



Eco Economic Epochs: Eco sustainable incentives for the programmable Economy - It's about TIME

The Heart Beacon Cycle Time - Space Meter USPTO 13/573,002 is an adaptive procedural template / checklist of ideas, methods, processes, procedures, algorithms, tools... used to organize diverse peoples speaking many different languages through the universal language of symbols into Distributed Autonomous groups organized in time - space to achieve common goals.

Use Case: Eco Economic Epochs Time-Space Meter ecology Eco incentives, consensus, interoperability, sync, stochastic UTZ harmonization for the programmable money, economy

Papers / Presentations: Github: <http://github.com/Beacon-Heart>

THESIS: All things internet, internet of programmable money are formed using:

1. Time epochs created by oscillating quartz crystal based silicon chips
2. Syntax used / not used as programming instructions during epoch time cycles

Time epochs / syntax: two main building blocks in creating the Artificial Intelligence A.I. powered global economic system of systems / Earth Intelligence Network EIN / Web 3.0 and the programmable economy in terms of temporal consistency, interoperability, and consensus.

PROJECT: Code Eco sustainable incentives into programmable economic system of systems engineering framework reusing / leveraging NATO systems of systems engineering best practice.

1. Reuse OPS CODE brevity codes mapped to message symbol sets enabling Artificial Intelligence / human interaction (i.e., man — machine interface).
2. Apply lessons learned (bandwidth discipline, interoperability, OPTEMPO sync cycles... intrinsic to NATO SOP swords to plowshares following German military proposal use cases circa 2003).

NATO has invested 30 years of mapping OPS CODE brevity codes to symbology / symbols / symbol sets contained in 300 plus message set / use cases as part of Battlefield digitization, Net Centric Warfare NET Enabled Operations NEO NETOPS. Blockchain, crypto currency developers are recreating, reinventing this decades old, tedious, time intensive, labor intensive, expensive... wheel.

PROJECT BEACON: Reuse NATO's system of systems syntax lexicon OPSCODE brevity code structured data exchange, heartbeat micro to macro cycle Universal Time Zone UTZ sync to support an EIN Earth Intelligence Network neural net emulation. We have a clear and present opportunity and responsibility to improve temporal, geo-spatial, syntactic - semantic consistency, interoperability among myriad programmable money memes among a federated, distributed system of systems.

The Heart Beacon Cycle Time - Space meter is a distributed system of systems engineering signaling -telemetry temporal, geo-spatial, semantic - syntactic sync and consensus foundation framework. A an adaptive procedural template checklist of tools, algorithms, cryptographic modules, it supports DAAE Distributed Autonomous Economy Eco - Economic Heartbeat.

The Heart Beacon Cycle is an adaptive procedural template checklist of things, processes, tools, building blocks useful to form, maintain Eco-responsible trade federations. Each item in the procedural template checklist links to a detailed treatise.

We can synchronize ourselves, our cities, towns, cyber-communities in time — space for a common purpose: shared, common, ecologically sound, responsible econometrics.

The Heart Beacon Cycle Time - Space meter is a swords to plowshares DAO Distributed Autonomous Organization project using NATO's Situational Awareness system of systems engineering framework, processes, procedures and internet building blocks to establish an Ecologically sustainable Economic Heartbeat, neural network emulation for the EIN Earth Intelligence Network and heartbeat sync pulse for a Universal Time Zone UTZ supporting a one world currency. It's syntax lexicon library of OPSCODE brevity codes used in programmable money, the programmable economy is descriptive of all things internet, internet of money down to the quantum computing, quantum blockchain level.

This course of action in challenging times involves reuse of over 300 NATO cases supported by hundreds of message sets further described in spread sheet row - column format populated by thousands of brevity OPSCODES mapped to symbols essential to artificial intelligence man - machine interface. NATO bases are small cities that transact virtually every good, item, commodity with its host nation. Why reinvent the syntax lexicon Rosetta Stone wheel? Think of this as a system of systems tool to accelerate an EIN Earth Intelligence Net – see Project #UNRIG for more information.

The Heart Beacon Cycle Time - Space meter is a signaling, telemetry distributed systems engineering framework improving temporal, geo-spatial, semantic - syntactic sync & consensus among DAAE Distributed Autonomous Automated Economy system of systems reusing Battlefield Digitization, Net Enabled Operations engineering swords to plowshares.

Eco sustainable incentives integral to an Economic system of systems SoS engineering framework used by NATO for decades. Digital Nations need an (Eco sustainable) Economic Heartbeat & a consistent syntax lexicon library. Crypto economics needs a universal syntax lexicon digital base Artificial Intelligence A.I., quantum blockchain heartbeat beacon to synchronize, sample tokenized commodities across a stochastically harmonized UTZ Universal Time Zone supporting an Earth Intelligence Network EIN see Robert David Steele's #UNRIG proposal @ <http://robertdavidsteele.com>

Economic #RESET is a mathematical certainty. Do we RESET the global system of systems as is or will we re-engineer using NATO system of systems engineering standing on the shoulders of giants?

IF / WHEN: Climate Change causes a drop in crop commodity food production by 20–25 % while population continues to grow, **THEN** it follows that this condition will become a matter of national security. It's **TIME** to implement an Ecologically Sustainable Economic Heartbeat **ELSE** face > greater chaos by not leveraging proven system of system structured data exchange methods. An ecologically sustainable economic heartbeat is needed. Why wait until crisis, DEFCON 2 stage?

