

TITLE: WORLD GAME (s) FULCRUM: New World Transition Mediation Gateway (s)
SUBTITLE: Foundation tech / Adaptive Procedural Template framework for Quantum AI



Tech Foundation quantum AI Framework: net, net of \$ DeFi, Tariff demurrage sync deltas

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Foundation Tech Framework: Net of \$\$\$, DeFi, QFS Quantum Financial System, AI, Structured Data

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Patent Application Type: Adaptive procedural template business process patent

Patent Application Title: The Heart Beacon Cycle Time - Space Meter

TITLE: The WORLD GAME (s) GREAT REDESIGN wave form based QFS Quantum Financial System Document Control Number: USPTO 13/573,002 Art Unit: 2468

SUBTITLE: Adaptive Procedural Template framework, control grid / matrix telemetry, metrics, meters for the World Game (s) Great Redesign wave based QFS

USE CASE: World game (s) fulcrum = (Sound, light) wave form based QFS Quantum Financial System % temporal epoch sync deltas

UsSE CASE: Adaptive Procedural Template foundation tech list for net, DeFi crypto, economy. Federated systems structured data exchange syntax lexicon mapped to symbol sets for A.I. man - machine interface

USE CASE: Tariff Trade Wars = Trade Reference Currency TRC = GDP pacing items statistical mean index Milton Friedman's K% rule #GDP pacing item index based economy #tariffs time - space calculation tool (s) IDMMaps - SonarHops Distance Estimation Service / Trade of GDP Gross Domestic Product Economic Pacing Items

SUMMARY: Eco Economic Epochs for an Equitable #Economy (s) / Adaptive Procedural Template checklist of OPW Other People's Work supporting a federated, distributed trade federation's QFS #Quantum #Financial System TRC #Trade Reference #Currency of OPM Other People's Money, #RWA Real World Assets (s) Tokenized Eco Economic Epochs for programmable money liquidity, monetization, Equilibrium of the programmable Economy #QFS

Key words: #tokens #blockchain #cryptocurrency #GDP #tokenization #commodity #RWA Real world Assets backed QFS Quantum Financial System of Federated Systems, liquidity, monetization, equilibrium, equity, equality, Eco Economics

THESIS: Foundation Technology trinity:

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

USPTO 13/573,002 The Heart Beacon Cycle Time - Space Meter THESIS: All artifacts internet, programmable net of money, QFS are formed using:

- 1) Epoch time cycle temporal intervals created by microchip, wave form oscillations

- 2) Syntax parsed, processed during epoch time cycle epoch temporal intervals
- 3) All things net, net of money, QFS, AI blockchains, hash-graphs etc., = time-chains are formed with unicast, multicast, anycast protocols, (statistically predictive) workflow logic, propagated by electro-magnetic wave form motion described by nature, natural law i.e., Tesla described electro - gravitic - magnetic wave forms (standing, scalar waves)

Invention Definition: 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: a German Army suggestion circa 2003. 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, memes. 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".

STATEMENT: Physical is the opposite of abstract.

USE CASE: The main use case of the (technically non-existent) blockchain derived from the video game industry adapted to the cryptocurrency industry is about adding micropayments / microtransactions with the intent to add a pay by event / action / (token) transaction additional income stream / control grid layer of control. Source: <https://intelligenteconomist.com/microtransactions/>



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 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.

USE CASE: Real World Assets commodity index backed stablecoin currency: commodity tokens / RWA Real World Assets index backed currency / algorithmic stable coin - DeFI / TradeFi algorithmically regulated programmable economy, control grid, permission access, price discovery derived from many stablecoin time (block) chains, that employ equilibrium algorithms (s) where stablecoin features, attributes: use of geo-spatial temporal event, activity intensity fencing to establish payment boundaries, geo-spatial areas of effect, geo-spatial temporal areas of support where a coin may have a set time limit based on time - stamp servers heartbeat, geo-spatial area of authorized use, select (federated) group of crowd funders, harvest, move crop commodities, goods backing the value of the coin from / to a given area's commons market, trade federation

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. 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, including all the major trading nations. Economist Bernard Lietaer Source: <https://www.lietaer.com/2010/01/terra/> Source: <http://lietaer.com/2010/01/terra/>

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

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: "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.

QUOTE: "As in nature, all is ebb and tide, all is wave motion, so that in all branches of industry, alternating currents, electric wave motion will have sway." N. Tesla



The Arlington Institute Transition Net / USPTO 13/573,002 HBC Time-Space Meter

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

USPTO 13/573,002 CLAIMS

The nature, purpose (s) of the invention is based on the thesis: all internet, programmable internet of money artifacts, building blocks are formed using:

- 1) Epoch time cycle intervals created by silicon microchip oscillations, sound wave oscillations intrinsic of, foundation tech for quantum computing at room temperature
- 2) Syntax parsed, processed, transmitted during epoch time cycle intervals
- 3) All things internet, internet of money, blockchains (time chains) are formed by unicast, multicast, anycast protocols. Programmable money's improvements are in cryptography for example, blockchains are formed like all things internet, internet of money through use of unicast, multicast, anycast of workflow filters... additionally, method of claims rely on the use of an adaptive procedural template's (list) tools, processes, procedures enabling micropayments / micro-transactions pay by event / action / (token) transaction income based on (energy) wave form motion (Tesla)

Method of claim 1 is to comply with Supreme Court SCOTUS US SC 573 US 134 2347 Alice Corp Vs CLS Bank ruling with use of a physical, non-abstract little league baseball tournament meme to describe, list steps, procedures, processes intrinsic to internet, internet of foundation technology framework adaptive procedural template to support for example: DeFi programmable money digital tokenized assets 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) for DeFi, TradeFi based trade federations to establish for example, a one world government, economic, financial system of system's universal unit of value, statistical mean value, tariff trade calculator tool for many cryptocurrencies, commodities, currencies, stocks, tariffs derived from price discovery algorithms, space – time metrics, meters collected, filtered, averaged then heartbeat event bus message beacon broadcasted across space - time

Method of claim 2 relies on use of an adaptive procedural template framework tools, procedures, processes to describe internet, internet of money, programmable money foundation technology, metrics, meters, SLA Service Level Agreements to form a syntax lexicon namespace derived from NATO / DoD brevity OPSCODE FFIRN, FFUDNS tokens structured data exchange mapped to symbols describing A.I. man – machine interface symbols, big data elements, sets, fields, to form a 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 syntax, code, date element Rosetta Stone referred to in military discussions as The "Grail": i.e., synchronized, common, shared situational awareness data dashboard view (s) of time stamped, brevity code / tokens, digital assets that are filtered, prioritized from heartbeat message bus filtered, parsed, processed from a federated system of systems via use of heartbeat message event bus sync delta epoch data updates Universal Time Zone UTZ synchronized, stochastically harmonized updates using an improvement described by the University of Bologna / Hungary's, Chinese University's firefly inspired heartbeat synchronization algorithm that matches,

synchronizes stochastic harmonizes via firefly inspired heartbeat synchronization pulses intrinsic analogous to Network Centric Warfare's Battlefield Digitization's closest OPTEMPO Operational Tempos epoch time intervals, cycles i.e., .0001, 05, 10, 15, 30 pico, milli, micro seconds, minutes, hours days, years posted to digital dashboards

Method of claim 3 relies on the use of an adaptive procedural template tools, processes, procedures 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

Method of claim 4 relies on the use of an adaptive procedural template processes, procedures 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, price discover algorithm data harvests for example stocks, commodity real world digital assets, currency arbitrage trade tariff exchange adjustments using heartbeat epoch time beacon's intrinsic temporally 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 in a control matrix among for example HFT stock market systems participating to establish algorithmic regulation via use of algorithmic price discovery, Nash Equilibrium algorithms to derive a uniform, universal statistical mean value index, discrete, time bounded trade windows, stock trade circuit breaker via heartbeat beacon message, event bus broadcasted , uni, multicast among many stock, commodity, ETF Exchange Traded Fund systems

Method of claim 5 relies on the use of the adaptive procedural template's 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 to achieve common, synchronized goals in conjunction with use of adaptive procedural template list items that are intrinsic to algorithms / protocols such as Princeton's John Nash Equilibrium algorithms and count minimum sketch or streaming K algorithms algorithmically regulating through use of epoch time intervals for HFT stock, commodity, digital token, tokenized RWA Real World Assets, cryptocurrency trade, arbitrage micro transaction epoch temporal time windows in federated systems supporting economic, fiscal control grid matrix among a federated system of systems i.e., Convention of States situationally aware dependent tethering, untethering to DAO

Method of claim 6 relies on the use of an adaptive procedural template framework to establish, support, maintain economist Milton Friedman's K% rule where a Central Bank Digital Currency CBDC, stablecoin or conventional FIAT, commodity index backed currency is derived from sampling lead GDP Gross Domestic Product economic indicators among a global event message bus sync delta data, event changes updating for example, a RWA Real World Asset based commodity index backed collective, consistent value unit based currency via use of filtered, stochastically harmonized, temporally synchronized telemetry polled from a universal event bus applying firefly-heartbeat algorithm events, state changes leveraging heartbeat message - event functions to update a statistical mean value index as a standard, consistent unit of value using algorithmic price discovery heartbeat beacon broadcasted among many systems

Method of claim 7 relies on the use of an adaptive procedural template's tools, processes, procedures, algorithms to derive from price discovery algorithm from Real World Assets a commodity index backed algorithmic stablecoin comprised of: commodity tokens / RWA Real World Assets index where algorithmic price discovery is derived from many stablecoin time (block) chains, that employ equilibrium algorithms (s) where a stablecoin may include attributes, processes, procedures: i.e., use of geo-spatial temporal event, activity intensity fencing to establish payment boundaries, geo-spatial areas of effect, geo-spatial temporal areas of support where a coin may have a set time limit based on time - stamp servers heartbeat, geo-spatial area of authorized use, select (federated) group of crowd funders, harvest, move crop commodities, goods backing the value of the coin from / to a given area's commons market, federation for example, a trade federation supported by Economist Bernard Lietaer's TRC Trade Reference Currency: TERRA RWA Real World Assets, commodities, commodity basket , index based featuring demurrage fees, charges to support tariffed supplier to consumer logistics transfer, travel of for example: GDP Gross Domestic Product pacing items as 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, management of trade tariffs

Method of claim 8 relies on referencing an adaptive procedural template to establish, maintain trade tariffs SLA Service Level 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 agreed upon by a trade federation (s)

Method of claim 9 relies on the use of an adaptive procedural template's tools, processes, procedures to establish, maintain a global system of systems telemetry data synchronization, stochastic harmonization, based on sound - light waveform based quantum computing to establish for example, temporal speed limits, discrete time intervals to derive, provide systemic metrics, meters, synchronization, stochastic harmonization among many system of systems Distributed Autonomous Systems DAS

Method of claim 10 relies on the use of adaptive procedural template tools, processes, procedures, algorithms and specifically 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 for quantum particles statistical predictive event sampling with electron microscopes

Method of claim 11 relies on the use of an adaptive procedural template framework's tools, processes, procedures, algorithms to apply the electric dipole effect electric meters, metrics where closer is cheaper given less infrastructure needed given energy attenuates over distances • data over energy link where energy pulses as a method and means to transmit data / electricity via wired, and wireless air – ground pathways as demonstrated by inventor, scientist Nicola Tesla circa 1900 near Colorado Springs CO



SUMMARY: USPTO 13/573,002: World Game (s) Fulcrum = Epoch % sync deltas

APPENDIX A: ADAPTIVE PROCEDURAL TEMPLATE SAMPLE

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 involves DoD / NATO derived agile, ad hoc joins, merges, drops to / from (trade) federation in lieu of formal merger, and acquisition.

1.1 PURPOSE: Establish a context syntax lexicon library structured data exchange time stamp server based described, defined, delineated by organization <Org_ID>, by data class type, resource type to form a universal syntax, code, date element, tag Rosetta Stone reference for coders, programmers. Establish a global control grid shared time – space geo spatial temporal matrix with time – space metrics, meters for all things net, internet of money i.e., Distributed Finance DeFi, stable coins. Reuse military OPSCODE brevity alpha- numeric codes as DeFi – TradeFi tokens, tokenization mapped, associated, paired with MILSTD 2525 A, B, C, D symbols and symbol sets. MIL Standard structured data exchange messages, message sets critical to A.I. Artificial Intelligence Man - machine interaction.

1.2 Goal: improve geo-spatial temporal, syntactic - semantic consistency, interoperability among myriad programmable cryptocurrencies, economy protocols, algorithms, syntax libraries. 300 + message sets supporting artificial intelligence A.I. through mapping of brevity operational OPSCODES to symbols, symbol sets supporting DeFi tokens, TradeFi tokenization supporting universal standards

1.3 SCOPE

Form trade federations among local communities or among sovereign (First) nations supported by trade mediation gateways controlled by corporate multinational organizations or nation states. 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 supporting stable coin DAO tokenization efforts

1.4 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

1.5 DEFINITIONS, ACRONYMS

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.

1.6 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.

1.7 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.

1.8 POLICIES

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

1.9 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 for example: ERC3643, Asset Tokenization blockchain cryptocurrency standard

1.10 PROCESSES

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

1.11 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 algorithms algorithmically regulating through use of epoch time intervals for stock, commodity, digital tokenized RWA Real World Assets, cryptocurrency trade, arbitrage transaction epoch time windows in a federated system

EXAMPLE: Economist Schelling's Schelling Point combined with price discover algorithm supporting tariff commodity price fluctuations. In game theory, a Schelling point describes an intuitive focal solution people gravitate towards without direct communication. Named after its progenitor, economist Thomas Schelling, its reach extends to realms like negotiations, economics, and international affairs, driven by common societal frameworks, policies, standards and references.

Definition: A Schelling point refers to a solution or focal point that people tend to use in the absence of communication because it seems special or relevant to them.

Applications Beyond Game Theory:

Negotiations: Parties may converge to a Schelling point when making decisions.

Economics: Pricing, especially in markets with limited communication or transparency.

Social Norms: How unwritten rules or conventions can emerge in societies.

International Relations: Nations may converge to unwritten standards or behaviors.

CURRENCY: BRICS / Eurasian Economic Union "new global reserve currency based on Real World Assets, commodities "creating a international reserve currency based on an index of currencies, commodities is under review" Source: Fintech Magazine

Origin: The concept is named after economist Thomas Schelling who introduced it in the context of game theory. Context of Introduction Schelling originally described this concept while discussing problems in which individuals must select an outcome without communicating with others. Source: <https://thebasics.guide/schelling-point/>

1.12 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 operations.

System-of-systems engineering, architecture approach: 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. Systems of systems, while still being investigated predominantly in the defense sector, is seeing application in other fields where it can be applied include 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., Earth system) are interpreted as interconnected or nested systems, need a systems-of-systems approach. An application in business can be found for supply chain resilience. Wikipedia

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

1.13 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 OPSCODE 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
 - Tariff trade calculation math tool, algorithm (s) based on space – time metrics, meters
 - 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 OPSCODE brevity codes naming conventions for objects, events. OPSCODE brevity code syntax - symbol set lexicon of tokenized GDP Gross Domestic Product pacing items described in a syntax lexicon OPSCODE 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 federated 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

1.14 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.

1.15 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

1.15.1 Begin a list of steps beginning at the number one

1.15.2 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. Unsuccessfully arriving at consensus agreement 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, 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.

1.16 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)

1.16.1 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

1.16.2 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, tariff, demurrage fee commodity exchanges, fungible goods, real time bidding, many use cases relying on epoch time stamping 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 given 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 drawn from a shared syntax lexicon

1.16.3 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 quantum sound wave propagated mesh fabrics grid control matrixes 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

1.16.4 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

1.16.5 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, DeFi – TradeFi tariffs

1.16.6 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) i.e., quantum computing electron microscope liquid hydrogen – helium facilities chain, sequentially linked, Tariff trade calculation math tool, algorithm (s) based on space – time metrics, meters

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 appliquéd 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. For example, this method is effective among quantum sound wave sites

1.16.8 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 appliquéd 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.

1.16.9 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 for example: use of the firefly inspired heartbeat message / event reporting in a system of systems

1.16.10 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

1.17 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, cryptocurrency consensus algorithms as workflow symbols for example <https://edrawsoft.com/flowchart-symbols.php>

1.18 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.

1.19 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

1.20 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 i.e., supporting quantum computing methods

1.21 Records Control Table ELECTRONIC RECORDS MANAGEMENT

1.22 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>

1.23 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

1.24 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.

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

1.26 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...

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

1.28 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

1.29 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.

1.30 TEMPLATES: Federation Checklist: minimum list of items, components, foundation technology building blocks, processes, procedures within federations to achieve consensus among organizations that may tether, join, untether situationally

1.30.1 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

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

1.30.3 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

Tariff trade calculation math tool, algorithm (s) based on space – time metrics, meters

Templates used by for example a (Constitutional) Confederation of States to allow (nation) states to join, add, merge, drop affiliation to DAO Distributed Autonomous Trade Federations / Organizations situationally dependent i.e., tariff levies, taxes. Convention of States; a national movement to call a convention under Article V of the United States Constitution, restricted to proposing amendments that will impose fiscal restraints on the federal government, limit its power and jurisdiction, and impose term limits on its officials and members of Congress. Applicable to United Nation members

1.31 Profiles: See Organizational Profile: for example: NIST National Institute of Standards and Technology 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 / Related Art

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 in AI apps.

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 OPSCODE brevity codes mapped to Military Standard MIL STANDARD 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 Cesium 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. 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> ›

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.

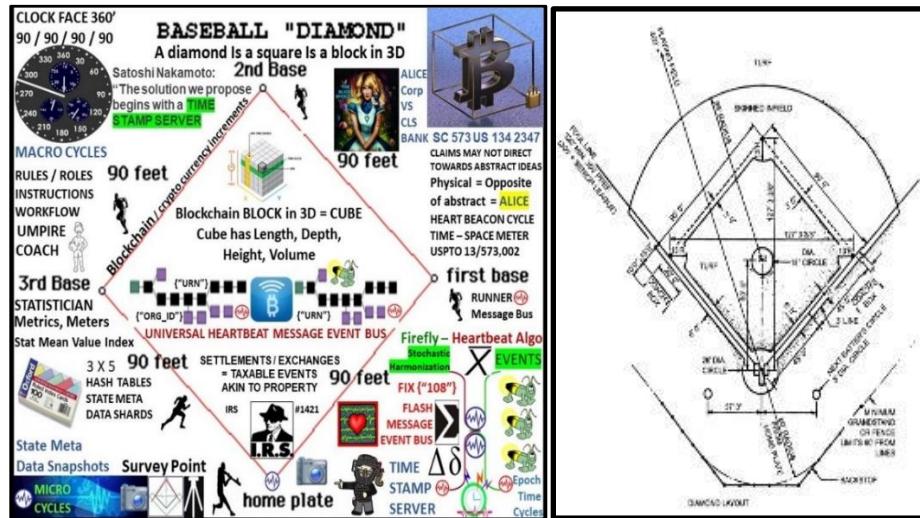


FIGURE D: SCOTUS ALICE CORP VS CLS BANK 2014 ruling compliant meme

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://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

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 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. 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. 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. 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, 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”)⁹

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. Redemptions – 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. 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.

- 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.

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.

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 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.

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

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:

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. In some Stablecoin arrangements, issuers use an algorithm to manage their backing reserve. This approach gives rise to the same types of risks as manual reserve management and is not differentiated

B. Financial Digital Assets

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)
- 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 (comnon-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, Alternative digital assets include:

- a. Tokenized Physical Commodities (e.g., wheat, oil, corn);
- b. tokenized Real Estate
- 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.
- e 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:
- f. 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
- g. 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, supply-demand

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 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 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 is called “books-and-records” use case, and a Settlement Token would not be considered as Digital Asset as defined herein.

G. Other Digital Assets

Micropayments / Microtransactions: derived from video game developers adapted as demurrage fee like, Ethereum “gas”, Ripple Labs XRP acting as start, stop, TTL Time To Live duration, threshold controls supporting transactions on the (fictitious) “blockchain

The Digital Assets Subcommittee recognizes the potential for future innovation and has retained this bucket for new developments that may arise in the digital asset’s ecosystem. 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 a₁, a₂, a₃, ..., 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 ϵ and probability of bad estimate δ .

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 geospatially 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 is 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 total token supply. function totalSupply() 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) 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) pub returns (bool success)

ALLOWANCE Returns amount spender is allowed to withdraw from _owner. function allowance (address _owner, address _spender) 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

ERC 3643, Asset Tokenization: Code name T-REX PROTOCOL - standard for permissioned tokens: The ERC3643 protocol is an open-source suite of smart contracts that enables the issuance, management, and transfer of permissioned tokens. Its built-in decentralized identity framework, [ONCHAINID](#), ensures only users meeting pre-defined conditions can become token holders, even on permissionless blockchains, RWA Real World Assets, Securities, E-Money, Loyalty programs

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). The metrics API's purpose is to collect real-time metrics from Erlang applications and publish them via Erlang time equations, 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, meters created, read, updated via 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 equilibrium algorithm (s) for every finite game 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 market 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

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. 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

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](#).

Financial Nostradamus a.k.a Reggie Middleton: 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/>

Financial Standard ISO 20022 is a 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. It is a 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, when use of the ISO 20022 XML or ASN.1-based syntax is preferred.

The resulting models and derived messages are published in the Catalogue of messages and stored in the ISO 20022 Financial Repository available on this website. This flexible framework allows communities of users and message development organizations to define message sets according to an internationally agreed approach using internationally agreed business semantics and, whenever desirable, to migrate to the use of a common XML or ASN.1-based syntax.

FIREFLY-HEARTBEAT ALGORITHM: 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 result of a timeout. Link: https://www.onixs.biz/fixdictionary/4.0/msgtype_0_0.html

ISO 20022 ISO describes semantic 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?

Gross national income (GNI), previously known as gross national product (GNP), is the total domestic and foreign output claimed by residents of a country, consisting of Gross Domestic Product (GDP), plus factor incomes earned by foreign residents, minus income earned in the domestic economy by nonresidents (Todaro & Smith, 2011: 44).[2] Comparing GNI to GDP shows the degree to which a nation's GDP represents domestic or international activity. Kuznets became the first economist to show that the Absolute Income Hypothesis gives inaccurate predictions in the long run by using time-series data. Wikipedia https://en.wikipedia.org/wiki/Simon_Kuznets

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

GDP INDEX ECONOMY: Thomas Edison and Henry Ford proposed a currency based on the value of a basket of crop commodities. Edison believed that crops held their value over time. Consider climate change reality and the merits are self-evident.

GERMAN ARMY RECOMMENDATION CIRCA 2003: using Battlefield Digitization, Net Centric Warfare, System of Systems Engineering best practice for OOTW Operations Other Than War - a German Army suggestion made in 2003 to support DATF Distributed Autonomous Trade Federations / DAOs for a world economic framework.

GEIA-STD-0007 Logistics Product Data Central Exchange Federated database, must establish exchange agreements with each “Partner”. • Point to Point Simple exchange, must establish exchange agreements and Protocols with each Partner , similar data and structure. Data Types Dictionary □ XML Schema for Logistics Product Data – Update/Change Process □ XML Schemas for Transaction Sets – Provisioning & Style Sheet — Task Analysis. Data Element Dictionary Example The probability that, when used under stated conditions in an ideal support environment, a system will operate satisfactorily at any time. This differs from Inherent Availability only in its inclusion of consideration for preventive action. Aa excludes supply downtime and administrative downtime. The measurement bases for MTBM and M must be consistent when calculating Aa. Aa may be expressed by the following formula: $Aa = MTBM - MTBM + M$ where $MTBM = (1 - 1 - 1) - 1 \cdot MTBF + MTBM-ND + MTBPM \sum_{i=1}^N (ETi) \cdot TFi$ $M = N \sum_{i=1}^N TFi$ $i = 1$ M = Mean active maintenance downtime (where corrective and preventive actions are considered) ETi = Elapsed time for task i TFi = Task frequency for task i N = Total number of tasks performed Note: The measurement bases for MTBF, MTBM-ND, and MTBPM must be consistent when calculating the MTBM parameter.

GITHUB: GitHub is a web-based Git repository hosting service. It offers distributed revision control, source code, source code management, bug tracking, feature requests, task management, and Wikis for every project. GitHub renders common formats like text, CSV, and geospatial data. GitHub includes enterprise controls to collaborate openly while limiting access to a team, to select stakeholders, or to entire organizations.

[LINK](http://github.com/Beacon-Heart/Heart-Beacon) <http://github.com/Beacon-Heart/Heart-Beacon>

GRAPHENE: form of partnership called a Decentralized Conglomerate A universal shared platform allows organizations to have a common interest in the platform itself, without the platform imposing any control on the organizations that join the universal platform ecosystem where organizations directly invest in each other.” Profits can be shared without the necessity of the companies coordinating their operations. “ By entering into a Decentralized Conglomerate means the co-ordination takes place within an automated system,” “The OpenLedger team has created the universal shared platform on which organizations can enter agreements to share their profits in exchange for community support.” Graphene Blockchain Worker System [LINK](#) https://bitshares.org/doxygen/group_workers.html

HASHED TIME LOCK CONTRACT HTLC

Hashed Timelock Contract (HTLC)

HTLCs are the centerpiece of every Lightning Network payment. Learn how they are formed to create secure multi-hop transactions. Hashed Timelock Contracts (HTLCs) are the centerpiece of any Lightning transaction. While your Lightning Network channel is a 2-of-2 multisignature address with funds on the bitcoin blockchain, a HTLC is an output of an unconfirmed transaction to a separate “smart contract” address with the following properties:

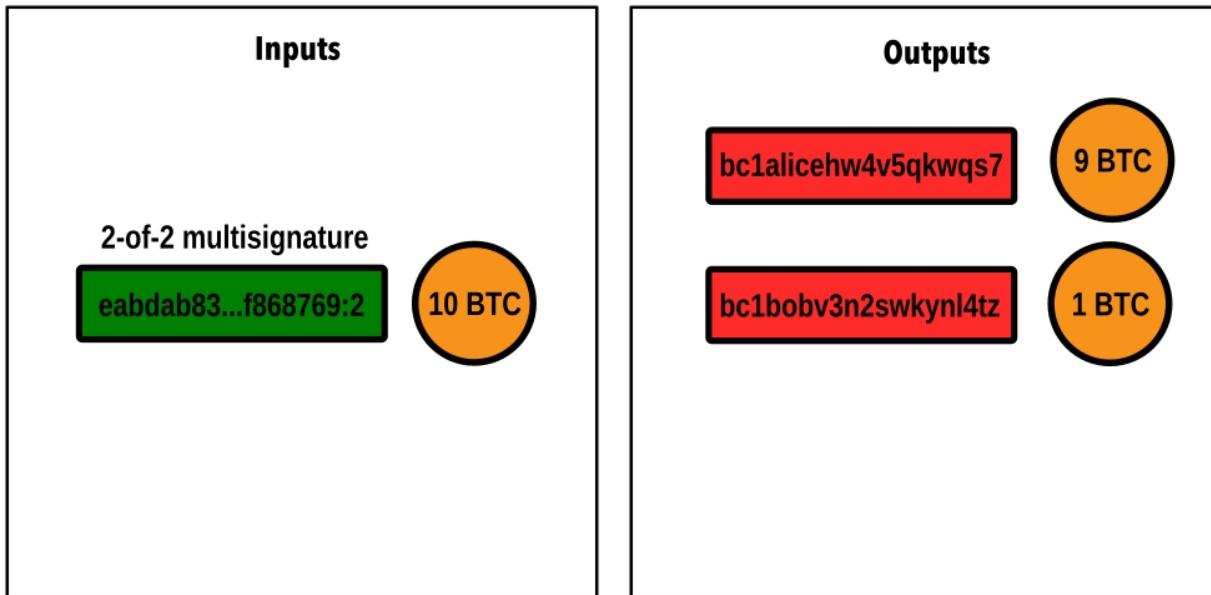
1. The smart contract can be spent by revealing a “secret” together with a valid signature of the recipient

2. The smart contract can be redeemed after a set amount of time together with a valid signature of the sender.

HTLCs with the above conditions also find application outside the Lightning Network. When used to transfer funds through a Lightning channel, a HTLC also comes with a third condition:

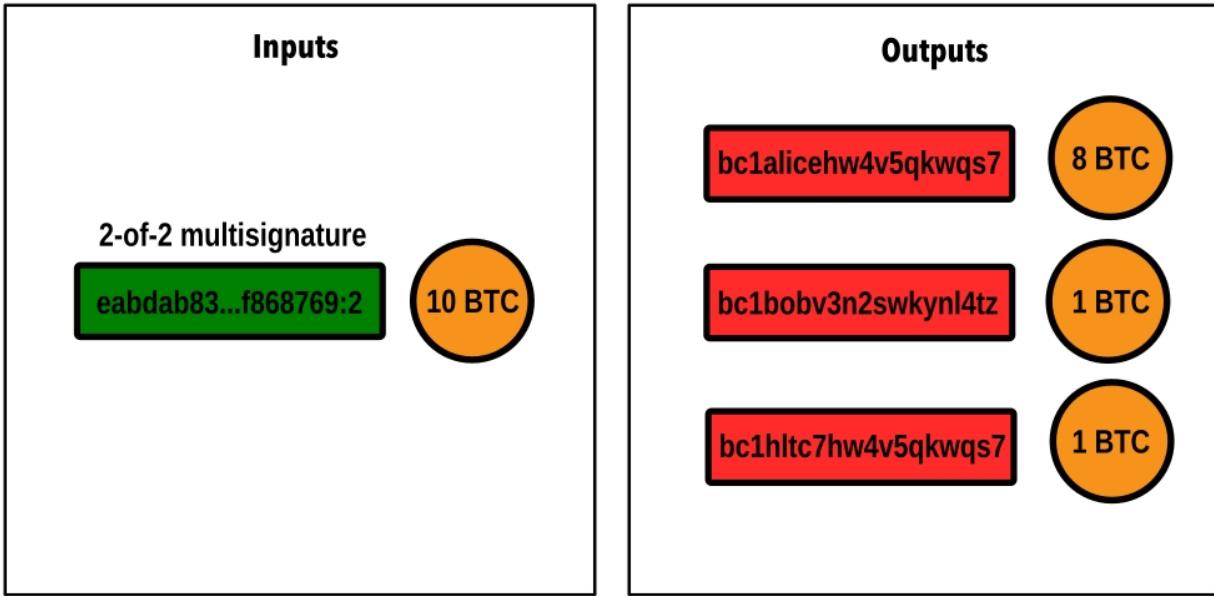
3. The smart contract can be spent immediately by presenting a revocation key. Ideally, this transaction never needs to be committed onto the blockchain. Instead, when the preimage is revealed by the recipient, the balances of the channel can be updated, creating a new commitment transaction and invalidating the previous one.

1) The commitment transaction



The commitment transaction of a regular payment channel can be visualized as above. It contains a single input. This input represents the channel point, or transaction ID of the channel. The transaction referenced by this input is recorded on the blockchain and can only be spent with a transaction signed both by Bob and Alice. The commitment transaction is signed by both Alice and Bob, and spends the channel balance (10 BTC) according to their channel balances, in this case 9 BTC to Alice and 1 BTC to Bob.

