 73.6% => WINNING GRANT

B = 76 votes, 15.2%

C = 56 votes, 11.2%



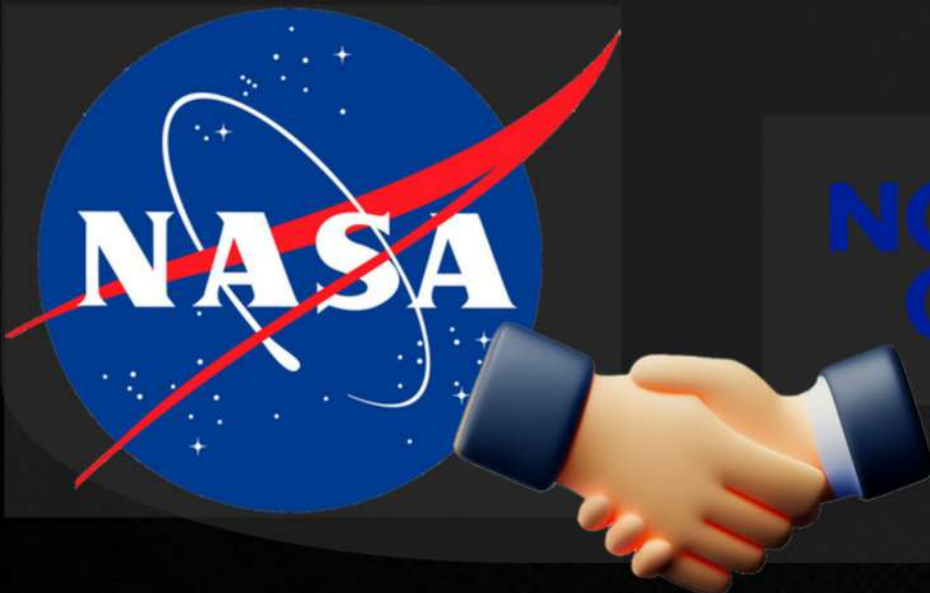
The MarsDAO smart contract automatically sends a grant of \$5M to the winning startup, MarsSolar.



Example II. Contracts

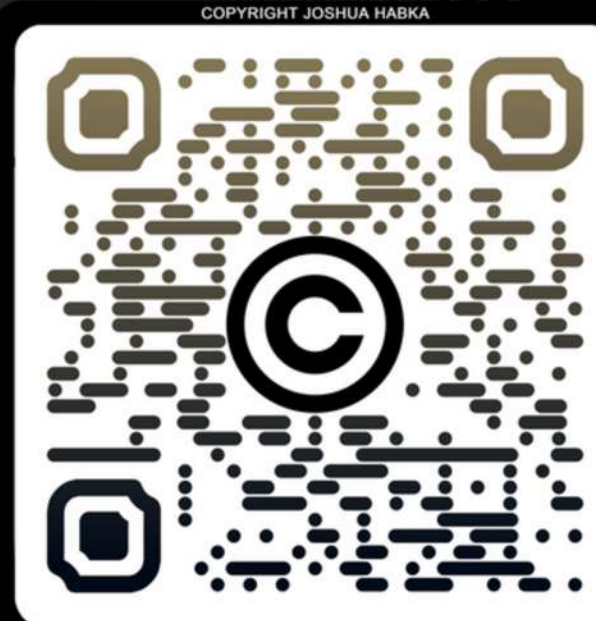
Contracts play a critical role in the global space economy, connecting different organizations and structures together. Contracts allow:

- Safeguarding of proprietary information
- Asset sharing
- Cooperative development on projects