IF climate change causes a drop in crop commodity by 20–25 % while population grows, **THEN** this condition will become a matter of national security. **THEN** this will require revisiting Belgian Economist Bernard Lietaer's TRC Trade Reference Currency **ELSE** face >socio economic chaos TERRA Trade Reference Currency by Economist Bernard Lietaer [LINK](http://lietaer.com/2010/01/terra/)

Ecologically sustainable economic transactions need to be incentivized among the world's Ecological and Economic system of systems. The world's systems need to be time-space synchronized, stochastically harmonized across the one world, global UTZ Universal Time Zone via heartbeat messages using universally shared, standards based OPSCODE brevity codes drawn from a universal structured data exchange syntax lexicon with over 300 use case templates e.g., NATO's lexicon library

System of Systems Engineering Framework: Crypto economics needs a universal syntax lexicon digital base Artificial Intelligence A.I., quantum blockchain heartbeat beacon to synchronize, sample tokenized commodities across a stochastically harmonized UTZ Universal Time Zone supporting an Earth Intelligence Network EIN. It is time to build a new economic system of systems framework.

All things internet, net of money blockchain cryptocurrencies are formed by unicast, multicast, anycast. Programmable money's improvements are in cryptography. The term DAO Distributed Autonomous Organization was coined by the RAND Corporation circa 2000.

Nobel Prize winning Economist Milton Friedman's K% rule is an "economic heartbeat". **K-Percent Rule DEFINITION:** The K-Percent Rule proposal by economist Milton Friedman was the central bank should increase the money supply by a constant percentage every year. The K-Percent Rule proposes to set the money supply growth / reduction at a rate equal to the growth of real GDP each year. **K-Percent Rule — Investopedia** [LINK](http://www.investopedia.com/terms/k/k-percent-rule.asp)

Quantum Computing: **Quantum computing** is the use of **quantum**-mechanical phenomena such as superposition and entanglement to perform computation. **Quantum** computers are believed to be able to solve certain computational problems, such as integer factorization. In a **quantum** Turing machine, the difference is that the tape exists in a quantum state, as does the read-write head. This means that the symbols on the tape can be either 0 or 1 or a **superposition** of 0 and 1; in other words the symbols are both 0 and 1 (and all points in between) at the same time. While a normal Turing machine can only perform one calculation at a time, a quantum Turing machine can perform many calculations at once.

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IEEE 802.11AG is used for hop by hop detection and control for epoch assignment and hop counts management and for hop by hop detection function to determine hop by hop count corresponding to machine readable and executable null / 0 and steps from null representing hop counts e.g., +1, +2, +3, +4 and / or -1, -2, -3, -4 Paul Revere linear, sequential metaphor indicating distance traveled in context with router / server / switch / node traversal

IEEE 802.11 HbH hop by hop control supporting Paul Revere, rain drop in pond metaphor metrics of increases / decreases in thresholds and by intensity, duration and hop count sums

HEARTBEAT SCOP Administrative Interface as an Internet, net of Money configuration tool. SCOP is a tool that exemplifies how the internet really works. There are no levels, layers, packets, frames, bits, ether gas, hashgraphs, bytes motes, block chain blocks, pings, packets... There are only 1) epoch time intervals, 2) syntax used as if, then, else instructions. Time epoch time cycles used / not used to parse, process syntax as instructions are the only building blocks available to scale the blockchain. Blockchain scaling usually involves a discussion of "layers" when the reality is that parsing, processing syntax (OPSCODE brevity codes, shards, hashes) is passed from the genesis Epoch Time Cycle 1 to a temporal follow on epoch time cycle often involving geo-spatial, temporal separation.

Project Task: form federations of Distributed, Autonomous Organizations DAO communities, states, sovereign nations using an adaptive procedural template checklist promoting synchronization among geo-spatially and temporally dispersed groups using a common syntax – symbol set lexicon. Federated groups activities are synchronized geo-spatially across time - space to achieve synergy, synchronicity of events orchestrated from micro to macro cycles from grassroots to capitals.



Fig 1: Eco sustainable Economic Epochs coded into a systems of systems framework

Reuse of DARPA - NATO's structured data exchange that maps data element OPSCODES to symbol sets is key to Artificial Intelligence #AI man - machine interface, consensus, consistency among myriad #blockchain programmable #money memes, metaphors, Web 3.0, Earth Intelligence Network EIN.. Given space travel risks, navigation based on consciousness / telepathy (use of symbols not words), a consistent syntax lexicon to communicate with #UFO EBO's that are likely Artificial Intelligence AI powered drones is reuse of DARPA - NATO's structured data exchange that maps data element OPSCODES to symbol sets with over 300 + use case messages



Fig 2: Eco sustainable incentives coded into a system of systems economic framework