2) A HTLC is created



Alice is now presented with an invoice over 1 BTC. She creates a new commitment transaction that reduces her balance to 8 BTC, while keeping Bob's balance at 1 BTC. A new output over 1 BTC is created. This output is the HTLC, and follows the rules of a HTLC as outlined above. The script of this address might look like this:

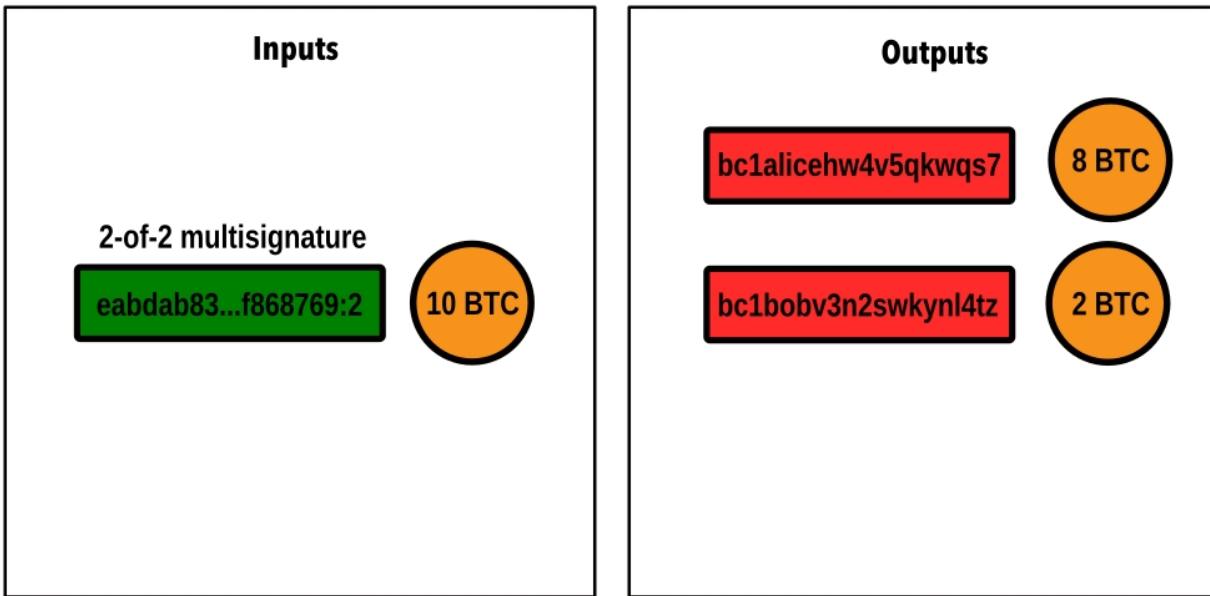
Copy

```
IF <revocation pubkey>
ELSE IF <hash(preimage)>
<recover pubkey>
ELSE CHECKLOCKTIME
<sender pubkey>
```

The revocation pubkey is to prevent either Bob or Alice from stealing funds by publishing older channel state. The recover pubkey is Bob's key to claim the 1 BTC if he provides the preimage from the final receiver (meaning the transaction went through). The sender pubkey is Alice's key to claim the 1BTC back after certain time, if Bob doesn't show the preimage.

Depending on the route chosen, Bob might now forward this HTLC by creating a new commitment transaction for one of his channels, removing 1 BTC from his channel balance. Then, he commits it into a similar HTLC with the same preimage hash with a swapped recover pubkey of his channel peer (so that the peer can claim the 1 BTC if they get the preimage) and his sender pubkey (so that Bob can claim the 1 BTC after certain time).

3) A HTLC is consolidated



Once the recipient of the 1 BTC payment sees a commitment transaction with a 1 BTC HTLC made to the hash of the preimage, they can safely reveal the preimage. Now, the HTLC can be consolidated back into the channel balance. In this case, Bob will create a new commitment transaction that removes the HTLC output and instead adds its balance to his channel balance. Alice, aware that Bob knows the preimage and could claim the HTLC on-chain, has an interest in co-signing this new commitment transaction. The payment cycle is complete.

An HTLC might also get consolidated because the payment could not be completed. In this case Alice will create a new commitment transaction that updates her balance back to its earlier state in step (1). Bob, aware of being unable to claim the HTLC for themselves, has an interest in signing this transaction to keep the channel alive.

4) A HTLC is settled on-chain In some rare events, the HTLC needs to be settled on-chain. This could happen in the event that Alice does not co-sign the new commitment transaction meant to consolidate the HTLC, for example because she has become unresponsive. Settling an HTLC will cause a force-close of the channel and lock up its funds. Depending on whether the preimage is known the HTLC can be redeemed immediately, or once the waiting period has passed.

There is also the possibility that an old, revoked HTLC is committed to the chain. In this case the revocation key can be used to take the funds by the other party.

5) Multi-hop payments

The main use of HTLCs is to safely enable payments through multiple channels. With HTLCs, payments can be made atomically, meaning they either fail entirely or succeed. Furthermore, a routing node is not able to take funds at any point. To achieve this, all peers along a route will construct their HTLCs from the same hash of the same secret preimage. They can rest assured that for their outgoing peer to be able to claim the funds they send, the preimage needs to be revealed, allowing them to likewise claim their funds from their incoming peer.

To remove racing conditions, meaning an execution in which the wrong sequence can lead to undesired consequences , peers along a route will want their HTLCs to expire in the order in which they can be redeemed. Thus, if an HTLC is settled on-chain, by the ultimate recipient, the preimage revealed in that transaction becomes known to their channel peer who can then claim their HTLC.

6) HTLC constraints

A) Asymmetry

Similar to commitment transactions, there is an asymmetry with regard to HTCLs. In that, depending on who attempts to commit the HTLC on chain, a different revocation key and waiting period is applied. (E.g. if Alice commits her transaction, Bob can contest the HTLC with his key, or the other way around.)

B) Waiting period: The waiting period can be defined individually for each channel at its creation using the --max_local_csv and --remote_csv_delay flags of Incli openchannel. A large waiting period makes it safer to recover from a failure, but will also lock up funds for longer if a channel closes unilaterally.

C) CLTV delta The timelock delta (or CLTV expiry delta) is the minimum difference between the expiration of an incoming and outgoing HTLC. This delta ensures that there is always enough time to settle an HTLC, even if previous HTLCs are settled on-chain at the last minute. It can be set using the --time_lock_delta flag of Incli updatechanpolicy or in the configuration file. bitcoin.timelockdelta=40

D) HTLC size For each channel, you can define the minimum and maximum HTLC size. It might be rational to set a minimum HTLC size with --min_htlc_msat to not risk a channel closure for a small HTLC, or a HTLC that cannot be settled on-chain due to the dust limit.

E) Maximum value in flight

It's also possible to limit the total number of satoshis that can be pending at any point in a channel using --remote_max_value_in_flight_msat at the channel opening.

F) Multiple HTLCs Each channel can handle hundreds of HTLCs at once. The maximum limit of 483 is set as the default, although this can be reduced in the configuration file. default-remote-max-htlcs=483

Example usage:

```
Incli updatechanpolicy --base_fee_msat 100 --fee_rate 0.00001 --time_lock_delta 50 --
min_htlc_msat 1000 --chan_point
17ec2d0ac18d953b1dfe2caca116b0c118020cab4d80c4063fe98debda6df469:1
Incli openchannel --node_key
021c97a90a411ff2b10dc2a8e32de2f29d2fa49d41bfbb52bd416e460db0747d0d --
connect 50.112.125.89:9735 --local_amt 210000000 --
remote_max_value_in_flight_msat 105000000000 --max_local_csv 50
```

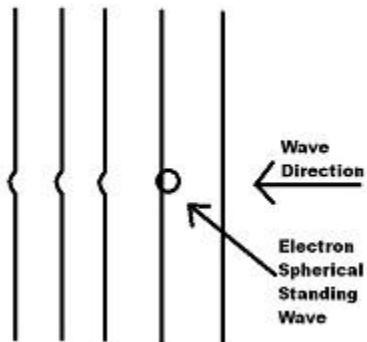
HEARTBEAT: is a periodic signal indicate normal operation or to synchronize other parts of a computer system. Heartbeat mechanism detects the network or systems failures of nodes or daemons which belongs to a network cluster—administered by a master server—for the purpose of automatic adaptation and 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. A heartbeat is sent between machines at a regular interval in the order of seconds; a **heartbeat message**.^[4] 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.^[5] 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**.^[3] 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.^[6] A heartbeat program as a whole consist of various **subsystems**:^[7]

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.)

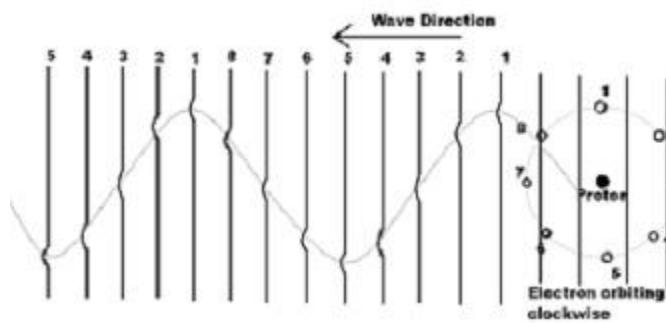
Charge



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'

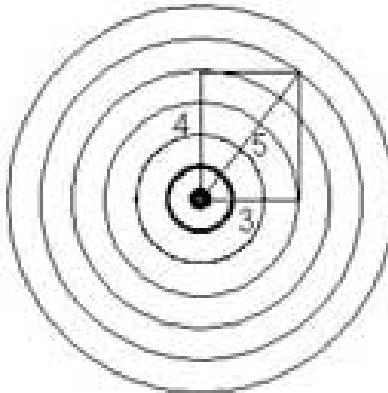


If the electron is bound in an atom or molecule, then it has a repeating wave pattern, and this pattern of advanced 'hills' on successive plane waves forms a wave pattern that is the cause of the 'electromagnetic' light wave. It is a resonance phenomenon, where the pattern of advanced

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).

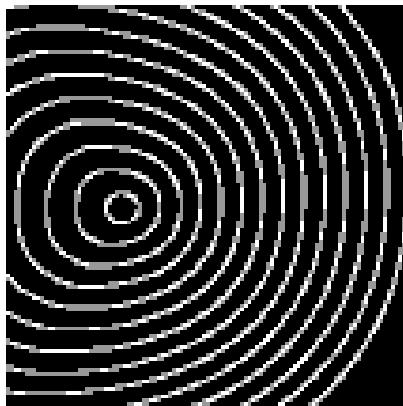
Acceleration and Ellipsoidal Geometry

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.

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 (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>

Article: Quantum data takes a ride on sound waves: Yale scientists have created a simple-to-produce device that uses sound waves to store quantum information and convert it from one form to another, all inside a single, integrated chip.

The device allows a superconducting artificial atom—a qubit—to exchange energy and quantum information with a high frequency bulk acoustic wave resonator (HBAR). The ability to manipulate and store fragile quantum data in a robust and easy-to-manufacture way is a crucial step in the development of quantum computing technology. The work is a collaboration at Yale between the labs of Robert Schoelkopf, the Sterling Professor of Applied Physics and Physics, and Peter Rakich, assistant professor of physics. Yiwen Chu, a postdoctoral associate in Schoelkopf's lab, led the effort and is first author of a study that appears Sept. 21 in the online edition of the journal *Science*. Chu said the new device features a qubit made from superconducting aluminum and a mechanical resonator made with a sapphire wafer. The wafer has two polished surfaces acting as mirrors for sound waves.

"We found that even a single quantum particle of sound, or a phonon, can live for a very long time when it bounces back and forth between these mirrors," Chu explained. "It can also be coupled to a superconducting qubit made on the surface of the sapphire using a disk of aluminum nitride, which converts acoustic energy into electromagnetic energy and vice versa." The combination of these properties enables the researchers to transfer quantum states back and forth between the qubit and the mechanical resonator, Chu added. She also noted that the new device is easier to manufacture than other systems that merge superconducting circuits with mechanical motion.

Yale scientists have made a series of quantum superconducting breakthroughs in recent years, directed at creating electronic devices that are the quantum version of the integrated circuit. The ability to combine that knowledge with a mechanical resonator is a valuable step, Chu said. "For example, mechanical resonators can be used to store quantum information generated by superconducting qubits in a more compact and robust way," she said. They can also be used to interface superconducting circuits to other types of quantum objects, such as visible or infrared light. It would potentially allow us to create quantum information in our circuits and then transmit it over long distances using light." More information: Yiwen Chu et al. Quantum acoustics with superconducting qubits, *Science* (2017). DOI: 10.1126/science.aao1511

Fermilab "We bring the world together to solve the mysteries of matter, energy, space and time". Fermilab Quantum Institute <https://education.fnal.gov/quantum-science/>

At the Fermilab Quantum Institute, leading quantum information science researchers partner to conduct high-impact QIS research and development, while advancing high-energy physics applications. Research areas include quantum computing, quantum communication, and electronics and controls for quantum.

SQMS Center The Superconducting Quantum Materials and Systems Center, led by Fermilab, is one of five national centers that are a part of the National Quantum Initiative working to advance quantum science and technology in the United States.

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 was conducted to determine 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. 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. This theory has 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 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 ω 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.

Tariff trade calculation math tool, algorithm (s) via space – time metrics, meters

FTA Tariff Tool to find tariff information and origin requirements US Free Trade Agreement tool: <https://youtu.be/JEABeh7t1U>

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:

- 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. References: [1] Hüpfel, 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 Hüpfel, Felix Russo, Lukas M. Rachbauer, Dorian Bouchet, Junjie Lu, Ulrich Kuhl & Stefan Rotter Nature <https://nature.com/articles/s41567-024-02519-8#citeas>

Quantum Computing Sound Waves generate individual phonons, the fundamental quantum units that comprise sound waves and use them to transfer quantum information between superconducting qubits. A phononic beamsplitter splits acoustic waves enabling manipulation of quantum phenomena like superposition, entanglement, and interference. The Hong-Ou-Mandel effect using phonons, The University of Tsukuba studied a process for creating coherent lattice waves inside silicon crystals

using ultrashort laser pulses, which could lead to quantum computers based on existing silicon devices to enable geo-spatial temporal system interoperability

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 2009 PT 2010 WO US Application US13/380,202 events 2010-06-22, 2012-04-19 Publication of US20120092107A1 Status Abandoned



Heart Beacon 2013 sculpture 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" https://en.wikipedia.org/wiki/Heart_Beacon_Link: City of Portland: <https://codaworx.com/project/heart-beacon-city-of-portland>

APPENDIC C: FINAL REJECTION RESPONSE PAPER SUMMARY July 6th, 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

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

Proton Email (secure) ecoeconomicepochs@protonmail.com

RUMBLE VIDEO: <https://rumble.com/v6ttlvb-new-wave-form-qfs-net-net-of-and-you.html>

VEED video talk slide share: <https://www.veed.io/view/9a10fbcb-941a-4aa9-8281-33b71b0edf28?panel=share>

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

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

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

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

Subscribe Star: https://www.subscribestar.com/eco_econ_epochs

Mastadon: 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

DISCORD: GDP_Index_Economy#6495

LinkTree: <https://linktr.ee/FutureMan2026>

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

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

APPENDIX E: BRIEF DESCRIPTION OF THE GRAPHICS

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

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 Source: Wikipedia:
https://en.wikipedia.org/wiki/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

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 C: 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 (Crop centric)

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 : DeFi = crypto + RWA Real World Assets will involve SCOTUS patent examination through the lens of Alice in Wonderland 2014 ruling. Q: What is your Alice compliant physical meme ? Physical = opposite of abstract

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).

Figure 13: 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 token, tokenized items representing fungible stores of value. Military NATO bases transact a wide range of goods, commodities, fungible items that are described by computer codes – OPS CODES 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 numeric form. 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, data token, element, data tag Rosetta Stone and reference for coders, programmers, heartbeat algorithm event message bus. Military OPS CODE 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 tokenized, fungible RWA Real World Asset federated system 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 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

Token Standards ERC-20 ERC-20 is the Ethereum standard for fungible tokens, types of cryptocurrencies, such as utility tokens, security tokens, and stablecoins.

ERC-721 is the non-fungible token (NFT) standard for Ethereum. NFTs are unique tokens with distinct identifiers that are not mutually interchangeable, like fungible tokens. They represent ownership of a specific asset, such as digital art, collectibles, gaming items, event tickets, or virtual real estate.

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

DoD / NATO system of systems engineering signaling, telemetry framework and syntax OPSCODE 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 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

Figure 19: 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 tens of thousands of 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.

FIGURE 26: 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.

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 See: <http://ncoic.org>

To determine if an 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, stagflation etc.

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 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 follows: 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 / 90A: 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 11th, 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 (θ,ϕ) 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 $(\cos\theta, \sin\phi\cos\theta, \sin\phi\sin\theta)$, 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 subdivided 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, CO₂, time resources used to produce, ship.. Demurrage fees incentivize conservation of resources, commodities i.e., discounts for locally produced, consumed goods and commodities. 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

Figure 107: Programmable money through the lens of metaphysics Metaphysical musings on programmable money in light of SCOTUS Alice in Wonderland 2014 ruling "claims may not direct towards abstract ideas"

Figure 108: Patent Litigation Summary graphic

Figure 109: 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 110: Curriculum Vitae: Steven J. McGee First Named Inventor

Figure 111: Schelling Point Fulcrum Price Discovery Algorithm for the New QFS

Figure 112: First Named Inventor / Patent Applicant's Business Card

Figure 113: Movie: Groundhogs Day / Movie: Limits of Control / Movie: City of Ember
Actor Bill Murray's sampling of movies i.e., Skull and Bones man in the Movie "Limits of Control" with co-star Tilda Swinton, Mayor of last city (underground) "City of Ember"

Figure 114: First Named Inventor: Aquarian / Aquarius Rising

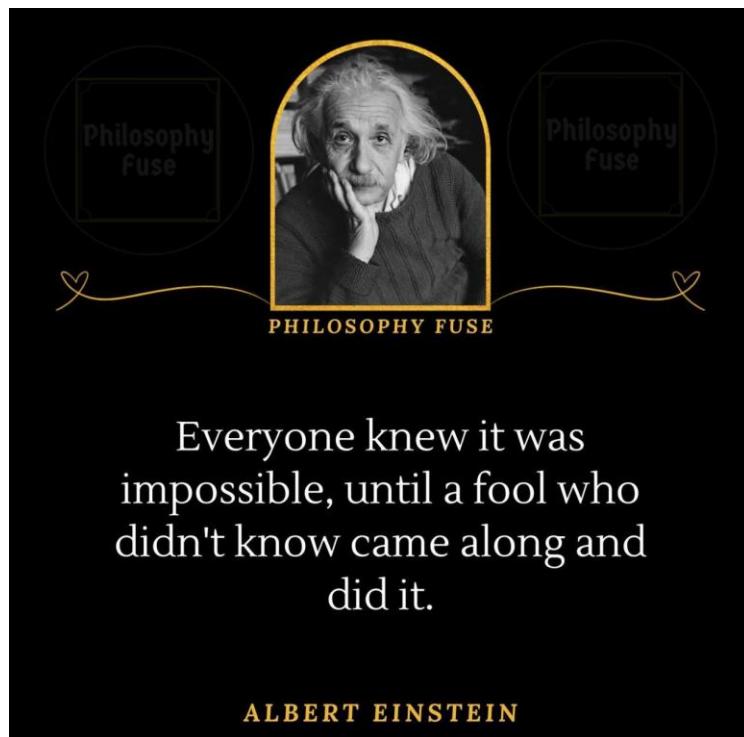
Steven James McGee born 06:44 A.M. February 10th 1960

Summary Graphic / Thesis #2

Curriculum Vitae: Steven J. McGee

PICTURES = THOUSANDS OF WORDS

Contact Info



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 NATO
Series of systemic actions to achieve goals ex: form, maintain ECO sustainable Trade Federations i.e., closer = < fuel, CO2

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

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) Organization Identifiers {"Org_ID"} routing / organizing
- 2) Track RWA Real World Assets / Commodities by </URN>
- 3) DISTRIBUTED STATE MACHINE SNAPSHOTS @ 15 / N min
- 4) TARIFF TOOL ZONE CALCULATION w Space – Time Metrics
- 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

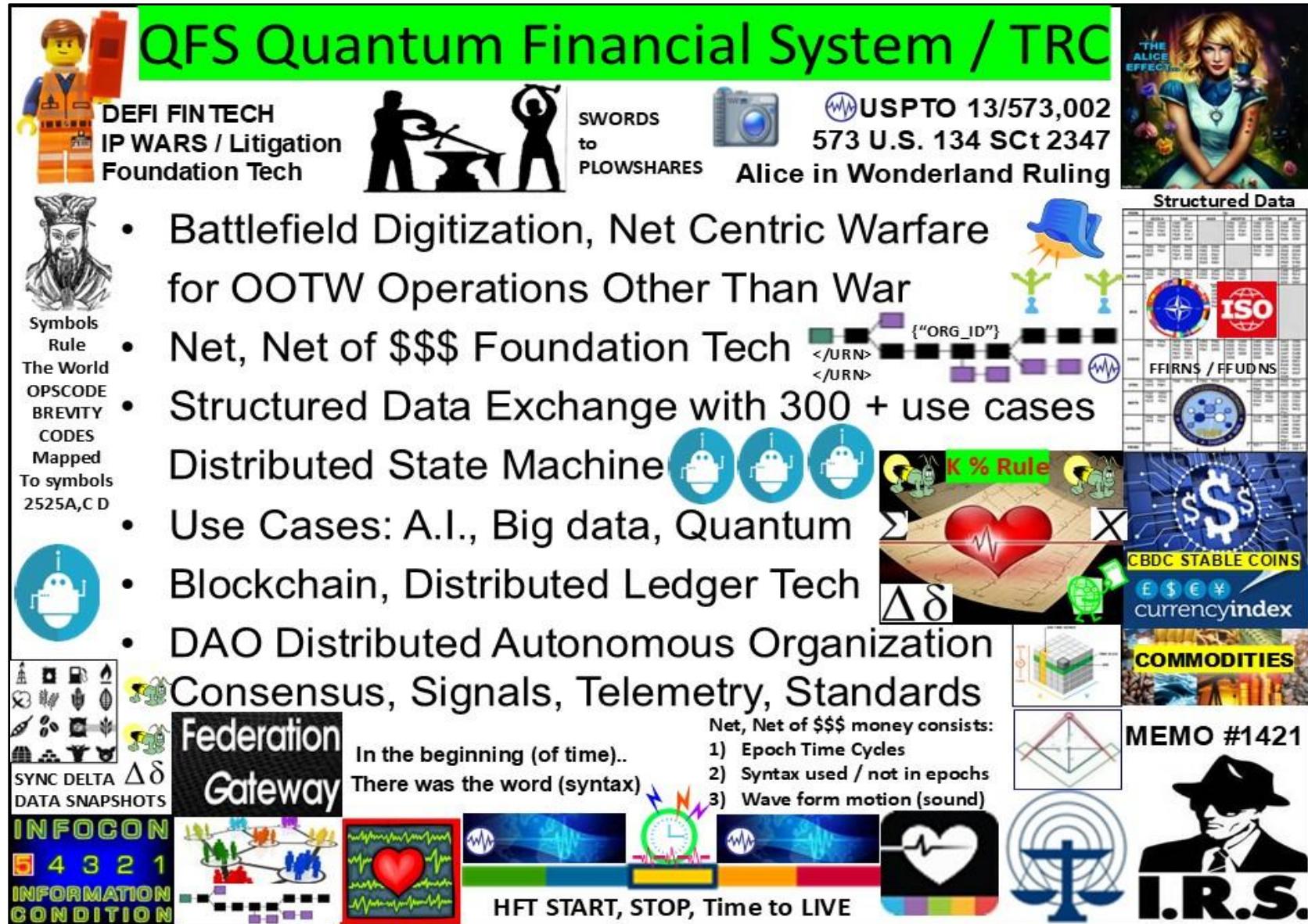


Figure 3: USPTO 13/573,002 Heart Beacon Cycle Time – Space Meter Summary



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

Economics of Microtransactions in Video Games: The Intelligent Economist

Microtransactions: in-game purchases that unlock specific features or give user special abilities, characters or content.

Q: is the main purpose of the (technically non-existent) #blockchain derived from the video game industry adapted to #cryptocurrency industry is about adding/ overlaying #micropayments / #microtransactions converting the world into a massive, virtual open world video game ?
<https://intelligenteconomist.com/microtransactions/>

REPLACEMENT SHEET

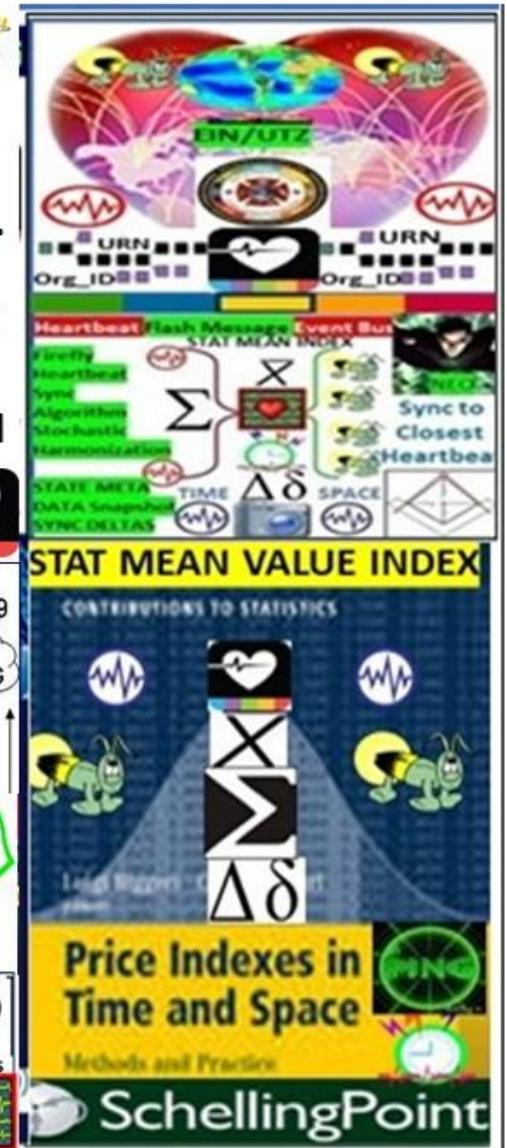
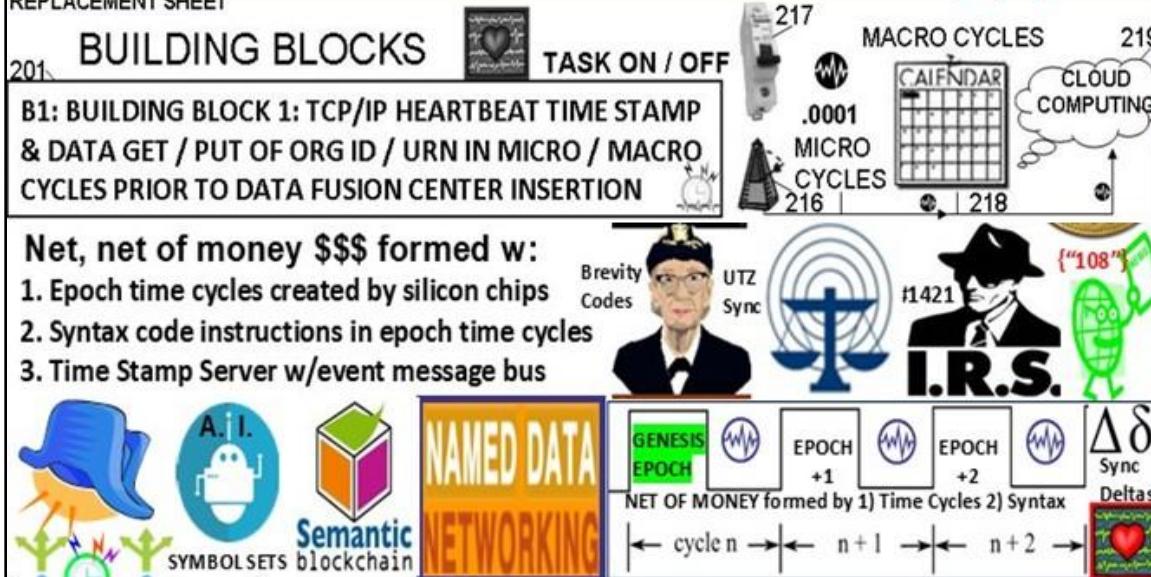


FIGURE 5: Source, origins of micro transactions, micro payments: video game industry



Figure 6: Edison's Monetary Option 1922 / TradeFI Real World Asset RWA Tokenization

