

**TITLE: WORLD GAME GREAT REDESIGN: SUBTITLE:** Telemetry data technology foundation matrix, control grid framework formed with an Adaptive Procedural Template



**FOUNDATION TECH FRAMEWORK FOR DEFI, PROGRAMMABLE MONEY, BIG DATA..**

FEBRUARY 13, 2025

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Foundation Technology Internet, Net of \$, DeFi, Fintech, Structured Data

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Document Control Number: USPTO 13/573,002 Art Unit: 2468

TITLE: The Heart Beacon Cycle Time - Space Meter

SUBTITLE: The World Game's (s) Great Reset / redesign's Adaptive Procedural Template framework, control grid / matrix telemetry, metrics, meters..

Patent Application Type: Adaptive procedural template

SUMMARY: System of systems telemetry data framework formed with an Adaptive Procedural Template foundation tech control grid framework for The World Game (s)

USE CASE: structured data exchange synchronization, stochastic harmonization, OPSCODE brevity codes - Artificial Intelligence symbol sets, sound - light based quantum computing speedbumps, reuse of DARPA, NATO systems OOTW Operations Other Than War use case for control grid / matrix telemetry, metrics, sync..

USE CASE: Real World Assets commodity index backed currency - Economy: commodity tokens / RWA Real World Assets index backed currency / stable coin - DeFI / TradeFi algorithmically regulated programmable ethical, equitable automated economy, control grid, access, permission, price discovery, equilibrium algorithms (s)

QUOTE: "There is only one revolution tolerable to all men, all societies, all political systems: Revolution by design and invention". Richard Buckminster Fuller author of The World (Peace) (simulation) Game book, futurist, environmentalist: <http://bfi.org>

QUOTE: "Build a new model that makes the old model obsolete" Richard Buckminster Fuller Author of the book Our Spaceship Earth

QUOTE: "Only a crisis - actual or perceived - produces real change. When that crisis occurs, the actions that are taken depend on the ideas that are lying around. That, I believe, is our basic function: to develop alternatives to existing policies, to keep them alive and available until the politically impossible becomes the politically inevitable." Milton Friedman Nobel Prize winning Economist who described a GDP Gross Domestic Product commodity RWA Real World Asset based K% rule to monetize a currency, implement GDP based rules automated inflation control to manage the global economy.

QUOTE: "The world desperately needs a universal time chain (blockchain) with a distributed time-stamping server with globally recognized immutability to preserve digital truth." "A provable and immutable global time chain is urgently needed, not to replace human conscience but to protect and preserve it." The global economy has begun to degenerate from a relatively free form of capitalism into a digital feudal system,"

QUOTE: "Avoiding danger is no safer in the long run than outright exposure. The fearful are caught as often as the bold." The Yale Book of Quotations Helen Adams Keller (June 27, 1880 – June 1, 1968) deaf and blind author, activist and lecturer.

"The Secret of Change Is to Focus All of Your Energy, Not on Fighting the Old, But on Building the New" / Quote Investigator: In 1980 the first edition of "Way of the Peaceful Warrior" by the world-class gymnast Dan Millman was released. "You have many habits that weaken you. The secret of change is to focus all your energy not on fighting the old, but on building the new." Source: Quote Investigator: Socrates:

<https://quoteinvestigator.com/2013/05/28/socrates-energy/>

Foundation Technology trinity for data telemetry time chain – blockchain Annex K:

- EPOCH (s) = Time intervals, cycles ex: Blockchain, AI dbase = TIME Chain
- SPACE (ex: IRS memo #1421 "Bitcoin transaction akin to land acquisition"
- SYNTAX: data elements mapped to symbols for A.I. / man - machine interface

THESIS: All artifacts internet, programmable net of money are formed using:

- 1) Epoch time cycle intervals ex: created by silicon microchip oscillations
- 2) Syntax parsed, processed during epoch time cycle intervals

All things internet, internet of money, blockchains (time chains) are formed by unicast, multicast, anycast protocols. Programmable money's improvements are in cryptography. Blockchains are formed by unicast, multicast, anycast of workflow filters.

Participant incentive: avoid duplication of DoD / NATO decades of work in concert with ISO, ITU, IEEE, DoD / NATO maps data element OPSCODE brevity codes to (Mil standard 2525C, D) symbols supporting A.I. man - machine interface requiring consensus, concurrence among an engineering system of systems.

An invention may be an improvement to an existing invention. USPTO 13/573,002's basis for invention is US Army CECOM Communication - Electronics Command's "Greatest Invention" a system of systems structured data digital dashboard geo-temporal - spatial synchronization, standardization program matching brevity codes to symbols, symbol sets critical for A.I. Artificial Intelligence man - machine interface used for OOTW Operations Other Than War following a German Army suggestion circa 2003.

TERRA Trade Reference Currency TRC: TERRA Trade Reference Currency TRC: currency backed by RWA Real World Assets / commodities / commodity basket / index based featuring demurrage fees / charges to support supplier to consumer logistics of goods. The Terra TRC Trade Reference Currency is a global complementary currency designed to provide an inflation-resistant international standard of value; to stabilize the business cycle on a global level; and to realign stockholder's interests with long-term sustainability. Economist Bernard Lietaer Source: <http://lietaer.com/2010/01/terra/>

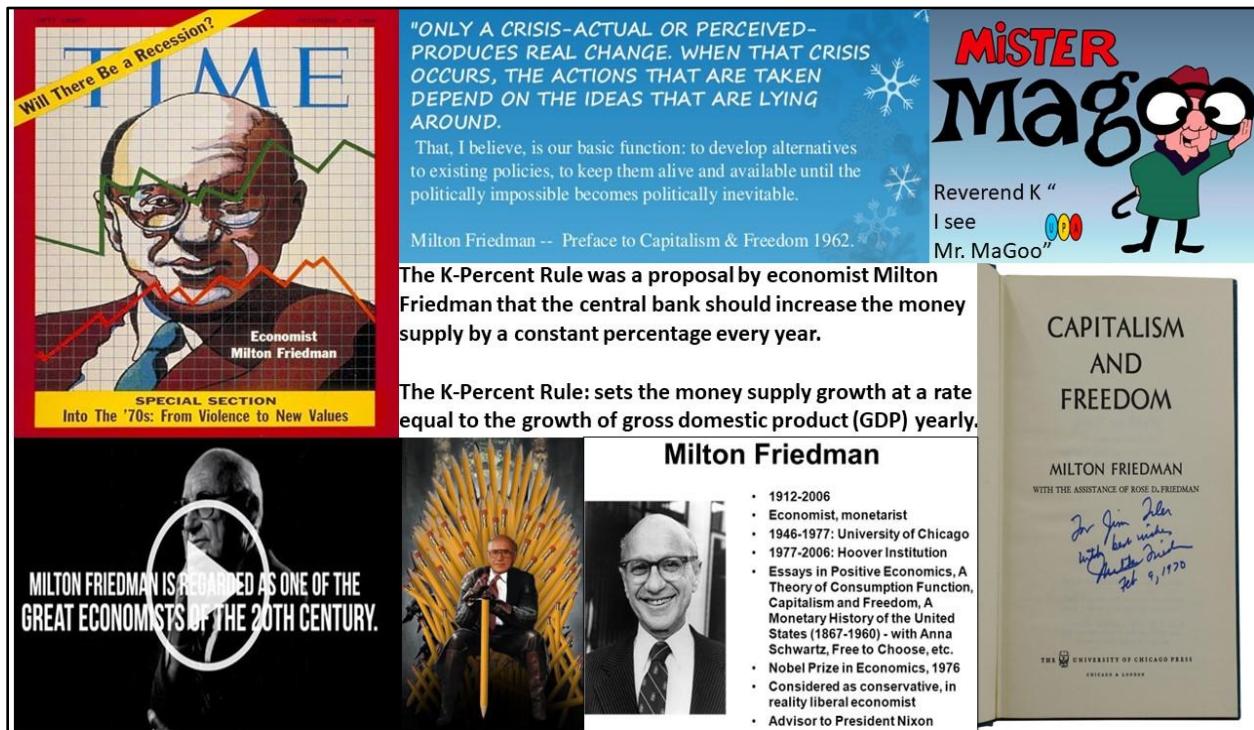
French Money of Peace: Le Fédériste" "L'Europa monnaie de la paix" January 1st 1933

PRECEDENT: BRICS / Eurasian Economic Union Commodity Basket backed currency / "new global reserve currency based on Real World Assets, commodities" "The matter of

creating the international reserve currency based on the basket of currencies of our countries is under review" Source: Fintech Magazine

Teams are forming to win the DeFi Distributed Finance / programmable \$\$\$ - money IP Intellectual Property wars. The winning team will prove that their IP intellectual property filings establishes / established foundation technology. Who established foundation technology given SCOTUS 2014 "Alice in Wonderland" ruling? The internet and now the internet of money Web 3.0 is described with memes, metaphors, made up words, terms.

Supreme Court SCOTUS Alice in Wonderland Precedent: Packets, frames, layers, blocks, shards, graphs, hash graphs "bots", "motes", ... or Satoshi's traversing the net, stored in a blockchain cube are abstractions, abstract ideas, terms. The afore mentioned terms are non-existent, fictitious, imaginary metaphorical fabrications are non - compliant with US Supreme Court SCOTUS Alice Corp Vs CLS Bank 2014 ruling "claims may not direct towards abstract ideas". Physical is the opposite of abstract.



Nobel Prize winning Economist Milton Friedman "only a crisis brings real change"

**Milton Friedman** (July 31, 1912 – November 16, 2006) economist and statistician who received the 1976 Nobel Memorial Prize in Economic Sciences for his research on analysis, monetary history and theory and the complexity of stabilization policy. Friedman promoted a macroeconomic viewpoint known as monetarism and argued that a steady, small expansion of the money supply was the preferred policy, compared to rapid, unexpected changes. See: Book: Capitalism and Freedom

## **USPTO 13/573,002 CLAIMS**

1 Method of claim to establish algorithmic regulation via use of firefly inspired heartbeat synchronization algorithm improving temporal trade parity by using the firefly-heartbeat algorithm to scheduled, periodic epoch time samples among trade federation participants, populations across time zones to establish temporal consensus among distributed cryptocurrency, stock, currency trade protocols establishing, maintaining optimal trade speed / frequency, rate, pace of algorithmic price discovery

2 Method of claim to establish, support The "Grail": synchronized, common, shared situational awareness view (s) filtered, prioritized events drawn from a system of systems via use of heartbeat message event bus characterized by sync delta epoch updates over the Universal Time Zone UTZ using an improvement described by the University of Bologna / Hungary's and a Chinese University's firefly inspired heartbeat synchronization algorithm that matches, synchronizes stochastic firefly synchronization pulses intrinsic to a specific species of mating fireflies as analogous to Network Centric Warfare's Battlefield Digitization's, DoD – NATO's closest OPTEMPO epoch cycle.

3, Method of claim supporting, establishing economist Milton Friedman's K% rule where a Central Bank Digital Currency CBDC currency is derived from sampling lead GDP Gross Domestic Product vital economic indicators across a global event message bus sync delta data, event changes updating for example, a RWA Real World Asset based commodity index backed global currency via use of filtered, stochastically harmonized, temporally synchronized telemetry polled from a universal event bus applying firefly-heartbeat algorithm events, state changes leveraging intrinsic message - event heartbeat functions to update for example, a statistical mean value currency index.

4 Method of claim to comply with Supreme Court SCOTUS US SC 573 US 134 2347 Alice Corp Vs CLS Bank ruling physical meme that describes steps, procedures intrinsic to internet, internet of foundation technology framework supporting for example, programmable money by providing system time epoch cycles, geospatial location survey points, workflow roles, rules, scoring system, rewards, penalties, rulings, schedules, event, alerts, sync deltas control grid, access, permission, price discovery, equilibrium algorithms (s) comprising an adaptive procedural template foundation technology framework for internet data, internet of money, DeFi, TradeFi networks

5. Method of claim to establish, maintain a global system of systems telemetry data synchronization, stochastic harmonization, shared syntax lexicon symbols based framework formed, guided, maintained with the use of an Adaptive Procedural Template foundation technology framework for The World Game control grid financial.. matrix comprised of structured data exchange synchronization, stochastic harmonization, OPSCODE brevity codes - Artificial Intelligence symbol sets, sound - light based quantum computing speedbumps, reuse of DARPA, NATO systems OOTW Operations Other Than War best practice for matrix telemetry, metrics, meters, synchronization

6. Method of claim using RWA Real World Assets algorithmically regulated programmable commodity index backed stable coin currency – economy that includes at a minimum: commodity tokens characteristic of DeFi / TradeFi networks

7. Method of claim to describe foundation technology i.e., forming a syntax lexicon namespace derived from NATO / DoD brevity OPSCODE FFIRN, FFUDNS structured data exchange mapped to symbols describing A.I. man – machine interface symbols, big data, consistent, universal syntax structured data exchange library – lexicon using UTZ / UTC time stamped data with organization <Org\_ID>. data class type, </URN>. Uniform Resource Name type to form a universal syntax, code, date element Rosetta Stone given all things internet, internet of programmable money are formed using 1. time epoch cycles 2. syntax used as code, instructions

8 Method of claim to support DAO Distributed Autonomous Organization Trade Federation, organizations with common, interoperable, synchronous signaling, telemetry, symbol, data elements, sets for a control grid matrix forming a foundation technology framework structured data exchange agreement among a DAO Distributed Autonomous Organization synchronized, stochastically harmonized across time zones

9 Method of claim to provide an alternative to formal mergers and acquisitions for example, tether, untether to autonomous DAO Distributed Autonomous Organization i.e., trade federations using agile, adhoc NetOps supporting federations for example; Ripple's consensus protocol based on federation / federated on demand liquidity drawn from a distributed (global) (trade) federation i.e., 1907 Knickerbocker Banker's Crisis JP Morgan protocol on demand AI directed response - financial system revaluation where Battlefield Digitization Network effects: splits, joins, adds, drops are used as needed as a temporary alternative to formal merger and organization, corporate acquisitions

10 Method of claim to broadcast, unicast, anycast data synchronization deltas “sync deltas” via micro to macro-cycle system of systems data updates at agreed upon times observing set durations of events, time, temporal epoch leases i.e., stock, commodity, currency trade exchanges with consistent, synchronized, time bounded i.e heartbeat start, stop, TTL Time to Live epochs providing discrete time interval start, stop, TTL Time To Live epoch windows embedded in </108> system heartbeats, messages.

11 Method of claim establishing, maintaining trade contract SLA Service Legal Agreements i.e., ecologically sustainable economic econometric epoch time cycles supporting universal standard measures, meters, metrics sync delta cyclic update temporal change, linear sequential, geo-spatial temporal intensity radius hop count metrics and meters where closer is shorter, closer is cheaper, given less CO2 carbon dioxide credits are used given less trade demurrage fees levied as a method of climate control in SLA Service Level Agreements agreed upon by a trade federation (s)

12 Method of claim using electromagnetic transmission of telemetry, data over wired, wireless energy transmission lines using metrics, meters described by USPTO 13/573,002 in maintaining SLA Service Level Agreements where electricity usage and data usage charges i.e., by the gigabyte, amp hour given closer is cheaper given less infrastructure is required to meet sustained power levels over time and distance

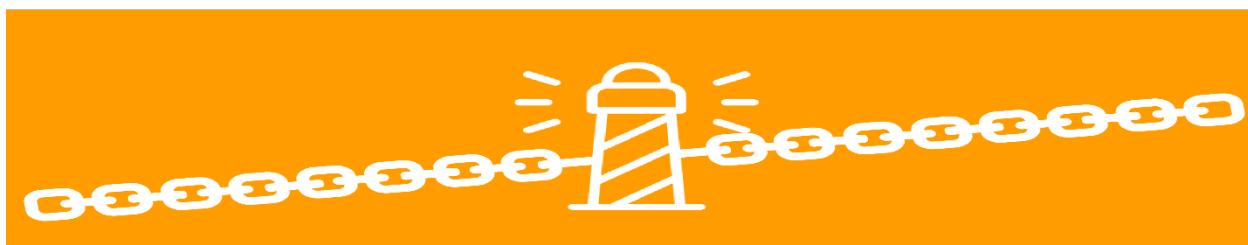
13 Method of claim involving use of DOD / DARPA / NATO's decades of work developing system of systems engineering best practice i.e., development of over 300 message, structured data exchange spreadsheet templates of OPS CODE brevity codes organized in message sets to support pre-defined, situation specific workflows, smart contracts supporting probability and statistically likely situation awareness, situation specific action – reaction supporting Artificial Intelligence, AI machine learning,

14. Method of claim to enable a Real World Assets commodity index backed currency – using price discovery algorithm (s) and sync delta heartbeat message event bus periodic system of systems updates of the status of commodity tokens based RWA Real World Asset backed cryptocurrency stable coin using a universal message event bus

15. Method of claim using sound waves (see water drop in pond meme, graphic) to measure trough, crest wave cycles that when statistically sampled represent a digital approximation of physical waves as the basis for establishing common, shared, universal method and means to measure, meter, communicate telemetry across a plurality of quantum computing system of systems using a system (s) for example: comprised of curved electrodes to concentrate sound waves similar to a magnifying lens to focus a point of light at room temperature rather than use of liquid hydrogen to cool a space for quantum particles event sampling with electron microscopes.

16 Method of claim to apply an electric dipole effect electric meter claim based on electric dipole effect where closer is cheaper given less infrastructure needed given energy attenuates over distances • data over energy link where energy pulses constitute a method and means to transmit data over electric wired, and wireless pathways as demonstrated by inventor, scientist Nicola Tesla circa 1900 in Colorado Springs CO.

17. Method of claim using OPS CODE brevity codes mapped to symbol sets used in 300 plus message sets intrinsic to Battlefield Digitization, Net Centric Warfare to re-establish a universal, standardized means to communicate, translate among, via a common syntax symbolic lexicon improving human ability to follow quantum - AI artificial intelligence driven computing transactions, event, alert postings in near real time



## APPENDIX A: SAMPLE ADAPTIVE PROCEDURAL TEMPLATE

**DEFINITION:** Adaptive Procedural Template = checklist of useful tools, procedures used to aid individuals join trade federations. Affiliated organizations are geo-spatially, temporally located in distributed, dispersed locations across time – space. Member organizations may join or leave in an ad hoc, agile manner to take advantage or react to events, situations while retaining autonomy or the ability to act on one's own behalf, control one's own activities, The process may involve agile, ad hoc joins, merges, drops to / from (trade) federation in lieu of formal merger, and acquisition.

**1.1 PURPOSE:** Establish a consistent context library / lexicon and time stamping data by organization <Org\_ID> and by data class type and by resource type to form a universal syntax, code, date element, tag Rosetta Stone and reference for coders, programmers. Common time – space geo spatial temporal meters. Military OPSCODE brevity alpha- numeric codes are mapped, associated, paired with MILSTD 2525 A, B, C, D symbols and symbol sets. MIL Standard structured data exchange messages, message sets are critical to A.I. Artificial Intelligence Man - machine interaction. USPTO 13/573,002 Goal: improve geo-spatial temporal, syntactic - semantic consistency, interoperability among myriad programmable cryptocurrencies, economy protocols, algorithms, syntax libraries. 300 + message sets support A.I. workflows.

### 1.2 SCOPE

Trade federations form among local communities or among sovereign (First) nations. The off-site connector workflow object convention connects, mitigates, adjusts by summation, statistical mean by aggregation among federated, non-federated groups acting as format gateways among participating, non – participating groups. USPTO 13/573,002's foundation is Battlefield Digitization / Network Centric Warfare's signaling, telemetry support framework where improvement to involves establishing a foundation framework for internet, net of programmable money, description, metrics, meters, econometrics for DAO Distributed Autonomous Organizations / trade federations participating in an eco-sustainable programmable economy model with UTZ Universal Time Zone temporal synchronization, stochastic spatial – temporal harmonization

### 1.3 ROLES

The baseball umpire meme is the rule observer / enforcer i.e., the cryptocurrency blockchain segregated witness observer. The baseball game statistician performs data analytics e.g., time series database maintainer, the base runner delivers (code syntax) instructions via 3 x 5 cards. Base running forms blocks on blockchain that is represented by the baseball diamond when stood up on its home plate corner in 3d embodies a cube that has length, width, depth height = volume, Little League Tournament board votes on most valuable player in voting functions. The Little League tournament Baseball meme complies with SCOTUS Alice Corp V CLS Bank rul

## **1.4 DEFINITIONS, ACRONYMS: See Appendix B**

Adaptive Procedural Templates are formed using entries linked to detailed treatises. Treatises spell out and describe definitions, acronyms and process details. Terms in internet, internet of money treatises are often abstractions – hence a baseball meme.

## **1.5 REFERENCES: See Appendix B**

References cite documents, detailed treatises, standards body publications describing procedural steps cited by a procedural template. References refer to detailed treatises.

## **1.6 TRACEABILITY**

The act of researching or ascertaining the origin or location of something: To ascertain the successive stages in the development or progress of for example, tracing a project's life cycle. In context with this paper's procedural template, tracking changes from micro-macro cycle across UTZ time zones across space time maintaining non-repudiation at any point, place in time in the future as provided for example, by NIST's QRNB Quantum Random Number Beacon operated by the Department of Commerce's NIST National Institute of Standards and Technology in Boulder Colorado.

## **1.7 POLICIES**

The adaptive procedural template includes standards and policies published by standards groups describing detailed treatises according to individual use cases

## **1.8 STANDARDS**

The adaptive procedural template will include standards and policies published by standards groups describing detailed treatises according to individual use cases, consensus algorithms, Web 3.0 standards, blockchain organization standards...

## **1.9 PROCESSES**

Heart Beacon Cycle adaptive procedural template emphasizes protocol, software application neutral rules (algorithms) over processes coded by software vendors.

## **1.10 PROCEDURES**

Procedures, workflow are derived from, are referential to Battlefield Digitization, Network Centric Operations, Net Enabled Operations systems engineering

**EXAMPLE:** Firefly inspired heartbeat synchronization message event bus algorithm – protocol, software application neutral monitors geo-spatial, temporally distributed events reported across a DAO Distributed Autonomous Organization among federated groups synchronized across time-space for common goals. Other procedures are intrinsic to algorithms / protocols such as Princeton's John Nash Equilibrium algorithms and count minimum sketch or streaming K algorithm

## 1.11 GUIDELINES

Example: Distributed Autonomous Organization DAO's in trade federations agree to use common components, shared processes, methods, signaling – telemetry micro-macro schedule, metrics, meters to form service level agreements used in smart contracts.

System of systems is a collection of task-oriented or dedicated systems that pool their resources and capabilities together to create a new, more complex system which offers more functionality and performance than simply the sum of the constituent systems. Currently, systems of systems is a critical research discipline for which frames of reference, thought processes, quantitative analysis, tools, and design methods are incomplete.[1] The methodology for defining, abstracting, modeling, and analyzing system of systems problems is typically referred to as system of systems engineering.

Overview: Commonly proposed descriptions—not necessarily definitions—of systems of systems,[2] are outlined below in order of their appearance in the literature:

Linking systems into joint system of systems allows for the interoperability and synergism of Command, Control, Computers, Communications and Information (C4I) and Intelligence, Surveillance and Reconnaissance (ISR) Systems:[3] description in the field of information superiority in modern military.

System of systems are large-scale concurrent and distributed systems the components of which are complex systems themselves:[4] description in the field of communicating structures and information systems in private enterprise.

System of systems education involves the integration of systems into system of systems that ultimately contribute to evolution of the social infrastructure:[5] description in the field of education of engineers on the importance of systems and their integration.

System of systems integration is a method to pursue development, integration, interoperability and optimization of systems to enhance performance in future battlefield scenarios:[6] description in the field of information intensive systems integration

Modern systems that comprise system of systems problems are not monolithic, rather they have five common characteristics: operational independence of the individual systems, managerial independence of the systems, geographical distribution, emergent behavior and evolutionary development:[7] description in the field of evolutionary acquisition of complex adaptive systems in the military.

Enterprise systems of systems engineering is focused on coupling traditional systems engineering activities with enterprise activities of strategic planning and investment analysis:[8] description in the field of information intensive systems in private enterprise.

System of systems problems are a collection of trans-domain networks of heterogeneous systems that are likely to exhibit operational and managerial

independence, geographical distribution, and emergent and evolutionary behaviors that would not be apparent if the systems and their interactions are modeled separately:[9] description in the field of National Transportation System, Integrated Military and Space Exploration. Taken together, all these descriptions suggest that a complete system of systems engineering framework is needed to improve decision support for system of systems problems. Specifically, an effective system of systems engineering framework is needed to help decision makers to determine whether related infrastructure, policy and/or technology considerations as an interrelated whole are good, bad or neutral over time.[10] The need to solve system of systems problems is urgent not only because of the growing complexity of today's challenges, but also because such problems require large monetary and resource investments with multi-generational consequences.

**System-of-systems topics:** The system-of-systems approach: While the individual systems constituting a system of systems can be very different and operate independently, their interactions typically expose and deliver important emergent properties. These emergent patterns have an evolving nature that stakeholders must recognize, analyze and understand. The system of systems approach does not advocate particular tools, methods or practices; instead, it promotes a new way of thinking for solving grand challenges where the interactions of technology, policy, and economics are the primary drivers. System of systems study is related to the general study of designing, complexity and systems engineering, but also brings to the fore the additional challenge of design. Systems of systems typically exhibit the behaviors of complex systems, but not all complex problems fall in the realm of systems of systems. Inherent to system of systems problems are several combinations of traits, not all of which are exhibited by every problem

Operational Independence of Elements, Managerial Independence of Elements, Evolutionary Development, Emergent Behavior, Geographical Distribution of Elements, Interdisciplinary Study, Heterogeneity of Systems, and Networks of Systems

The first five traits are known as Maier's criteria for identifying system of systems challenges. The remaining three traits have been proposed from the study of mathematical implications of modeling and analyzing system of systems challenges by Dr. Daniel DeLaurentis and his co-researchers at Purdue University.

**Research:** Current research into effective approaches to system of systems problems includes: Establishment of an effective frame of reference, **Crafting of a unifying lexicon**, Developing effective methodologies to visualize, communicate complex systems, Distributed resource management, Study of designing architecture, Interoperability, Data distribution policies: policy definition, design guidance and verification, Formal modelling language with integrated tools platform, Study of various modeling, simulation and analysis techniques:, network theory. agent based modeling, general systems theory, probabilistic robust design (including uncertainty modeling/management), object-oriented simulation and programming, multi-objective optimization. Study of various numerical and visual tools for capturing the interaction of system requirements, concepts and technologies. Sample Applications

Systems of systems, while still being investigated predominantly in the defense sector, is also seeing application in such fields as national air and auto transportation and space exploration. Other fields where it can be applied include health care, design of the Internet, software integration, and energy management and power systems. Social-ecological interpretations of resilience, where different levels of our world (e.g., the Earth system, the political system) are interpreted as interconnected or nested systems, take a systems-of-systems approach. An application in business can be found for supply chain resilience. Reference: Wikipedia

## 1.12 TEMPLATES

Checklist: minimum list of items, components, building blocks, processes, procedures agreed upon within federations to achieve consensus forming a basis for equitable trade

### CHECKLIST ITEMS MINIMUM ESSENTIAL:

- Consensus Algorithms: consensus methods to establish common metrics, meters and space-time synchronization across many disparate, distributed autonomous organizations. The main method uses conventions of a Little League Baseball tournament where the environment is surveyed, and boundaries form a 360-degree clock face time clock. Agents and workflow are represented by players, officials
- Method includes for example, universal meme for Bitcoin and like cryptocurrencies, Blockchain Proof of Work, Stake, POET Proof of Elapsed Time, Project Lightning Vs Segregated Witness, and Fast Internet Bitcoin Relay Engine FIBRE... Therefore, a common tool / meme is needed to help establish consensus metrics, meters and to establish a code reference syntax lexicon - library of OPS CODE brevity codes mapped to symbols and (DoD / NATO) symbol sets useful for A.I. Artificial Intelligence
- Minimum essential requirements for Trade Federations on the cryptocurrency DLT Distributed Ledger Technology blockchain (partial listing):
  - GDP Gross Domestic Product Index / statistical mean value index based TRC Trade Reference Currency demurrage fees by Economist Bernard Lietaer of Belgium
  - Geo-spatial temporal metrics, and meters i.e. storing increments of value for all things internet, internet of \$\$\$ into the “blockchain cube” fictional data structure
  - Ecologically sustainable Economic Epochs applying geospatial temporal methods and means i.e., IDMMaps - SonarHops, Ericsson Erlang time algorithms / time equations to base economic incentives, derive TRC Trade Reference Currency demurrage charges i.e., closer is cheaper given closer = less fuel, less time, demurrage fees
  - Universal lexicon OPS CODE brevity codes naming conventions for objects, events. OPS CODE brevity code syntax - symbol set lexicon of tokenized GDP Gross Domestic Product pacing items described in a syntax lexicon OPS CODE brevity code library

- Rosetta Stone syntax lexicon library needed for A.I. Artificial Intelligence man - machine interface. Symbols, symbol sets / standardized OPSCODE brevity codes
- Universal heartbeat message event / transaction QRNB Quantum Random Number Beacon non-repudiation bus, Time-space synchronized Universal Time Zone UTZ stochastic harmonization using a firefly inspired heartbeat algorithm / heartbeat message event - transaction bus comprised of a </108> system heartbeat message
- Quantum computing mediation, mitigation and techniques e.g., particle detection using liquid nitrogen vs waves at room temperature that will affect for example, transactions of HFT High Frequency Trade stock, commodities, cryptocurrencies, crypto currency synthetics, Central Bank Digital Currencies among DeFi DAO exchanges – federations.
- Big data sync, time – space metrics and meters descriptive framework based on geo-spatial temporal time – space stamp methods to establish time - space Epochs i.e., IDMaps – SonarHops distance estimation service, Ericsson Erlang time equations
- Epoch time cycles are (not) used in describing sync delta cyclic changes from one epoch time cycle to the next. Paul Revere meme linear sequential and water drop in pond mem geo-spatial temporal intensity radius hop count form common, universal, shared econometric metrics and meters among distributed, federated trade units
- Invention relies on System of systems type processes: collection of task-oriented, dedicated systems pooling resources, capabilities together to create a more complex system with more functionality, performance than the sum of separate systems
- A systemic, adaptive, procedural template method used to improve synchronization in metrics, metering using </Org\_ID>, {"URN"} XML data tags in signaling during heartbeat micro-cycles prior to data fusion center entry consisting of iterative heartbeat cycle metrics, meters reporting where state meta data heartbeat snapshot recalculations are performed at off site connectors that are signaling relays performing recalculation, syntax processing during macro-cycle epochs reconciling dissimilar standards, data syntax formats that are then reported signaled, news casted, beacon broadcasted to applique overlay graphics displays. Syntax code language parsed, processed during silicon chip generated time cycles forms all things internet, internet of money. Claim describes the military's network centric operations systems of systems method of collecting state meta data sync delta heartbeat snapshot data during operational micro-cycles that is then summed, aggregated, disseminated and displayed during macro-cycles as part of situation awareness system of systems engineering procedures.
- A systemic, adaptive procedural template used to improve signaling, synchronization using TCP/IP heartbeat time stamping occurring during micro-cycles of state meta data prior to data fusion center entry among metrics, metering processes comprised of TCP/IP heartbeats, heartbeat messages signaled during micro-cycles scheduling instructions, commands, processes, procedures, algorithms, telemetry instructions for example, to master-controller processes i.e., block, start, stop, pause, resume, set Time To live TTL i.e., stock market high frequency flash trade, currency, interest rates, tax

rates, time banking, cloud computing commodity exchanges, big data, electrical micro-grid, fungible goods, real time bidding, many use cases. Time stamping and applying descriptive data type tags to heartbeat state meta data after data is collected and queued, stored in temporary structures or entered into database instantiations after the fact is problematic. All internet supported devices including high frequency stock, currency, commodity etc., flash trade master controllers receive heartbeats. Heartbeats are silicon chip created intervals, epochs, time cycles used to (not) process syntax.

- A systemic adaptive procedural template method improving stochastic networks harmonization through use of timing, synchronization intrinsic to TCP/IP heartbeat / heartbeat message signaling using set, scheduled, epochs in micro-cycles in combination with firefly insect signaling stochastic harmonization algorithms where firefly protocol sample means are matched with closest heartbeat sync delta micro-cycle report values to recalculate statistical averages, means signaled through off site connector conversion, recalculation gateways that news-cast, beacon broadcast to subscribers monitoring macro-cycle reports that heretofore would not exist without following the Heart Beacon Cycle procedural template as guides for reporting thus improving temporal harmonization in metrics and metering of stochastic telecommunication mesh fabrics grid control planes over wide areas in cases involving issues in terms of consistency, reliability, traceability, positive organizational identification, temporal transaction fidelity, event, alert predictability, data analytics, network forensics real time bidding, stock market exchange floor server co-location versus servers distantly located, fluctuations in interest rates, currency exchanges, double payment adjudication, fungible good trading stochastic harmonization, electrical power micro-grids, cloud computing, "big data" use cases.

- A systemic adaptive procedural template method using time stamping and signaling intrinsic to TCP/IP heartbeat, heartbeat sync delta snapshot message signaling to improve dynamic, adaptive organization change management using XML <ORG\_ID> network service interface NSI templates updating self-organizing process templates i.e., directory service, reporting, map, network, system of systems effecting changes in directory structures database MIB i.e., network subnet joins, moves, splits drops, adds as alternatives to mergers, acquisitions effecting changes responsive to leader's actions, decisions i.e., mission-aware networking, network centric operations improving agile, ad hoc organizational business operations course of actions selection by organizations registered for more than one <ORG\_ID> improving reaction to change.

- A systemic adaptive procedural template method improving search engine methods using heartbeat, beacon signaling, <ORG\_ID>, , <class\_types>, Paul Revere, water drop in pond meme metric recalculations occurring at off site connectors, conversion relay gateways where detection of trigger point function recalculations of state meta data set aggregations are used to detect threshold fluctuations by resource , , quantity, availability duration etc., further used to improve geo-spatial temporal descriptive mapping methods, changes in clusters of objects, entities, artifacts i.e., location, epoch time stamp geo-spatially, temporally, used to locate, search, then group into virtual collections using <data\_tags> i.e., in spatial econometric, volumetric operations within

network mesh fabrics triggering news-casting invitations to join equitably metered federated group arbitrage events, activities that are triggered by internet search operations improving collaboration, metrics and metering in for example, commodity, fungibles trading, resource pooling, crowd sourcing, economics. Summary: Physical linear – sequential “Paul Revere” meme used given TCP/IP internet “hops” are abstractions ineligible for patent protect. Water drop in pond physical metaphor describes geospatial temporal intensity in omni-directional, circle, radius type situations. Naval sonar meme describes geo-spatial temporal intensity metrics, meters.

- A systemic adaptive procedural template method used to improve handicapped / information alerts, events, methods reliant on heartbeat timing, signaling synchronization of state meta-data improved using Paul Revere, water drop in pond memes to create, calculate radius, intensity metrics viewed as geo-spatial, temporal intensity effects i.e., visual light bar tabs i.e., stock exchange candlestick charts, audible tone, vibration-tactile situational awareness alerts by correlating tone based messaging precedence XML where lower / higher precedence settings equate to lower / higher audible tones, tactile vibrations for deaf where fewer / greater number of light tabs lit correlates, corresponds to priority, precedence further used in alert triggers of threshold fluctuations displayed in appliqué overlay graphics as metrics, meters. Describes reuse of structured military messaging's precedence system to support for example, processing of Named Data Networking distance, interest packets by numeric precedence for example, among Internet of Everything / Things IoT, IOTE
- A systemic, adaptive procedural template method using heartbeat signaling, time stamp record keeping processes of state meta data described, typed by organizations, resources typed by Uniform Resource Name, further improved through use of Paul Revere, Water Drop in Pond memes to quantify, describe unused resources with unmet needs by performing recalculations of state meta-data snapshot artifacts occurring at off site connector conversion gateways where micro-cycle reports from local, micro-cycle activities are signaled, relayed to higher echelon organizations monitoring macro-cycles who are interested in for example stock market "pools" where "output" is correlated and displayed onto appliqué views of aggregate sync delta changes in macro-micro economic recalculations, stocks, commodities, currencies, interest rates, electric micro-grids, currency (Terra) exchanges, spatial econometrics, contributory economics. Claim highlights 'off site connector" that is a workflow convention as the method where for example, trade federation "A" interfaces with organization (s), nations, states.
- A systemic, adaptive procedural template method using state meta data typed by organization, resources by Uniform Resource Name, improved using Paul Revere, Water Drop in Pond memes to quantify, describe unused resources with unmet needs in terms of proximity from source to point of use, consumption, storage etc., by performing recalculations of state meta-data snapshot artifacts occurring at off-site connector conversion gateways where micro-cycle reports from local, micro-cycle activities are signaled, relayed to macro-cycles reports of data fluctuations due to geo-spatial temporal intensity changes filtered by priority, precedence then newscast signaled to ad

hoc federated group subscriptions where state meta data snapshot reports are shown in appliqué overlay data filtered value index views

- A system adaptive procedural template method to reuse, improve on Network Centric Warfare best practice of organizing individuals in groups spatial - temporally distributed and UTZ time zones that involves use of micro – macro cycle scheduling, , organizational, resource identifiers embedded in structured data exchanges messages
- Systemic use of an adaptive procedural template checklist of tools, procedures to aid individuals join trade federations. Affiliated organizations are geo-spatially, temporally located in distributed, dispersed locations across time – space. Member organizations may join or leave in an adhoc, agile manner to take advantage or react to events, situations while retaining autonomy or the ability to act on one's own behalf, This process involves agile, adhoc joins, merges, drops to / from DAO federation in lieu of formal merger, and acquisition Trade federations form among local communities or among sovereign (First) nations. Off-site connector workflow object convention connects, mitigates, mediates adjusts by summation, statistical mean by numerical aggregation among federated groups providing mediation gateways with non – participating groups, alternative (cryptocurrency consensus algorithms), non-standard.

- Electric dipole effect electric meter claim based on electric dipole effect where closer is cheaper given less infrastructure needed given energy attenuates over distances • data over energy link where energy pulses constitute a method and means to transmit data over electric wired, wireless pathways. See electric dipole effect Radio Wave Properties / Electric and Magnetic Dipole Antennae LINK: <https://youtu.be/wUpOlqbHcjI?t=111>

**SECTION SUMMARY:** 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 a system of federated systems comprised of diverse groups, people speaking many different languages through the universal language of symbols into Distributed Autonomous groups organized in time - space to achieve common goals. DoD / NATO structured data exchange involves reuse of over 300 use cases supported by hundreds of message sets described in spread sheet row - column format populated by thousands of brevity OPSCODES mapped to symbols essential to A.I. artificial intelligence man - machine interface human cognition.

### 1.13. TOOLS

Tool selections may be inserted, removed by majority federation vote. If a superior tool is deemed an improvement, the old tool is replaced by the new at a point in time agreed upon by a majority of for example, trade federation representatives.

### 1.14 PROCEDURES / STEPS

Steps are adapted from military system of systems situation awareness reporting, net-centric warfare / operations or NEO Net Enabled Operations. Steps are correlated with

Little League Baseball tournament operations and game play for universal understanding, and compliance with Supreme Court Alice Corp Vs CLS Bank ruling: claims may not direct towards abstract ideas. Physical = opposite of abstract

1.14.1 Begin a list of steps beginning at the number one

1.14.2 Begin a list of steps that restart at the number one

EXAMPLE: Net Centric Warfare procedural steps are cyclic, iterative

Entry Criteria: Example: Organizations agree to adopt a minimum list of procedures, processes, tools. Unsuccessful consensus on the minimum list may be resolved by member exit 3.2 Process / Procedure Map. Trade federations use stored procedures e.g., process workflows to implement business logic.

Inputs: Heart Beacon Cycle invention programming involves processes. Applications, procedures, procedure calls, workflows, algorithms and tools agreed upon by Trade Federations to support a signal and telemetry framework reporting events, transactions to facilitate reporting of data sync deltas in time window intervals, stages and uses data filtering iteration to eliminate duplicated instructions, identical source code in the system of systems signaling, systems telemetry engineering framework.

- A systematic series of actions directed to a goal ex: form, maintain federations
- A continuous action, operation, series of changes, sync deltas updating groups
- A cyclic, iterative process syncing groups in, across time-space i.e., UTC zones
- Common foundation blocks data entrees
- Organization Identifiers {"Org\_ID"}
- Uniform Resource Name {"URN"} Describe Resources i.e., commodities
- Sample / distribute state meta data heartbeat snapshots @ N time epoch

Outputs: USPTO 13/573,002 aids in establishing consistency, interoperability, temporal synchronization and syntax, syntactical interoperability among myriad consensus algorithm memes, and cryptocurrency, programmable money memes, metaphors.

## 1.15 METHODS

Specific activities depend on the type of use case. However, all use cases are iterative and follow the design of adaptive procedural templates – see detailed treatise (s)

1.15.1 METHOD 1: A systemic, adaptive, procedural template method used to improve synchronization in metrics, metering using </Org\_ID>, {"URN"} XML data tags in signaling during heartbeat micro-cycles prior to data fusion center entry consisting of

iterative heartbeat cycle metrics, meters reporting where state meta data heartbeat snapshot recalculations are performed at offsite connectors that are signaling relays performing recalculation, syntax processing during macro-cycle epochs reconciling dissimilar standards, data syntax formats that are then reported signaled, news casted, beacon broadcasted to distributed organization applique overlay displays

1.15.2 METHOD 2. An adaptive procedural template used to improve signaling, synchronization, stochastic harmonization across UTZ Universal Time Zones using TCP/IP heartbeat time stamping occurring during micro-cycles of state meta data prior to data fusion center entry among metrics, metering processes comprised of TCP/IP heartbeats, heartbeat messages signaled during micro-cycles scheduling instructions, commands, processes, procedures, algorithms, telemetry instructions for example, to master-controller processes i.e., block, start, stop, pause, resume, set Time To live TTL i.e., stock market high frequency flash trade, currency, interest rates, tax rates, time banking, cloud computing commodity exchanges, big data, electrical micro-grid, fungible goods, real time bidding, many use cases. Time stamping and applying descriptive data type tags to heartbeat state meta data after data is collected and queued, stored in temporary structures or entered into database instantiations after the fact is problematic. All internet supported devices including high frequency stock, currency, commodity etc., flash trade master controllers receive heartbeats. System Heartbeats are intervals, epoch time cycles used to (not) process syntax.

1.15.3 METHOD 3 A systemic adaptive procedural template method improving stochastic networks harmonization through use of timing, synchronization intrinsic to TCP/IP heartbeat / heartbeat message signaling using set, scheduled, epochs in micro-cycles in combination with firefly insect signaling stochastic harmonization algorithms where firefly protocol sample means are matched with closest heartbeat sync delta micro-cycle report values to recalculate statistical averages, means signaled through off site connector conversion, recalculation gateways that news-cast, beacon broadcast to subscribers monitoring macro-cycle reports that heretofore would not exist without following the Heart Beacon Cycle procedural template as guides for reporting thus improving temporal harmonization in metrics and metering of stochastic telecommunication and sound wave stimulated mesh fabrics grid control planes over wide areas in cases involving issues in terms of consistency, reliability, traceability, positive organizational identification, temporal transaction fidelity, event, alert predictability, data analytics, network forensics real rime bidding, stock market exchange floor server co-location verses servers distantly located, fluctuations in interest rates, currency exchanges, double payment adjudication, fungible good trading stochastic harmonization, electrical power micro-grids, cloud computing, spatial – temporal "big data" over a plurality of quantum computing wave form based systems

1.15.4 METHOD 4. A systemic adaptive procedural template method using time stamping and signaling intrinsic to TCP/IP heartbeat, heartbeat sync delta snapshots, heartbeat </108> message signaling to enable adaptive organization change management using XML <ORG\_ID> network service interface NSI templates updating self-organizing process templates i.e., directory service, reporting, map, network, system of systems effecting changes in directory structures database MIB i.e., network

subnet joins, moves, splits drops, adds as alternatives to mergers, acquisitions effecting changes responsive to leader's actions, decisions i.e., mission-aware networking, network centric operations improving agile, ad hoc organizational business operations course of actions selection by organizations improving action / reaction to change. Use cases: network moves, adds, joins, splits, drops used instead of merger, acquisition.

1.15.5 METHOD 5. A systemic adaptive procedural template method improving search engine methods using heartbeat, beacon signaling, <ORG\_ID>, , <class\_types>, Paul Revere, water drop in pond meme metric recalculations occurring at offsite connectors, conversion relay gateways where detection of trigger point function recalculations of state meta data set aggregations are used to detect threshold fluctuations by resource, quantity, availability duration etc., further used to improve geo-spatial temporal descriptive mapping methods, changes in clusters of objects, entities, artifacts i.e., location, epoch time stamp geo-spatially, temporally, used to locate, search, then group into virtual collections using <data\_tags> i.e., in spatial econometric, volumetric operations within network mesh fabrics triggering news-casting invitations to join equitably metered federated group arbitrage events, activities that are triggered by internet search operations improving collaboration, metrics and metering in for example, commodity, fungibles trading, resource pooling, crowd sourcing, economics.

1.15.6 Method 6: Physical linear – sequential “Paul Revere” meme used to represent TCP/IP internet “hops” that are abstractions ineligible for patent protection. Water drop in pond physical metaphor describes geospatial temporal intensity in omni-directional, circle, radius type situations. Naval sonar water drop in pond USPTO 13/573,002 meme explains geo-spatial temporal intensity metrics, meters using a physical metaphor. TCP/IP “ping” is an abstraction as are “packets”, “frames”, “hops”, “Satoshi’s” as data stores in a cryptocurrency “blockchain” (distributed database)

1.16.7 METHOD 7. A systemic adaptive procedural template method used to improve handicapped / information alerts, events, methods reliant on heartbeat timing, signaling synchronization of state meta-data improved using Paul Revere, water drop in pond memes to create, calculate radius, intensity metrics viewed as geo-spatial, temporal intensity effects i.e., visual light bar tabs i.e., stock exchange candlestick charts, audible tone, vibration-tactile situational awareness alerts by correlating tone based messaging precedence XML where lower / higher precedence settings equate to lower / higher audible tones, tactile vibrations for deaf where fewer / greater number of light tabs lit correlates, corresponds to priority, precedence further used in alert triggers of threshold fluctuations displayed in appliqué overlay graphics as metrics, meters. Reference: Describes reuse of structured military messaging's precedence system to support for example, processing of Named Data Networking distance, interest packets by numeric precedence. This method is effective among machine to machine (Internet of Things).

1.15.8 METHOD 8. A systemic, adaptive procedural template method using heartbeat signaling, time stamp record keeping processes of state meta data described, typed by organizations, resources typed by Uniform Resource Name, further improved through use of Paul Revere, Water Drop in Pond memes to quantify, describe unused resources with unmet needs by performing recalculations of state meta-data snapshot artifacts

occurring at offsite connector conversion gateways where micro-cycle reports from local, micro-cycle activities are signaled, relayed to higher echelon organizations monitoring macro-cycles who are interested in for example stock market "pools" where "output" is correlated and displayed onto appliqué views of aggregate sync delta changes in macro-micro economics recalculations, stocks, commodities, currencies, interest rates, electric micro-grids, currency (Terra) exchanges, spatial econometrics, contributory economics. Syntax code language parsed, processed during silicon chip generated time cycles forms all things internet, internet of money.

1.15.9 Method 9: Method / Claim describes the military's network centric operations systems of systems method of collecting state meta data sync delta heartbeat snapshot data during operational micro-cycles that is then summed, aggregated, disseminated and displayed during macro-cycles as part of Network Enabled Operations NEO situation awareness system of systems engineering best practice over time

1.15.10 Invention relies on System of systems type processes: collection of task-oriented, dedicated systems pooling resources, capabilities together to create a more complex system with more functionality, performance than the sum of separate systems

1.16 Outputs: State meta data collected from a current micro-cycle to the next and from many micro-cycles summed, aggregated to report during macro-cycle reporting periods are stored, collected in the off-site collector depicted by that corresponding workflow symbol. See detailed treatise on workflow, workflow symbols for example <https://edrawsoft.com/flowchart-symbols.php>

1.17 Verification and Validation: A comprehensive review, analysis, and testing, (software and/or hardware) performed by an objective third party to confirm (i.e., verify) that the requirements are correctly defined, and to confirm (i.e., validate) that the system correctly implements the required functionality and security requirements.

1.18 Exit Criteria: Organizations may elect to tether, untether to the Distributed Autonomous Organization based federation at their discretion (maintain autonomy) or organizations may be disconnected if they fail to observe federation rules

1.19 Metrics: Use of physical metaphors such as the water drop in pond, Paul Revere metaphor comply with Supreme Court Alice Corp Vs CLS Bank ruling claims may not direct towards abstract ideas. See USPTO application 13/573,002 main embodiment. Metrics are based on epoch time cycles

1.20 Records Control Table ELECTRONIC RECORDS MANAGEMENT

1.21 Controlled Documents Table ELECTRONIC RECORDS MANAGEMENT

EXAMPLE: World Financial Standard ISO 20022 is a multi-part International Standard prepared by ISO Technical Committee TC68 Financial Services. It describes a common platform for the development of messages in ASN.1 Abstract Syntax Notation: A single standardization approach (methodology, process, repository) to be used by all financial standards initiatives. common platform for the development of messages using: a

modelling methodology to capture in a syntax-independent way financial business areas, business transactions and associated message flows a central dictionary of business items used in financial communications a set of XML and ASN.1 design rules to convert the message models into XML or ASN.1 schemas, whenever the use of the ISO 20022 XML or ASN.1-based syntax is preferred ISO 20022: <https://www.iso20022.org/about-iso-20022>

1.22 Roles: For example, the baseball umpire meme is the rule observer / enforcer i.e., the cryptocurrency blockchain segregated witness observer. The baseball game statistician performs data analytics e.g., time series database maintainer, the base runner delivers (code syntax) instructions via 3 x 5 cards. Base running forms blocks on blockchain that is represented by the baseball diamond when stood up on its home plate corner in 3d embodies a cube that has length, width, depth height = volume, Little League Tournament board votes on most valuable player in voting functions. The Little League tournament Baseball meme roles comply with SC Alice Corp V CLS Bank rule, 1.23 TRACEABILITY: Template entries reference, point towards, link to detailed treatises. Treatises define, spell out and describe definitions, acronyms and process details. Terms in internet, internet of money treatises are often abstractions. References cite, detailed treatises, standard body publications describing procedural steps cited by the procedural template. References refer to detailed treatises. The act of researching or ascertaining the origin or location of something: To ascertain the successive stages in the development or progress of for example, tracing a project's life cycle.

1.24 POLICIES: adaptive procedural template will include standards and policies published by standards groups describing detailed treatises

1.25 STANDARDS: adaptive procedural template will include standards and policies published by standards groups describing detailed treatises according to individual use cases, consensus algorithms, Web 3.0 standards, blockchain organization standards...

1.26 PROCESSES: adaptive procedural template emphasizes protocol, software application neutral rules (algorithms) over processes coded by software vendors.

1.27 Procedures / Processes / Workflow are derived from, and are referential to Battlefield Digitization, Network Centric Operations, Net Enabled Operations and like terms. Procedures are intrinsic to algorithms / protocols such as Princeton's John Nash Equilibrium algorithms and count minimum sketch or streaming K algorithms. Invention relies on System of systems type processes: collection of task-oriented, dedicated systems pooling resources, capabilities together to create a more complex system with more functionality, performance than the sum of each separate systems

1.28 GUIDELINES: Distributed Autonomous Organization DAO's trade federations agree to use common technology framework components, shared processes, methods, signaling – telemetry micro-macro schedule, metrics, meters, algorithms. API Application Program Interfaces describing smart contract service level agreements.

1.29 TEMPLATES: Checklist: minimum list of items, components, foundation technology building blocks, processes, procedures within federations to achieve consensus.

1.29.1 EXAMPLE: TRC Trade Reference Currency: global complementary currency designed to provide an inflation-resistant international standard of value; to stabilize the business cycle on a global level; and to realign stockholder's interests

1.29.2 EXAMPLE: GDP Gross Domestic Product Index / statistical mean value index based TRC Trade Reference Currency demurrage fees by Economist Bernard Lietaer

1.30 TOOLS: Tool selections may be inserted, removed by majority federation vote. If a superior tool is deemed an improvement, the old tool is replaced by the new at a point in time agreed upon by a majority of for example, trade federation representatives.

#### TOOL EXAMPLES:

Adaptive Cards Template Language: Templating enables the separation of data from layout in your Adaptive Card. The template language is the syntax used to author a template. See: Adaptive Cards Templating Three 3 major components:

The Template Language is the syntax used for authoring a template. The Designer even lets you preview your templates at design time by including "sample data". The Templating SDK's will exist on all supported Adaptive Card platforms. These SDKs allow you to populate a template with real data, on the back-end or directly on the client. The Template Service is a proof-of-concept service that allows anyone to find, contribute to, and share a set of well-known templates. Source: Microsoft:  
<https://learn.microsoft.com/en-us/adaptive-cardstemplating/>

Templating enables the separation of data from the layout in an Adaptive Card. It helps design a card once, and then populate it with real data at runtime

Adaptive Cards Source: Microsoft <https://adaptivecards.io/samples/>

GitHub - pnp/AdaptiveCards-Templates: Samples on different adaptive card designs demonstrating the art of possible with them. Designs provided by the Microsoft design team and first versions targeting Viva Connections Adaptive Card Extensions (ACE) scenarios. [github.com/pnp/AdaptiveCards-Templates](https://github.com/pnp/AdaptiveCards-Templates)

Samples on different adaptive card designs demonstrating the art of possible with them. Designs provided by the Microsoft design team and first versions targeting Viva Connections Adaptive Card Extensions (ACE) scenarios. -

1.31 Profiles: See Organizational Profile: for example: NIST National Institute of Standards and Technology [http://nist.gov/baldridge/publications/bus\\_org\\_profile.cfm](http://nist.gov/baldridge/publications/bus_org_profile.cfm)

1.32 Procedure (Steps) Steps are adapted from military system of systems situation awareness reporting, net-centric warfare / operations or NEO Net Enabled Operations. Steps are correlated with Baseball tournament operations and game play for universal understanding, and compliance with Supreme Court Alice Corp Vs CLS Bank ruling: claims may not direct towards abstract ideas. Physical = opposite of abstract

- Begin a list of steps beginning at the number one
- Begin a list of steps that restart at the number one

1.33 Entry Criteria: Organizations agree to use a minimum list of procedures, processes, tools. Unsuccessful consensus of the minimum list may be resolved by member exit. Members may join, tether, untether, dissolve membership at will.

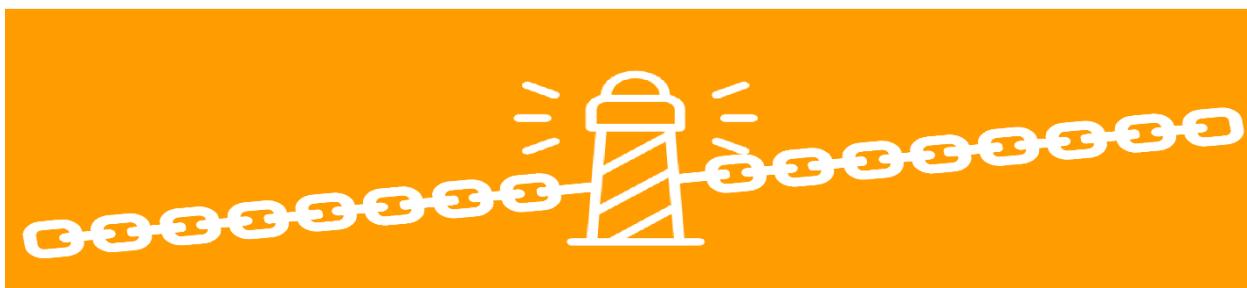
1.34 Process / Procedure Map: System of Systems trade federations use stored procedures e.g., process workflows to implement business logic in the distributed database / blockchain. Logic filters and text tags used as code syntax is stored in a syntax lexicon "Rosetta Stone" i.e., database

1.34.1 Inputs: programming involves processes. Applications, procedures, procedure calls, workflows, algorithms, and tools agreed upon by Trade Federations to support a signal and telemetry framework reporting events, transactions to facilitate reporting of data sync deltas in time window intervals, stages and uses data filtering iteration to eliminate duplicated instructions, identical source code in the system of systems signaling, systems telemetry engineering framework.

1.34.2 Outputs: aids in establishing consistency, interoperability, temporal synchronization and stochastic harmonization among myriad consensus algorithm memes, and metaphors under constant development and change

1.35 Verification and Validation See detailed treatise (s) on Verification and Validation abbreviated as V&V) are independent procedures used to check that a product, service, or system meets requirements and specifications and that it fulfills its intended purpose. These are critical components of a quality management system such as ISO 9000.

1.36 Exit Criteria: Organizations may elect to tether, untether to the Distributed Autonomous Organization based federation at their discretion (maintain autonomy) or organizations may be disconnected if they fail to observe federation rules.



## **APPENDIX B: Prior Art References, Acronyms, Terms, Memes, Metaphors**

### **ABSTRACT / ABSTRACTION:**

1. existing in thought or as an idea but not having a physical or concrete existence. thought of apart from concrete realities, specific objects, an abstract idea
2. expressing a quality or characteristic apart from any specific object or instance
3. theoretical; not applied or practical: abstract science.
- 4, difficult to understand; abstruse

Alice Corp Vs CLS Bank Supreme Court precedent case requires all internet, internet of money (Bitcoin, Blockchain) related patent applications to apply physical memes. For example, the internet TCP/IP “ping” terms is an abstraction. The internet’s “hop”, “hop count” is an abstraction. SAW Concept LLC’s application is compliant with the Supreme Court internet, internet of money precedent by using a Little League Baseball tournament as a main embodiment with internet technical theme derivative use cases

**Adaptive dispatch table** US 7,571,430 Trimbell, et al. August 4, 2009 Adaptive dispatch table based on templates Assignee: LSI Logic Corp Inventors: Forrest Trimbell,

**AMERICAN AXLE V. NEAPCO RULING** Judge: "an inventive concept to instead focus on the reliance on Hooke's law and predicted that because all inventions depend to some extent on the operation of unstated natural laws, the majority's opinion would open the door to Section 101 challenges in practically every patent case. Tesla: "think of energy, frequency, and vibration" Judge Moore also took exception to the majority disregarding the use of a cardboard liner as an inventive concept to instead focus on the reliance on Hooke's law and predicted that because all inventions depend to some extent on the operation of unstated natural laws, the majority's opinion would open the door to Section 101 challenges in practically every patent case.

Source: <https://bilski.typepad.com/blog/2018/03/good-vibrations-bad-vibrations-american-axle-v-neapco-ruling.html>

**Apache ZooKeeper** is a software project of the Apache Software Foundation, providing an open source distributed configuration service, synchronization service, and naming registry for distributed systems. [LINK https://en.wikipedia.org/wiki/Apache\\_ZooKeeper](https://en.wikipedia.org/wiki/Apache_ZooKeeper)

**Apache Storm** is a free and open source distributed real-time computation system. Storm makes it easy to reliably process unbounded streams of data, doing for real-time processing what Hadoop did for batch processing. Storm has many use cases: real-time analytics, online machine learning, continuous computation, distributed RPC, ETL etc. Storm benchmark clocked it at over a million tuples processed per second per node. Trident is an abstraction on top of Storm providing higher-level constructs “cascading”, it batches groups of Tuples to 1) Make reasoning about processing easier 2) efficient data persistence with the help of an API that provides exactly-once semantics [LINK](#)

## A.I. Artificial Intelligence / Machine Learning

Artificial intelligence (AI) syntax refers to the set of rules and principles that govern the arrangement of words and phrases in a programming language. In the context of AI and natural language processing, syntax ensures that language is structured in a systematic way, allowing for effective communication and comprehension.

In programming, syntax is crucial for writing correct and efficient code. It dictates the correct structure of sentences, including word order, sentence constituents, and the relationship between different elements in a sentence. Understanding syntax is essential for developers to write code that is readable, maintainable, and scalable.

Some programming languages are specifically designed for AI applications, while others have libraries that are used to develop AI applications.

A.I. market applications: Fortune Magazine <https://fortune.com/2023/11/28/goldman-sachs-ai-employees-wall-street/>

See: Artificial Intelligence A.I. as probability and statistic based workflow. The DoD / DARPA / NATO / ISO International Standards Organizations leverage 300+ spreadsheet message sets populated by thousands of OPS CODE brevity codes mapped to Military Standard MILSTANDARD 2525 A, B, C, D.. standard symbol sets essential to rapid action – reaction workflows responding to common scenario's, situations, smart contracts. Symbols are essential to human – A.I. machine interaction.

**ATOMIC CLOCK NIST** National Institute of Science and Technology timing is based on the consistent decay of radioactive material such as Cesium. Atomic clocks are constructed by locking an electronic oscillator to the frequency of an atomic transition. The frequencies associated with such transitions are so reproducible that the definition of the second is now tied to the frequency associated with a transition in cesium-133: 1 second = 9,192, 631,770 cycles of a standard Cs-133 transition

## BASEBALL DIAMOND

A baseball diamond is a square, is a block. A Bitcoin block is awarded using age (time) or vectors (time / direction / velocity) or voting (tournament league board). A baseball tournament is played on baseball diamonds that are physical, tangible = not abstract.

## BASEBALL COMPUTING CODE

Computing an Optimal Pitching Strategy in a Baseball At-Bat

A novel model of a baseball at-bat as a zero-sum stochastic game, in which the goal of the batter is to get on base and the pitcher aims to prevent it. The paper proposes novel representations of pitcher and batter, a deep neural network architecture for outcome prediction, and experiments using Kaggle data from MLB seasons.

Source: <https://arxiv.org/pdf/2110.04321.pdf>

Computing an Optimal Pitching Strategy in a Baseball At-Bat - arXiv.org

Every at-bat ends in one of two ways: 1) the batter is out (and, in our model, the pitcher wins), for example, after receiving the third strike, or 2) the batter gets on-base, for example, by hitting a home run. In modeling an at-bat, we assume that the goal of the batter is solely to get on base, while the pitcher aims to get the batter out.