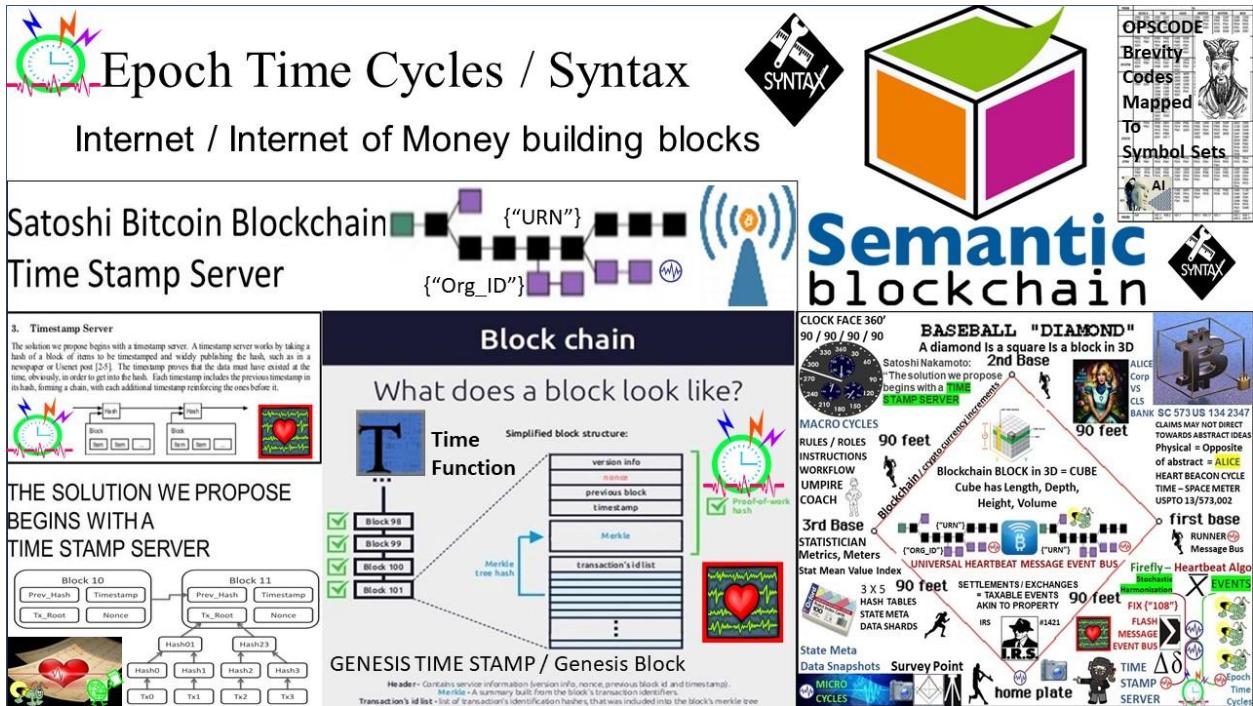


Figure 3: Epoch Time Cycles / Syntax two main building blocks for web, web of \$\$\$

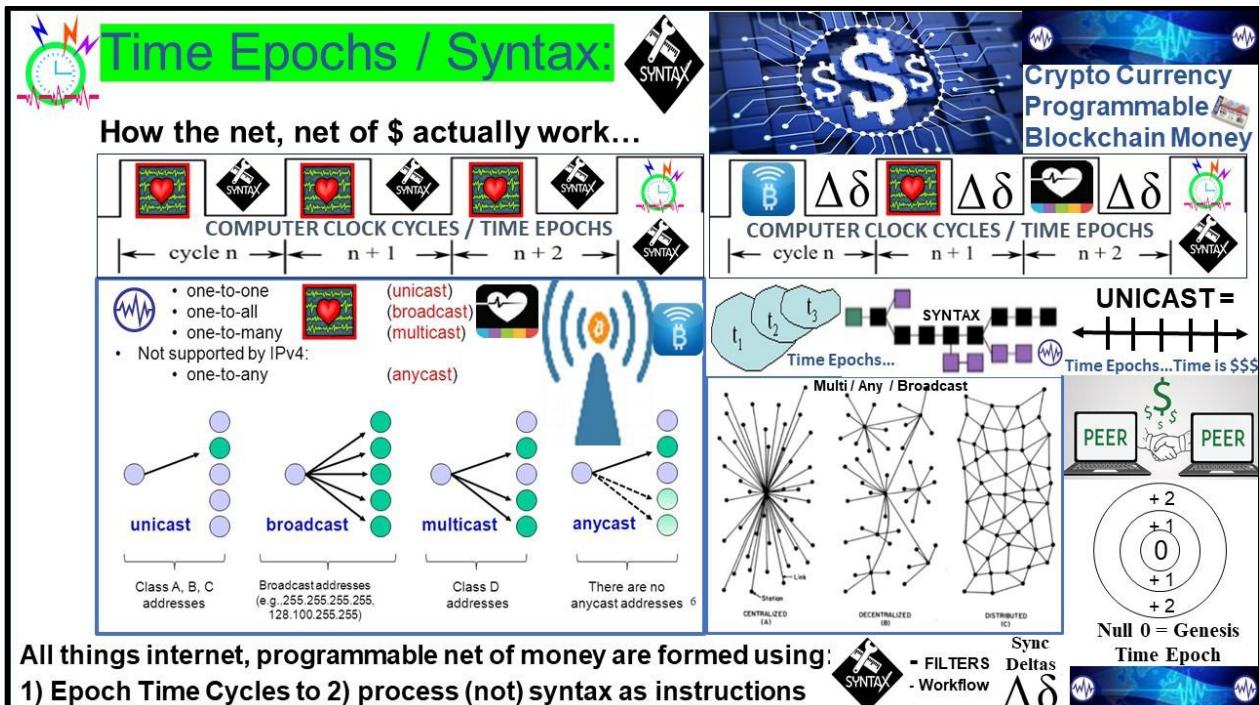


Figure 4: Time Epochs / Syntax: how the internet actually works: Unicast / Multicast IP

Q: What US Supreme Court Alice compliant (physical = opposite of abstract) meme describes the myriad #blockchain #consensus #algorithms the most comprehensively that uses an algorithm (based on nature) enabling distributed system of systems geo-spatial, UTZ Universal Time Zone temporal, semantic - syntactic sync / OPSCODE brevity code consensus?

Blockchain Consensus Algorithms & Mechanisms

In the world of blockchain consensus algorithms, consensus is the **HEART OF THE BLOCKCHAIN NETWORK**. Its main purpose is to achieve agreement on transactions among a distributed system (s) **Proof of Formulation: PoF**: generation / propagation of blocks using a previously agreed sequence between participants of the generation of blocks, formed by two groups: a generator group and/or Formulator and a group of synchronization.