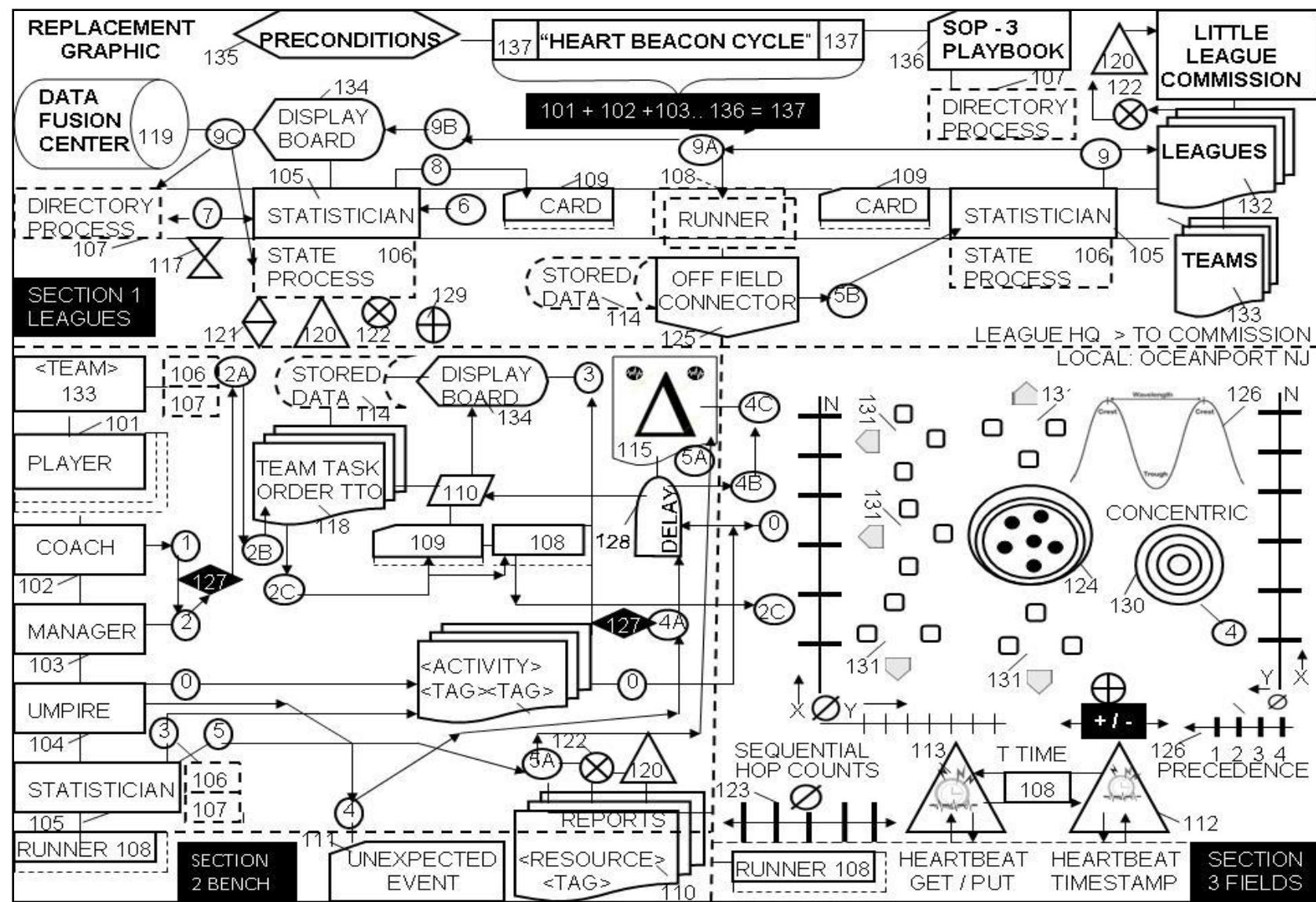


FIGURE 7: USPTO 13/573,002 Main Graphic

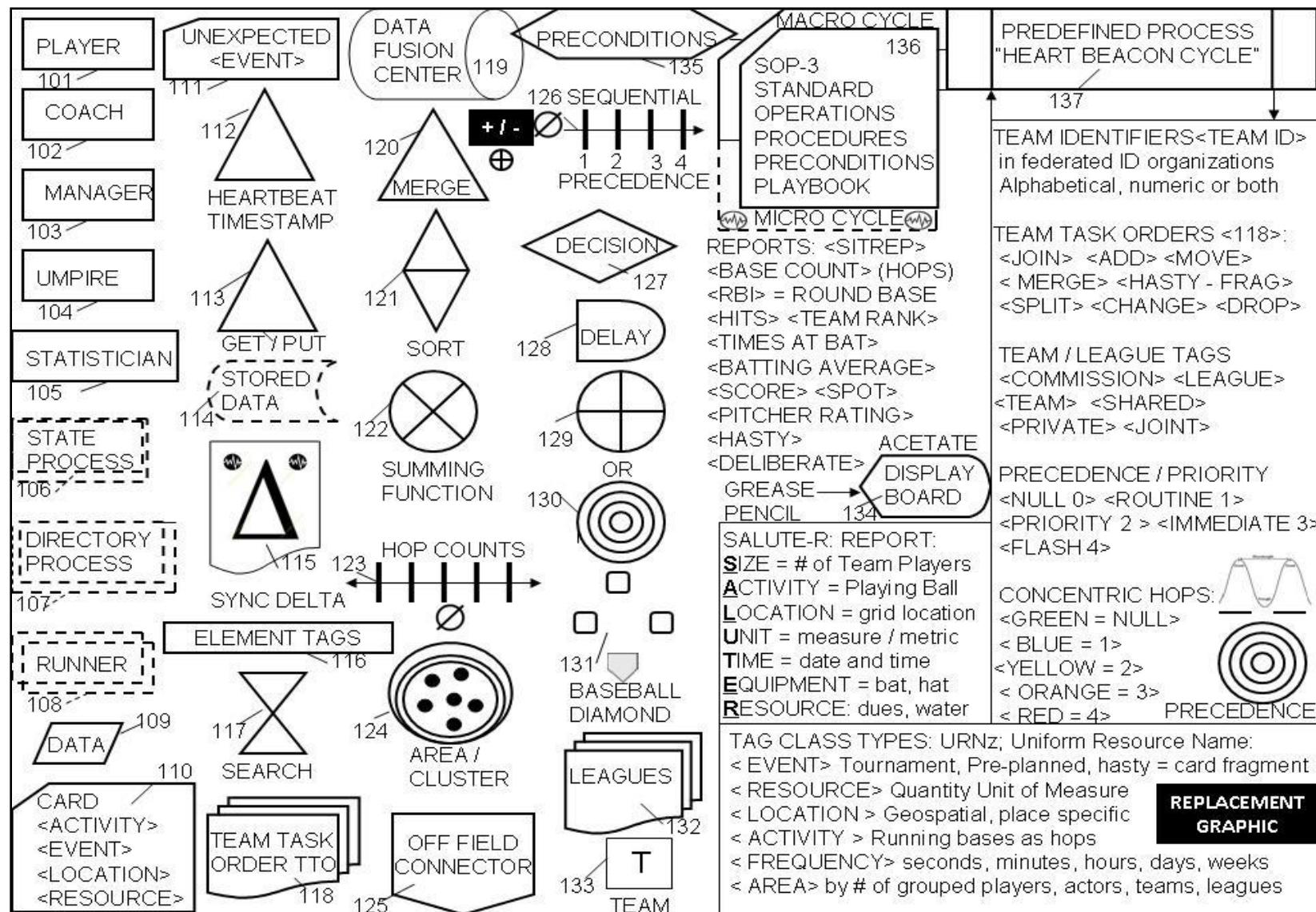


Figure 8: USPTO 13/573,002 MAIN GRAPHIC LEGEND

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

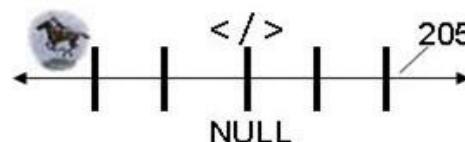


203

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

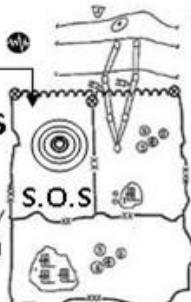
SEARCH FOLLOWED BY ARBITRAGE INVITES VIA BEACON NEWSCASTS. INVITE ACROSS SPACE / TIME

208



APPLIQUE' OVERLAYS

209



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 9: USPTO 13/573,002 Building Blocks

SOUND WAVES enable Different types of quantum tech to "talk"

BITCOIN TRANSACTION AKIN TO LAND ORG_ID in CLEAR / Person ID encrypted

"BLOCKCHAIN"

'wave-particle duality is simply the quantum 'uncertainty principle'

CUBE = SOURCE OF ALL FORM

TIME EPOCHS & SYNTAX = FOUNDATION TECH

USPTO 13/573,002 The Heart Beacon Cycle Time – Space Meter / Adaptive Template

EPOCH **EPOCH** **EPOCH** **Δ**

NET OF \$ formed by 1) Time Cycles 2) Syntax
← cycle n → ← n+1 → ← n+2 →

SCOTUS Alice in Wonderland Ruling 2014

ABSTRACTIONS MAY NOT BE CLAIMED:

Chain Abstraction: Simplifying the Complex World of Blockchain

The Net, Net of Money (Cryptocurrency)
Does not have / has no:

- LAYERS i.e., seven layer internet model
- BLOCKS on the BLOCKCHAIN
- Blockchain data stored in a CUBE
- QUBIT (S) quantum two state system
- Packets i.e., Vinton Cerf's "ode to a packet" Nikola Tesla "All is wave form motion"

Lightchain AI introduces Proof of Intelligence (PoI), consensus mechanism designed to reward nodes for performing AI computations i.e., model training, inference, optimization... INTERNET, NET OF \$\$\$ TRUTH = WAVE FORMS

All computing is essentially workflow logic if, then, else then do {'task'} multicasted, Unicasted, anycasted / filtered over TCP / IP

Q*bert pondering qubits

Q*bert

QUBITS STORED ON A BLOCKCHAIN

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 ???

ABSTRACT VS NATURE: 573 U.S. 134 S.Ct 2347

"BITCOIN'S VALUE = TIME ITSELF"

TIME IS SPECIFIED IN UNITS OF BLOCK TRANSACTION CONFIRMATION TIMES"

FISHER INFORMATION FLUX FLOWS

ACOUSTIC PHONON
In-phase motion of neighboring ions in a lattice vibration

SOUND / LIGHT e.g., Q.R.N.B. QUANTUM COMPUTING @ ROOM TEMPERATURE

SOUND WAVES = INTEROP

UTC SYNC **SYNC DELTA** **</URN>** **Data Snapshots** **</Org_ID>**

TIMESTAMP SERVER **</Org_ID>**

TIME CHAIN

Net of \$\$\$ formed with:

1 EPOCH TIME CYCLES

2 {"Syntax"} "The Word"

"In the Beginning" Genesis Block

"All things internet, Internet of money are formed using time epoch cycles to process, parse, syntax as instructions"

"A blockchain is a consensus-based system. It only works if all nodes reach an identical state"

Fig 10: DeFi, cryptocurrency + Real World Asset tokenization will be scrutinized thru Alice in Wonderland lens

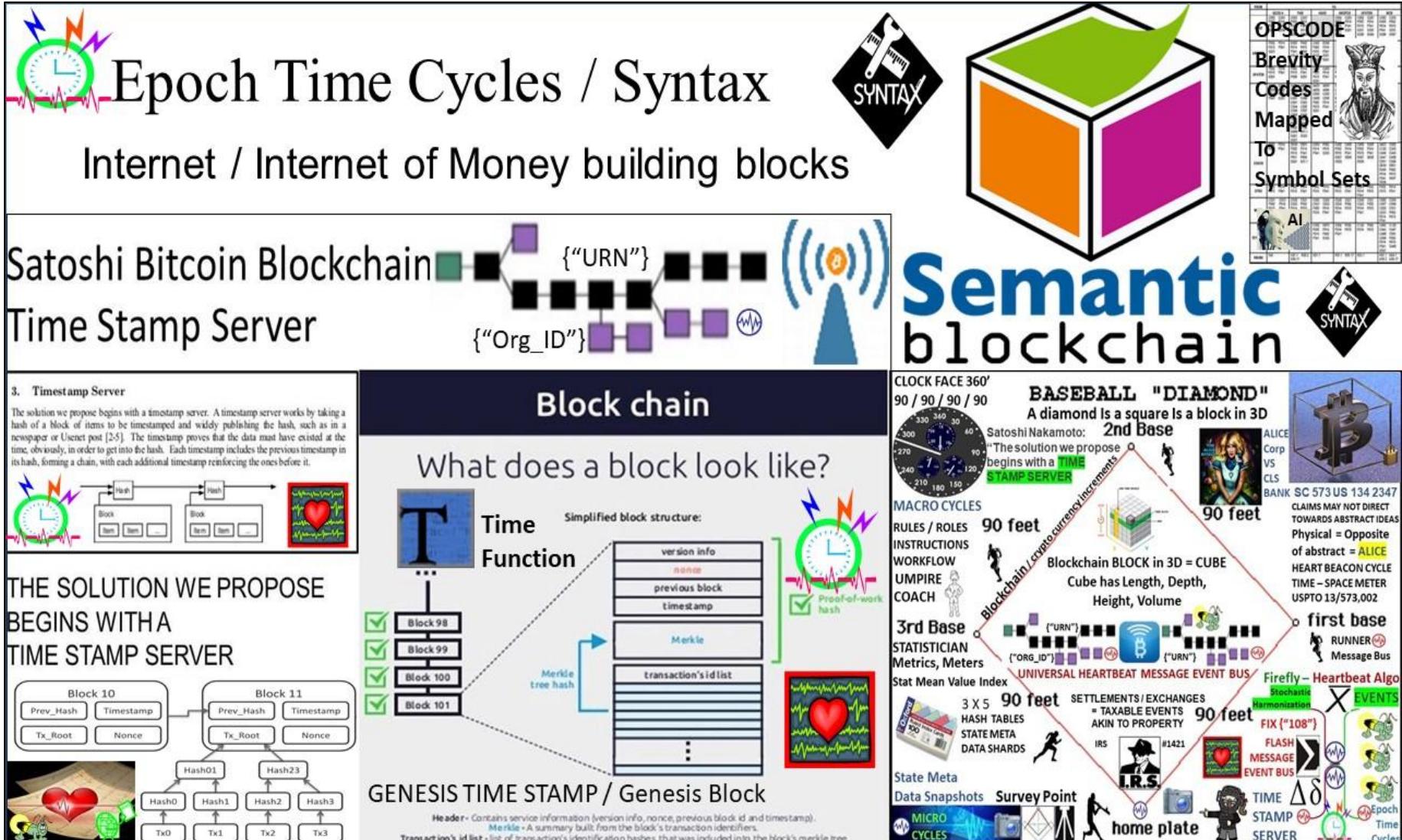
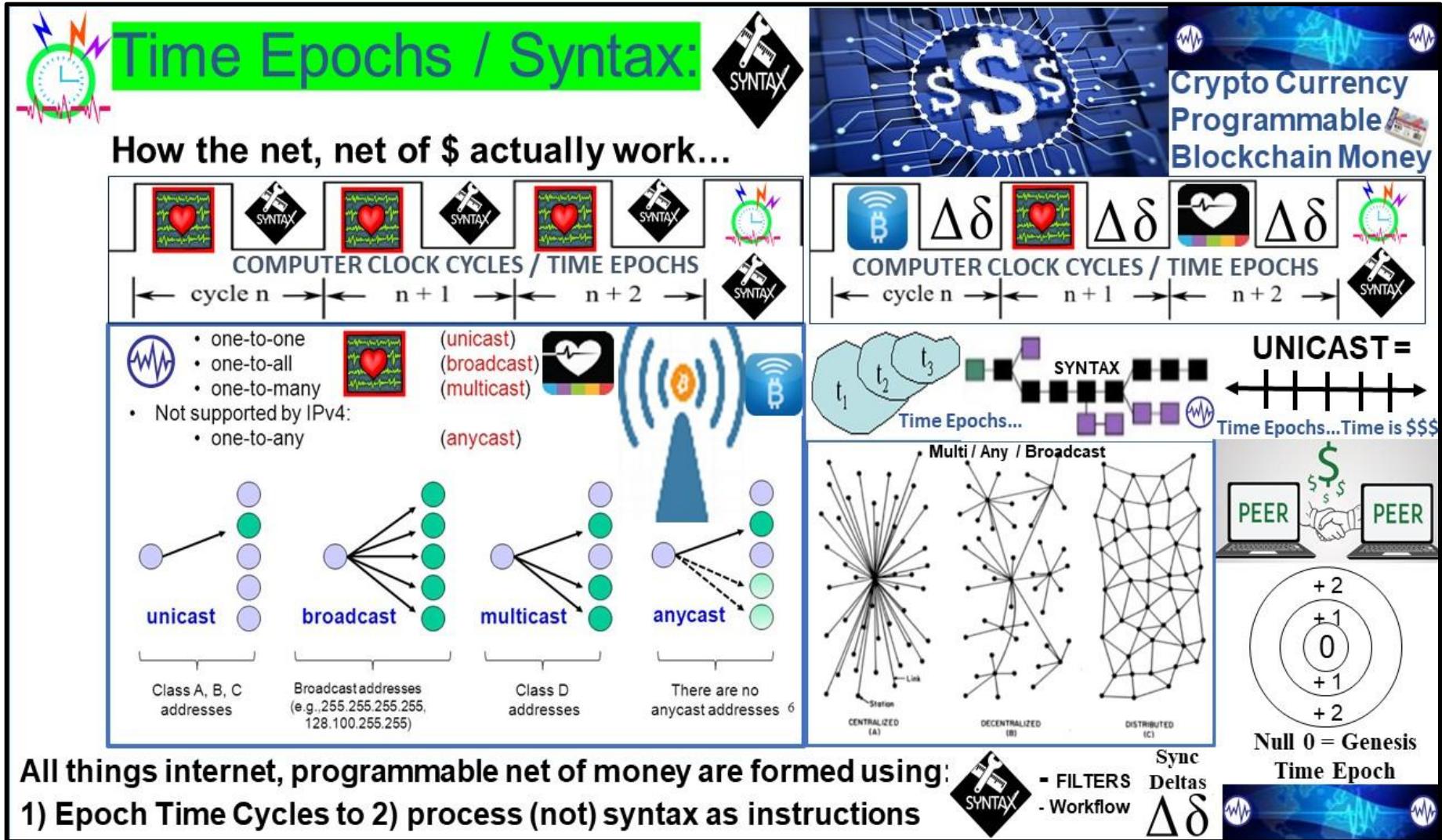


Figure 11: All things internet, artifacts of the programmable economy formed using 1) time epochs 2) syntax



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

1) Epoch Time Cycles to 2) process (not) syntax as instructions

FIGURE 12: How Internet, Web 3.0 are formed using 1) Time epochs 2) syntax 3) Wave form motion



Your systems.
Working as one.

"The fundamental value driver is easy
integration of applications into subsystems, of subsystems into systems, and of systems into larger SYSTEM OF SYSTEMS"



INTERNET / BLUE FORCE TRACKER BASICS: Unicast / Multicast & Workflow

NET FUNDAMENTALS USED BY MANY OTHER SYSTEMS / FRAMEWORKS



http://rti.com/whitepapers/RTI_Connext_WP.pdf

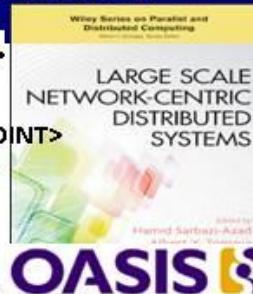


"Supports huge fanout. With the only standardized reliable multicast protocol, Connext DDS can provide updates to thousands of endpoints efficiently"

BOOK [Large Scale Network-Centric Distributed Systems](#)

A workflow consists of an orchestrated, repeatable pattern of business activity enabled by the systematic organization of resources into processes that provide services, or process information. It can be depicted as a sequence of operations, declared as work of a person or GROUP, an organization of staff, or one or more simple or complex mechanisms.

<http://en.wikipedia.org/wiki/Workflow>



OASIS

The term **unicast** is contrasted with the term **broadcast** which means transmitting the same data to all possible destinations. Another multi-destination distribution method, **multicasting**, sends data only to **interested** destinations by using special address assignments.

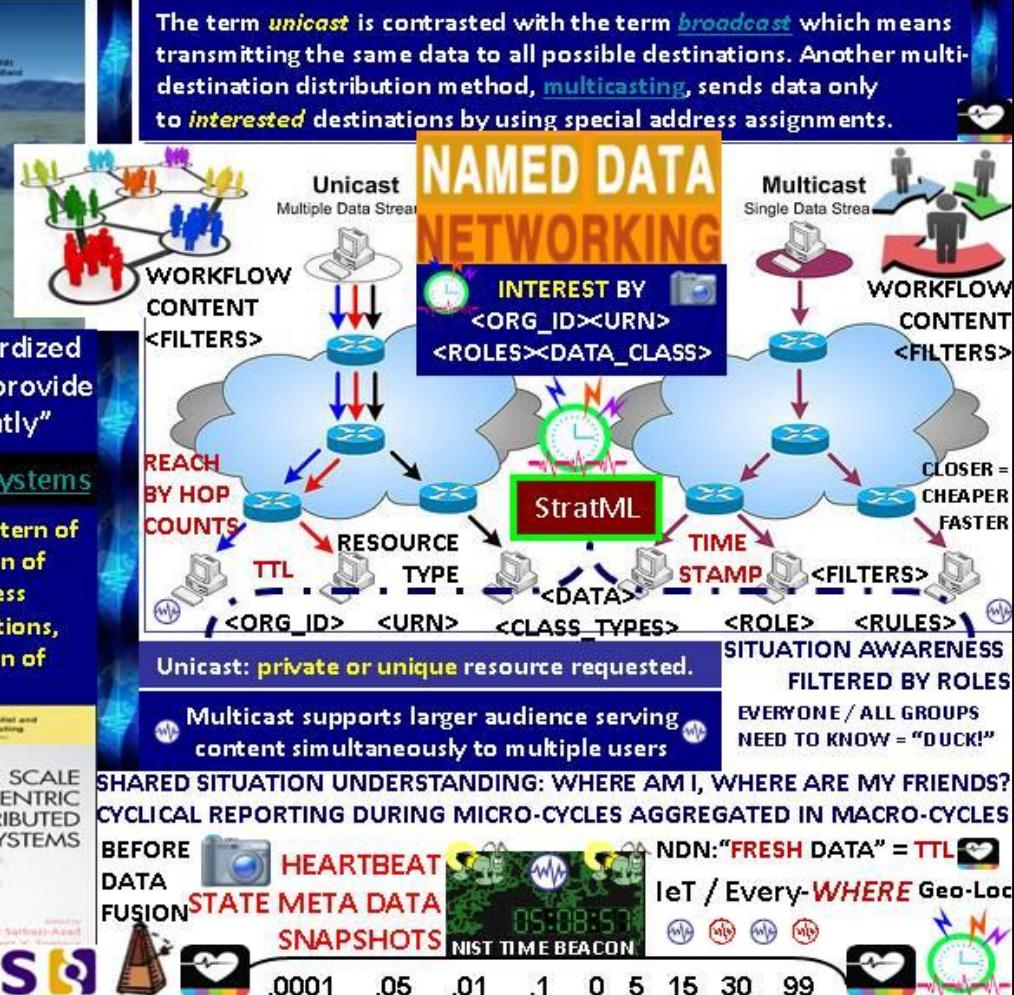


Figure 13: Blue Force Tracker / Maneuver Control Systems framework templates

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	TOKENS OPSCODE BREVITY CODES	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					
AFATDS	F002 F014 F015 F541 S201				A.I.	C203 C400 D630 E500 F002 F014	INFOCON 5 4 3 2 1 INFORMATION CONDITION
MCS	 	A423 C203 C505 F002 F014 F015 F541 S201	A423 A659 C002 C203 C400 C443 C447 C488 C501 C503 C504 C505 C506 C507 C508 E400 F002 F014 F015 F541 F658 F756 G489 K01.1 S201 S303	A423 A659 A656 A690 C002 C203 C400 C505 C502 F002 F015 F541	  	A423 C505 F014 F541 S201	M2M "SYMBOLS RULE THE WORLD"
	MESSAGE CATALOG 300 + Use Cases	Data Elements: entity, attribute, relationship equivalents					
		HEARTBEAT MESSAGE = K00.99 </108> {"108"}					
		Information Categories and Examples					
Object Categories	Examples	Location	Movement	Identify	Status	Activity	Intent
OOB	SYNTAX LEXICON	STRUCTURED DATA Machine Trust Language MTL	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, threanatics	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 MTF FFRN / FFN / FFUDN
		Domain Value	PURCHASE CODES	Instance, Value			TOKENS



FIGURE 14: Code Syntax Lexicon, Message Template Library from 1st patent application 9 / 11 / 2003

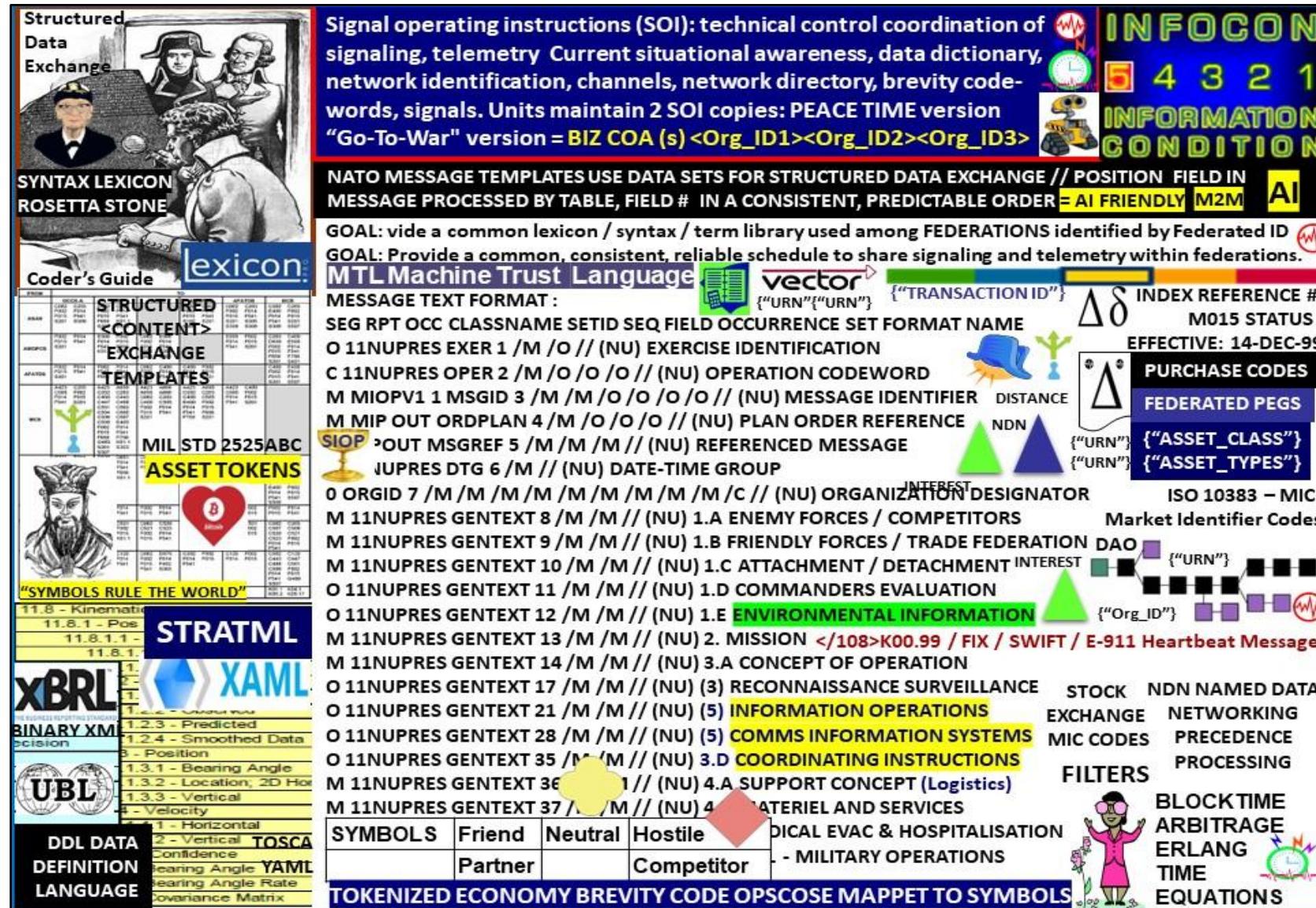


FIGURE 15: Structured Military Messaging / Structured Data Exchange FFIRNS, FFUDNS