Source: <https://www.jstage.jst.go.jp/article/jorsj>

### Dynamic Programming Algorithm for Optimizing Baseball Strategies

In addition, we compute the optimal batting order, in consideration of the decision making in a game. Keywords: Dynamic programming, OR in sports, Markov perfect equilibrium, advantage of the last-batting team, optimal lineup 1. Introduction A dynamic programming (DP) approach to baseball is the main theme for this paper, and <https://community.fangraphs.com/how-game-theory-is-applied-to-pitch-optimization>  
How Game Theory Is Applied to Pitch Optimization

Simulation of Baseball Gaming by Cooperation and Non-Cooperation Strategies  
Matías Alvarado, Arturo Yee Rendón, and Germinal Cocho 1 Computer Sciences Department, Center for Research and Advance Studies, Mexico City, Mexico  
2 Complex Sciences Department, Physics Institute, UNAM, Mexico City, Mexico  
Baseball is a top strategic collective game that challenges the team manager's decision-making. A classic Nash equilibrium applies for non-cooperative games, while a Kantian equilibrium applies for cooperative ones. We use both Nash equilibrium (NE) and Kantian equilibrium (KE), separate or in combination, for the team selection of strategies during a baseball match: as soon as the selection of strategies by NE or KE carries a team to stay match loosing, a change to KE or NE is introduced. From this variation of selection of strategies, the team that is losing tends to close or overcome the score with respect to the team with advantage according to the results from computer simulations. Hence, combining Nash selfish-gaming strategies with Kantian collaboration-gaming strategies, a baseball team performance is strengthened.

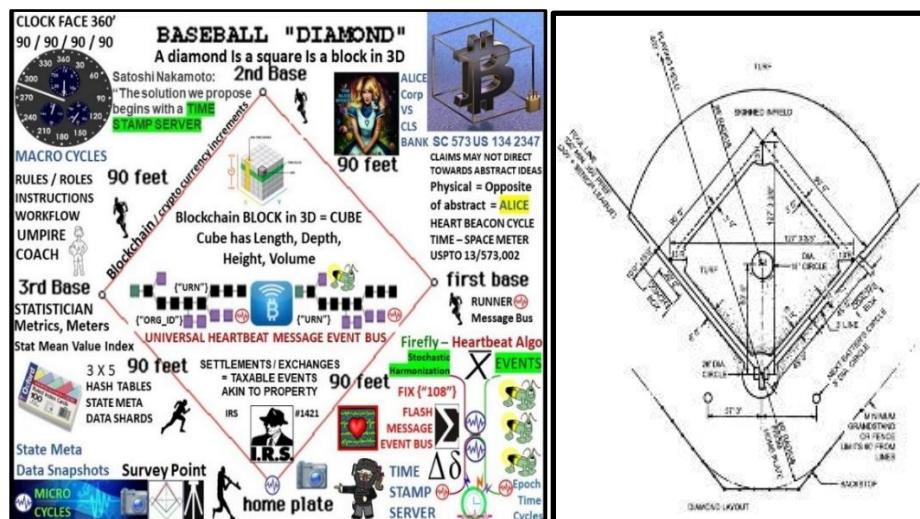


FIGURE D: SCOTUS ALICE CORP VS CLS BANK 2014 ruling compliant meme

## **BASEBALL TOURNAMENT RULES AND GUIDELINES**

The Tournament Committee also reserves the right in its sole discretion to impose any penalties if, in its judgment, any player, manager, coach, umpire, or other volunteer conducts him/herself in any manner, on or off the field, that does not positively reflect the high standard Little League holds for sportsmanship, Tournament Rules and Guidelines citizenship, and decorum. This includes displays of unsportsmanlike conduct, "making a travesty of the game," or violating any rules, regulations, or policy contained herein during the game, at the game site, at any other location or time related to the International Tournament. The Committee also reserves the right to impose any penalty the Committee deems appropriate, if the committee determines action is necessary to correct a situation brought to its attention, regardless of the source of that information. The decision of the Tournament Committee is final and binding. Knowledge of the rules must be guaranteed before a Tournament Director is declared qualified. All Tournament Directors will undergo a thorough and instructive briefing session prior to taking on their duties, must signify that they understand the rules, and regardless of personal feelings, they are in full agreement and can interpret them properly. At the time of the District tournament meeting, it will be required that each league president or the representative in attendance signify that the league and tournament team managing personnel are knowledgeable of Tournament Rules and are in full agreement with these conditions.

**SOURCE:** <https://www.littleleague.org/downloads/tournament-rules-baseball/>

On optimal control, game theory, and applications. A. Bressan, B. Piccoli, Introduction to the Mathematical Theory of Control, AIMS Series in Applied Mathematics, Springfield Mo. 2007. A. Bressan, Noncooperative differential games. Milan J. of Mathematics , 79 (2011), 357-427. A. Bressan Source: <https://cim.math.psu.edu/publications/on-optimal-control-game-theory-applications>

Sabermetrics Big Data is one way baseball teams use big data to leverage game theory in baseball. Source: Game Theory Applications in Baseball - Baseball Data Science Game theory is the science of strategy. It determines how logical "players" should behave in strategic contexts and predicts the utility the "players" will reap from their actions. A "game" is any strategic set of interactions. In baseball, an example would be an (instance of) at bat. Source: <https://www.baseballdatascience.com/game-theory-applications-in-baseball/>

## **BITCOIN AS PROPERTY / LAND / Land Use Meme PRECEDENTS:**

- Hong Kong Court ruling Bitcoin as property Equivalent share of Bitcoin's total value in the form of digital real estate, using Earth's physical land model as the reference model
- IRS memo #1421 Bitcoin purchase is akin to land purchase

Owning 1 BTC of digital real estate is equivalent to owning 1126 acres habitable land:

- 15.77 billion acres of habitable land

- 14 million coins of active supply (not lost or Satoshi's coins)
- One 14 millionth of the 15.77 billion habitable acres is 1126 acres.
- Owning 0.01 of a coin (1 million sats) is equivalent to 11 acres.

Source: Reddit: <https://lnkd.in/gbCVAX7X>

Blocks created along a blockchain items #113, 123, 126, stored in a cube 131 USPTO 13/573,002 see main graphic FIGURE 3: USPTO 13/573,002

**BITCOIN / CRYPTOCURRENCY PROGRAMMABLE MONEY:** a.k.a. the “Internet of Money” “Bitcoin is a language” “Bitcoin’s language is time itself” Diginomics.com

**Bitcoin Time-Chain** "creates a new layer of trust that we can all reference".. Bitcoin is the TIME - CHAIN that creates a BEACON of TRUTH.. economically incentivized to show truth" Bitcoin Magazine & Mark Moss .. "store of wealth = baseball card": SOURCE: <https://bitcoinmagazine.com/>

**Black Sox Major League 1919 World Series Baseball game-fixing scandal:** eight members of the Chicago White Sox were accused of losing the 1919 World Series against the Cincinnati Reds on purpose in exchange for money from a gambling syndicate led by Arnold Rothstein. The National Baseball Commission was dissolved, and Judge Kenesaw Mountain Landis was appointed to be the first Commissioner of Baseball and given absolute control over the sport to restore its integrity.

Philadelphia Bulletin published a poem which would quickly prove to be ironic:

Still, it really doesn't matter, After all, who wins the flag. Good clean sport is what we're after, And we aim to make our brag To each near or distant nation Whereon shines the sporting sun That of all our games gymnastic Baseball is the cleanest one!

Source: [https://en.wikipedia.org/wiki/Black\\_Sox\\_Scandal](https://en.wikipedia.org/wiki/Black_Sox_Scandal)

**BLOCKCHAIN DISTRIBUTED LEDGER:** provides a tamper-proof data structure, providing a shared public ledger open to all. The mathematics involved are impressive, and the use of specialized hardware to construct this vast chain of cryptographic data renders it practically impossible to replicate. All transactions are embedded in the bitcoin blockchain. Use of SHA-256 cryptography ensures the integrity of the blockchain applications – all transactions must be signed using a private key or seed, which prevents third parties from tampering with it. Transactions are confirmed by the network within 10 minutes or so and this process is handled by bitcoin miners. Mining is used to confirm transactions through a shared consensus system, and usually requires several independent confirmations for the transaction to go through. This process strives towards random distribution and makes tampering difficult.

**BLOCH SPHERE:** In quantum mechanics and computing, the **Bloch** sphere is a geometrical representation of the pure state space of a two-level quantum mechanical system ( qubit ), named after the physicist Felix **Bloch**. Quantum mechanics is mathematically formulated in Hilbert space or projective Hilbert space.

**Blockchain Tri-lemma:** The perfect blockchain includes three elements: Security, decentralization, and scalability. Finding a balance between the three is difficult and presents a problem referred to as the blockchain trilemma. Scalability and decentralization are often held back by security, but security tends to be compromised by any shifts on a network that offer scalability. Projects either choose to focus on two out of three or work on finding a solution to tackle the trilemma once and for all. Innovative ideas like sharding, side-chains and state channels are used to address the trilemma. A solution to the problem could lead to greater adoption of cryptocurrency and blockchain and a wide-spread use of the technology across industries.

### **BITNATION GOVERNANCE 2.0** [LINK](https://bitnation.co/) <https://bitnation.co/>

BITNATION provides the same services traditional governments provides, from dispute resolution and insurance to security and much more – but in a geographically unbound, decentralized, and voluntary way. BITNATION is powered by Cryptocurrency blockchain Distributed Ledger DLT technology – a cryptographically secured distributed public ledger. “As we like to say – BITNATION: Blockchains, Not Borders”.

**BUCKMINSTER FULLER’s SPACE-SHIP EARTH:** Operating Manual for Spaceship Earth relates Earth to a spaceship flying through space. The spaceship has a finite amount of resources and cannot be resupplied. Buckminster Fuller Institute [LINK](#) BFI dot Org [https://en.wikipedia.org/wiki/Operating\\_Manual\\_for\\_Spaceship\\_Earth](https://en.wikipedia.org/wiki/Operating_Manual_for_Spaceship_Earth). FOCUS QUOTE: "There is only one revolution tolerable to all men, all societies, all political systems: Revolution by design and invention". Richard Buckminster "Bucky" Fuller

**CASPER PoC3 Blockchain BACKBONE:** Casper is a security-deposit based economic consensus protocol. Nodes, as “bonded validators”, have to place a security deposit (action called “bonding”) in order to serve the consensus by producing blocks. The protocol’s direct control of these security deposits is the primary way in which Casper affects the incentives of validators. Specifically, if a validator produces anything that Casper considers “invalid”, their deposit is forfeited along with the privilege of participating in the consensus process. The use of security deposits addresses the “nothing at stake” problem; that behaving badly is not expensive. When something is at stake, bonded validators who misbehave in an objectively verifiable manner will lose it.

**CELIOMETER, GNOCCHI, PANDA:** builds metering around a data structure called samples. A sample is generated each time Ceilometer measures something. It is composed of a few fields, such as the resource id that is metered, the user and project ID owning resources, the meter name, the measured value, a timestamp and a few free-form metadata. Each time Ceilometer measures something, one of its components (an agent, a pollster...) constructs and emits a sample headed for the storage component called the collector. The collector is responsible for storing samples into a database. The Ceilometer collector uses a pluggable storage system usable with any database

**Ceilometer REST API** allows executing various reading requests on the data store. It returns the list of resources that have been measured for a particular project, or computes statistics on metrics. Source: <https://dzone.com/articles/openstack-ceilometer>

## CFTC Commodities Future Trading Commission

### DIGITAL ASSETS CLASSIFICATION APPROACH AND TAXONOMY CFTC

A clear, consensus-driven approach to classifying assets and the functions they serve underpins robust markets and effective regulation. The evolving digital asset ecosystem has led many to develop proprietary taxonomies to classify digital assets and their related technology. In recognition of this progress, the Commodity Futures Trading Commission’s Global Markets Advisory Council for Digital Asset Markets (“CFTC GMAC DAM”) Subcommittee (the “Subcommittee”) has engaged digital asset stakeholders across the broader digital asset ecosystem to build a common approach for the classification and understanding of Digital Assets (“Approach”).

#### Approach to Classifying and Understanding Digital Assets

**Definition | Digital Asset:** a controllable electronic record where one or more parties can exclusively exercise control through transfer of this record and where the controllable electronic record itself is uniquely identifiable.<sup>2, 3, 4, 5, 6, 7</sup> Excluded from the definition of Digital Asset are those controllable electronic records that exist in and function solely as part of a financial institution’s books and records. Broadly, Digital Assets may serve a variety of economic functions such as a store of value, medium of exchange or payment, a means for investment or trading, or a utility to access other goods, governance, or other services. Within those functions, when those assets have the characteristics of regulated instruments that do not qualify as Digital Assets, a specific regulatory framework may already apply, and the Subcommittee believes that digitization does not, as a legal or practical matter, alter the functioning of the product or service, with the result that it is unnecessary to look beyond the existing classification for the regulated instrument.

#### Issuer:

a. Definition: the entity that issues a Digital Asset or for whom a Digital Asset is being issued by a service provider; the entity upon which the person controlling the Digital Asset may have legal claim, for the value of the asset (which necessarily varies by asset type); some Digital Assets may not have an issuing entity (e.g., a bitcoin)

b. Example: a Central Bank is the “issuer” of a central bank digital currency (“CBDC”)<sup>9</sup>

#### Mechanism Underpinning Asset Value:

a. Pegged: Definition (Pegged): a Digital Asset attempts to maintain a peg if its market price is referenced to the notional value or amount (as may be applicable) of a different asset, basket of assets, index or any other variable on a consistent basis; the market

price may reflect the value of a claim on a particular backing asset or entitlement to a fixed amount of value; the value of “pegged” assets may be enabled through “backing”.

Definition (Backing): an asset or basket of multiple assets that purport to guarantee or fund redemptions of the Digital Asset (note that the assets backing a Digital Asset may consist of various asset classes that could differ from the reference asset of the pegged Digital Asset; for example, the Digital Asset may reference the US Dollar, but the backing assets may include high quality liquid assets such as US Treasuries as cash equivalents held in reserve). Example (Pegged & Backed): many Stablecoins are examples of pegged and backed Digital Assets (e.g., pegged to the price of one US Dollar and backed either 100% by cash, or by a combination of cash, cash equivalents, and other assets held in a custody account to maintain the value of the peg).

b. Unpegged: Definition: not designed to reference the value of another asset and, therefore, its price is free-floating, determined by market supply and demand for that asset. ii. Example: many Crypto assets, such as bitcoin or ether, are unpegged.

### 3. Rights Conferral:

a. Definition: the attribute of a Digital Asset to provide the party (or parties) that control such Digital Asset a legally enforceable claim or rights against the issuer. For example, a monetary claim, rights to participate in future revenue distributions, or share in the losses of, or participate in other arrangements by the issuer such as voting, coupon payments, etc.

b. Example: the owner of a Tokenized Security is conferred the rights to the recurring cashflows it may pay and or any other applicable rights (e.g., voting rights).

### 4. Fungibility – Fungible vs. Non-Fungible:

a. Fungible: i. Definition: a Digital Asset with individual units that are interchangeable on a like-for-like basis.

ii. Example: Ether is fungible with other Ether tokens.

b. Non-Fungible: Definition: a Digital Asset with individual units that are not interchangeable on a like-for-like basis; Digital Assets could also be described as “unique” or “one of a kind”. Example: Non-Fungible Tokens representing individual pieces of art, with unique artistic features (and where price often varies due to these features), and thus cannot be interchanged with other Non-Fungible Tokens; two Stablecoins (as defined herein) from different issuers would not be fungible.

### 5. Redemrability – Redeemable vs. Non-Redeemable:

a. Redeemable:

- i. Definition: the ability to relinquish ownership of a Digital Asset in exchange for equivalent value in another asset class, such as money
- ii. Example: fixed income Financial Digital Assets (as defined herein) may be redeemable for their notional value upon maturity; other Tokenized Securities (as defined herein) may be redeemable for the underlying traditional security it represents.

b. Non-Redeemable:

- i. Definition: a Digital Asset where no issuer exists, or the issuing entity has no obligation to redeem the asset.
- ii. Example: Ether is not redeemable for any reference asset.

## 6. Nature of Record – Digital Twin vs. Digital Native: 17

a. Digital Twin: Definition: an electronic controllable record representing an asset that has been immobilized on another system of record, and reconciled with that original system of record to ensure ownership is reflected precisely. Example: a Tokenized Alternative Asset (as defined herein) (such as Tokenized Real Estate as defined herein) is a Digital Twin of that alternative asset that has been immobilized on another system of record.

b. Digital Native: Definition: a Digital Asset representing the primary record of value, that is not recorded on another system of record and does not require reconciliation with another system of record. Example: a bitcoin is a Digital Native because it is the original record of value that does not need to be recorded elsewhere to verify ownership.

Note: There may be tokenized arrangements (e.g., in the case of tokens representing a fractionalized interest in a security) that may not be wholly categorized by one of these two features. In these instances, this attribute may not be relevant. In addition to the attributes that help set out the nature of a Digital Asset, there are other attributes related to a Digital Asset's intended use case or function that may also be effective tools to understand when seeking to classify them. The Subcommittee notes that the primary objective of this document is to set out definitions. Any relevant regulatory understanding should also account for and vary based on these characteristics:

- Types of users/holder types (e.g., retail vs. wholesale);
- intended end user (e.g., consumer product vs. financial product); and
- the entity that serves as the custodian (e.g., regulated depository institution), if any.

## Classification of Digital Assets: Money or Money-Like Digital Assets

For a Digital Asset to be classified as money or a money-like Digital Asset it must meet one of three conditions: reliable store of value, medium of exchange, unit of account.

## Digital Money

1. Central Bank Digital Currencies (CBDC): digital tokens representing a claim on a central bank for a fixed amount of central bank money denominated in a single currency; also, a liability of a central bank, with no credit or liquidity risk. It may or may not be programmable.
  - a. "General Purpose" or "Retail" CBDC: a CBDC that is specifically designed for use in transactions and holdings by individuals and/or small and medium-sized enterprises;
  - b. "Wholesale" CBDC: a CBDC that is specifically designed for wholesale use in transactions and holdings by regulated financial institutions and could be used in the facilitation of regular financial markets functions (e.g., settlement of securities transactions).

The Subcommittee notes that these terms are important to the classification of Digital Assets as they provide context as to the various record-keeping approaches that may be used to record ownership.

Note: A Digital Twin Digital Asset can be issued after the asset it represents has been created. The Digital Twin does not need to be created at the same time.

19 BIS, Central Bank Digital Currencies: System Design & Interoperability; BIS Technology of Retail Central Bank Digital Currency, Mar 2020; BIS, Central Bank Digital Currencies, Mar 2018 Board of Governors of the Federal Reserve System, CBDC, Apr 2023 21 In some jurisdictions, CBDCs may be classified as legal tender. The Subcommittee notes that as specific CBDC arrangements vary by jurisdiction, the attributes of a Retail CBDC and Wholesale CBDC may also necessarily vary (e.g., fungibility between the two types).

### 2. Bank Deposits:

- a. Tokenized Deposits: digital tokens that represent an existing record of a traditional ownership claim for a bank deposit on the token-issuing bank or depository institution, for a fixed amount of commercial bank money denominated in a single currency.<sup>22</sup>
- b. Deposit Tokens: transferable digital tokens issued by a licensed depository institution which evidence a deposit claim against the token-issuing bank or depository institution, for fixed amount of commercial bank money or fiat cash denominated in a single currency. The Subcommittee notes that this definition should be considered in the context of the applicable legal framework and local regulations of a given jurisdiction. The intent of the definition drafted here is to reflect a global perspective.
3. "Reserve-Backed" Digital Currencies: a privately issued (e.g., by a financial market infrastructure provider of digital tokens where a token's value is based on and is backed by central bank reserves i.e., Treasury Bonds, T-Bills, commercial paper...

## Money-Like Digital Assets

4. Stablecoins: privately-issued, money-like, digital token that aims to maintain a stable value relative to a peg specified by a reference asset(s) and designed to minimize value fluctuations relative to these reference assets(s). They are not issued by a central bank. They must also be at least fully backed by one or more assets specified under the specific regulatory framework, including: 25, 26

a. Cash: to one or a combination of fiat currencies

b. Securities: low risk, highly liquid securities such as those classified as High-Quality-Liquid Assets (“HQLA”) under the BCBS LCR30 framework (e.g., US Treasury Bills) 27 The Subcommittee notes that to meet the classification standard of a Stablecoin, the issuer should provide for the timely redemption of the Stablecoin, including during times of market-wide or issuer-specific stress (e.g., redemption demands that may exceed the available liquidity for backing assets, or other events that could potentially call into question the solvency of the issuer). In practice, the means by which this is achieved may vary. The Subcommittee also notes that Stablecoin issuers use different asset classes to maintain parity with the value of the reference asset. For issuers who hold higher-risk backing assets or no backing assets in the collateral reserve, such as Cryptoassets (as defined in Section D), the Subcommittee would not classify these as Stablecoins. This is due to the potential for incremental liquidity risk and volatility that could lead to a loss of confidence in the issuer’s ability to provide for the timely redemption of the Stablecoin. Further, this loss of confidence may lead to secondary market effects affecting the parity of the Stablecoin to the reference asset, also known as a “depegging” event. The Subcommittee would instead classify such digital assets as

Other Crypto assets.

The Subcommittee further notes that some Stablecoin issuers use algorithms to automate the processes that manage supply and demand of stablecoins in relation to the value of the underlying backing reserve. This mechanism has been commonly conflated with the “Crypto assets” category described above and as “algorithmic stablecoins,” which may not have any backing assets and purport to solely maintain a peg through use of supply and demand mechanics. 28

The Subcommittee highlights that in some Stablecoin arrangements, issuers may use an algorithm to manage their backing reserve. Such an approach in itself gives rise to the same types of risks as manual reserve management and is not a differentiated

## B. Financial Digital Assets

Typical use cases include financial investment, financial return, and access to capital markets.

1. Securities (and other financial instruments):

- a. Tokenized Security: a Digital Twin token that represents an underlying security or financial instruments issued on a different platform (e.g., a traditional CSD or registrar), where such representation itself satisfies the definition of a security/financial instrument under local law.
- b. Security Token: a Digital Native token that satisfies the applicable regulatory definition of a security or financial instrument under local law.

## 2. Derivatives:

- a. Tokenized Derivative: a Digital Twin token that represents an underlying derivative instrument issued and recorded on a different platform, where such representation itself satisfies the definition of a derivative under local law.
- b. Derivative Token: a Digital Native token that satisfies the applicable regulatory definition of a derivative instrument under local law.

The Subcommittee highlights that traditional derivative contracts which provide exposure to an underlying Digital Asset (e.g., bitcoin futures) are out of the scope of this document and not considered here, regardless of settlement type (e.g., physically or net in cash)

## c. Alternative Digital Assets

Typical use cases include representation of interest in a good or non-financial asset

### 1. Tokenized Alternative Assets: Digital Twin tokens representing an interest in, entitlement to, or claim on, an alternative (non-security) asset (or claim on the issuing entity for the asset, where applicable), where such representation itself satisfies the definition of such interest, entitlement, or claim under local law; these alternative digital assets may include:

- a. Tokenized Physical Commodities (e.g., wheat, oil, corn);
- b. tokenized Real Estate; or
- c. other Tokenized Assets of Goods (e.g., carbon credits, art, intellectual property rights, and intangible, discrete assets that only exist in digital form on a programmable ledger platform). If certain activities are performed on a tokenized non-financial asset, the classification category may change. For example, in the case of Tokenized Real Estate, fractionalization may convert the Alternative Digital Asset to a Financial Digital Asset.

## D. Cryptos assets (often referred to as Cryptocurrencies)

Typical use cases include a network-specific medium of exchange, unit of account for transaction fees, speculative investment, and branded store of value.

1. Platform Crypto assets: non-redeemable Digital Native tokens, with no rights conferred against the issuer (if one exists), that may be exchangeable for specified value, is hard-coded into any platform and must serve one or both functions:
  - a. Cryptographic economic incentive to maintain and secure to network or application infrastructure including preservation of processing throughput (e.g., through payment of “gas fees” or staking); or
  - b. universal medium of exchange of the underlying network infrastructure.  
Examples of Platform Crypto assets include bitcoin or ether tokens
2. Other Crypto assets: non-redeemable Digital Native tokens, with no rights conferred against the issuer (if one exists), that are used as a speculative investment.

Examples of Other Crypto assets include “meme-coins” such as shiba inu coin.

As all Crypto assets are not pegged to the value of a reference asset, do not represent ownership or other legal claim against a company or other type of issuer, nor guaranteed by a regulated financial institution, their value is driven by market dynamics and/or supply and demand mechanics.

#### E. Functional Digital Assets

Typical use cases include governance or access to a specific infrastructure or app, and specific functional utility.

1. Functional Digital Assets: digital tokens that cannot be exchanged for value issued (where applicable) to provide the owner of the token with a specific utility such as:
  - a. Application-specific governance rights, voting weights, or decision-making authority
  - b. record of entitlement right to rewards or revenue from a specific application or community. As the Digital Asset ecosystem continues to evolve, the Subcommittee recognizes that there may be additional functions or utilities that are not contemplated at this time, and as such expects this classification category to continue to evolve over time.

#### F. Settlement Controllable Electronic Records

Typical use cases include digital record-keeping, in facilitation of financial transactions.

1. Settlement Tokens: digital tokens where such representation itself does not satisfy the definition of a security bank deposit, nor financial instrument under local law and is used solely to transfer or record ownership or perform other middle/back-office financial functions (e.g., collateral transfer, recording of ownership); often exists temporarily, typically for the length of the transaction it facilitates. This may be called the “books-and-records” use case, and a Settlement Token would not be considered as Digital Asset as defined herein.

## G. Other Digital Assets

The Subcommittee recognizes the potential for future innovation and has retained this bucket for new developments that may arise in the digital assets ecosystem.

SOURCE: DIGITAL ASSETS CLASSIFICATION APPROACH AND TAXONOMY RECOMMENDATIONS TO THE COMMODITY FUTURES TRADING COMMISSION GLOBAL MARKETS ADVISORY COMMITTEE GMAC / DIGITAL ASSET MARKETS SUBCOMMITTEE 6 March 2024 CFTC Commodities Futures Trade Committee

**CHAMBER OF DIGITAL COMMERCE** is the world's leading trade association representing the digital asset and blockchain industry. Our mission is to promote the acceptance and use of digital assets and blockchain-based technologies. Through education, advocacy, and working closely with policymakers, regulatory agencies and industry, our goal is to develop a pro-growth legal environment that fosters innovation, jobs and investment. [LINK](http://www.digitalchamber.org) <http://www.digitalchamber.org>

**CODE FOR AMERICA** city, county, state governments redesign public services in three key areas that have high impact for communities. Goal: Turn challenges into opportunities to serve communities better, transform how governments use tech. [LINK](#)

**COUNT MINIMUM SKETCH ALGORITHM:** streaming algorithm Find a randomized streaming algorithm whose output (as a random variable) has the desired expectation but usually high variance (i.e., noise). To reduce the variance/noise, run many independent copies in parallel and combine their outputs. Count sketch is a probabilistic data structure designed to answer the following question: Reading a stream of elements  $a_1, a_2, a_3, \dots$ , where many elements are replicas in a given time it will provide an answer to question: how many original elements have been seen Count minimum sketch is a probabilistic data structures sacrificing certainty for space. Count minimum sketch selects 2 parameters: accuracy of the results  $\epsilon$  and probability of bad estimate  $\delta$ .

**Cool Copper Collider** (or C3 for short). This proposal calls for accelerating particles with conventional, or “normal-conducting,” radio frequency (RF) cavities—as opposed to the superconducting RF cavities used in modern colliders. <https://lifeboat.com/blog/2022/10/a-retro-collider-design-for-a-higgs-factory>

## DISCOVERY MACHINE ARTIFICIAL INTELLIGENCE / MACHINE LEARNING

Discovery Machine® leverages a wide range of AI techniques from knowledge acquisition (KA)

to machine learning (ML) to develop “intelligent constructs” for training, decision support and automation. Discovery Machine®’s highly acclaimed, patented knowledge capture methodology works in conjunction with our patented visual modeling tools to enable the agile production of intelligent constructs. Discovery Machine®’s AI overcomes the limitations of ML imposed by sparse data environments by capturing the mental models trapped in the heads of your organization’s subject matter experts (SME) to bias and direct learning. Discovery Machine® is headquartered in Williamsport, Pennsylvania (the home of Little League). Discovery Machine® has a vibrant team of software and knowledge engineers working on several Department of Defense (DoD) projects. Source <https://discoverymachine.com/>

**Distributed Autonomous Organization DAO** was created by a military think tank RAND Corporation circa 2001. This term is being reused by organizations describing cryptocurrency blockchain technology. USPTO 13/573,002 reuses and improves upon military Network Centric Warfare best practice of organizing individuals in groups geographically distributed across distances and UTZ time zones i.e., micro – macro cycle scheduling, use of organizational, resource identifiers via structured data exchanges is improved through use of algorithms which are essentially workflow rules and , math.

**DASH:** Unlike Bitcoin nodes, Master nodes receive payments for their service to the network – similar to demurrage charges in the Trade Reference Currency TERRA TRC. Dash includes decentralized funding, decentralized governance, decentralized storage. Dash's governance system, visit <https://dash.org>. Dash features: - InstantX:

Masternodes instantly lock transactions to solve the problem of lag time in transactions

- Self-Budgeting: To solve the problem of lack of funding for development, Masternodes can direct funds right from the blockchain to support development.
- Self-Governance: To solve the problem of making governance decisions on the future of the currency, Masternodes can vote on what development occurs.

**DEMURRAGE FEE:** "the (carrying) costs for (holding) currencies/commodities," or "international maritime shipping delay penalty fees." The TRC is a demurrage-charged currency. A demurrage charge acts much like a parking or rental fee, incurring a cost over time to its holder. The cost for holding onto the TRC currency is estimated at 3.5%-4% per annum. This demurrage charge insures the currency's use mainly as a trading device: it would not be hoarded but always tend to remain in circulation. It would thereby strongly activate commercial exchanges and investments wherever it circulates, the opposite of a conventional currency.

**DEMMURAGE FEE / SATOSHI:** The Satoshi represents one hundred millionths of a bitcoin because bitcoin has increased in value exponentially, smaller denominations are needed to facilitate smaller transactions. Small denominations make bitcoin transactions easier to conduct and, can act as demurrage fees to for example, move real world assets / commodities from point a to point n within trade federations.

**DHS goal:** "A national common operating picture for critical infrastructure". A congressional directive states "nothing less than network centric homeland security akin

to network centric warfare". This Interoperability challenge exists to this day to develop a common syntax library / Rosetta Stone among disparate systems to form an integrated, synchronized, situational awareness system of systems. Syntax / symbol source libraries that need a common reference format include a partial list:

- Named-Data Networking NDN <Content> Centric Networking (XML tags)
- OASIS TOSCA YAML document indent data encoding scheme
- GITHUB code, syntax library, Java Script OS ("tag") convention

## DISTRIBUTED EVENT PROCESSING

A distributed event processing system consists of one or more nodes (machines), and can execute a directed acyclic graph (DAG) of operators called a dataflow (or query), over long-running high-event-rate data sources. An important component of such a system is cost estimation, which predicts or estimates the "goodness" of a given input, i.e., operator graph and/or assignment of individual operators to nodes. Source: IEEE <https://ieeexplore.ieee.org/document/5767926/>

## DISTRIBUTED STATE MACHINE

In many distributed applications, processes synchronize with one another in a complex way and execute for a long period of time. Atomic transactions are inadequate for designing reliable applications with these characteristics, because transactions restrict the types of synchronization than can be specified. An alternative approach that exploits behavior specified in a hierarchical finite-state machine (FSM) model is proposed. A set of general conditions that ensures the correctness of recovery is identified. These general conditions permit combinations of different types of recovery methods to be used in a recovery. They also enable one to enhance recovery efficiency by exploiting permutation and substitution of operations allowed by the behavior specification. In Zeebe.io — a horizontally scalable distributed workflow engine I explained that Zebee is a super performant, highly scalable and resilient cloud-native workflow engine. Source: IEEE: <https://ieeexplore.ieee.org/document/235125>

**ECO INCENTIVES:** Ecologically sustainable economic transactions need to be incentivized among the world's Ecological and Economic system of systems.

**DECISION POINT:** 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

1. **CLIMATE CHANGE: 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?

2. CLIMATE CHANGE: 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

**Econometrics** analyzes data using statistical methods to test, develop economic theory. These methods rely on statistical inferences to quantify and analyze economic theories by leveraging tools such as frequency distributions, probability, and probability distributions, statistical inference, correlation analysis, simple and multiple regression analysis, simultaneous equations models, and time series methods. Source: Investopedia: <https://www.investopedia.com/terms/e/econometrics.asp>

**EDISON's MONETARY OPTION 1922:** Thomas Edison's Monetary option: Edison, Henry Ford proposed a currency based on the value of a basket / index of crop commodities in 1922. Edison believed that crops held their value over time. "I want to cast the variable out of money. This gold money is not good enough. It's a fiction" Source: (New York Times 1922). Source: Journal of the History of Economic Thought Volume 28 , Issue 3 , September 2006 , pp. 295 - 308 Copyright © The History of Economics Society 2006 DOI: <https://doi.org/10.1080/10427710600857773> Source: Beale, W. T. M. Jr., Kennedy, M. T., Winn, W. J. (1942) Commodity Reserve Currency: A Critique, Journal of Political Economy, 50 (4), pp. 579–94. Source: Boyle, David (Ed) (2002) The Money Changers: Currency Reform from Aristotle to E-cash

**Electric dipole effect** Electric meter claim based on electric dipole effect: closer is cheaper given less infrastructure needed given energy attenuates over distances • data over energy link where #energy pulses constitute a method and means to transmit data over electric wired, wireless pathways • electric dipole effect Radio Wave Properties: Electric and Magnetic Dipole Antennae Source: <https://youtu.be/wUpOlqbHcjI?t=111>

## ENERGY WIRELESS TRANSFER TESLA INSPIRED

DARPA POWER ("Persistent Optical Wireless Energy Relay"): "develop a means of distributing energy wirelessly around the globe through airborne power transfer. First dreamed up by Nikola Tesla almost 100 years ago, if successful, this would be the most significant change to energy transfer since the first rollout of electrification almost 150 years ago. The program goals include demonstrating the key components of a resilient, speed-of-light energy network". DARPA plans to create wireless energy transfer infrastructure to supply near-uninterruptable power to U.S. military bases worldwide. The plan, as reported by Popular Mechanics, is to use laser technology to beam electricity around the planet. Famously a dream of Nikola Tesla over 100 years ago, if successful, this technology, called fittingly enough POWER ("Persistent Optical Wireless Energy Relay"), would make the U.S. military less reliant on liquid fuel like diesel and vulnerable power lines, which can be intercepted or sabotaged by enemy forces. <https://interestingengineering.com/innovation/darpa-laser-power-transfer>

USPTO 13/573,002 claim: closer- cheaper given less attenuation over distance, less infrastructure needed. SCOTUS Alice in Wonderland 2014 ruling compliant water drop in pond physical meme for sound / light metrics, meters, descriptions relevant to sound, optical based

quantum computing. Source: Interesting Engineering:  
<https://interestingengineering.com/innovation/wireless-energy-transmission-darpa>

## ERC 20 TOKENS STANDARDS LIST

ERC standard allows for the implementation of a standard API for tokens within smart contracts. This standard provides basic functionality to transfer tokens, as well as allow tokens to be approved so they can be spent by another on-chain third party. A standard interface allows any tokens on Ethereum to be re-used by other applications: from wallets to decentralized exchanges. Function examples:

**totalSupply** Returns the total token supply. function totalSupply() public view returns (uint256)

**balanceOf** Returns the account balance of another account with address \_owner. function balanceOf(address \_owner) public view returns (uint256 balance)

**TRANSFER** Transfers \_value amount of tokens to address \_to, and MUST fire the Transfer event. The function SHOULD throw if the message caller's account balance does not have enough tokens to spend. Note Transfers of 0 values MUST be treated as normal transfers and fire the Transfer event.

function transfer (address \_to, uint256 \_value) public returns (bool success)

**TRANSFER FROM** Transfers \_value amount of tokens from address \_from to address \_to, and MUST fire the Transfer event. The transferFrom method is used for a withdraw workflow, allowing contracts to transfer tokens on your behalf. This can be used for example to allow a contract to transfer tokens on your behalf and/or to charge fees in sub-currencies. The function SHOULD throw unless the \_from account has deliberately authorized the sender of the message via some mechanism. Note Transfers of 0 values MUST be treated as normal transfers and fire the Transfer event.

**FUNCTION TRANSFER From**(address \_from, address \_to, uint256 \_value) public returns (bool success)

**APPROVE:** Allows \_spender to withdraw from your account multiple times, up to the \_value amount. If this function is called again it overwrites the current allowance with \_value. function approve(address \_spender, uint256 \_value) public returns (bool success)

**ALLOWANCE** Returns the amount which \_spender is still allowed to withdraw from \_owner. function allowance (address \_owner, address \_spender) public view returns (uint256 remaining)

EVENTS TRANSFER MUST trigger when tokens are transferred, including zero value transfers. A token contract which creates new tokens SHOULD trigger a Transfer event with the \_from address set to 0x0 when tokens are created.

event Transfer (address indexed \_from, address indexed \_to, uint256 \_value)

APPROVAL MUST trigger on any successful call to approve (address \_spender, uint256 \_value). event Approval (address indexed \_owner, address indexed \_spender, uint256 \_value) Implementations: Example implementations are available at

OpenZeppelin implementation / ConsenSys implementation

**ERICSSON OPEN MONEY:** Ericsson Patents Open Money for Society 20130166398 "System And Method For Implementing A Context Based Payment System." "It is our vision that one day everyone with access to a mobile phone will be able to spend, send and receive money as easily as sending a text via SMS." "When money is open, the way we send, spend and receive money will change forever." Ericsson posted on their commerce site "Bitcoin And the Value of Money" which discusses "From Bartering, to Gold, to Bitcoins" Facilitation of Effective Trade, Limited Resources, and Value as a Mutual Agreement. <https://letstalkbitcoin.com/ericsson-patents-open-money-for-society>

"Local producers are sometimes forced to price goods relative to distant competition, and, because of lower production and wage costs in different parts of the world (or even country), substantially lower profit margins can be the result. There are times, however, when consumers might be willing to buy locally produced goods for the good of the society {Emphasis LTB}, and that attitude is more prevalent today than in the past. But what a consumer says they will do, and what occurs in practical, real shopping situations can be significantly different. Faced with competitive quality products, but disparate prices, the consumer often feels that he or she has no real choice, especially if budgets are more constrained because of uncertain economic conditions, and therefore are not what they used to be. Thus, personal economic pressures can hinder "good" buying decisions. Retailers too are cognizant of an increased awareness for the value of locally produced products. They market local producers and arrange special sections with "good" products, i.e., those that minimally impact the environment both in terms of environmentally friendly manufacturing methods, but also those articles that have been produced locally." "Thus, current economic conditions, and prevailing economic theories make it difficult, if not impossible, for an average consumer to make an impact on the local economy and the local environment, regardless of their attitudes. Therefore, we provide methods for creating a context based payment system.

**ERICSSON CONTEXT BASED PAYMENT SYSTEM:** "Disclosed herein is a context-based payment system. Electronic currency or coupons can be made dependent on context, and the context can be one of location or geography, time, date, distance, sound, or other devices. The value of the currency exists only if a pre-condition is fulfilled. For example, if the currency is location dependent, the value only exists in a defined area (currency value area). The goods or the service in the value-system are

also context dependent, that is, they can only be sold or offered in a defined area (product value area). Accordingly, if the product value area and the currency value area overlap, a purchase and payment can be made."

**ERLANG – ERLANG FOLSOM** by ERICSSON: Erlang based metrics system inspired by Coda Hale's metrics (<https://github.com/dropwizard/metrics>). The metrics API's purpose is to collect real-time metrics from Erlang applications and publish them via Erlang APIs and output plugins. folsom is not a persistent store. There are 6 types of metrics: counters, gauges, histograms (and timers), histories, meter\_readers and meters. Metrics can be created, read and updated via the folsom\_metrics module. [LINK  
https://github.com/boundary/folsom](https://github.com/boundary/folsom)

**ETHEREUM “WORLD COMPUTER”** combination of cryptographic architecture and Turing completeness, Ethereum virtual machine (EVM) refers to part of the protocol that handles internal state and computation. It is often referred to as the project's defining innovation over other blockchain-based systems. By taking the cryptographic payment structure of bitcoin and adding a Turing complete scripting language, The term "Turing complete" means a system capable of performing logical steps of computational functions. Ethereum is different than from bitcoin in that it is first and foremost a computing platform Vs a payment system. [LINK http://coindesk.com/whats-big-idea-behind-ethereums-world-computer/](http://coindesk.com/whats-big-idea-behind-ethereums-world-computer/)

**EQUILIBRIUM ALGORITHM** / polynomial-time algorithm by John Nash Princeton University: Nash equilibrium, named after the mathematician John Nash, is the most common way to define the solution of a non-cooperative game involving two or more players. In a Nash equilibrium, each player is assumed to know the equilibrium strategies of the other players, and no one has anything to gain by changing only one's own strategy.[1] The principle of Nash equilibrium dates back to the time of Cournot, who in 1838 applied it to competing firms choosing outputs.[2]

If each player has chosen a strategy – an action plan based on what has happened so far in the game – and no one can increase one's own expected payoff by changing one's strategy while the other players keep theirs unchanged, then the current set of strategy choices constitutes a Nash equilibrium.

If two players Alice and Bob choose strategies A and B, (A, B) is a Nash equilibrium if Alice has no other strategy available that does better than A at maximizing her payoff in response to Bob choosing B, and Bob has no other strategy available that does better than B at maximizing his payoff in response to Alice choosing A. In a game in which Carol and Dan are also players, (A, B, C, D) is a Nash equilibrium if A is Alice's best response to (B, C, D), B is Bob's best response to (A, C, D), and so forth.

Nash showed that there is a Nash equilibrium for every finite game: see further the article on strategy. See: <http://web.cs.ucla.edu/~awm/cs288/class3.pdf>

Eurasian Economic Union (EAEU or EEU) [note 1] is an economic union of five post-Soviet states located in Eurasia. The EAEU has an integrated single market. As of 2023, it consists of 183 million people and a gross domestic product of over \$2.4 trillion.[4] The Treaty on the Eurasian Economic Union was signed on 29 May 2014 by the leaders of Belarus, Kazakhstan, and Russia, and came into force on 1 January 2015.[5] The EAEU encourages the free movement of goods and services, and provides for common policies in the macroeconomic sphere, transport, industry and agriculture, energy, foreign trade and investment, customs, technical regulation, competition, and antitrust regulation. Provisions for a single currency and greater integration are envisioned for the future.[9][10]

Main articles: Eurasian Customs Union and Eurasian Economic Space

**Eurasian Conformity mark EAC.** The core objective of the Single Economic Space is the development of a single market and achieving the "four freedoms", namely the free movements of goods, capital, services and people within the single market. List of bilateral free trade agreements, Commonwealth of Independent States Agreement on the Establishment of a Free Trade Area (1994), and Commonwealth of Independent States Free Trade Area. See also ASEAN, Collective Security Treaty Organization, Comecon Community for Democracy and Rights of Nations, Enlargement of the Eurasian Economic Union, Eurasian Economic Community, Eurasian Patent Convention Eurasian Patent Organization, Soviet Union, Union of Sovereign States, Warsaw Pact, List of multilateral free-trade agreements

SOURCE: [https://en.wikipedia.org/wiki/Eurasian\\_Economic\\_Union](https://en.wikipedia.org/wiki/Eurasian_Economic_Union)

**FEDERATION (CLOUD COMPUTING):** FEDERATION: from Latin: *foedus*, gen.: *foederis*, covenant characterized by a union of partially self-governing states or regions under a central (federal) government. In a federation, the self-governing status of the component states, as well as the division of power between them and the central government, are typically constitutionally entrenched and may not be altered by a unilateral decision of either party, the states or the federal political body. Individuals, organizations retain AUTONOMY to act on their own behalf. Federation: reuse of military System of Systems research, best practice guiding formation of a procedural template framework is key to forming and maintaining sustainable Trade Federations as Distributed Autonomous Organizations DAO's / DAC's Corporations. Military's organize individuals into organizations <OrgID> and Organizational Units <OU><OU><OU> dispersed autonomous groups working on collective goals synchronized in space-time.

**FEDERATE:** Within a federated system, an organization needs a standardized and repeatable way of describing services it makes available to teams in leagues and policies by which it runs its operations. Organization Identifiers </ORG IDs> represents a business, non-profit corporation, or government entity in the American Registry of Internet Numbers ARIN database. Entities may have more than one <Org\_ID> for contingency planning. More than one ORG\_ID enables business contingency plans for different scenarios, use cases, different circumstances.

## **FEDERATION EXAMPLE: RIPPLE LABS ON DEMAND LIQUIDITY**

Ripple Labs offers On-Demand Liquidity (ODL) as a service on its RippleNet platform, designed to facilitate faster and more cost-effective cross-border payments. ODL uses XRP, Ripple's native digital asset, to eliminate the need for pre-funding of accounts in foreign countries and reduce operational costs for financial institutions and businesses. This technology allows for seamless, real-time, and cost-effective payments without the need for traditional correspondent banking relationships. In the United States, Ripple does not use XRP for liquidity solutions due to regulatory concerns. Instead, Ripple uses Tether (USDT) as a bridge currency for on-demand liquidity transactions. ODL aims to address the inefficiencies of the traditional payments infrastructure, which can take 3-5 days to settle international transactions involving multiple parties and is prone to errors and high costs. RippleNet serves as a payment network for financial institutions, while XRP functions as a bridge currency for cross-border transactions. Users can send XRP directly to other wallet addresses for near-instant settlements or trade it on cryptocurrency exchanges. Source: Ripple Labs, Wikipedia, Google search

## **FEDERATION EXAMPLE: ON DEMAND LIQUIDITY TO REMONETIZE BANKS**

The Panic of 1907, also known as the 1907 Bankers' Panic or Knickerbocker Crisis,[1] was a financial crisis that took place in the United States over a three-week period starting in mid-October, when the New York Stock Exchange suddenly fell almost 50% from its peak the previous year. The panic occurred during a time of economic recession, and there were numerous runs affecting banks and trust companies. The 1907 panic eventually spread throughout the nation when many state and local banks and businesses entered bankruptcy. The primary causes of the run included a retraction of market liquidity by a number of New York City banks and a loss of confidence among depositors, exacerbated by unregulated side bets at bucket shops.[2]

The panic was triggered by the failed attempt in October 1907 to corner the market on stock of the United Copper Company. When the bid failed, banks that had lent money to the cornering scheme suffered runs that later spread to affiliated banks and trusts, leading a week later to the downfall of the Knickerbocker Trust Company, New York City's third-largest trust. The collapse of the Knickerbocker spread fear throughout the city's trusts as regional banks withdrew reserves from New York City banks. The panic then extended across the nation as vast numbers of people withdrew deposits from their regional banks, causing the 8th-largest decline in U.S. stock market history.[3]

The panic might have deepened if not for the intervention of financier J. P. Morgan,[4] who pledged large sums of his own money and convinced other New York bankers to do the same to shore up the banking system. That highlighted the limitations of the US Independent Treasury system, which managed the nation's money supply but was unable to inject sufficient liquidity back into the market. By November, the financial contagion had largely ended, only to be replaced by a further crisis due to the heavy borrowing of a large brokerage firm using the stock of Tennessee Coal, Iron and Railroad Company (TC&I) as collateral. Collapse of TC&I's stock price was averted by an emergency takeover by Morgan's U.S. Steel Corporation, a move approved by the

trust-busting President Theodore Roosevelt. The following year, Senator Nelson W. Aldrich, a leading Republican, established and chaired a commission to investigate the crisis and propose future solutions, which led to the creation of the Federal Reserve System.[5][6] SOURCE: WIKIPEDIA [https://en.wikipedia.org/wiki/Panic\\_of\\_1907](https://en.wikipedia.org/wiki/Panic_of_1907)

**FEDERATED IDENTITY MANAGEMENT:** federation describes the organization arrangements necessary for interconnection between teams, leagues, and commissions joined to achieve common goals. Federated systems need to interoperate across organizational boundaries and connect processes utilizing different technologies, identity storage, security approaches and programming models. Resources available to the group include the health or availability of individuals forming groups where monitoring is performed to ascertain if groups are mission capable or not in context with available resources and whether the group's location is within a pre-defined geo-spatial range of a given activity or event. A federation describes the organization arrangements necessary for linkage between teams, leagues, and commissions joined to achieve common goals. Operations are performed as part of group's activities. If trade is deemed non-equitable, groups, individuals may leave the trade federation as a network drop until conditions change or the individuals change their minds and decide to re-affiliate, re-tether to the collective. [LINK https://en.wikipedia.org/wiki/Federation](https://en.wikipedia.org/wiki/Federation)  
See Bitcoin Blockchain smart contract RSK [federation](#) network Buenos Aires [Rootstock](#).

**FIREFLY-HEARTBEAT ALGORITHM** UNIVERSITY of BOLOGNA / HUNGARY: Firefly inspired Heartbeat Synchronization: in a paper entitled Firefly-inspired Heartbeat Synchronization in Overlay Networks by the University of Bologna and Trento Italy along with the University of Szeged, Hungary: "Heartbeat synchronization strives to have nodes in a distributed system generate periodic, local "heartbeat" events approximately at the same time. Many useful distributed protocols rely on the existence of such heartbeats for driving their cycle- based execution. The heartbeat synchronization protocol for overlay networks is inspired by mathematical models of flash synchronization in certain species of fire flies. Nodes send flash messages to their neighbors when a local heartbeat triggers. Fireflies adjust the phase of their next heartbeat based on incoming flash messages using an algorithm inspired by mathematical models of fire-fly synchronization. Heartbeat synchronization strives to have nodes in a distributed system generate periodic, local "heartbeat" events approximately at the same time. It differs from classical clock synchronization in that nodes are not interested in counting cycles and agreeing on a ID of a current cycle. There is no requirement regarding the length of a cycle with respect to real time as long as a length is bounded and all nodes agree on it eventually. The goal is to guarantee that all nodes start and end their cycles at the same time, with an error that is at least one, but preferably more, orders of magnitude smaller than a chosen cycle length. Firefly heartbeat synchronization reduces uncertainty in stochastic networks.  
Paper: Firefly-inspired Heartbeat Synchronization in Overlay Networks. Ozalp Babaoglu. University Bologna, Italy <http://cs.unibo.it/~babaoglu/papers/pdf/SASO07-fireflies.pdf>

**FIREFLY – HEARTBEAT ALGORITHM CHINA:** The firefly algorithm (FA) is a nature-inspired metaheuristic optimization algorithm developed by Xin-She Yang that is inspired by the flashing behavior of fireflies (Yang, 2008), originally designed to solve continuous optimization problems (Lukasik and Žak, 2010) a major part of an edited book was also dedicated to the firefly algorithm and its applications (Yang, 2013a). For example, Senthilnath et al. provided an extensive performance study by comparing the firefly algorithm with 11 different algorithms and concluded that FA can be used for efficient clustering (Senthilnath et al., 2011); From: Swarm Intelligence and Bio-Inspired Computation, 2013 <https://www.sciencedirect.com/topics/engineering/firefly-algorithm>

**FIX 4.0 : Heartbeat <0> message:** The Heartbeat <0> is useful for monitoring the status of the communication link and to identify when the last of a string of messages was not received. When either end of a FIX connection has not sent any data for [HeartBtInt <108>] seconds, it will transmit a Heartbeat <0> message. When either end of the connection has not received any data for (HeartBtInt <108> + "some reasonable transmission time") seconds, it will transmit a Test Request <1> message. If there is still no Heartbeat <0> message received after (HeartBtInt <108> + "some reasonable transmission time") seconds then the connection should be considered lost and corrective action be initiated. If HeartBtInt <108> is set to zero then no regular Heartbeat <0> messages will be generated. Note that a Test Request <1> message can still be sent independent of the value of the HeartBtInt <108> which will force a Heartbeat <0> message. Heartbeats issued as the result of Test Request <1> must contain the TestReqID <112> transmitted in the Test Request <1> message. This is useful to verify that the Heartbeat <0> is the result of the Test Request <1> and not as the result of a regular timeout. Source: [https://www.onixs.biz/fix-dictionary/4.0/msgtype\\_0\\_0.html](https://www.onixs.biz/fix-dictionary/4.0/msgtype_0_0.html)

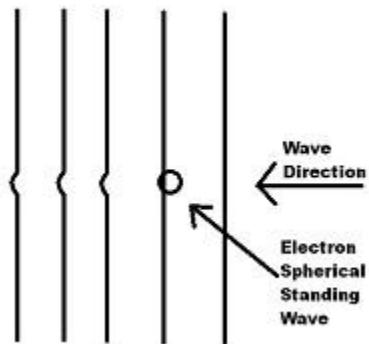
**HEARTBEAT:** In computer science, a **heartbeat** is a **periodic signal** generated by **hardware** or **software** to indicate normal operation or to **synchronize** other parts of a **computer system**.<sup>[1][2]</sup> Heartbeat mechanism is one of the common techniques in mission **critical systems** for providing **high availability** and **fault tolerance** of **network services** by detecting the **network** or **systems failures** of **nodes** or **daemons** which belongs to a **network cluster**—administered by a **master server**—for the purpose of automatic adaptation and **rebalancing** of the system by using the remaining redundant nodes on the cluster to take over the **load** of failed nodes for providing constant services.<sup>[3][1]</sup> Usually a heartbeat is sent between machines at a regular interval in the order of seconds; a **heartbeat message**.<sup>[4]</sup> If the endpoint does not receive a heartbeat for a time—usually a few heartbeat intervals—the machine that should have sent the heartbeat is assumed to have failed.<sup>[5]</sup> Heartbeat messages are typically sent non-stop on a **periodic** or recurring basis from the originator's start-up until the originator's shutdown. When the destination identifies a lack of heartbeat messages during an anticipated arrival period, the destination may determine that the originator has failed, shutdown, or is generally no longer available.

**Heartbeat protocol** used to negotiate and monitor the availability of a resource, such as a [floating IP address](#). The procedure involves sending [network packets](#) to all the nodes in the cluster to verify its [reachability](#).<sup>[3]</sup> Typically when a heartbeat starts on a machine, it will perform an election process with other machines on the [heartbeat network](#) to determine which machine, if any, owns the resource. On heartbeat networks of more than two machines, it is important to take into account partitioning, where two halves of the network could be functioning but not able to communicate with each other. In a situation such as this, it is important that the resource is only owned by one machine, not one machine in each partition. As a heartbeat is intended to be used to indicate the health of a machine, it is important that the heartbeat protocol and the transport that it runs on are as reliable as possible. Causing a [failover](#) because of a false alarm may, depending on the resource, be highly undesirable. It is also important to react quickly to an actual failure, further signifying the reliability of the heartbeat messages. For this reason, it is often desirable to have a heartbeat running over more than one transport; for instance, an [Ethernet](#) segment using [UDP/IP](#), and a serial link. A "cluster membership" of a node is a property of [network reachability](#): if the master can communicate with the node it's considered a member of the cluster and "dead" otherwise.<sup>[6]</sup> A heartbeat program as a whole consists of various [subsystems](#):<sup>[7]</sup>

### ***Unification of the Fundamental Forces (Charge / Light, Gravity)***

Let us now put our one law to work to explain and unite charge, light and gravity, since all matter interactions (causal connection) are a result of this one law, bigger waves travel faster. (Though this is now obvious to me, it took me 25 years to realise that causal connection must involve a change in velocity, since acceleration is always involved in matter interactions, as per newton's law of inertia, Force = Mass \* Acceleration.)

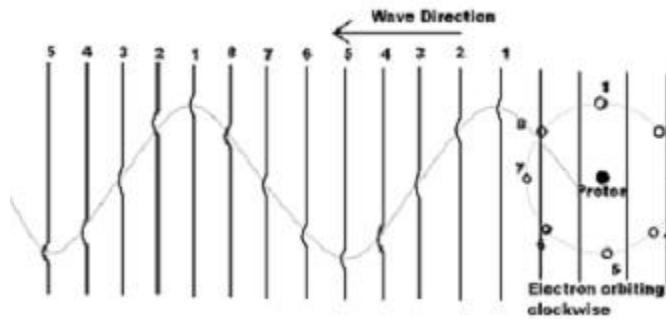
## **Charge**



When an in phase plane wave flows through a high wave amplitude wave center, the wave travels faster and the wave front is advanced (hill). This occurs between electrons, and also between positrons, and the result of this advanced wave is that it causes electrons to repel one another, and positrons to repel one another (each advanced 'hill' on the wave front acts like a small 'push' when it flows through another standing wave, see below). However, if you have an electron and a positron

interacting, then the waves are opposite phase, cancel one another, the total wave amplitude is lower, the wave travels more slowly, causing a retarded wave front (hollow), and this causes opposite phase standing waves (electrons and positrons) to attract one another.

## Light and the 'Electromagnetic Wave'

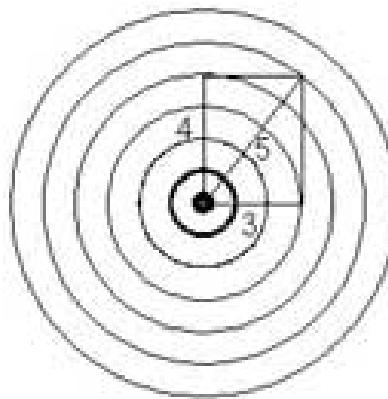


If the electron is bound in an atom or molecule, then it has a repeating wave pattern, and this pattern of advanced 'hills' on successive plane waves forms a wave pattern that is the cause of the 'electromagnetic' light wave. It is a resonance phenomenon, where the pattern of advanced

curves must match the standing wave pattern of the electron it interacts with (like pushing a swing, you must push at the correct phase for the swing to absorb the energy and swing higher). The energy is discrete (quanta / photon) because the change from one standing wave pattern to another is discrete. de Broglie first proposed this, without understanding the true wave mechanism behind it (he worked with a particle wave duality for matter).

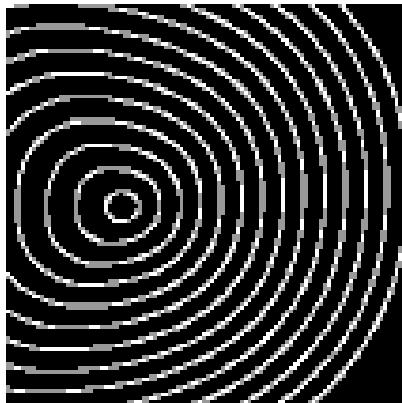
## Acceleration and Ellipsoidal Geometry

A stationary standing wave in space is perfectly spherical. The diagram below shows this and why Pythagoras theorem is a property of spheres.



However, if the incoming plane wave from one direction has an advanced 'hill' on the surface of the wave, then this causes the stationary standing wave to move in the direction of the 'hill', and it changes its shape from spherical to ellipsoidal (like an egg!).

In the diagram below, imagine the incoming plane waves from the left have an advanced hill on them, this then changes the ellipsoidal shape of the standing wave and it begins to move to the right.



The ellipsoidal wave is stretched in the direction of motion (right side), thus the same wave energy is spread over a larger surface area and has a lower wave amplitude and thus velocity and wavelength, as per our one law. On the opposite side the effects are reversed, the ellipsoidal wave is squashed, has a smaller surface area, a higher wave amplitude, the wave travels faster and has a longer wavelength. This changing ellipsoidal geometry and wavelength / velocity is the foundation of inertia, since when you accelerate the standing wave, its resultant ellipsoidal shape changes, as does the in wave velocity which is slower in the direction of motion, faster on the opposite side, which then maintains its new velocity through space.

Importantly, the Lorentz Transformations have the electron becoming a squashed ellipsoid on both sides with motion, whereas the Wave Structure of Matter (WSM) has the electron as a stretched ellipsoid in the direction of motion (with slower in waves and shorter wavelength) and a squashed ellipsoid on the opposite side (with faster in waves and longer wavelength). This difference in ellipsoidal geometry from one side to the other is the foundation of the Doppler effect, magnetic moment, and also the Lorentz transformations and Einstein's general relativity. Note - Perhaps there is some experiment that could distinguish between Lorentz's squashed ellipsoid Vs the WSM where it is stretched in the direction of motion.

Most profoundly, we now have a physical reason for why acceleration is related to curvature and ellipsoidal geometry, since whenever a wave changes velocity there is a change in ellipsoidal curvature of the wave front (Einstein's matter-energy curves space-time). However, Einstein changed the length and time when he should have changed the length and wave velocity and kept the time (frequency) constant. In this way, even though the velocity of the waves changes, so does the wavelength such that you always measure the same velocity of light (which is also why Pythagoras' Theorem is true irrespective of motion and ellipsoidal geometry).

**Gravity:** To understand how gravity is united with light we must first understand where all the antimatter / positrons are, since positrons and electrons (opposite phase standing waves) are created equally, and both contribute to gravity. Positrons are naturally produced due to radioactive decay of certain isotopes, and can be artificially produced using high energy laser beams fired at gold. In Beta+ decay the proton emits a positron

and becomes a neutron, likewise, the neutron can emit an electron and become a proton in Beta- decay. The obvious conclusion from this is that positrons and electrons make up the structure of the proton, with one extra positron to account for the positive charge. What this exact structure is is unknown, but if the quark theory of protons is correct then the quarks are most likely positronium (a bound positron and electron). However, this exact structure of protons and neutrons is not needed, all we need to know is that in a neutral atom there are equal numbers of positrons and electrons. So now let us consider a plane wave flowing through a large body like the Earth, that has roughly the same number of positrons as electrons. If the plane waves are in phase with the electrons then they will get an advanced curve (hill) on their wavefront, and they will get a retarded curve (hollow) when travelling through positrons. The result is that you get as many advanced curves as retarded curves, and they will cancel one another out. i.e. It is a neutral body and there is no charge effect. And now finally we can unite light and gravity (though it took me 20+ years to work this out, even though it is simple and obvious, deduced from our one law). The solution. When the plane waves have advanced or retarded curves on their wave front, then the same wave energy is spread over a larger surface area, so the curved part of the wave front has a smaller wave amplitude, and thus a slower wave velocity. Thus an advanced curve will get smaller over time: the 'push force' decreases the further the wave travels through space), the retarded curve will do the opposite and get bigger over time (the 'pull force' increases the further the wave travels through space). So the push and pull 'forces' of advanced and retarded curves on the plane waves do not exactly cancel each other out, instead, there must always be a slight attractive force due to the slowing of the curved wave fronts due to our one law. This slight attractive force is the cause of gravity. What remains to be done is for mathematical physicists to calculate this relationship between wave amplitude, wave velocity, and ellipsoidal curvature. Einstein was correct to relate gravity to ellipsoidal curvature, but we now need to correct the error of Einstein working from continuous fields in space-time rather than discrete standing waves in space, and his changing of time rather than wave velocity as occurs with the Wave Structure of Matter. Geoff Haselhurst June 25th, 2023

**Source:** <https://www.spaceandmotion.com/physical-reality-simple-summary.htm>

**"If you want to find the secrets of the universe, think in terms of energy, frequency and vibration". Nikola Tesla**

### **Using Waves to Measure the World: Fisher Information Flux to Track Info Flow**

International Space Federation ISF: A team of physicists has discovered that electromagnetic waves scattered by an object contain detailed, locally defined information about that object's properties. This information, quantified by a concept called Fisher information, flows through space in a way that's analogous to how energy flows in electromagnetic fields. a study has revealed a new way to understand how these waves carry information about the objects they encounter. Just as the famous Poynting vector describes energy flow in electromagnetism, the team has introduced a new "Fisher information flux" that tracks the flow of information in wave fields. This

revolutionary research published in *Nature physics* [1], opens up new possibilities for understanding and manipulating electromagnetic waves in various applications, from medical imaging to telecommunications. This new understanding based on Fisher information flux / flow is based on three key characteristics:

**Local definition:** The Fisher information content can be assigned to specific points in space, much like energy density in electromagnetic fields. This localization allows for precise mapping of information distribution within a wave field.