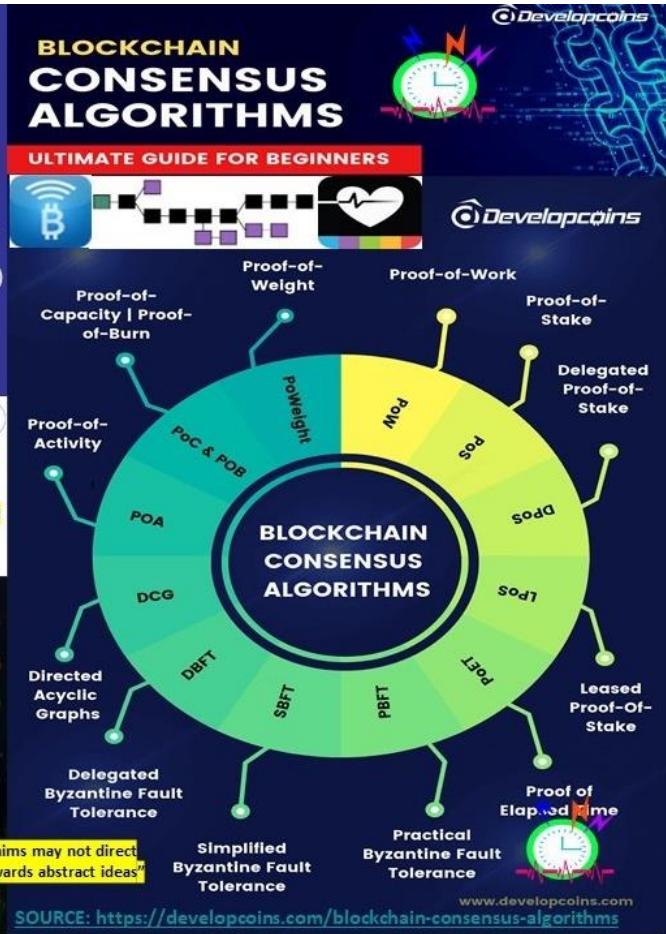


Figure 5: Heart of the cryptocurrency / blockchain world: consensus algorithms



Figure 6: Building blocks of an adaptive procedural template checklist

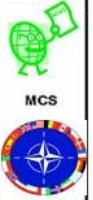
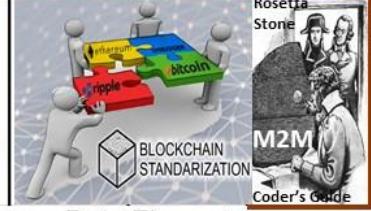
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USMTF / XML MTF FORMATTED MESSAGE CATALOG = 300 + messages info exchange sets using common, CONSENSUS Message Text Formats MTFs. MTFs specify <CONTENT>/ info agreed by group consensus presenting information in a logical, well specified unambiguous layout resulting in a highly efficient info payload to overhead ratio														INFOCON		4 3 2 1	INFORMATION CONDITION	FFUDN: Field Format Unit Designator #		FFIRN Field Format Index Reference #																																																																																																																																					
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<table border="1"> <thead> <tr> <th colspan="14">Information Categories and Examples</th></tr> <tr> <th>Object Categories</th><th>Examples</th><th>Location</th><th>Movement</th><th>Identify</th><th>Status</th><th>Activity</th><th>Intent</th><th> </th><th> </th><th> </th><th> </th><th> </th><th> </th></tr> </thead> <tbody> <tr> <td>OOB</td><td>SYNTAX LEXICON</td><td>STRUCTURED DATA lat/long</td><td>EXCHANGE spd/hdg</td><td>Message Sets country / alliance, type/class</td><td>readiness</td><td>targeting, reconning</td><td>COA {"Java JS"}</td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr> <td>Infrastructure</td><td>Comm, power, transportation, water/sewer</td><td>Machine Trust Language MTI network, grid</td><td>throughput, flow rates,</td><td>name, part-of relationships</td><td>BDA, op levels</td><td>repair, broadcasts</td><td>YAML expansion ratios</td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr> <td>Sociological</td><td>Culture, religion, economic, ethnic, government, history, languages</td><td>temples, historic structures</td><td>ER Model</td><td>Class Diagram</td><td>Relational Database</td><td>Object DBMS</td><td>XML DTD / Schema</td><td>TADILs</td><td>MTF</td><td> </td><td> </td><td> </td><td> </td></tr> <tr> <td>Geophysical</td><td>Terrain, weather, climatology, oceanography, astrometry</td><td>feature lat/long, alt/dpth</td><td>Attribute</td><td>Attribute</td><td>Field / Column</td><td>Attribute</td><td>Child Element or Element Attribute</td><td>DF</td><td>FFRN / FFN / FFUDN</td><td>PURCHASE CODES</td><td>SYMBOL</td><td>Friend</td><td>Neutral</td><td>Hostile</td><td>Competitor</td><td> </td><td> </td><td> </td><td> </td></tr> <tr> <td></td><td></td><td></td><td>Domain Value</td><td>PURCHASE CODES</td><td>Instance, Value</td><td>FEDERATE</td><td>DUI</td><td>FUD</td><td> </td><td> </td></tr> </tbody> </table>														Information Categories and Examples														Object Categories	Examples	Location	Movement	Identify	Status	Activity	Intent							OOB	SYNTAX LEXICON	STRUCTURED DATA lat/long	EXCHANGE spd/hdg	Message Sets country / alliance, type/class	readiness	targeting, reconning	COA {"Java JS"}							Infrastructure	Comm, power, transportation, water/sewer	Machine Trust Language MTI network, grid	throughput, flow rates,	name, part-of relationships	BDA, op levels	repair, broadcasts	YAML expansion ratios							Sociological	Culture, religion, economic, ethnic, government, history, languages	temples, historic structures	ER Model	Class Diagram	Relational Database	Object DBMS	XML DTD / Schema	TADILs	MTF					Geophysical	Terrain, weather, climatology, oceanography, astrometry	feature lat/long, alt/dpth	Attribute	Attribute	Field / Column	Attribute	Child Element or Element Attribute	DF	FFRN / FFN / FFUDN	PURCHASE CODES	SYMBOL	Friend	Neutral	Hostile	Competitor								Domain Value	PURCHASE CODES	Instance, Value	FEDERATE	DUI	FUD												11.4 - Classification	11.8 - Kinematics	11.4.1 - Category	11.8.1 - Pos / Vel / Acc (PVA)	11.4.1.1 - Confidence Level	11.8.1.1 - Acceleration	11.4.1.1.1 - Angular	11.4.1.2 - Estimate Type	11.8.1.2 - Linear	1 - Estimate Type	11.4.1.2.1 - Alternative	1.2.1 - Estimated	11.4.1.2.2 - Evaluated D	1.2.2 - Observed	11.4.1.3 - Value	1.2.3 - Predicted	11.4.1.4 - Generated Data	1.2.4 - Generated Data												
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Fig 7: Syntax Lexicon library 300 + message sets / data elements mapped to symbols