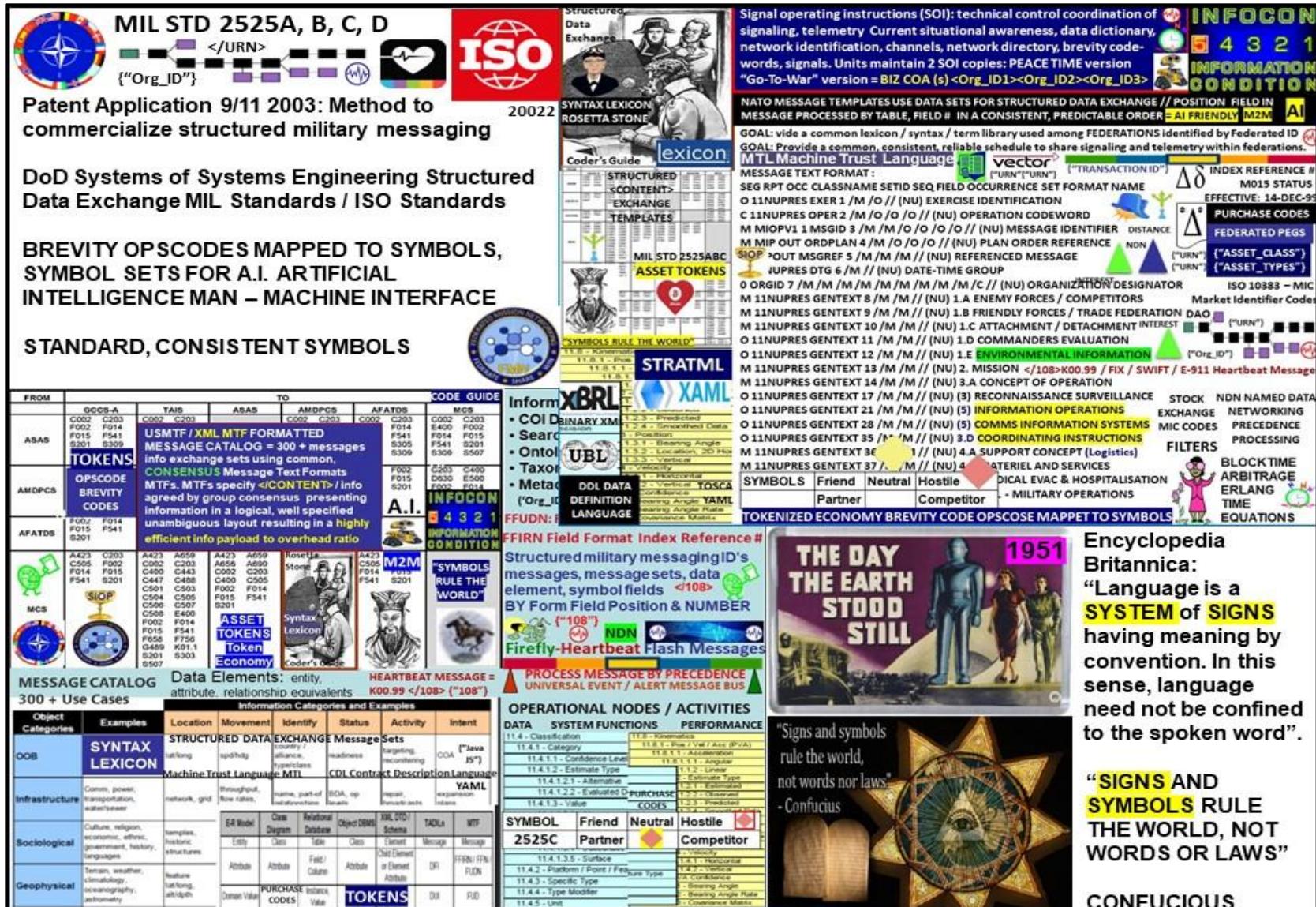


FIGURE 16 Artificial Intelligence Man – Machine Interface Syntax lexicon

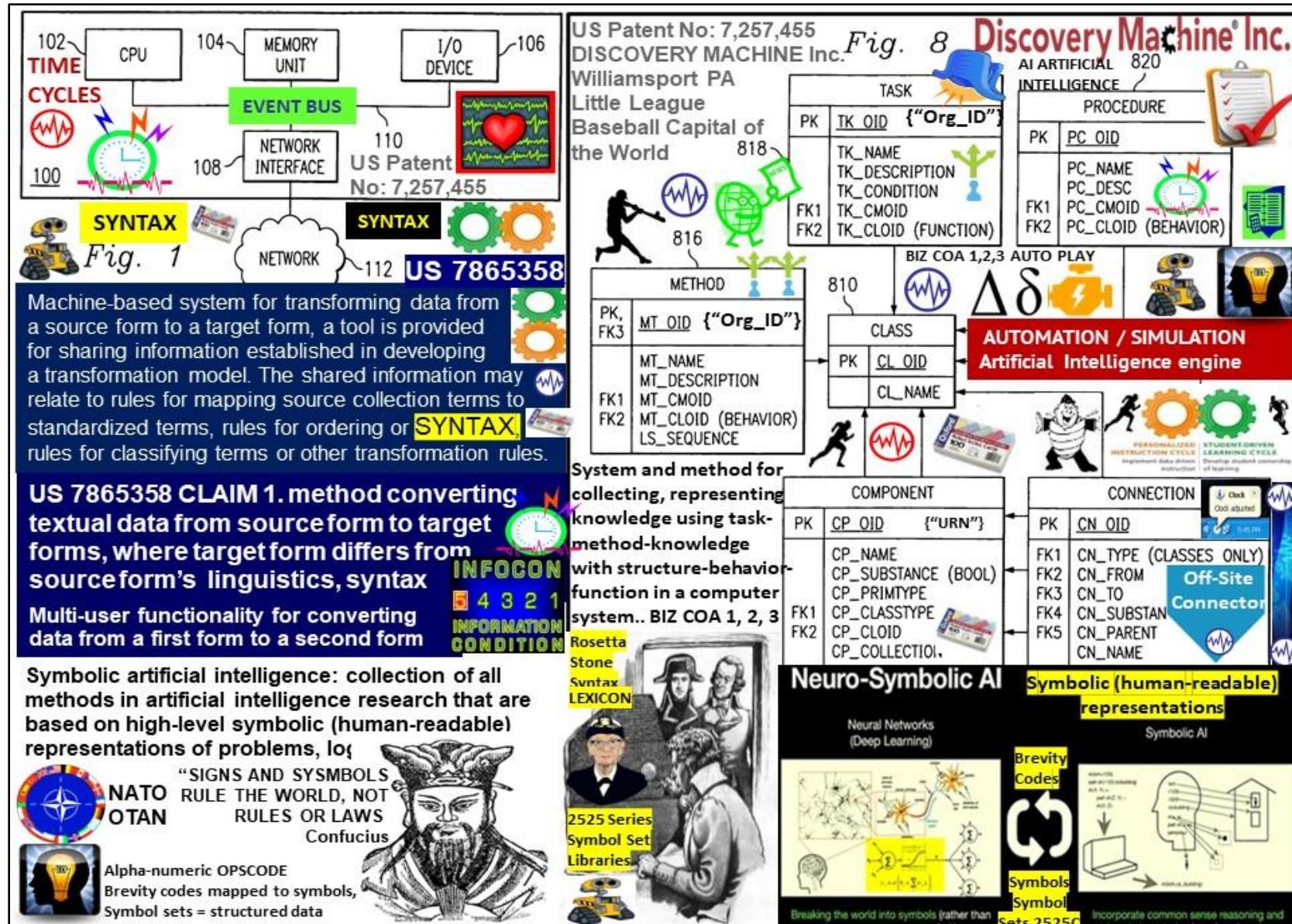


Figure 17: Discovery Machine Machine Learning IP / USPTO 13/573,002

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

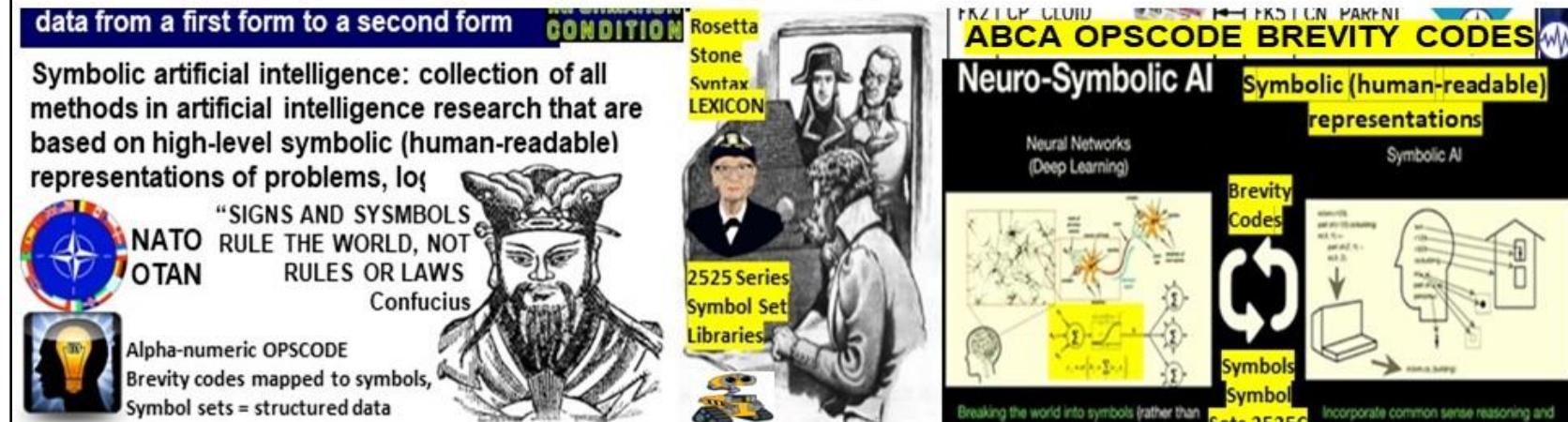


Figure 18: Discovery Machine Symbolic Artificial Intelligence / USPTO 13/573,002

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

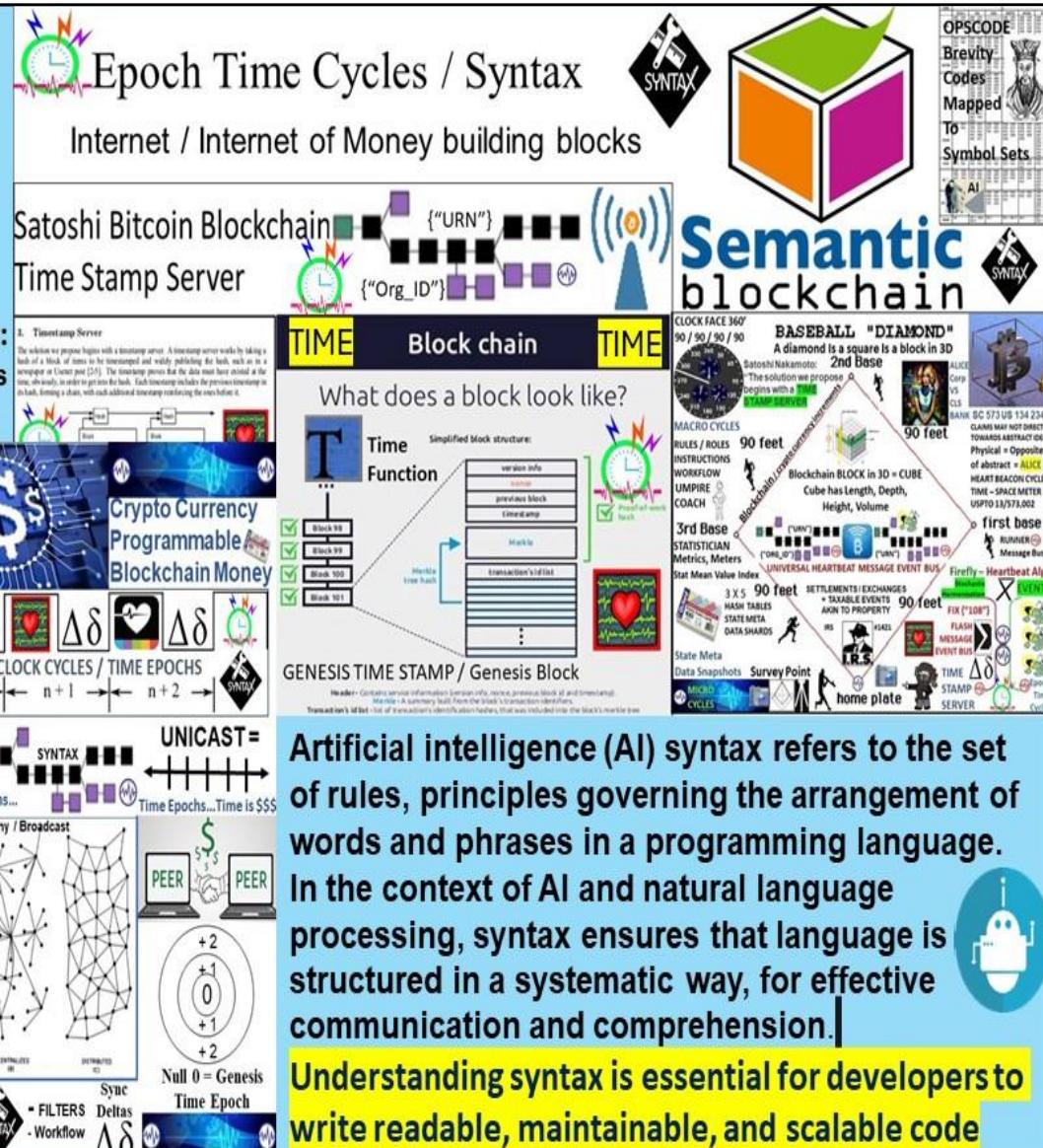
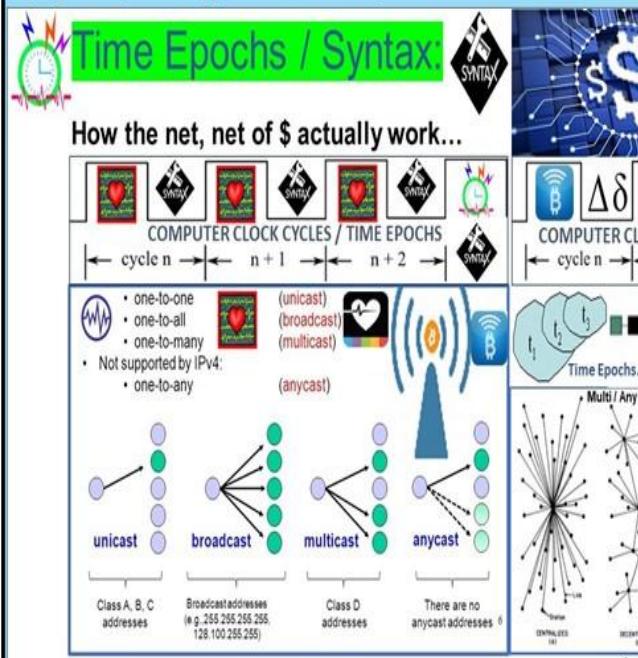


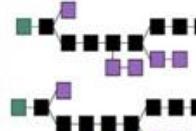
Figure 19: Net, Net of money, Artificial Intelligence A.I. = 1. Epoch time cycles 2. Syntax 3. Wave forms

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



Decentralized

START

Scalable = AVAILABLE EPOCH TIME CYCLES
 TIME EPOCHS = TEMPORAL LAYERS

Genesis Epoch
 Genesis +1
 Genesis +2..

TEMPORAL LAYERS



Traditional chains (BTC, ETH...)
 TTL Time To Live

Water drop
 In pond Meme
 USPTO
 13/573,002

TEMPORAL CONSENSUS
 - Time Sync
 - Stochastic harmonization

SYNTAX CONSENSUS
 Brevity Codes

Secure

STOP

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.

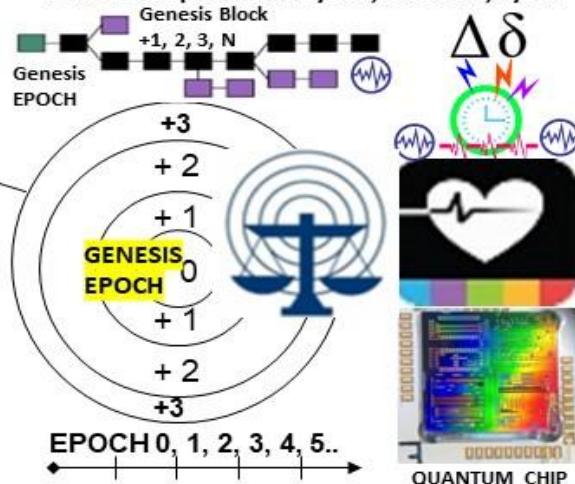
Database Flat File

"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

NET, Net of programmable \$\$\$
 Programming Reality Ground Truth
 No Layers L0, L1, L2... only GENESIS EPOCH,
 Follow on Epoch time cycles, intervals, cycles

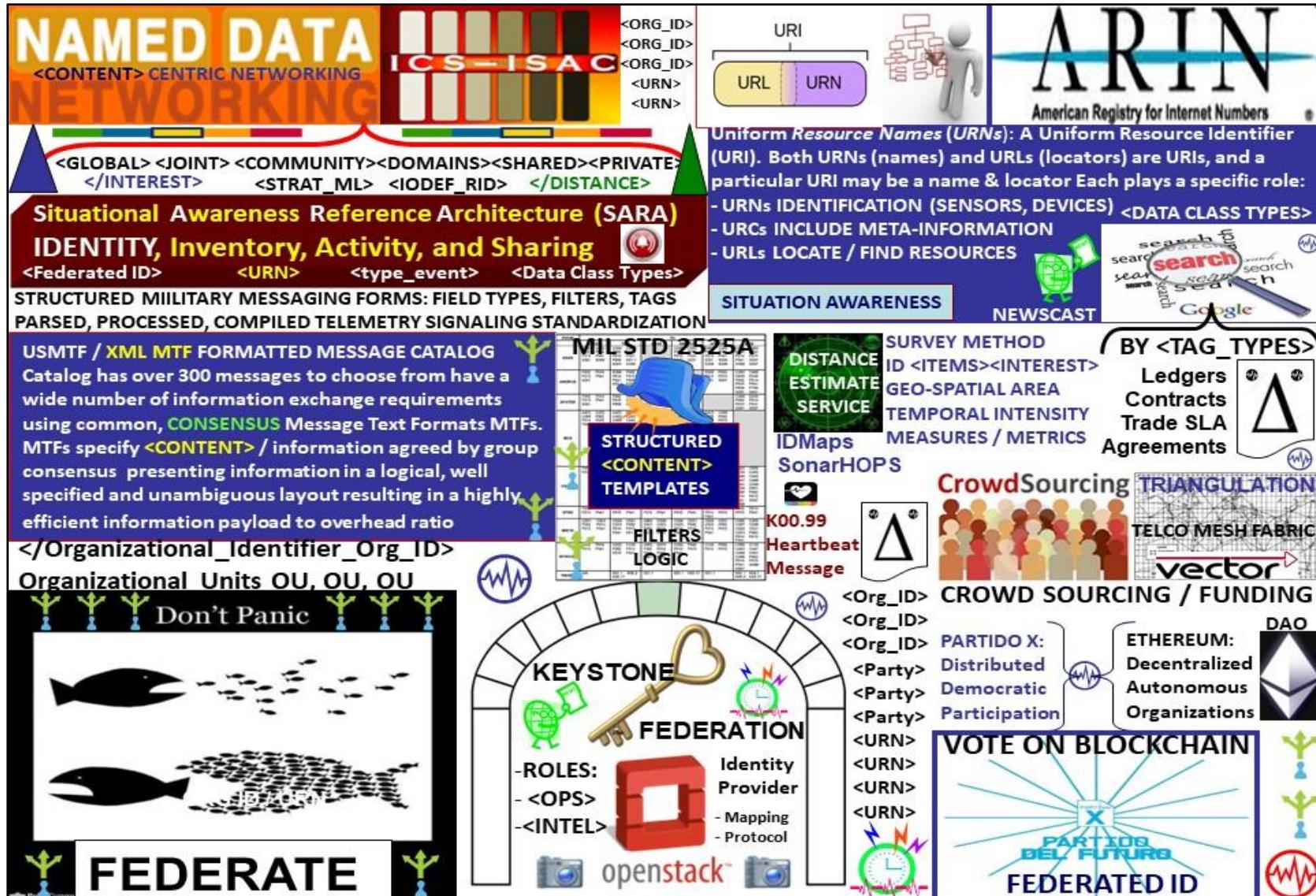


THESIS: All things internet, net of programmable money are formed using:

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

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 20: The Blockchain Quad-lemma / Internet, Net of \$\$\$ ground Truth



Situational Awareness Reference Architecture (SARA)

: Identity, Inventory, Activity, and Sharing

<http://ics-isac.org/sara/>



IDENTITY: <UUID> = Devices, sensors
Federation Gateway <ORG_ID> Organizations

INVENTORY: Uniform Resource Name <URN>

<URN><URN> <COMMODITY><WATER><ENERGY><AVAILABLE UNITS>
<URN><URN> GEO-SPATIAL TEMPORAL INTENSITY METRICS
<URN><URN> UNIFIED EVENT / ALERT TRIGGER / THRESHOLDS

ACTIVITY: <EVENT><ALERT> <TIME_STAMP><ORG_ID><URN>

CONTENT LEXICON
ROSETTA STONE



SHARING:

COMMON <TAGS>
<Organizational_ID>
Resource Names <URN>
<Time_Stamps>
<State-Meta_Data>
<DATA_CLASS_TYPE>
<Heartbeat_snapshots>

<TAG>LIBRARY
TEMPLATES
NIEM
BUILDING INFORMATION MODELS

NAMED DATA NETWORKING
<Content> Centric

USMTF / XML MTF FORMATTED MESSAGE CATALOG
Catalog has over 300 messages to choose from have a wide number of information exchange requirements using common, CONSENSUS Message Text Formats
MTFs. MTFs specify <CONTENT>/ information agreed by group consensus presenting information in a logically well specified and unambiguous layout i.e., templates

<ELEMENTS>

STRATML / IODEF RID CLASSES:
<GLOBAL><JOINT><SHARED>
<DOMAIN><FEDERATION>
<CITY><STATE><PRIVATE>

STRATEGIC
MARKUP
StratML
LANGUAGE

Industrial Control System
Information Sharing and
Analysis Center
IODEF

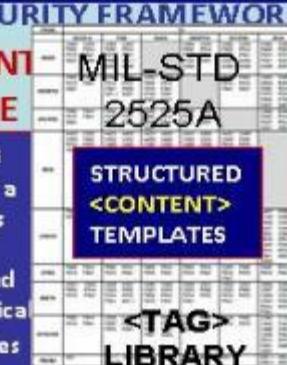


FIGURE 22: Situation Awareness Reference Architecture SARA

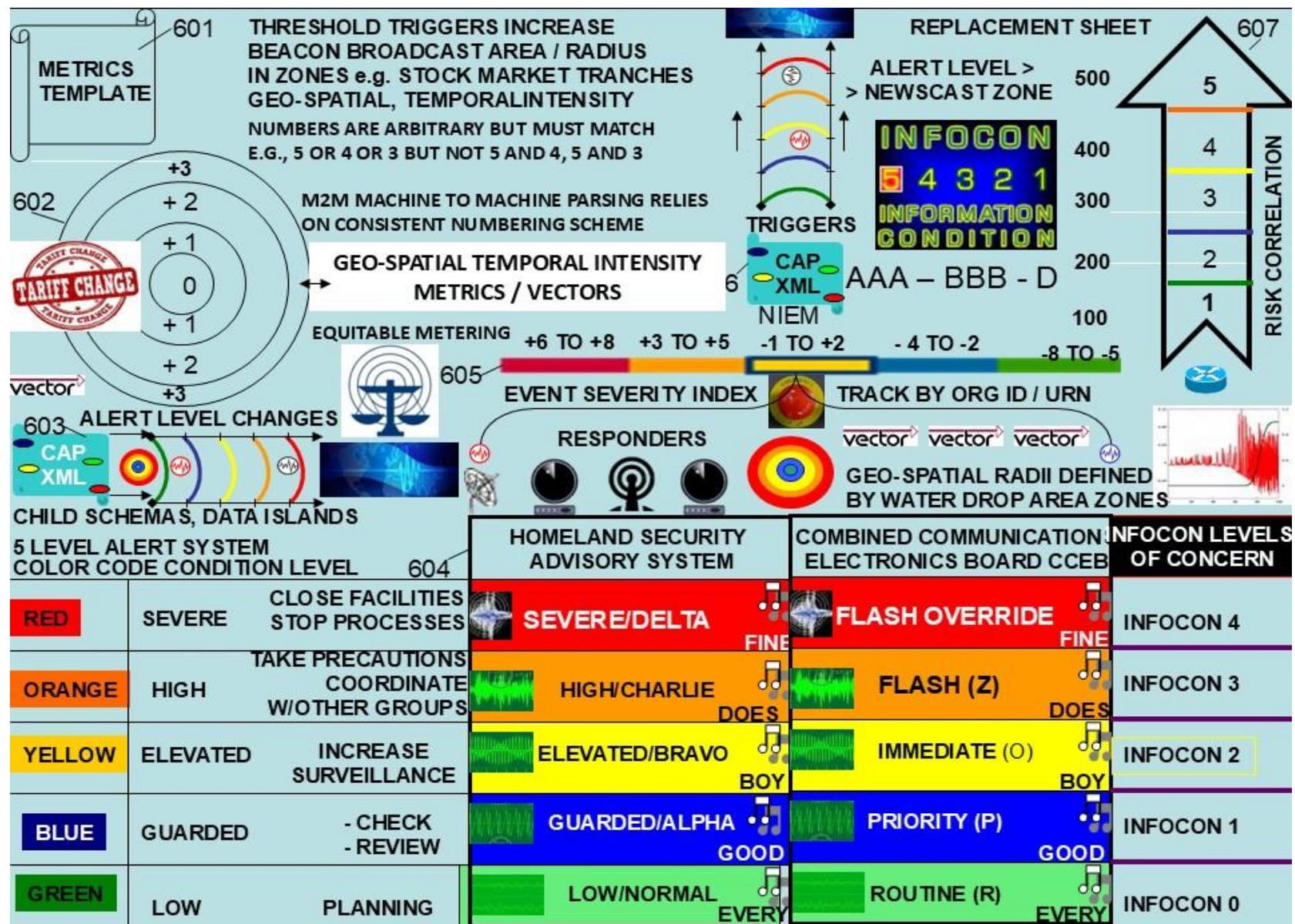


Figure 23: Structured Data Exchange INFOCON Precedence model

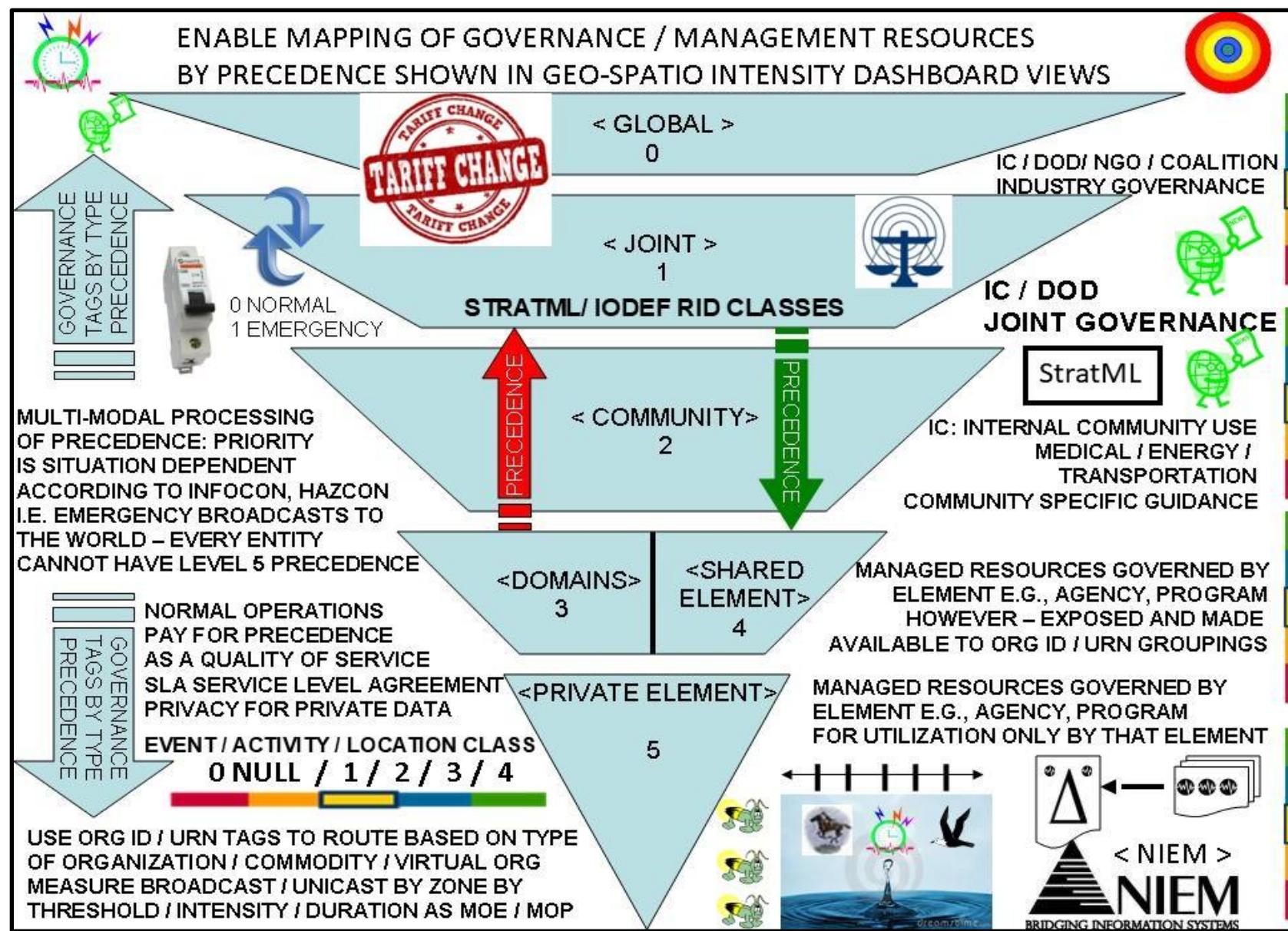


Figure 24: STRATML Markup Language

The current standard time common throughout the world is based on a 24-hour clock, with zones that are either 12 hours ahead or behind **Coordinated Universal Time (UTC)**. However, these time zones are decided upon by individual governments, without overall coordination and can even extend fourteen hours ahead UTC.



Figure 25: Universal Time Zone UTZ Stochastic Harmonization / UTC Space – Time Synchronization

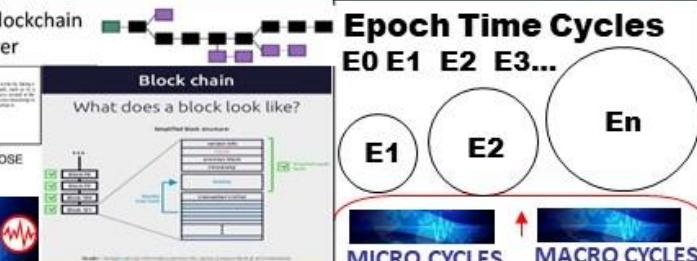
Interface Name	HEARTBEAT Administration Interface [SCOP]		
Documentation URL	http://scop.sourceforge.net/ http://linuxvirtualserver.org/software/index.html 		
API Information #leT	#Big_Data	Functionality Areas  	Cloud Interface Management configuration, start, stop cloud services, edit configuration (heartbeat messages)
Programmable Money World Computer / Blockchain		API Operation Count 	
		Web service access type Network Effects / A.I. 	Web application, front end to [network, device, system, blockchain] heartbeat
		LANGUAGE / PLATFORM BINDINGS 	
Interface Characteristics		<p>SCOP is a web application, PHP based front-end to heartbeat, IP Virtual Server ipvs and Idirectord [e.g., check interval @ 5 seconds]</p> <p>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> 			Epoch Time Cycles E0 E1 E2 E3... 
QubitCoin Interval: Every 30 Seconds			

Figure 26: SCOP Heartbeat Epoch Time Interval Start, Stop, TTL Time To Live



FIGURE 27: The Alice Effect / SCOTUS Alice Corp Vs CLS Bank 2014 ruling



Figure 28: Firefly Inspired Heartbeat Synchronization Algorithm



FIGURE 29: ECONOMIST MILTON FRIEDMAN'S K% RULE Economic GDP HEARTBEAT



FIGURE 30: TERRA TRC TRADE REFERENCE COMMODITY BASED CURRENCY

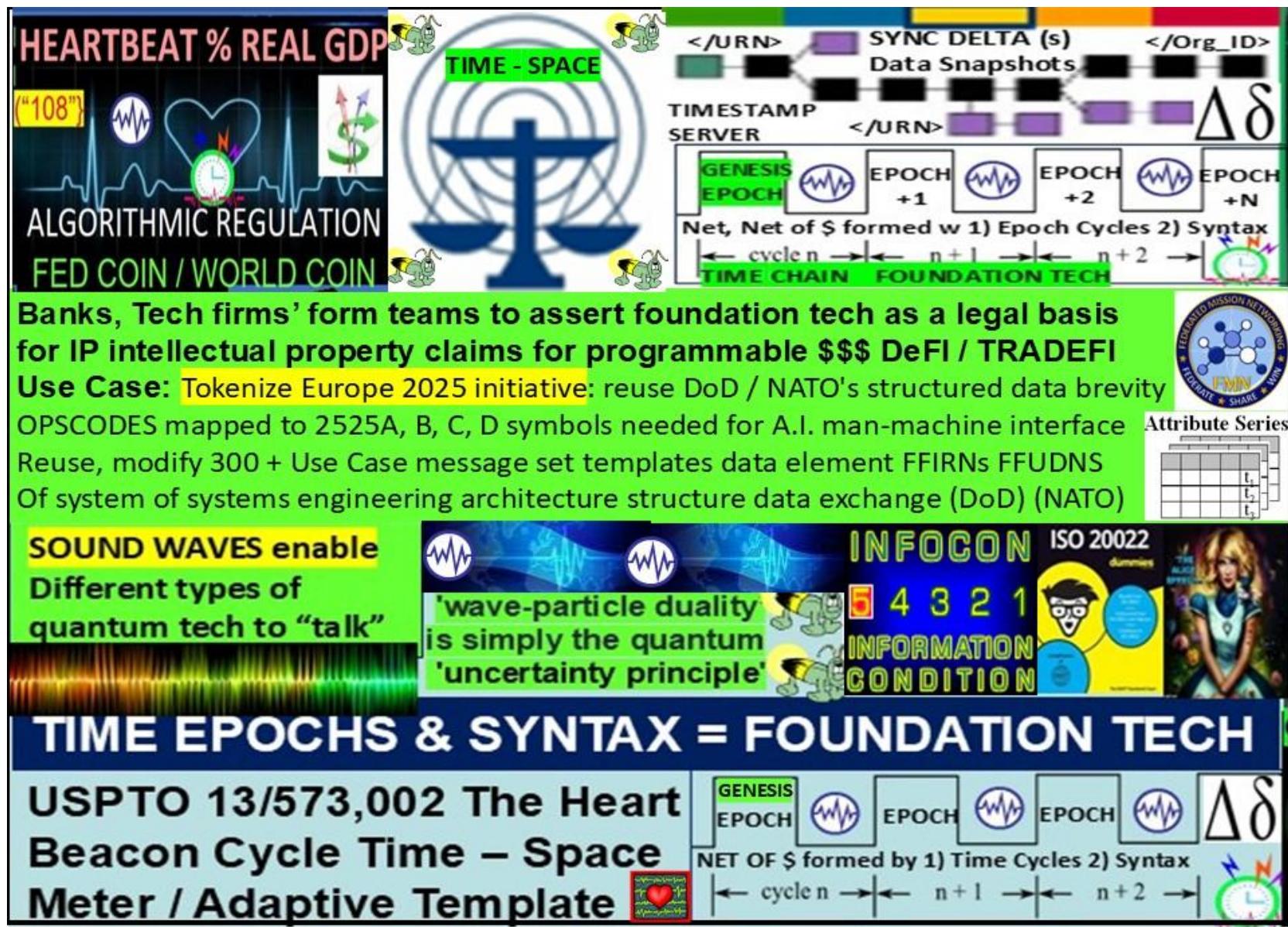


Figure 30A: Tokenized RWA Real World Assets GDP Heartbeat foundation technology



Figure 31: FEDERATE / FEDERATION / DAO



Figure 32: Federate / Federation Beacon Communities



FIGURE 33: 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.