**Conservation:** The flow of Fisher information follows a continuity equation, similar to how energy is conserved in electromagnetic waves.

**Measurability:** The researchers have demonstrated that this information flow can be experimentally observed and quantified using microwave experiments. This practical aspect of the discovery paves the way for real-world applications. empirical studies

The concept of Fisher information isn't new – it's been used in statistics and data analysis for decades. In simple terms, Fisher information quantifies how much a signal tells us about a particular parameter we're trying to measure. What's revolutionary about this new work is the realization that Fisher information has a physical presence in wave fields, with its own density and flow patterns.

Previous studies have looked at how to maximize the Fisher information collected by detectors or how to shape input waves to get the most information out of a system. However, until now, little was known about how information is created when waves interact with an object and how that information propagates through complex environments. This new research opens up the "black box" of information flow between a target object and our detectors. To visualize this concept, imagine dropping a pebble into a pond. The ripples that spread out carry information about the pebble's size, shape, and the point where it hit the water. Now, picture being able to see not just the ripples, but also a colored "information field" that shows exactly where and how the information about the pebble is flowing through the water. That's essentially what this new theory allows scientists to do with electromagnetic waves. researchers created a complex scattering environment in a microwave waveguide – essentially a metal box that guides microwaves. Inside this box, they placed a movable metal target surrounded by small Teflon scatterers. By precisely measuring the microwave fields around the target as it was moved slightly, they were able to map out the flow of Fisher information about the target's position

Here's how the experiment worked: Microwaves were injected into the waveguide from one end. The waves scattered off the target and the surrounding Teflon objects. Sensitive antennas measured the resulting microwave field at many points around the target. The target was moved slightly, and the measurements were repeated. By comparing the two sets of measurements, the researchers could calculate the Fisher information flux at each point. One of the most surprising findings from this work is that the flow of energy and the flow of information can be decoupled (Fig. 3). The

researchers demonstrated this with a simulation where most of the wave energy was transmitted through a system, but almost all of the Fisher information flowed in the opposite direction. This has potential applications in secure communication, where you might want to send information in one direction while minimizing the detectable energy in that same direction. To understand the technical details of how Fisher information propagates, the researchers derived a continuity equation that describes its flow. This equation shows that Fisher information is created at “sources” – areas where the electromagnetic field changes when the parameter of interest (like the target’s position) is varied. The information then flows away from these sources, either propagating out of the system or being reabsorbed by “sinks” such as areas with energy dissipation. The mathematical framework developed in this study goes beyond just static situations. The researchers extended their theory to the time domain, showing how Fisher information is generated and stored in wave packets as they propagate. This temporal aspect is crucial for understanding how information builds up in a system over time (Fig. 4).

Fisher information content of a wave packet. A one-dimensional wave packet closely centered around a frequency  $\omega$  scatters off a dielectric (grey rectangle), whose position is the parameter of interest. a, Energy density envelope (red) at times  $T = 2, 6.5, 10$  (arbitrary units). The black arrows indicate the direction of motion of the wave packet. b, Fisher information density (blue) at the same times. The information is created at the sources located at the two sides of the scatterer (purple). Most of the energy is transmitted, whereas the information is solely flowing into the reflection channel. The researchers also made connections to quantum mechanics. They showed that the integrated Fisher information density in their framework corresponds to the quantum Fisher information of coherent light states. This provides a solid theoretical foundation for their work and suggests that the framework can extend to other quantum systems.

**Unified Science in Perspective:** While this research was focused on electromagnetic waves, the underlying principles could potentially be applied to other types of waves, such as acoustic waves used in ultrasound imaging or seismic waves used to study the Earth’s interior. This broad applicability makes the work particularly exciting for fields ranging from medical imaging to geophysics. This discovery bridges the gap between abstract mathematical concepts and physical reality, providing a new tool for scientists and engineers to analyze and manipulate wave phenomena. It could lead to improvements in various fields, such as:

- Medical imaging: Enhanced techniques for interpreting scattered waves in ultrasound or MRI scans.
- Telecommunications: More efficient ways to encode and transmit information using electromagnetic waves.
- Remote sensing: Improved methods for detecting and analyzing objects from a distance using radar or other wave-based technologies.
- Quantum information: New insights into the behavior of quantum systems and potential applications in quantum computing.

The implications of this new understanding of information flow are far-reaching. In fields like levitated optomechanics, where scientists are trying to cool tiny particles to their quantum ground state, knowing exactly how information about a particle's position radiates out could lead to more efficient detection schemes. In imaging and sensing applications, this framework could guide the design of new systems that maximize the collection of relevant information. As our world becomes increasingly reliant on precise measurements and efficient information transfer, theories like this one that provide a fundamental understanding of how information propagates through physical systems will become ever more crucial. This work opens up new possibilities for tracking and designing the flow of information, even in complex, disordered environments. It's a significant step forward in our ability to use waves not just to see the world, but to truly understand it. Using waves to explore our environment is a widely used paradigm, ranging from seismology to radar technology, and from biomedical imaging to precision measurements. In all these fields, the central aim is to gather as much information as possible about an object of interest by sending a probing wave at it and processing the information delivered back to a detector. Here we demonstrate that an electromagnetic wave scattered at an object carries locally defined and conserved information about all of the object's constitutive parameters. Specifically, we introduce the density and flux of Fisher information for general types of wave fields and identify the corresponding sources and sinks of information through which all these new quantities satisfy a fundamental continuity equation. We experimentally verify our theoretical predictions by studying a movable object embedded in a disordered environment and by measuring the corresponding Fisher information flux at microwave frequencies. Our results improve the understanding of the generation and propagation of information and possibilities for tracking the flow of information in complex environments. References: [1] Hüpfl, J., Russo, F., Rachbauer, L.M. et al. Continuity equation for the flow of Fisher information in wave scattering. Nat. Phys. (2024). <https://doi.org/10.1038/s41567-024-02519-8> SOURCE: <https://spacefed.com/physics/using-waves-to-measure-the-world-a-new-way-to-track-information-flow/>

10 June 2024 Continuity equation for the flow of Fisher information in wave scattering  
Jakob Hüpfl, Felix Russo, Lukas M. Rachbauer, Dorian Bouchet, Junjie Lu, Ulrich Kuhl & Stefan Rotter Nature <https://nature.com/articles/s41567-024-02519-8#citeas>

**WAVE BASED ENERGY GENERATION, PROPULSION:** Propulsion system using the antigravity force of the vacuum and applications Abstract: A propulsion system for aerial, terrestrial, underwater or space propulsion, achieved through the manipulation of a vacuum with electromagnetic interactions. This vacuum manipulation will allow the use of a new form of propulsion and has applications in energy production and on the change of the time decay of radioactive elements. Opposing magnetic or electric fields create a mass repelling force, while attracting magnetic or electric fields create a mass attracting force. his vacuum manipulation process can be used to propel a mass that contains the field sources that perturb the vacuum. One possible application is the creation of a repulsion point in space through the interference of two or more longitudinal electrodynamic wave beams, which cause a repulsion force on the mass.

Vacuum manipulation... new form of propulsion, and has applications in ENERGY production and on **CHANGE of TIME** decay of radioactive elements. Opposing magnetic or electric fields create a mass repelling force, while attracting magnetic or electric fields create a mass attracting force. This vacuum manipulation process.. used to propel a mass that contains field sources that perturb the vacuum. ... the creation of a repulsion point in space through the interference of two or more longitudinal ELECTRO dynamic (micro) waves US20120092107A1: Inventor Alexandre Tiago Baptista De Alves Martins Current Assignee Individual Worldwide applications 2009 PT 2010 WO US Application US13/380,202 events 2010-06-22 Application filed by Individual 2012-04-19 Publication of US20120092107A1 Status Abandoned



### The Heart Beacon Sculpture in Portland Oregon, USA

**Heart Beacon** 2013 sculpture by American artists Blessing Hancock and Joe O'Connell installed in **Portland, Oregon**, United States. *Heart Beacon* "takes the literal and metamorphic 'pulse'" of Portland's community and serves as a "symbol of hope, reminder of the resilience of the individual taking inspiration from the life-saving mission" of the center. Source:

[https://en.wikipedia.org/wiki/Heart\\_Beacon](https://en.wikipedia.org/wiki/Heart_Beacon) Link: <https://codaworx.com/project/heart-beacon-city-of-portland>

SUMMARY: structured data syntax – symbol mapping / messaging / economy, quantum computing, AI artificial intelligence. Minimum trade federation consensus checklist i.e., timing - sync schedule, OPSCODE brevity codes, UTZ event stochastic harmonization, consensus algorithm common description, measurements, metrics supporting trade federation (s), support for DAO Distributed Autonomous Organizations, parallel economies e.g., Texas gold backed currency. USPTO 13/573,002 The Heart Beacon Cycle Time - Space Meter Patent type: Adaptive Procedural Template Framework: checklist: ideas, algorithms, processes, procedures, metrics, meters, signal & telemetry structured data for consistent Eco sustainable economic time cycle epochs for programmable \$ / economy / Net, Net of Money Foundation Technology for DeFi, programmable internet of money / Web 3.0 USPTO 13/573,002 framework supports for example, Distributed Trade Federation Organizations with DoD / NATO system of systems engineering signaling, telemetry engineering, syntax OPSCODE brevity codes matched with 2525C symbol sets vital for A.I. man-machine interface, interoperability,

## **APPENDIC C: FINAL REJECTION RESPONSE PAPER SUMMARY July 6<sup>th</sup>, 2016**

United States Patent and Trademark Office  
ATTN: COMMISSIONER FOR PATENTS  
P.O. Box 1450 Alexandria, Virginia 22313-1450

July 6, 2016

SAW Concepts LLC Simple Always Wins Concepts LLC  
Attn: Tammy Lee McGee (Owner) and Steven J. McGee (CEO)  
P.O. Box 28, Oceanport, NJ 07757

1. US Supreme Court Ruling Alice Corp V CLS Bank: "claims ineligible for patent protection under 35 U. S. C. §101 "directed to an abstract idea" <http://1.usa.gov/1V91pQe> [LINK](#)
2. 13/573,002 achieves Supreme Court Alice Corp V CLS Bank compliance via a Little League Baseball Tournament physical meme embodiment. Physical, tangible memes are applied.
3. Supreme Court Alice Corp V CLS Bank applies greater weight than Transco V Performance Ultimately, only the date when the best, most useful meme was filed matters. There is no point in establishing dates of other filings that have been superseded by a superior ruling
4. USPTO screen captures establish a patent worthy idea is formed at the exact instant of capture. The only method to protect intellectual property is patent assignment. Once a patent worthy idea is deemed formed, a court may not reverse itself. Stare decisis et non quæstio movera.
5. All internet artifacts are formed using time epochs, cycles, intervals, periods to process or not process syntax as instructions. 10/605,144, 10/708,000 establish this idea / fact. Metaphorical terms “ping”, “hop”, “packet”, “frames”, “Bitcoin”, “blockchain” “transactor chip” are described in baseball terms. “Incomprehensible” opinion due to USPTO examination of treatise language
6. All materials submitted after 10/605,144, 10/708,000 Jan 30, 2004 are theme, use case variants. No materials submitted after 10/708,000 may be considered “new” given this fact, truth.
7. USPTO cites 12/856,715 to examine 13/573,002 claims. 12/856,715 is labeled as a parent document and abandoned. USPTO must choose a condition, 12/856,715 cannot be both.
8. USPTO states applicants must submit an amendment and USPTO states application is final. USPTO must choose a condition, 13,573,002 cannot be both requiring an amendment / final.
9. Transco V Performance Contracting Inc. screen captures suspend USPTO procedures and methods redirecting examination outside USPTO PAIR system. Re-direction outside PAIR suspends expectation of applicant’s skill. USPTO lacks skill outside USPTO PAIR.
10. No date, time stamps on both / two USPTO screen captures creates temporal ambiguity. What is the effective date, time stamp for each screen capture mailings over a total of four years?

## APPENDIX D: REFERENCES / SOCIAL MEDIA LINKS / DOCUMENTS

GITHUB: [https://github.com/Beacon-Heart/Heart\\_Beacon](https://github.com/Beacon-Heart/Heart_Beacon)

Proton Email (secure) [ecoeconomicepochs@protonmail.com](mailto:ecoeconomicepochs@protonmail.com)

Unstoppable Domains IPFS Web 3 page: <http://ecoeconomicepochs.dao>

Slideshare: <https://www.slideshare.net/EcoEconomicHeartbeat>

SCRIBD files: <https://www.scribd.com/user/11781571/Steven-James-McGee>

PATREON: [https://www.patreon.com/Heart\\_Beacon](https://www.patreon.com/Heart_Beacon)

PIN INTEREST: <https://www.pinterest.com/EcoEconomicEpochs/>

LINKEDIN: <https://www.linkedin.com/in/ecoeconepochs/>

WordPress: <http://ecoheartbeat.wordpress.com>

Substack: <https://ecoeconomicheartbeat.substack.com/>

Subscribe Star: [https://www.subscribestar.com/eco\\_econ\\_epochs](https://www.subscribestar.com/eco_econ_epochs)

Mastodon: [https://universeodon.com/@Heart\\_Beacon](https://universeodon.com/@Heart_Beacon)

FACEBOOK: <https://www.facebook.com/beaconheart>

MEDIUM: <https://medium.com/@heart.beacon.cycle>

MINDS: <https://www.minds.com/beaconheart>

TWITTER: @Heart\_Beacon [https://twitter.com/Heart\\_Beacon](https://twitter.com/Heart_Beacon)

DISCORD: GDP\_Index\_Economy#6495

Skype: Steven McGee

Gravatar: <https://en.gravatar.com/ecoeconheartbeat>

MeWE: <http://mewe.com/i/stevenmcgee2>

Maven: <https://app.maven.co/maven/506065>

Gitter <https://gitter.im/EcoEconHeartbeat/Lobby>

**SLACK Workspace:** Eco Economic Epochs for the programmable Economy  
Workspace URL: [ecoeconomicep-jo74963.slack.com](https://ecoeconomicep-jo74963.slack.com)

## APPENDIX E: BRIEF DESCRIPTION OF THE GRAPHICS

### **Figure A: Adaptive Procedural Template checklist of tools, processes, procedures.** OOTW Operations Other Than War: Foundation

A list of ideas, processes, procedures, tools, computing artifacts, algorithms used to support for example, a (Distributed Autonomous Organization DAO) trade federation. A minimum list of items required for use by consensus. An item in the list may be replaced by an item deemed an improvement – hence the description “adaptive”. Adaptive Procedural Template checklist view combining figure A and a view of a bank – tech firm team systems structure to describe a foundation technical framework. SUMMARY structured data syntax – symbol mapping / messaging, quantum computing, and AI artificial intelligence. Minimum trade federation consensus checklist i.e., timing - sync schedule, OPSCODE brevity codes, UTZ event stochastic harmonization, consensus algorithm common description, measurements, metrics supporting trade federation (s), DAO Distributed Autonomous Organizations, standards organizations.

This Adaptive Procedural Template document represents, cites decades of work with DoD / NATO and major defense contractors in over 36 congressional districts with international standards organization i.e., ISO, ITU, IEEE for example: DoD / NATO maps data element OPSCODE brevity codes to (Mil standard 2525C, D) symbols supporting A.I. man - machine interface that is time consuming, tedious process requiring consensus, concurrence among a (distributed) system of systems.

See DoD / DARPA system of systems engineering

### **Figure B: Nobel Prize winner Economist Friedman “only a crisis brings real change”**

Nobel Prize winning Economist Friedman described in his K% rule a means to automate liquidity insertion, reduction in an economy based on GDP input among his many views

### **Figure C: OOTW Operations Other Than War: Eco Economic Epoch Heartbeat**

### **Figure D: Structured Data derived, developed via Net Enabled Operations NEO**

### **Figure E: SCOTUS ALICE CORP VS CLS BANK 2014 ruling compliant meme**

Supreme Court ruled in the “Alice and Wonderland ruling” that “claims may not direct towards abstract ideas. The opposite of abstract for example, is a baseball field

### **FIGURE F: The Heart Beacon Sculpture, Portland Oregon USA**

### **Figure 1: Foundation tech forming the internet, programmable \$\$\$, economy listed in an Adaptive Procedural Template of tools, processes, procedures, routines algorithms, etc.**

A adaptive procedural template used to improve signaling, synchronization using TCP/IP heartbeat time stamping occurring during micro-cycles of state meta data prior to data fusion center entry among metrics, metering processes comprised of TCP/IP heartbeats,

heartbeat messages signaled during micro-cycles scheduling instructions, commands, processes, procedures, algorithms, telemetry instructions for example, to master-controller processes i.e., block, start, stop, pause, resume, set Time To live TTL i.e., stock market high frequency flash trade, currency, interest rates, tax rates, time banking, cloud computing commodity exchanges, big data, electrical micro-grid, fungible goods, real time bidding, many use cases. Time stamping and applying descriptive data type tags to heartbeat state meta data after data is collected and queued, stored in temporary structures or entered into database instantiations after the fact is problematic. All internet supported devices including high frequency stock, currency, commodity etc., flash trade master controllers receive heartbeats. Heartbeats are silicon chip created intervals, epochs, time cycles used to (not) process syntax during epoch time cycles.

### **Figure 2: The Heart Beacon Cycle Time Space Meter Adaptive Procedural Template checklist of tools, processes, procedures linked to treatises**

An adaptive procedural template is a checklist where items on the checklist may be added or removed and replaced by items considered to be more useful or superior. Most of the items are intrinsic to DARPA, DOD system of systems engineering internet development supporting data digital dashboard operations in use over decades. An improvement to an invention may be itself considered to be an invention such as the firefly inspired heartbeat algorithm with it's intrinsic heartbeat message event bus. If a superior algorithm is found then this algorithm replaces the old algorithm and so on

### **Figure 3: USPTO 13/573,002 Heart Beacon Cycle Time – Space Meter Summary**

SUMMARY: An invention can be an improvement to an existing invention, idea, product. USPTO 13/573,002's basis for invention is US Army CECOM Communication - Electronics Command's "Greatest Invention" a system of systems structured data exchange digital dashboard geo-temporal - spatial synchronization, standardization program matching brevity codes to symbols, symbol sets critical for A.I. Artificial Intelligence man - machine interface that has had many names over the decade used for OOTW Operations Other Than War following a German Army suggestion circa 2003. Invention relies on System of systems type processes: collection of task-oriented, dedicated systems pooling resources, capabilities together to create a more complex system with more functionality, performance than the sum of separate systems.

### **Figure 4: OOTW Operations Other Than War / H.A.N.Ds / System of Systems Engineering framework structured data exchange**

Humanitarian Assistance Networked Donor System: H.A.N.D.S adaptation of military doctrine, organization, training, material, infrastructure, interagency interaction, leadership, personnel and facilities" to OOTW Operations Other Than War i.e., humanitarian aid... Circa 2003, German Bundeswehr suggested reuse of the concepts of "Network Centric Warfare" "Network Enabled Operations" "Vernetzte Operationsführung" in Germany, "Shared situational awareness enables collaboration

synchronization, and enhances sustainability, speed of command" DOD SITUATION AWARENESS PROGRAM SWORDS TO PLOWSHARES OOTW

#### **Figure 5: Edison's Monetary Option 1922 / Algorithmic Stable Coin**

Thomas Edison's Monetary option: Thomas Edison and Henry Ford proposed a currency based on the value of a basket of crop commodities in 1922. Inventor Thomas Edison believed that crops held their value over time. "I want to cast the variable out of money. This gold money is not good enough. It's a fiction" (New York Times 1922).

#### **Figure 6: USPTO 13/573,002 Main Graphic**

Graphic images representing a list of symbols, objects used to describe the invention

#### **Figure 7: USPTO 13/573,002 Main Graphic Legend**

Legend for graphic images represent a list of symbols used to describe the invention

#### **Figure 8: USPTO 13/573,002 Building Blocks**

Amended graphic depicting the main components, building blocks

#### **Figure 9: Adaptive Procedural Template Checklist**

Adaptive Procedural Template: list of ideas, processes, procedures, tools, computing artifacts, algorithms used to support for example, a trade federation. Minimum list of items required for use by consensus. An item in the list may be replaced by an item deemed as an improvement – hence “adaptive” Adaptive Procedural Template = checklist of useful tools, procedures...Use adaptive, procedural templates to aid individuals join trade federations. Affiliated organizations are geo-spatially, temporally located in distributed, dispersed locations across time – space. Member organizations may join or leave in an adhoc, agile manner to take advantage or react to events, situations while retaining autonomy or the ability to act on one’s own behalf, control one’s own activities, The process involves agile, adhoc joins, merges, drops to / from federation in lieu of formal merger, and acquisition.

#### **Figure 10 : All things internet, net of programmable money, Economy, Web 3.0 are formed using 1) Time epochs 2) syntax**

Silicon quartz crystal based computer chips oscillate, vibrate when stimulated by an electric current. The trough and crest wave pattern after being represented by sawtooth cube, square, boxes emanating, propagating along a line is used to describe time epochs or time cycles that are used or not used to process, parse syntax as if, then, else instructions or used in math calculations such as cryptographic math proofs. There are no internet “layers”, “packets”, “frames”, “pings”, “satoshis”, blockchain blocks...

## **FIGURE 11: internet, net of \$ formed by 1) epoch time intervals 2) syntax**

All things internet, internet of money, blockchains are formed by unicast, multicast, anycast protocols. Programmable money's improvements are in cryptography.

Blockchains are formed by unicast, multicast, anycast and workflow filters.

Programmable money's improvements are in cryptography. Web 3.0 is based on the original internet TCP/IP structure that has not changed because it cannot change.

Statement: there are no packets, frames, layers, blocks, shards, graphs, hash graphs "bots", "motes", ... or Satoshi's traversing the net, stored in a blockchain cube.

Transactions are unicast, multicast, or anycast (workflow). The afore mention terms are non-existent, fictitious, imaginary metaphorical fabrications that are non - compliant with US Supreme Court SCOTUS Alice Corp Vs CLS Bank 2014 ruling "claims may not direct towards abstract ideas". Physical is the opposite of abstract

## **Figure 12: Blue Force Tracker / Maneuver Control System framework system**

Force XXI Battle Command Brigade and Below (FBCB2) is a Linux-based communication platform designed for commanders to track friendly and hostile forces on the battlefield.[1] It increases a vehicle commander's situational awareness of the battlefield by gathering information near real-time based on vehicle locations being updated on the battlefield. This information is viewed graphically, and exchanged via both free and fixed text message formats (instead of verbal collection of reports).

## **Foundation technology standards basis for DeFi / Fintech IP wars**

Framework: is a checklist: ideas, algorithms, processes, procedures, metrics, meters, signal & telemetry structured data for consistent Eco sustainable economic time cycle epochs for programmable \$ / economy / Net, Net of Money Foundation Technology for DeFi, programmable internet of money / Web 3.0 USPTO 13/573,002 framework supports for example, Distributed Trade Federation Organizations with DoD / NATO system of systems engineering signaling, telemetry engineering, syntax OPSCODE brevity codes matched with 2525C symbol sets vital for A.I. man-machine interface, interoperability, consistency, spatial – temporal, syntax lexicon consensus.

Foundation tech forming the internet, programmable \$\$\$, economy listed in an Adaptive Procedural Template of tools, processes, algorithms, etc. A adaptive procedural template used to improve signaling, synchronization using TCP/IP heartbeat time stamping occurring during micro-cycles of state meta data prior to data fusion center entry among metrics, metering processes comprised of TCP/IP heartbeats, heartbeat messages signaled during micro-cycles scheduling instructions, commands, processes, procedures, algorithms, telemetry instructions for example, to master-controller processes i.e., block, start, stop, pause, resume, set Time To live TTL i.e., stock market high frequency flash trade, currency, interest rates, tax rates, time banking, cloud computing commodity exchanges, big data, electrical micro-grid, fungible goods, real

time bidding, many use cases. Time stamping and applying descriptive data type tags to heartbeat state meta data after data is collected and queued, stored in temporary structures or entered into database instantiations after the fact is problematic. All internet supported devices including high frequency stock, currency, commodity etc., flash trade master controllers receive heartbeats. Heartbeats are sound wave / silicon chip created intervals, epochs, time cycles used to (not) process syntax during epochs.

The Heart Beacon Cycle Time - Space Meter is an Adaptive Procedural Template Framework checklist of ideas, algorithms, processes, procedures, metric, meters, signal & telemetry standards to establish consistent Eco sustainable economic time cycle epochs for program programmable money / programmable economy among Distributed Autonomous Organizations participating in trade federations on the (technically non-existent) crypto currency blockchain / hash-graph etc.

#### **FIGURE 14: Code Syntax Lexicon, Message Template Library**

Blockchain developers use alpha-numeric brevity OPSCODES to describe commodities or fungible goods or items that represent fungible stores of value. Military NATO bases are small cities that transact a range of goods, commodities, fungible items that are described by computer codes – OPSCODES that are matched with systemically, procedurally generated symbols and 2525 A, B, C, D standard series symbol sets essential to man – machine – computer Artificial Intelligence A.I. This disciplined effort took decades and thousands of man hours to develop and refine. Why reinvent this syntax lexicon library wheel with every new cryptocurrency blockchain startup ?

Structured military messaging involves identifying use cases as messages and message sets commonly used to accomplish tasks that are identified by number. Data elements or Field Form Identifiers Reference Numbers or FFIRNS and Field Unit Designators as three and four digit codes unambiguously identify the use of the data element in number forms. Three and four digit codes in turn refer to text descriptions referencing symbols in symbol libraries / databases. Messages are processed, parsed in - out of distributed database. Syntax / symbol source libraries that need a common reference format include as a minimum:

- Named-Data Networking NDN Centric Networking (XML tags)
- OASIS TOSCA YAML document indent data encoding scheme
- GITHUB code, syntax library, Java Script OS (“tag”) convention..

World Financial Standard ISO 20022 is a multi-part International Standard prepared by ISO Technical Committee TC68 Financial Services. It describes a common platform for the development of messages in ASN.1 Abstract Syntax Notation: A single standardization approach (methodology, process, repository) to be used by all financial standards initiatives. common platform for the development of messages using:

- a modelling methodology to capture in a syntax-independent way financial business areas, business transactions and associated message flows
- a central dictionary of business items used in financial communications

- a set of XML and ASN.1 design rules to convert the message models into XML or ASN.1 schemas, whenever the use of the ISO 20022 XML or ASN.1-based syntax is preferred ISO 20022: <https://www.iso20022.org/about-iso-20022>

### **FIGURE 15: Code Syntax Lexicon / Symbols / USPTO 13/573,002**

Code Syntax Lexicon, Message Template Library: Establishing a consistent context library / lexicon and time stamping data by organization <Org\_ID> and by data class type and by resource type to form a universal syntax, code, date element, tag Rosetta Stone and reference for coders, programmers, heartbeat algorithm event message bus. Military OPSCODE brevity alpha- numeric codes are mapped, associated, paired with MILSTD 2525 A, B, C, D symbols and symbol sets. MIL Standard sets are critical to A.I. Artificial Intelligence Man - machine interaction. USPTO 13/573,002's foundation is Battlefield Digitization / Network Centric Warfare's signaling, telemetry support framework where the improvement is OOTW Operations Other Than War involves use for net, net of programmable money, econometrics for DAO Distributed Autonomous Organizations / trade federations participating in a programmable economy.

Common syntax library of various Message Text Formats MTF to enable universal signaling / telemetry among a system of systems is ESSENTIAL. Decades of research at the taxpayer's expense into structured messaging / structured data exchange where the location, type of data identified by table number will help accelerate the process of organizing syntax into categories from disparate systems into data set reference repositories. Many semantic, syntax tags will be reusable. The rules, roles and logic developed by years of research involving of thousands of subject matter experts solving real world issues is the value to be extracted from 300+ message sets. NATO stays synchronized across many languages and cultures so why reinvent the wheel?

MESSAGE CATALOG: The USMTF message library has over 300 messages to choose from to facilitate information exchange requirements. MTFs presenting data in a logical, well specified and unambiguous layout. MTFs are transmission medium neutral. The content of the Message Catalogue has been developed by military operators. Military brevity codes and stock exchange codes are similar. security Identifier used in financial markets are: SYMBOL, CUSIP, ISIN, SEDOL, RIC Code, Syntax Lexicon Library

### **FIGURE 16: DoD / NATO structured data system of systems engineering / symbols**

DoD / NATO system of systems engineering signaling, telemetry framework and syntax OPS CODE brevity codes matched with 2525C symbol sets vital for A.I. man-machine interface, interoperability, consistency and DAO consensus

### **Figure 17: Discovery Machine Machine Learning IP / USPTO 13/573,002**

Discovery Machine® leverages a wide range of AI techniques from knowledge acquisition (KA) to machine learning (ML) to develop “intelligent constructs” for training, decision support and automation. Discovery Machine®'s highly acclaimed, patented

knowledge capture methodology works in conjunction with our patented visual modeling tools to enable the agile production of intelligent constructs. Discovery Machine® leverages a wide range of AI techniques from knowledge acquisition (KA) to machine learning (ML) to develop “intelligent constructs” for training, decision support and automation. Discovery Machine Discovery Machine®’s patented knowledge capture methodology works in conjunction with our patented visual modeling tools to enable the agile production of intelligent constructs. Discovery Machine®’s AI overcomes the limitations of ML imposed by sparse data environments by capturing the mental models trapped in the heads of your organization’s subject matter experts (SME) to bias and direct learning. Source: <https://discoverymachine.com/>

**Figure 18: Discovery Machine Symbolic Artificial Intelligence / USPTO 13/573,002**

**Symbolic artificial intelligence:** is the term for the collection of all methods in artificial intelligence research that are based on high-level symbolic (human-readable) representations of problems, logic and search.[1] Symbolic AI used tools such as logic programming, production rules, semantic nets and frames, and it developed applications such as knowledge-based systems (in particular, expert systems), symbolic mathematics, automated theorem provers, ontologies, the semantic web, and automated planning and scheduling systems. The Symbolic AI paradigm led to seminal ideas in search, symbolic programming languages, agents, multi-agent systems, the semantic web, the strengths. imitations of formal knowledge and reasoning systems. Physical symbol system (also called a formal system) takes physical patterns (symbols), combining them into structures (expressions) and manipulating them (using processes) to produce new expressions. The physical symbol system hypothesis (PSSH) is a position in the philosophy of artificial intelligence formulated by Allen Newell and Herbert A. Simon. They wrote: "A physical symbol system has the necessary and sufficient means for general intelligent action." [2] —Allen Newell and Herbert A. Simon

This claim implies both that human thinking is a kind of symbol manipulation (because a symbol system is necessary for intelligence) and that machines can be intelligent (because a symbol system is sufficient for intelligence).[3] The idea has philosophical roots in Hobbes (who claimed reasoning was "nothing more than reckoning"), Leibniz (who attempted to create a logical calculus of all human ideas), Hume (who thought perception could be reduced to "atomic impressions") and even Kant (who analyzed all experience as controlled by formal rules).[1] The latest version is called the computational theory of mind, associated with philosophers Hilary Putnam and Jerry Fodor.[4] Source: Wikipedia: [https://en.wikipedia.org/wiki/Physical\\_symbol\\_system](https://en.wikipedia.org/wiki/Physical_symbol_system)

**Artifical Intelligence / USPTO 13/573,002:** Artificial Intelligence is statistically predictive workflow. Human – AI interaction depends on symbols mapped to brevity OPSCODE that DoD has invested many man hours

## **Figure 20: Net, Net of \$, Artificial Intelligence A.I. = 1. Epoch time cycles 2. Syntax**

Artificial Intelligence is generated by 1) Time Epoch cycles used to parse, process during microchip oscillations created opportunities to apply rules described by syntax

## **Figure 21: Syntax, brevity codes mapped to symbols for A.I. artificial intelligence Man-machine interface**

Artificial Intelligence is generated by 1) Time Epoch cycles used to parse, process during microchip oscillations created opportunities to apply rules described by syntax

## **FIGURE 22: Blockchain Basics / How the internet works / USPTO 13/573,002**

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

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

All things internet, net of money blockchains are formed by unicast, multicast, anycast protocols. Programmable money's improvements are in cryptography. Blockchains are formed by unicast, multicast, anycast and workflow filters. Programmable money's improvements are in cryptography. Internet 3.0 and the new web will be based on the original structure and an Adaptive Procedural Template described by Stanford University. There are no packets, frames, layers, blocks, shards, graphs, hash graphs "bots", "motes"... or Satoshi's traversing the net, stored in a blockchain cube.

## **Figure 23: Blockchain Tri-lemma Quad-lemma / Net, net of Money ground truth**

The perfect blockchain has three elements: Security, decentralization, and scalability. Finding a balance between the three is difficult and presents a problem referred to as the blockchain trilemma.

Scalability and decentralization are often held back by security, but security tends to be compromised by any shifts on a network that offer scalability.

Projects either choose to focus on two out of three or work on finding a solution to tackle the trilemma once and for all. Innovative ideas like sharding, side-chains and state channels are used to address the trilemma but they're still experimental.

A solution to the problem could lead to greater adoption of cryptocurrency and blockchain and a wide-spread use of the technology across industries.

In reality, Terms like blockchain, levels, (side) chains are epoch cycles created after the genesis block that is an epoch time interval, cycle produced by (silicon chip) oscillations.

## **Figure 24: Defi, Fintech Foundation tech for IP intellectual property wars**

Foundation Tech / Standards for programmable \$ given the internet was financed, steered by the Department of Defense / NATO. Why reinvent decades of research and system of systems engineering structured data exchange best practice? Is this even possible any time soon? ISO 20022: <https://iso20022.org/about-iso-20022>

## **FIGURE 25: Situation Awareness Reference Architecture SARA**

Situational Awareness Reference Architecture (**SARA**) to foster knowledge sharing capabilities. **SARA** is a compilation of industry standards, technical practices and processes designed to enable situational **awareness** across shared infrastructure.

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Situational Awareness Reference Architecture (**SARA**) to foster knowledge sharing capabilities. **SARA** is a compilation of industry standards, technical practices and processes designed to enable situational **awareness** across shared infrastructure.

## **Figure 27: INFOCON Structured Data Exchange Precedence model**

NATO / DoD SYSTEM OF SYSTEMS ENGINEERING REUSE: DoD - NATO has invested decades of mapping OPSCODE brevity codes to symbology / symbols / symbol sets contained in three hundred 300 plus message set / use cases as part of Battlefield digitization, Net Centric Warfare NET Enabled Operations NEO NETOPS system of systems engineering. Blockchain, Digital Ledger Technology DLT crypto currency developers are recreating, reinventing this decades old, tedious, time intensive, labor intensive, expensive structured data exchange wheel with every new meme, metaphor. Crypto currency 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 using the firefly-heartbeat algorithm and Princeton University Mathematician John Nash's Equilibrium algorithms NATO bases are small cities that transact most goods, commodities with the host nation. Why reinvent the syntax lexicon Rosetta Stone wheel? Reuse: system of systems tool to accelerate an EIN Earth Intelligence Net – see Project #UNRIG by Robert David Steele

NET CENTRIC OPERATIONS / NET ENABLED OPERATIONS NEO See:  
[https://en.wikipedia.org/wiki/Network-centric\\_warfare](https://en.wikipedia.org/wiki/Network-centric_warfare) See: <http://ncoic.org>

To determine if a organization - squad or platoon was mission capable or where it was supposed to be and equipped with the requisite resources: food, water, fuel, ammo etc. data is sampled and forwarded using a minimum of network resources e.g., time frames, intervals, epochs allocated for specific purposes. The Internet Protocol was examined closely and it was re-discovered that time interval frame assignments were left unassigned / available by internet creators (Stanford U etc.) to transport additional state meta data at some future date when a need arose. These heretofore unassigned time intervals set aside for future use would be used to carry data about the organization – the unit designation or Organizational Identifier <Org\_ID>, geo-location

at specified times and its resources Uniform Resource Name. Deriving common building blocks from JBFSA which are the common building blocks (heartbeat and </108< heartbeat messages intrinsic to financial and First Response Systems. USPTO 13/573,002 is based upon and applies improvements to United States Army Communication Electronic Command CECOM's greatest invention Blue Force Tracker.

### **Figure 28: STRATML Markup Language**

Strategy Markup Language (StratML) is an XML-based standard vocabulary and schema for the information commonly contained in strategic and performance plans and reports. StratML Part 1 specifies the elements of strategic plans, including: mission, vision, values, goals, objectives, and stakeholders. Part 2 extends Part 1 to include the additional elements required for performance plans and reports, including stakeholder roles and performance indicators. Originally adopted as an American national standard (ANSI/AIIM 21:2009) Part 1, Strategic Plans, was published as an international standard (ISO 17469–1) on February 11, 2015, with minor changes from the ANSI version.[1] On November 13, 2015, the ANSI version of Part 1 was replaced with the ISO version (ANSI/AIIM/ISO 17469-1).[2] On January 9, 2017, the ISO changes and several additional enhancements were approved for incorporation into Part 2, Performance Plans and Reports (ANSI/AIIM 22).[3] Internationalization of Part 2 will depend upon sufficient support from other nations in the ISO process.

The vision of the StratML standard is: "A worldwide web of intentions, stakeholders, and results." Its more explicit purposes include enabling strategic alignment through literal linkages between performance objectives and the business records supporting them. Although the initial focus has been on the plans and reports that U.S. federal agencies are required to compile and maintain under the Government Performance and Results Act (GPRA), the standard has been specified generically so as to be applicable not only to all organizations, worldwide, but also to individuals who choose to lead mission/goal-directed lives. Section 10 of the [4] GPRA Modernization Act (GPRAMA) requires U.S. federal agencies to publish their strategic and performance plans and reports in machine-readable format. StratML is such a format. Source: [Wikipedia](#)

### **Figure 29: Universal Time Zone UTZ Stochastic Harmonization / Synchronization**

Geo-spatial, temporal metrics, meters that are synchronized, stochastically harmonized across UTZ Universal Time Zone. Micro to macro-cycle heartbeat cycle, heartbeat message, blockchain updates for system of systems synchronization, stochastic harmonization, spatial econometrics

### **Figure 30: SCOP Heartbeat Epoch Time Interval Start, Stop, TTL Time To Live**

INTERNET BUILDING BLOCK: HEARTBEAT ADMINISTRATIVE INTERFACE: SCOP Administrative Interface as an Internet, net of Money configuration tool. SCOP is a tool that exemplifies how the internet really works. SCOP is a web application, PHP based,

that is a front-end to heartbeat. . SCOP can start/stop services, view/edit configuration files, make backups, take a server online/offline, add/remove virtual/real servers, etc.

### **FIGURE 31: The Alice Effect / SCOTUS Alice Corp Vs CLS Bank 2014 ruling**

SCOTUS 2014 Alice in Wonderland Alice Corp Vs CLS Bank ruling "claims may not direct towards abstract ideas". Physical is the opposite of abstract.

How the internet really works / impact on SCOTUS Alice Ruling 2014

Internet = unicast / anycast publish - subscribe / multicast - broadcast & workflow stored across, among a distributed database now as it was in the beginning

### **Figure 32: Firefly Inspired Heartbeat Synchronization Algorithm**

Firefly inspired heartbeat synchronization algorithm proposed by the Universities of Bologna Italy, Hungary includes message event bus algorithm – protocol, software application neutral monitors geo-spatial, temporally distributed events reported across a DAO among federated groups synchronized in time-space for common goals. The firefly algorithm (FA) is a nature-inspired metaheuristic optimization algorithm developed by Xin-She Yang that is inspired by the flashing behavior of fireflies (Yang, 2008), originally designed to solve continuous optimization problems (Lukasik and Žak, 2010; From: Swarm Intelligence and Bio-Inspired Computation, 2013).

This work presents a **heartbeat** synchronization protocol for overlay networks **inspired** by mathematical models of flash synchronization in certain species of fireflies, and shows that synchronization emerges even when messages can have significant delay subject to large jitter. **Heartbeat** synchronization strives to have nodes in a distributed system generate periodic, local "**heartbeat**" events as heartbeat messages over a universal event message bus.

### **FIGURE 33: ECONOMIST MILTON FRIEDMAN'S K% RULE GDP HEARTBEAT**

Economist Milton Friedman predicted the rise of a computer capable of automatically adjusting the inflation rate of money. is the monetarist proposal that the money supply should be increased by the central bank by a constant percentage rate every year, irrespective of business cycles.

### **FIGURE 34: TERRA TRC TRADE REFERENCE COMMODITY BASED CURRENCY**

TRADE REFERENCE CURRENCY TERRA TRC: Terra (The Trade Reference Currency, TRC) is the name of a possible "world currency". The concept was proposed by Belgian economist and expert on monetary systems Bernard A. Lietaer in 2001, based on a similar proposal from the 1930s. The currency is meant to be based on a basket of the 9-12 most important commodities (according to their importance in worldwide trade). Currency resistant to inflation.

## **FIGURE 35: FEDERATE / FEDERATION**

Trade federations form among local communities or among sovereign (First) nations. The off-site connector workflow object convention connects, mitigates, adjusts by summation, statistical mean by aggregation among federated, non-federated groups acting as format gateways among participating, non – participating groups. Federate Latin: foedus, gen.: foederis Latin: foedus, gen.: foederis, covenant characterized by a union of partially self-governing states or regions under a central (federal) government

## **Figure 36: Federate / Federation Beacon Communities**

The parallel economy has two major draws. For consumers, it offers the opportunity to buy from firms that reflect their values. PublicSq, an online marketplace, is home to 40,000 firms devoted to freedom, the family unit and the constitution. The term “parallel economy” has been used to describe black markets, regional economies, and is also the name of a payment processor by Rumble. The term is most often used to describe the emergence of new technologies - centered ecosystem

## **FIGURE 37: ERICSSON ERLANG OPEN MONEY / USPTO 13/573,002**

ERLANG – ERLANG FOLSOM: Erlang based metrics system inspired by Coda Hale's metrics (<https://github.com/dropwizard/metrics>). The metrics API's purpose is to collect real-time metrics from Erlang applications and publish them via Erlang APIs and output plugins. folsom is not a persistent store. There are 6 types of metrics: counters, gauges, histograms (and timers), histories, meter\_readers and meters. Metrics can be created, read and updated via the folsom\_metrics module.

LINK <https://github.com/boundary/folsom>

## **FIG 38: CRYPTOCURRENCY LAND USE IRS MEMO 1421 / USPTO 13/573,002**

IRS Memo #1421: Purchased Bitcoins are treated akin to property. Plots A, B, C represent 3 unspent transaction outputs controlling N Bitcoins. - End-state Bitcoin quantity will be fixed like land “Bitcoin as protocol of ownership, not transfer. Coins never travel, but simply switch owners”. Method and means metric steps:

Step 1: prove coin ownership <Org\_ID> Coin Issuer

Step 2: coins sent where, when Lat-Long, Time Stamp

Step 3: specify ownership <Org\_ID> issuing agent

Step 4: Issuing Org of Record adjudicates w buyer

## **Figure 39: IDMaps / SonarHops Distance Estimation Service / USPTO 13/573,002**

IDMAPS – SONAR HOPS: IDMaps / SonarHops internet distance estimation service: IDMaps is a global internet host distance estimation service that provides distance information used by SONAR / HOPS query / reply service. IDMaps measures, disseminates internet wide distance information to for example, Distributed Autonomous Virtual Organizations DAVOS. Higher level services for example at the macro-cycle level collect distance information to build a virtual distance map of internet by estimating distance between any IP address pair. Location is achieved by use of triangulation Distance information adjusts to “permanent” topology changes e.g., splits, joins, adds, moves, drops, merges in lieu of formal merger / acquisition. IDMaps assists Network Time Protocol (NTP) servers establish long term peering relationships. Distance Metrics focus is on latency (e.g., round-trip delay) and where possible, bandwidth. We improve stochastic harmonization by use of firefly inspired algorithms that strive to achieve synchronization by matching firefly synchronization behavior with the closest matching heartbeat time temporal snapshot cycle interval.

#### **FIGURE 40: BIG DATA THE NEXT OIL / USPTO 13/573,002**

Big Data as the “Next Oil”: Establishing a consistent context library / lexicon and time stamping data by organization <Org\_ID> and by data class type and by resource type to form a universal syntax, code, date element, tag Rosetta Stone and reference for coders, programmers, heartbeat algorithm event message bus. Establish a consistent context library / lexicon and time stamping data by organization <Org\_ID> and by data class type and by resource type to form a universal syntax, code, date element, tag Rosetta Stone and reference for coders, programmers, heartbeat algorithm event message bus. Military OPSCODE brevity alpha- numeric codes are mapped, associated, paired with MILSTD 2525 A, B, C, D symbols and symbol sets. MIL Standard sets are critical to A.I. Artificial Intelligence Man - machine interaction. USPTO 13/573,002's foundation is Battlefield Digitization / Network Centric Warfare's signaling, telemetry support framework where the improvement is OOTW Operations Other Than War involves use for net, net of programmable money, econometrics for DAO Distributed Autonomous Organizations / trade federations participating in a new model eco sustainable programmable economy across the UTZ Universal Time Zone.

#### **FIGURE 41: (Wireless) ENERGY ATTENUATION / USPTO 13/573,002 claim**

USPTO 13,573,002 electric meter claim based on electric dipole effect: closer is cheaper given less infrastructure needed given energy attenuates over distances • data over energy link where #energy pulses constitute a method and means to transmit data over electric wired, wireless pathways • electric dipole effect Radio Wave Properties: Electric and Magnetic Dipole Antennae LINK: <https://youtu.be/wUpOlqbHcjI?t=111>

#### **FIGURE 42: Tesla inspired Energy / data (sound) waves as medium for unified quantum field propagation / transmission / quantum computing foundation technology #Tesla #energy #data #quantumcomputing**

### **FIGURE 43: Wave based energy producing propulsion system**

ABSTRACT: A propulsion system for aerial, terrestrial, underwater or space propulsion, through manipulation (or engineering) of the vacuum with proper electromagnetic interactions. Vacuum manipulation.. new form of propulsion, and has applications in ENERGY production and on CHANGE of TIME decay of radioactive elements. Opposing magnetic or electric fields create a mass repelling force, while attracting magnetic or electric fields create a mass attracting force. This vacuum manipulation process.. used to propel a mass that contains field sources that perturb the vacuum. .. the creation of a repulsion point in space through the interference of two or more longitudinal ELECTRO dynamic (micro) waves

### **FIGURE 44: Tesla / Nature inspired method for an Energy Token Economy**

### **FIGURE 4X: SPACE – TIME BEACON / CLOSER = CHEAPER = LESS TIME / FUEL**

PROJECT BEACON METHOD: A snapshot or sync delta value taken at a predetermined time interval (micro-cycle to macro cycle) is used to calculate a statistical mean value of commodities comprising a GDP index used as a value index nation's / world's unit of value as the basis for valuating a currency unit of exchange. 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

### **Figure 44: Time Chain / Time Stamp Server based QFS Quantum Financial System**

All things internet, internet of money are formed with epoch time cycles – intervals and syntax OPSCODE brevity codes used as instructions. Space or the land use meme is used in blockchain – time chain based systems to represent stored, accrued value. See the IRS memo #1421 where a land use meme is described to represent Bitcoin's blockchain also referred to DLT Digital Ledger Technology where blocks from cubes

### **Figure 45: Space - Time Energy over distance SLA: energy attenuates over distance.**

Shorter = closer = cheaper given less infrastructure, maintenance needed

USPTO 13/573,002 energy metrics, meter. Example: "when space-time spins, it creates mass. It produces energy in space that radiates. This radiation is what we call mass. At the fundamental level of space-time is a honey comb of overlapping spheres of energy each having a singularity at the center: Nassim Haramein "the new Einstein" USPTO 13/573,002 claim [#energy](#) [#Haramein](#) [#Tesla](#) [#Bucky](#) Fuller [#SLA](#) [#space-time](#)

### **Figure 46: myriad consensus algorithm blockchain memes / metaphors = Tower of Babel / Universal meme SCOTUS 2014 Alice Corp Vs CLS Bank compliant**

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 algorithms,

memes. Method includes for example, universal meme for Bitcoin and like cryptocurrencies, Blockchain Proof of Work, Stake, POET Proof of Elapsed Time, Project Lightning Vs Segregated Witness, and Fast Internet Bitcoin Relay Engine FIBRE... A common tool / meme is needed to help establish consensus metrics, meters

#### **Figure 47: Proof of Work Consensus / USPTO 13/573,002**

Proof of Work (PoW) was first published in 1993 by Cynthia Dwork and Moni Naor and was later applied by Satoshi Nakamoto in the Bitcoin paper in 2008. The Proof of Work consensus algorithm involves solving a computational challenging puzzle in order to create new blocks in the blockchain. The process of verifying the transactions in the block to be added, organizing these transactions in a chronological order in the block and announcing the newly mined block to the entire network does not take much energy and time. The energy consuming part is solving the 'hard mathematical problem' to link the new block to the last block in the valid blockchain. When a miner finally finds the right solution, the node broadcasts it to the whole network at the same time, receiving a cryptocurrency prize (the reward) provided by the PoW protocol.

#### **FIGURE 48: Proof of Stake Consensus**

Proof-of-stake is a cryptocurrency consensus mechanism for processing transactions and creating new blocks in a blockchain. A consensus mechanism is a method for validating entries into a distributed database and keeping the database secure. In the case of cryptocurrency, the database is called a blockchain—so the consensus mechanism secures the blockchain. The next block writer on the blockchain is selected at random, with higher odds being assigned to nodes with larger stake positions.

#### **Figure 49: PoST Proof of Space – Time Consensus**

The rational proof of financial interest in the network achieved by PoST addresses two problems with proof-of-capacity: Arbitrary amortized cost - In a consensus system that doesn't account for time, participants can generate an arbitrary amount of PoC proofs by reusing the same storage space, lowering their true cost.

#### **Figure 50: Proof of Activity Consensus**

Proof-of-activity (PoA) is a blockchain consensus algorithm used to ensure that all transactions occurring on the blockchain are genuine, as well as to ensure that all miners arrive at a consensus. PoA is a combination of two other blockchain consensus algorithms: proof-of-work (PoW) and proof-of-stake (PoS). PoA increases the difficulty level of mining as time passes, PoA also prevents the chance of a 51% attack, like in POW and POS, because it is impossible to predict who the signing peer would be in the future, and coin saving competition among signers does not allow the computing power to be accumulated within a group.

### **Figure 51: Proof of Authority Consensus**

Proof-Of-Authority (PoA) is a consensus method that gives a small and designated number of blockchain actors the power to validate transactions or interactions with the network and to update its more or less distributed registry. It works as follow: according to the chosen scheme, one or more validating machines are responsible for generating each new block of transactions that will be included in the Blockchain. The new block can be accepted directly without verification, or by unanimous vote of block generators, or simply by a majority, depending on the configuration chosen for the Blockchain.

### **Figure 52: Proof of Burn Consensus**

PoB coins are “burned” by sending coins to an address from where they are irretrievable. By committing the coins to an unreachable address, validators earn a privilege to mine on the system based on a random selection process. Thus, burning coins means that validators have a long-term commitment in exchange for their short-term loss. Depending on how the PoB is implemented, miners may burn the native currency of the Blockchain application or the currency of an alternative chain, such as bitcoin. The more coins validators burn, the better the chances of being selected to mine the next block.

### **Figure 53: Proof of Capacity Consensus**

Proof of capacity (PoC) is a consensus mechanism algorithm used in blockchains that allows for mining devices in the network to use their available hard drive space to decide mining rights and validate transactions. Proof of capacity (PoC) authentication systems employ spare space on a device's hard drive to store solutions to a cryptocurrency hashing problem. Proof of capacity allows the mining devices, also known as nodes, on the blockchain network to use empty space on their hard drive to mine the available cryptocurrencies. Instead of repeatedly altering the numbers in the block header and repeated hashing for the solution value as in a PoW system, PoC works by storing a list of possible solutions on the mining device's hard drive even before the mining activity commences. The larger the hard drive, the more possible solution values one can store on the hard drive, the more chances a miner has to match the required hash value from his list, resulting in more chances to win the mining reward. To draw an analogy, if lottery rewards are based on matching the most numbers on the winning ticket, then a player with a longer list of possible solutions will have better chances of winning. Additionally, the player is allowed to keep using the lottery ticket block numbers again and again repeatedly.

### **Figure 54: Proof of Weight / Volumetric Consensus**

Proof-of-Weight is a blockchain consensus mechanism that gives users a 'weight' based on how much cryptocurrency held. Proof-of-weight consensus mechanisms are based off of the first Proof-of-Weight consensus model used in the cryptocurrency Algorand,

which was developed by researchers at the MIT Computer Science & Artificial Intelligence Laboratory. The Proof-of-Weight consensus mechanism remains secure as long as the majority of weighted users are honest, and protects the network against double-spend attacks. Each time a transaction is made on a blockchain using the Proof-of-Weight consensus mechanism, the network creates a committee of random network members and assigns each member 'weight' (based on how much currency held on the network) which slightly centralizes the consensus process within a random committee.

#### **FIGURE 55: Bitcoin Classic / Core / Unlimited / USPTO 13/573,002**

Bitcoin Classic was a proposed hard fork from Bitcoin Core that proposed increasing the maximum size of transaction blocks. Bitcoin Classic proposed increasing blockchain sizes from 1 megabyte to 2 megabytes. In effect, this would double the number of transactions that could be processed per second. The proposed increase was less aggressive than what was proposed by Bitcoin XT in 2015 proposed increasing the size of blocks to 8 megabytes.

#### **FIGURE 56: Microsoft Cloud blockchain formerly known as Project BLETCHLEY**

Project Bletchley is a vision for Microsoft to deliver Blockchain as a Service (BaaS)

In Project Bletchley, Azure provides the fabric for blockchain, serving as the cloud platform where distributed applications are built and delivered.

Azure will be open to a variety of blockchain protocols, supporting simple, Unspent Transaction Output-based protocols (UTXO) like Hyperledger, more sophisticated, Smart Contract-based protocols like Ethereum, and others as developed. Introduced in Project Bletchley are two new concepts: blockchain middleware and cryptlets.

Blockchain middleware will provide core services functioning in the cloud, like identity and operations management, in addition to data and intelligence services like analytics and machine learning. These technologies will ensure the secure, immutable operation that blockchain provides, at the same time, deliver the business intelligence and reporting capabilities business leaders and regulators demand. Newly developed middleware will work in tandem with existing Azure services, like Active Directory and Key Vault, and other blockchain ecosystem technologies, to deliver a holistic platform and set of solutions. Cryptlets, a new building block of blockchain technology, will enable secure interoperation and communication between Microsoft Azure, ecosystem middleware and customer technologies. Cryptlets function when additional information is needed to execute a transaction or contract based on a date or time and providing market data. They will become a critical component of sophisticated blockchain systems, enabling all technology to work together in a secure, scalable way.

#### **Figure 57: SAWTOOTH / POET Proof of Elapsed Time Consensus**

Proof of elapsed time (PoET) is a [blockchain](#) network consensus mechanism that prevents high resource utilization and energy consumption; it keeps the process more efficient by following a fair lottery system. The algorithm uses a randomly generated

elapsed time to decide mining rights and block winners on a blockchain network. By running a trusted code within a secure environment, the PoET [algorithm](#) also enhances transparency by ensuring lottery results are verifiable by external participants.

- Proof of elapsed time (PoET) is a consensus algorithm developed by Intel Corporation that enables permissioned blockchain networks to determine who creates the next block.
- PoET follows a lottery system that spreads chances of winning equally across network participants, giving each node the same chance.
- The PoET algorithm generates a random wait time for each node in the blockchain network; each node must sleep for that duration.
- The node with the shortest wait time will wake up first and win the block, thus being allowed to commit a new block to the blockchain.
- PoET workflow is similar to Bitcoin's proof of work (PoW) but consumes less power because it allows a node to sleep and switch to other tasks for the specified time, thereby increasing network energy efficiency.

#### **Figure 58: Proof of Space Time POST / USPTO 13/573,002**

A proof of space-time ( PoST) shows the prover has spent an amount of time keeping the reserved space unchanged. Its creators reason that the cost of storage is inextricably linked not only to its capacity, but to the time in which that capacity is used.

#### **Figure 59: State Channels / USPTO 13/573,002**

State channels allow participants to securely transact off-chain while keeping interaction with Ethereum Mainnet at a minimum. Channel peers can conduct an arbitrary number of off-chain transactions while only submitting two on-chain transactions to open and close the channel. State channels are two-way pathways opened between two users that want to communicate with each other in the form of transactions. Each participant in the channel signs these transactions with his private key to ensure that they are undeniably true and authorized.

#### **FIGURE 60: Segregated Witness - Lightning Consensus / USPTO 13/573,002**

Segregated Witness (SegWit) refers to a change in the transaction format of Bitcoin. Its stated purpose as a protocol upgrade was to protect against transaction malleability and decrease transaction times by increasing block capacity. Transaction malleability refers to the possibility that tiny pieces of transaction information could be changed, invalidating new cryptocurrency blocks. It is intended to speed up the validation process by storing more transactions in a block.

Segregated Witness (SegWit) is a change in Bitcoin's transaction format where the witness information was removed from the input field of the block. The stated purpose of Segregated Witness is to prevent non-intentional Bitcoin transaction malleability and

allow for more transactions to be stored within a block. SegWit is intended to solve a blockchain size limitation problem that reduces Bitcoin transaction speed.

The Lightning Network is a second layer for Bitcoin that uses micropayment channels to scale the blockchain's capability to conduct transactions more efficiently. This layer consists of multiple payment channels between parties or Bitcoin users. A Lightning Network channel is a transaction mechanism between two parties. Using channels, the parties can make or receive payments from each other. Transactions conducted on the Lightning Network are faster, less costly, and more readily confirmed than those conducted directly on the Bitcoin blockchain. The Lightning Network can also be used to conduct other types of off-chain transactions involving exchanges between cryptocurrencies. Concerns About the Lightning Network

The most apparent problem with the Lightning Network—which is meant to be decentralized—is that it could lead to a replication of the hub-and-spoke model that characterizes today's financial systems. In the current model, banks and financial institutions are the primary intermediaries through which all transactions occur. Businesses that invest in Lightning Network nodes may become similar hubs or centralized nodes in the network by having more open connections with others. Other concerns are fraud, fees, hacks, and price volatility.

#### **FIGURE 61: BITCOIN NG NEXT GENERATION / USPTO 13/573,002**

Bitcoin-NG is a Byzantine fault tolerant blockchain protocol that is robust to extreme churn and shares the same trust model as Bitcoin. In addition to Bitcoin-NG, we introduce several novel metrics of interest in quantifying the security and efficiency of Bitcoin-like blockchain protocols. We implement Bitcoin-NG and perform large-scale experiments at 15% the size of the operational Bitcoin system, using unchanged clients of both protocols. These experiments demonstrate that Bitcoin-NG scales optimally, with bandwidth limited only by the capacity of the individual nodes and latency limited only by the propagation time of the network.

#### **Figure 62: Decentralized Oracle Networks / USPTO 13/573,002**

Decentralized metalayer of oracle networks allows smart contracts to seamlessly use and create an array of decentralized services that accelerate dApp development, enable cross-chain functionality, and harmonize disparate technologies. DON's enables smart contracts on any blockchain to leverage extensive off-chain resources, such as tamper-proof price data, verifiable randomness, automation functions, external APIs,

#### **FIGURE 63: Brave New Coin B-WAP Consensus / USPTO 13/573,002**

Block-Weighted-Average-Price (B-WAP) API creates a USD price for any block in the Bitcoin blockchain, based on BNC's Bitcoin Liquid Index (BLX). Automatically appropriates blockchain transactions with a USD price or technical indicator for traders. Key Features: Look up any bitcoin blockchain transaction and receive back a USD value for any transaction. Built using historic bitcoin price index - the BNC BLX.API

updated every 10 min with a 2 hour delay on latest blocks (due to the nature of Block propagation to ensure avoidance of publishing rates on orphaned blocks). All rates time-stamped in UTC. Ability to look up by time-stamp. Ability to look up by block-height. Get by: Block-height, Time-stamp or Transaction, Transaction ID, Block ID, time-stamp, BWAP per block, Value in USD. BTC per transaction, bitcoin transaction fees per transaction. Exchanges Covered: Price discovery for the B-WAP comes from utilizing the BNC Bitcoin Liquid Index (BLX) bitcoin price calculation. As of 2018, coins were mined using a proof of work algorithm with a hash function called "X11", with eleven rounds of hashing, and the average time to mine a coin was around two and a half minutes. Masternodes provide two additional kinds of transactions. "InstantSend" bypasses mining and instead requires a consensus of masternodes to validate a transaction, speeding transactions.[3][1] "PrivateSend" gives users optional consumer-grade privacy; it mixes participating users' unspent Dash before executing a transaction.

#### **FIGURE 64: DASH / USPTO 13/573,002**

**Dash** is an open source cryptocurrency. It is an altcoin that was forked from the Bitcoin protocol. It is also a decentralized autonomous organization (DAO) run by a subset of its users called "masternodes". Dash was designed to allow transactions quickly and to have a swift governance structure in order to overcome shortfalls in Bitcoin.[3] What makes Dash different from Bitcoin is that it splits its rewards into three categories: 45% goes to miners, 45% goes to masternodes (these are computers that provide additional services in the network and have a significant investment in Dash tokens), and 10% goes towards its decentralized governance budget. Governance is handled through a form of decentralized autonomous organization in which decisions are made on a blockchain via masternodes. Masternodes perform standard node functions like hosting a copy of the blockchain, relaying messages, and validating transactions on the network, and in addition act as shareholders, voting on proposals for improving Dash's ecosystem. Anyone with 1,000 Dash Coins (DASH), the protocol's native cryptocurrency, can become a masternode owner.