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Figure 9: Proof of Stake / Eco Economic Epoch Heartbeat Cycles Time – Space Meter

Proof of stake is a type of consensus algorithm by which a cryptocurrency blockchain network aims to achieve distributed consensus. In PoS-based cryptocurrencies the creator of the next block is chosen via various combinations of random selection and wealth or age.

Proof of Stake (PoS) concept states that a person can mine or validate block transactions according to how many coins he or she holds. This means that the more [Bitcoin](#) or [altcoin](#) owned by a miner, the more mining power he or she has.

Bitcoin miners mine or validate block transactions based on the amount of coins a miner holds. When a transaction is initiated, the transaction data is fit into a block with a maximum capacity of 1 megabyte, and then duplicated across multiple computers or nodes on the network. The nodes are the administrative body of the [blockchain](#) and verify the legitimacy of the transactions in each block.

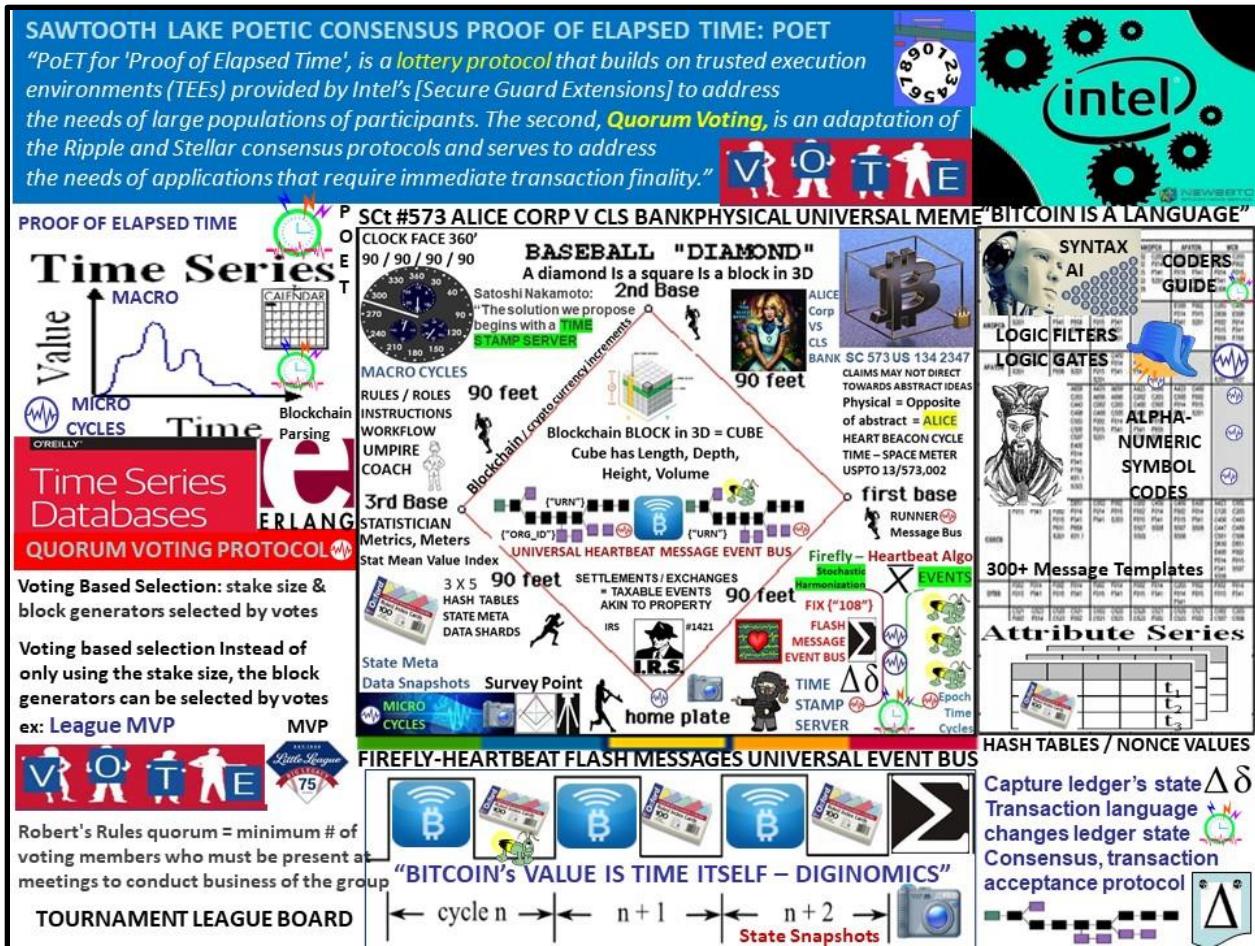


Figure 10: Proof of Elapsed Time POET / Epoch Heartbeat Cycles Time – Space Meter

Proof of elapsed time (POET) is a [blockchain](#) network consensus mechanism algorithm that prevents high resource utilization and high energy consumption and keeps the process more efficient by following a fair lottery system. Based on the principle of a fair lottery system where every single node is equally likely to be a winner, the POET mechanism is based on spreading the chances of winning fairly across the largest possible number of network participants.