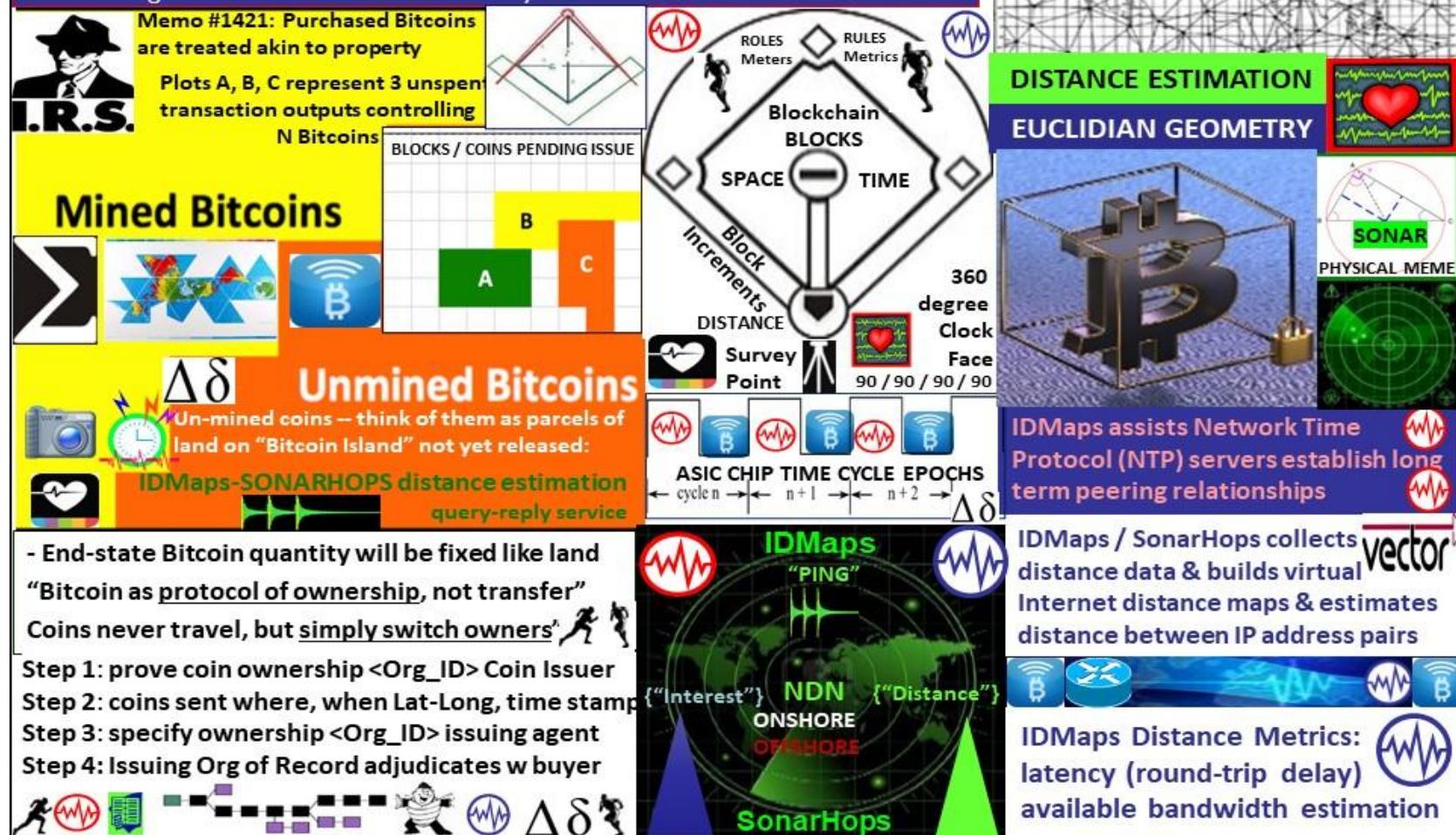


FIGURE 34: CRYPTOCURRENCY LAND USE MEME / IRS MEME 1421 / USPTO 13/573,002

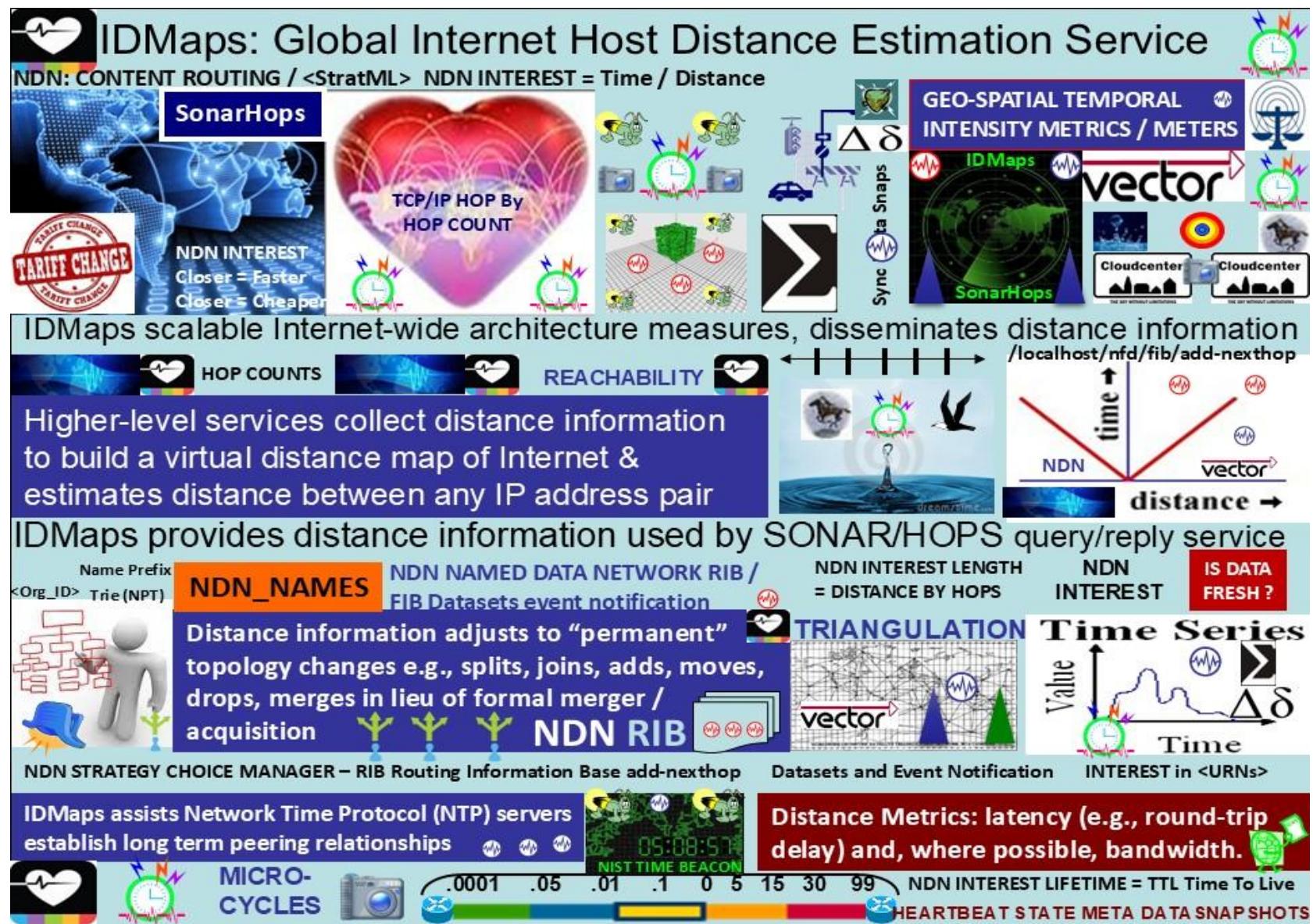


Figure 35: IDMaps / SonarHops Distance Estimation Service / USPTO 13/573,002

13/573,002 HEART BEACON CYCLE

Time -Space meter, metrics / Universal data event, alert bus
Internet of Everything "ability to hear the world's heartbeat"



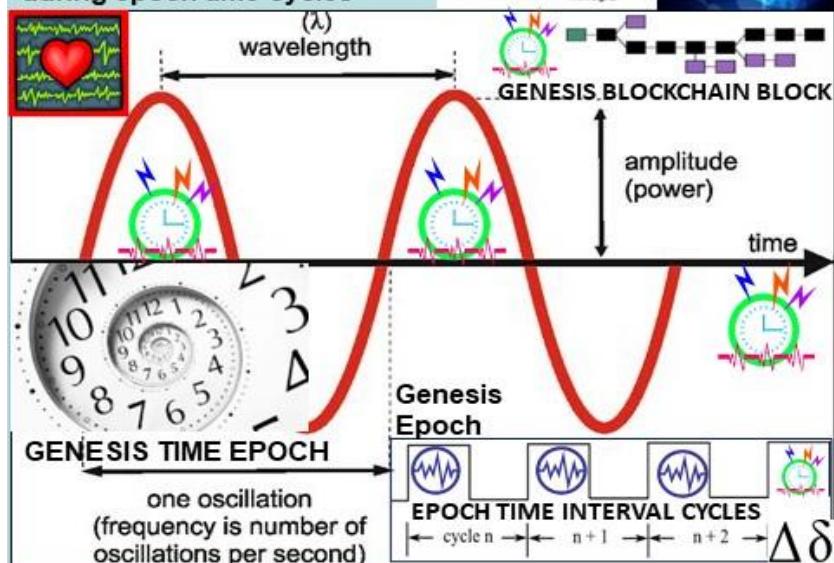
FIGURE 36: BIG DATA THE NEXT OIL / USPTO 13/573,002



FIGURE 37: ENERGY METRICS / METERS: 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



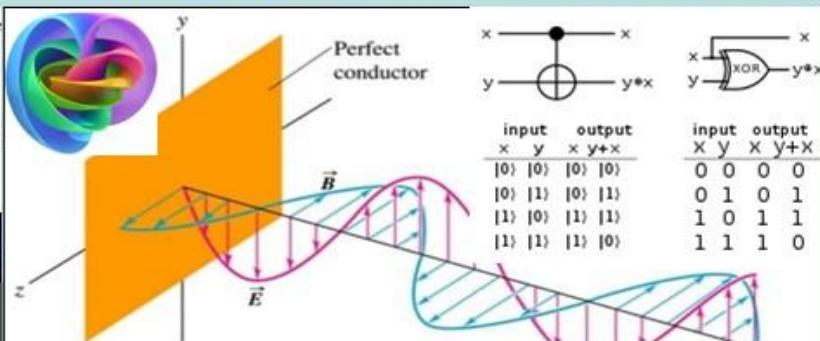
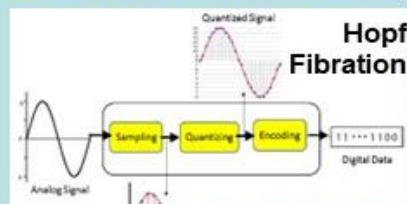
Quantum Computing Vibrations encode, process data like quantum computers. A simple mechanical system built from aluminum rods uses vibrations to encode information, mimicking quantum computing in a non-quantum system. "Light is made from photons, the quantum of light."

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

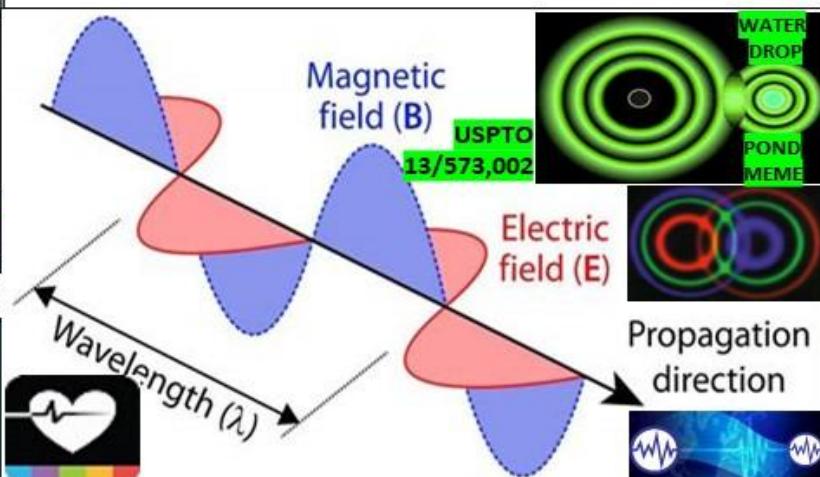
ENERGY / DATA WAVE METRICS / METERS

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

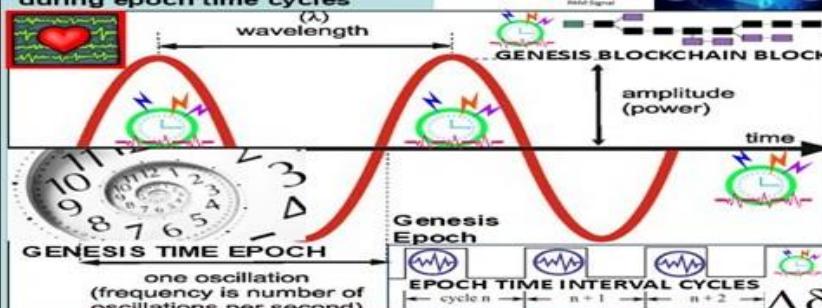
Figure 38: Energy / Data unified field propagation claim water drop in pond meme

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**

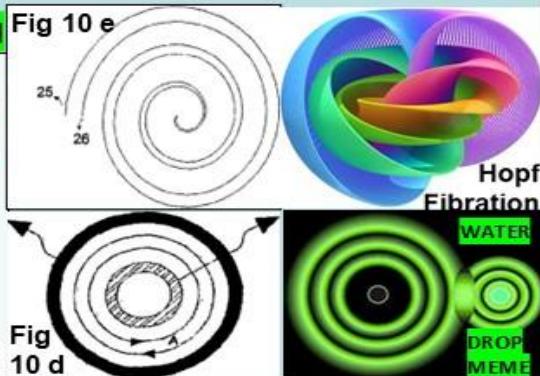
THESSIS: All things net, net of programmable \$\$\$ are formed using:

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



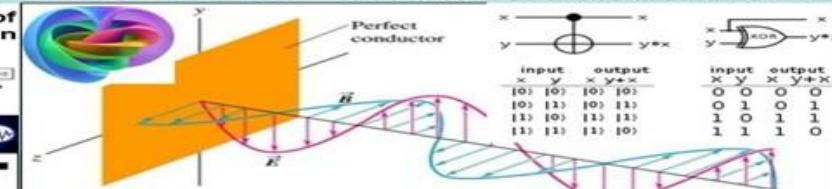
ENERGY PRODUCTION

ANTIGRAVITY FORCE OF THE VACUUM



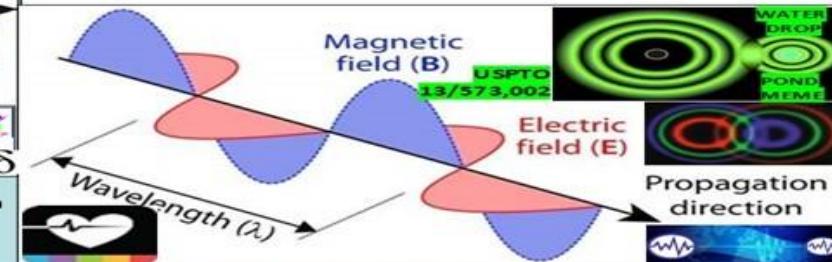
ENERGY / DATA WAVE METRICS / METERS

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 39: Wave based Energy / Propulsion System

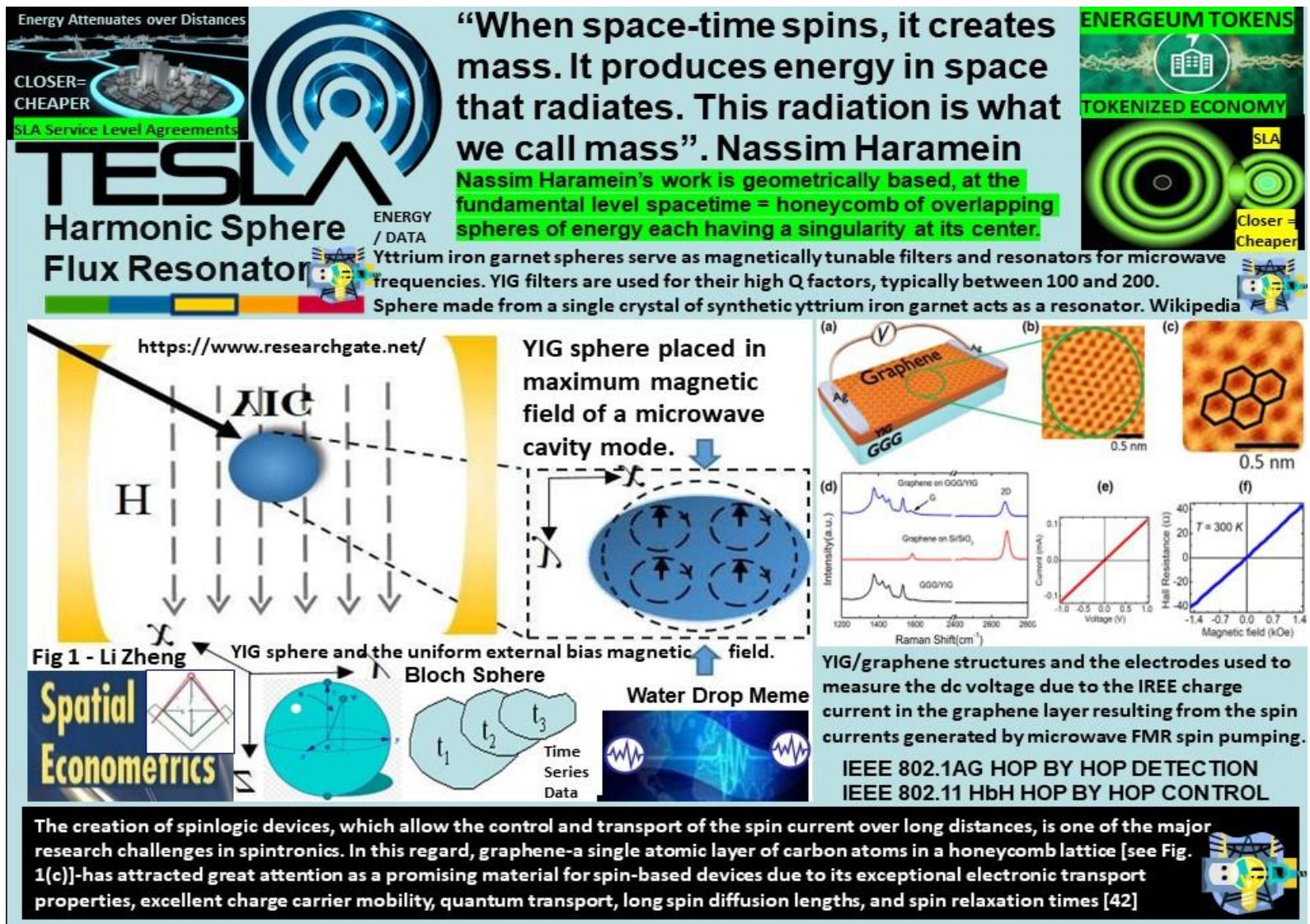


Figure 40: Harmonic Shere Flux Resonator

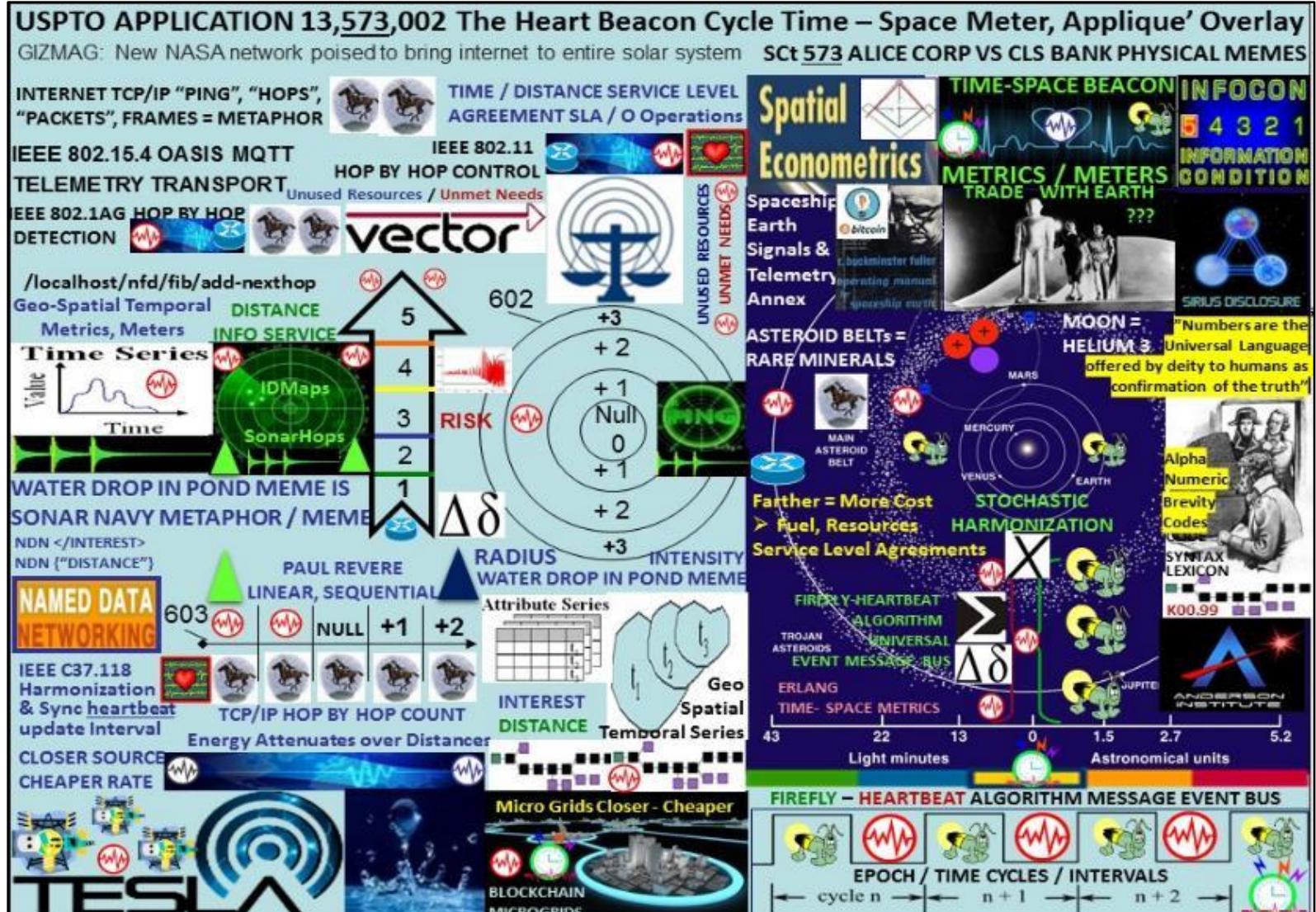


Figure 41: SPACE – TIME BEACON / CLOSER = CHEAPER = LESS TIME / FUEL

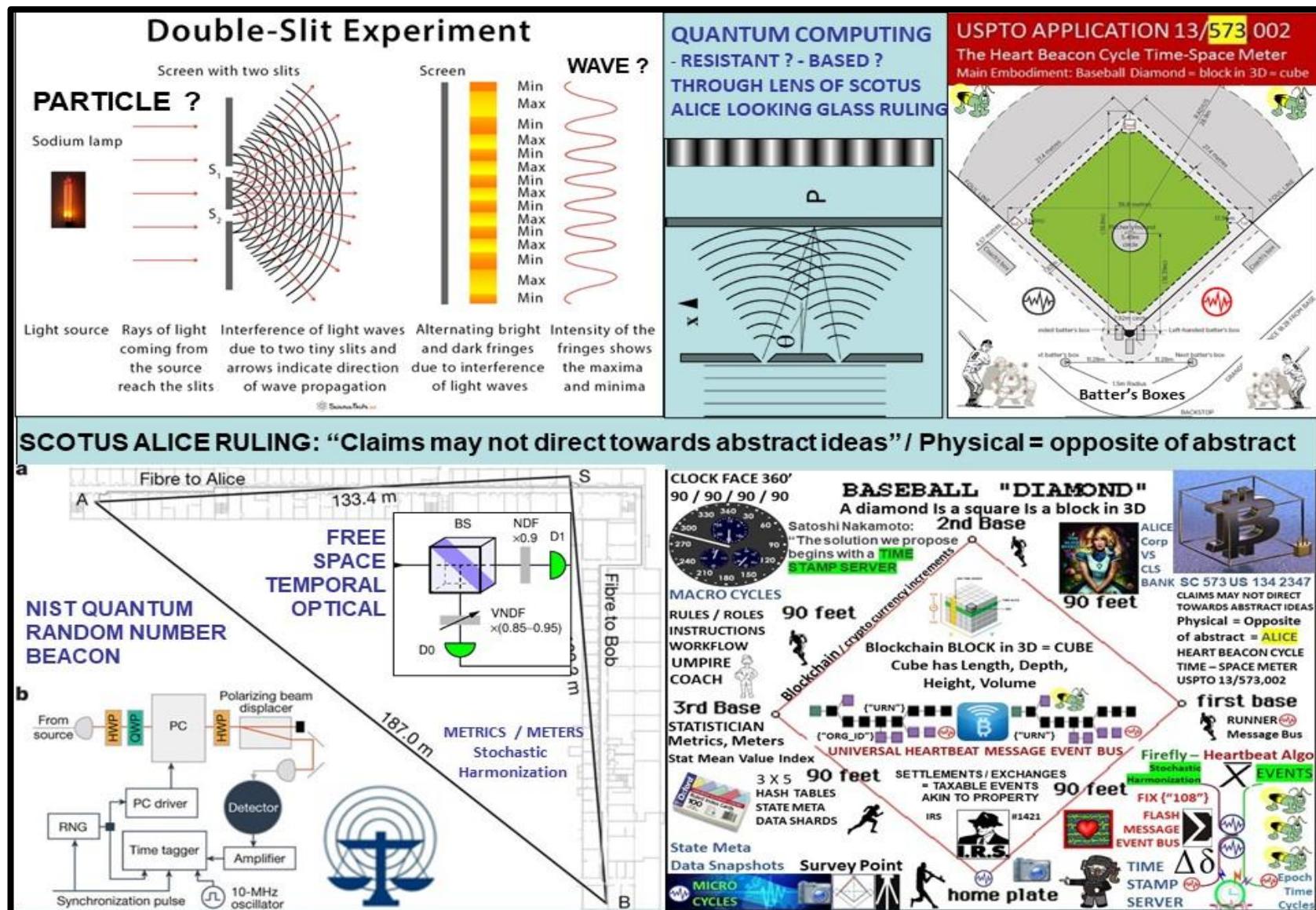


Figure 42: Time Chain / Time Stamp Server based QFS “Quantum Financial System” (Quantumly bogus)

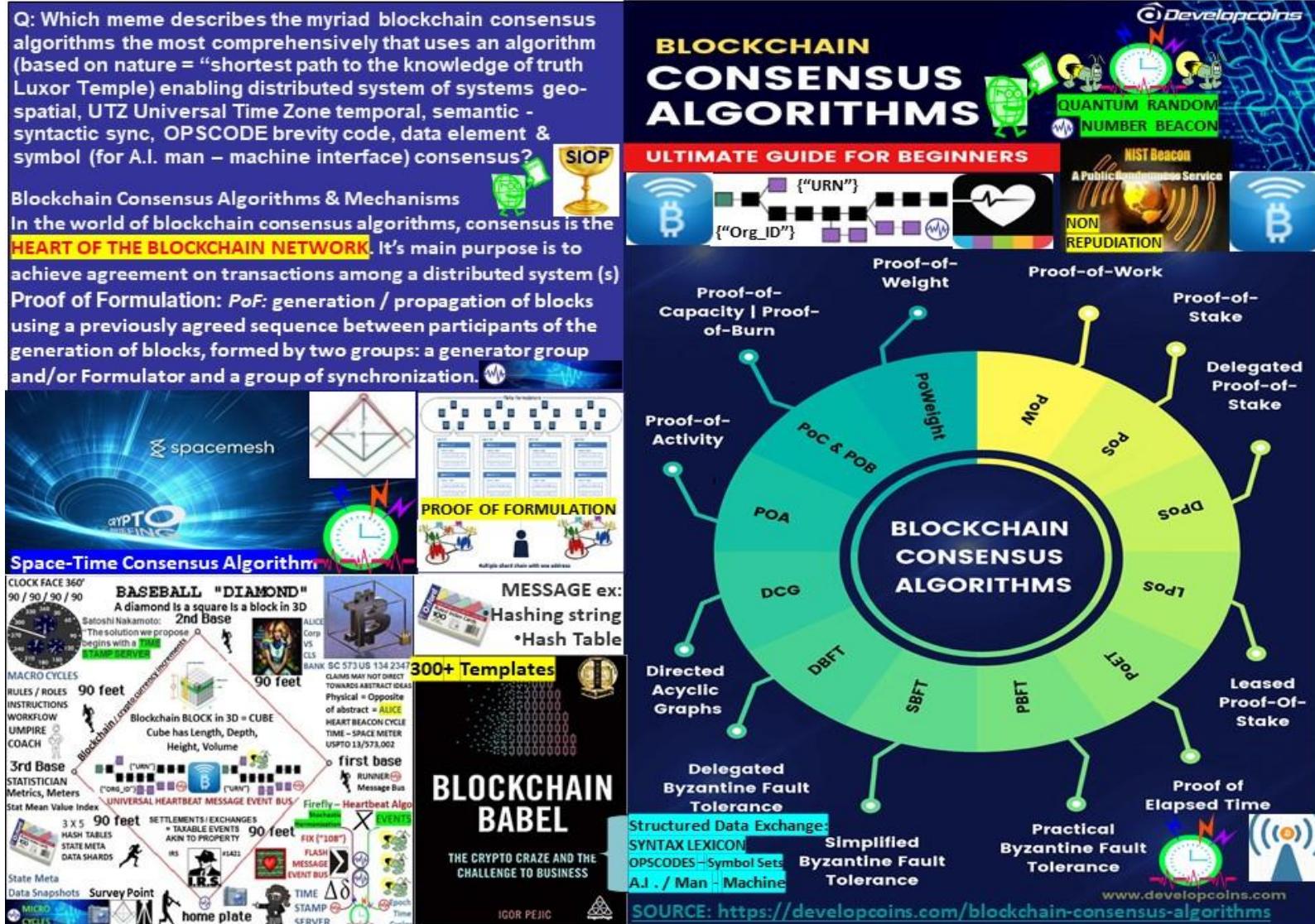
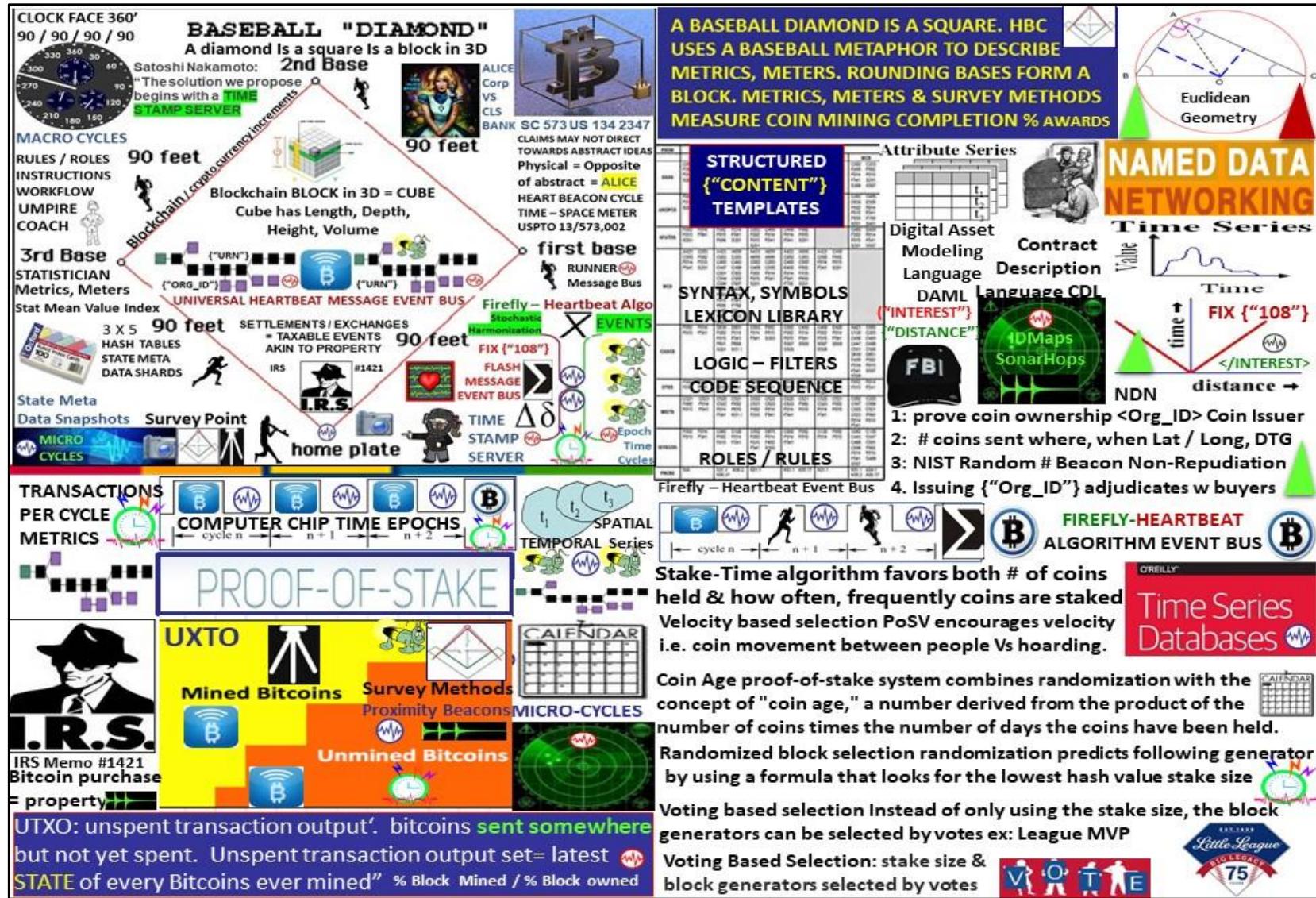


Figure 43: Universal meme / myriad consensus algorithm blockchain memes / metaphors = Tower of Babel

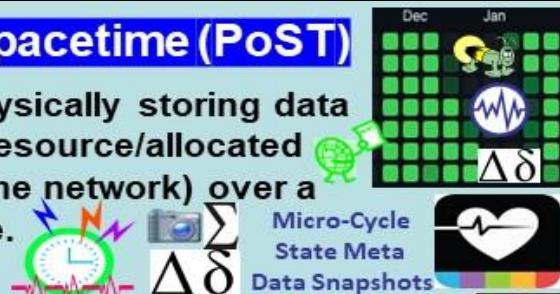


Figure 44: Proof of Work Consensus / USPTO 13/573,002



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.