#### **FIGURE 65: ETHEREUM – CASPER / USPTO 13/573,002**

Casper is a security-deposit based economic consensus protocol. Nodes = "bonded validators" place security deposit (an action called "bonding") If a validator generates an invalid action, account deposits are forfeited along with consensus privilege. Use of security deposits address "nothing at stake" problem; that behaving badly is not expensive. Casper is an EVENTUALLY CONSISTENT blockchain-based consensus protocol. CASPER favors availability over consistency

#### **FIGURE 66: HYPERLEDGER FRAMEWORK / USPTO 13/573,002**

Hyperledger Fabric, an open source project from the Linux Foundation, is the modular blockchain framework and de facto standard for enterprise blockchain platforms. Intended as a foundation for developing enterprise-grade applications and industry solutions, the open, modular architecture uses plug-and-play components

### **FIGURE 67: R3 Consortium CORDA / USPTO 13/573,002**

CORDA is a scalable, permissioned peer-to-peer (P2P) distributed ledger technology (DLT) platform that enables the building of applications that foster and deliver digital trust between parties in regulated markets. CORDA core functions:

- Choreographing workflow between firms without a central controller
- Supports inclusion of regulatory & supervisory observer nodes
- Validating transactions solely between parties to the transaction
- Supporting a variety of consensus mechanisms
- Recording explicit links between human-language legal prose documents and smart contract code

### **FIGURE 68: DFINITY Blockchain Nervous System / USPTO 13/573,002**

The DFINITY Foundation is a major contributor to the Internet Computer blockchain. Internet Computer (IC) is a platform for executing smart contracts/The term “smart contract: a general-purpose, tamperproof computer program whose execution is performed autonomously on a decentralized public network. smart contracts

- are composable, meaning that they may interact with one another, and
- support tokenization, meaning that they may use and trade digital tokens.

### **Figure 69: Byzantine Fault Tolerant BFT-SMART / USPTO 13/573,002**

Byzantine Fault-Tolerant State Machine Replication BFT-SMART dynamic distributed system processes are divided in two nonintersecting subsets: replicas and clients. Each system process has a unique identifier. During dynamic system execution, a sequence of views is installed to denote the reconfigurations due to replicas joins and leaves. A view is composed by a set of replicas identifiers. Modularity is achieved using a set of building blocks(or modules)containing the core functionality of BFTSMART. Blocks are divided in three groups: communication system, state machine replication and state management. BFT-SMART needs an eventually synchronous system. Total order multicast is achieved using the Mod-SMaRt protocol and with the Byzantine consensus algorithm Clients send requests to all replicas in cv, and wait for replies. replicas store each batch of ordered requests to a (stable) log and, periodically, take snapshots of the application state and store it in stable memory.

### **FIGURE 70: OpenBazaar Free Trade on the Blockchain / USPTO 13/573,002**

OpenBazaar is an open source project developing a protocol for e-commerce transactions in a fully decentralized marketplace. [2] It uses cryptocurrencies as medium of exchange and was inspired by a hackathon project called DarkMarket. OpenBazaar Creates an online store for users to sell goods for Bitcoin

Connects these stores directly to each other on a global network

Users browse individual stores, search for products across whole network

A buyer directly connects, purchases good from the merchant using Bitcoin

Bitcoin payments via escrow protect merchants & buyers during trade

#### **FIGURE 71: EPCIS RFID / USPTO 13/573,002**

Electronic Product Code Information Services (EPCIS) GS1 Standard for creating, sharing visibility event data. What identifiers of object(s) or entities / subject of event

When date time when event took place, local time zone in effect

Where location identifier where event occurred, identifier of location where object(s) are expected to be following the event

Why Information about the business context, including: a Identifier that indicates the business step taking place

#### **Figure 72: HASHGRAPH DAG Directed Acyclic Graph / USPTO 13/573,002**

**Hashed Timelock Contract (HTLC)** A hashed timelock contract (HTLC) is a type of smart contract used in blockchain applications. It reduces counterparty risk by creating a time-based escrow that requires a cryptographic passphrase for unlocking. In practical terms, this means that the person receiving the funds in a transaction has to perform two actions to access the funds: enter the correct passphrase and claim payment within a specific timeframe. If they enter an incorrect passphrase or do not claim the funds within the timeframe, they lose access to the payment. A hashed timelock contract (HTLC) reduces counterparty risk in decentralized smart contracts by effectively creating a time-based escrow that utilizes a cryptographic passphrase. This type of smart contract requires the receiver of a payment to acknowledge it within a certain period of time or forfeit it. HTLCs is a fundamental tool used by the lightning network.

#### **Figure 73: FEDCOIN – WORLD COIN ECONOMIC HEARTBEAT**

Economist Milton Friedman's K% rule: "FEDCOIN / WORLD COIN currency derived from sampling lead economic indicators across a global, universal event bus by use of the firefly-heartbeat algorithm message event bus to track changes i.e., updating statistical means of a GDP Gross Domestic Product based index, USPTO 13/573,002 supports economist Milton Friedman's K% rule where a FEDCOIN / WORLD COIN currency is derived from sampling lead economic indicators across a global, universal event bus applying the firefly-heartbeat algorithm tracking changes, updating q statistical mean value index. Nobel Prize winning economist Milton Friedman described an "economic heartbeat" in his K% rule where the Treasury increases the money supply increases and decreases pegged to increases, decreases in GDP index volume.

#### **FIGURE 74: ERC 20 TOKENS STANDARDS LIST / USPTO 13/573,002 List**

Standards allow for the implementation of a standard API for tokens within smart contracts. This standard provides basic functionality to transfer tokens, as well as allow tokens to be approved so they can be spent by another on-chain third party. Motivation:

A standard interface allows any tokens on Ethereum to be re-used by other applications: from wallets to decentralized exchanges. SOURCE: <https://eips.ethereum.org/EIPS/eip-20>

### **Figure 75: Federal Reserve FedNOW Metallicus / USPTO 13/573,002**

Federal Reserve Integration of FedNow with Metal Blockchain. Metal Blockchain is a crypto network designed by Metallicus, based on a modified version of Avalanche's code. The network was developed to offer compliance-friendly options for DeFi developers. The network incorporates a subnet called "X-Chain" that empowers developers to establish transfer rules for assets. For instance, a token can be issued with guidelines, such as "only for US citizens" or "non-tradable until tomorrow."

### **Figure 76: BIS project mBridge, bridges, blockchain – time chains, cubes..**

mBridge mBL is an Ethereum EVM-compatible solution, referring to the ability of a blockchain to process transactions based on smart-contract codes that can run on many blockchain platforms. CBDC issuance, redemption, payments are implemented through smart contracts in the Solidity programming language. mBridge code is open sourced. mBL uses the Dashing consensus algorithm, a Byzantine Fault Tolerance (BFT) consensus protocol that uses proofs of partial confirmation of a block validation to reduce time needed to achieve consensus and to improve the overall protocol performance. Pseudonymous addresses and encrypted payment meta-data payloads are used to support privacy and confidentiality in transactions. mBL APIs are based on the global ISO 20022 messaging standard for financial information Legal Entity identifiers (LEIs) facilitate identification of entities facilitating AML/ CFT checks.

### **Figure 77: World Bank IMF Unicoin STABLE COIN / USPTO 13/573,002**

Universal Monetary Unit (UMU), a.k.a Unicoin: store of value cryptograph supported by artificial intelligence (A.I.) Goals: continuous purchasing demand, minimal price volatility, and annual asset pricing targets. The primary value of any commodity is its utility value. Utility = pay for goods, services, and debts, preserve value over a long period of time. Employs machine learning trading bots. UMPC will establish yield payout rates for wallet holders to stake Unicoin in the Staked Proof of Trust (SPOT) consensus protocol. PoT consensus selects validators I.A.W contribution to the DeFI network.

### **Figure 78: STABLE COIN CBDC / USPTO 13/573,002**

The primary value of any commodity is its utility value. Utility = pay for goods, services, and debts, preserve value over a long period of time. Employs machine learning trading bots. UMPC will establish yield payout rates for wallet holders to stake Unicoin in the Staked Proof of Trust (SPOT) consensus protocol. PoT consensus selects validators I.A.W contribution to the DeFI network / UNIVERSAL TIME ZONE UTZ PROJECT: Universal Time Zone (UTZ) Proposed Clock At the United Nations on May 20, 2003, President, George W. Bush, announced a proposal to unify all the world's time zones into a single Universal Time Zone (UTZ). Events across time zones will require synchronization, stochastic harmonization to be displayed by all in a common picture.

## **FIG 79: TRUTH COIN Nullius in Verba: On the word of no one. Future Wikipedia**

### **1) Tradable Reputation**

- Abstract Corp exists to prove consistency within / across TIME
- Collects \$ to power the mechanism.

### **2) SVD Cross-Validation**

- Statistical technique: seeks importance.
- Gleans truth, measures conformity.

### **3) Strategic Use of TIME**

- Funds can be 'locked' across time, Yet info-search-costs constantly fall.
- Net effect: time penalizes attackers only.

## **Figure 80: Figure 69: Volatility Problem Solution**

How 'Bitbanks' Could Solve Bitcoin's Volatility Problem:

$$MV = PQ \text{ Money} \times \text{Velocity} = \text{Price} \times \text{Quantity}$$

The most important equation in monetary economics, the equation of exchange:  $MV = PQ$ . The quantity of money (M) times the rate spent (V for velocity) equals the price of everything bought (P) times the amount bought (Q for quantity). In Bitcoin, M Money is on a predetermined path, converging to 21m bitcoins. In relation to the other variables, Bitcoin is fixed. V, P, & Q fluctuate.

## **Figure 81: NEO / NEO Net Enabled Operations / Distributed Smart Economy**

NEO NET Enabled Operations: Users are monitored as individuals within groups. Groups status is described, validated, authenticated, defined by statistical readiness / availability. operational concepts, architecture definition, information exchange requirements, data standards and protocols, and strategic and tactical-level decision support (with special emphasis on timely, data-driven collaborative decision making for complex operational problems among a system of systems using structure data).

## **Figure 82: IBM – Samsung ADEPT / USPTO 13/573,002**

ADEPT: Autonomous Decentralized Peer-to-Peer Telemetry) concept that uses the BitTorrent peer-to-peer file sharing protocol, the Bitcoin cryptocurrency, Ethereum, and the peer-to-peer comms protocol Rehash. ADEPT tech ledgers, or record-keepers, store transactions which the IoT Internet of Things, programmable money will generate.

## **Figure 83: High Frequency Flash Trade Breaker / Algorithmic Regulation**

HFT given: other than the ubiquitous </108> {"108"} heartbeat message sending start, stop, TTL Time To Live commands to algorithmic HFT trade to master controllers, how will stock, commodity, crypto etc. markets be mitigated, moderated among the quantum computing haves / have nots? Quantum computing mediation, mitigation among the quantum haves, have nots and techniques e.g., particle detection using liquid nitrogen vs waves at room temperature that will affect for example, transactions of HFT High Frequency Trade stock, commodities, cryptocurrencies, crypto currency synthetics, Central Bank Digital Currencies / and activities among DeFi DAO exchanges – trade federations. HFT Algorithmic regulation: firefly inspired heartbeat synchronization algorithm applied to stocks, commodities, currency exchanges. Improving temporal trade parity between cryptocurrency blockchain and conventional and HFT, quantum computing enabled stock exchanges by using the firefly-heartbeat algorithm to take trade speed samples among trade populations across time zones to establish temporal consensus among disparate trade protocols, optimal trade speed / frequency by defining a start, stop and duration TTL Time To Live trade window. Define time intervals with discrete start, stop, TTL Time To Live trade windows using commands embedded within </108> heartbeats, heartbeat messages organic to all system's master controller.

#### **Figure 84: USPTO 13/573,002 Econometrics, Meters, Trade Demurrage Fees**

GDP Gross Domestic Product Index / statistical mean value index based TRC Trade Reference Currency demurrage fees by Economist Bernard Lietaer of Belgium. Demurrage fees incentivize conservation of resources, commodities i.e., discounts for locally produced, consumed goods and commodities where for example, closer is cheaper given closer consumes less fuel and produces less carbon emissions. Currency based on demurrage charges to support logistics of goods moved from supplier to consumer called the TERRA TRC. The Terra TRC Trade Reference Currency is a global complementary currency designed to provide an inflation-resistant international standard of value; to stabilize the business cycle on a global level; and to realign stockholder's interests with long-term sustainability. From a legal viewpoint, the Terra is standardized "countertrade" (international barter), which is routinely used for over one trillion dollars' worth of transactions per year. Legislation on countertrade exists in about two hundred countries,.. SOURCE: <https://lietaer.com/2010/01/terra/>

#### **FIGURE 85: BLOCKCHAIN TRADENET**

Block Tradenet trade system simple trade-investment platform uses a copy-trading method. Each investment runs on an FX-Bot which trades using trading algorithms. Bitcoin and the blockchain function as a medium of exchange, a store of value, a unit of account. Bitcoin adds digital, cryptographic, and distributed server functions to currencies. Because it functions simultaneously as a currency, an asset and a platform, Bitcoin is better described as a global cryptoCAP (currency, asset, platform) -- a synergistic form of "cryptocapital" to unleash the full economic power of the networked age. Bitcoin makes money PROGRAMMABLE. MONEY IS SIMPLY DATA - a simple way to measure and keep track of exchanges in value wealth accumulation. Bitcoin

aggregates data in a distributed global ledger accessible to anyone, and software. First open platform for financial services. Color coins represent stocks, bonds, currencies,

#### **FIGURE 86: Block-Time Arbitrage Blockchain: Blueprint for a New Economy**

Blocktime Arbitrage MTL (machine trust language) time primitives might be assigned to a micropayment channel DAPP as a time arbiter. In blocktime, the time interval at which things are done is by block. This is the time that it takes blocks to confirm, so blockchain system processes like those involving smart contracts are ordered around the conception of blocktime quanta or units. Since blocktime is an inherent blockchain feature, one of the easiest ways to programmatically specify future time intervals for event conditions and state changes in blockchain-based events is via BLOCKTIME. Universal blocktime source example: a procedure call to NIST or other time oracle.

BLOCKTIME: A General Temporality of Blockchains Blocktime as blockchains' temporality allows the possibility of rejiggering time and making it a malleable property of blockchains. The in-built time clock in blockchains is blocktime, the chain of time by which a certain number of blocks will have been confirmed. Time is specified in units of transaction block confirmation times, not minutes or hours like in a human time system. Block confirmation times are convertible to minutes. Conversion metrics may change over time. Credit: Melanie Swan: Blockchain Blueprint for a new economy

#### **FIGURE 87: Financial Nostradamus / FutureMan fusion USPTO 13/573,002**

Financial Nostradamus / USPTO 13/573,002 fusion: Veritaseum is a blockchain-based fintech software company which delivers global access to peer-to-peer capital markets through its decentralized platform, digital asset research, and transfers. At heart, the project seeks to level the economic playing field by creating software which enables participation in P2P capital markets without intermediates like banks, brokers, financial advisors, and other mediators. The use case of VERI token is to redeem with Veritaseum software for advisory services, research and to gain entry into Veritaseum's autonomous financial machines, P2P value trading system, and P2P letters of credit. The platforms utility token VERI is used to purchase access to the platform's products and services, which range from asset tokenization to financial research data and even self-custody escrow services. VeADIR stands for Veritaseum Autonomous Distributed Interactive Research. Source: <https://cryptonews.com/coins/veritaseum/>

#### **FIGURE 88: GAMIFICATION / USPTO 13/573,002**

GAMIFICATION: application of typical elements of game playing (e.g., point scoring, competition with others, rules of play) to other areas of activity, typically as an online marketing technique to encourage engagement with a product or service

#### **FIGURE 89: IOTA TANGLE DAG / USPTO 13/573,002**

IOTA: Internet Of Things IOT distributed ledger with microtransactions without fees. Tangle: a directed, ASYNCHRONOUS acyclic graph (DAG) for storing transactions

## **FIGURE 90: RIPPLE XRP Real Time Protocol / USPTO 13/573,002**

Ripple Transaction Protocol or Ripple protocol, built on a distributed open source Internet protocol, consensus ledger and native currency called XRP. Ripple enables "secure, instant and nearly free global financial transactions of any size with no chargebacks." Ripple supports tokens representing fiat currency, cryptocurrency, commodity or any other unit of value such as frequent flier miles or mobile minutes. Ripple is based around a shared, public database or ledger, which uses a consensus process that allows for payments, exchanges and remittance in a distributed process.

## **FIGURE 91: E Government as a Service E-GASS/ USPTO 13/573,002 Synergy**

E-GaaS: international blockchain platform for organizing economic, state, social activities of citizens , communities on the basis of smart law, smart contract system. eGaaS offers a comprehensive solution needed for state and business management on the blockchain platform. Distributed digital asset registries were the first projects that used blockchain systems such as databases designed for secure storage of records on real estate property, stocks, copyright and so on. It is assumed hosting any document on the blockchain is equivalent to notarization of its content at a fixed time point ex:

7.2 A continuous action, operation, series of changes, sync deltas updating groups

1.5.7.3 A cyclic, iterative process syncing groups in time-space

Sync Deltas = changes from one epoch time cycle to the next: crypto currencies tethered to tangible commodities formed into indices of assets.

Heart Beacon Cycle provides a signal and telemetry framework reporting events, transactions to facilitate reporting of data sync deltas in time window intervals, stages and uses data filtering iteration to eliminate duplicated instructions, identical source code in the system of systems signaling, systems telemetry engineering framework.

## **Figure 92: GNOSIS / USPTO 13/573,002**

Gnosis Wisdom (WIZ) pay platform fees in Services layer, Wiz subsidize other participants fees, provide initial subsidies for markets, or market trading. WIZ pegged to \$1 USD worth of fees. WIZ acts as coupon for \$1 of Gnosis

Gnosis tokens (GNO) generate Wisdom token s(WIZ) via smart contract

GNO token holders agree to "lock" tokens in a smart contract (30-365 days). A multiplier is added for longer lock durations. Smart contract determines selected lock duration and applies that duration to a formula regulating supply of WIZ tokens currently in use. Once users execute the contract, 30% of their WIZ are distributed for use, the remaining 70% is distributed proportionally over the locked duration. When lock duration expires, the locked GNO ceases to generate WIZ & GNO is freely transferable

### **Figure 93: Programmable money's main issues / adjustments**

The crypto community has six major issues: Volatility, Inconsistent Memes, Identity, lack of intrinsic value and blockchain scalability. USPTO 13/573,002 addresses all six issues systemically. All things internet are built / made of TIME Cycles used / not used to process syntax as instructions. It follows, that issues with any internet system -- including Bitcoin must be fixed using this fundamental, universal truth.

**ARTICLE:** Could the Bitcoin Lightning Network Solve Blockchain

Scalability? LINK: "hashed timelock contracts between users , in the blockchain, if only two participants care about a transaction, it's not necessary for all other nodes in the bitcoin network to know about that transaction. It is instead preferable to only have the bare minimum of information on the blockchain. It is desirable for two individuals to net out their relationship at a later date, rather than detailing every transaction on the blockchain. This can be achieved by using time locks as a component to global consensus. As a result, Bitcoin can scale to billions of transactions per day with the computational power available today on a modern desktop computer. Transaction between users occurs during a micro-cycle, then reconciled at a pre-arranged macro-cycle, with a NIST Cyber Beacon random # time stamp for non-repudiation given reconciliation will probably occur at a later date in time.

**SCALABILITY:** SEE ARTICLE: Could the Bitcoin Lightning Network Solve Blockchain Scalability? LINK: "hashed time-lock contracts between users" In the blockchain, if only two participants care about a transaction, it's not necessary for all other nodes in the bitcoin network to know about that transaction. It is instead preferable to only have the bare minimum of information on the blockchain. It is desirable for two individuals to net out their relationship at a later date, rather than detailing every transaction on the blockchain. This can be achieved by using time locks as a component to global consensus. As a result, Bitcoin can scale to billions of transactions per day with the computational power available today on a modern desktop computer. Transaction between users occurs during a micro-cycle, then reconciled at a pre-arranged macro-cycle, with a NIST Cyber Beacon random # time stamp for non-repudiation given reconciliation will occur at a later date in time. Bitcoin Lightning Network

**IDENTITY:** Organizational unit (computing) From Wikipedia, In computing, an organizational unit (OU) provides a way of classifying objects located in directories, or names in a digital certificate hierarchy, typically used either to differentiate between objects with the same name (John Doe in OU "marketing" versus John Doe in OU "customer service"), or to parcel out authority to create and manage objects (for example: to give rights for user-creation to local technicians instead of having to manage all accounts from a single central group). Organizational units most commonly appear in X.500 directories, X.509 certificates, Lightweight Directory Access Protocol (LDAP) directories, active directory (AD), and directories and certificate trees, but they may feature in almost any modern directory or digital certificate container grouping system. In most systems, organizational units appear

within a top-level organization grouping or organization certificate, called a domain. In many systems one OU can also exist within another OU. When OUs are nested, as one OU contains another OU, this creates a relationship where the contained OU is called the child and the container is called the parent. Thus, OUs are used to create a hierarchy of containers within a domain. Only OUs within the same domain can have relationships. OUs of the same name in different domains are independent.

#### **Figure 94: USPTO 13/573,002 Application key events**

Patent application key events and concepts. USPTO SCREEN CAPTURES

SUSPENDED PAIR RULES:

- Moved Examination outside PAIR
- Admin forms, fees, amendments MUTED
- NO Time Stamps = TEMPORAL AMBIGUITY
- Screen captures before / after filing

Alice Corp. v. CLS Bank International, 573 U.S. 134 S. Ct. 2347 (2014) RULING:  
“claims may not direct towards abstract ideas”

#### **Figure 95: USPTO 13/573,002 Amendment timeline**

The first patent application was filed on September 11<sup>th</sup>, 2003 Method to commercialize structured military messages that establishes that the internet consists of internet time epoch cycles used / not used to process syntax (structured data). This filing was followed by many amendment filings. The USPTO sent web file captures from the first named inventor's site to the inventor several times from 2006 at two year intervals citing the precedent Transco Vs Performance Contracting Inc establishing a patentable idea

#### **Figure 96: Double Slit experiment particle / wave duality**

In physics, the double-slit experiment is a demonstration that light and matter can display characteristics of both classically defined waves and particles; ... experiment with light was part of classical physics long before the development of quantum mechanics and the concept of wave-particle duality. Quantum computing based on waves at room temperature Vs particles in a liquid nitrogen cooled chamber given energy required to keep the environment near absolute zero with liquid nitrogen. Use of light waves at room temperature = more ecologically sustainable, more accurate quantum computing given less challenge to synchronize, stochastically harmonize quantum computing sites over UTZ Universal Time Zone as a basis for programming, computing programmable money / programmable economy

### **Figure 97: USPTO 13/573,002 Quantum Computing Space – Time**

Alice Corp Vs CLS Bank are your patent applications, patents grants descriptive to the quantum computing level - future proofed? Are they written to be quantum resistant, or quantum based or both? What if events could be propagated by waves - is there a need for liquid nitrogen if the method and means is light wave laser based? Why go the liquid nitrogen route if we know the challenges in maintaining consistent temperatures across the globe at sea level Vs mountain tops, equator Vs poles... and don't forget the need to stochastically harmonize data sampling fluctuations across the world's time zones...

### **Figure 98: QUANTUM COMPUTING / USPTO 13/573,002 SYNERGY**

A quantum computer is a computer that exploits quantum mechanical phenomena. At small scales, physical matter exhibits properties of both particles and waves, and quantum computing leverages this behavior using specialized hardware. USPTO 13/573,002 graphics are descriptive of quantum computing measures and metrics and the particle / wave duality using a water drop in pond meme, Paul Revere linear, sequential meme to describe quantum mechanics methods and metrics, meters

### **Figure 99: NIST QRNB Quantum Random Number Beacon / USPTO 13/573,002**

National Institute for Standards and Technology NIST ATOMIC CLOCK in Boulder Colorado provides a global temporal reference source across the UTZ Universal Time Zone source for sync data event time stamps and NIST QRNB Quantum Random Number Beacon for non-repudiation of events / transactions at any point in time / place in the future. 1.11 Cited method uses waves Vs particles in quantum computing for ecological, temporal efficiencies and ease of synchronization, stochastic harmonization

### **Figure 100: NIST QRNB Quantum Random Number Beacon**

NIST has developed a method for generating numbers guaranteed to be random by quantum mechanics. The method generates digital bits (1s and 0s) with photons, or particles of light. An intense laser hits a special crystal that converts laser light into pairs of photons that are entangled, a quantum phenomenon that links their properties. 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.

### **Figure 101: Hopf Fibration / Bloch sphere**

Hopf fibration, Hopf bundle or Hopf map describes a 3-sphere (a hypersphere in four-dimensional space) in terms of circles and an ordinary sphere. Discovered by Heinz Hopf in 1931, it is an influential early example of a fiber bundle. "The most important object in the universe". "Hopf fiber bundles appear in 8 quantum physics situations."

In quantum mechanics and computing, the Bloch sphere is a geometrical representation of the pure state space of a two-level quantum mechanical system ( qubit ), named after the physicist Felix Bloch. [1] Quantum mechanics is mathematically formulated in Hilbert space or projective Hilbert space. the points on the surface of the Bloch sphere represent the pure states of a single 2-level quantum system. A pure state being of the form:  $|\psi\rangle=a|0\rangle+b|1\rangle$  and typically the north and south poles of this sphere correspond to the  $|0\rangle$  and  $|1\rangle$ states. The qubit  $|\psi\rangle=a|0\rangle+b|1\rangle$  can be represented as a point (theta,phi) on a unit sphere called the Bloch sphere. Define the angles theta and phi by letting  $a=\cos(\theta/2)$  and  $b=e^{i\phi}\sin(\theta/2)$ . Here, a is taken to be real, which can always be made real by multiplying  $|\psi\rangle$  by an overall phase factor (that is unobservable). Then  $|\psi\rangle$  is represented by the unit vector ( $\cos\theta\sin\theta$ ,  $\sin\theta\sin\theta$ ,  $\cos\theta$ ) called the Bloch vector.

### **Figure 102: Fisher Information flux flow waves**

Fisher information flux flows are generated and stored in wave packets as they propagate. This temporal aspect is crucial for understanding how information builds up in a system over time. The International Space Federation (ISF) / Explore / Physics / Using Waves to Measure the World: A New Way to Track Information Flow Physics- Technology / Fisher wave information flux flows

Using Waves to Measure the World: A New Way to Track Information Flow  
A team of physicists has discovered that electromagnetic waves scattered by an object contain detailed, locally defined information about that object's properties. This information, quantified by a concept called Fisher information, flows through space in a way that's analogous to how energy flows in electromagnetic fields. A team of physicists has discovered that electromagnetic waves scattered by an object contain detailed, locally defined information about that object's properties. This information, quantified by a concept called Fisher information, flows through space in a way that's analogous to how energy flows in electromagnetic fields. Just as the famous Poynting vector describes energy flow in electromagnetism, the team has introduced a new "Fisher information flux" that tracks the flow of information in wave fields. This revolutionary research published in Nature physics [1], opens up new possibilities for understanding and manipulating electromagnetic waves in various applications, from medical imaging to telecommunications. The implications of this discovery are far-reaching and could potentially revolutionize our approach to wave-based technologies.

Fisher Information flows refer to the concept of quantifying the non-Markovianity of open quantum systems. In this context, the Quantum Fisher Information (QFI) flow provides a measure to statistically distinguish Markovian and non-Markovian processes. The QFI flow is based on the exchange of information between the open system and its environment. It has been established as an information-theoretic approach for characterizing the non-Markovianity of open quantum processes (Lu et al., 2009). In addition to its application in quantum systems, Fisher Information flows have been explored in other domains, such as: Ecosystems: Fisher information is a measure of

order in dynamic systems, and its stability over time is linked to sustainability (Cabezas et al., 2002; Karunanithi et al., 2011). Physical systems: The behavior of Fisher information for molecular systems is consistent with the 2nd and 3rd Laws of Thermodynamics (Cabezas and Karunanithi, 2008). Fisher Information flows encompass: Quantum Fisher Information (QFI) flow for characterizing non-Markovianity in open quantum systems Fisher information as a measure of order in dynamic systems, applicable to ecosystems and physical systems

**FIGURE 103: QUBIT = non-existant notional construct = group think contrived for an expected outcome favorable to controlling agent (s) groups, cartels..**

**Figure 104: Acoustic Phonon:** wave forms are the fundamental foudation tech for all things internet and the internet of money in the beginning of the net and moving forward

**Figure 105:** Trump Quantum computing speed bump. Conventions to limit division of the qubit quantum computing abstraction is necessary to moderate the quantum computing speed arms race where division of the qubit results in a 1000X speed "bump"

Time Magazine's person of the year might be the person of the decade, century if he implements the Trump "Quantum computing speed bump" for crypto, stocks, commodities, big data as the next oil.. yes? The Bitcoin to a million prediction was made at the same time Google announced it's Willow Quantum computing chip applying sub-divided qubits that can potentially compromise the Bitcoin network unless a strategy for resistance is made. Qubits are non-existent abstractions in this common man's opinion. #TIME #quantumcomputing #cryptocurrency #stocks #HFT #DeFI

**FIGURE 106: SPACESHIP EARTH OPERATING MANUAL SIGNALS ANNEX K**

QUOTE: "There is only one revolution tolerable to all men, all societies, all political systems: Revolution by design and invention". Richard Buckminster Fuller author of The World (Peace) (simulation) Game book, futurist, environmentalist: Climate change impact on food production: given food, fertilizer shortages (wheat, sunflower, soybean...), energy, fuel prices and looming fuel rationing, it logically follows that the world has no other options than to organize both micro (local) and macro (global) economies observing space - time conservative SLA Service Level Agreements where closer = cheaper given closer = less fuel, CO<sub>2</sub>, time resources used to produce, ship.. Demurrage fees incentivize conservation of resources, commodities i.e., discounts for locally produced, consumed goods and commodities. ECO INCENTIVES: Ecologically sustainable economic transactions need to be incentivized among the world's Ecological and Economic system of systems. DECISION POINT: Economic #RESET is a mathematical certainty. Do we RESET, redesign the global system of systems using NATO system of systems engineering? CLIMATE CHANGE: 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. 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/>

### **Figure 107: Programmable money through the lens of metaphysics**

Metaphysical musings on programmable money: fictional "blocks on the cryptocurrency blockchain" in light of SCOTUS Alice in Wonderland 2014 ruling "claims may not direct towards abstract ideas" / The endless debate over (distributed) Database Vs messaging structured data exchange. In reality, messages are parsed in / out of data storage conventions using point to point or multicast internet protocol = same as it ever was

### **Figure 108: THESIS / SUMMARY**

### **Figure 109: Patent Litigation Summary graphic**

### **Figure 110: Numismatics is the study or collection of currency, including coins, tokens, paper money, medals, and related objects.**

Specialists, known as numismatists, are often characterized as students or collectors of coins, but the discipline also includes the broader study of money and other means of payment used to resolve debts and exchange goods. Numismatic specimens from Ancient, medieval and British India, made of silver. The earliest forms of money used by people are categorized by collectors as "odd and curious", [1] but the use of other goods in barter exchange is excluded, even where used as a circulating currency (e.g., cigarettes or instant noodles in prison). [2] As an example, the Kyrgyz people used horses as the principal currency unit, and gave small change in lambskins; [3] the lambskins may be suitable for numismatic study, but the horses are not. [dubious – discuss] Many objects have been used for centuries, such as cowry shells, precious metals, cocoa beans, large stones, and gems.  
<https://en.wikipedia.org/wiki/Numismatics>

### **Figure 111: Curriculum Vitae: Steven J. McGee First Named Inventor USPTO 13,573,002 The Heart Beacon Cycle Time – Space meter**

#### **First Named Inventor / Patent Applicant's Business Card**

First Named Inventor: Aquarian / Aquarius Rising coincidentally

First Named Inventor: Steven James McGee born 06:44 A.M. February 10<sup>th</sup> 1960

#### **Figure 112: Summary Graphic / Thesis #2**

#### **Figure 113: Curriculum Vitae: Steven J. McGee**

#### **Figure 114: Movies: Groundhogs Day / Limits of Control / City of Ember**

**Actor Bill Murray's sampling of movies i.e., Skull and Bonesman in the Movie "Limits of Control" with co-star Tilda Swinton, Mayor of last (underground) city on the late great planet earth in the movie "City of Ember"**

## FIGURE 1165 LIST / PICTURES = THOUSANDS OF WORDS

Figure 116: “FutureMan’s” Metaphysics / Contact Info



**SUMMARY:** structured data syntax – symbol mapping / messaging / economy, quantum computing, AI artificial intelligence. Minimum trade federation consensus checklist i.e., timing - sync schedule, OPSCODE brevity codes, UTZ event stochastic harmonization, consensus algorithm common description, measurements, metrics supporting trade federation (s), support for DAO Distributed Autonomous Organizations, parallel economies e.g., Texas gold backed currency. USPTO 13/573,002 The Heart Beacon Cycle Time - Space Meter Patent type: Adaptive Procedural Template Framework: checklist: ideas, algorithms, processes, procedures, metrics, meters, signal & telemetry structured data for consistent Eco sustainable economic time cycle epochs for programmable \$ / economy / Net, Net of Money Foundation Technology for DeFi, programmable internet of money / Web 3.0 USPTO 13/573,002 framework supports for example, Distributed Trade Federation Organizations with DoD / NATO system of systems engineering signaling, telemetry engineering, syntax OPSCODE brevity codes matched with 2525C symbol sets vital for A.I. man-machine interface, interoperability,

## **APPENDIX F: DRAWINGS / GRAPHICS**

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Figure 1: USPTO 13/573,002 Foundation Technology framework formed with an Adaptive Procedural Template

**PROCEDURAL TEMPLATE**  
List Items point / refer to detailed treatises

**HEART BEACON CYCLE** {"RWA"}  
**COMMODITIES ISO**

Series of systemic actions to achieve goals ex: form, maintain ECO sustainable

**Trade Federations i.e., closer = < fuel, CO<sub>2</sub>**

A continuous action, operation, or series of changes, sync deltas i.e., price indexes

Universal Event Bus Algorithm  
Process Events by Precedence  
Sync geo-spatial temporal Eco econometrics across space-time

Off Site connect  
PROXIMITY BEACONS  
Cloudcenter TESLA

Δδ  
 $\Sigma X$   
Sync to Closest Heartbeat  
Firefly-Heartbeat Algorithm  
{"EVENT\_BUS"}  
("Org\_ID")  
("URN")  
("URN")  
USPTO Transco v Performance  
13,573,002 SCT. 573 134 2347

MINIMUM LIST OF COMPONENTS / BUILDING BLOCKS, PROCESSES, PROCEDURES... AGREED ON BY TRADE FEDERATIONS TO ACHIEVE DAO DISTRIBUTED AUTONOMOUS ORGANIZATIONS CONSENSUS

DAO's in FEDERATIONS AGREE TO USE COMMON COMPONENTS, SHARED PROCESSES, METHODS, SIGNALING - TELEMETRY SCHEDULE & METRICS IN SMART CONTRACTS, SERVICE LEVEL AGREEMENTS

CHECKLIST: TRADE FEDERATION ECONOMIC FRAMEWORK EX:

- 1) Organize with Organization Identifiers {"Org\_ID"}
- 2) Track RWA Real World Assets / Commodities by </URN>
- 3) Take State Meta Data heartbeat snapshots @ 15 / N min
- 4) Honor Satoshi's intent for Crypto to be paired w markets
- 5) Use NIST Quantum Random Number Beacon QRNB

USPTO 13/573,002 = Spaceship Earth's Signals & Telemetry Annex

FIGURE 2: Adaptive Procedural Template list: USPTO 13,573,002 The Heart Beacon Cycle Time Space Meter

# Eco Economic Epochs Heartbeat

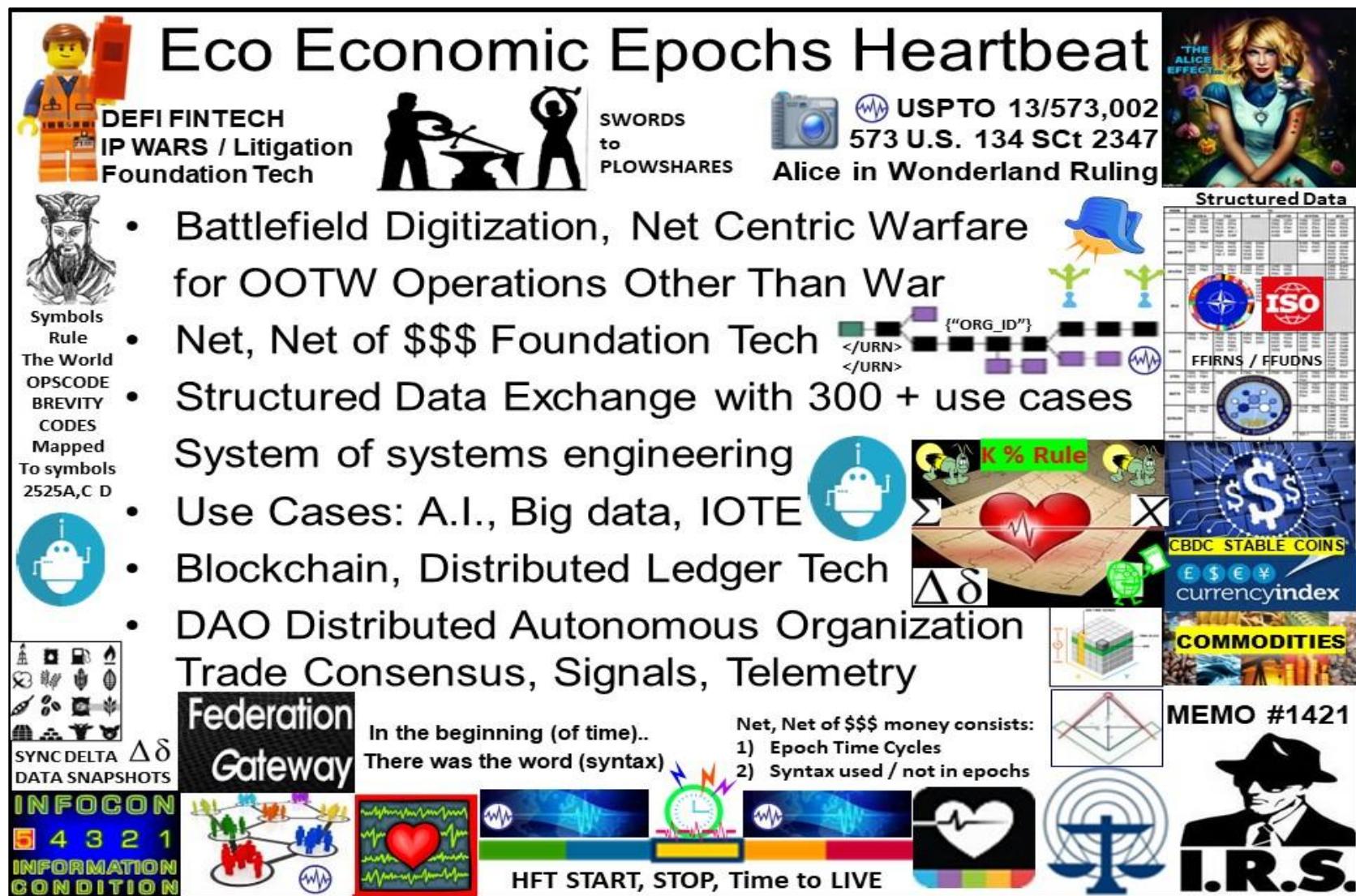


Figure 3: USPTO 13/573,002 Heart Beacon Cycle Time – Space Meter Summary



Figure 4: OOTW Operations Other Than War / H.A.N.Ds / System of Systems Engineering framework



Figure 5: Edison's Monetary Option 1922 / TradeFI Real World Asset RWA Tokenization

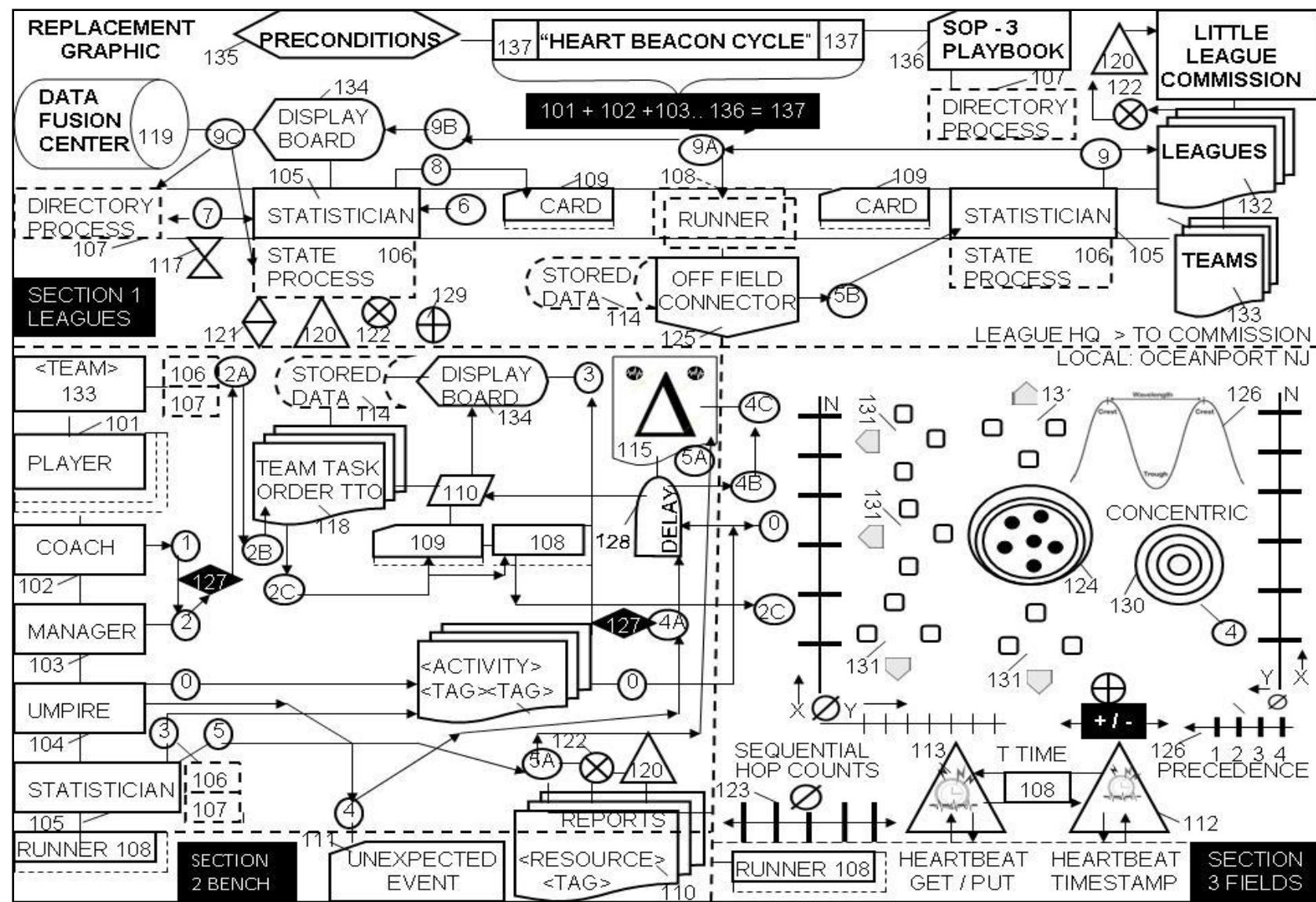


FIGURE 6: USPTO 13/573,002 Main Graphic

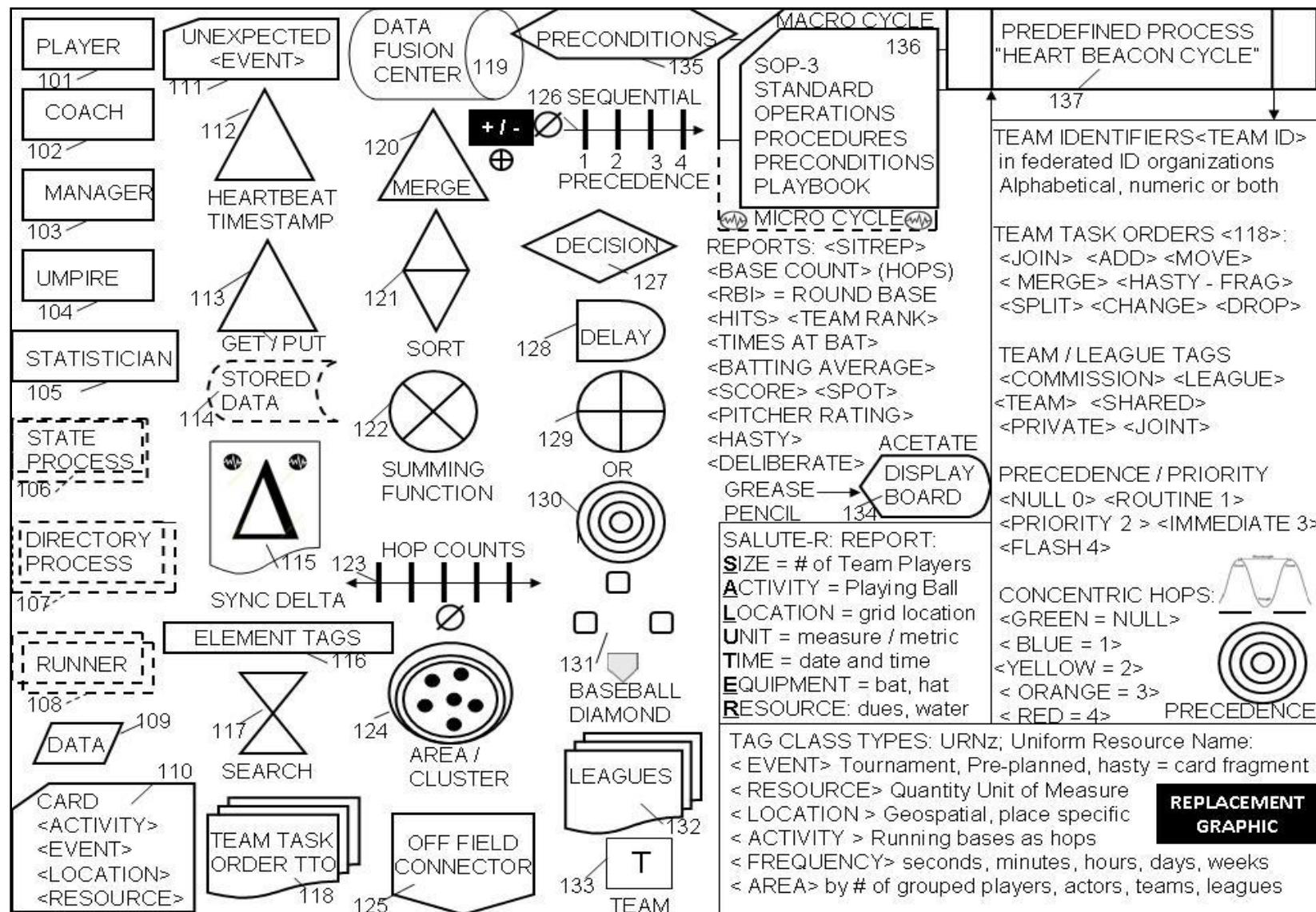


Figure 7: USPTO 13/573,002 MAIN GRAPHIC LEGEND

REPLACEMENT SHEET

## BUILDING BLOCKS

201

**B1: BUILDING BLOCK 1: TCP/IP HEARTBEAT TIME STAMP & DATA GET / PUT OF ORG ID / URN IN MICRO / MACRO CYCLES PRIOR TO DATA FUSION CENTER INSERTION**



TASK ON / OFF



202 **FEDERATED GROUP JOINS, MERGE, ADDS, DROPS**

**B2: BUILDING BLOCK 2: ADAPTIVE, CYCLIC, ITERATIVE PROCEDURAL TEMPLATES: XML ARTIFACTS i.e. UNIT TASK ORDER & K00.99 HEARTBEAT SYNC DELTA MESSAGES / STATE META DATA SNAPSHOTS IN NETWORK EXECUTION MANAGEMENT MARKUP OF SERVICE INTERFACE ARTIFACTS**

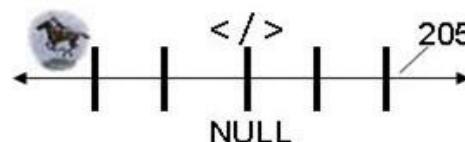


203

**B3: BEACON TECH TYPE I: PAUL REVERE LINEAR, SEQUENTIAL HOP COUNTS**



SYNC DELTA METRICS IN SLA CLAUSES AS MOE, MOP METER IN TAX CODES, TRANCHE CLASSES / RATINGS ARBITRAGE TRIGGERS



LENGTH, THRESHOLD, INTENSITY, DURATION



206



207

SEARCH FOLLOWED BY ARBITRAGE INVITES VIA BEACON NEWSCASTS. INVITE ACROSS SPACE / TIME



208

APPLIQUE' OVERLAYS



MAP VIEWS GEO-LOCATION SPECIFIC SHOW SYNC DELTAS BY GROUP / RESOURCE TYPE, EVENT CLASS / NEWSCAST BY TRANCHE <CLASSES>

204

**B4 BEACON TECH TYPE II: WATER DROP IN POND RADIUS, CIRCUMFERENCE GEO SPATIO-TEMPORAL**

Figure 8: USPTO 13/573,002 Building Blocks



Fig 9: Adaptive Procedural Template Checklist of ideas, processes, procedures, structured data exchange templates

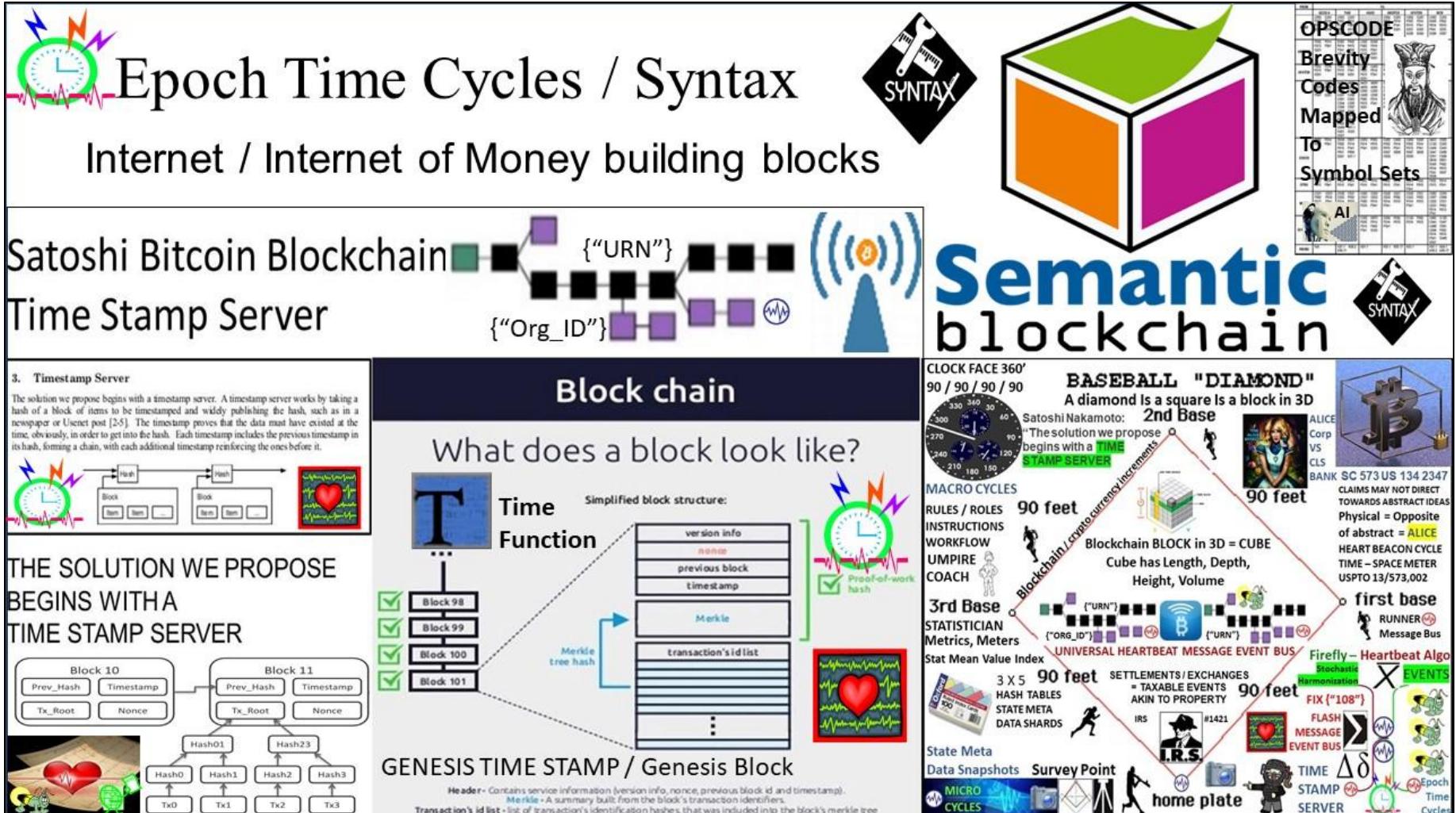
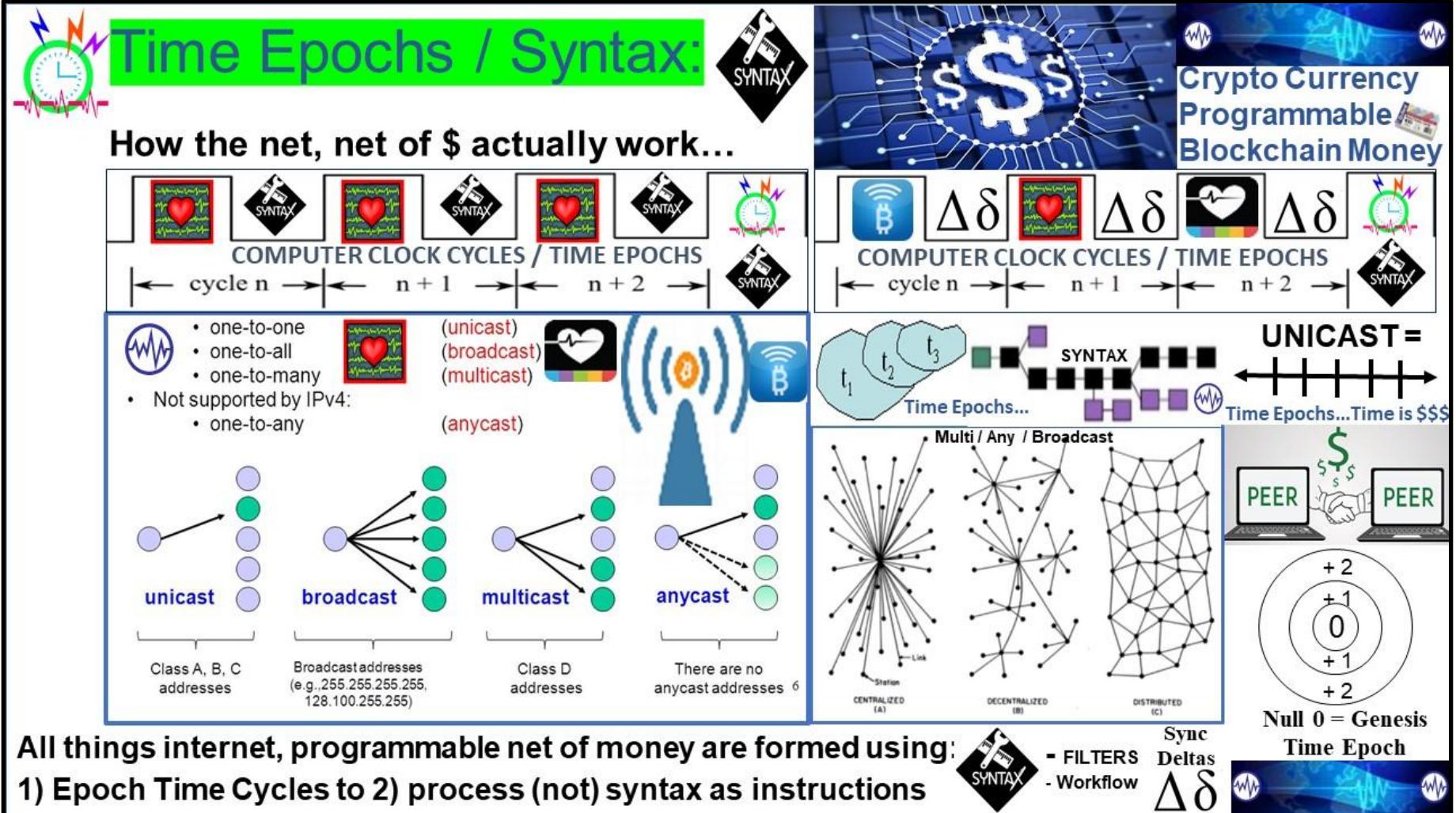


Figure 10: All things internet, artifacts of the programmable economy formed using 1) time epochs 2) syntax



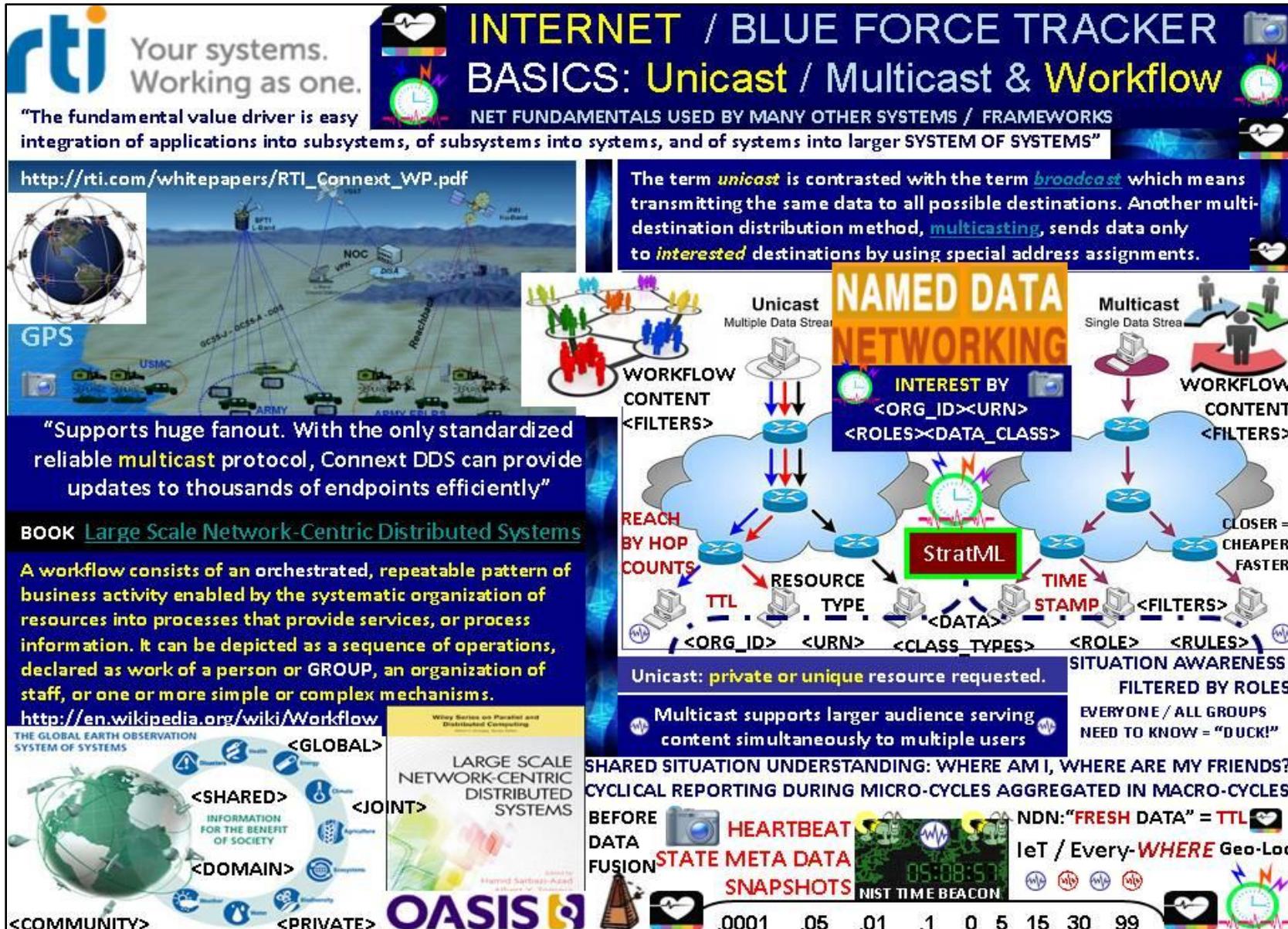
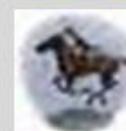


Figure 12: Blue Force Tracker / Maneuver Control Systems framework templates

FROM	TO						CODE GUIDE
	GCCS-A	TAIS	ASAS	AMDPCS	AFATDS	MCS	
ASAS	C002 C203 F002 F014 F015 F541 S201 S309	C002 C203		C002 C203	C002 C203 F014 F541 S305 S309	C002 C203 E400 F002 F014 F015 S201 S507	
AMDPCS	<b>TOKENS</b> <b>OPSCODE BREVITY CODES</b>			<b>USMTF / XML MTF FORMATTED MESSAGE CATALOG = 300 + messages info exchange sets using common, CONSENSUS Message Text Formats MTFs. MTFs specify &lt;/CONTENT&gt; / info agreed by group consensus presenting information in a logical, well specified unambiguous layout resulting in a highly efficient info payload to overhead ratio</b>		<b>A.I.</b> 	<b>INFOCON</b> 5 4 3 2 1 <b>INFORMATION CONDITION</b>
AFATDS	F002 F014 F015 F541 S201				A423 A659 C002 C203 C400 C443 C447 C488 C501 C503 C504 C505 C506 C507 S201	A423 A659 C002 C203 C400 C443 C447 C488 C501 C503 C504 C505 C506 C507 S201	<b>M2M</b>  "SYMBOLS RULE THE WORLD" 
MCS	  	A423 A659 C505 F002 F014 F015 F541 S201	A423 A659 C002 C203 C400 C443 C447 C488 C501 C503 C504 C505 C506 C507 S201	<b>ASSET TOKENS Token Economy</b>   	<b>HEARTBEAT MESSAGE = K00.99 &lt;/108&gt; {"108"}</b>		<b>({"108"})</b> <b>NDN</b> <b>Firefly-Heartbeat Flash Messages</b>
<b>MESSAGE CATALOG</b> 300 + Use Cases		<b>Data Elements:</b> entity, attribute, relationship equivalents			<b>HEARTBEAT MESSAGE = K00.99 &lt;/108&gt; {"108"}</b>		
<b>Information Categories and Examples</b>							
Object Categories	Examples	Location	Movement	Identify	Status	Activity	Intent
OOB	<b>SYNTAX LEXICON</b>	STRUCTURED DATA Machine Trust Language MTI	EXCHANGE Message Sets CDL Contract Description Language	country / alliance, type/class	readiness	targeting, reconitering	COA {"Java JS"}
Infrastructure	Comm, power, transportation, water/sewer	lat/long	spd/hdg	name, part-of relationships	BDA, op levels	repair, threacments	YAML expansion plans
Sociological	Culture, religion, economic, ethnic, government, history, languages	temples, historic structures	ER Model	Class Diagram	Relational Database	Object DBMS	XML DTD / Schema
Geophysical	Terrain, weather, climatology, oceanography, astrometry	feature lat/long, alt/dpth	Attribute	Field / Column	Attribute	Child Element or Element Attribute	TADILs FFIRN / FN / FFUDN
		Domain Value	PURCHASE CODES	Instance, Value			<b>TOKENS</b>

## Information Elements Roles

- COI Determination Org Interaction
- Search and Discovery
- Ontologies STANDARDS
- Taxonomies REFERENCE
- Metadata Attributes / Filters ("Org\_ID"} {"URN"} </URN></URN> FILTERS



**FFUDN: Field Format Unit Designator #**

**FFIRN Field Format Index Reference #**

Structured military messaging ID's messages, message sets, data element, symbol fields </108>  
BY Form Field Position & NUMBER

**({"108"})**  
**NDN**  
**Firefly-Heartbeat Flash Messages**

**PROCESS MESSAGE BY PRECEDENCE**  
UNIVERSAL EVENT / ALERT MESSAGE BUS

## OPERATIONAL NODES / ACTIVITIES

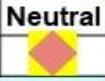
DATA	SYSTEM FUNCTIONS	PERFORMANCE
11.4 - Classification		11.8 - Kinematics
11.4.1 - Category		11.8.1 - Pos / Vel / Acc (PVA)
11.4.1.1 - Confidence Level		11.8.1.1 - Acceleration
11.4.1.2 - Estimate Type		11.8.1.1.1 - Angular
11.4.1.2.1 - Alternative		11.1.2 - Linear
11.4.1.2.2 - Evaluated D		11.1.2.1 - Estimate Type
11.4.1.3 - Value		11.2.1 - Estimated
	PURCHASE CODES	11.2.2 - Observed
		11.2.3 - Predicted
		11.2.4 - Smoothed Data
<b>SYMBOL</b>	<b>Friend</b>	<b>Neutral</b>
2525C	Partner	
11.4.1.3.1 - Collocated		3 - Velocity
11.4.1.3.5 - Surface		1.4.1 - Horizontal
11.4.2 - Platform / Point / Feature Type		1.4.2 - Vertical
11.4.3 - Specific Type		VA Confidence
11.4.4 - Type Modifier		1 - Bearing Angle
11.4.5 - Unit		2 - Bearing Angle Rate
		3 - Covariance Matrix

FIGURE 13: Code Syntax Lexicon, Message Template Library from 1<sup>st</sup> patent application 9 / 11 / 2003



FIGURE 14: Structured Military Messaging / Structured Data Exchange FFIRNS, FFUDNS

**MIL STD 2525A, B, C, D**

Patent Application 9/11 2003: Method to commercialize structured military messaging

DoD Systems of Systems Engineering Structured Data Exchange MIL Standards / ISO Standards

BREVITY OPSCODES MAPPED TO SYMBOLS, SYMBOL SETS FOR A.I. ARTIFICIAL INTELLIGENCE MAN – MACHINE INTERFACE

STANDARD, CONSISTENT SYMBOLS

FROM TO CODE GUIDE

GC5-A	TAIS	ASAS	AMOPCS	AFATDS	MCS
C002	C003	C002	C203	C002	C003
F002	F014	C002	C203	C002	C003
F015	F541	C400	C400	F014	E400
S201	S309	C400	C400	F541	F014

**TOKENS:** 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

A423	C203	A423	A659	A423	A659
C002	C003	C002	C203	C002	C203
F014	F015	C443	C443	C443	C443
F541	S201	C447	C448	C447	C448
S201	S309	C503	C503	C503	C503

**AMOPCS**

F002	F014	C400	C400	F002	F014
F002	F541	C400	C400	F002	F541
S201	S309	C503	C503	F002	F541

**AFATDS**

F002	F014	C400	C400	F002	F014
F002	F541	C400	C400	F002	F541
S201	S309	C503	C503	F002	F541

**MESSAGE CATALOG** 300 + Use Cases

DATA ELEMENTS: entity, attribute, relationship equivalents = HEARTBEAT MESSAGE = K00.99 </108> {“108”}

**SYNTAX LEXICON**

STRUCTURED DATA EXCHANGE Message Sets Machine Trust Language MTL

Information Categories and Examples

OPERATIONAL NODES / ACTIVITIES

DATA SYSTEM FUNCTIONS PERFORMANCE

SYMBOL Friend Neutral Hostile

2525C	Partner	◆	Competitor
2525C	Purchase Codes	Tokens	UI

Signal operating instructions (SOI): technical control coordination of signaling, telemetry Current situational awareness, data dictionary, network identification, channels, network directory, brevity code-words, signals. Units maintain 2 SOI copies: PEACE TIME version "Go-To-War" version = BIZ COA (s) <Org\_ID1><Org\_ID2><Org\_ID3>

INFOCON 4 3 2 1 INFORMATION CONDITION

INFOCON INDEX REFERENCE # M015 STATUS

INFOCON EFFECTIVE: 14-DEC-95

INFOCON PURCHASE CODES

INFOCON FEDERATED PEGS

INFOCON ISO 10388 – MIC Market Identifier Codes

INFOCON STOCK NDN NAMED DATA

INFOCON EXCHANGE NETWORKING

INFOCON MIC CODES PRECEDENCE

INFOCON PROCESSING

INFOCON FILTERS

INFOCON BLOCK TIME

INFOCON ARBITRAGE

INFOCON ERLANG

INFOCON TIME

INFOCON EQUATIONS

XBRL XAML

UBL YOSCA

FFUDN: 4 3 2 1 INFORMATION CONDITION

FFIRN Field Format Index Reference # Structured military messaging ID's messages, message sets, data element, symbol fields <108> BY Form Field Position & NUMBER {“108”} NDN Firefly-Heartbeat Flash Messages

PROCESS MESSAGE BY PRECEDENCE UNIVERSAL EVENT / ALERT MESSAGE BUS

THE DAY THE EARTH STOOD STILL 1951

"Signs and symbols rule the world, not words nor laws" - Confucius

**Encyclopedia Britannica:** "Language is a SYSTEM of SIGNS having meaning by convention. In this sense, language need not be confined to the spoken word".