POET algorithm working mechanism: Each node in the network is required to wait for a randomly chosen time period. The first one to complete the designated waiting time wins the new block. Each node in the blockchain network generates a random wait time and goes to sleep for that specified duration. The one to wake up first – that is, the one with the shortest wait time – wakes up and commits a new block to the blockchain, broadcasting the necessary information to the whole peer network. The process repeats for next block discovery.

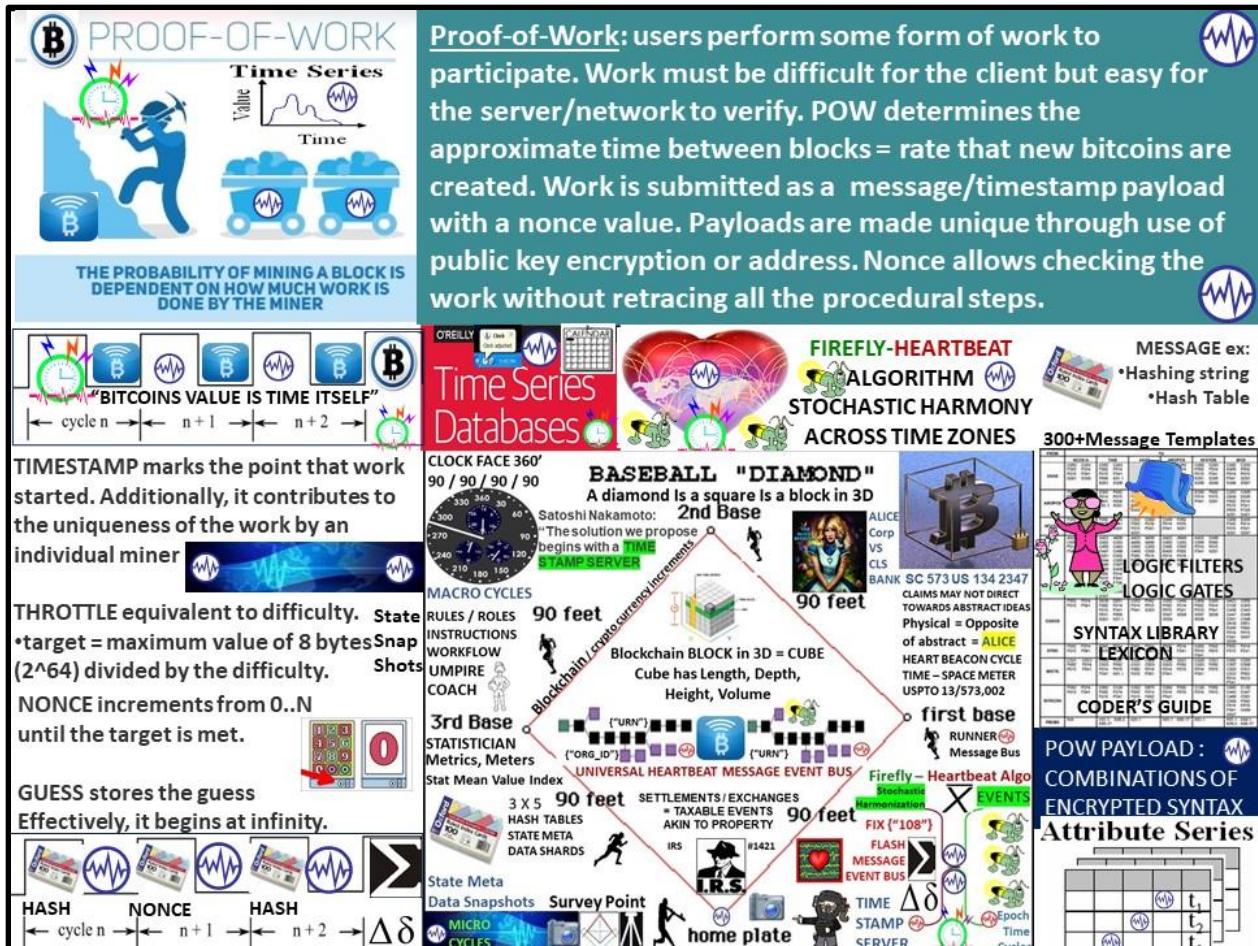


Figure 11 Proof of Work / Eco Economic Epoch Heart Beacon Cycle

A **proof-of-work** (PoW) system (or protocol, or function) is a consensus mechanism. It deters denial-of-service attacks and other service abuses such as spam on a network by requiring some **work** from the service requester, usually meaning processing time by a computer. The way that users detect tampering in practice is through **hashes**, long strings of numbers that serve as proof of work. Put a given set of data through a hash function (bitcoin uses SHA-256), and it will only ever generate one hash. Due to the "avalanche effect," however, even a tiny change to any portion of the original data will result in a totally unrecognizable hash. Whatever the size of the original data set, the hash generated by a given function will be the same length. The hash is a one-way function: it cannot be used to obtain the original data, only to check that the data that generated the hash matches the original data.