PoST users / nodes must prove that they are spending a certain amount of space for storage.

DISTRIBUTED AUTONOMOUS ORGANIZATIONS DAO

Heart Beacon Cycle
FEDERATE / TRADE FEDERATIONS

BASEBALL "DIAMOND"
A diamond is a square is a block in 3D
Satoshi Nakamoto: 2nd Base

CLOCK FACE 360°
90 / 90 / 90 / 90
330 340 30 60
270 240 210 180 150
Blockchain / crypto currency increments 90 feet

ALICE Corp VS CLS BANK SC 573 US 134 2347 CLAIMS MAY NOT DIRECT TOWARDS ABSTRACT IDEAS Physical is Opposite of abstract = ALICE HEART BEACON CYCLE TIME - SPACE METER USPTO 13/573,002

first base 90 feet RUNNER Message Bus

Blockchain = CUBE Cube has Length, Depth, Height, Volume

Blockchain BLOCK in 3D = CUBE

Macro Cycles
Rules / Roles
Instructions
Workflow
Umpire
Coach

3rd Base STATISTICIAN Metrics, Meters

Stat Mean Value Index

90 feet SETTLEMENTS / EXCHANGES TAXABLE EVENTS AKAIN TO PROPERTY

3 X 5 HASH TABLES STATE META DATA SHARDS 90 feet

IRS #1421 FIX ("108") FLASH MESSAGE EVENT BUS

State Meta Data Snapshots Survey Point MICRO CYCLES

home plate TIME STAMP SERVER

Firefly - Heartbeat Algo EVENTS

Shore

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.

queueing systems wait times stochastic processes, function scheduling Start, Stop TTL

PROXIMITY BEACONS BLOCKCHAIN PARSING

ERLANG TIME EQUATIONS

Time Series Databases

Time Series

Process transactions by precedence Attribute Series TIME Function

Geo Spatial Temporal Series

Erlang / Equilibrium Time - Sync Algorithms ROLES RULES Nicotib

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

NON- REPUDIATION ATOMIC CLOCK

Arrival Rate Queue Forms Limited Resource Service Rate RFID Utilization * Service Time (T_s)

Delay

Value Time

ERLANG CALENDAR: Calculate Wait Times Time Stamp to Date Time Conversion

Figure 46: PoST Proof of Space – Time Consensus / USPTO 13/573,002

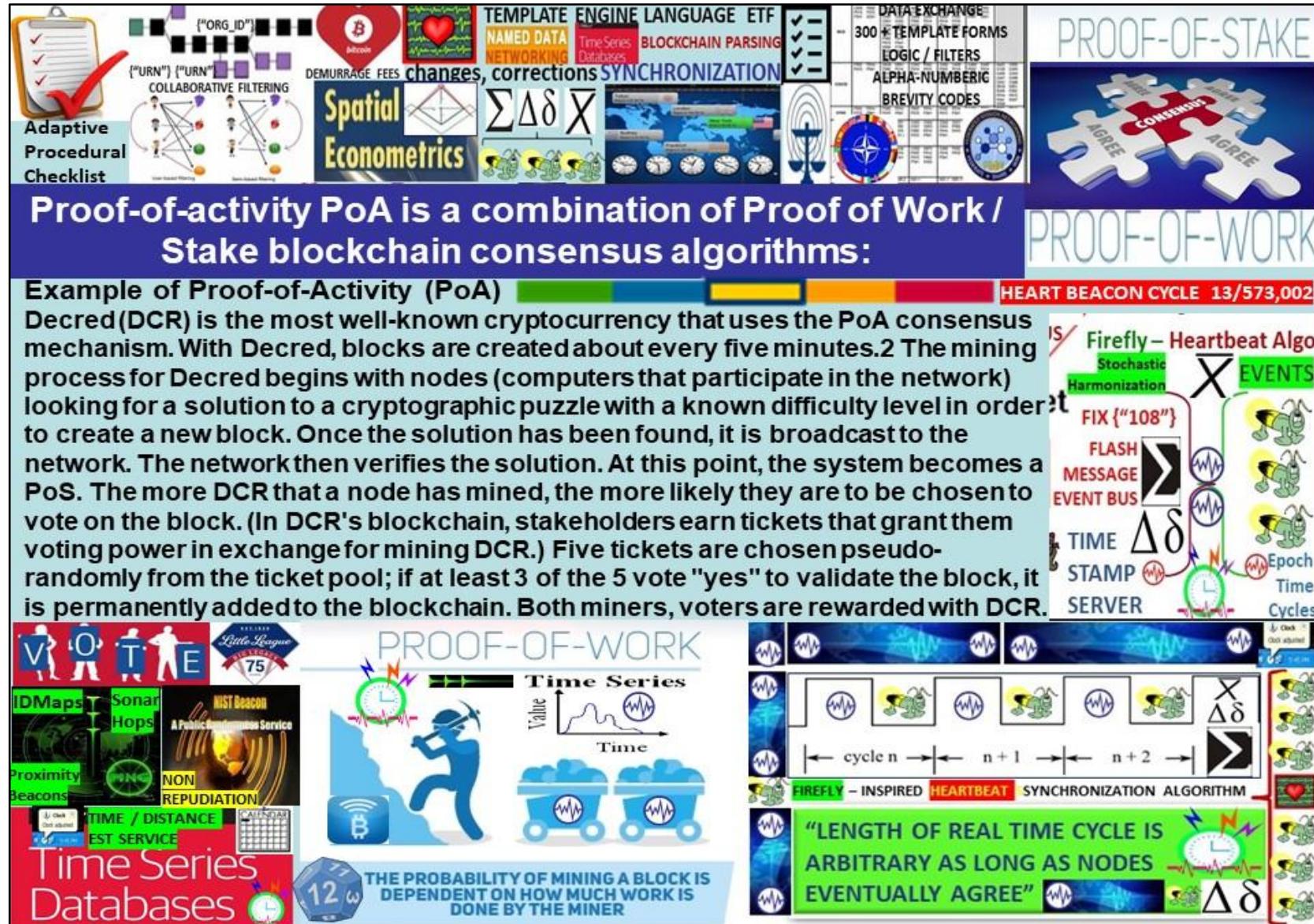


Figure 47: Proof of Activity Consensus / USPTO 13/573,002

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

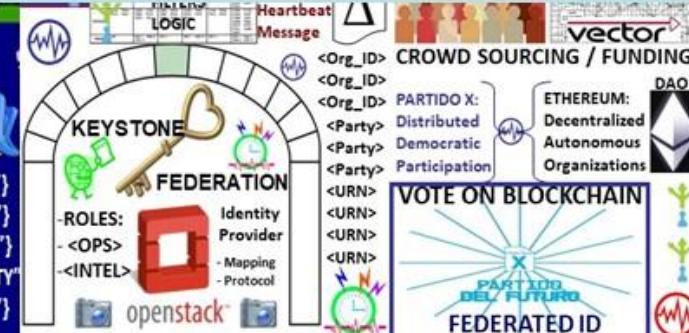
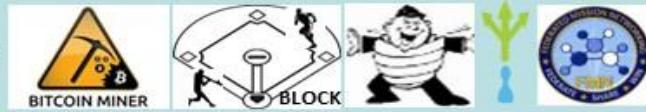
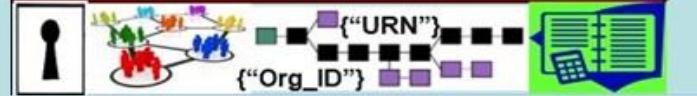


Figure 48: Proof of Authority Consensus // USPTO 13/573.002

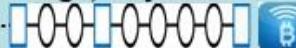
Proof of Burn



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.²

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

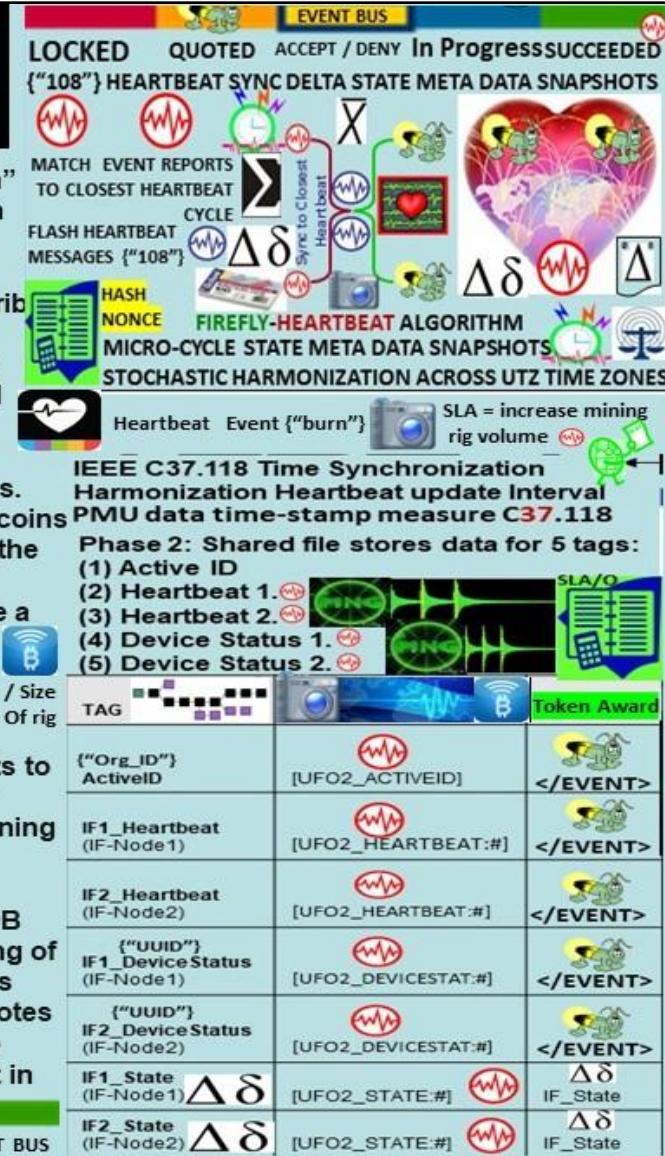


Figure 49: Proof of Burn Consensus / USPTO 13/573,002

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 Σ $\Delta\delta$

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.

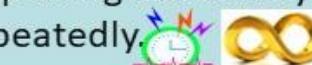


Figure 50: Proof of Capacity Consensus / USPTO 13/573,002

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.

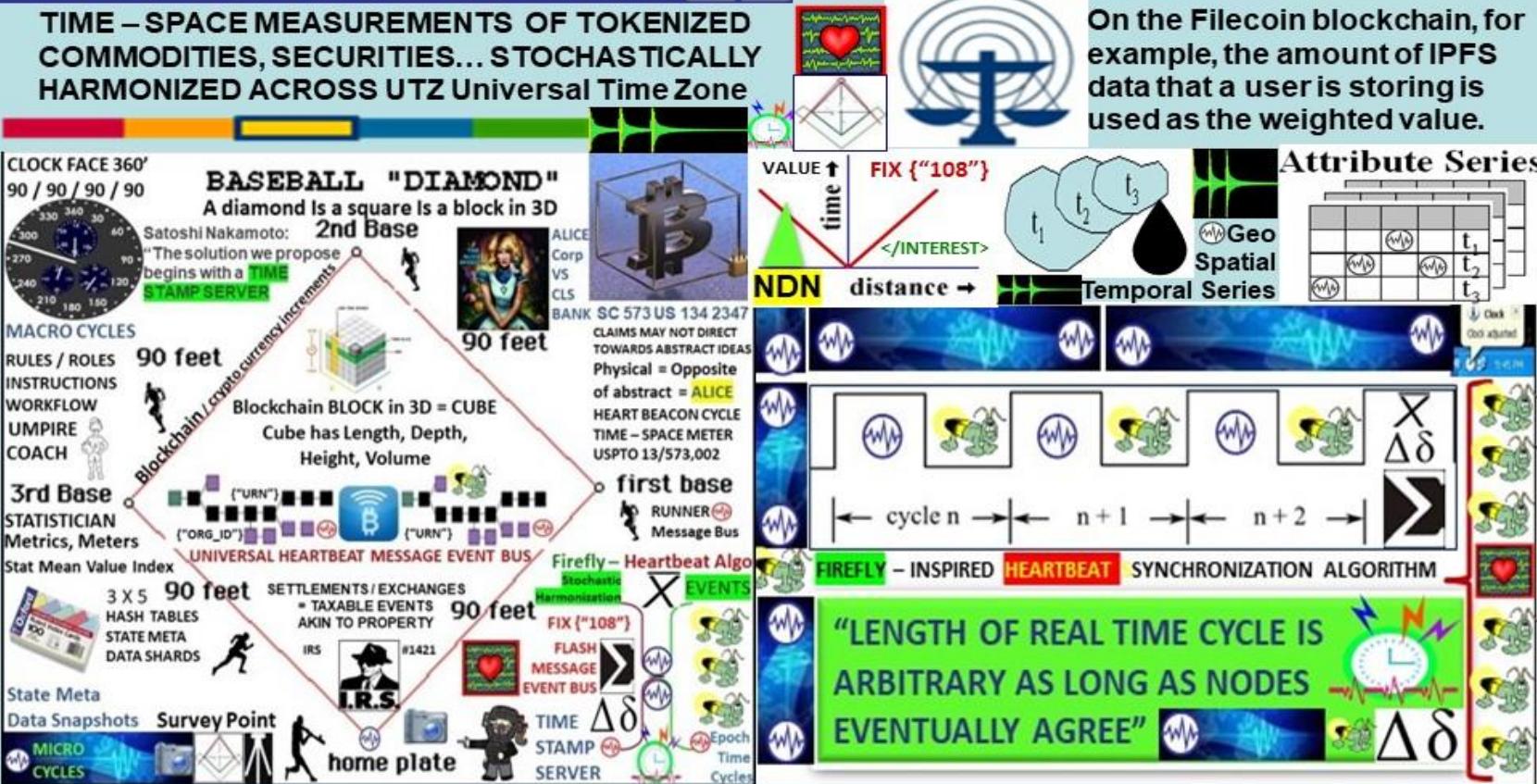
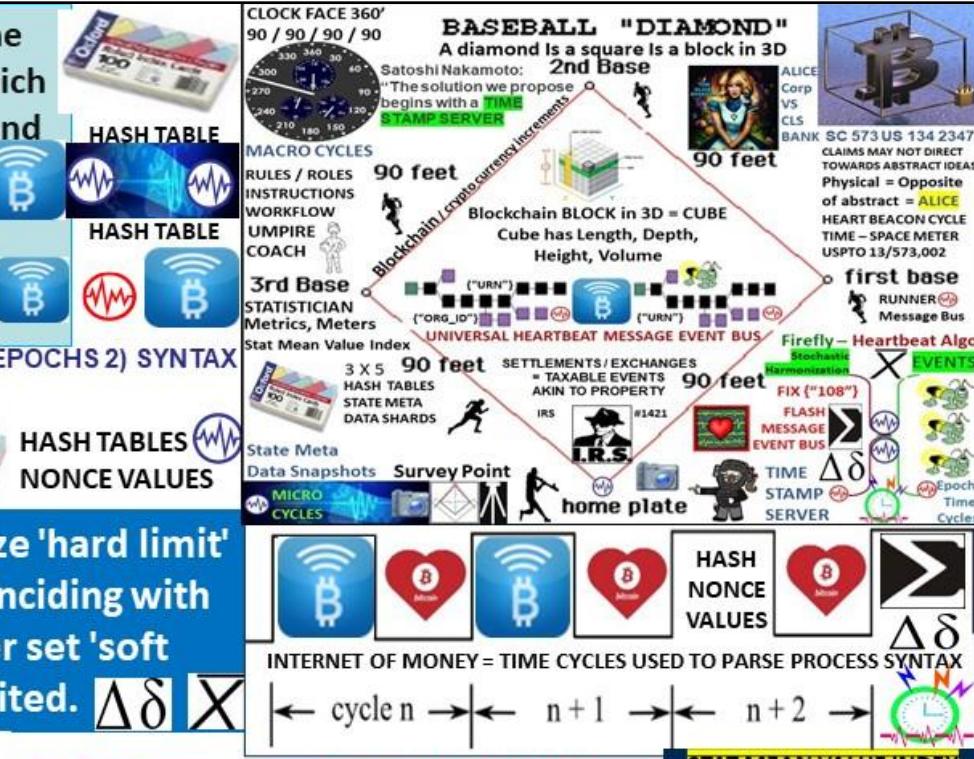


Figure 51: Proof of Weight Volumetric Consensus / USPTO 13/573,002

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.

ALL THINGS INTERNET FORMED W 1) TIME EPOCHS 2) SYNTAX



BitPay Core: limits: 1) block size 'hard limit' adjusted on a regular basis coinciding with difficulty adjustments, 2) miner set 'soft limit' like focal points in Unlimited. $\Delta\delta$



Bitcoin Unlimited: absence of a hard-coded block-size limit. Users manually set limits on their own nodes; Consensus on a limit expected to emerge naturally at Schelling focal point. Unlimited introduces a level of democracy into development, management of the implementation, the community votes on changes.



FIGURE 52: Bitcoin Classic - Core - Unlimited // USPTO 13/573,002

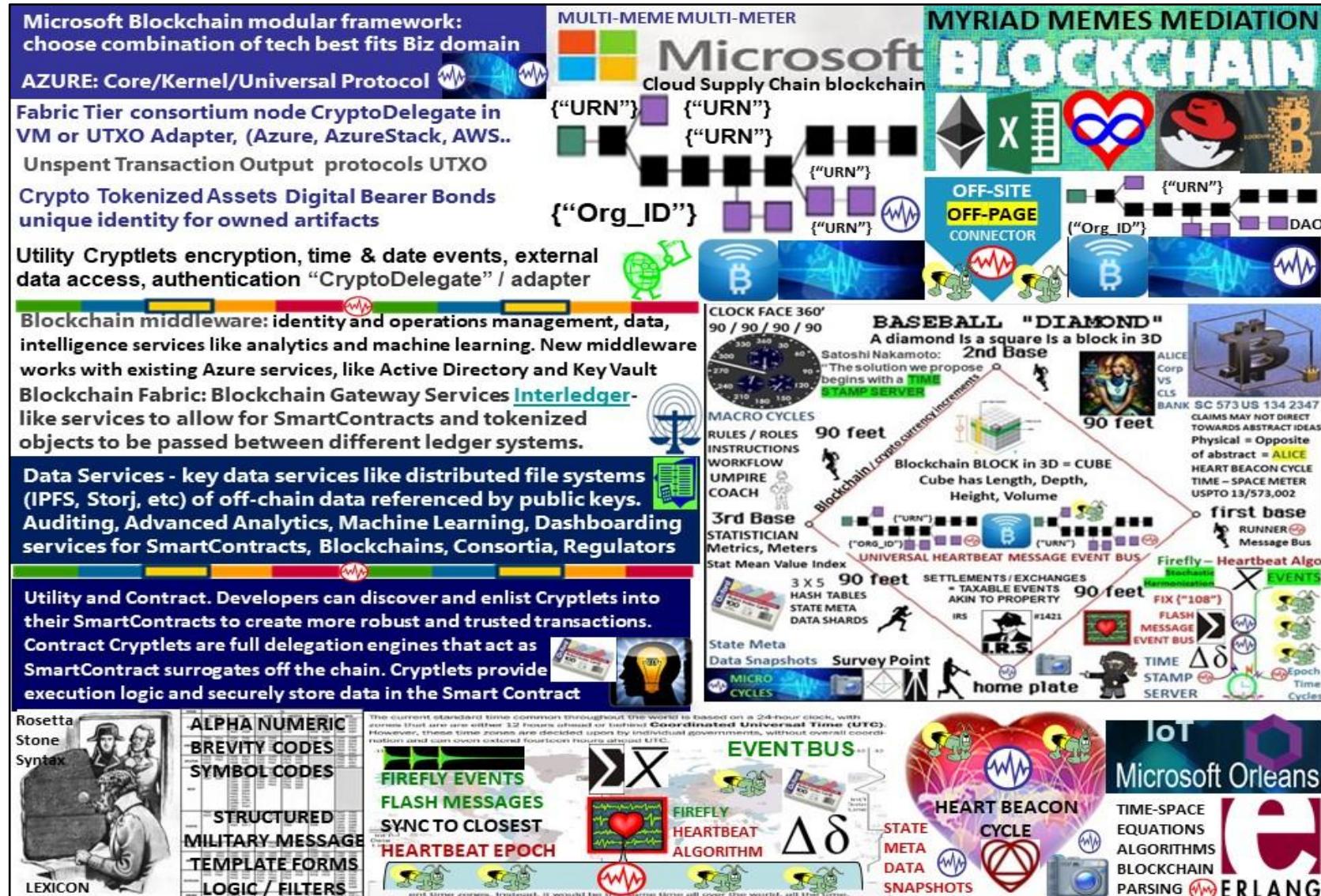


FIGURE 53: MICROSOFT CLOUD BLOCKCHAIN INTEROPERABILITY / USPTO 13/573,002

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."

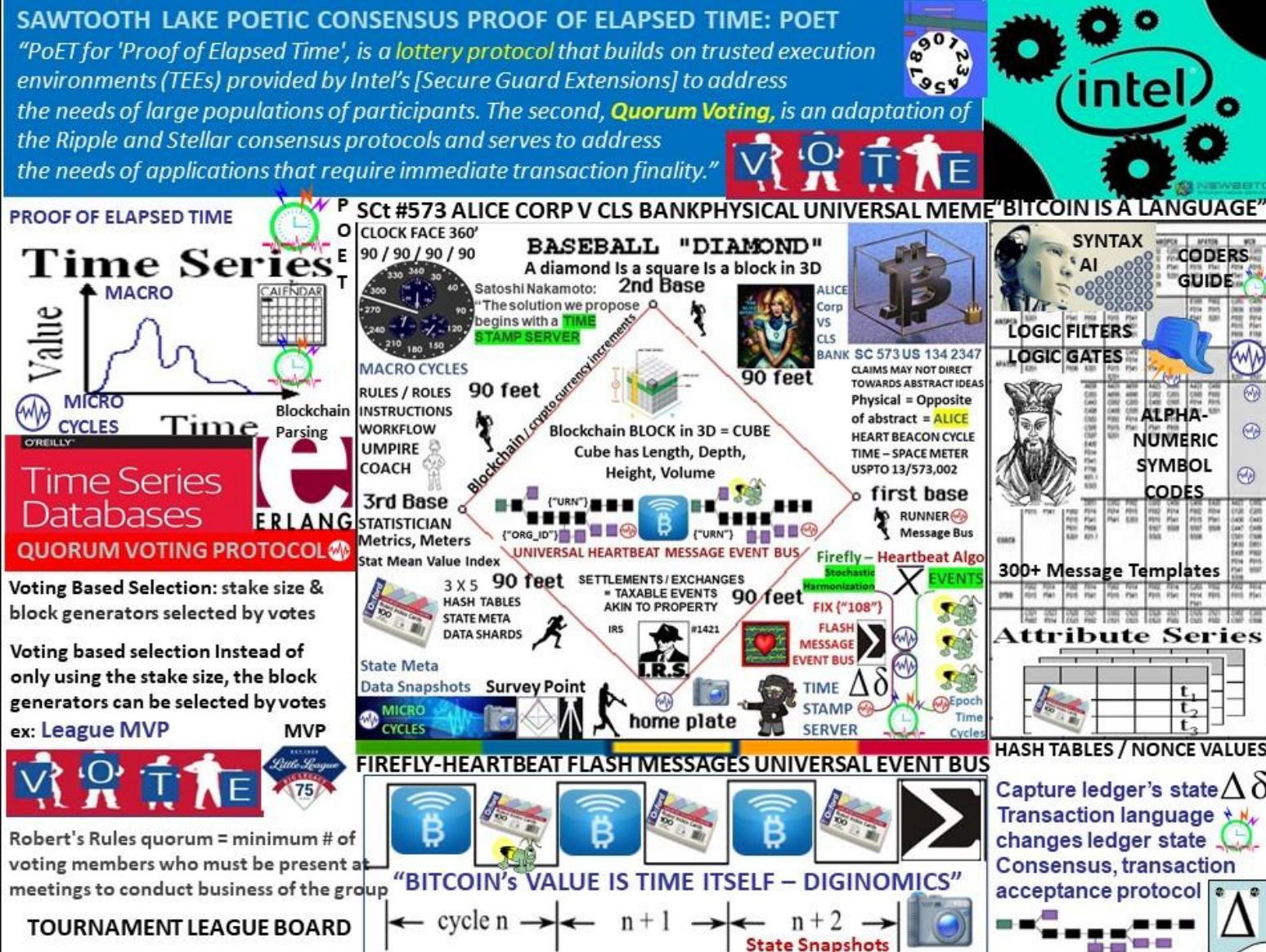


Figure 54: SAWTOOTH POET Proof of Elapsed Time Consensus / USPTO 13/573,002

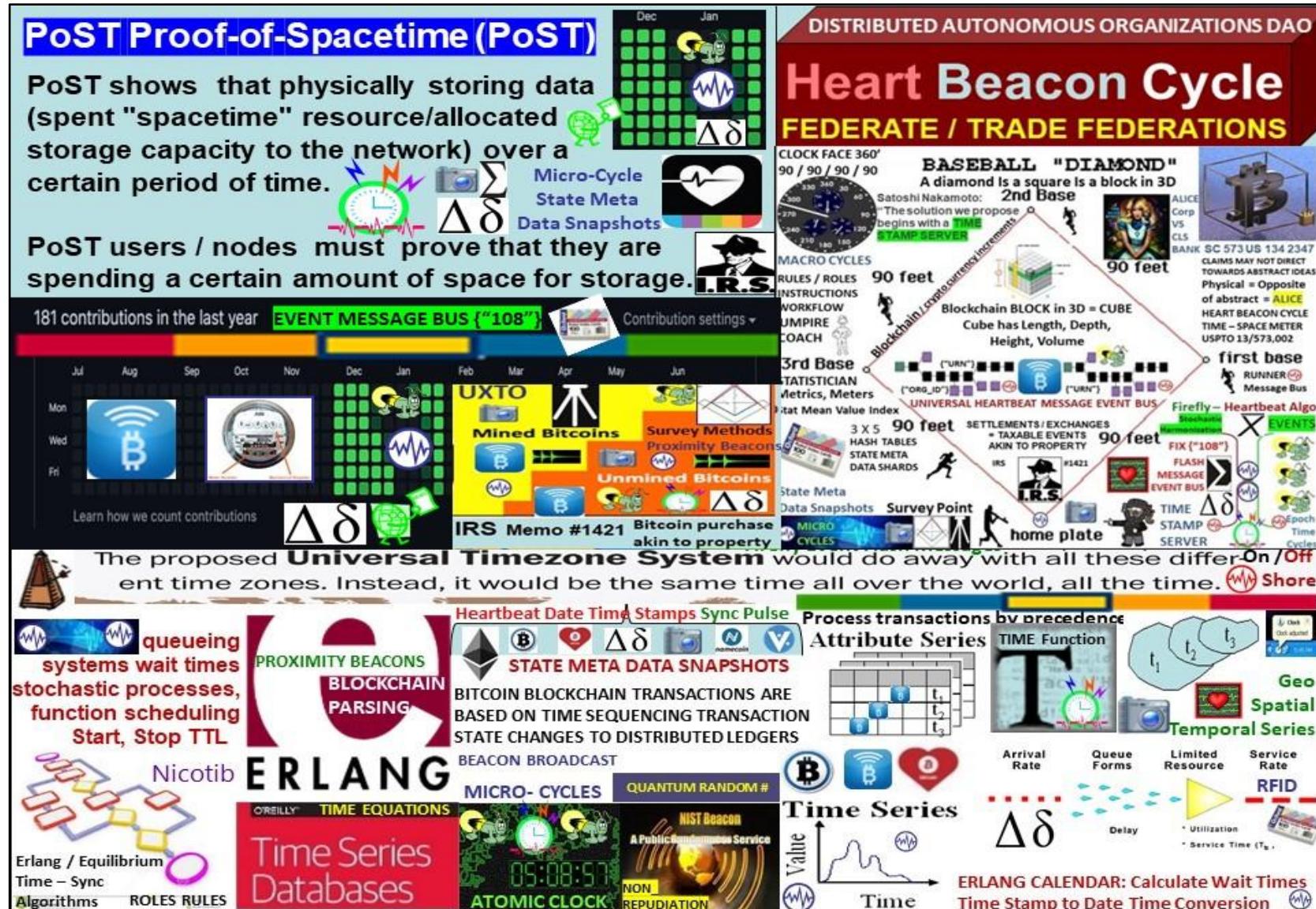


Figure 55: Proof of Space Time POST / USPTO 13/573,002

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.