**SIGNS AND SYMBOLS RULE THE WORLD, NOT WORDS OR LAWS"**

**CONFUCIOUS**

FIGURE 15: Artificial Intelligence Man – Machine Interface Syntax lexicon

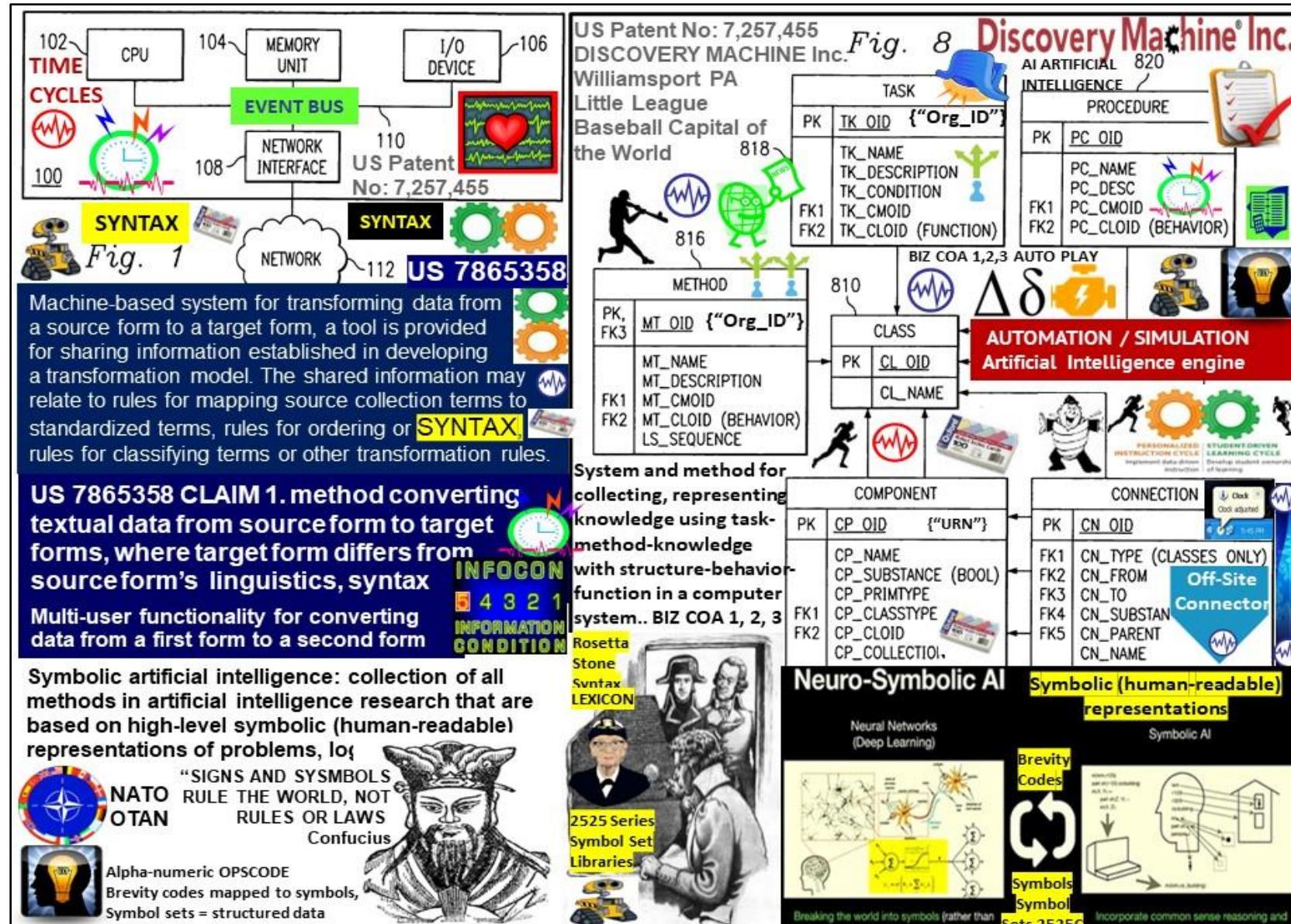


Figure 16: Discovery Machine Machine Learning IP / USPTO 13/573,002

## Symbolic artificial intelligence: collection of all methods in artificial intelligence

research that are based on high-level symbolic (human-readable) representations of problems, logic and search.[1]

Symbolic AI used tools such as logic programming, production rules, semantic nets and frames, and it developed applications such as knowledge-based systems (in particular, expert systems), symbolic mathematics, automated theorem provers, ontologies, the semantic web, and automated planning and scheduling systems. The Symbolic AI paradigm led to seminal ideas in search, symbolic programming languages, agents, multi-agent systems, the semantic web, the strengths, imitations of formal knowledge and reasoning systems.

Physical symbol system (also called a formal system) takes physical patterns (symbols), combining them into structures (expressions) and manipulating them (using processes) to produce new expressions. The physical symbol system hypothesis (PSSH) is a position in the philosophy of artificial intelligence formulated by Allen Newell and Herbert A. Simon. They wrote: "A physical symbol system has the necessary and sufficient means for general intelligent action." [2] —Allen Newell and Herbert A. Simon

This claim implies both that human thinking is a kind of symbol manipulation (because a symbol system is necessary for intelligence) and that machines can be intelligent (because a symbol system is sufficient for intelligence). [3] The idea has philosophical roots in Hobbes (who claimed reasoning was "nothing more than reckoning"), Leibniz (who attempted to create a logical calculus of all human ideas), Hume (who thought perception could be reduced to "atomic impressions") and even Kant (who analyzed all experience as controlled by formal rules). [1] The latest version is called the computational theory of mind, associated with philosophers Hilary Putnam and Jerry Fodor. [4]

Source: Wikipedia: [https://en.wikipedia.org/wiki/Physical\\_symbol\\_system](https://en.wikipedia.org/wiki/Physical_symbol_system)

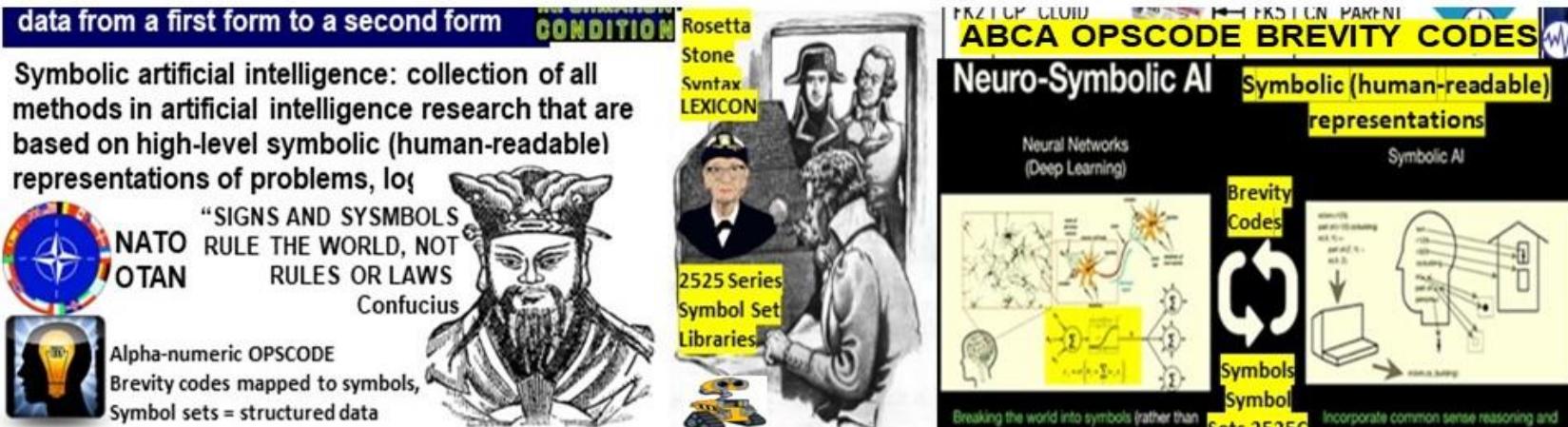


Figure 17: Discovery Machine Symbolic Artificial Intelligence / USPTO 13/573,002

**Foundation Technology Trinity:**

1. EPOCH (s) = Time intervals, cycles
2. SPACE (land use meme) ex: IRS memo #1421 "Bitcoin transaction akin to land"
3. SYNTAX structured data mapped to symbols for A.I. / man - machine interface

**THESIS:** All net artifacts, net of \$ are formed with:

- 1) Epoch time cycle intervals ex: chip oscillations
- 2) Syntax parsed, processed in epoch time intervals

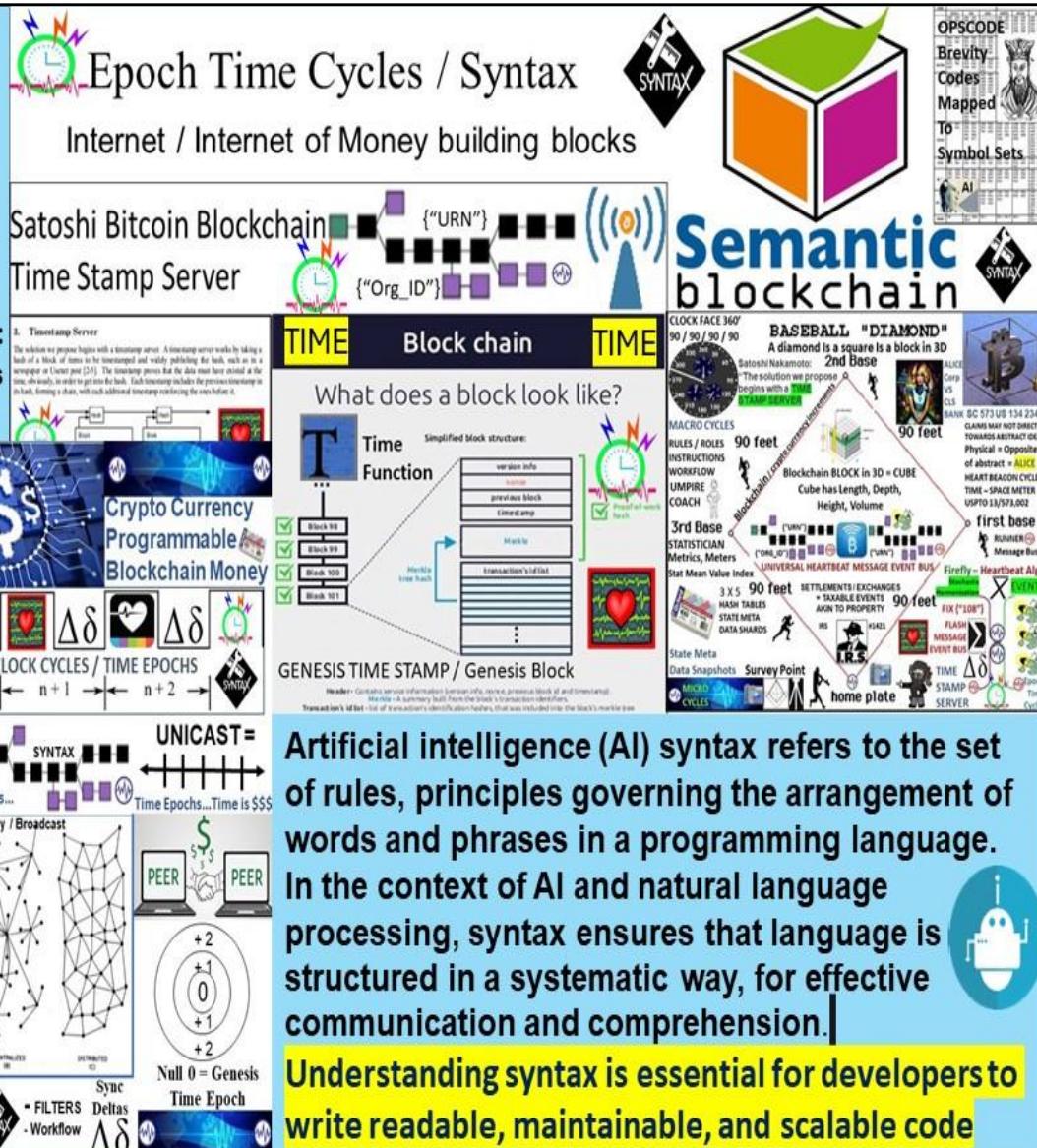
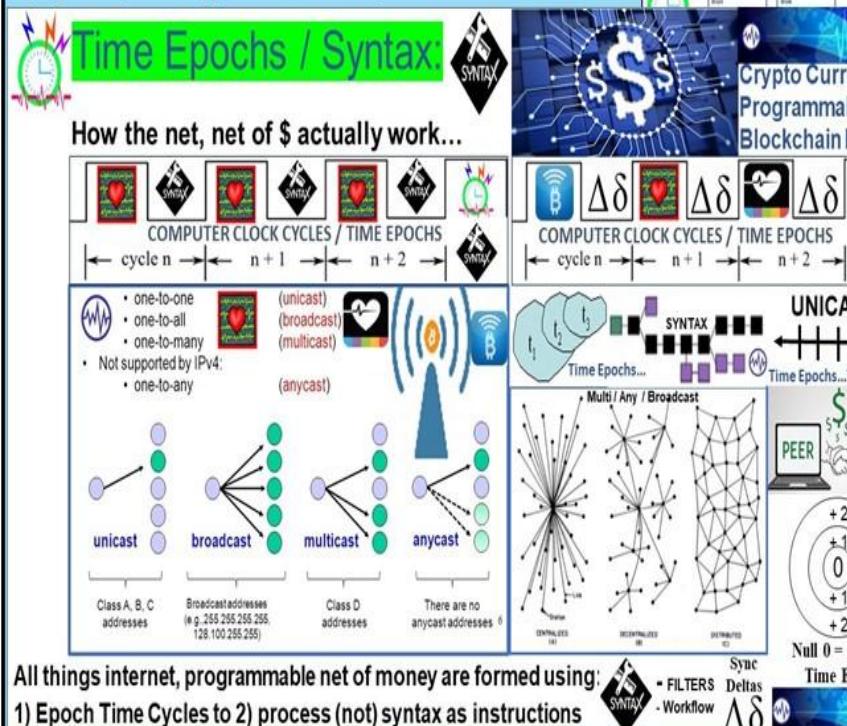
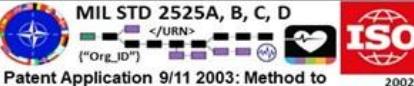


Figure 18: Net, Net of money, Artificial Intelligence A.I. = 1. Epoch time cycles 2. Syntax

**USE CASE: standards adherence support for IEEE, ITU, ISO international data, internet, internet of money, IoT, Artificial Intelligence A.I ... standards**

**Systemic, signaling, synchronization of state meta data encoded as brevity OPSCODE tokens stochastically harmonized over the UTZ**

FROM	TO	CODE GUIDE
GCCS-A	TAIS	C002 C203
F002 F014	ASAS	C002 C203
F015 F541	AMDPCS	C002 C203
S201 S309	USM TFM / 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	TOKENS
F002 F014	OPSCODE BREVITY CODES	F015 F541
F015 F541	AFATDS	S201
A423 C203	A423 A659	A423 A659
C505 F002	C002 C203	C002 C203
F014 F015	C404 C405	C404 C405
F541 S201	C447 C488	C447 C488
MCS	Syntax Lexicon	Rosetta Stone
SIOP	Asset Tokens	Coder's Guide
SIOP	Token Economy	M2M
A423 A659	C505 F002	A423 C505
C506 F014	C404 C405	C506 F014
F015 F541	C447 C488	F015 F541
F541 S201	C504 C505	F541 S201
S309	C507	S307
MESSAGE CATALOG 300 + Use Cases	Data Elements: entity, attribute, relationship equivalents	HEARTBEAT MESSAGE = K00.99 </108> {"108"}
Object Categories	Examples	Information Categories and Examples
OOB	SYNTAX LEXICON	STRUCTURED DATA / EXCHANGE Message Sets
Infrastructure	Comm, power, transportation, water/sewer	Machine Trust Language MTL
Sociological	Culture, religion, economic, ethnic, government, history, languages	ER Model / Class Diagram / Relational Database
Geophysical	Terrain, weather, climatology, oceanography, astrometry	Object DBMS / XML DTD / Schema
		TADILs / MTF
		Entity / Class / Table
		Attribute / Field / Column
	PURCHASE CODES	Child Element or Element Attribute
	Instance, Value	DRI / FFBN / FN / FUN
	TOKENS	DUI / FUD



Patent Application 9/11 2003: Method to commercialize structured military messaging



2002

DoD Systems of Systems Engineering Structured Data Exchange MIL Standards / ISO Standards

BREVITY OPSCODES MAPPED TO SYMBOLS, SYMBOL SETS FOR A.I. ARTIFICIAL INTELLIGENCE MAN – MACHINE INTERFACE

STANDARD, CONSISTENT SYMBOLS

### Information Elements Roles

- COI Determination Org Interaction
- Search and Discovery
- Ontologies STANDARDS
- Taxonomies REFERENCE
- Metadata Attributes / Filters

FFUDN: Field Format Unit Designator #

FFIRN Field Format Index Reference #

Structured military messaging ID's messages, message sets, data element, symbol fields </108> BY Form Field Position & NUMBER

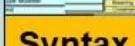
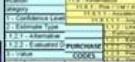
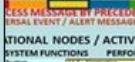
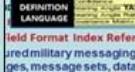
PROCESS MESSAGE BY PRECEDENCE UNIVERSAL EVENT / ALERT MESSAGE BUS

### OPERATIONAL NODES / ACTIVITIES

DATA SYSTEM FUNCTIONS PERFORMANCE

11.4 - Classification	11.1 - Kinematics
11.4.1 - Category	11.1.1 - Pos / Vel / Acc (PV/A)
11.4.1.1 - Confidence Level	11.1.1.1 - Acceleration
11.4.1.1.1 - Angular	11.1.1.1.1 - Angular
11.4.1.2 - Estimate Type	11.1.2 - Linear
11.4.1.2.1 - Alternative	11.1.2.1 - Estimated
11.4.1.2.2 - Evaluated	11.1.2.2 - Predicted
11.4.1.3 - Value	11.1.2.3 - Smoothed

SYMBOL	Friend	Neutral	Hostile	Competitor
2525C	Partner			



Signal operating instructions [SOI]: technical control coordination of signaling, telemetry Current situational awareness, data dictionary, mission identification, location, network diversity, security words, signals. Units maintain 2 SOI copies: PEACE TIME version "Go-To-War" version 0/BIZ COA <Org\_ID>+<Org\_ID><Org\_ID>

**INFOCON**

4 3 2 1

INFORMATION GROWTH

INDEX REFERENCE #

M015 STATUS

EFFECTIVE: 14-DEC-09

PURCHASE CODES

FEDERATED PEGS

ISO 10388 - MIC

Market Identifier Codes

STOCK EXCHANGE NETWORKING

MIC CODES PRECEDENCE PROCESSING

FILTERS

BLOCK TIME ARBITRAGE

TIME EQUATIONS

Encyclopedia Britannica:

"Language is a

SYSTEM OF SIGNS

having meaning by convention. In this sense, language need not be confined to the spoken word".

"SIGNS AND SYMBOLS RULE THE WORLD, NOT WORDS OR LAWS"

CONFUCIUS

Syntax code language parsed, processed during silicon chip generated epoch time cycles forms all things internet, net of money. state meta data sync delta heartbeat snapshots during epoch temporal micro-cycles

Figure 19: Syntax, brevity codes mapped to symbols essential for A.I. Man-machine interface

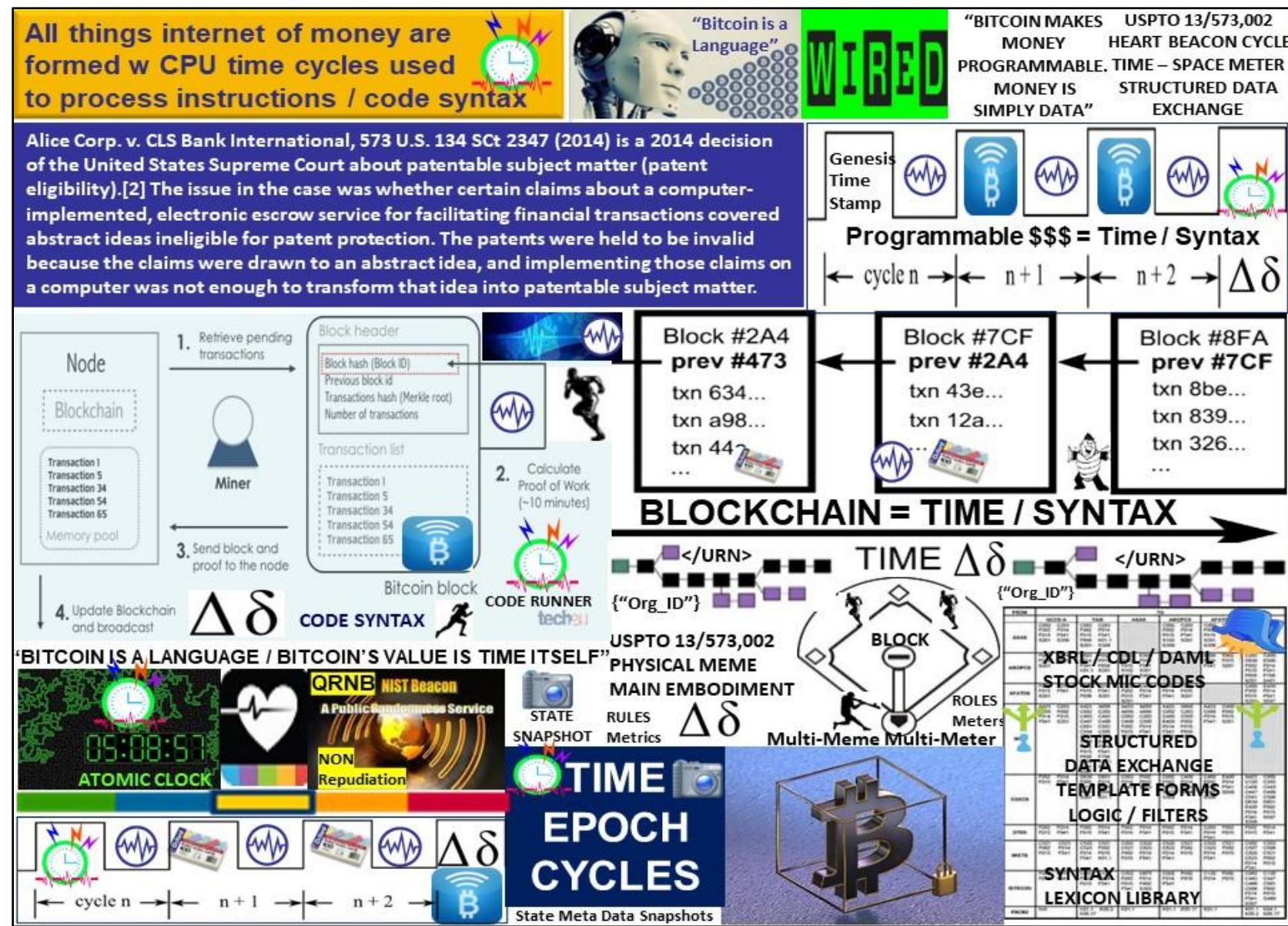


FIGURE 20: Blockchain Basics / How the internet really works / USPTO 13/573,002

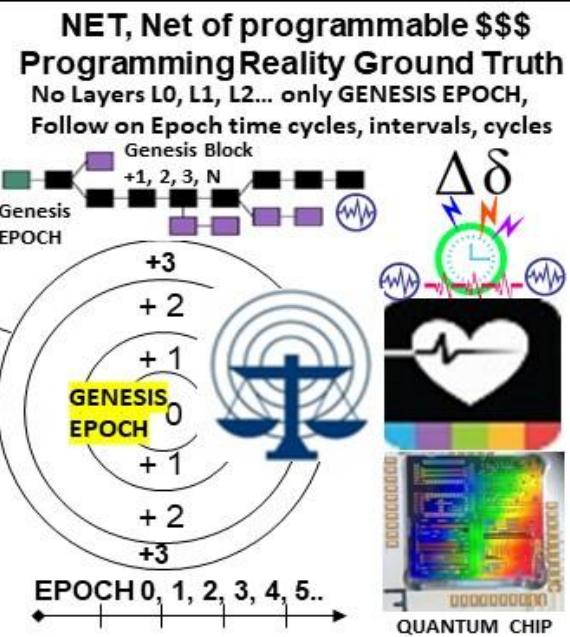
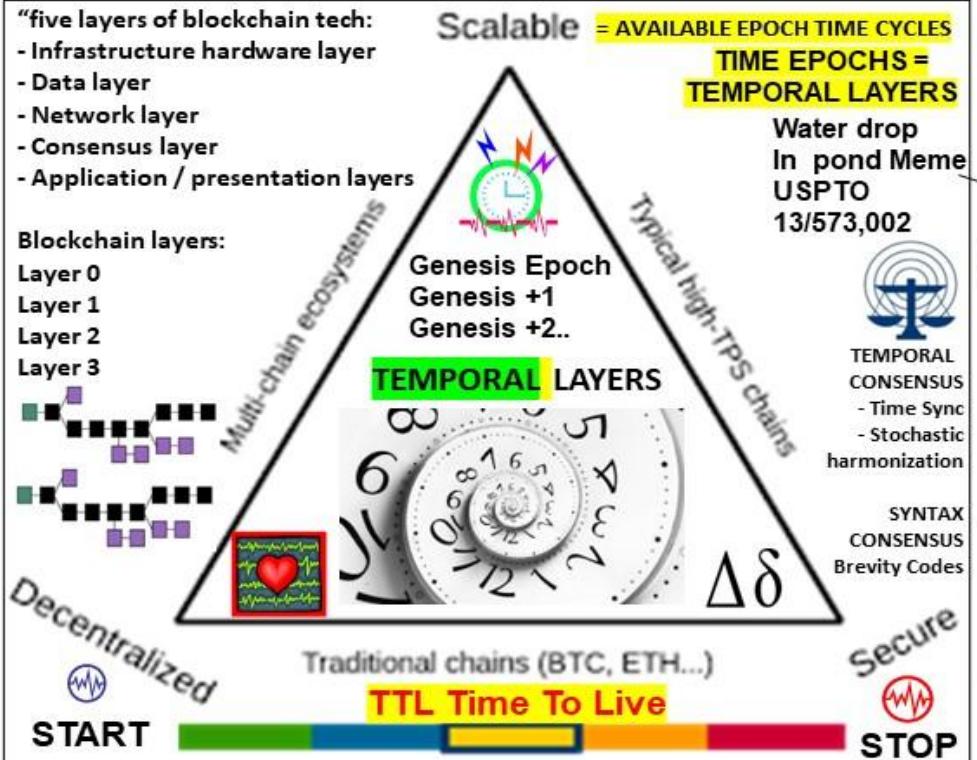
# Blockchain Quad-lemma

"five layers of blockchain tech:  
 - Infrastructure hardware layer  
 - Data layer  
 - Network layer  
 - Consensus layer  
 - Application / presentation layers

Blockchain layers:

Layer 0  
 Layer 1  
 Layer 2  
 Layer 3

Blockchain = series of hashed blocks carrying transactional records. The first block of the blockchain is the **Genesis block**. After that, every new block added to the blockchain is linked to the Genesis block through a (temporal) iterative process.



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

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

**Database Flat File**  
**"BLOCKCHAIN" = LEDGER / Database**  
Database flat file sama dengan file data pada spreadsheet (misal MS Excel™), berupa satu file berisi baris-baris dengan jumlah kolom tetap yang disimpan berurutan dalam file.

NIP	Nama	Nama Depan	Telp
123-45-6789	Santoso	Heru	021-316-1234
987-65-4321	Purnama	Widya	022-543-9876
987-65-4321	Jackson	Michael	021-234-5678
567-89-0123	Iskandar	Dodi	021-987-6431

All things internet, internet of money, blockchains are formed by unicast, multicast, anycast protocols. Programmable money's improvements are in cryptography. The internet consists of unicast, multicast broadcast, anycast and workflow filters, publish – subscribe paradigms..

Figure 21: The Blockchain Tri-lemma / Quad-lemma / Internet, Net of \$\$\$ ground Truth



Figure 22: Defi, Fintech Foundation technology for IP intellectual property wars

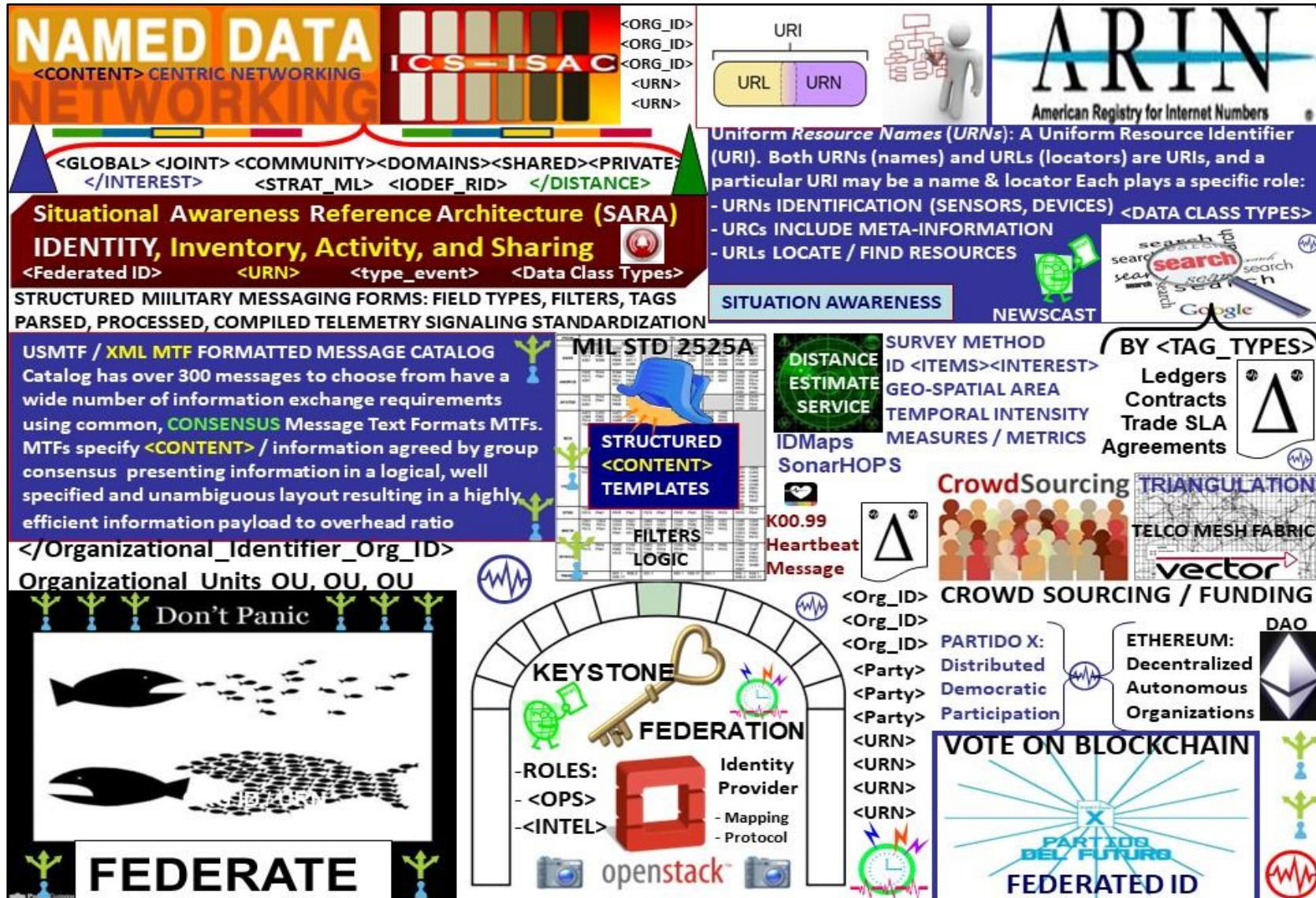




FIGURE 24: Situation Awareness Reference Architecture SARA

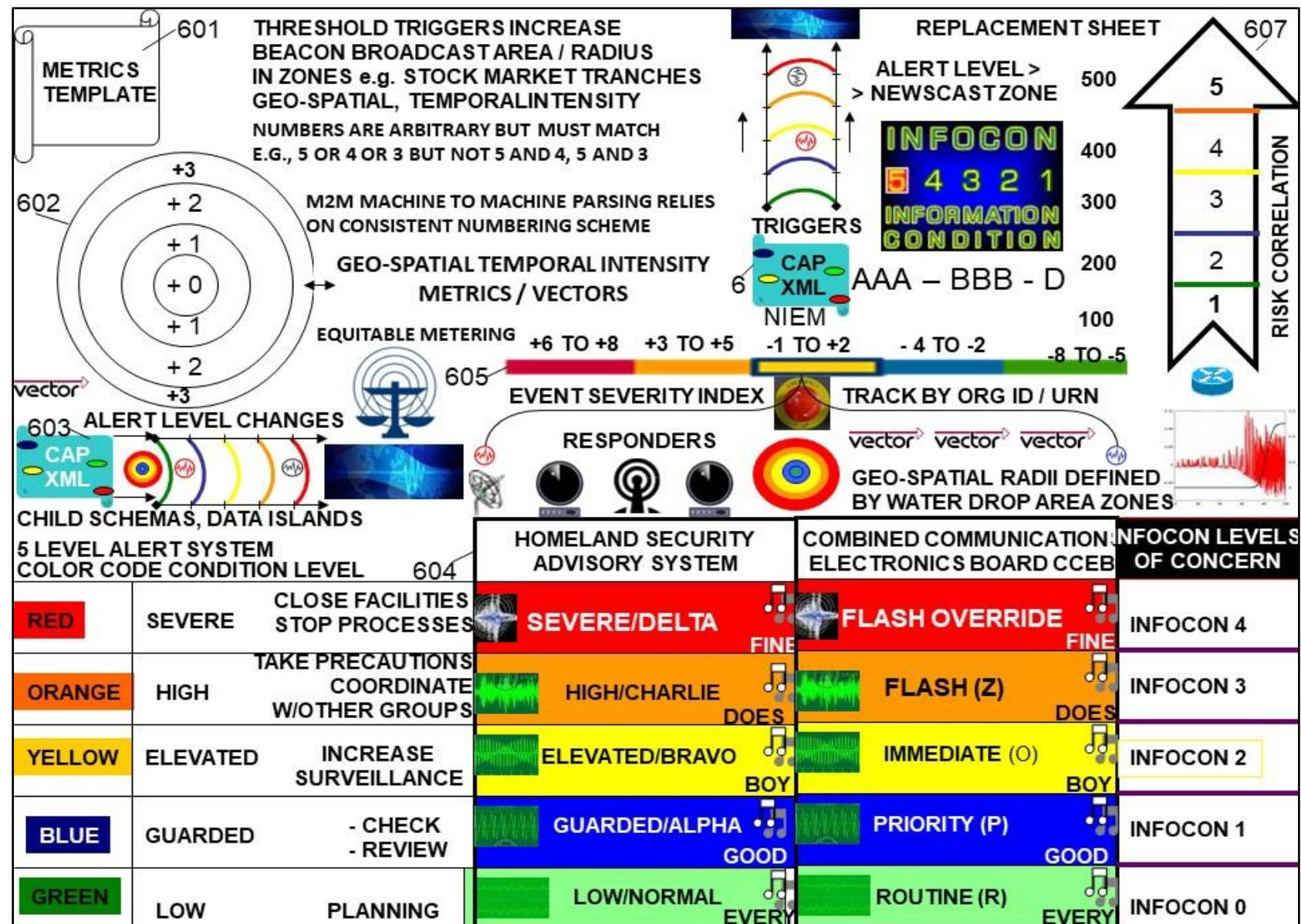


Figure 25: Structured Data Exchange INFOCON Precedence model

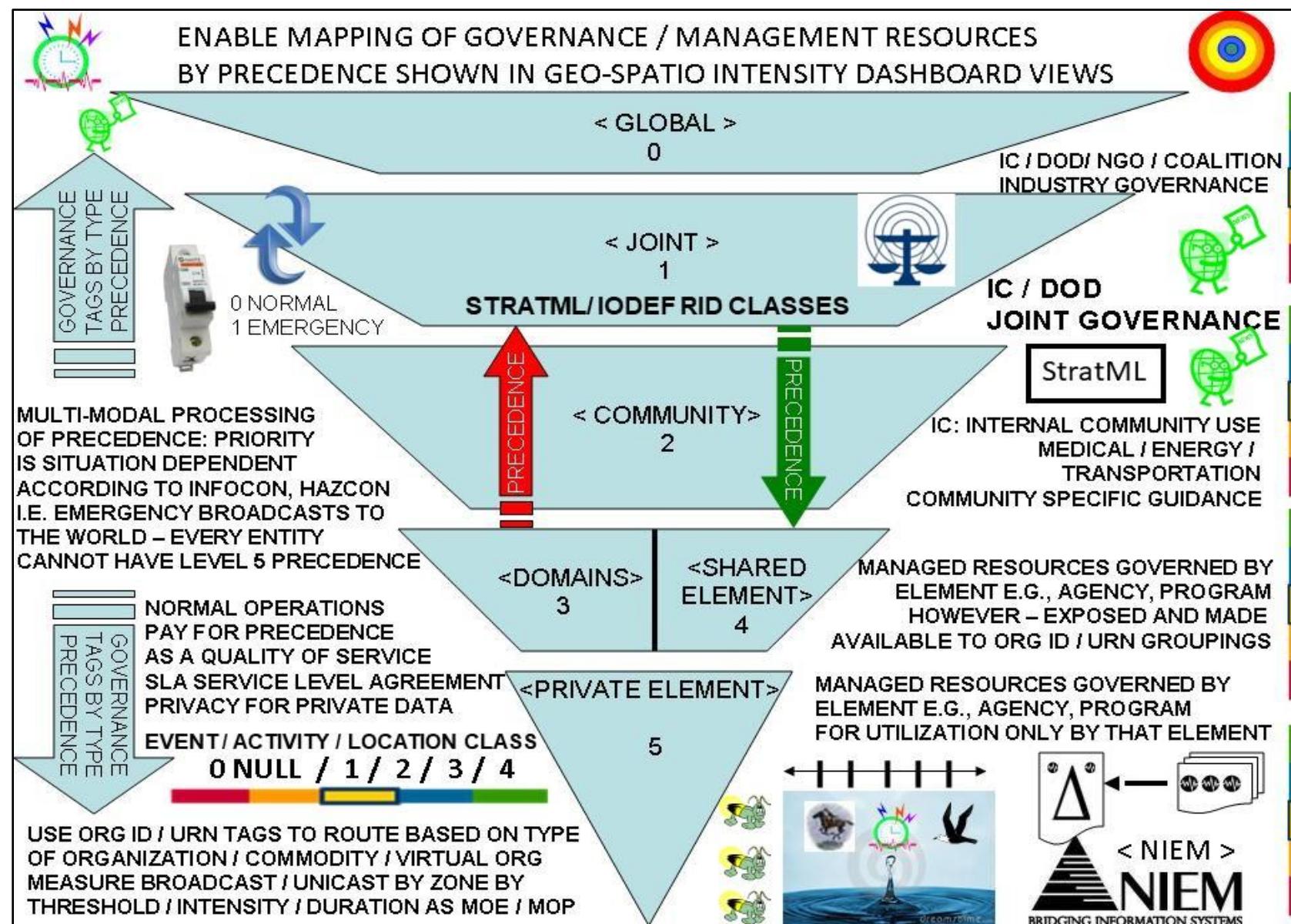


Figure 26: STRATML Markup Language



Figure 27: Universal Time Zone UTZ Stochastic Harmonization / Synchronization

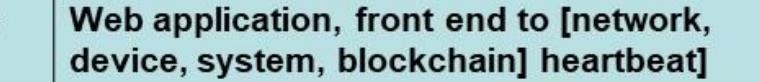
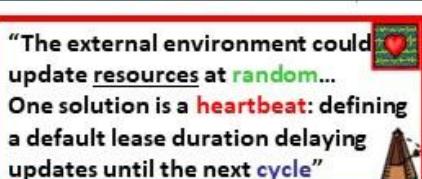
Interface Name	<b>HEARTBEAT</b> Administration Interface [SCOP]		
Documentation URL	<a href="http://scop.sourceforge.net/">http://scop.sourceforge.net/</a> <a href="http://linuxvirtualserver.org/software/index.html">http://linuxvirtualserver.org/software/index.html</a> 		
API Information #leT	#Big_Data	 <p>Functionality Areas</p>	Cloud Interface Management configuration, start, stop cloud services, edit configuration (heartbeat messages)
Programmable Money World Computer / Blockchain		 <p>API Operation Count</p>	LOCATE <CONTENT> IDMAPS / SonarHOPS
NIST TIME BEACON		 <p>Web service access type Network Effects / A.I.</p>	Web application, front end to [network, device, system, blockchain] heartbeat
Interface Characteristics		 <p>LANGUAGE / PLATFORM BINDINGS</p>	PHP Java Cloudcenter Erlang... Cloudcenter
		<p>SCOP is a web application, PHP based front-end to heartbeat, IP Virtual Server ipvs and Idirectord [e.g., check interval @ 5 seconds]  SCOP can start/stop services, view/ edit configuration files e.g., heartbeat message state management snapshots, backups, take a service online/offline, add/ remove virtual/real servers, services etc.</p> 	
<p>"The external environment could update resources at random... One solution is a heartbeat: defining a default lease duration delaying updates until the next cycle"</p> 		 <p>Satoshi Bitcoin Blockchain Time Stamp Server</p> <p>Clock adjusted</p> <p>5:45 PM</p> <p>THE SOLUTION WE PROPOSE BEGINS WITH A TIME STAMP SERVER</p>	 <p>Epoch Time Cycles E0 E1 E2 E3...</p> <p>E1 E2 En</p> <p>MICRO CYCLES MACRO CYCLES</p>
<p><b>QubitCoin Interval: Every 30 Seconds</b></p>			

Figure 28: SCOP Heartbeat Epoch Time Interval Start, Stop, TTL Time To Live



FIGURE 29: The Alice Effect / SCOTUS Alice Corp Vs CLS Bank 2014 ruling



Figure 30: Firefly Inspired Heartbeat Synchronization Algorithm



FIGURE 31: ECONOMIST MILTON FRIEDMAN'S K% RULE Economic GDP HEARTBEAT



FIGURE 32: TERRA TRC TRADE REFERENCE COMMODITY BASED CURRENCY

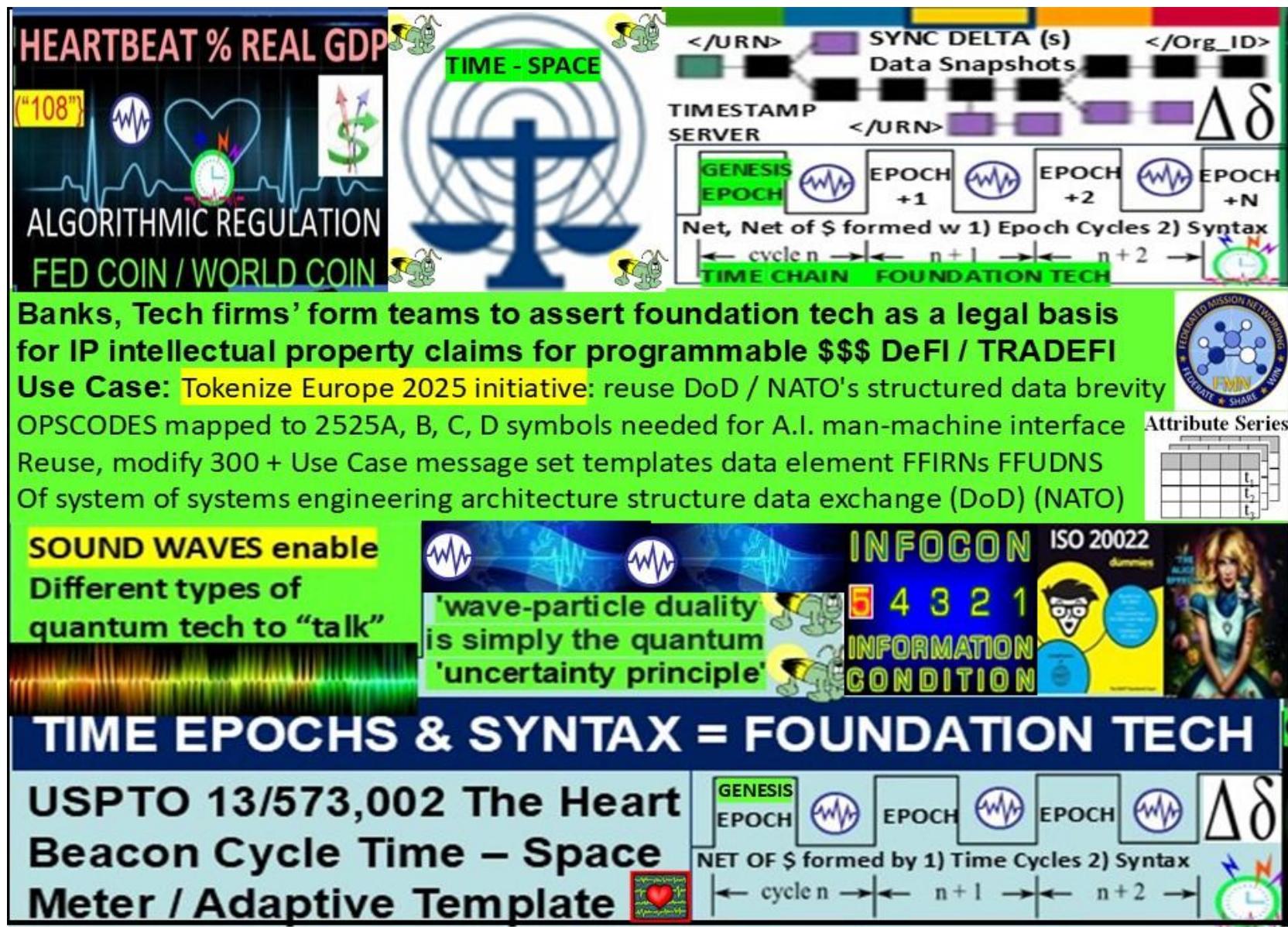


Figure 32A: Tokenized RWA Real World Assets GDP Heartbeat foundation technology



Figure 33: FEDERATE / FEDERATION / DAO



## FEDERATE: COMMON GOALS SYNCHRONIZED IN SPACE - TIME



Figure 34: Federate / Federation Beacon Communities



FIGURE 35: ERICSSON ERLANG - ERICSSON'S OPEN MONEY / USPTO 13/573,002

## What happens if we think about Bitcoin through the lens of *land*?

**SC ALICE CORP VS CLS BANK:** "claims may not direct towards abstract ideas"  
 UTXO: unspent transaction output'. bitcoins that have been sent somewhere but not yet themselves been spent. The set of all unspent transaction outputs (UTXOs) can be thought of as the latest STATE of every bitcoin that has ever been mined.