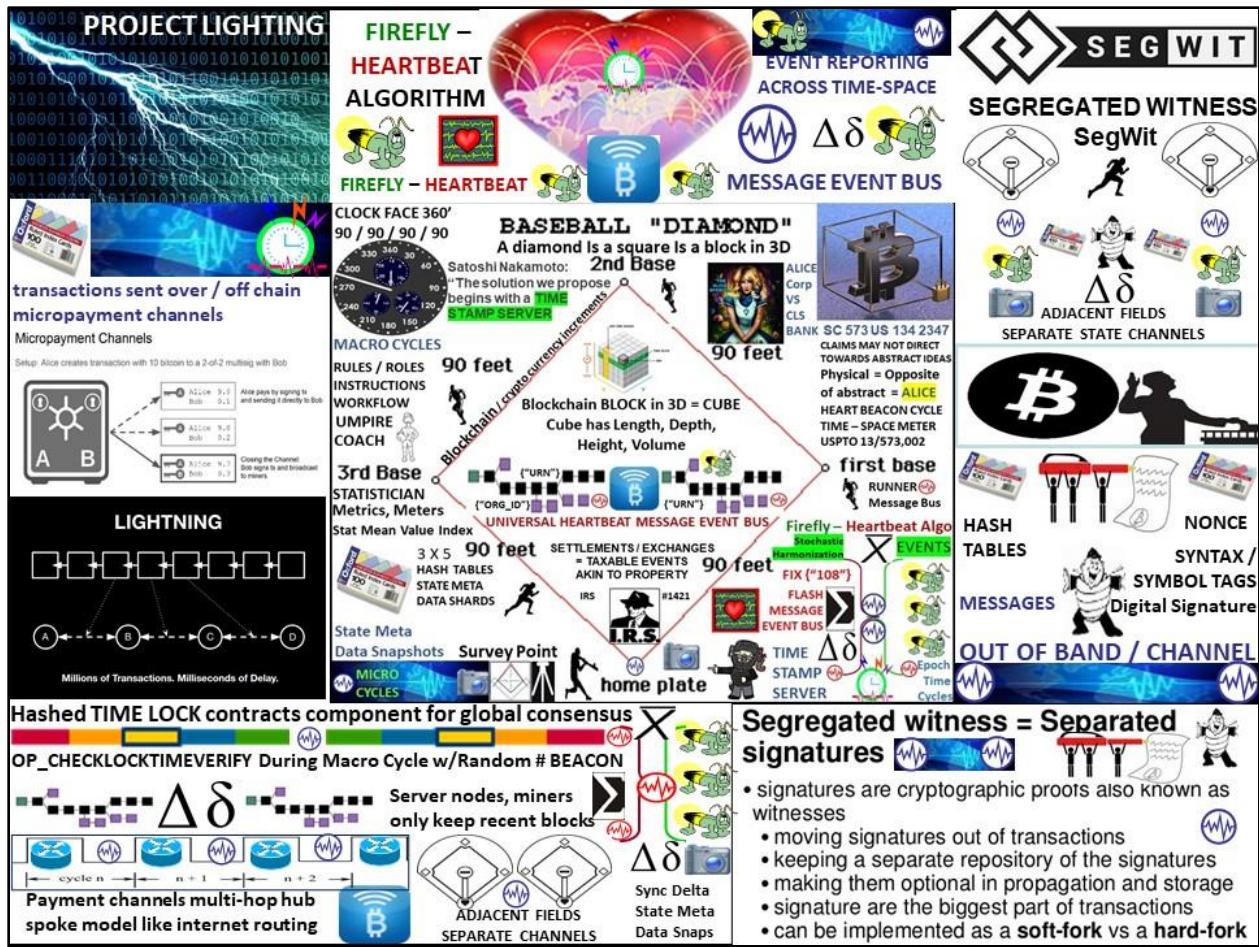


Figure 12: Project Lightning / Segregated witness / Heart Beacon Cycle

Lightning is a decentralized **network** using smart contract functionality in the **blockchain** to enable instant payments across a **network** of participants. The **Lightning Network** is dependent upon the underlying technology of the **blockchain**. Lightning Bitcoin/**blockchain** transactions uses a native smart-contract scripting language Lightning is a "Layer 2" payment protocol that operates on top of a **blockchain**-based cryptocurrency

SegWit is the process by which the block size limit on a [blockchain](#) is increased by removing signature data from [Bitcoin transactions](#). When certain parts of a transaction are removed, this frees up space or capacity to add more transactions to the chain.

Segregate means to separate, and Witnesses are the transaction signatures. Hence, Segregated Witness, in short, means to separate transaction signatures.