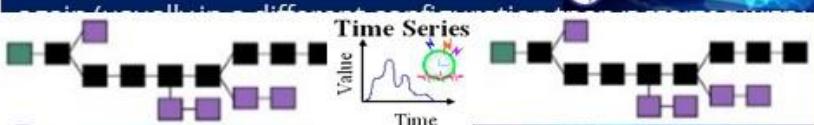
1. Part of the blockchain state is locked via multisignature or smart contract convention, so that a specific set of participants must completely agree with each other to update it.



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 update.



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

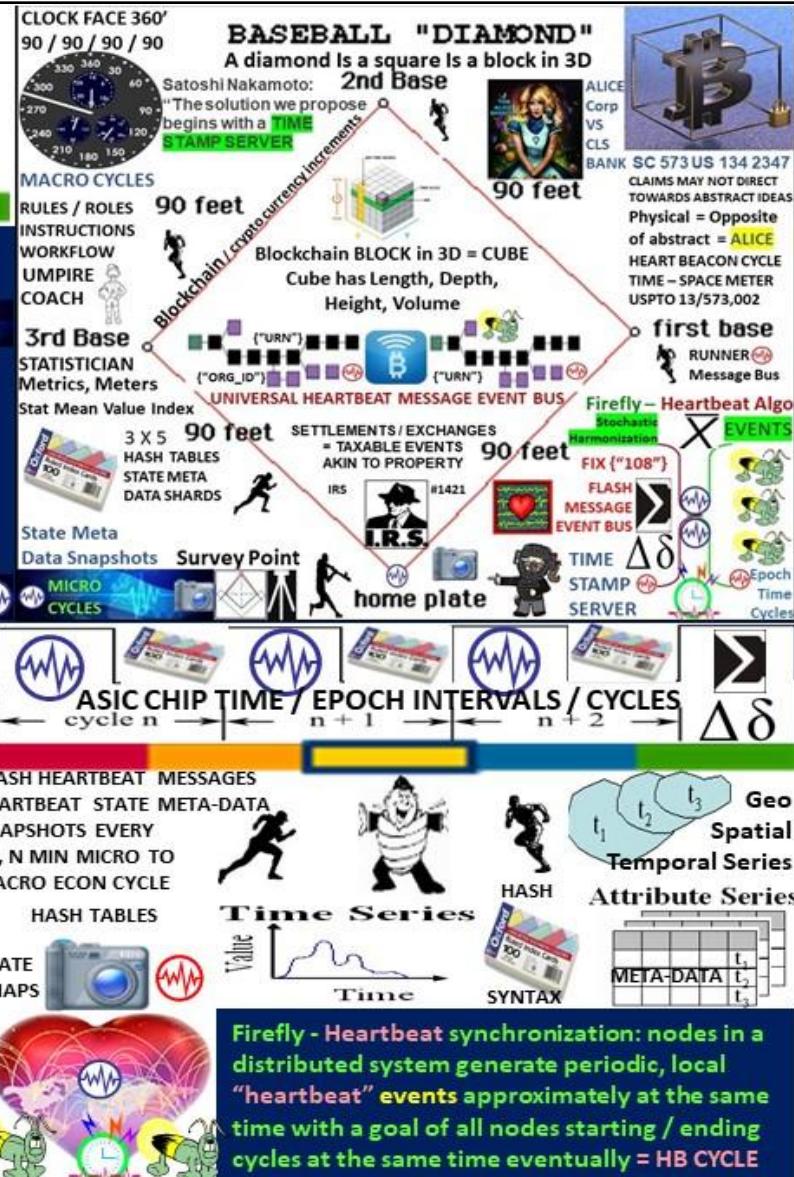


Figure 56: State Channels / USPTO 13/573,002

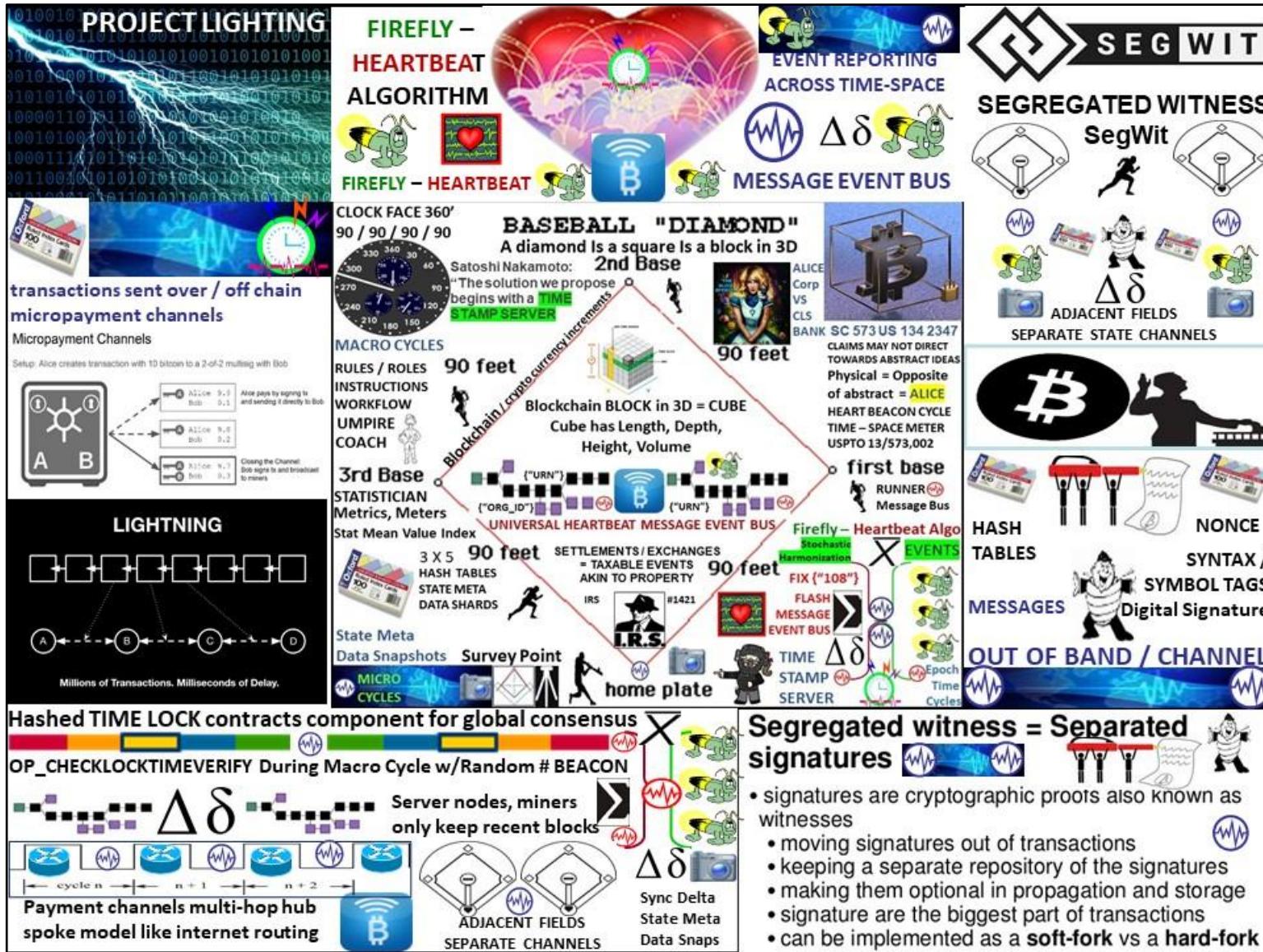


FIGURE 57: Segregated Witness / Project Lightning Consensus / USPTO 13/573,002

BITCOIN NG NEX GEN / Heart Beacon Cycle 13/573,002

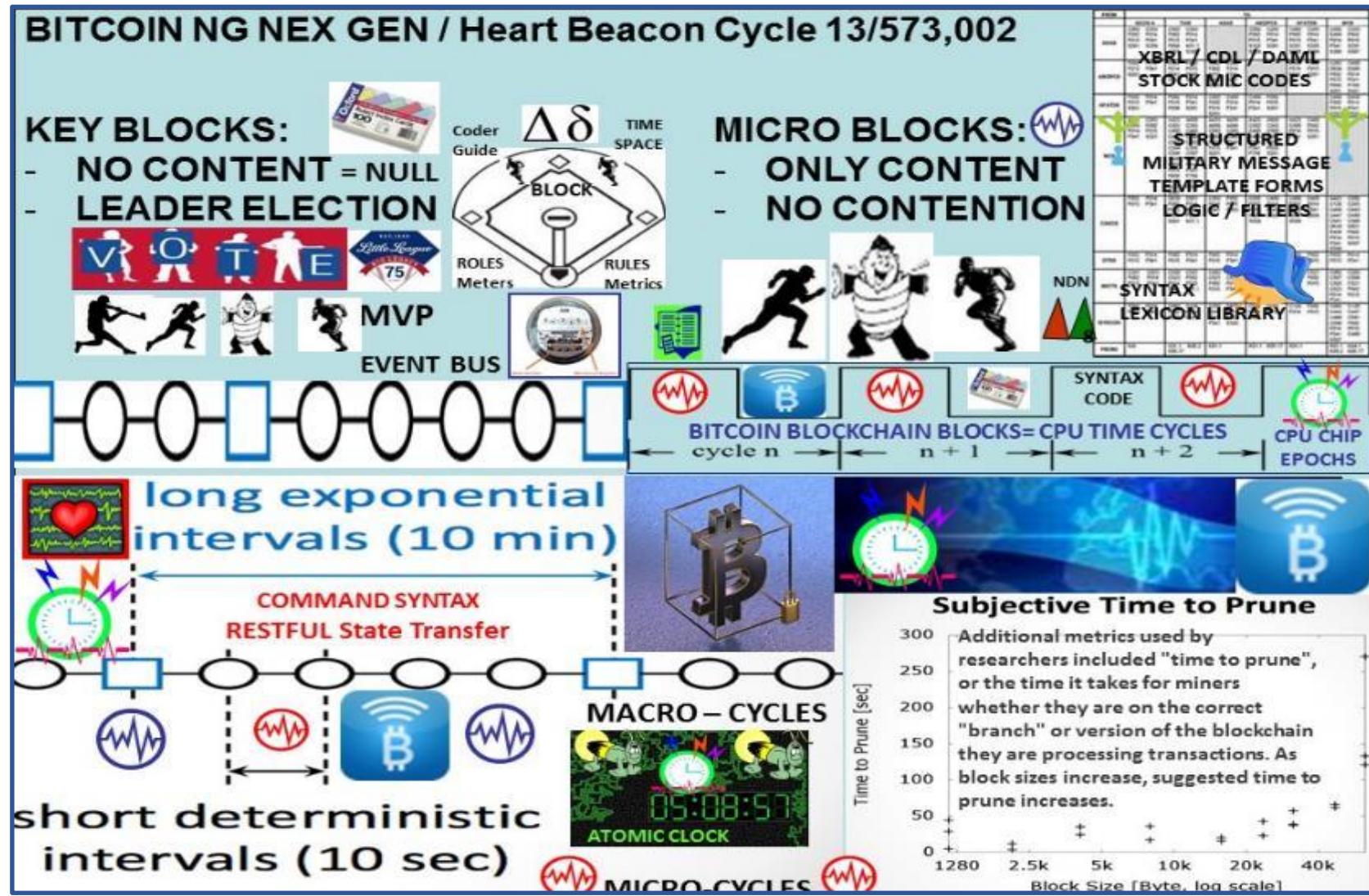


FIGURE 68: BITCOIN NG NEXT GENERATION / USPTO 13/573,002

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.

ALERT LEVEL > NEWSCAST ZONE

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.

TIME OUT

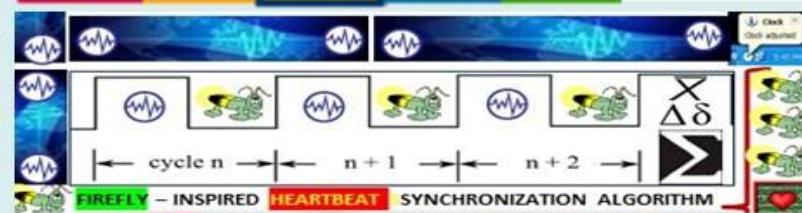


DISTRIBUTED AUTONOMOUS ORGANIZATIONS DAO

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

One country observes one time zone, whereas others observe two or three time zones. This results in 24-hour shifts, with zones that are one or 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.

EVENT BUS

FIREFLY EVENTS FLASH MESSAGES SYNC TO CLOSEST HEARTBEAT EPOCH

FIREFLY HEARTBEAT ALGORITHM

$\Delta\delta$



Figure 59: 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

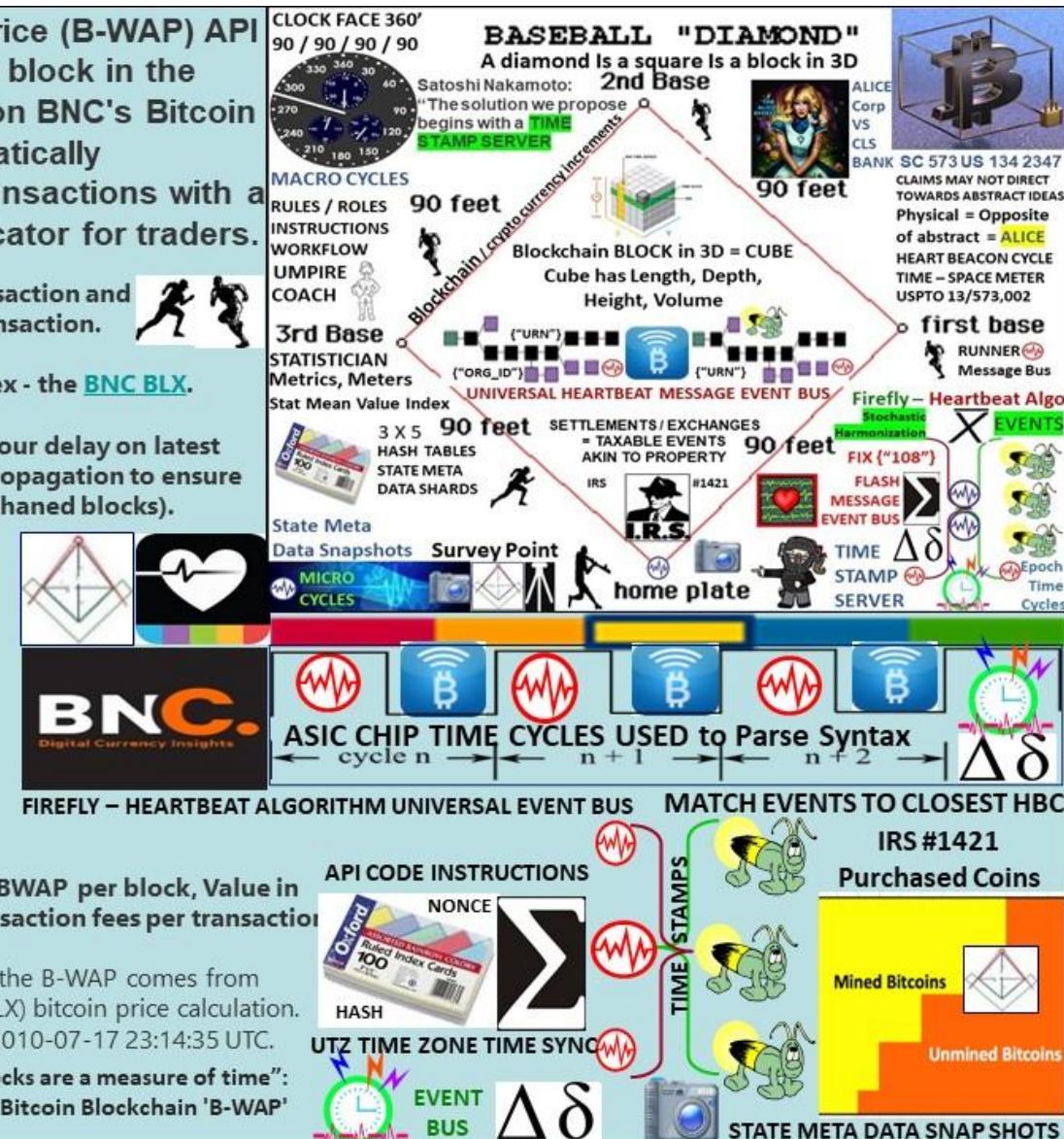


FIGURE 60: Brave New Coin B-WAP Consensus / USPTO 13/573,002



FIGURE 62: ETHEREUM – CASPER / USPTO 13/573,002

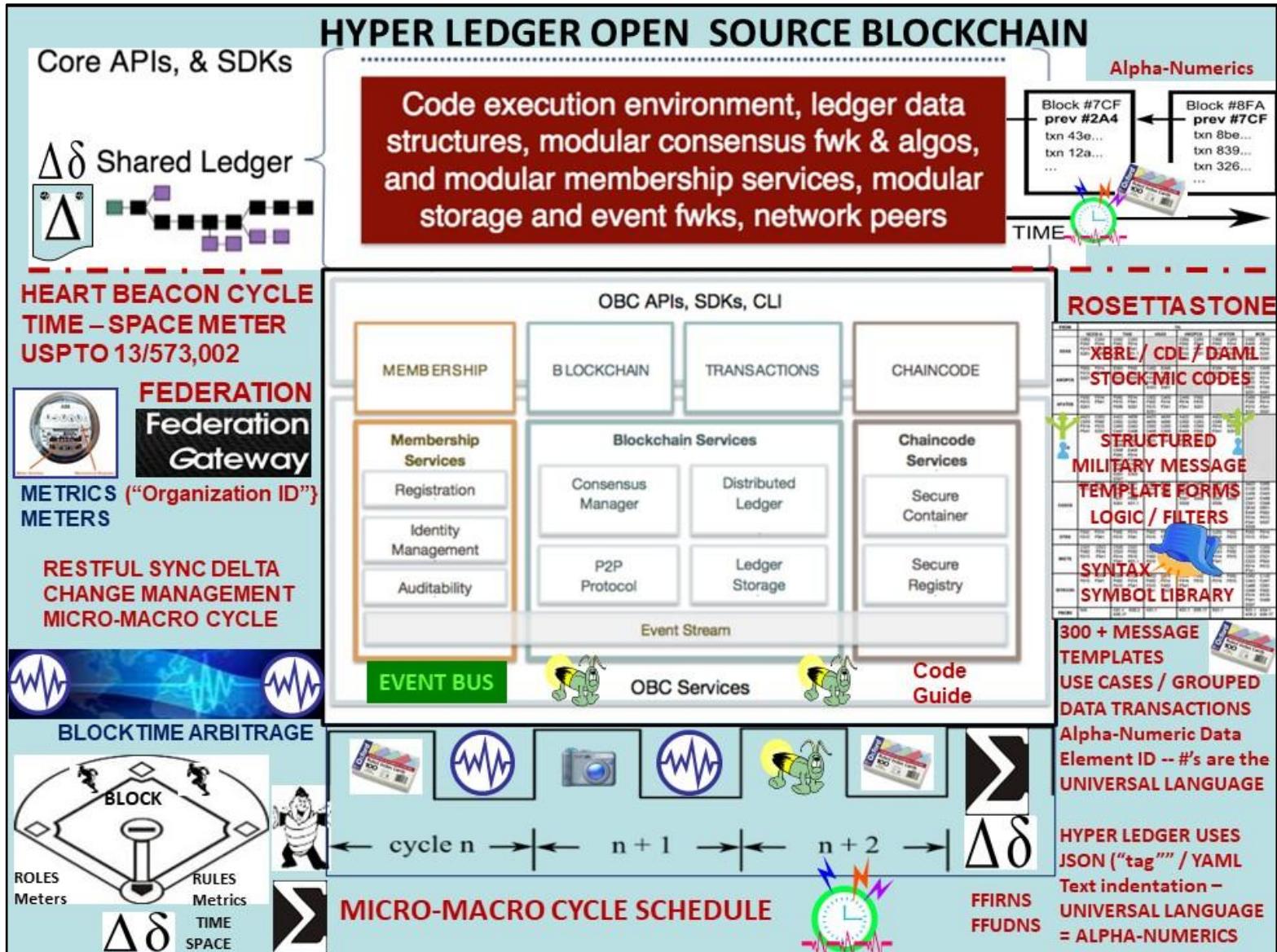


FIGURE 63 HYPERLEDGER FRAMEWORK / USPTO 13/573,002

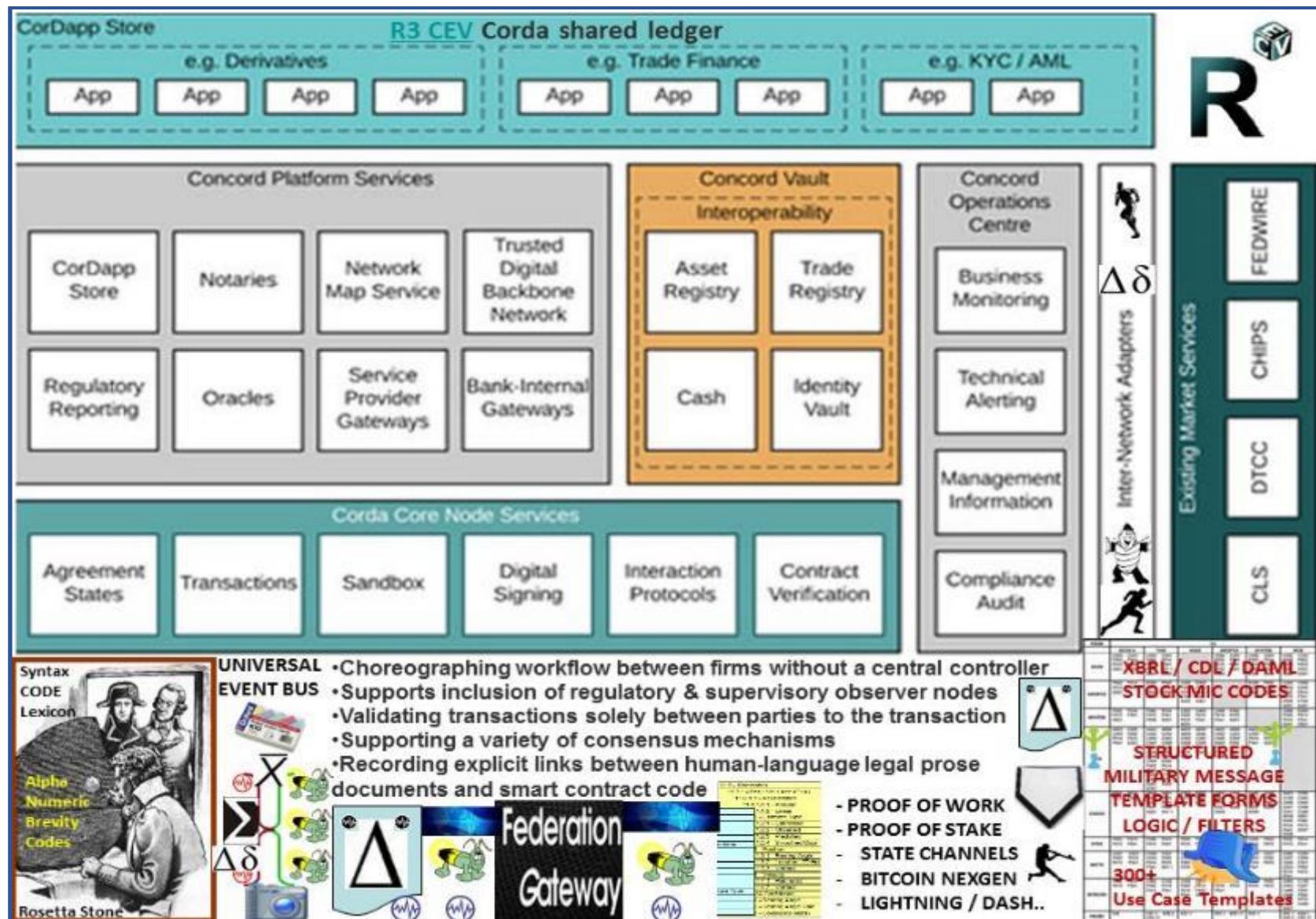


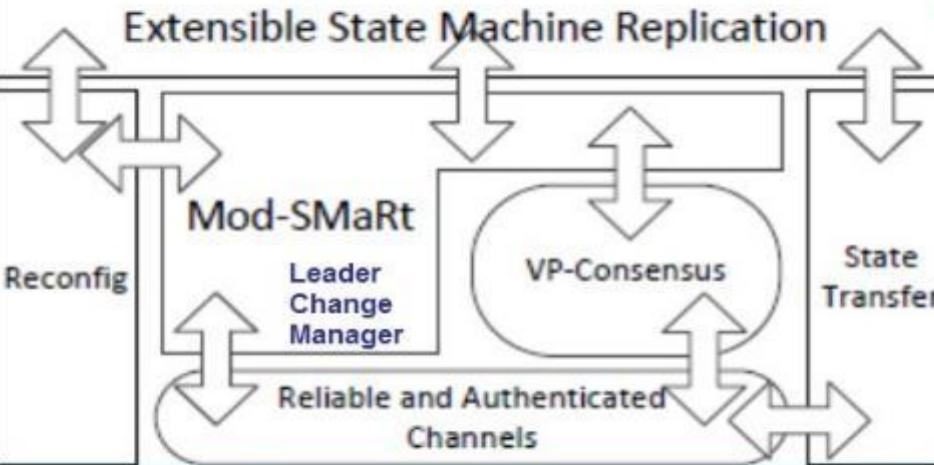
FIGURE 64: R3 Consortium CORDA / USPTO 13/573,002



FIGURE 65: 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

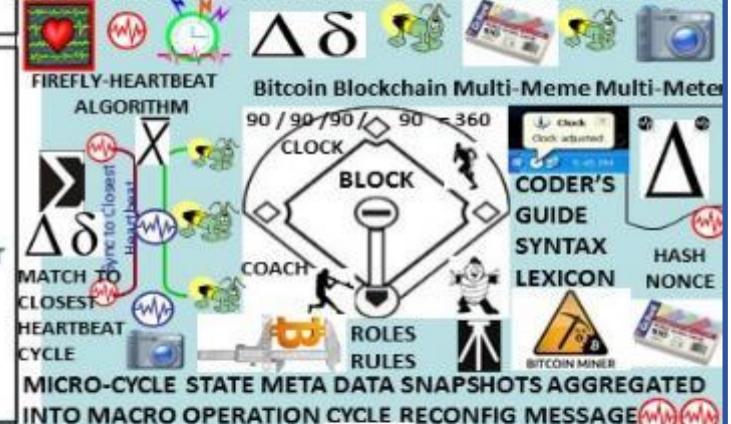
USCT ALICE CORP V CLS BANK
PHYSICAL = OPPOSITE OF ABSTRACT



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



MICRO-CYCLE STATE META DATA SNAPSHOTS AGGREGATED INTO MACRO OPERATION CYCLE RECONFIG MESSAGE

BUILDING BLOCKS:

- TIME CYCLE EPOCHS
- SYNTAX INSTRUCTIONS

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 66: 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



FIGURE 67: Open Bazaar / USPTO 13/573,002

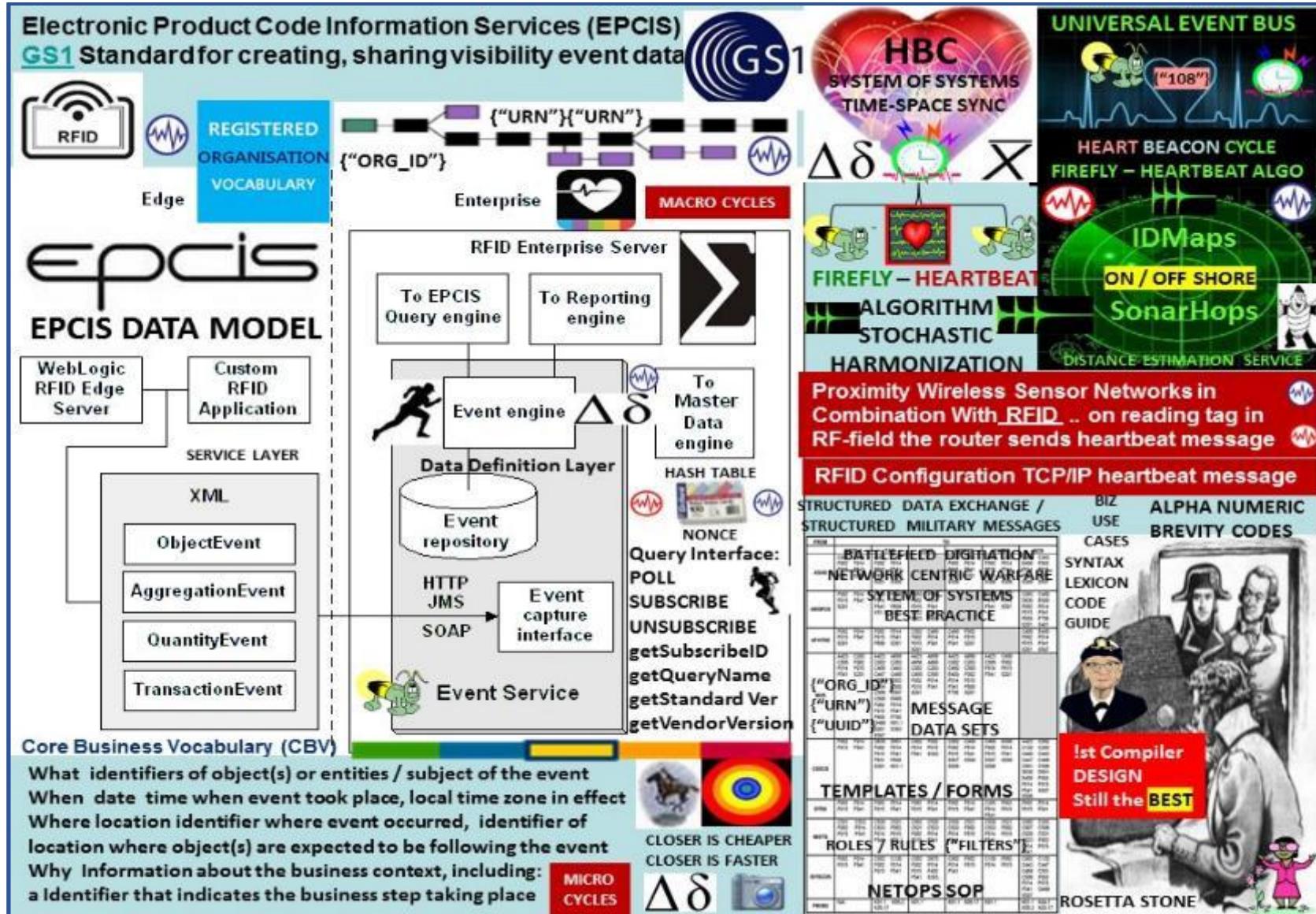


FIGURE 68: EPCIS RFID / USPTO 13/573,002



Figure 69: HASHGRAPH DAG Directed Acyclic Graph / USPTO 13/573,002

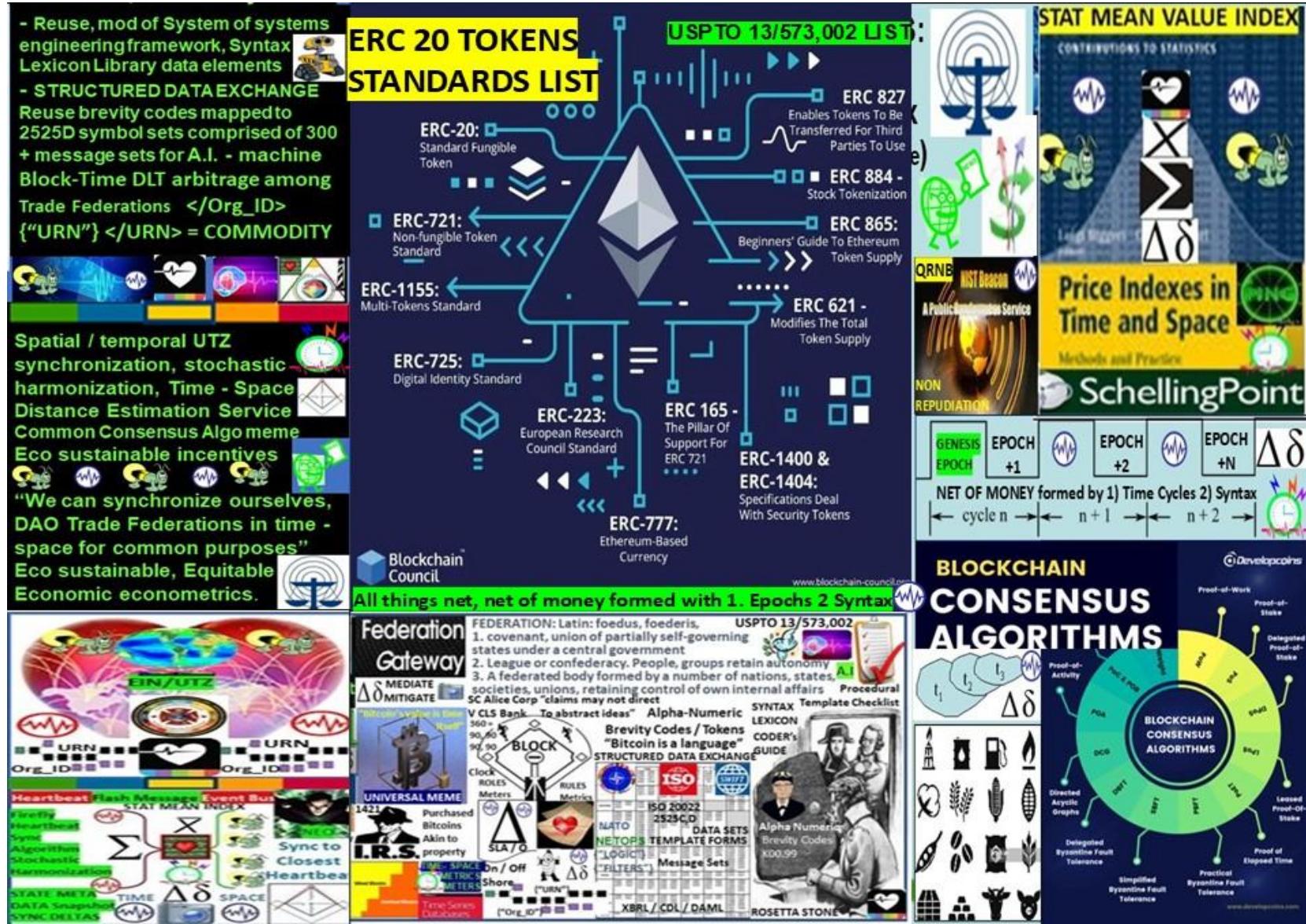


FIGURE 70: ERC 20 TOKENS STANDARDS LIST



Figure 71: FEDCOIN – WORLDCOIN STABLE COIN / USPTO 13/573,002 ECONOMIC HEARTBEAT



Programmable
Money Transactions
Intrabank settlements

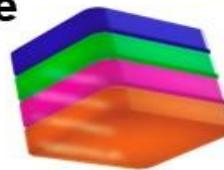


PROTON A CHAIN Virtual Machine

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"}



coordinates validators, keeps track of active subnets, SNOWMAN consensus Token representation of real-world resources (e.g., equity, bonds) smart contract rules </URN>