**NORTHROP
GRUMMAN**

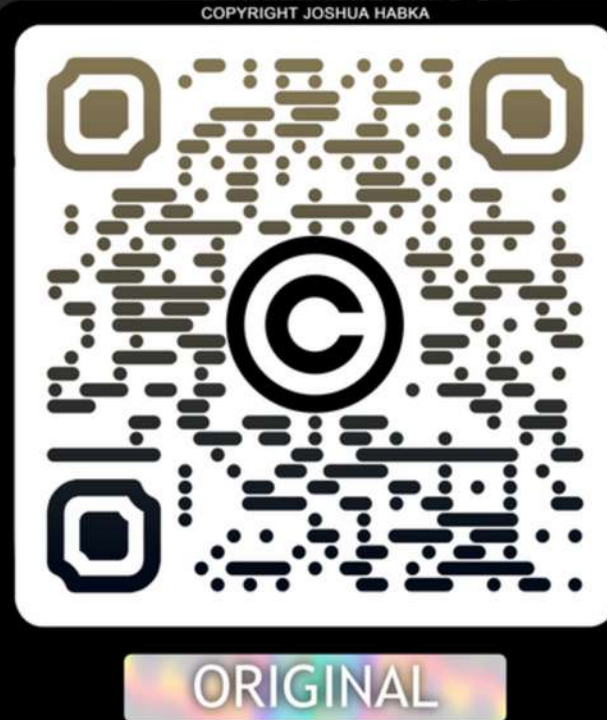
SPACEX



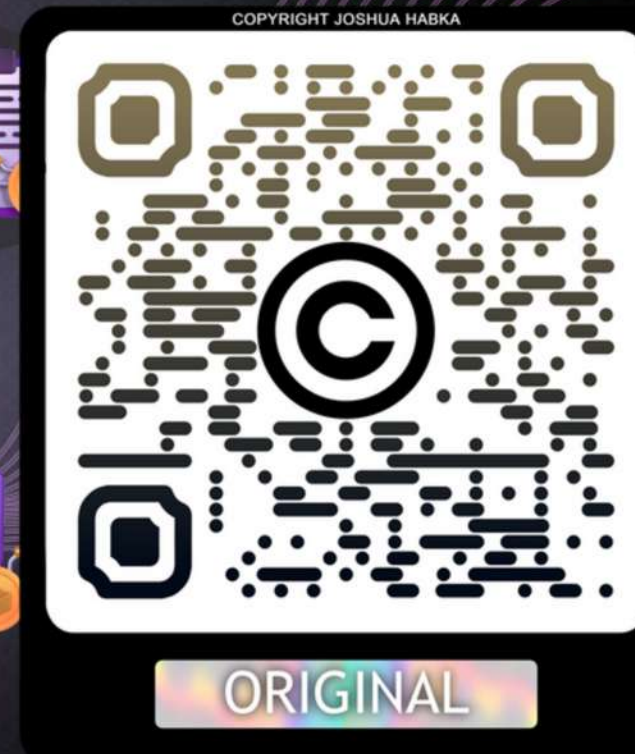
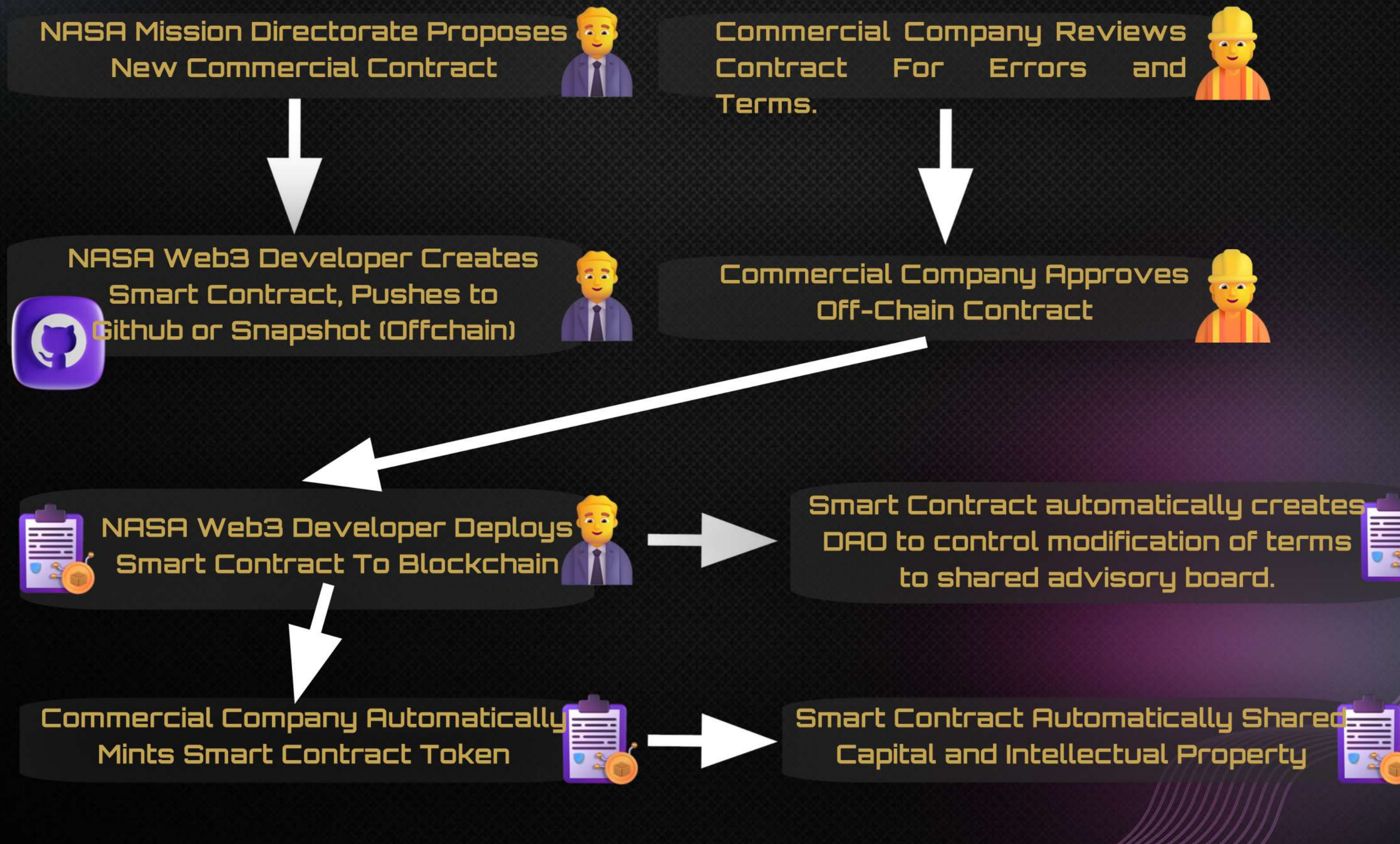
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Example II. Contracts