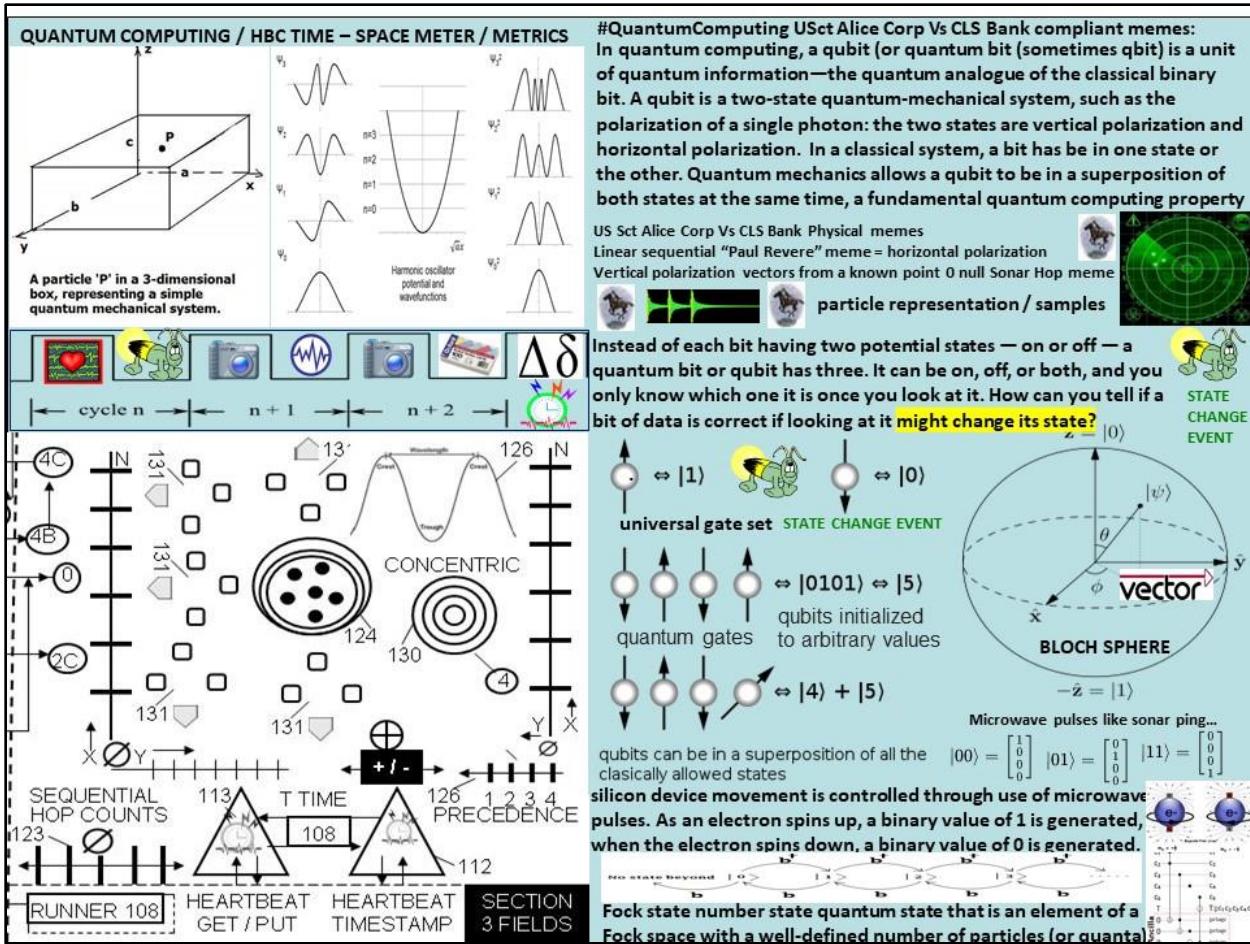


Figure 13: Quantum Computing / Heart Beacon Cycle Time – Space Meter

Quantum computing is the use of quantum-mechanical phenomena such as superposition and entanglement to perform computation. Computers that perform quantum computations are known as quantum computers. Quantum computers are believed to be able to solve certain computational problems, such as integer factorization, substantially faster than classical computers.

In a **quantum** Turing machine, the difference between it and the original tape Turing machine is that the tape exists in a quantum state, as does the read-write head. This means that the symbols on the tape can be either 0 or 1 or a **superposition** of 0 and 1; in other words the symbols are both 0 and 1 (and all points in between) at the same time. While a normal Turing machine can only perform one calculation at a time, a quantum Turing machine can perform many calculations at once.



Fig 14: NIST Quantum Randomness Beacon / Heart Beacon Cycle Time – Space Meter

NIST's quantum-based random number generator, on the other hand, creates random numbers by shining an intense laser into a crystal that converts laser light into pairs of photons that are entangled, a quantum phenomenon that links their properties. These photons are then measured to produce a string of truly random numbers. Source: [PDF The NIST Randomness Beacon 2](#)

This prototype implementation generates full-entropy bit-strings and posts them in blocks of 512 bits every 60 seconds. Each such value is sequence-numbered, time-stamped and signed, and includes the hash of the previous value to chain the sequence of values together and prevent even the source to retroactively change an output package without being detected. NIST Randomness Beacon [LINK](#)

Many in the programmable money space think quantum computing will obsolete the crypto currency #blockchain. In my opinion, the opposite is true - the programmable economy will be anchored by quantum computing - specifically NIST's Quantum Random Number Beacon / Github: <http://github.com/Beacon-Heart>



Fig 15: NIST Quantum Random Number Beacon / Time Beacon / USPTO 13/573,002

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See hop count treatise referential to internet / TCP/IP treatises Figure 11

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REFERENCES / LINKS

GITHUB Documents: [LINK https://github.com/Beacon-Heart](https://github.com/Beacon-Heart)

MEDIUM ARTICLE: "The blockchain needs a killer use case" (climate change / population increase)

[LINK: https://medium.com/coinmonks/blockchain-needs-a-killer-use-case-2f4def841883](https://medium.com/coinmonks/blockchain-needs-a-killer-use-case-2f4def841883)

MEDIUM ARTICLE: Digital Nations need an Ecologically sustainable Economic Heartbeat

[LINK: https://medium.com/@heart.beacon.cycle/eco-sustainable-economic-heartbeat-43e4e30246da](https://medium.com/@heart.beacon.cycle/eco-sustainable-economic-heartbeat-43e4e30246da)

MEDIUM ARTICLE: Deep Thought pondering the crypto blockchain through Alice's Looking Glass: [LINK https://medium.com/@heart.beacon.cycle/deep-thought-pondering-the-bitcoin-blockchain-f20ad6112d7](https://medium.com/@heart.beacon.cycle/deep-thought-pondering-the-bitcoin-blockchain-f20ad6112d7)

MEDIUM ARTICLE: "Delusional Bitcoin Vs Fool's Gold":

[LINK: https://medium.com/@heart.beacon.cycle/delusional-bitcoin-vs-fools-gold-e4bea26afba8](https://medium.com/@heart.beacon.cycle/delusional-bitcoin-vs-fools-gold-e4bea26afba8)

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Business Card



How to change the world by standing on the shoulders of giants / swords to plowshares