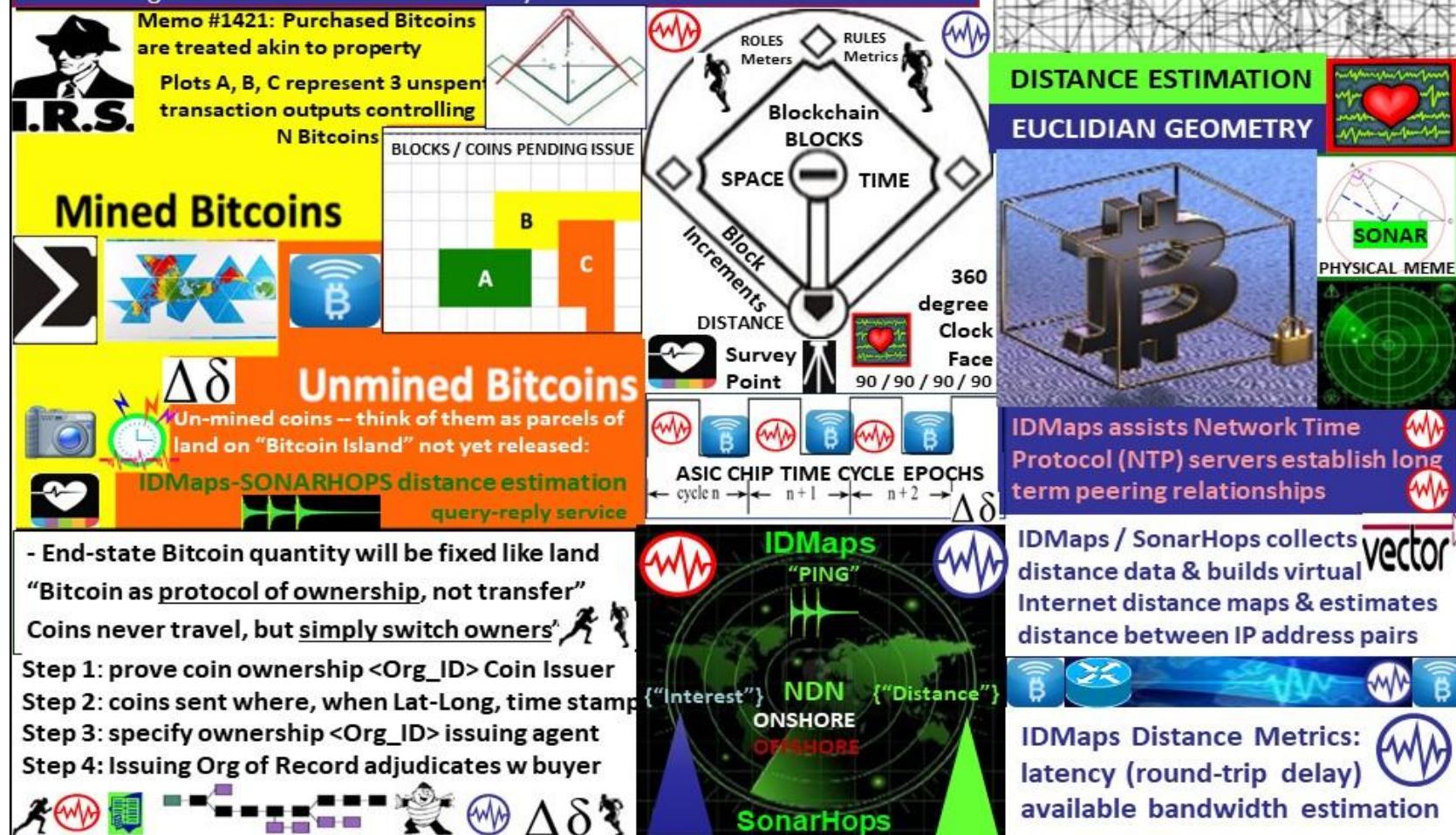


FIGURE 36: CRYPTOCURRENCY LAND USE MEME / IRS MEME 1421 / USPTO 13/573,002

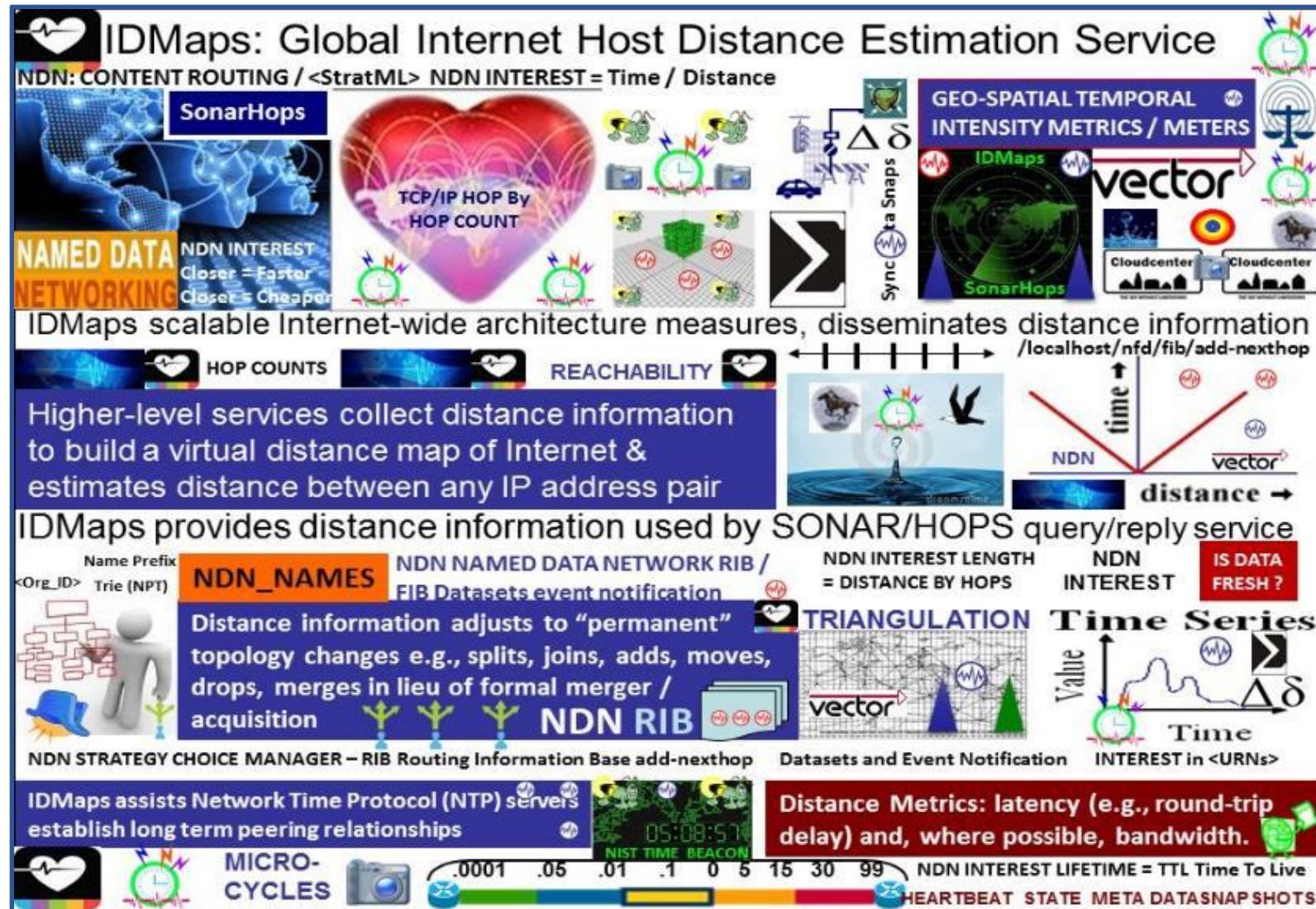


Figure 37: IDMaps / SonarHops Distance Estimation Service / USPTO 13/573,002

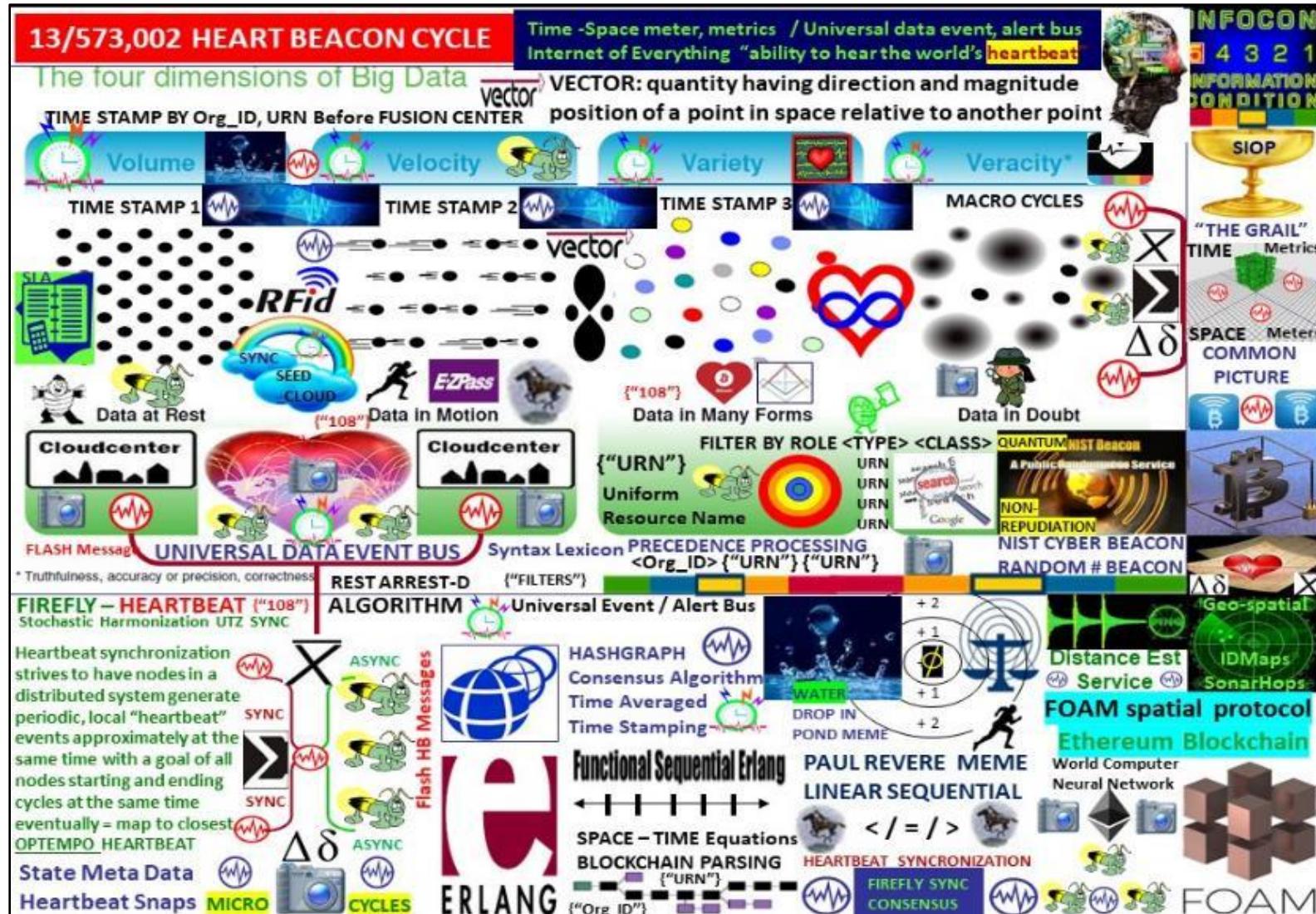


FIGURE 38: BIG DATA THE NEXT OIL / USPTO 13/573,002

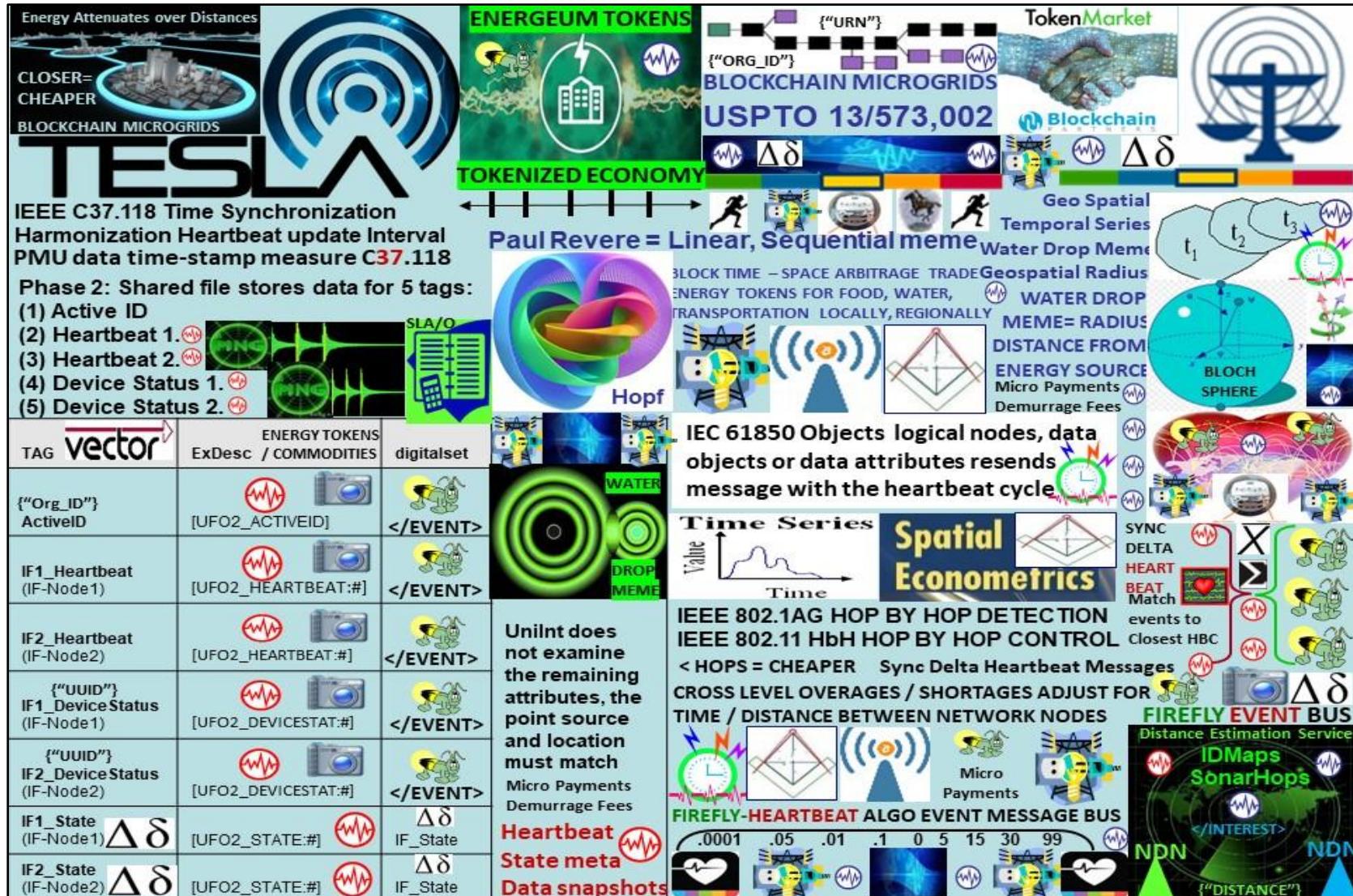
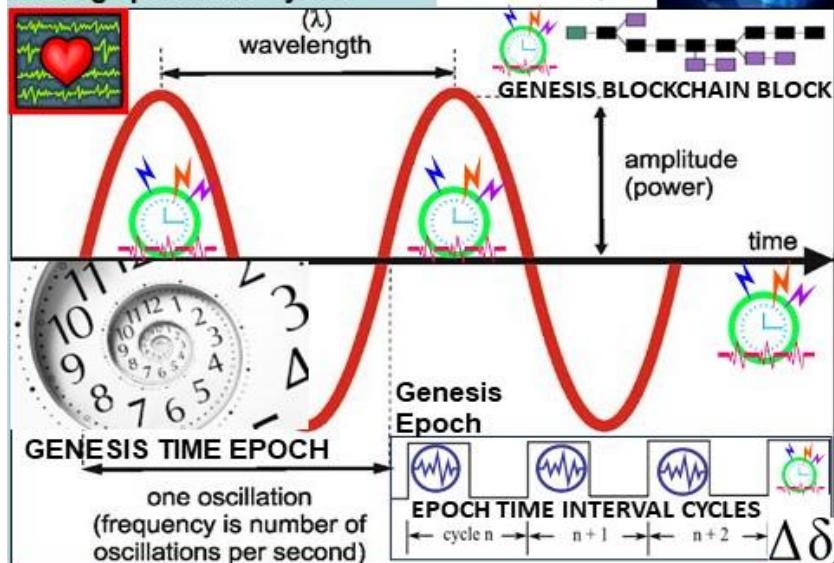


FIGURE 39: ENERGY ATTENUATES OVER DISTANCES / USPTO 13/573,002 Energy claim

**THESIS:** All things net, net of programmable \$\$\$ are formed using:

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



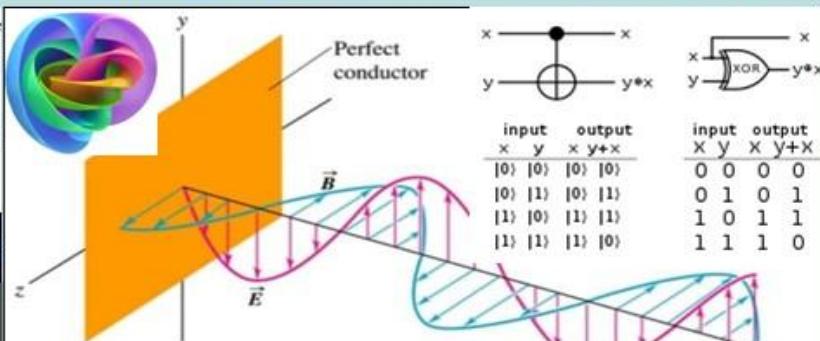
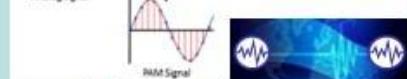
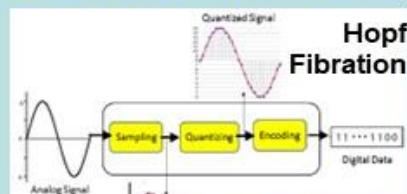
Quantum Computing Vibrations encode, process data like quantum computers. A simple mechanical system built from aluminum rods uses vibrations to encode information, mimicking quantum computing in a non-quantum system. "Light is made from photons, the quantum of light."

mechanical vibrations or sound waves can be described in a quantum-mechanical manner i.e., composed of phonons: the smallest possible units of mechanical vibration"

Link: [https://phys.org/news/2018-06-quantum\\_1.html](https://phys.org/news/2018-06-quantum_1.html)

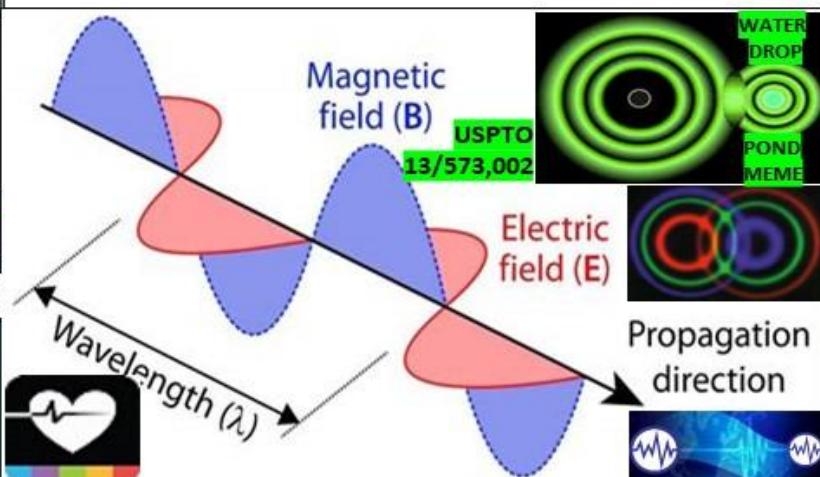
## ENERGY / DATA WAVE METRICS / METERS

## BELL STATE QUANTUM COMPUTING



### STANDING ELECTRO- MAGNETIC WAVE

A **standing** electromagnetic wave does not propagate along the x-axis; instead, at every point on the x-axis the **E** and **B** fields simply oscillate.



"Nature may reach the same result in many ways. Like a wave in the physical world, in the infinite ocean of the medium which pervades all.. Nikola Tesla

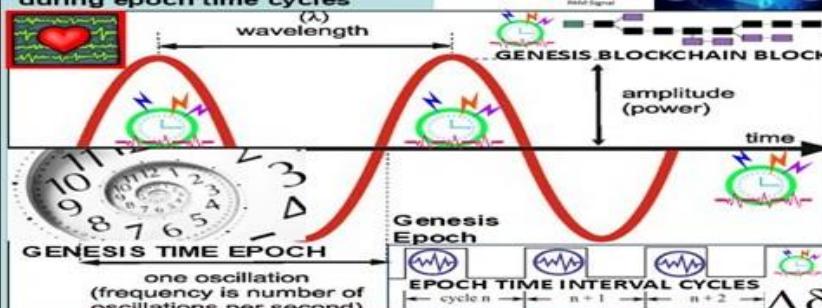
Figure 40: Energy / Data unified field propagation claim water drop in pond meme

United States US 20120092107A1 (12) PROPULSION SYSTEM USING THE  
Baptista De Alves Martins (43) ENERGY PRODUCTION  
Pub. Date: Apr. 19, 2012

**ABSTRACT:** A propulsion system for aerial, terrestrial, underwater or space propulsion, through manipulation (or engineering) of the vacuum with proper electromagnetic interactions. Vacuum manipulation.. new form of propulsion, and has applications in **ENERGY production** and on **CHANGE of TIME decay** of radioactive elements. Opposing magnetic or electric fields create a mass repelling force, while attracting magnetic or electric fields create a mass attracting force. This vacuum manipulation process.. used to propel a mass that contains field sources that perturb the vacuum. .. the creation of a repulsion point in space through the interference of two or more longitudinal **ELECTRO dynamic (micro) waves**

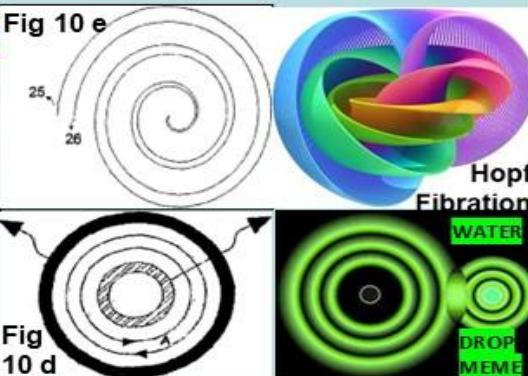
**THESSIS:** All things net, net of programmable \$\$\$ are formed using:

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



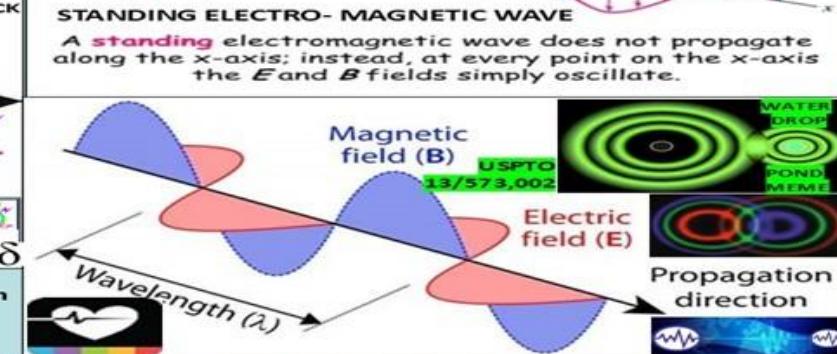
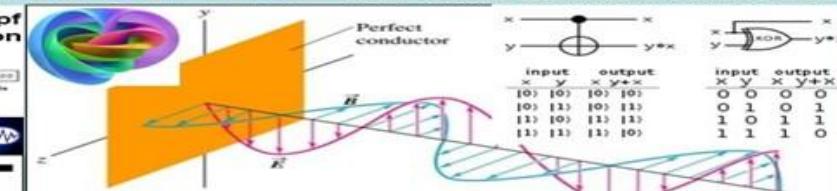
### ENERGY PRODUCTION

Fig 10 e



### ENERGY / DATA WAVE METRICS / METERS

### BELL STATE QUANTUM COMPUTING



"Nature may reach the same result in many ways. Like a wave in the physical world, in the infinite ocean of the medium which pervades all.. Nikola Tesla

Figure 41: Wave based Energy / Propulsion System

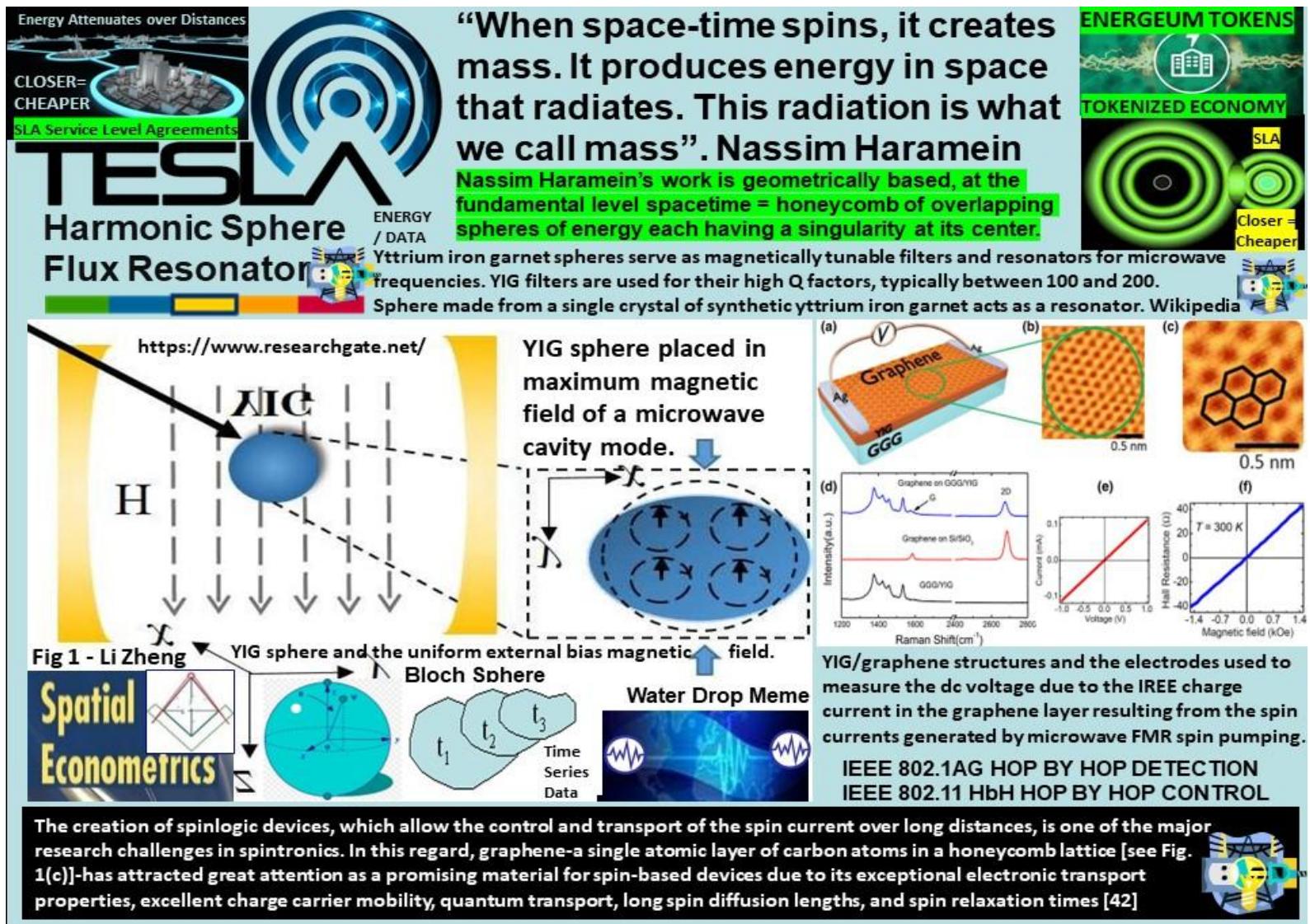


Figure 42 Harmonic Shere Flux Resonator

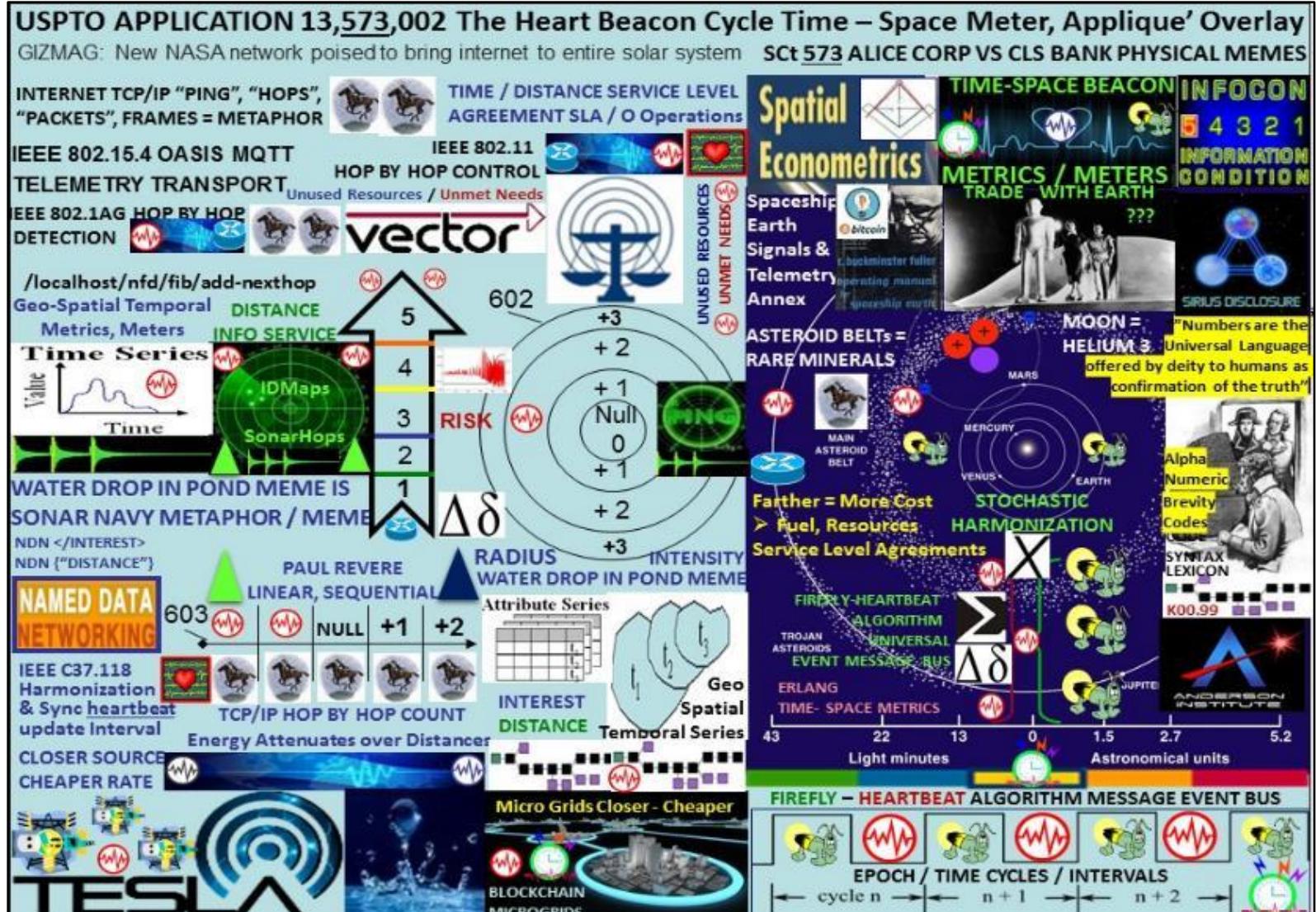


Figure 43: SPACE – TIME BEACON / CLOSER = CHEAPER = LESS TIME / FUEL

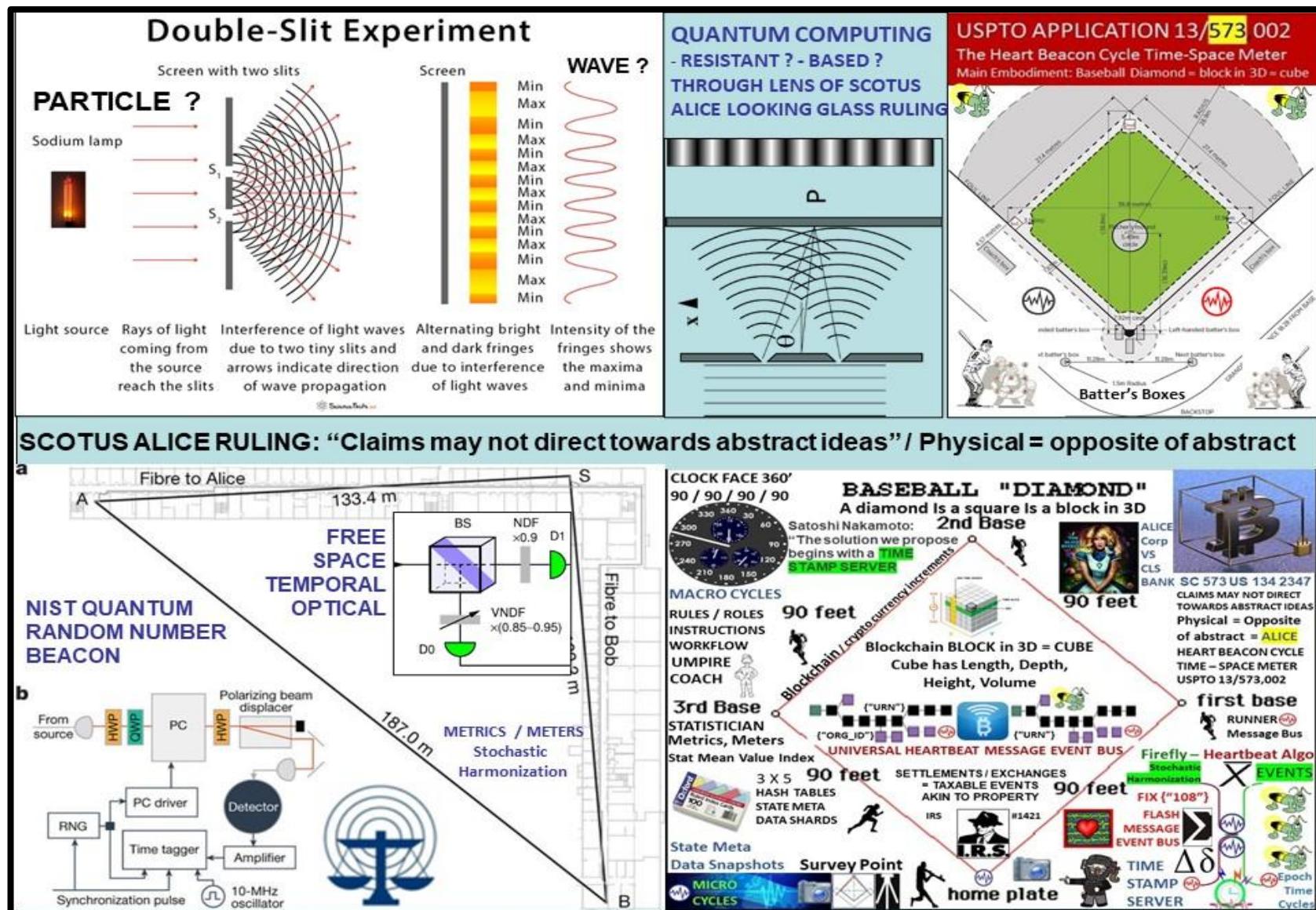


Figure 44: Time Chain / Time Stamp Server based QFS “Quantum Financial System” (Quantumly bogus)

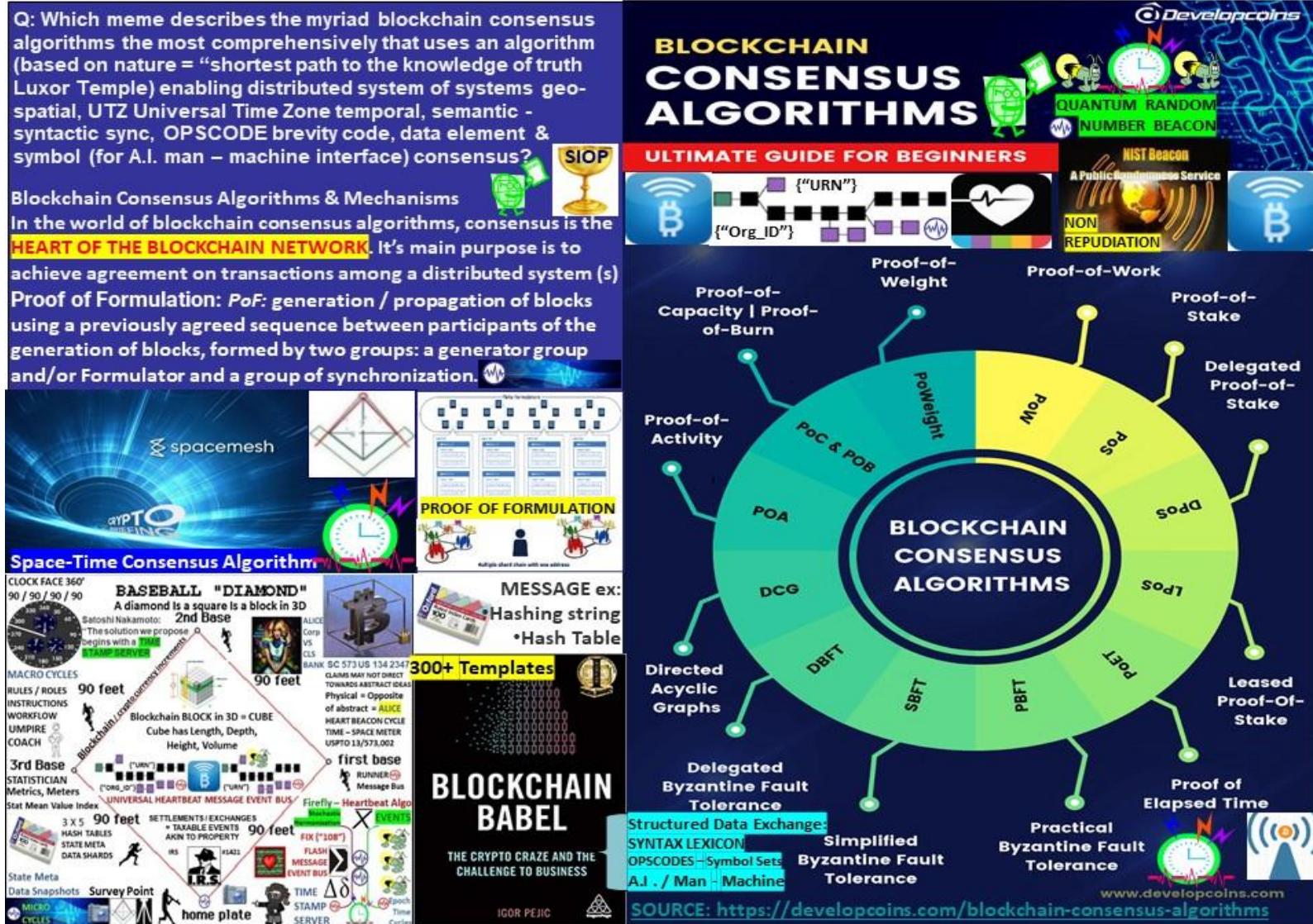


Figure 45: Universal meme / myriad consensus algorithm blockchain memes / metaphors = Tower of Babel

**PROOF-OF-WORK**

THE PROBABILITY OF MINING A BLOCK IS DEPENDENT ON HOW MUCH WORK IS DONE BY THE MINER

BITCOINS VALUE IS TIME ITSELF

cycle n → n + 1 → n + 2

TIMESTAMP marks the point that work started. Additionally, it contributes to the uniqueness of the work by an individual miner

THROTTLE equivalent to difficulty. State •target = maximum value of 8 bytes Snap (2^64) divided by the difficulty.

NONCE increments from 0..N until the target is met.

GUESS stores the guess Effectively, it begins at infinity.

HASH → cycle n → n + 1 → n + 2 → Δδ

**Proof-of-Work:** users perform some form of work to participate. Work must be difficult for the client but easy for the server/network to verify. POW determines the approximate time between blocks = rate that new bitcoins are created. Work is submitted as a message/timestamp payload with a nonce value. Payloads are made unique through use of public key encryption or address.Nonce allows checking the work without retracing all the procedural steps.

MESSAGE ex:  
•Hashing string  
•Hash Table

300+Message Templates

LOGIC FILTERS  
LOGIC GATES

SYNTAX LIBRARY  
LEXICON

CODER'S GUIDE

POW PAYLOAD : COMBINATIONS OF ENCRYPTED SYNTAX Attribute Series

Time Series Databases

FIREFLY-HEARTBEAT ALGORITHM STOCHASTIC HARMONY ACROSS TIME ZONES

CLOCK FACE 360°  
90 / 90 / 90 / 90

Satoshi Nakamoto: "The solution we propose begins with a TIME STAMP SERVER

BASEBALL "DIAMOND"

A diamond Is a square Is a block in 3D

2nd Base

ALICE Corp VS CLS BANK SC 573 US 134 2347 CLAIMS MAY NOT DIRECT TOWARDS ABSTRACT IDEAS Physical = Opposite of abstract = ALICE HEART BEACON CYCLE TIME - SPACE METER USPTO 13/573,002

90 feet

Blockchain BLOCK in 3D = CUBE Cube has Length, Depth, Height, Volume

3rd Base

STATISTICIAN Metrics, Meters Stat Mean Value Index

90 feet

SETTLEMENTS / EXCHANGES = TAXABLE EVENTS AKIN TO PROPERTY

IRS #1421

90 feet

3 X 5 HASH TABLES STATE META DATA SHARDS

90 feet

UNIVERSAL HEARTBEAT MESSAGE EVENT BUS

Firefly - Heartbeat Algo Stochastic Harmonization

FIX ("108")

FLASH MESSAGE EVENT BUS

TIME STAMP SERVER

Δδ

Epoch Time Cycles

Micro Cycles

Survey Point

home plate

Time Series

Value

Time

O'REILLY

CALENDAR

ALICE

CLL

BANK

SC

573

US

134

2347

CLAIMS

MAY

NOT

DIRECT

TOWARDS

ABSTRACT

IDEAS

Physical

=

Opposite

of

abstract

=

ALICE

HEART

BEACON

CYCLE

TIME

-

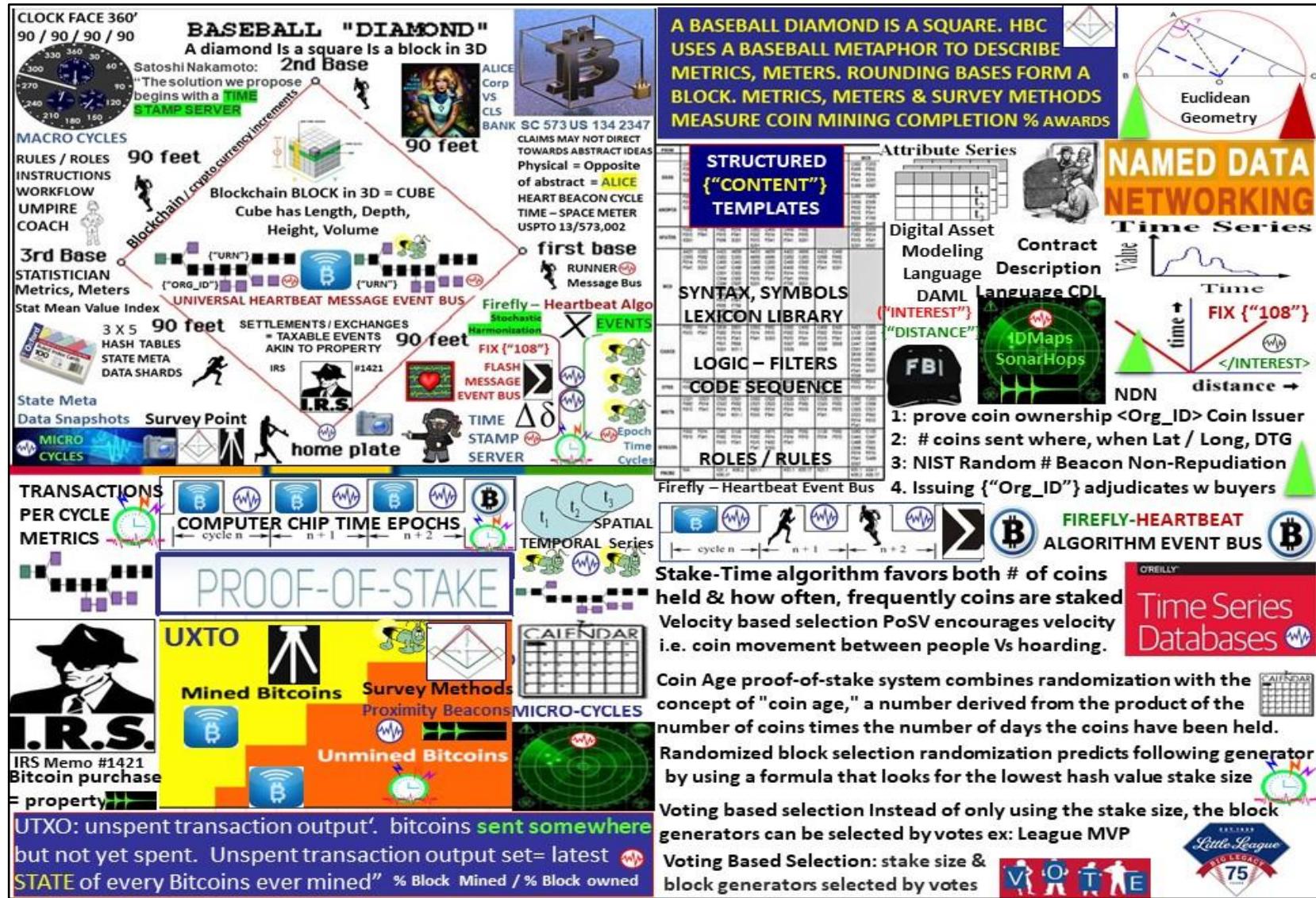
SPACE

METER

USPTO

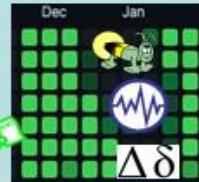
13/573,002

Figure 46: Proof of Work Consensus / USPTO 13/573,002



## PoST Proof-of-Spacetime (PoST)

PoST shows that physically storing data (spent "spacetime" resource/allocated storage capacity to the network) over a certain period of time.



Micro-Cycle  
State Meta  
Data Snapshots

$$\Delta\delta$$

PoST users / nodes must prove that they are spending a certain amount of space for storage.

181 contributions in the last year EVENT MESSAGE BUS ("108") Contribution settings ▾

Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun

Mon Wed Fri

Learn how we count contributions  $\Delta\delta$

The proposed Universal Timezone System would do away with all these different time zones. Instead, it would be the same time all over the world, all the time.

**ERLANG** TIME EQUATIONS

queueing systems wait times stochastic processes, function scheduling Start, Stop TTL Nicotib Erlang / Equilibrium Time - Sync Algorithms ROLES RULES

PROXIMITY BEACONS BLOCKCHAIN PARSING

STATE META DATA SNAPSHOTS BITCOIN BLOCKCHAIN TRANSACTIONS ARE BASED ON TIME SEQUENCING TRANSACTION STATE CHANGES TO DISTRIBUTED LEDGERS BEACON BROADCAST

MICRO- CYCLES QUANTUM RANDOM # NIST Beacon A Public Randomness Service ATOMIC CLOCK NON REPUDIATION

Heartbeat Date Time Stamps Sync Pulse Process transactions by precedence Attribute Series TIME Function  $t_1, t_2, t_3$  Geo Spatial Temporal Series

Arrival Rate Queue Forms Limited Resource Service Rate RFID Utilization \* Service Time ( $T_s$ )

Time Series Value Time  $\Delta\delta$

DISTRIBUTED AUTONOMOUS ORGANIZATIONS DAO Heart Beacon Cycle FEDERATE / TRADE FEDERATIONS

CLOCK FACE 360° 90 / 90 / 90 / 90 330 340 30 60 270 240 210 180 150 120 90 Satoshi Nakamoto: 2nd Base BASEBALL "DIAMOND" A diamond is a square is a block in 3D SC 573 US 134 2347 CLAIMS MAY NOT DIRECT TOWARDS ABSTRACT IDEAS Physical = Opposite of abstract = ALICE HEART BEACON CYCLE TIME - SPACE METER USPTO 13/573,002 first base RUNNER Message Bus Firefly - Heartbeat Algo EVENTS Blockchain Intermediary FIX ("108") FLASH MESSAGE EVENT BUS TIME STAMP SERVER  $\Delta\delta$  Epoch Time Cycles Survey Point IRS #1421 home plate

Figure 48: PoST Proof of Space – Time Consensus / USPTO 13/573,002

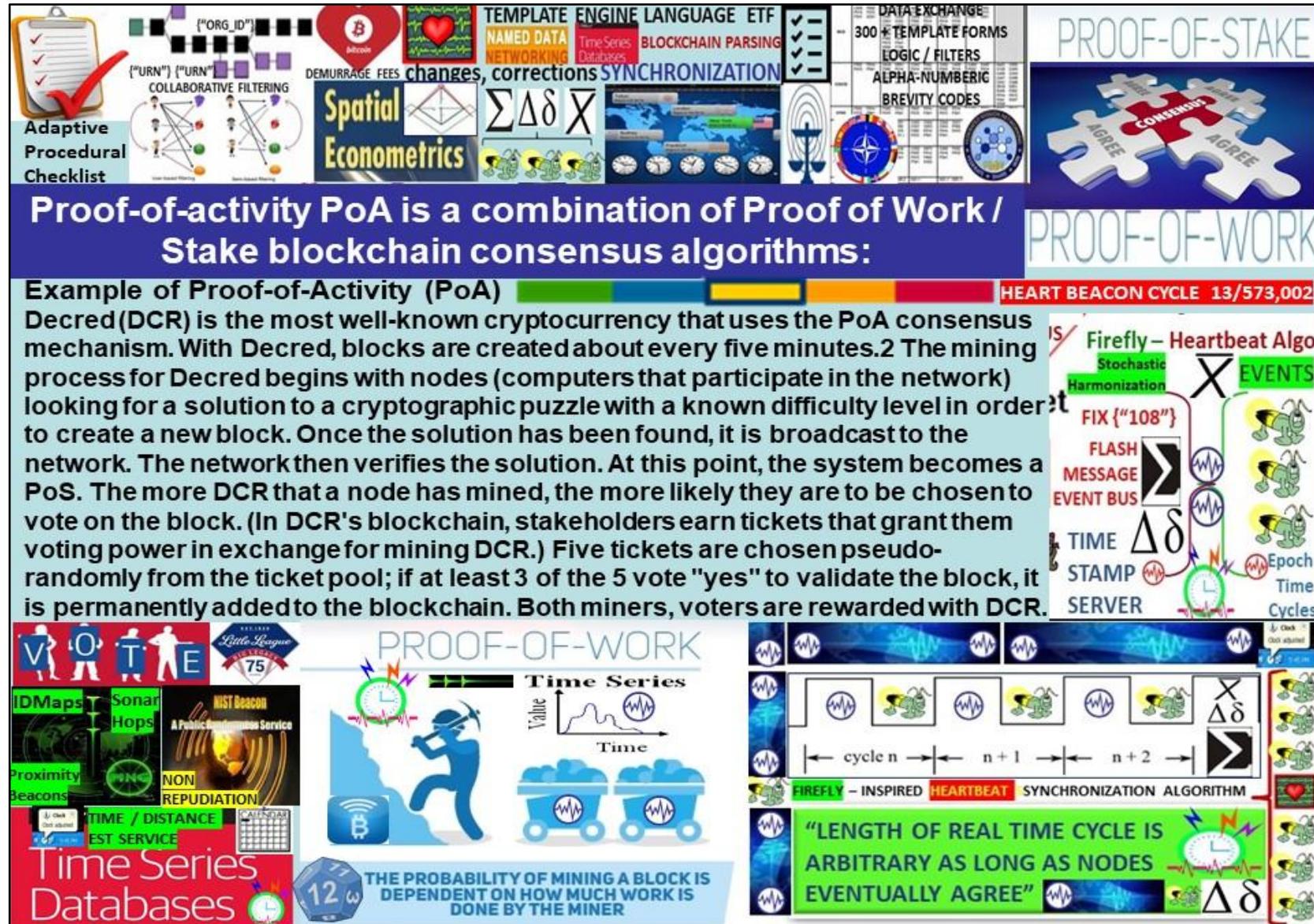


Figure 49: Proof of Activity Consensus / USPTO 13/573,002

## Proof of Authority

Not pay to play, Node identity is kept as stake

A PoA network are secured by validators, that are selected democratically by existing validators. The nodes on the PoA network are rewarded for validating the transactions on the network. The identity of the validator is kept anonymous by encryption and secured cryptographically. It is revealed only as a negative reinforcement when the validator processes a fraudulent or a malicious transaction.

A notary license verifies the identity of the person formally, a notary license is released by the Federation / Government after extensive verification. The identity of the validator is kept for cross-referencing with the notary data and blockchain data

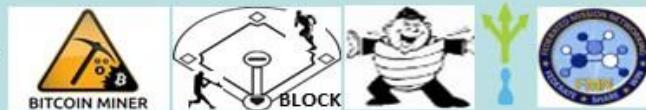
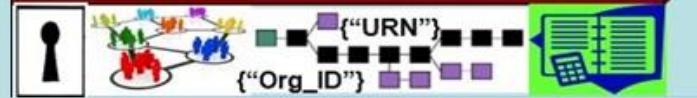
Parity supports a Proof-of-Authority consensus engine. Proof-of-Authority is a replacement for Proof-of-Work, and can be used for private or centralized chains. PoA as tested by a Kovan test network improves outdated economic models.

1. FEDERATION: Latin: foedus, foederis, covenant, union of partially self-governing states or regions under a central (federal) government
  2. A league or confederacy. Individuals / groups retain AUTONOMY
  3. A federated body formed by nations, states, and... unions  
each retaining control of internal affairs
- Federation Gateway CHANNEL
- Net joins, drops, splits, merges, moves Agile, adhoc NETOPS Vs acquisition preserves the CHANNEL



DISTRIBUTED AUTONOMOUS ORGANIZATIONS DAO

## Heart Beacon Cycle FEDERATE / TRADE FEDERATIONS



DISTRIBUTED AUTONOMOUS ORGANIZATION = DAO RAND Corp

term coined circa 1991 now in use by Blockchain tech corporations

Uniform\_Resource\_Name

IoT DEVICE / PLATFORM {"Asset\_Type"}  
IoT SENSOR DEVICE {"Asset\_Class"} </URN>

123e4567-e89b-12d3-a456-426655440000  
123e4567-e89b-12d3-a456-426655440001  
123e4567-e89b-12d3-a456-426655440002

UUID  
STOCK EXCHANGE  
MIC MARKET IDENTIFIER  
CODES / BREVITY CODES

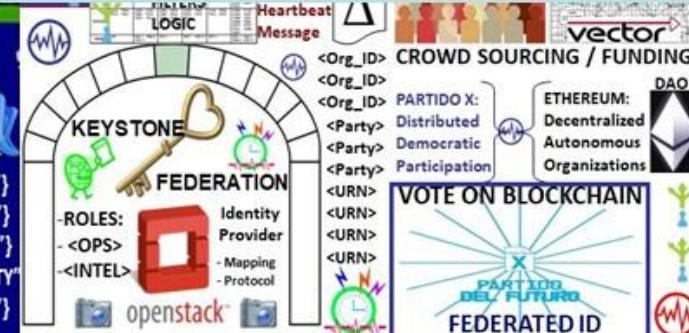


Figure 50: Proof of Authority Consensus // USPTO 13/573.002

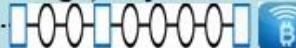
# Proof of Burn



Proof of burn (POB) operates on the principle of allowing miners to “burn” virtual currency tokens. They are then granted the right to write blocks in proportion to the coins burnt.

Iain Stewart, the inventor of the POB algorithm, uses an analogy to describe the algorithm: burnt coins are like mining rigs. In this analogy, a miner burns their coins to buy a virtual mining rig that gives them the power to mine blocks. The more coins burned by the miner, the bigger their virtual mining “rig” will be.<sup>2</sup>

To burn the coins, miners send them to a verifiably un-spendable address. This process does not consume many resources (other than the burned coins) and ensures that the network remains active and agile. Depending upon the implementation, miners are allowed to burn the native currency or the currency of an alternate chain, such as Bitcoin. In exchange, they receive a reward in the native currency token of the blockchain.



You can send out transactions to the network that will burn your own cryptocurrency coins. Other participants can mine/burn on top of your block, and you can also take the transactions of other participants to add them to your block. Essentially, all of this burning activity keeps the network agile, and participants are rewarded for their activities (both burning their own coins and burning other people's coins).

To prevent the possibility of unfair advantages for early adopters, the POB system has implemented a mechanism that promotes the periodic burning of cryptocurrency coins to maintain mining power. The power of burnt coins “decays” or reduces partially each time a new block is mined. This promotes regular activity by the miners, instead of a one-time, early investment. To maintain a competitive edge, miners may also need to periodically invest in better equipment as technology advances.

UNIVERSAL HEARTBEAT MESSAGE EVENT BUS

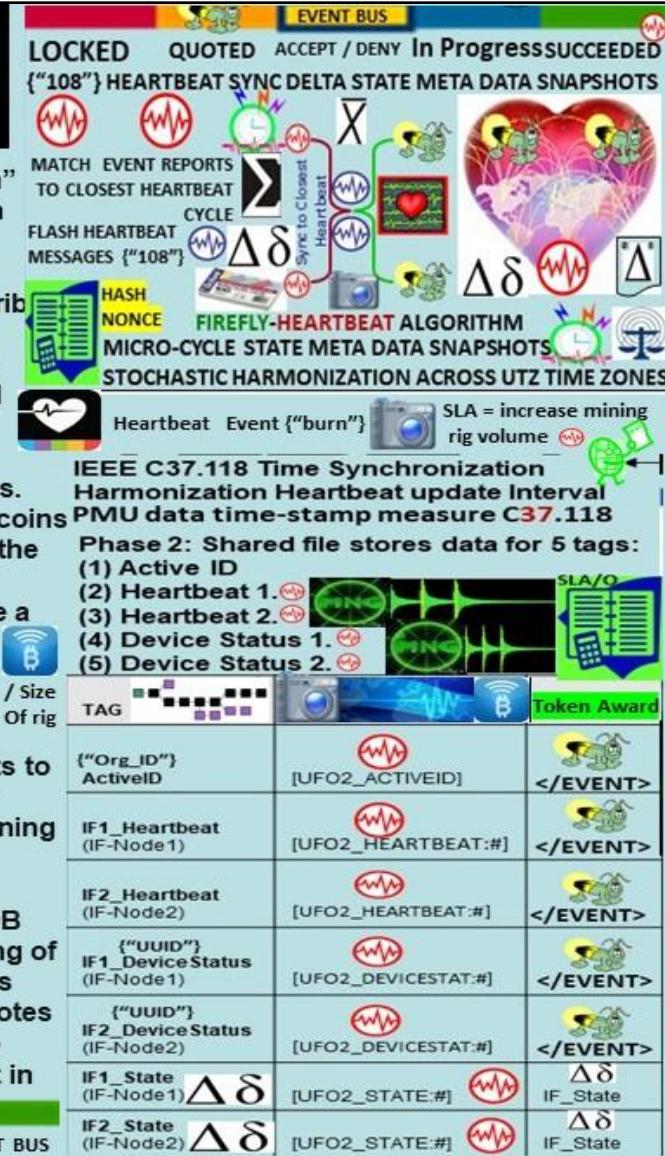


Figure 51: Proof of Burn Consensus / USPTO 13/573,002

# Proof of Capacity PoC

**consensus mechanism algorithm for mining devices to use hard drive space to decide mining rights, validate transactions**

Proof of capacity for mining devices, also known as blockchain nodes, to use empty space on their hard drive to mine the available [cryptocurrencies](#).



Instead of repeatedly altering the numbers in the block header & repeated hashing for the solution value as in a PoW system, PoC works by storing a list of possible solutions on the mining device's hard drive before mining activity starts

Micro-Cycle State Meta Data Snapshots  $\Sigma$   $\Delta\delta$

The larger the hard drive, the > possible solution values one can store on the hard drive, the more chances a miner has to match required hash value from his list, resulting in more chances to win the mining reward.



Analogy: if lottery rewards are based on matching the most numbers on the winning ticket, then a player with a longer list of possible solutions will have better chances of winning. Additionally, the player is allowed to keep using the lottery ticket block numbers again and again repeatedly.



Figure 52: Proof of Capacity Consensus / USPTO 13/573,002

In a proof-of-stake network, it is the number of coins held in a wallet that determines the "weight" of the user the likelihood for the user to receive the block reward. In a Proof-of-Weight consensus mechanism, any value, not just the amount of coins held, is used to determine the "weight" of a user.

  
The Volumetric Weight is often referred to as dimensional weight

$$\text{Volumetric Weight} = [\text{Width} \times \text{Length} \times \text{Height}]$$



On the Filecoin blockchain, for example, the amount of IPFS data that a user is storing is used as the weighted value.

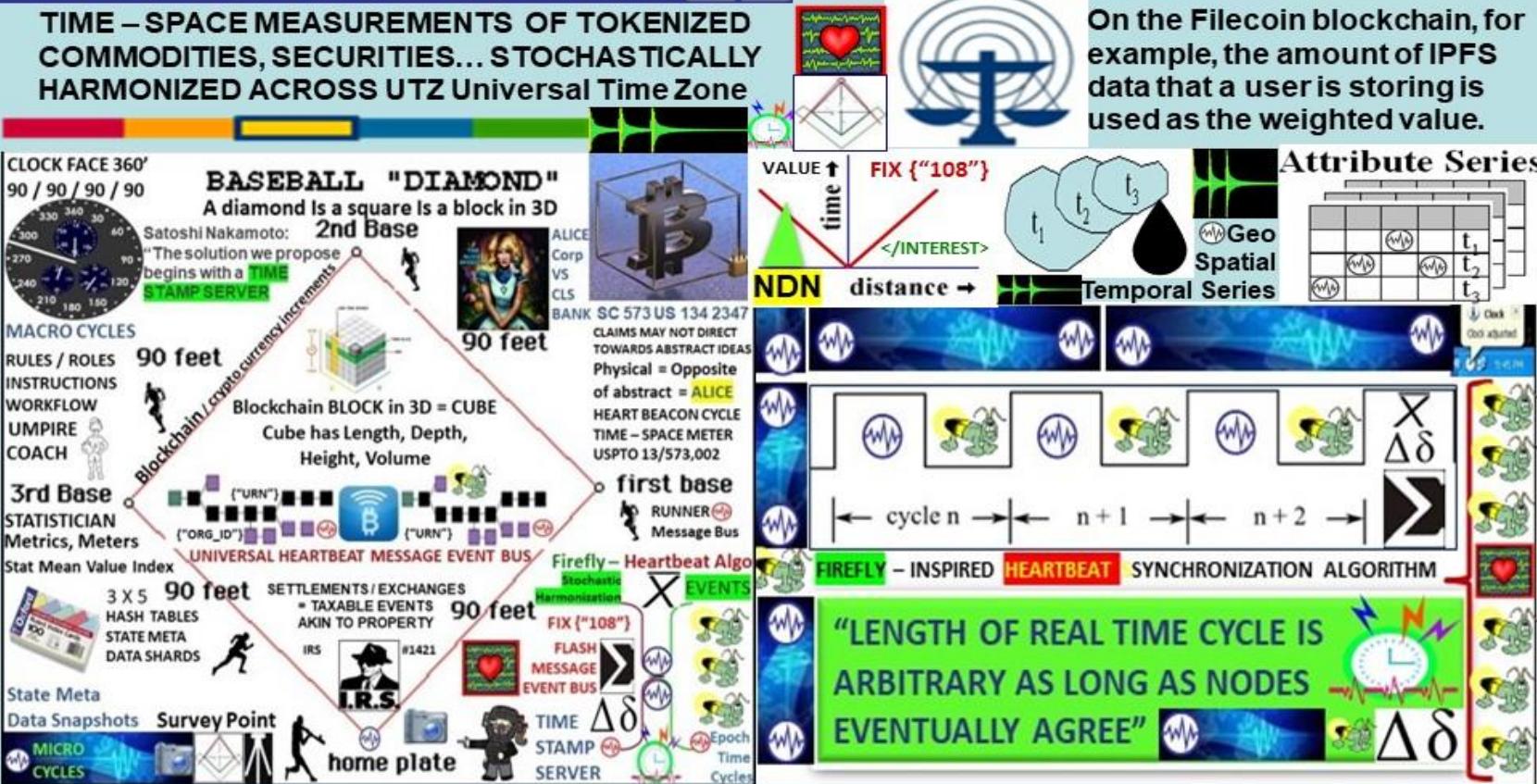


Figure 53: Proof of Weight Volumetric Consensus / USPTO 13/573,002

Bitcoin Classic seeks to mitigate the problem of more transactions, which are causing transaction backlogs and increased transaction costs, by increasing the block size - the number of kilobytes in a block of transactions - from 1MB to 2MB.



FIGURE 54: Bitcoin Classic - Core - Unlimited // USPTO 13/573,002

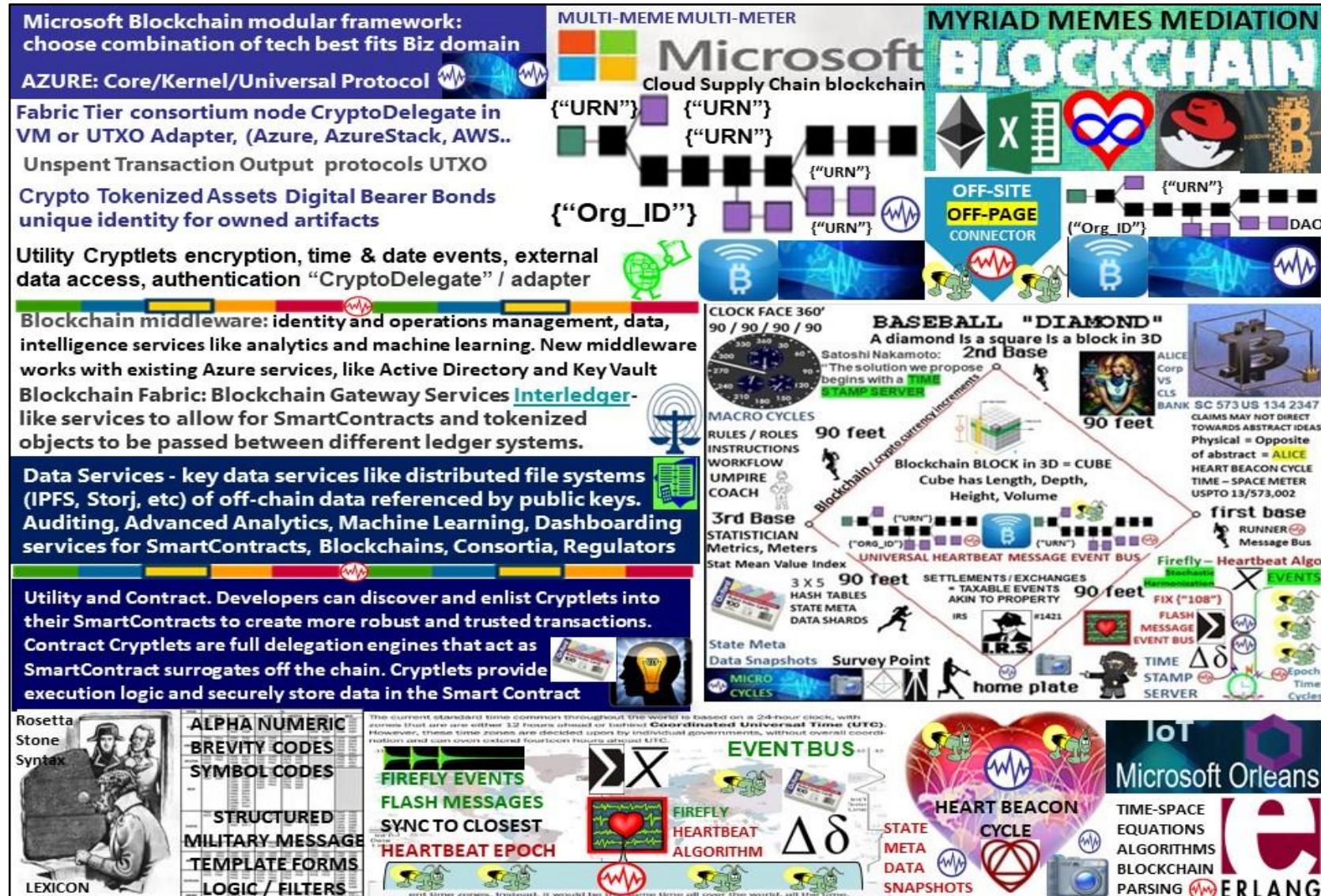


FIGURE 55: MICROSOFT CLOUD BLOCKCHAIN INTEROPERABILITY / USPTO 13/573,002

## SAWTOOTH LAKE POETIC CONSENSUS PROOF OF ELAPSED TIME: POET

"PoET for 'Proof of Elapsed Time', is a **lottery protocol** that builds on trusted execution environments (TEEs) provided by Intel's [Secure Guard Extensions] to address the needs of large populations of participants. The second, **Quorum Voting**, is an adaptation of the Ripple and Stellar consensus protocols and serves to address the needs of applications that require immediate transaction finality."