As DAOs will only automatically execute only when exact criteria are met, they can be automatically accepted or rejected based on previously defined criteria. Security can be increased by using an open-source double-contract filter system on the sending and receiving side



Example II. Contracts



Example II. Contracts

What did we do?



Reduced Human Intervention. This reduces error and cost.



Improved contract integrity by preventing modification of the original contract by a single party.



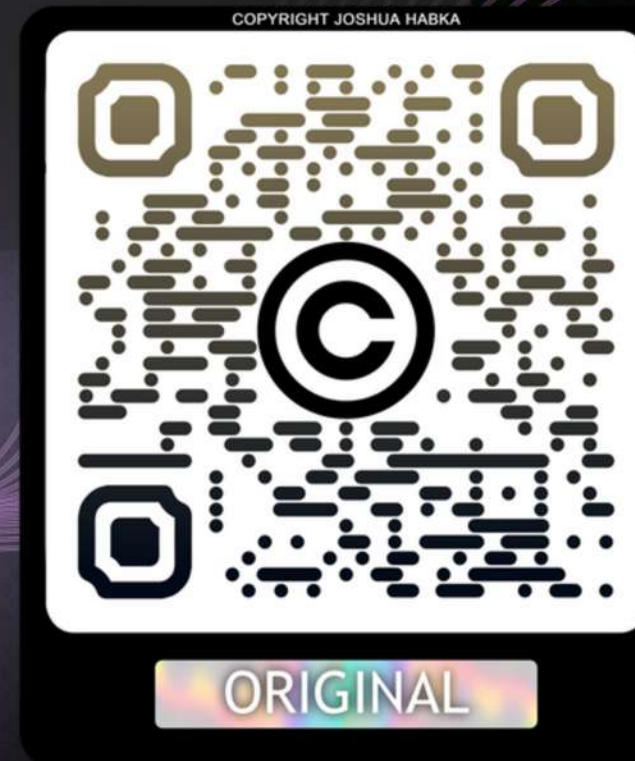
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Example II. Contracts

While this may sound like it is resource intensive, this all can be done with a few lines of open-source, immutable code on the blockchain instead of having multiple drafters and reviewers on both sides of a partnership.



Why Mars?

- DAOs would be nearly impossible to pass in existing governments on Earth due to the amount of resources already allocated to current operations and separation of governments on Earth.
- As humanity has generally moved forward to collaborating as one in space, a DAO allows for an actual binding agreement where each country invests assets into one pool instead of a contract of one's word.



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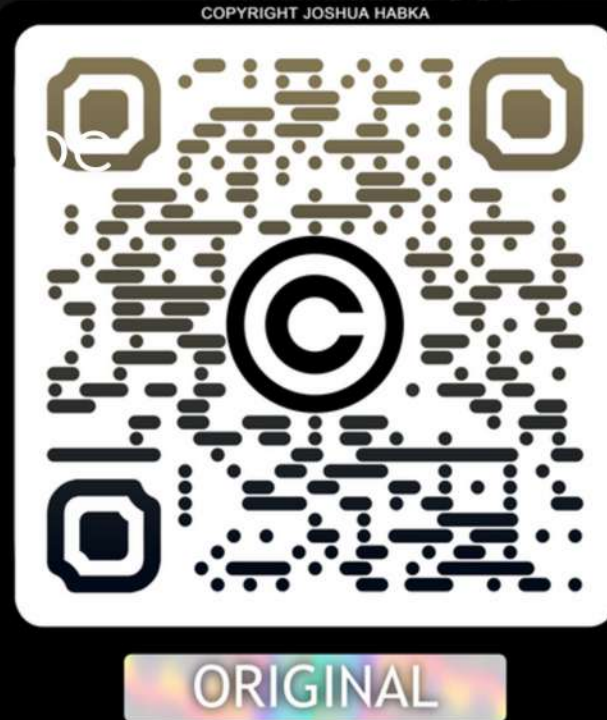
How Would DAOs Benefit The Mars Economy

- Increased civilization development

- As DAOs allow for faster funding, emerging technologies to scale Martian colonies and civilization are likely to grow quicker.

- Faster scientific discoveries

- Anyone can vote with the money of themselves and DAOs on institutes and organizations to receive funding, making it easier for scientific discoveries to be made.



Thank You

JOSHUA HABKA

Joshua Habka

Florida Institute of Technology



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