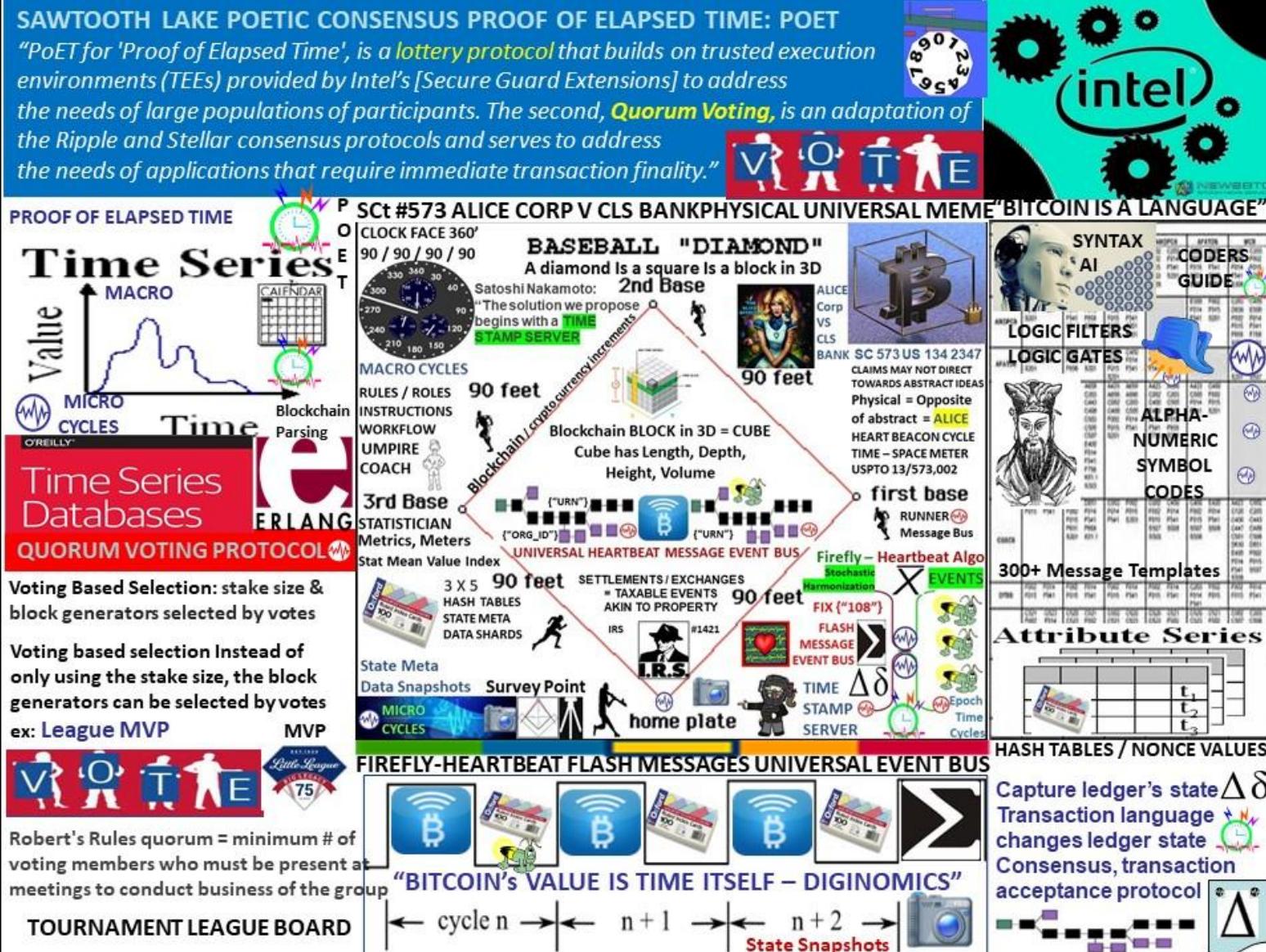


Figure 56: SAWTOOTH POET Proof of Elapsed Time Consensus / USPTO 13/573,002

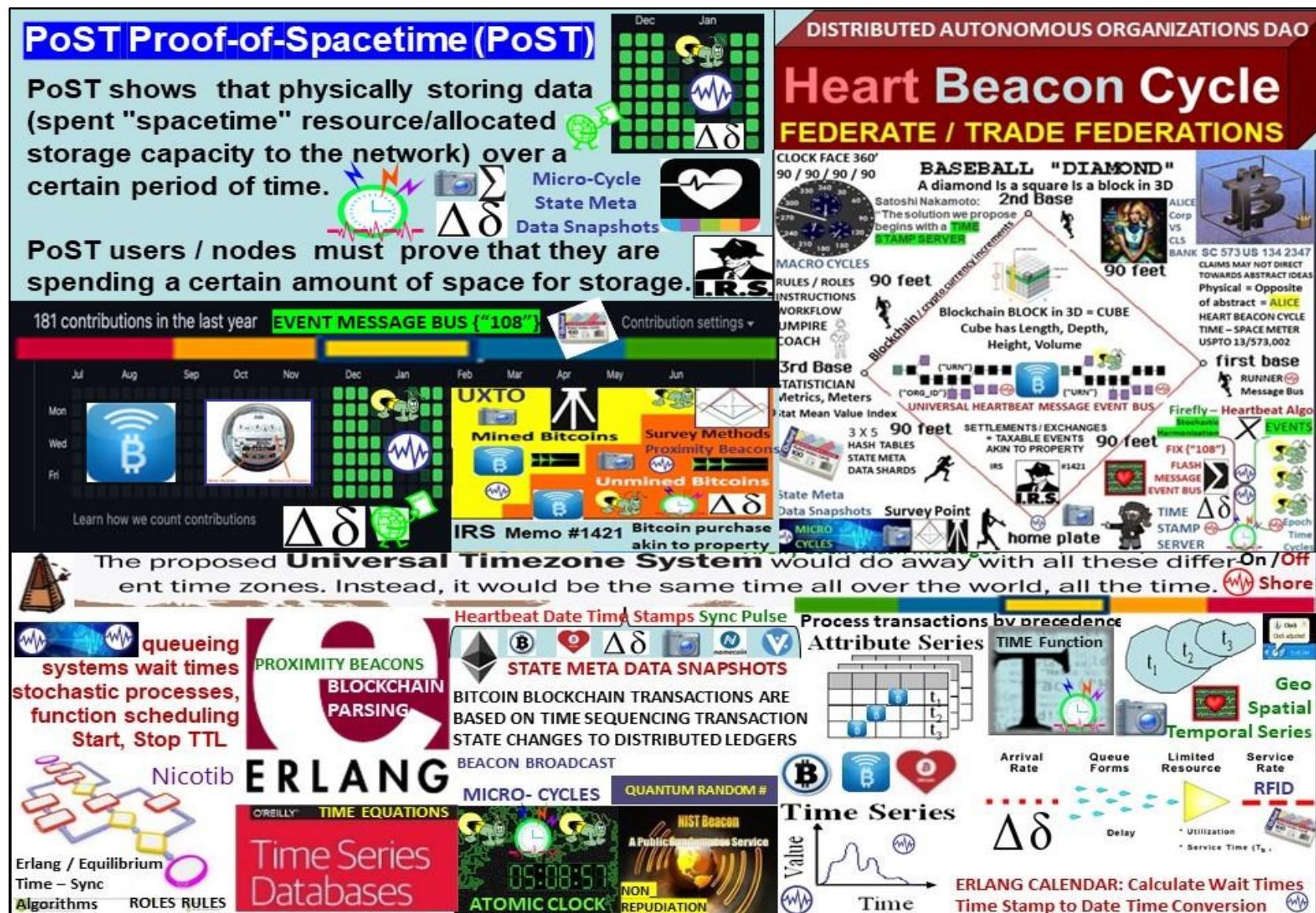


Figure 57: Proof of Space Time POST / USPTO 13/573,002

**STATE:** stored data at a given instant in time  
**STATE CHANNELS:** blockchain interactions which *could* occur on the blockchain, but instead get conducted off of the blockchain, without significantly increasing the risk of any participant.



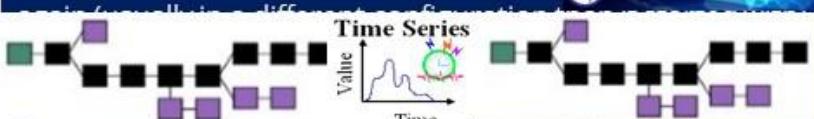
1. Part of the blockchain state is locked via multisignature or smart contract convention, so that a specific set of participants must completely agree with each other to update it.



2. Participants update the state amongst themselves by constructing and signing transactions that *could* be submitted to the blockchain, but instead are made public for all to see. A new update "trumps" previous updates.



3. Finally, participants submit the state back to the blockchain, which closes the state channel.



**NEW UPDATES OVERWRITE THE PREVIOUS:** simplest way is to have any unlocking attempt start a timer, during which any *newer* update can replace the old update (restarting the timer). When the timer completes, the channel is closed and the state adjusted to reflect the last update received. The length of the timer would be chosen for each state channel, balancing the inconvenience of a long channel closing time with the increased safety it would provide against internet connection or blockchain problems. Alternatively, one could structure channel with a financial penalty so anyone publishing an inaccurate update to the

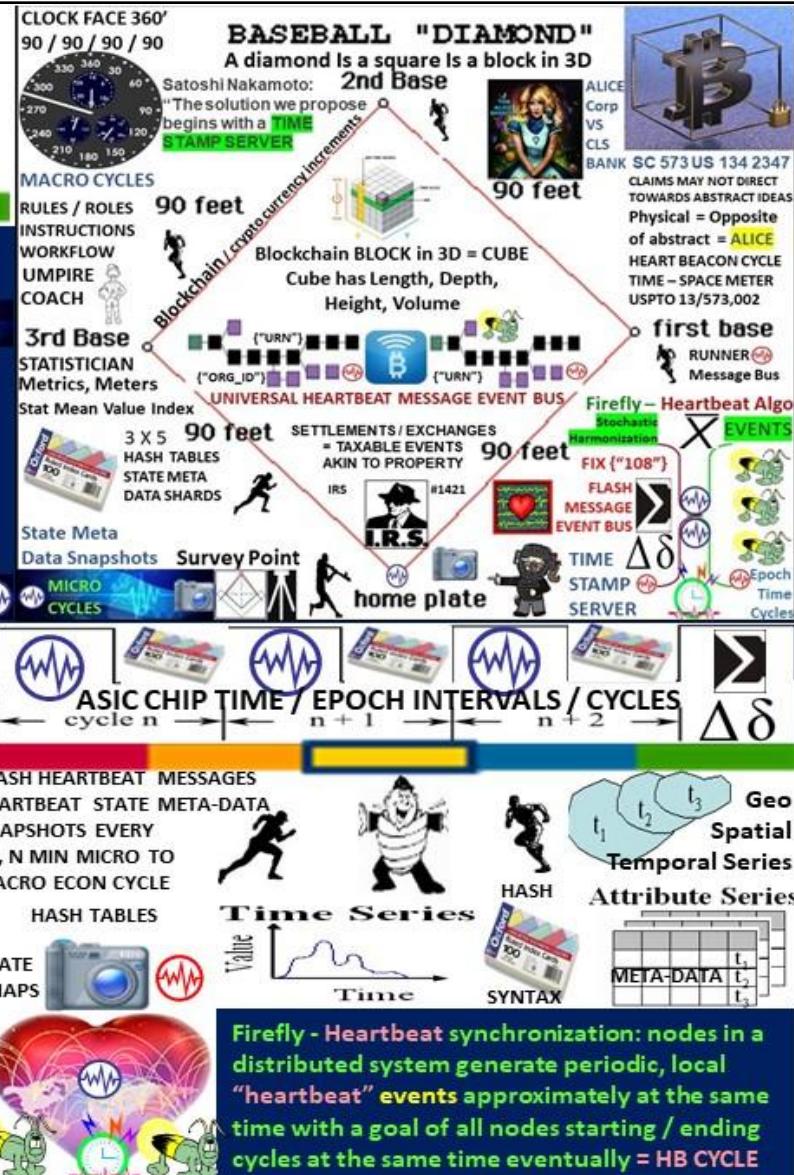


Figure 58: State Channels / USPTO 13/573,002

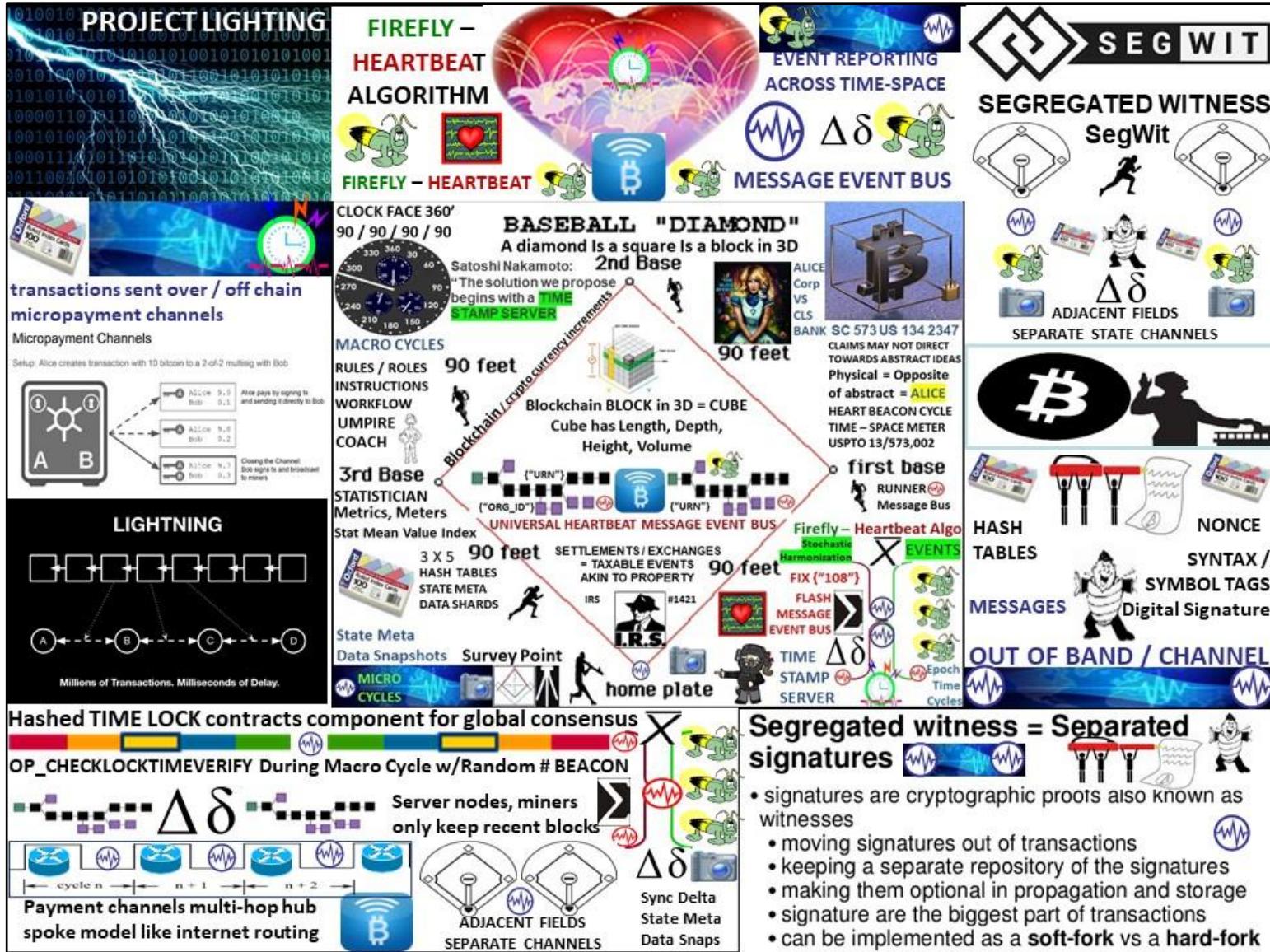


FIGURE 59: Segregated Witness / Project Lightning Consensus / USPTO 13/573,002

## BITCOIN NG NEX GEN / Heart Beacon Cycle 13/573,002

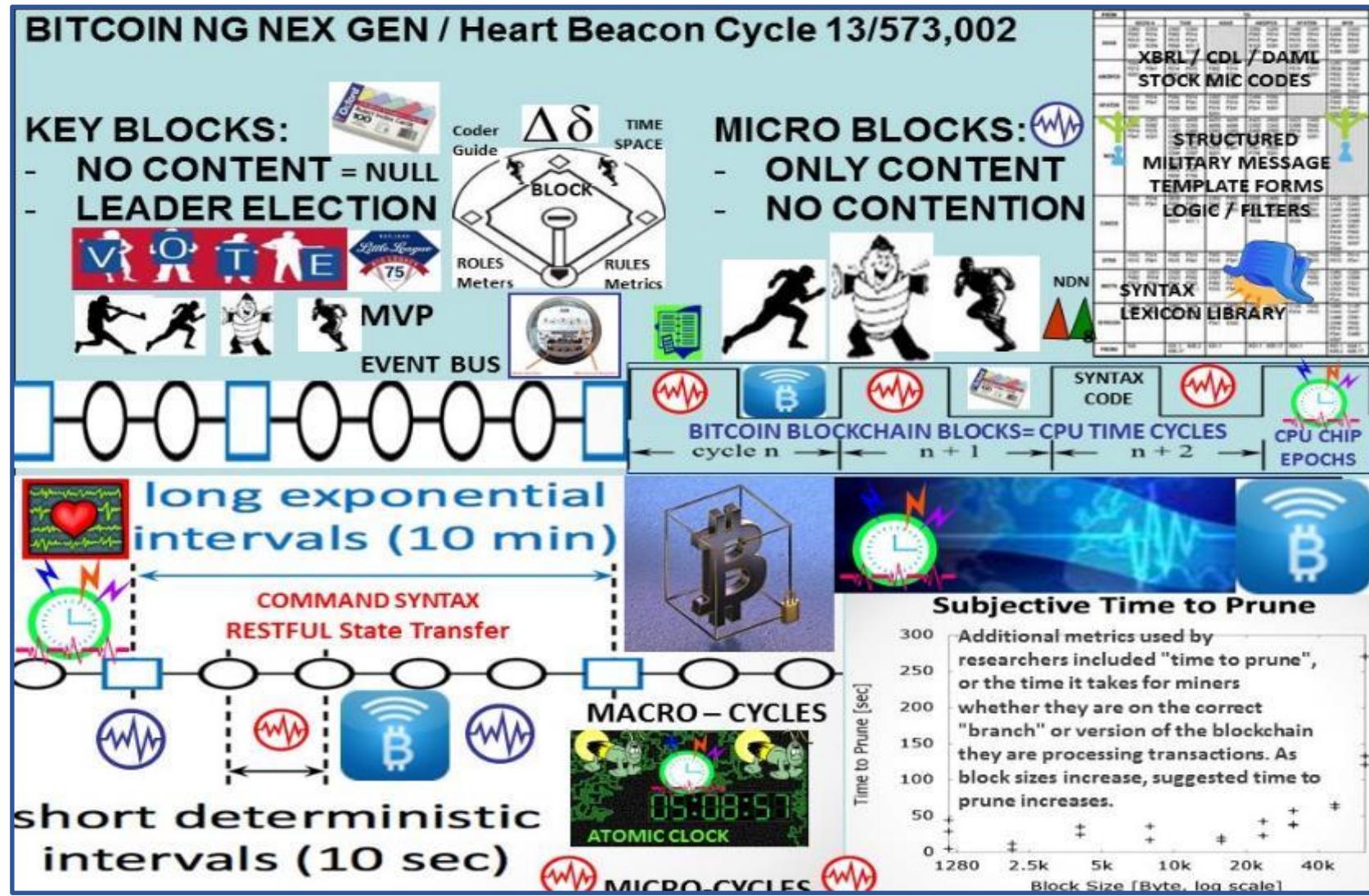


FIGURE 60: BITCOIN NG NEXT GENERATION / USPTO 13/573,002

**DON: DECENTRALIZED ORACLE NETWORKS**



**Explicit Staking**

Chainlink nodes lock up LINK tokens as collateral that can be slashed for malicious and undesirable behavior.

Chainlink's explicit staking model's goal is to achieve a super-linear staking impact—a mechanism where malicious actors are required to have a budget significantly larger than the combined deposits of all nodes within a DON, creating increasingly greater security guarantees for high-value smart contract applications in a cost-efficient manner.

Explicit staking in Chainlink 2.0 oracle reports reflect the state of specific real-world events outside a blockchain (off-chain).

Chainlink's explicit staking mechanism protects against a broad range of attacks, including advanced strategies like prospective bribery, in which nodes are targeted according to their role in the network, such as those selected for report adjudication.

Behind each DON is a service agreement that will define the number of LINK tokens each oracle node is required to stake and key performance requirements, such as how far an individual node's response can deviate from the aggregated value and how far the aggregated value in an oracle report can deviate from the correct value it should represent. The service agreement can also define other parameters such as the data sources used, how often updates should occur, how much each node is paid, and more.

Outputs produced by a DON are structured into reporting rounds, where each round involves the creation of a new oracle report containing each node's individual response for a particular piece of data (e.g. the price of ETH/USD), with all the individuals responses aggregated into a single value (e.g. taking the median). A DON network's service agreement defines how each report should be generated & conditions in which a node's stake can be slashed.



**DISTRIBUTED AUTONOMOUS ORGANIZATIONS DAO**

# Heart Beacon Cycle

## FEDERATE / TRADE FEDERATIONS

Linear Sequential Meme  
....-1 / 0 / +1...  $\Delta\delta > \Sigma$

**FIREFLY – INSPIRED HEARTBEAT SYNCHRONIZATION ALGORITHM**

**HEART BEACON CYCLE STATE META DATA SNAPSHTOS**

**IoT Microsoft Orleans**

TIME-SPACE EQUATIONS ALGORITHMS BLOCKCHAIN PARSING

**ERLANG**

**EVENT BUS**

One country observes one time zone, whereas others observe different times. This results in 24-hour clocks, with zones that are one either 32 hours ahead or behind Coordinated Universal Time (UTC). However, these time zones are decided upon by individual governments, without overall coordination and can cover up to four hours ahead UTC.

**FIREFLY EVENTS FLASH MESSAGES SYNC TO CLOSEST HEARTBEAT EPOCH**

**FIREFLY HEARTBEAT ALGORITHM**

Figure 61: Decentralized Oracle Networks / USPTO 13/573,002

**Block-Weighted-Average-Price (B-WAP) API** creates a USD price for any block in the Bitcoin blockchain, based on BNC's Bitcoin Liquid Index (BLX). Automatically appropriates blockchain transactions with a USD price or technical indicator for traders.

#### Key Features:

Look up any bitcoin blockchain transaction and receive back a USD value for any transaction.



Built using historic bitcoin price index - the [BNC BLX](#).

API updated every 10 min with a 2 hour delay on latest blocks (due to the nature of Block propagation to ensure avoidance of publishing rates on orphaned blocks).

All rates time-stamped in UTC.

Ability to look up by time-stamp.

Ability to look up by block-height.

Asset Classes: Digital Currencies

Get by: Block-height, Time-stamp or Transaction

Transaction ID, Block ID, time-stamp, BWAP per block, Value in USD. BTC per transaction, bitcoin transaction fees per transaction

- Exchanges Covered: Price discovery for the B-WAP comes from utilizing the BNC [Bitcoin Liquid Index](#) (BLX) bitcoin price calculation.

- Historical Rates: This API goes back to 2010-07-17 23:14:35 UTC.

**BRAVE NEW COIN.**  
Digital Currency Insights

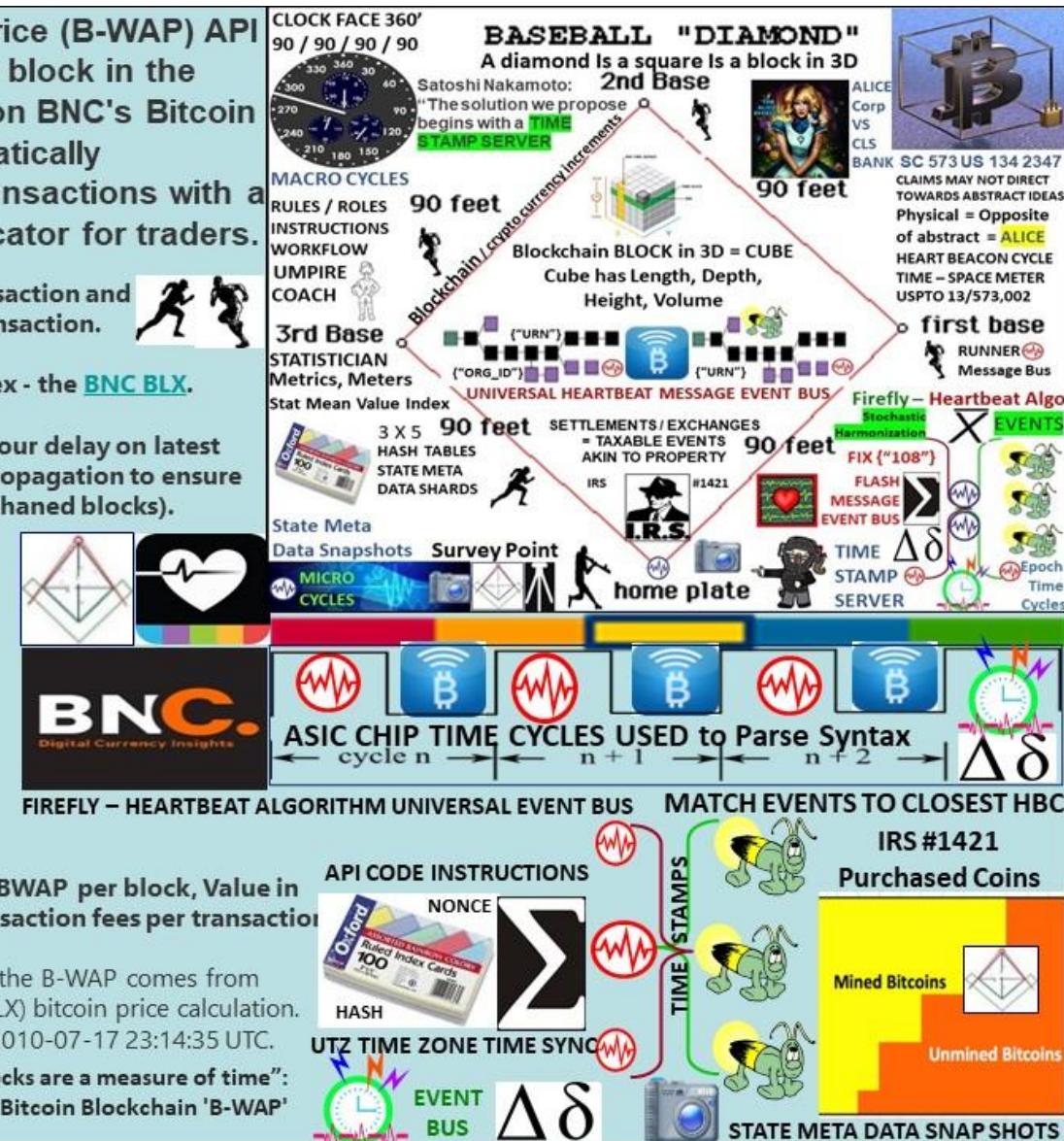


FIGURE 62: Brave New Coin B-WAP Consensus / USPTO 13/573,002



FIGURE 63: DASH / USPTO 13/573,002



FIGURE 64: ETHEREUM – CASPER / USPTO 13/573,002

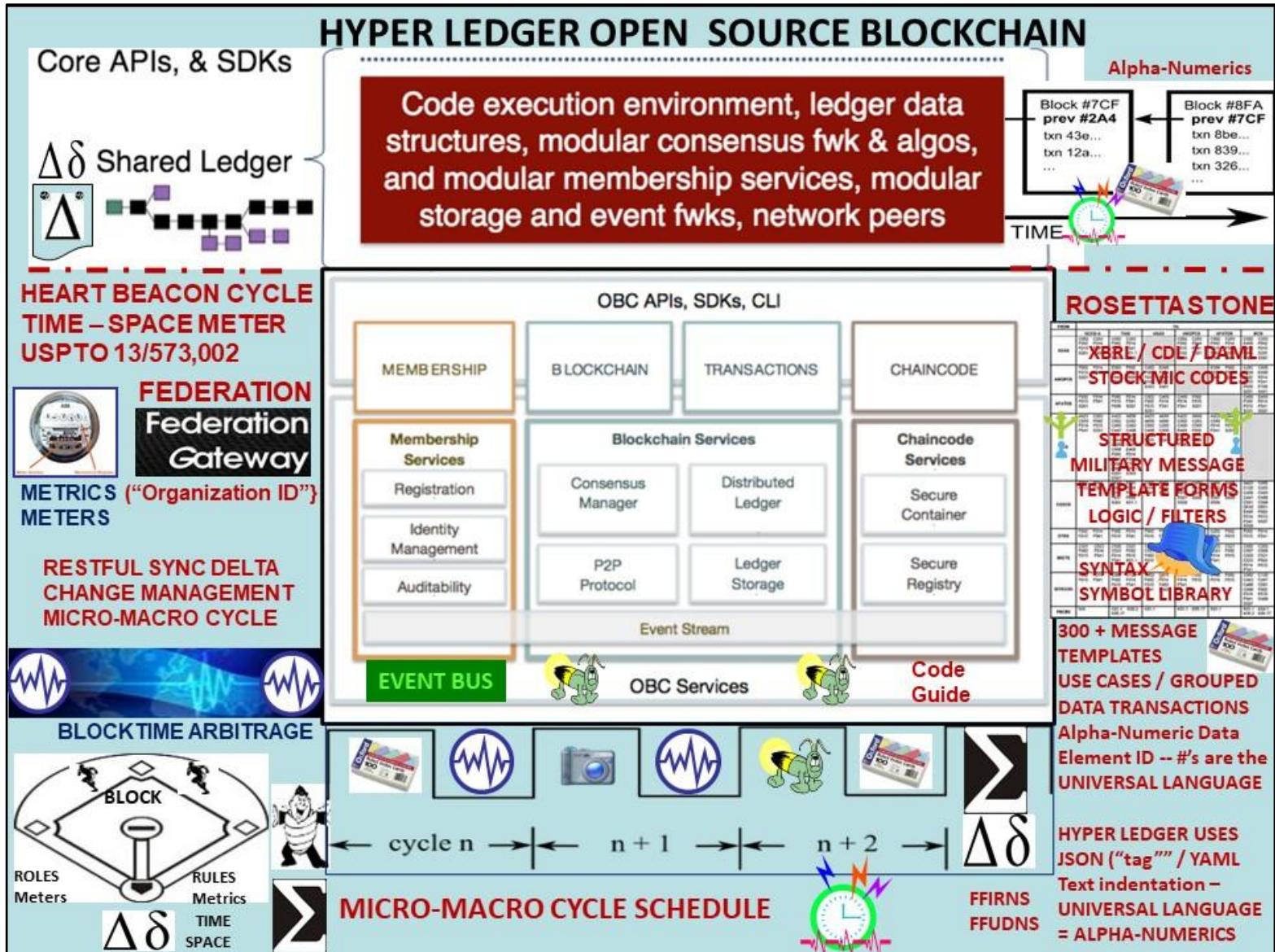


FIGURE 65: HYPERLEDGER FRAMEWORK / USPTO 13/573,002

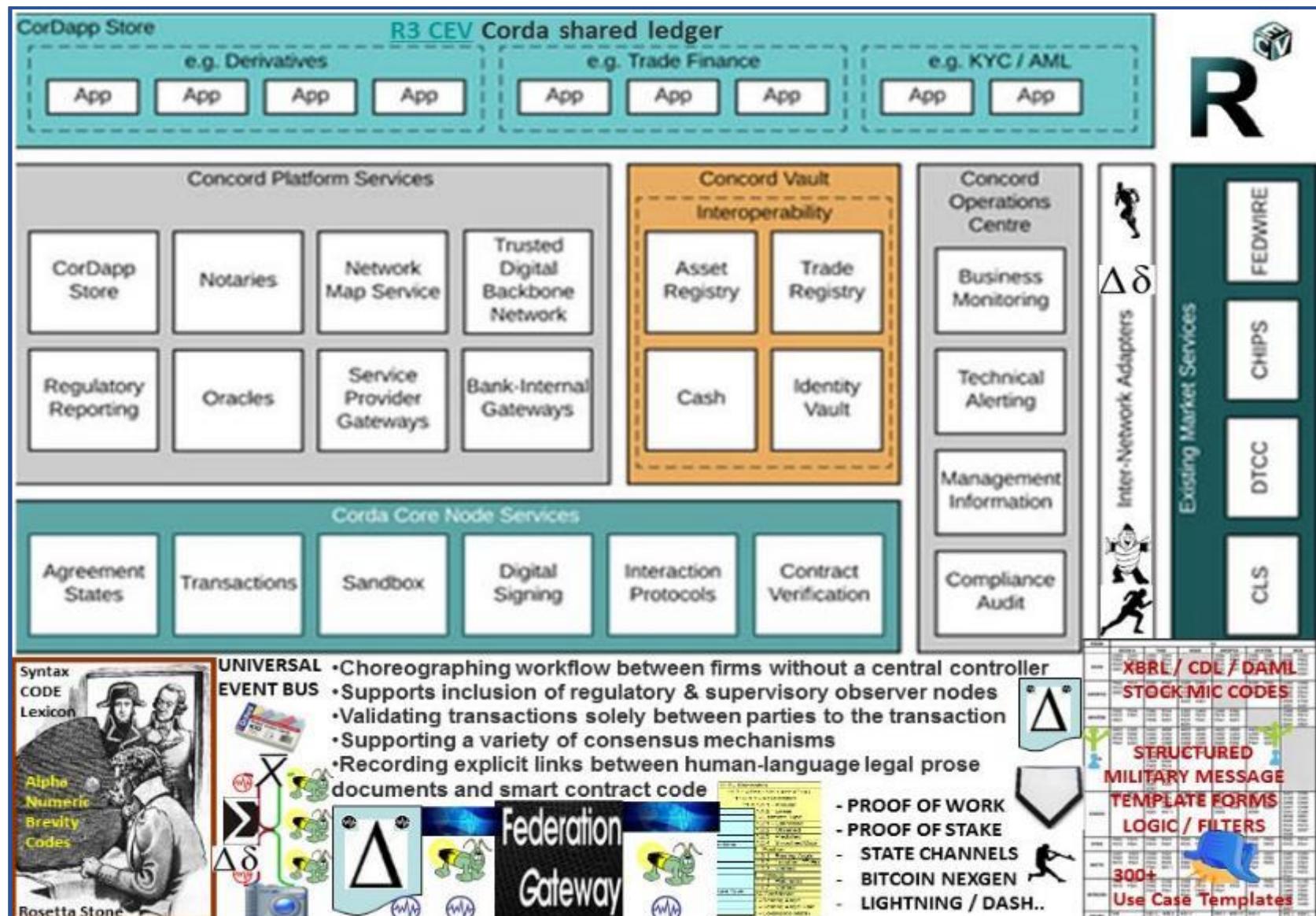


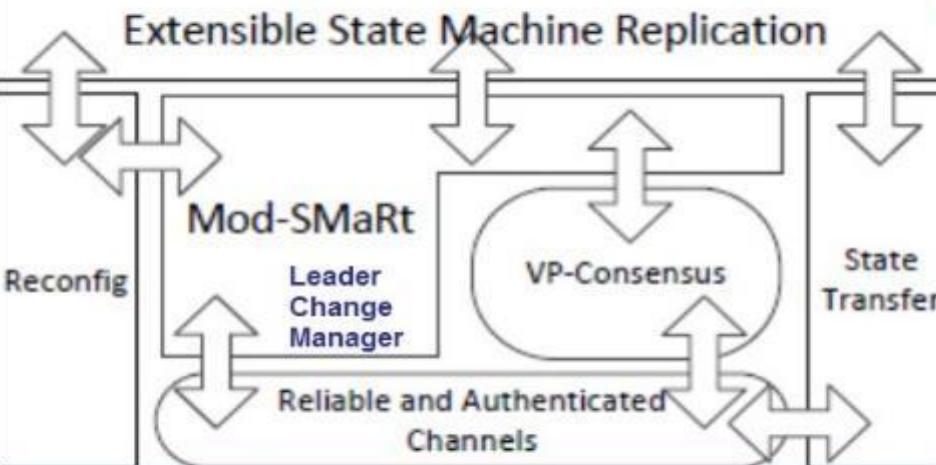
FIGURE 66: R3 Consortium CORDA / USPTO 13/573,002



FIGURE 67: DFINITY Blockchain Nervous System / USPTO 13/573,002

## Byzantine Fault-Tolerant State Machine Replication

BFT-SMART dynamic distributed system processes are divided in two nonintersecting subsets: replicas and clients. Each system process has a unique identifier. During dynamic system execution, a sequence of views is installed to denote the reconfigurations due to replicas joins and leaves. A view is composed by a set of replicas identifiers.



Modularity is achieved using a set of building blocks(or modules)containing the core functionality of BFTSMARt. Blocks are divided in three groups: communication system, state machine replication and state management.

### BFT-SMART needs an eventually synchronous system

Total order multicast is achieved using the Mod-SMaRt protocol and with the Byzantine consensus algorithm Clients send requests to all replicas in cv, and wait for replies. replicas store each batch of ordered requests to a (stable) log and, periodically, take snapshots of the application state and store it in stable memory.

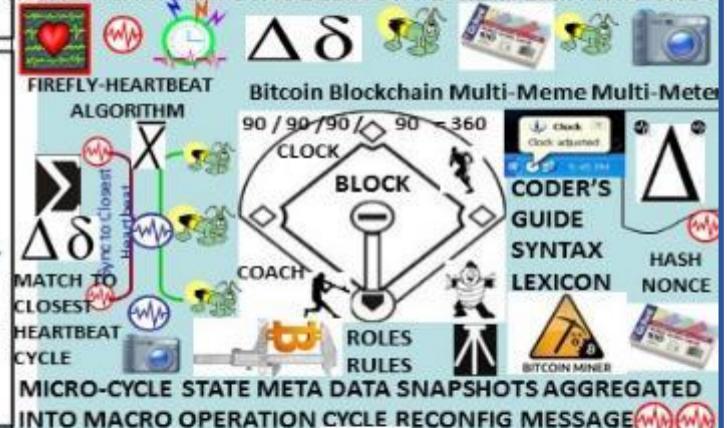
## USPTO 13/573,002 HEART BEACON CYCLE TIME-SPACE METER

USC ALICE CORP V CLS BANK  
PHYSICAL = OPPOSITE OF ABSTRACT



DERIVED FROM BATTLEFIELD DIGITIZATION DISTRIBUTED AUTONOMOUS ORGANIZATION DAO SYSTEM OF SYSTEMS  
FEDERATED ID / ORGANIZATIONAL IDENTIFIER {"ORG\_ID"}  
ADDS, JOINS, DROPS, MOVES TO / FROM DAO  
CHANGES IN STATE VIEWED IN "APPLIQUE' OVERLAY VIEWS

## K00.99 HEARTBEAT SYNC DELTA STATE META DATA SNAPSHOT



BUILDING BLOCKS:  

- TIME CYCLE EPOCHS
- SYNTAX INSTRUCTIONS

- LINEAR, SEQUENTIAL  

- GEO SPATIAL, TEMPORAL

Firefly inspired Heartbeat Synchronization nodes strive to sync in a distributed system. Nodes generate periodic "heartbeat" events approximately at the same time. It differs from classical clock sync in that nodes are not interested in counting cycles to agree on the ID of the current clock cycle. There is no requirement to sync during a cycle length in real time as long as the length is bounded and all nodes AGREE ON IT EVENTUALLY"

Figure 68: Byzantine Fault Tolerant BFT-SMART / USPTO 13/573,002

**OpenBazaar open source decentralized peer to peer network online commerce —using Bitcoin —no fees and no restrictions**



- Creates an online store for users to sell goods for Bitcoin
- Connects these stores directly to each other on a global network
- Users browse individual stores, search for products across whole network
- A buyer directly connects, purchases good from the merchant using Bitcoin
- Bitcoin payments via escrow protect merchants & buyers during trade

OpenBazaar is a different approach to online commerce. OpenBazaar connects buyers and sellers directly. Because there is no one in the middle of your transactions there are no fees, no restrictions, no accounts to create, and you only reveal personal information you choose.

**PROJECT PHILOSOPHY: *MAKE TRADE FREE***  
**Mission:** *shift trade to a decentralized platform*

**VALUES:** Demurrage TERRATRC TRADE Fees REFERENCE CURRENCY "Money of Peace"

**Free, open markets:** Commodity / Currency Index  
 Creating open, competitive markets for services that cannot be perfectly solved with technology

**Privacy** </Org\_ID>  
 - Users should fully control their data. Users have freedom to reveal as much personal identifiable information as they want, when they want

**Bitcoin: OpenBazaar transactional currency**

**Cryptographic Security**  
 - tamper-proof agreements  
 - 1) minimize potential disputes  
 - 2) fast-track dispute resolution



TERRA TRC  
 HEART BEACON CYCLE USPTO 13/573,002 TIME – SPACE METER  
 STAT MEAN VALUE PULSE REAL WORLD ASSETS RWA  
 STAT MEAN VALUE INDEX CONTRIBUTIONS TO STATISTICS  
 FIREFLY – HEARTBEAT ALGO SYNC EVENTS Δδ TO CLOSEST HB CYCLE UTZ SYNC Δδ  
 Price Indexes in Time and Space Methods and Practice SchellingPoint

FIGURE 69: Open Bazaar / USPTO 13/573,002

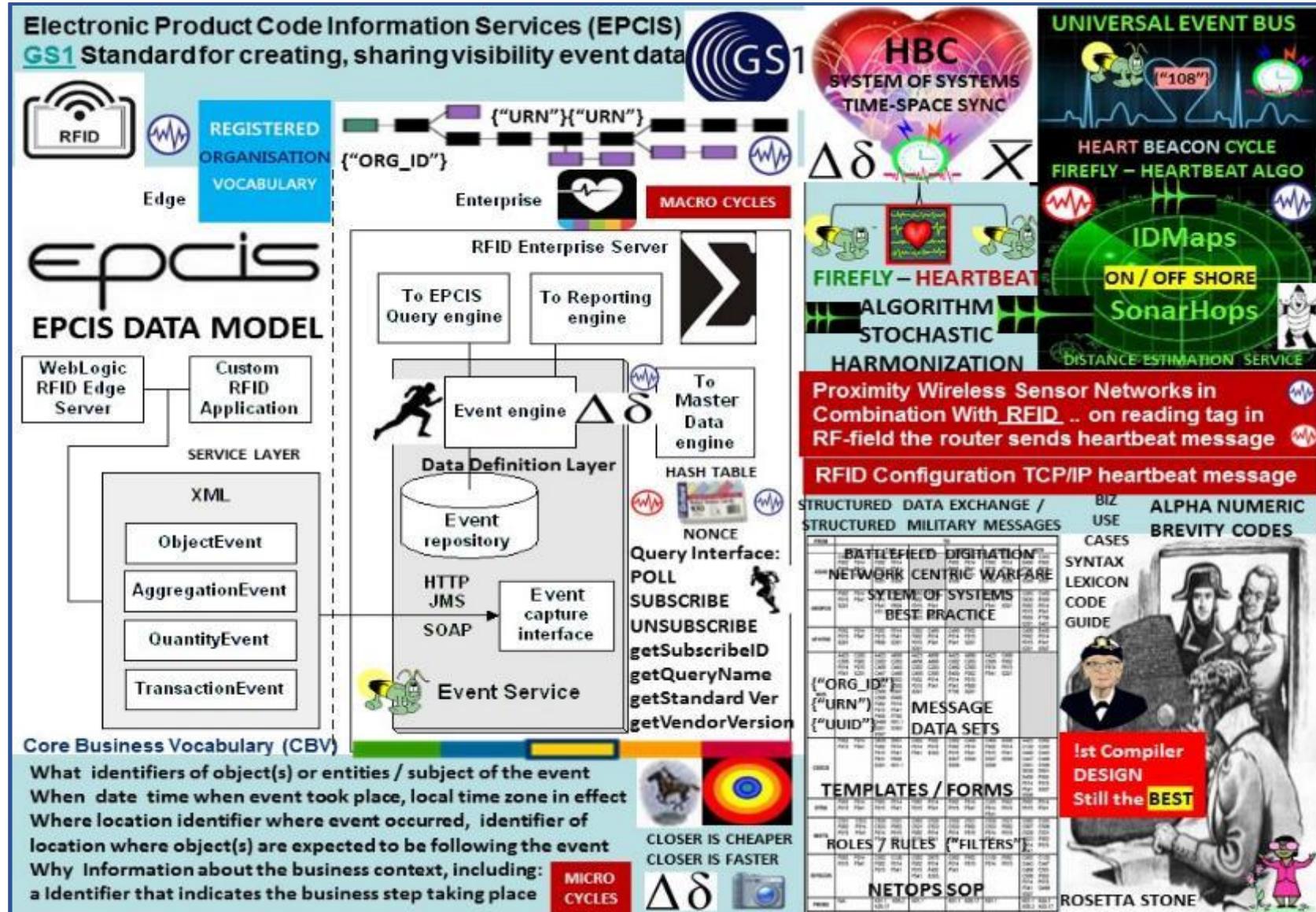


FIGURE 70: EPCIS RFID / USPTO 13/573,002



Figure 71: HASHGRAPH DAG Directed Acyclic Graph / USPTO 13/573,002

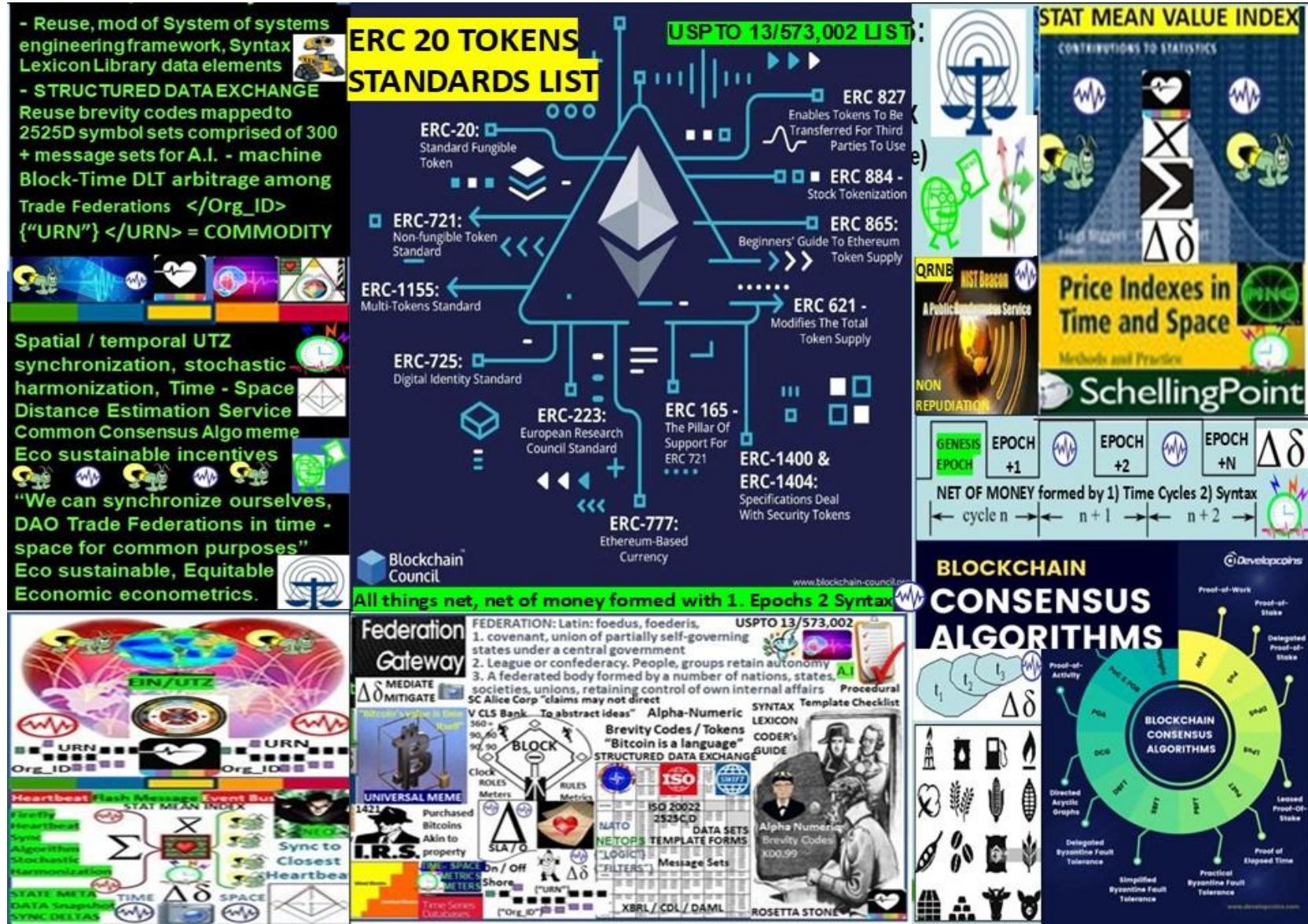


FIGURE 72: ERC 20 TOKENS STANDARDS LIST



Figure 73: FEDCOIN – WORLDCOIN STABLE COIN / USPTO 13/573,002 ECONOMIC HEARTBEAT

**Metallicus**

Programmable  
Money Transactions  
Intrabank settlements

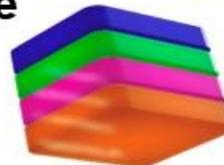
**FedNOW**  
INSTANT PAYMENTS

## PROTON A CHAIN Virtual Machine

## CONTRACT C CHAIN Smart contract

## PLATFORM P CHAIN Meta Data

## EXCHANGE X CHAIN Cross blockchain



Universal @names Identity / Governance / Resources / Staking

**Snowball Consensus Algorithm**  
preference := pizza  
consecutiveSuccesses := 0  
while not decided:  
  ask k random people preference  
  if >= α give the same response:  
    preference := response with >= α  
  if preference == old preference:  
    consecutiveSuccesses++  
  else:  
    consecutiveSuccesses = 1  
  else:  
    consecutiveSuccesses = 0  
  if consecutiveSuccesses > β:  
    decide(preference)

**EOSIO computer function emulation**  
NET, CPU bandwidth, RAM data  
Publishing, Voting based not mining

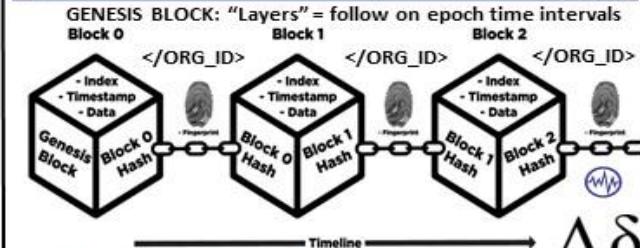
**Delegated Proof of Stake** {"Org\_ID"}

**PROOF-OF-STAKE**

**DAG Acyclic Graph Parameters:**  
n: number of participants  
k (sample size): between 1 and n  
α (quorum size): between 1 and k  
β (decision threshold): >= 1

**ALL THINGS NET, NET OF \$\$\$**  
1) EPOCH TIME INTERVALS  
2) SYNTAX (not) used in epochs

USPTO  
13/573,002



**SECURITY TOKEN: A DIGITAL ASSET THAT'S BACKED UP BY TANGIBLE ASSETS IN THE REAL WORLD**

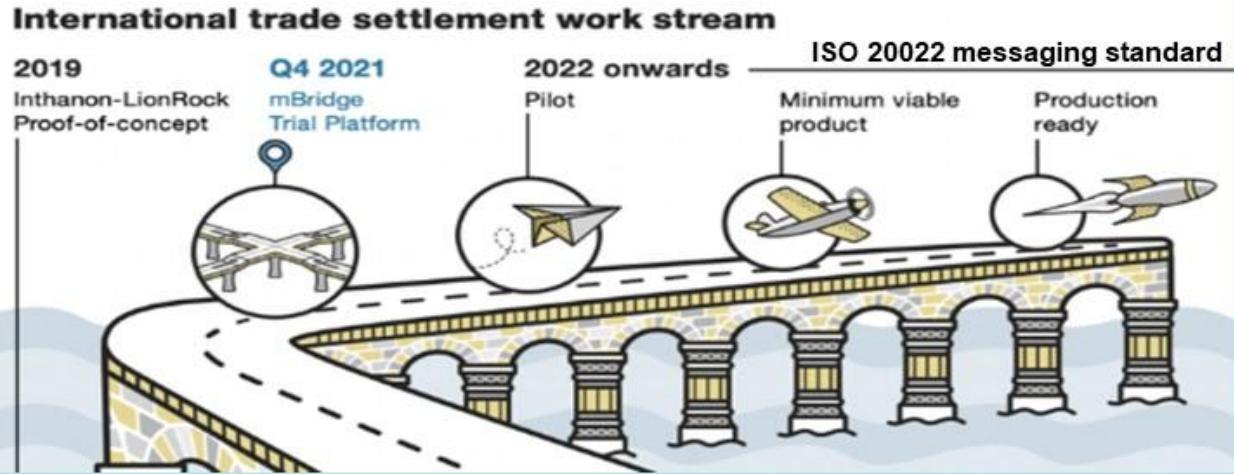
EST. 1929 Little League BIG LEGACY 75 YEARS MVP

"all digital currency networks, the base layer of people generating the blockchain — "miners," "stakers," "witnesses," "validators," or "forgers" get paid"



Figure 74: Federal Reserve FedNOW Metallicus / USPTO 13/573,002

# BIS



mBridge mBL is an Ethereum EVM-compatible solution, referring to the ability of a blockchain to process transactions based on smart-contract codes that can run on many blockchain platforms. CBDC issuance, redemption, payments are implemented through smart contracts written using Solidity programming language. The code open sourced.

mBL employs the Dashing consensus algorithm, a Byzantine Fault Tolerance (BFT) consensus protocol that uses proofs of partial confirmation of a block validation to reduce time needed to achieve consensus and to improve the overall protocol performance. Pseudonymous addresses and encrypted payment meta-data payloads are used to support privacy and confidentiality in transactions. mBL APIs are based on the global ISO 20022 messaging standard for financial information Legal Entity identifiers (LEIs) facilitate identification of entities facilitating AML/ CFT checks.



Figure 75 BIS project mBridge core participants, bridges, blockchain – time chains, cubes..

## STABLE PROTOCOL THREE MAIN TYPES:

**DeFi-Native:** Cap Labs, Elixir, Level

**Collateralized Debt Positions:** Ducat, Felix

**RWA-Backed:**, EAnzen, Superstatethena (UStb update)

**1) DeFi-Native collateral backing:** stablecoin engine produces redeemable tokens of various denominations (USD, BTC, ETH, etc) system of external agents, such as market makers, MEV actors and RWA protocols, to access collateral and generate independent yield on behalf of holders. These actors keep profits over a predetermined threshold, incentivized to earn as much as possible. behavior is kept in check by security delegations from restaking protocols, support good actors, penalize bad ones

## 2) Collateralized Debt Positions (CDPs)

CDP protocols allow users to borrow assets by locking up collateral. When a user creates a CDP, they deposit a certain amount of ETH, BTC, USDC, or other assets into the protocol to borrow a proportionate amount of another asset, in this case a stablecoin. If the value of the deposited collateral falls below a specified threshold (loan-to-value level or collateral ratio), the CDP becomes under-collateralized and is recalled, or liquidated, with the protocol automatically selling off the underlying assets to repay the debt and maintain the stability of the system. After the underlying collateral is liquidated, the user usually gets to keep the asset they've borrowed, minus some kind of liquidation penalty.

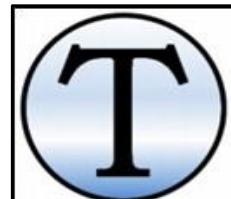
## 3) RWA-Backed by off-chain real-world assets



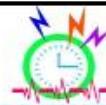
Figure 76 STABLE COINS / USPTO 13/573,002



Figure 77: Unicoin STABLE COIN CBDC / USPTO 13/573,002 TERRA TRC / UTZ- UTC



**TRUTHCOIN** Nullius in Verba: “On the word of no one”



## Three ideas combined

HOW TRUTHCOIN WORKS:

### 1) Tradable Reputation

- Abstract Corp exists to prove consistency within / across TIME
- Collects \$ to power the mechanism.

### 2) SVD Cross-Validation

- Statistical technique: seeks importance.
- Gleans truth, measures conformity.

### 3) Strategic Use of TIME

- Funds can be ‘locked’ across time.
- Yet info-search-costs constantly fall.
- Net effect: time penalizes attackers only.



## 2. A kind of ‘Future Wikipedia’

Finance Thing	Interpretation	EVENT DERIVATIVE CORP = <Org_ID_1,2,3>
Bond (Debt)	“I, Paul Sztorc, owe \$20 to whoever is holding this bond certificate on 03/02/2015.”	
Stock (Equity)	“I, the CEO of SztorcCorp, owe 1/100 <sup>th</sup> of SztorcCorp’s profits to whoever is holding this stock certificate on 03/02/2015.”	
Binary Call Option	“I, Paul Sztorc, owe \$20 to whoever is holding this Option on 03/02/2015, <u>only if</u> the stock price of SztorcCorp is above 40 \$/share on that date.”	
...(others)...	...(others)...	...(others)...
Event Derivative	“I, Paul Sztorc, owe \$20 to whoever is holding this derivative on 12/01/2016, <u>only if</u> Hillary Clinton is elected US President in 2016. Otherwise I owe \$0.”	...(others)...
...(others)...	...(others)...	...(others)...



Truthcoin



Focus

Outcomes of past events.  
Consensus on known facts.

Outcomes of *future* events.  
*Future* consensus on *knowable* fact:

## 3. A software protocol

A protocol is a set of rules that determine how something is performed or accomplished



Protocol (Decentralized)	Centralized Non-Protocol
Spoken English	Shakespeare’s Globe Theatre, The Library of Alexandria, MLA Citation Format, Walt Whitman, J.K. Rowling.
Rules to American Football	The NFL, ESPN, The Buffalo Bills.
Bluetooth	A Set of Stereo Speakers, The iPhone 6, A Car Radio Equipped with Bluetooth
Bitcoin	VISA, PayPal, SWIFT, Western Union, Airline Miles, Amazon Coins, e-Gold, Liberty Reserve.

Figure 78: Truth Coin: Nullius in Verba On the word of no one / Wikipedia

# How 'Bitbanks' Could Solve Bitcoin's Volatility Problem

## $MV=PQ$ Money x Velocity = Price x Quantity

The most important equation in monetary economics, the equation of exchange:  $MV=PQ$ . The quantity of money (M) times the rate spent (V for velocity) equals the price of everything bought (P) times the amount bought (Q for quantity). In Bitcoin, M Money is on a predetermined path, converging to 21m bitcoins. In relation to the other variables, Bitcoin is fixed. V, P, & Q fluctuate



MACRO  
ECONOMIC CYCLES

X  
Q = QUANTITY



Figure 79: Volatility Problem Solution / USPTO 13/573,002



Figure 80: NEO Net Enable Operations / NEO Distributed Smart Economy / USPTO 13/573,002

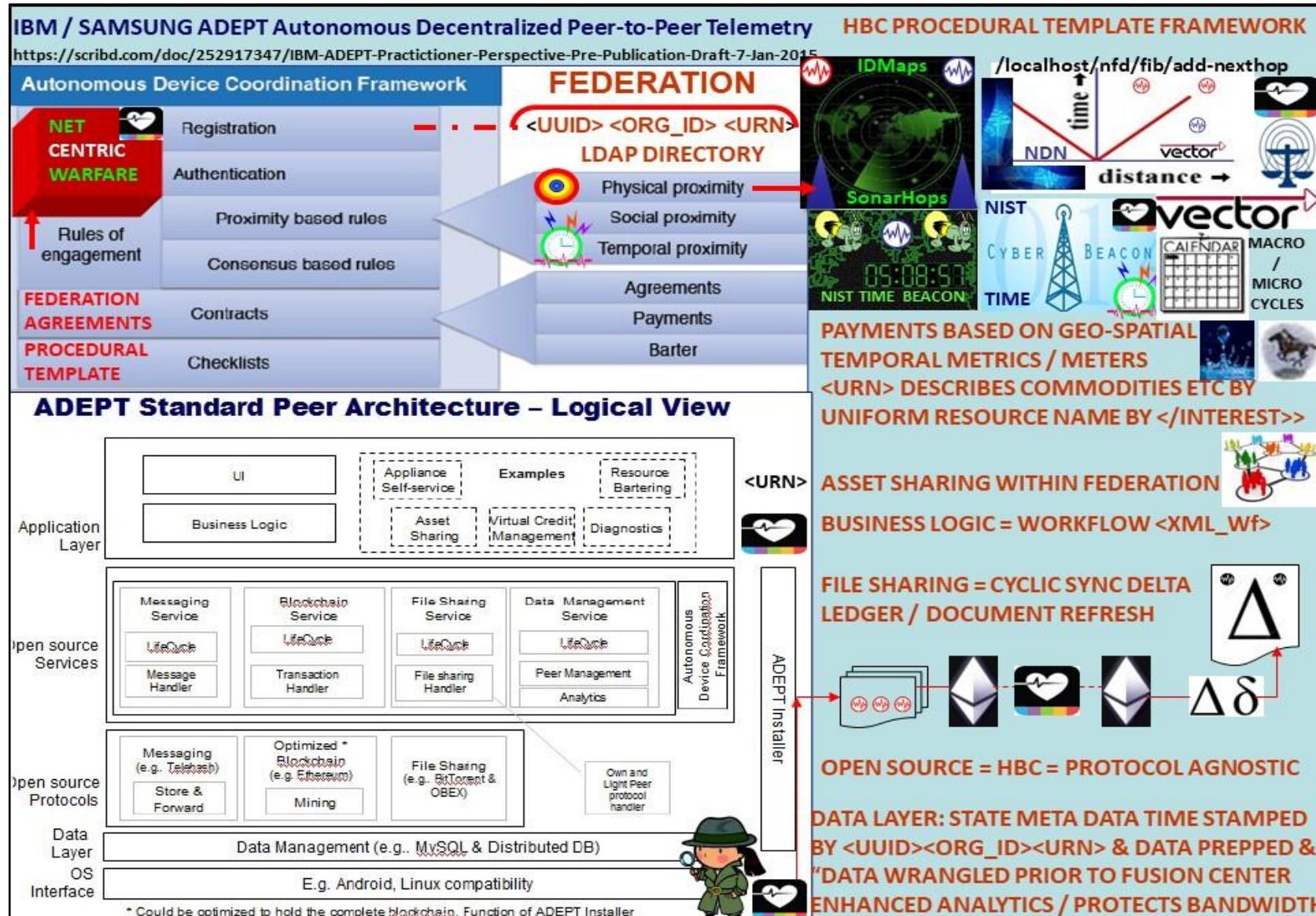


Figure 81: IBM – Samsung ADEPT / USPTO 13/573,002



FIGURE 82: Sustainable Stock Exchange Initiative SSEI / HFT Algorithmic Regulation / USPTO 13/573,002



Figure 83: USPTO 13/573,002 Econometrics, Meters, Metrics, Trade Federation Demurrage Fees



FIGURE 84: TRADENET / USPTO 13/573,002



FIGURE 85 NEW ECONOMY BLOCKTIME ARBITRAGE / USPTO 13/573,002

**Veritaseum™**

**"THE FINANCIAL NOSTRADAMUS"**  
REGGIE MIDDLETON

**ULTRA COIN**

**USPTO 13/573,002**  
**Heart Beacon Cycle**  
**Time – Space Meter**

**VERITAS TOKENS P2P Capital Market smart contracts**

Decentralized Trading Platform DAO ORACLE access conventional, legacy financial data to price, value, trade & settle OTC, P2P financials

Zero Trust Transaction: money performs I.A.W. to terms agreed to by parties. Ex: purchase of widget from retail store where widget must be delivered to person B on TIME X, in Y condition at PLACE Z or person A does not get paid. Stock, currency, commodities, letters of credit, insurance underwriting, trading, intellectual property...

Cost = stated rates that fluctuate with VeUSD exchange rate. Veritas holders get priority. The ability to redeem Ve against USD gives clients instant value.

DAO Distributed Autonomous Organization Investor Pools

Place Order ritaseum™

Principal:	\$100.00
Collateral:	0%
Leverage:	10x
Notional Amount:	\$1000.00
Receive:	QCOM
Pay:	INTC

DeFi Ve TOKENS

VeriDAO

Denominating Asset: ~BTC:SATOSHIS

Contract Expiry: 16w

Contract Starts at: -

Contract Ends at: -

Cancel Contract at: -

Est. Trans. Fees: \$0.0437

Transaction Fees: \$1.0262

Leverage Fees: \$3.2528

Max. Profit/Loss: + \$95.6773 / - \$104.3227

Total Required: \$104.3227

START

STOP

Eventually Agree

TTL

("Org\_ID") ("URN") "Tagged\_Bitcoins"

Pay: INTC

Switch » INTC

#DeFI All Market Orders

Expiry: 16w Advanced

Search "108"

("Org\_ID") ("URN")

Collateral Notional Expiry

Heartbeat Flash Messages Precedence Processing

FIREFLY HEARTBEAT ALGO EVENT MSG BUS

As long as INTC decline outpaces QCOM, you get paid. QCOM can be replaced with GOOG, or even AAPL although I feel AAPL will have its issues in the upcoming quarters as well.

("Tagged") Crypto

QRNB NIST Beacon A Public Randomness Service

IDMaps SonarHops

DISTANCE ESTIMATION SERVICE

Non Repudiation

Time – Space Meter Metrics

Qubit

SYNTAX LEXICON OPSCODE Rosetta Stone

Brevity Codes mapped to symbols sets for A.I. / Man – machine interface / interop

FIGURE 86: Financial Nostradamus Veritaseum / FutureMan USPTO 13/573,002

**Gamification** is the use of game thinking and game mechanics in non-game contexts to engage users in solving problems. Gamification techniques strive to leverage people's natural desires for competition, achievement, status, self-expression, altruism, closure.



FIGURE 87: GAMIFICATION / USPTO 13/573,00



**IOTA: Internet Of Things IOT distributed ledger with microtransactions without fees**

Tangle, a directed, ASYNCHRONOUS acyclic graph (DAG) for storing transactions

Contrary to Blockchains, consensus is no longer decoupled, It is an intrinsic part of the system for decentralized, self-regulating peer-to-peer network. Transfer value without fees

The iota network is ASYNCHRONOUS. In general, nodes do not necessarily see the same set of transactions. The tangle may contain conflicting transactions. The nodes do not have to achieve consensus on which valid transactions have the right to be in the ledger, meaning all of them can be in the tangle. However, in the case where there are conflicting transactions, the nodes need to decide which transactions will become orphaned. Nodes use the tip (unapproved transaction) selection algorithm to decide between two conflicting transactions. GHOST protocol main ledger = tree

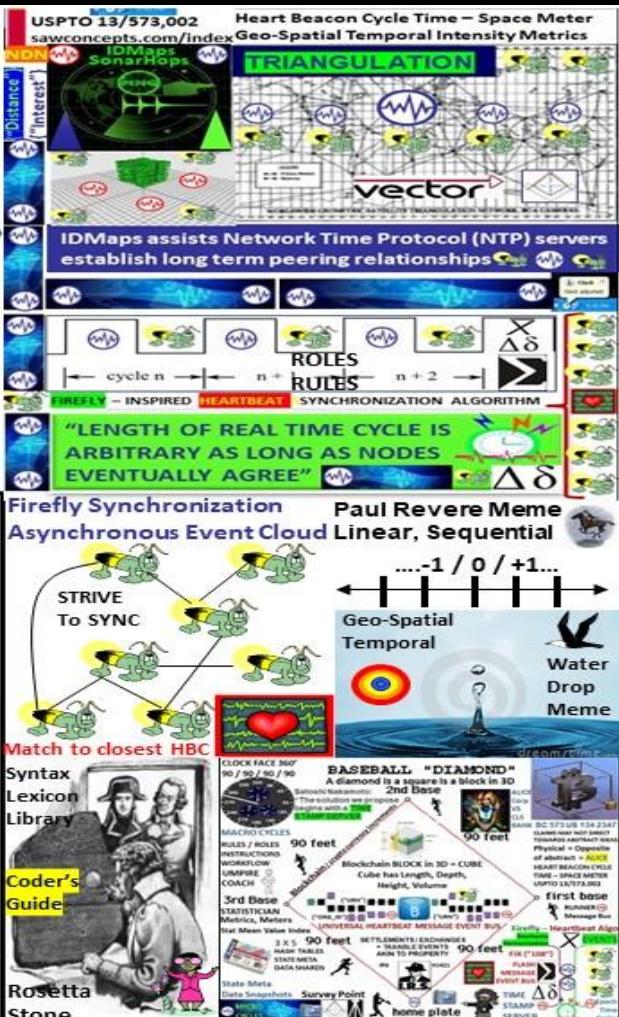
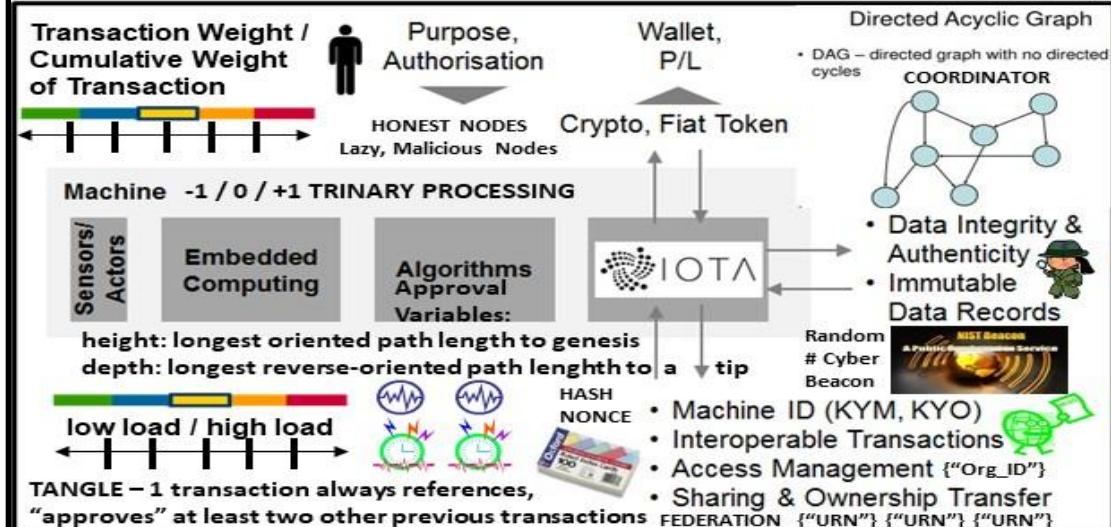


FIGURE 88: IOTA TANGLE DAG / USPTO 13/573,002

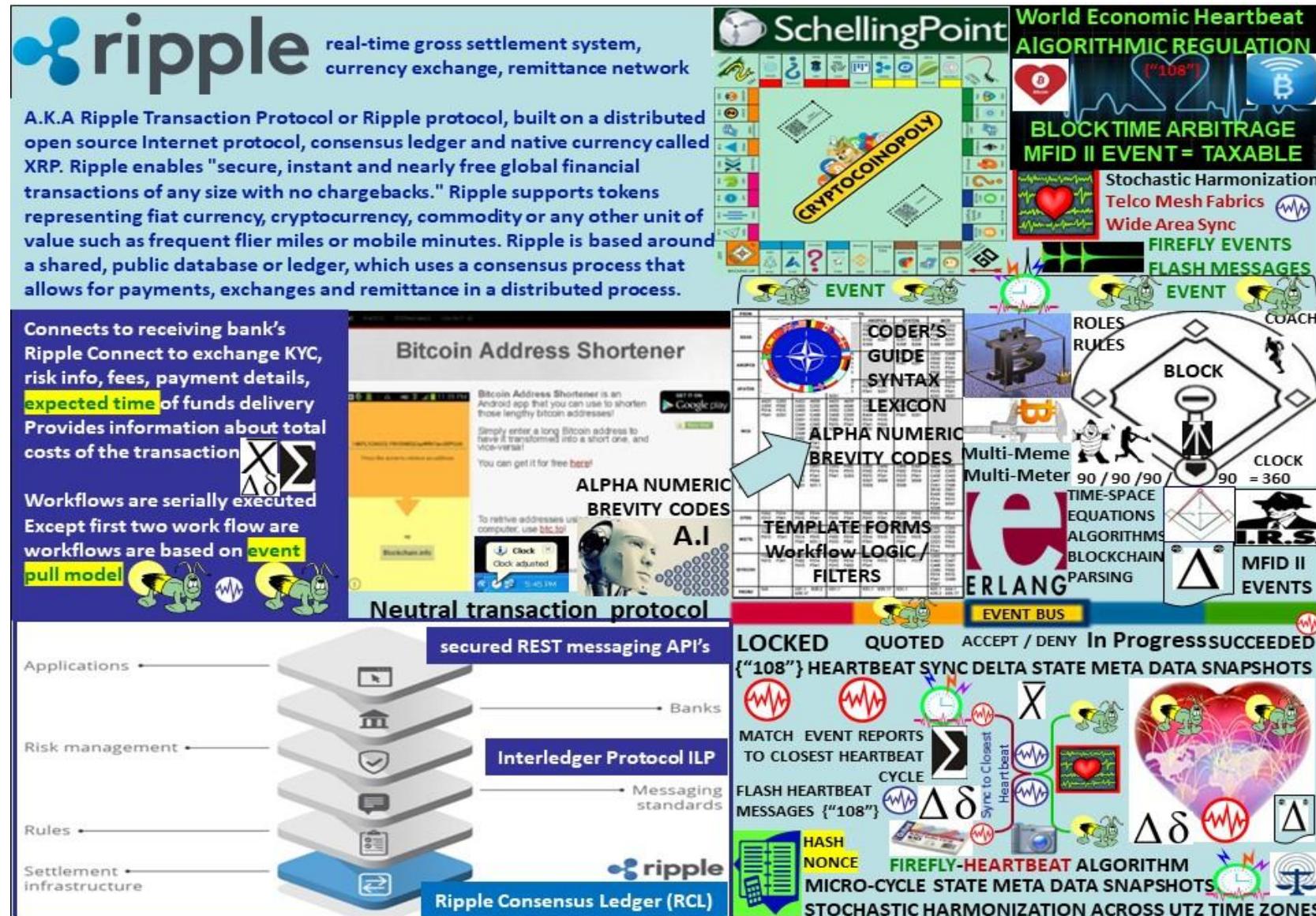


FIGURE 89: RIPPLE XRP Real Time Protocol / USPTO 13/573,002



FIGURE 89A: RIPPLE XRP Real Time Protocol / USPTO 13/573,002

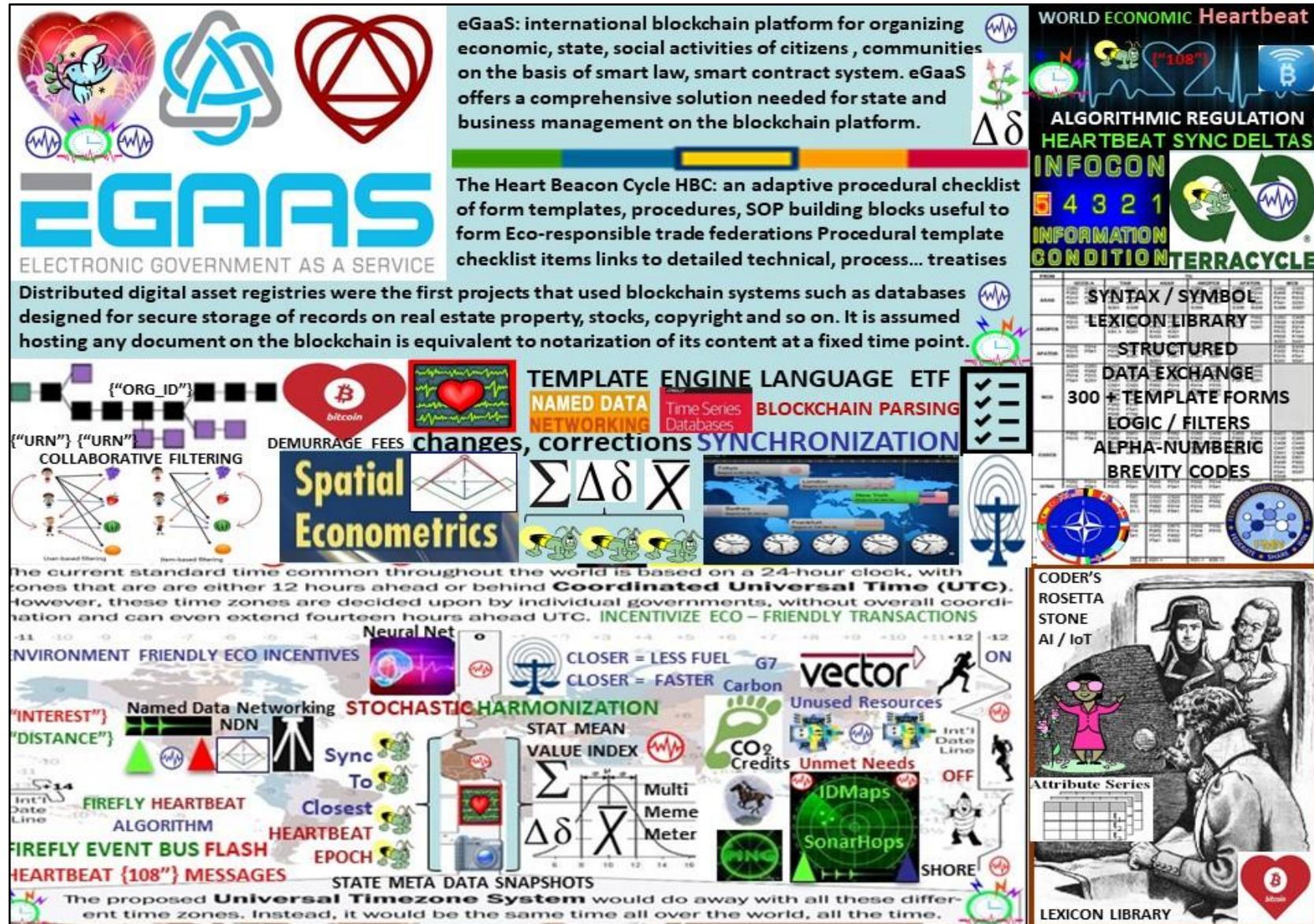


FIGURE 90: E Government as a Service E-GASS/ USPTO 13/573,002



Figure 91: GNOSIS / USPTO 13/573,002



Figure 92: Cryptocurrencies main issues / fixes



Figure 93: USPTO 13/573,002 Application time line, key events / SCOTUS compliant meme



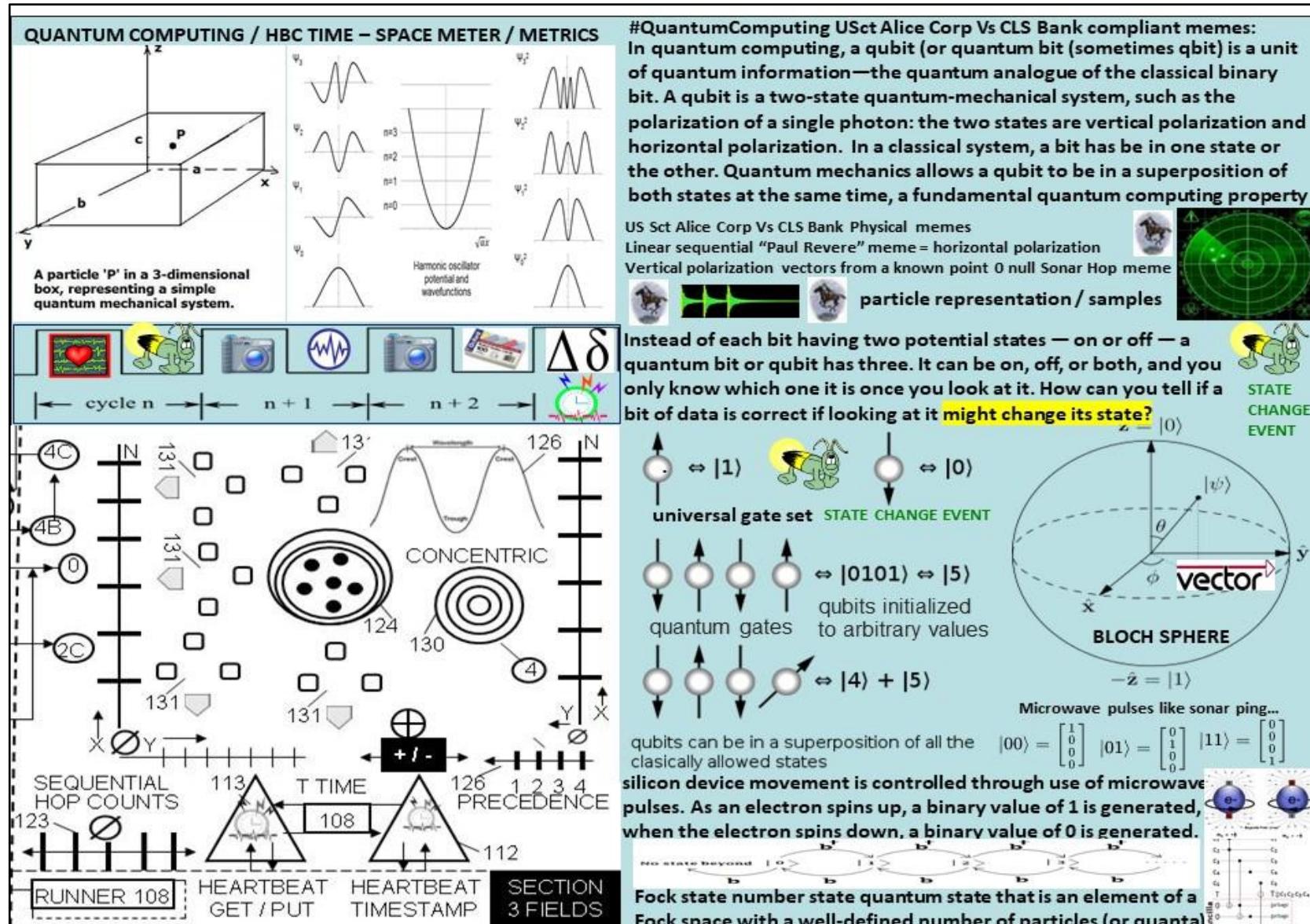


Figure 95: USPTO 13/573,002 Graphic supporting Quantum Computing Space – Time



Figure 96: QUANTUM COMPUTING / USPTO 13/573,002

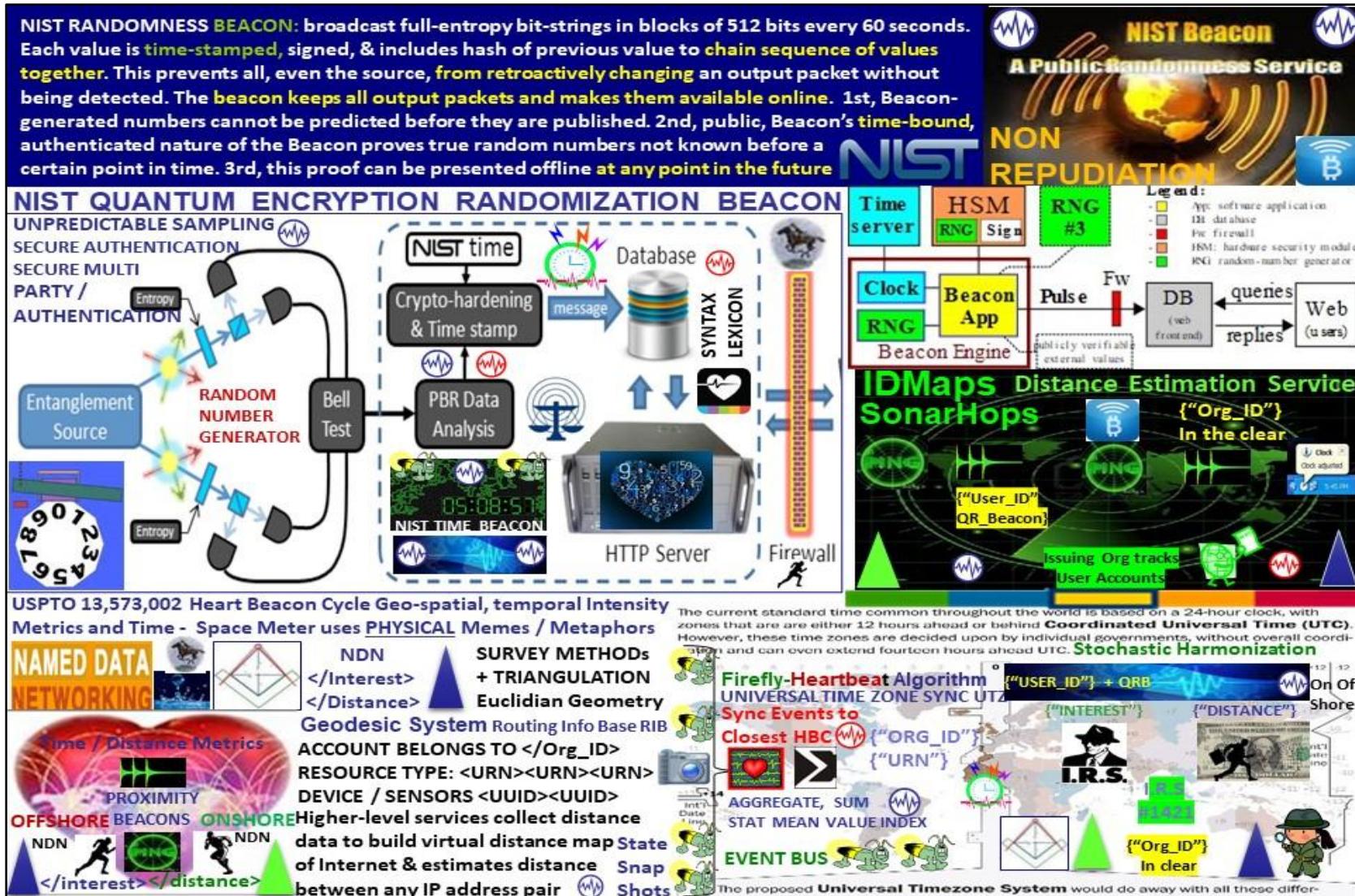


Figure 97: NIST QRNB Quantum Random Number Beacon / USPTO 13/573,002

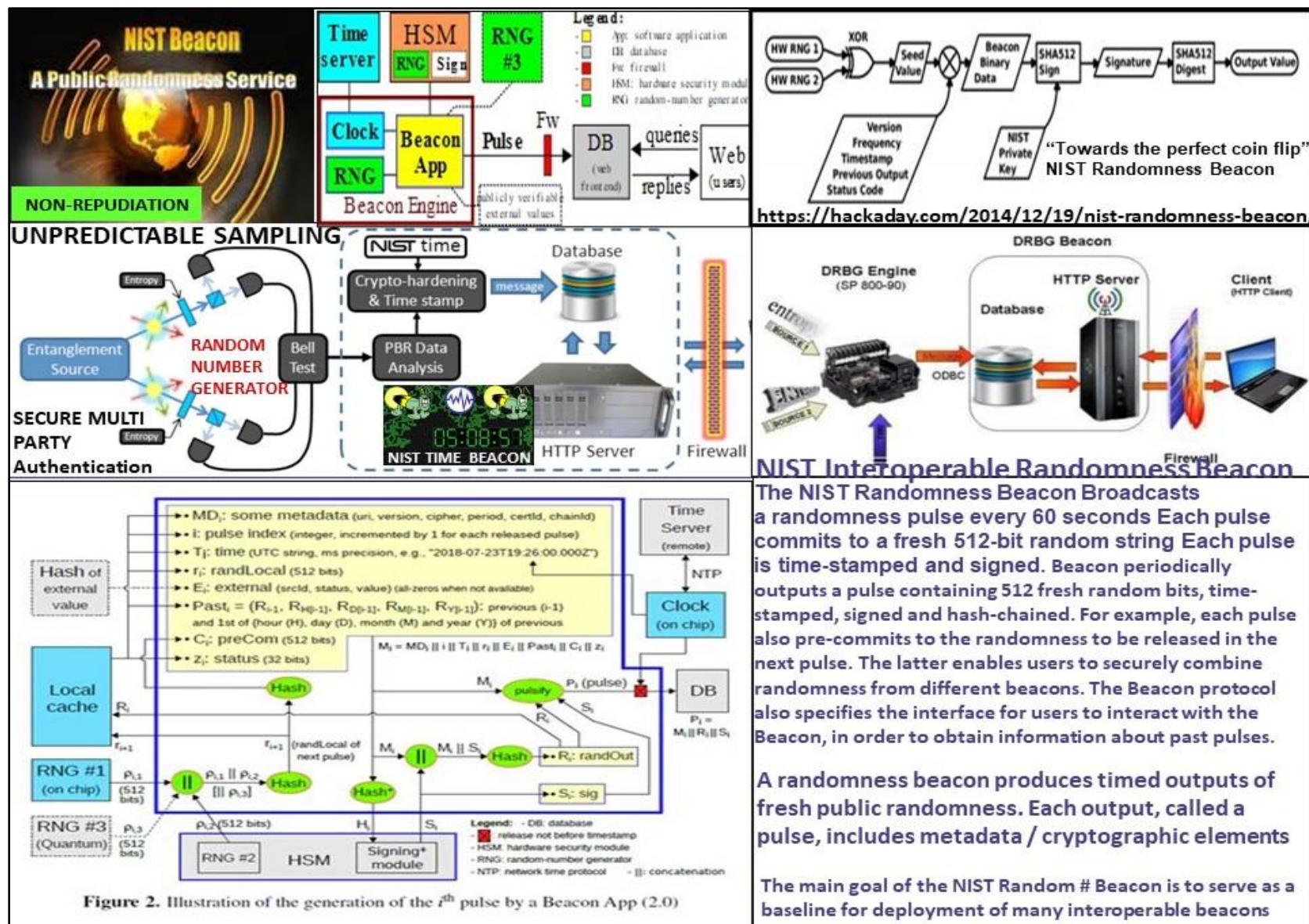
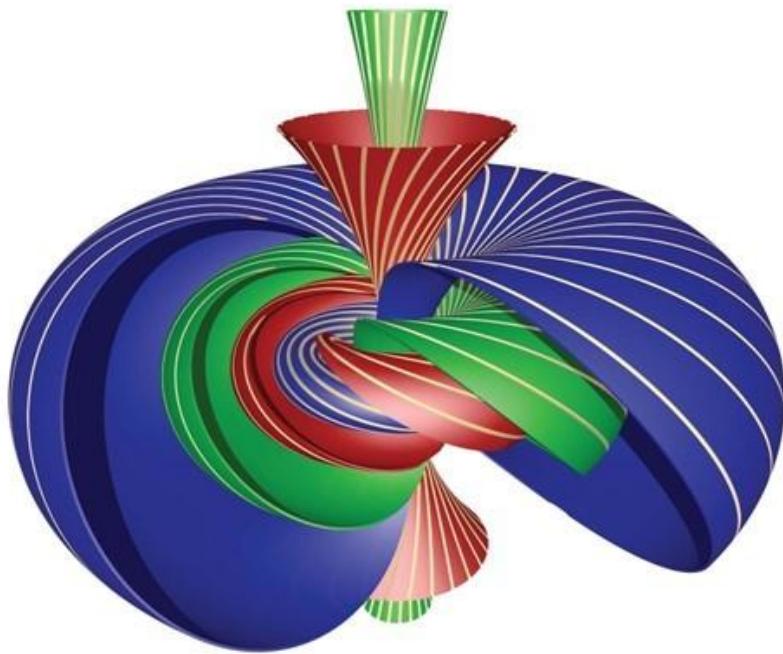


Figure 98: NIST QRNB Quantum Random Number Beacon Text Description

# The Hopf Fibration

Edmund Harriss



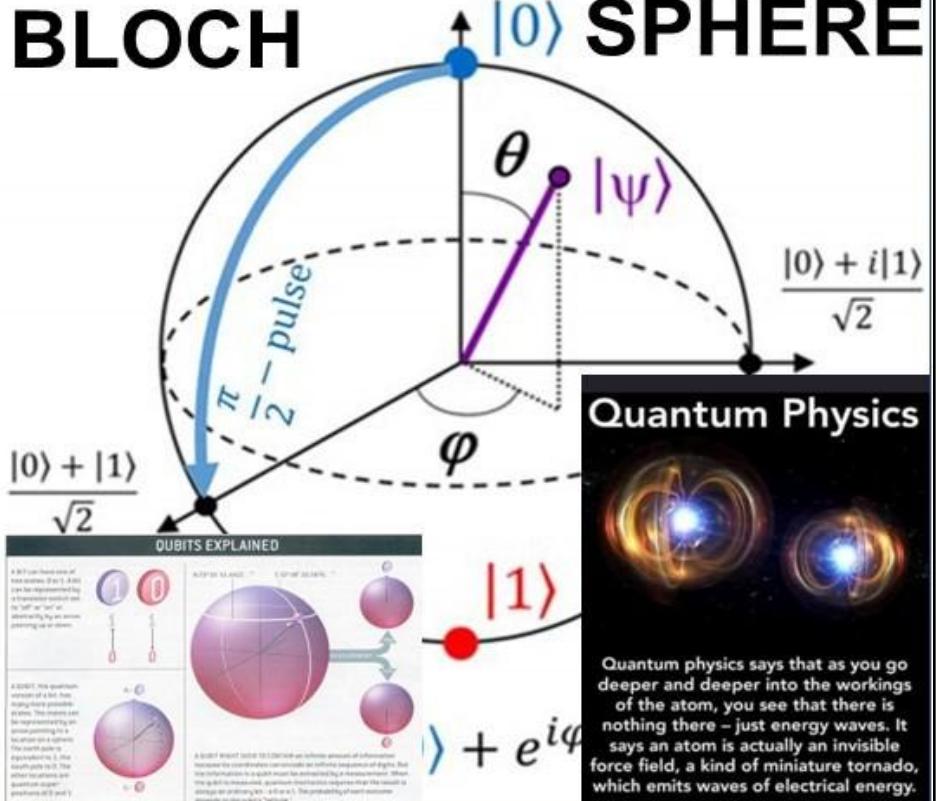
## Hopf Fibration / #Bloch sphere

"the most important object in the universe"

"Hopf fiber bundles pop up in 8 quantum physics situations"... USPTO 13/573,002 water drop in pond meme / scalar wave in 2D - 3D

Paul Revere linear - sequential hop count meme

# BLOCH SPHERE



The Bloch sphere provides a useful means of visualizing the state of a single qubit & operations on it. Any point on this sphere represents a linear combination of the 0 and 1 states with complex coefficients. A  $\pi/2$ -pulse 'rotates' a qubit from the 0-state to a superposition state.

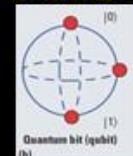


Figure 99: Hopf Fibration / Bloch sphere

**Fisher information flux flows are generated and stored in wave packets as they propagate. This temporal aspect is crucial for understanding how information builds up in a system over time**



The Variance of...  
the partial derivative w.r.t.  $\theta$  of...  
the log-likelihood function of  $\theta$  given observed value of  $X$

$$\Delta\delta \quad \mathcal{I}(\theta) = \text{Var}\left(\frac{\partial}{\partial\theta} \ell(\theta | X)\right)$$



USPTO 13/573,002 Time – Space Meter

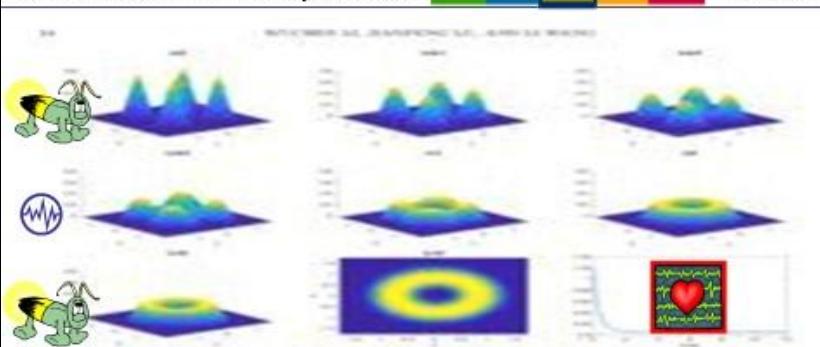
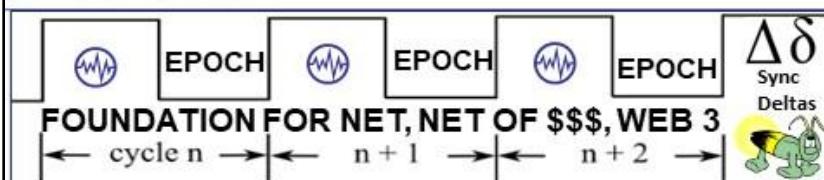


Figure 3.1. The evolution of 2000 propagations with equations with  $\Delta\delta(x) = \frac{\partial}{\partial\theta} \ell(\theta | x)$  and  $\mathcal{I}(\theta) = -\frac{1}{2} \ln(\mathcal{L}(\theta))$ . The steady state is a stationary profile with linearized constitutive relations  $R_1 = \beta_1$ ,  $R_2 = \sqrt{\beta_1}$ . Our computational domain is  $\Omega = [0, 2\pi] \times [0, 2\pi]$ , small enough where size  $\Delta\theta = \Delta\phi = 0.1$ ,  $\tau = 0.2$ . The initial wave propagation is  $\mathcal{I}(0) = 0.05 \approx 10^{-2}$ , and  $\beta = 1000$  is used for representing strong absorption.

3.2.6. The 3D plot model. Why chose the metric for integrating a three-dimensional EINR?

$$d\sigma = \nabla \cdot \left[ \text{PV} \left( \frac{\partial}{\partial\theta} \ell(\theta | x) = \mathcal{I}(\theta) \right) \right]$$

with  $\mathcal{I}(\theta) = \frac{\partial}{\partial\theta} \ell(\theta | x)$  initial condition consisting of some Gaussian. In this case, we choose model a configuration, and therefore is measured exactly. As seen in Fig. 3.1, the absorption converges to the equilibrium  $\rho_{\infty} = \frac{1}{2\pi^2} e^{-\frac{R_1}{2}}$  very rapidly. The fiber location constant path, and also convergence of the steady state measured via our method with the exact equilibrium and otherwise a general method.



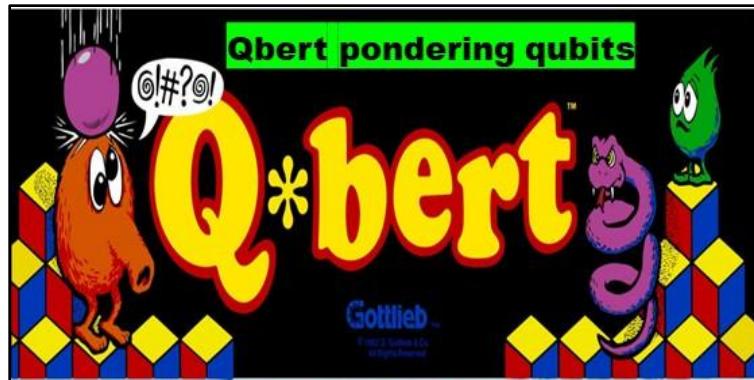
## Continuity equation for flow of Fisher information in wave scattering: Nature / ISF International Space Federation



An electromagnetic wave scattered at an object carries locally defined and conserved information about all of the object's constitutive parameters. Specifically, we introduce the density and flux of Fisher information for general types of wave fields and identify the corresponding sources and sinks of information through a fundamental continuity equation. Our theoretical predictions involve a movable object embedded in a disordered environment by measuring the corresponding **Fisher information flux** at microwave frequencies. Our results improve the understanding of the generation, propagation of information supports tracking and designing the flow of information in complex system of systems environments.



Figure 100: Fisher Information flux flow waves



**Qubit vs bit:** Qubits are represented by a superposition of multiple possible states. A qubit uses the quantum mechanical phenomena of superposition to achieve a linear combination of two states. A classical binary bit can only represent a single binary value, such as 0 or 1, meaning that it can only be in one of two possible states. A qubit, however, can represent a 0, a 1, or any proportion of 0 and 1 in superposition of both states, with a certain probability of being a 0 and a certain probability of being a 1.

**Q: ARE WE ABSOLUTELY CERTAIN QUBITS EXIST ?**

**Q: IF CUBITS DO NOT EXIST, THEN ARE THEY SIMPLY A WAY TO ACHIEVE GROUP THINK FASTER ???**

**Q: 1/3 of an event (transaction) ... really ???**

### A bit is a unit for measuring information

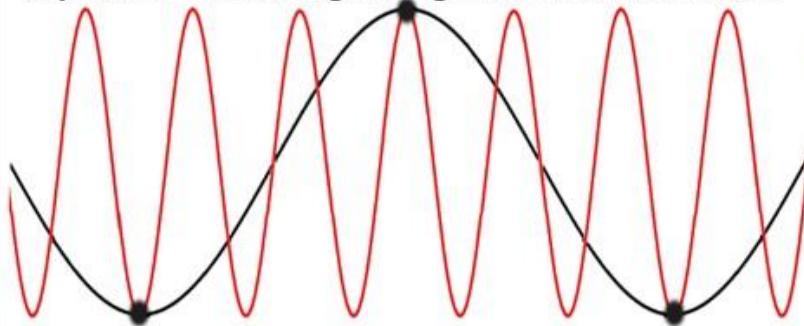
Classical bits	Quantum bits (Qubits)
Bit 1 Empty = "0"	Bit 2 Filled = "1"
20 red beads ="0"	20 blue beads ="1"
Head = "0"	Tail = "1"
	50% chance of landing on "0" 50% chance of landing on "1"

**FIGURE 101: QUBIT = non-existant notional construct = group think contrived expected outcome**

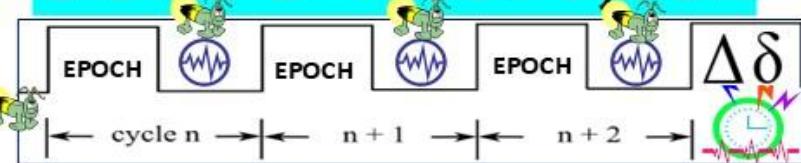
# ACOUSTIC PHONON

USPTO 13/573,002

in-phase motion of neighboring ions in a lattice vibration

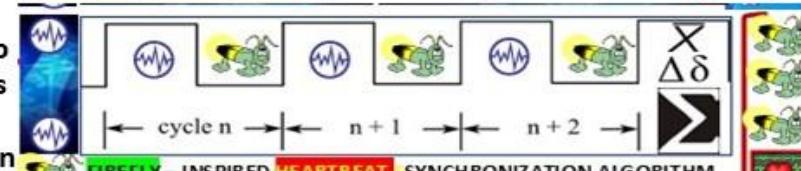


**Phonons:** A phonon is a quantum of the lattice vibration, the collective motion of atoms constituting a crystal. There are two types of phonons: optical and acoustic. The optical phonon has high-frequency oscillation in the THz range and the unit cell center of mass does not move. It undergoes a dipole interaction with light. The acoustic phonon propagates at sound velocity, which is the first derivative of the phonon dispersion curve at the  $\Gamma$ -point (wave vector  $k \approx 0$ ) in the first Brillouin zone. A simple example is a one-dimensional diatomic chain, in which the unit cell contains two atoms. In a crystal of  $N$  unit cells, there are  $2N$  atoms and  $2N$  degrees of freedom of motion. The displacement of an atom from its equilibrium position is expressed using plane waves with reduced wave vectors, defined within the first Brillouin zone. The oscillations are approximated by  $2N$  harmonic oscillators of different wave vectors. The vibrational frequency is related to the wave vector through the phonon dispersion relation. Phonons are created and annihilated in the harmonic oscillators. SOURCE: SCIENCE DIRECT: <https://sciedirect.com/topics/engineering/acoustic-phonon>



"nodes eventually agree" stochastic harmonization temporal sync

"Similarly, the electromagnetic force will also be found to vary continuously and retain a TIME-AVERAGED value"



"LENGTH OF REAL TIME CYCLE IS ARBITRARY AS LONG AS NODES EVENTUALLY AGREE"

THESES: All things net, net of programmable \$\$\$ are formed using: 1. Time epochs created by quartz crystal silicon chips 2) Syntax used / not used as programming instructions during epoch - temporal time cycles

SOUND WAVES enable Different types of quantum tech to "talk"



Figure 102: Acoustic Phonon



Figure 103: Trump Quantum computing speed bump

**Foundation Technology Trinity:**

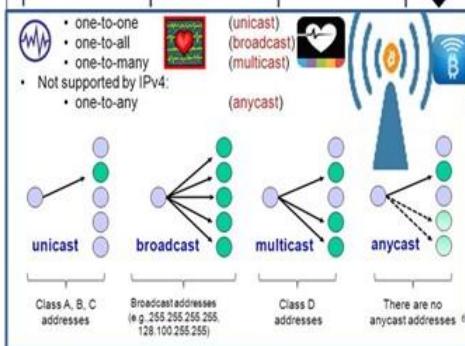
- 1. EPOCH (s) = Time intervals, cycles**
- 2. SPACE (land use meme) ex: IRS memo #1421 "Bitcoin transaction akin to land"**
- 3. SYNTAX structured data mapped to symbols for A.I. / man - machine interface**

**THESIS:** All net artifacts, net of \$ are formed with:

- 1) Epoch time cycle intervals ex: chip oscillations
- 2) Syntax parsed, processed in epoch time intervals

## Time Epochs / Syntax:

How the net, net of \$ actually work...



All things internet, programmable net of money are formed using:  
1) Epoch Time Cycles to 2) process (not) syntax as instructions

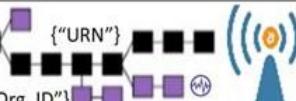
## Epoch Time Cycles / Syntax

Internet / Internet of Money building blocks

Satoshi Bitcoin Blockchain  
Time Stamp Server

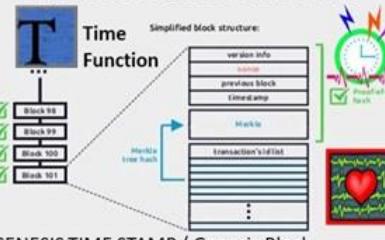
### 2. Timestamp Server

The solution we propose begins with a timestamp server.



### TIME Block chain TIME

What does a block look like?



### GENESIS TIME STAMP / Genesis Block

Header = Contains service information (version info, resource, previous block id, and timestamp).  
Metadata = A summary header from the block's transaction identifiers.

Transaction's ID list = list of transaction's identification header that was included into the block's merkle tree.

## Semantic blockchain



**Artificial intelligence (AI) syntax refers to the set of rules, principles governing the arrangement of words and phrases in a programming language. In the context of AI and natural language processing, syntax ensures that language is structured in a systematic way, for effective communication and comprehension.**

**Understanding syntax is essential for developers to write readable, maintainable, and scalable code**

FIGURE 104: TIME – SYNTAX = Foundation technology framework for the internet of everything IoT-E, DeFi / FINTECH



FIGURE 105: SPACESHIP EARTH OPERATING MANUAL SIGNALS ANNEX K

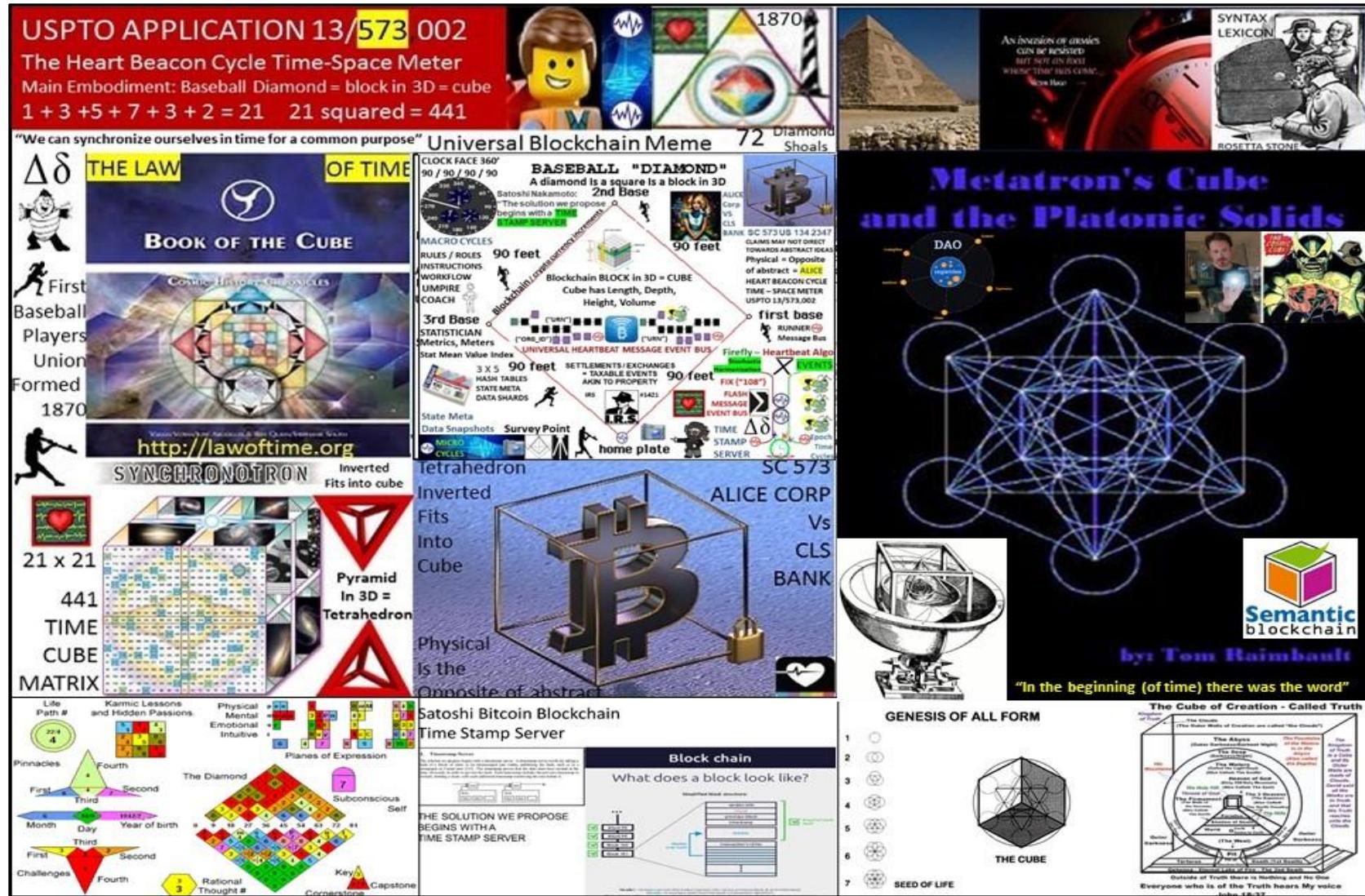


Figure 106: Programmable money through the lens of metaphysics / USPTO 13/573,002

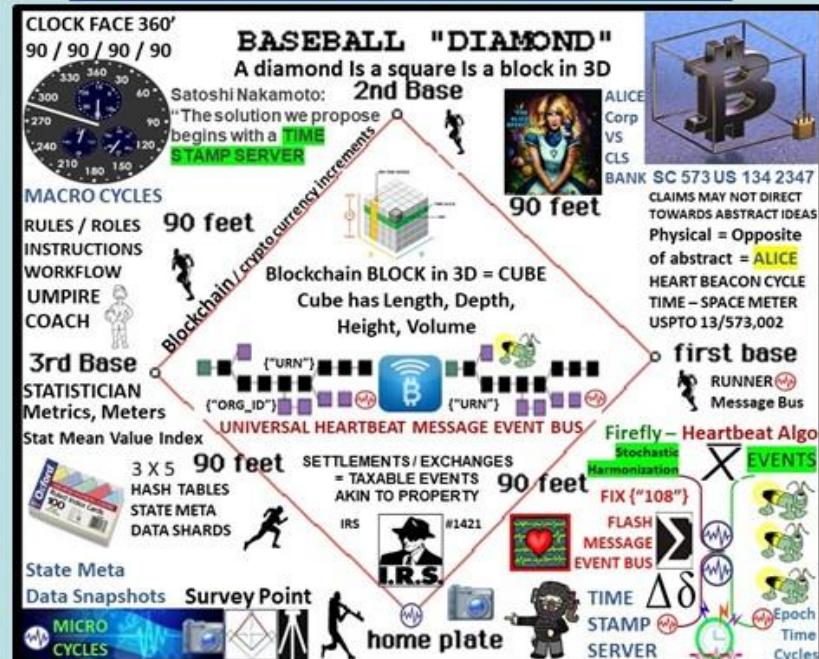
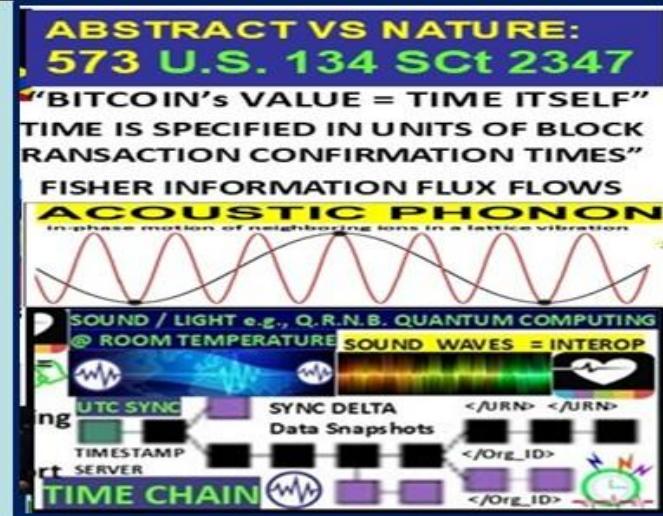
## Circle USDC

Investopedia

Stablecoins are cryptocurrencies whose value is pegged, or tied, to that of another currency, commodity, or financial instrument. Stablecoins aims to provide an alternative to the high volatility of the most popular cryptocurrencies, Source JDSUPRA



**Circle Internet Financial Ltd**  
lawsuit brought by Veritasium Capital for alleged infringement of its digital-asset trading patent. U.S. District Court for the Eastern District of Texas, No. 2:22-cv-00498



## NOSTRADAMUS of FRANCE CENTURY 8: QUATRAIN 28



## "THE FINANCIAL NOSTRADAMUS"

REGGIE MIDDLETON

Reggie Middleton  
“Father of DeFi”  
US11196566  
US11895246  
JP6813477

**Veritaseum**

Figure 107: Patent Lawsuit Litigation Snapshot

# Numismatics: study of currency

Marcus Aurelius



Legend: IMP. M.  
ANTONINVS  
AVG. TR. P. XXV.

## THE TERRA (TRC) Trade Reference Currency

TELLURIUM PRODUCERS  
UNDIFFERENTIABLE MINERALS  
WITH EXHAUSTION  
**COMMODITIES**  
PRODUCERS CONSUMERS



Terra Trade Reference Currency TRC  
"world currency" Bernard A. Lietaer  
Belgian economist proposed 1991  
Basket of 9-12 most important  
commodities. Public issued  
demurrage fees for storage,  
shipping, handling..



### Roman Denominations



Images Courtesy Of: Roma Numismatics Ltd., Numismatica Ars Classica, Berlinsche Fine Arts, Nomos, & The Mata Museum in Berlin

### BRONZE / LEAD / AES SIGNATUM AES GRAVE / SILVER / LEAD / IRON..

Unlike most modern coins, Roman coins had (at least in the early centuries) significant intrinsic value. However, while the gold and silver issues contained precious metals, the value of a coin could be slightly higher than its precious metal content, so they were not, strictly speaking, equivalent to bullion. Also, over the course of time the purity and weight of the silver coins were reduced.[15] Estimates of the value of the denarius range from 1.6 to 2.85 times its metal content,[citation needed] thought to equal the purchasing power of 10 modern British pound sterling at the beginning of the Roman Empire to around 18 pound sterling by its end (comparing bread, wine, and meat prices) and, over the same period, around one to three days' pay for a legionary.[16]

### Commodities Index Basket / FIAT PRICE Discovery Algo / MEDIATION

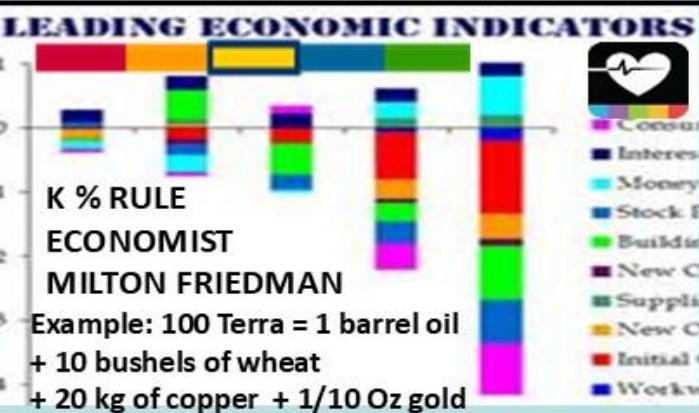


Figure 108: Numismatics: The Study of Currencies

# World Game Annex K

## Signals & Telemetry



Figure 109: USPTO 13/573,002 Summary

DAO: Distributed Autonomous Organization

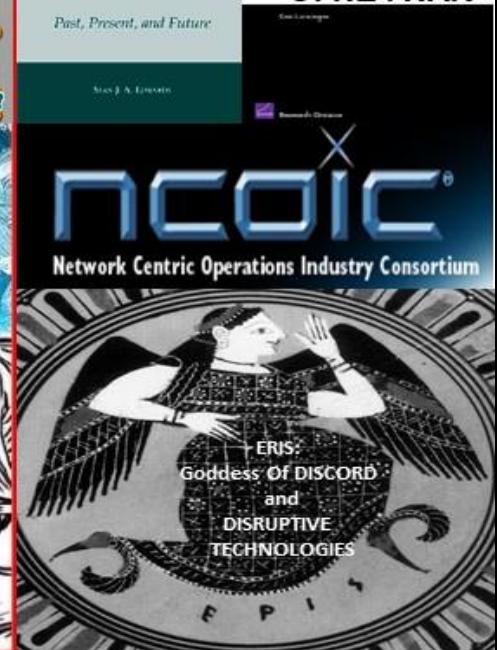
RAND term circa 2000 / The TAO OF THE DAO

SWARMING AND THE FUTURE OF CONFLICT



RAND  
Monograph  
Report

THE  
ADVENT  
Of NETWAR



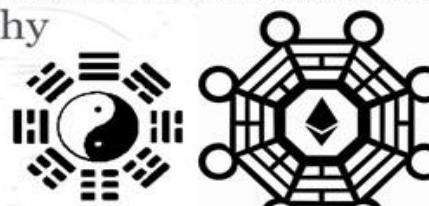
<http://cointelegraph.com/news/112077/the-new-frontier-after-cryptocurrency-cryptoequity>

### Taoism Philosophy

Taoism represents:

- Contraction of the past to the future.
- The transcendence of time and place.
- The balance of the old and the new.
- The balance between opposing forces and desires.

Overall the Taoism Philosophy represents "The Way" in which to live.



(An ancient philosophy tradition. This article involves the yin-yang principle of harmony and change.)

Eris, The Dawn of Distributed Autonomous Organizations and The Future of Governance

@TheBitcoinArmy



Figure 110: The TAO of the DAO: Distributed Autonomous Organization = RAND Think Tank term

# Patent Applicant 13/573,002 Curriculum Vitae

**What does your name mean?**



**Steven + McGee**

Intellectual      Revolutionary

You have a sharp spirit paired with a strong will. You have the power to change the world with your intelligence!

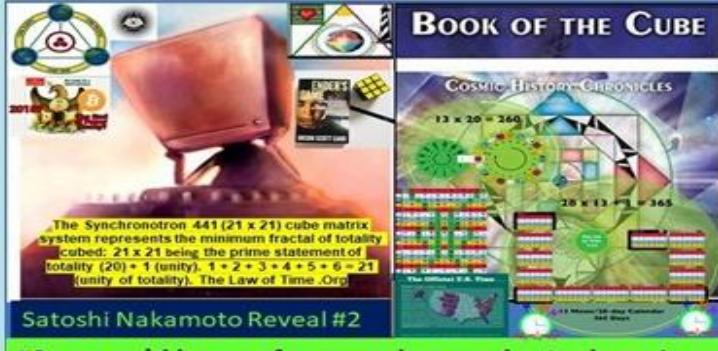
**What does your name mean?**



**Steven + McGee**

Endless      Luck

You are an inspiration for your friends. Your loving ways, your huge heart and your beauty spread endless joy to the world!



The Synchrontron 441 ( $21 \times 21$ ) cube matrix system represents the minimum fractal of totality cubed:  $21 \times 21$  being the prime statement of totality ( $20 + 1$  (unity),  $1 + 2 + 3 + 4 + 5 + 6 = 21$  (unity of totality)). The Law of Time .Org

Satoshi Nakamoto Reveal #2

**COSMIC HISTORY CHRONICLES**

**BOOK OF THE CUBE**

"As an avid lover of numerology and astrology, I use both in my day-to-day life. I believe God is the ultimate mathematician, as everything around us can be viewed as numbers" Satoshi Nakamoto White Paper 2008 "The solution we propose begins with a time - stamp server"



KANSAS  
"CARRY ON MY WAYWARD SON"  
GUBE REMIX 121 BPM

REO SPEEDWAGON

Roll With The Changes

You can Chase a place, but you can't Chase God.

CLOCK FACE 360°  
BASEBALL "DIAMOND"  
MACRO CYCLES  
INSTRUCTIONS  
WORKFLOW  
UMPIRE  
COACH

3rd Base  
STATISTICIAN Metrics, Meters  
Stat Mean Value Index

90 feet  
Blockchain BLOCK in 3D = CUBE  
Cube has Length, Depth, Height, Volume

first base  
RUNNER Message Bus

90 feet  
Blockchain BLOCK in 3D = CUBE  
Cube has Length, Depth, Height, Volume

90 feet  
Blockchain BLOCK in 3D = CUBE  
Cube has Length, Depth, Height, Volume

INFOCON  
4 3 2 1  
INFORMATION CONDITION

Eco Incentives

Figure 111: Curriculum Vitae: Steven J. McGee



Figure 112: Bill Murray Movies: Groundhogs Day / Limits of Control / City of Ember



FIGURE 113: LIST / PICTURES = THOUSANDS OF WORDS



FIGURE 114: Pictures: Thousands of Words

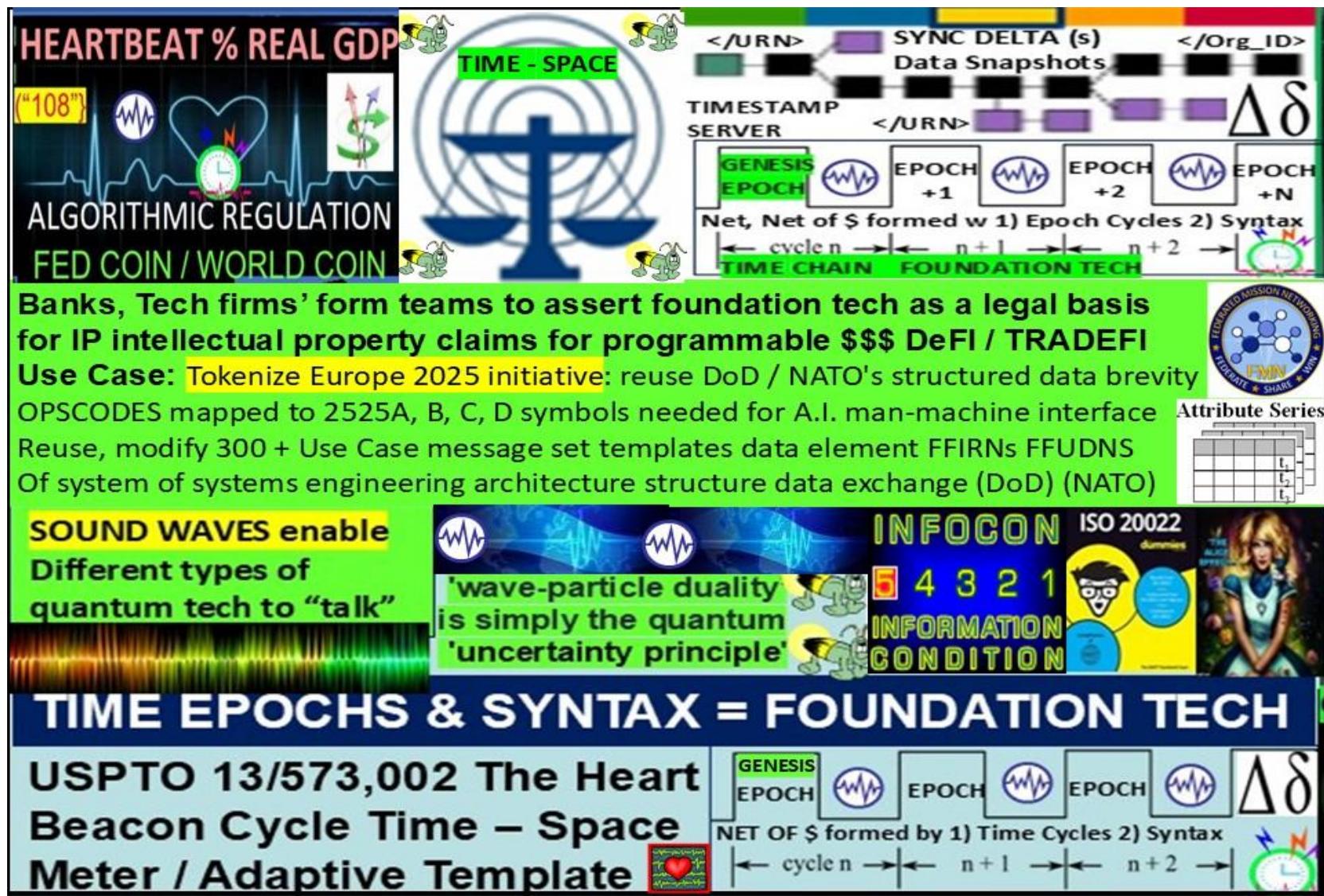


FIGURE 115: Tokenize Europe 2025 Initiative / USPTO 13/573,002



Figure 116: Inventor “FutureMan’s” Contact Information



Figure 117: “FutureMan” Herald of the Age of Aquarius