DAG Acyclic Graph Parameters:

n: number of participants

k (sample size): between 1 and n

α (quorum size): between 1 and k

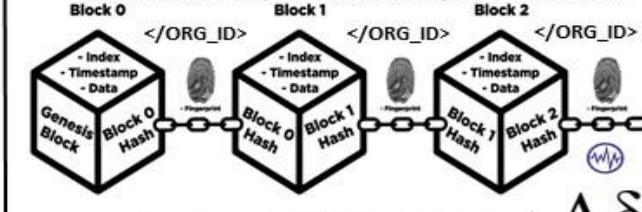
β (decision threshold): ≥ 1

ALL THINGS NET, NET OF \$\$\$

- 1) EPOCH TIME INTERVALS
- 2) SYNTAX (not) used in epochs



GENESIS BLOCK: "Layers" = follow on epoch time intervals



SECURITY TOKEN: A DIGITAL ASSET THAT'S BACKED UP BY TANGIBLE ASSETS IN THE REAL WORLD

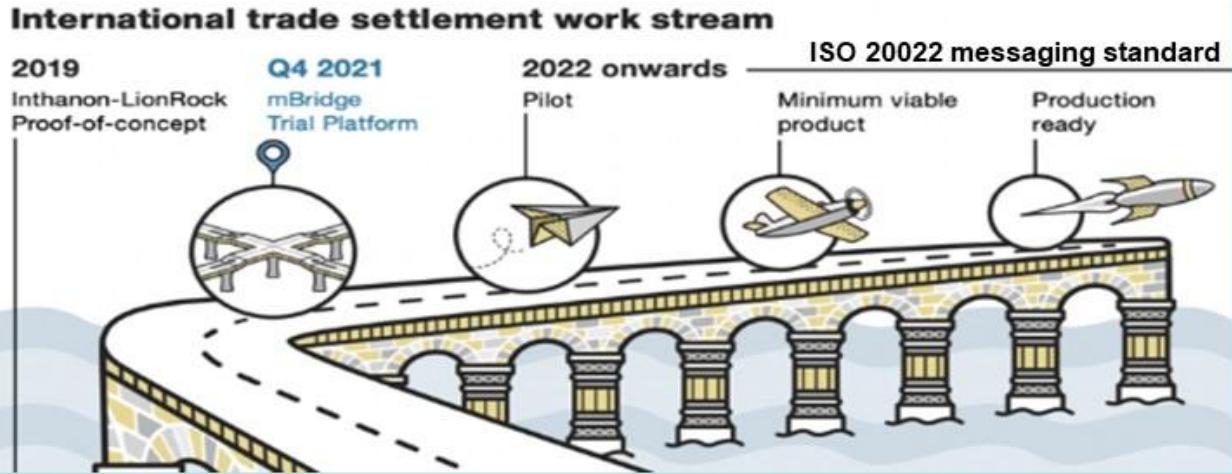
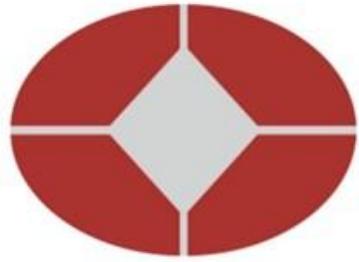


"all digital currency networks, the base layer of people generating the blockchain — "miners," "stakers," "witnesses," "validators," or "forgers" get paid"



Figure 72: 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 73 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

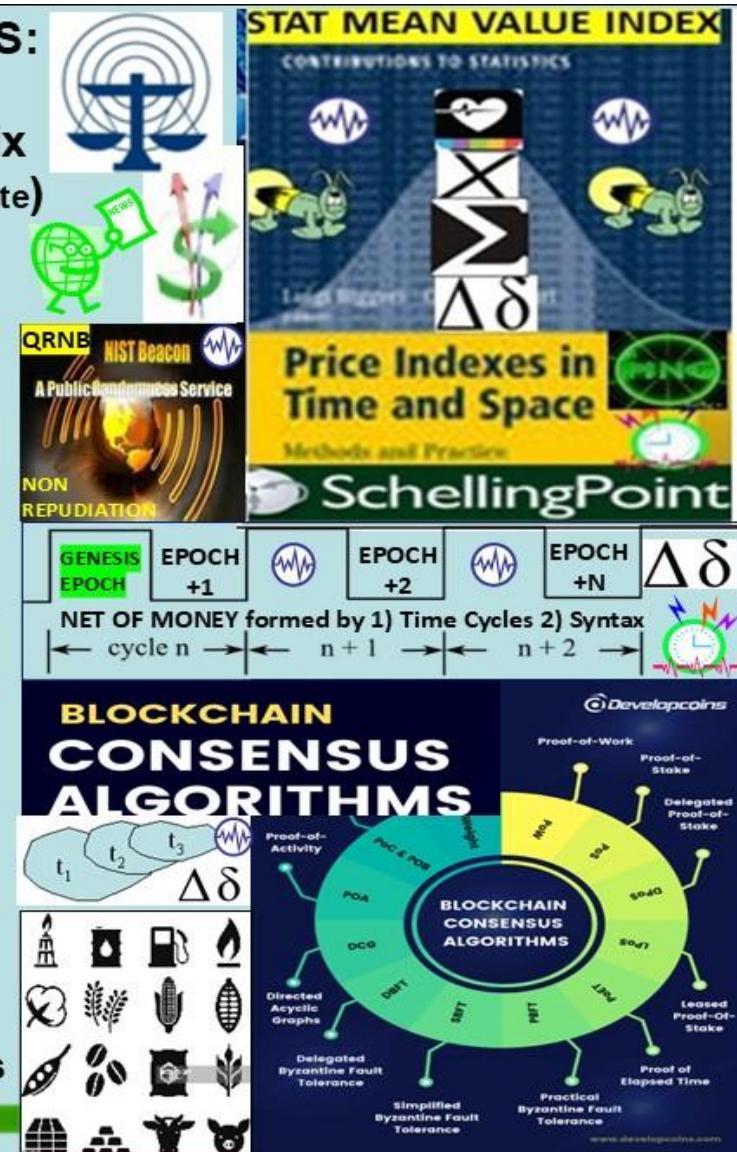
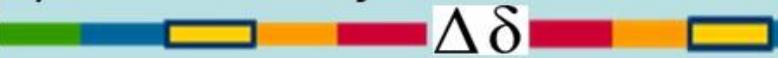
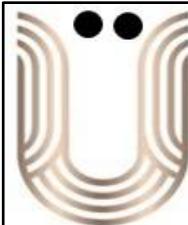


Figure 74: STABLE COINS / USPTO 13/573,002



UNICOIN

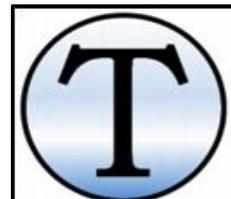
Digital Capital Exchange

Unicoin: IMF CBDC legal tender settlement coin

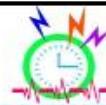
Universal Monetary Unit (UMU), a.k.a Unicoin: store of value cryptography, artificial intelligence (A.I.) Goals: continuous purchasing demand, minimal price volatility, and annual asset pricing targets. The primary value of any commodity is its utility value. Utility = pay for goods, services, and debts, 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 75: 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’

	Wikipedia	Truthcoin
Focus	Outcomes of past events. Consensus on known facts.	Outcomes of <i>future</i> events. <i>Future</i> consensus on <i>knowable</i> facts.

3. A software protocol

A protocol is a set of rules that determine how something is performed or accomplished

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 <u>SztorcCorp</u> , owe 1/100 th of <u>SztorcCorp’s profits</u> 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 the stock price of SztorcCorp is above 40 \$/share</u> 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 Hillary Clinton is elected US President in 2016</u> . Otherwise I owe \$0.”	...(others)...
...(others)...	...(others)...	...(others)...

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 76: 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 77: Volatility Problem Solution / USPTO 13/573,002

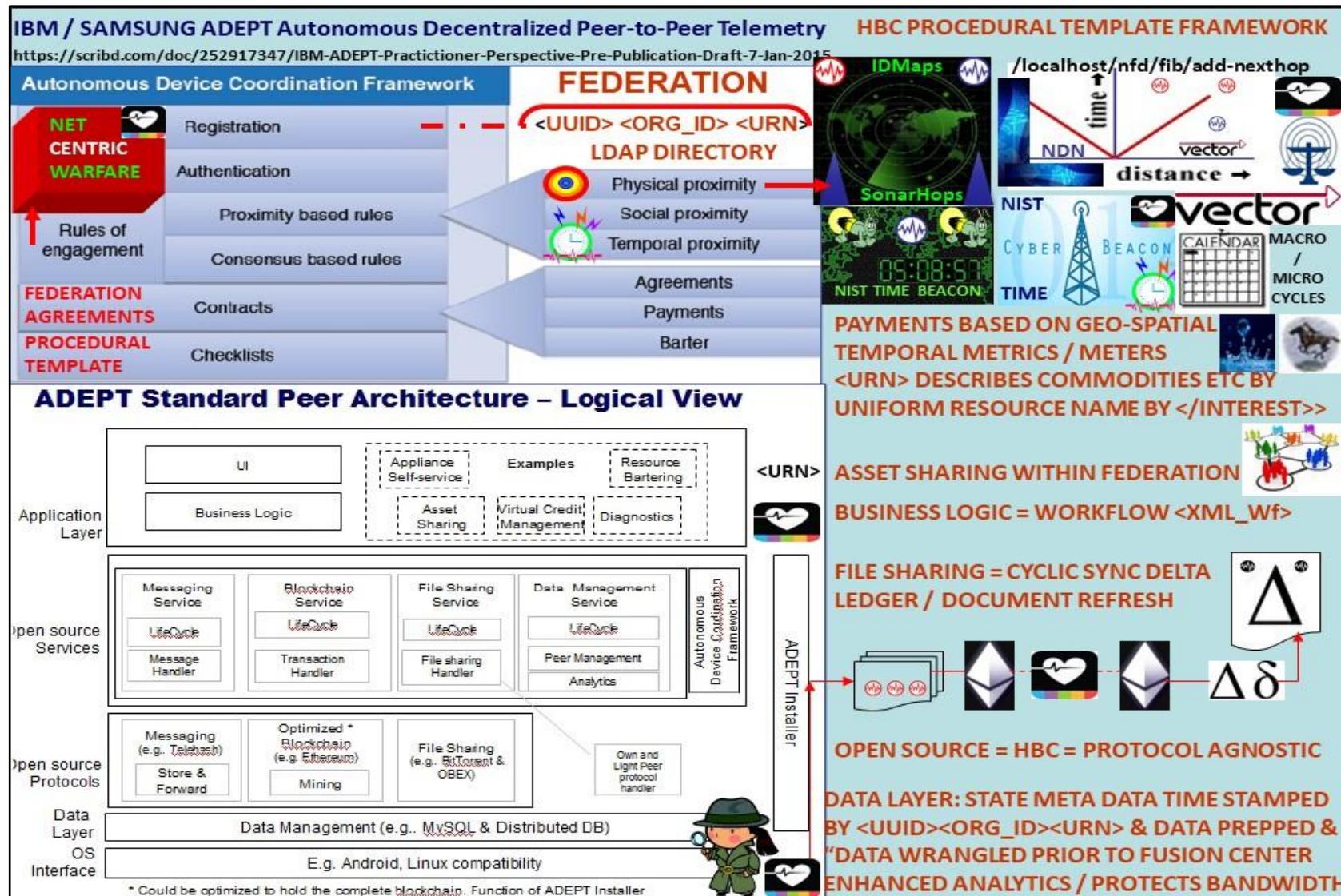


Figure 78: IBM – Samsung ADEPT / USPTO 13/573,002



FIGURE 79: Sustainable Stock Exchange Initiative SSEI / HFT Algorithmic Regulation / USPTO 13/573,002



Figure 80: USPTO 13/573,002 Econometrics, Meters, Metrics, Trade Federation Demurrage Fees



FIGURE 81: TRADENET / USPTO 13/573,002



FIGURE 82 NEW ECONOMY BLOCKTIME ARBITRAGE / USPTO 13/573,002



FIGURE 83: 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 84: 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

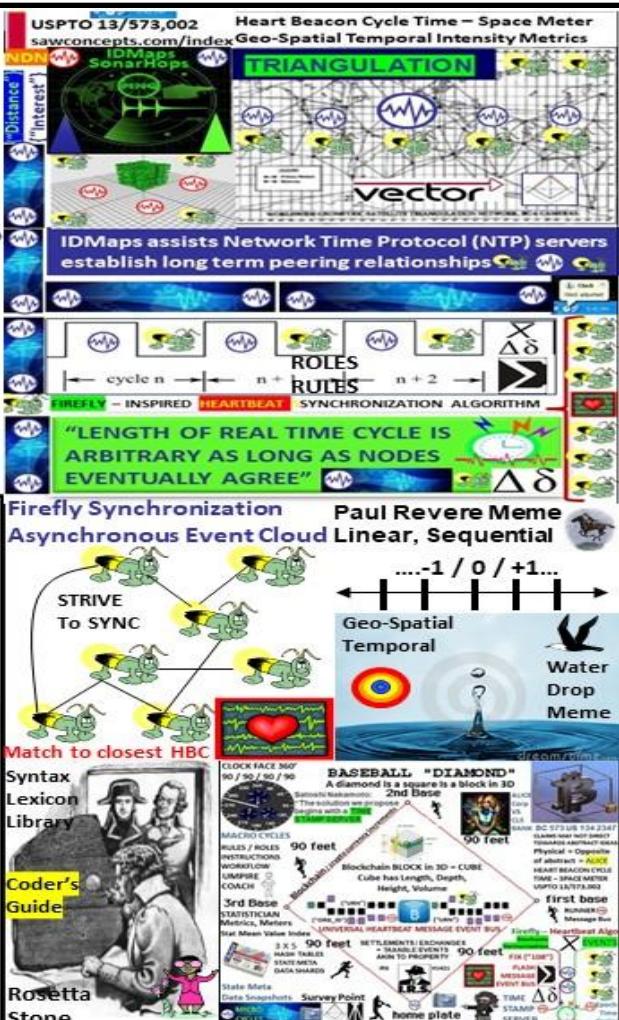
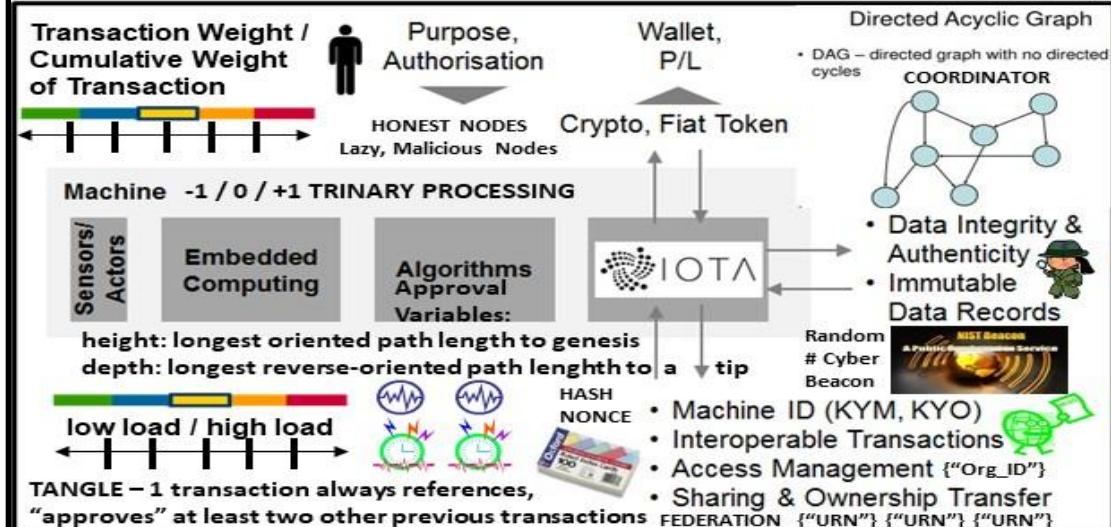


FIGURE 85: IOTA TANGLE DAG / USPTO 13/573,002

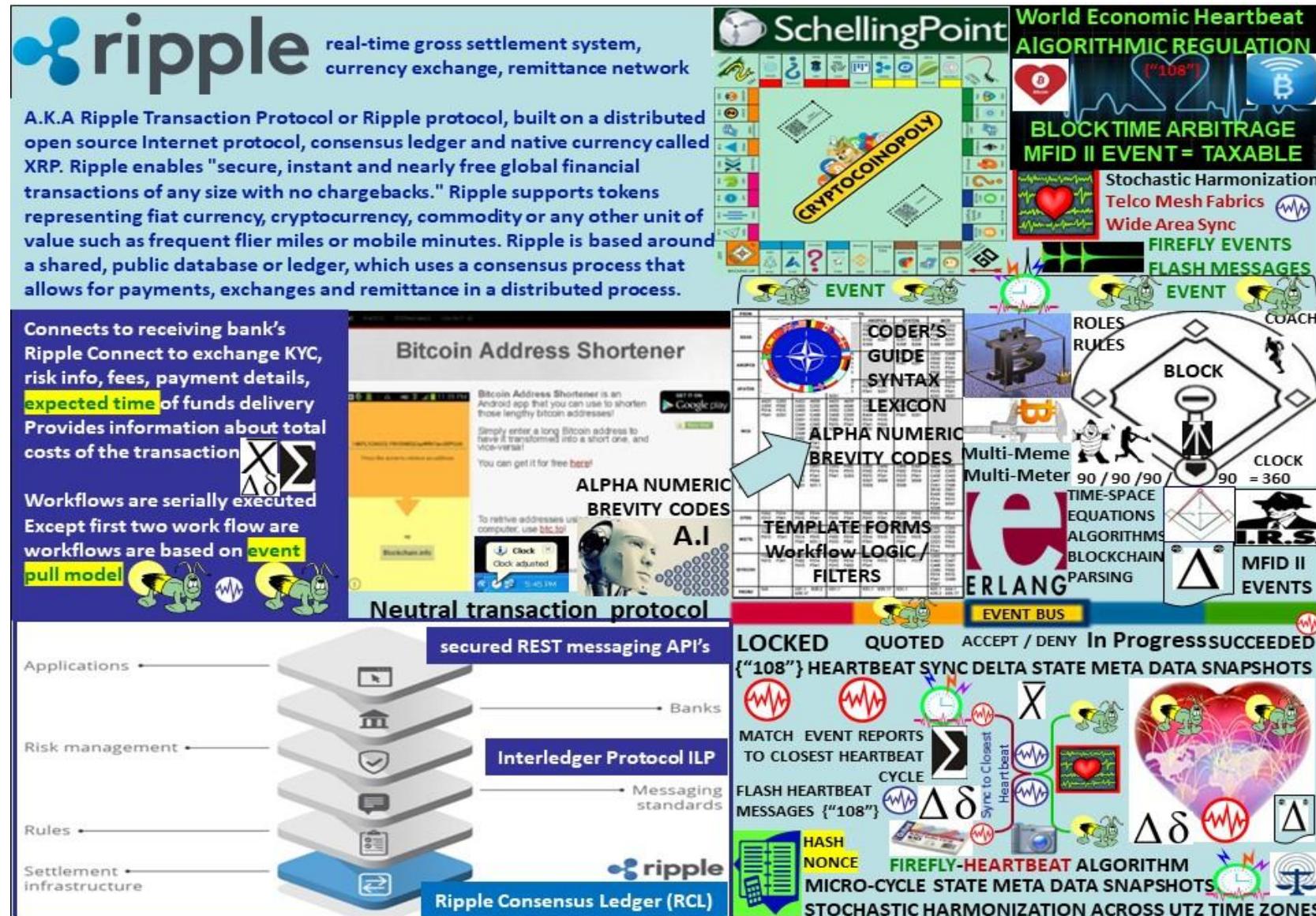


FIGURE 86: RIPPLE XRP Real Time Protocol / USPTO 13/573,002



FIGURE 86A: RIPPLE XRP Real Time Protocol / USPTO 13/573,002

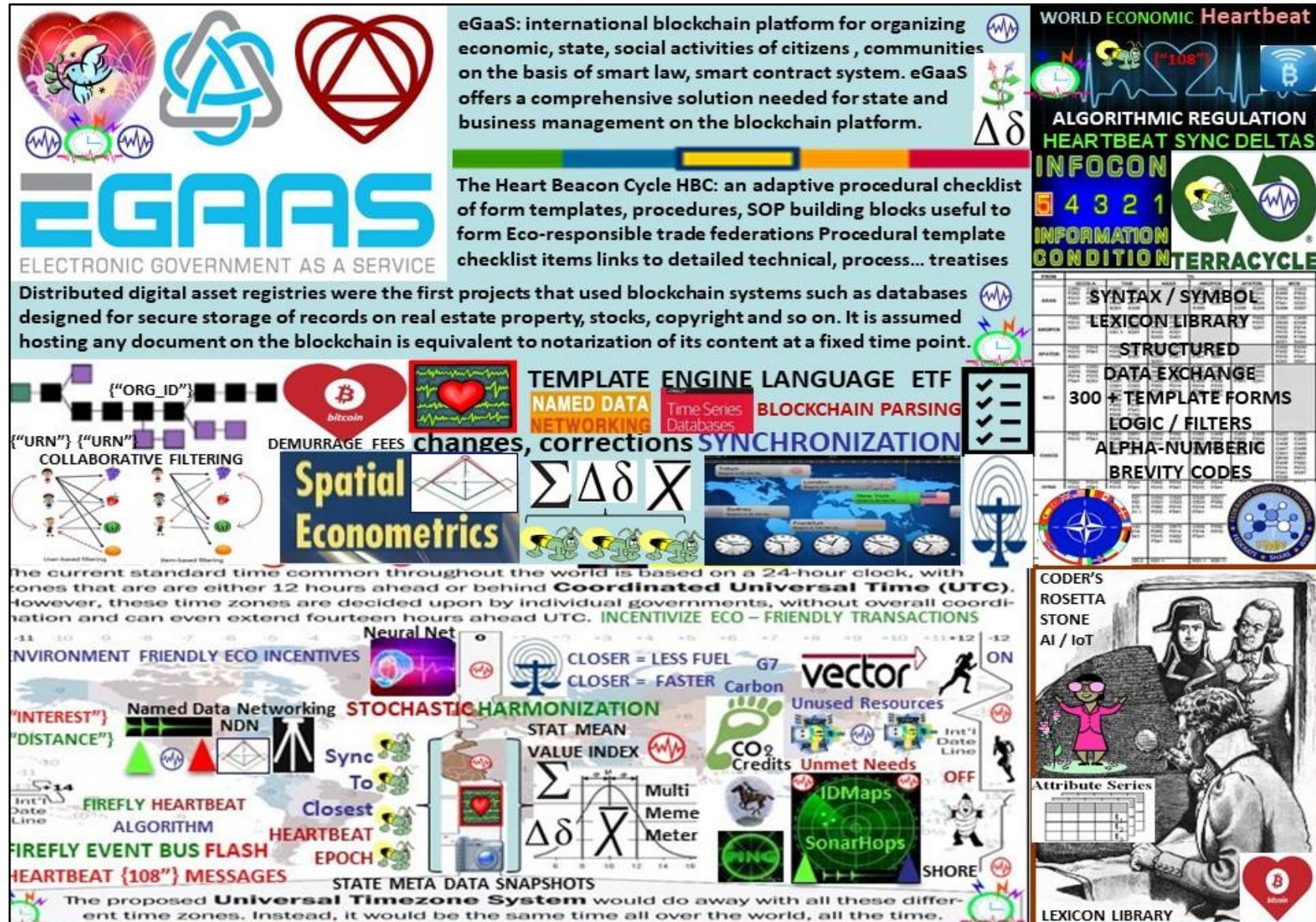


FIGURE 87: E Government as a Service E-GASS/ USPTO 13/573,002



Figure 88: GNOSIS / USPTO 13/573,002



Figure 89: Cryptocurrencies main issues / fixes



Figure 90: USPTO 13/573,002 Application time line, key events / SCOTUS compliant meme



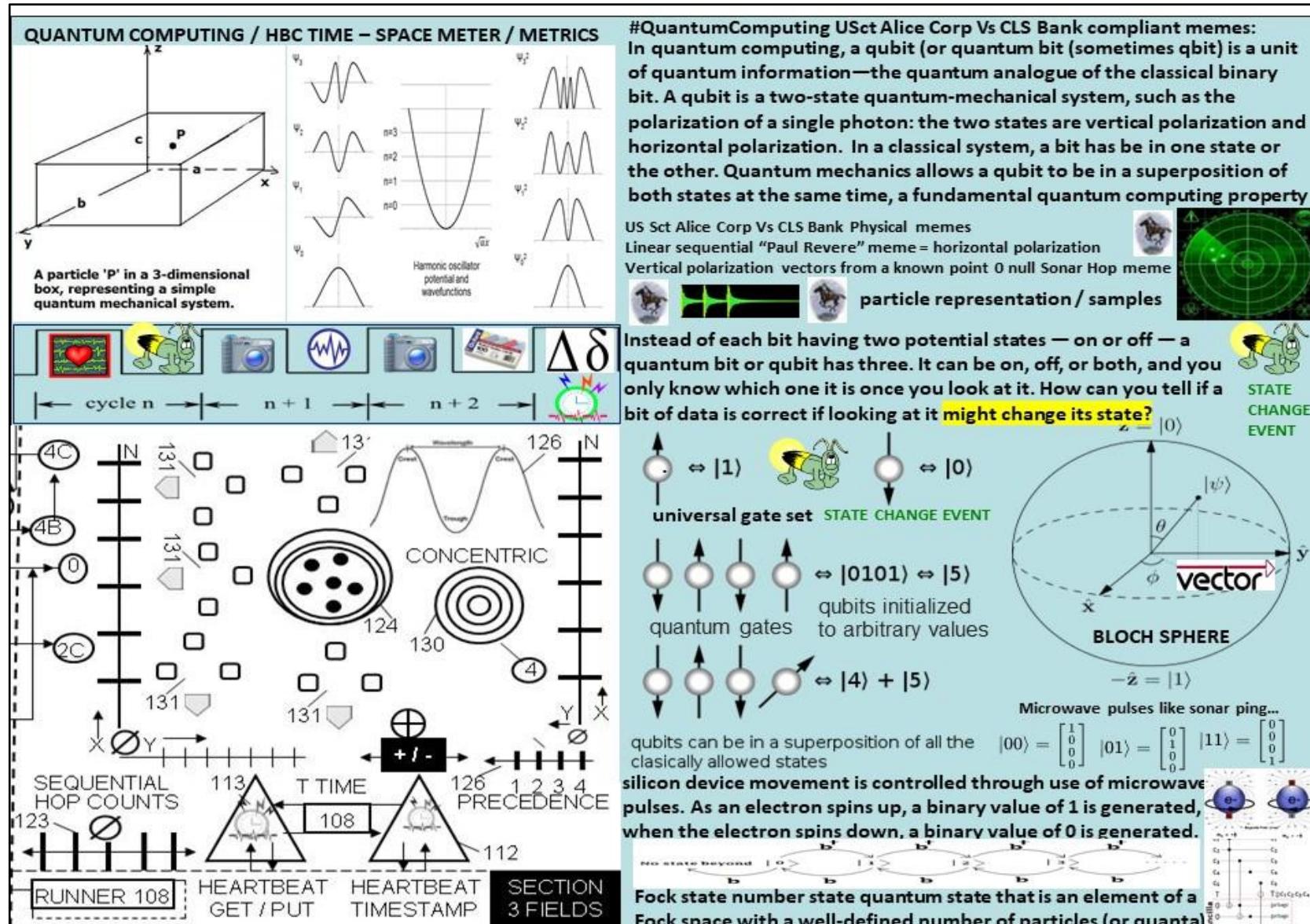


Figure 92: USPTO 13/573,002 Graphic supporting Quantum Computing Space – Time



Figure 93: QUANTUM COMPUTING / USPTO 13/573,002

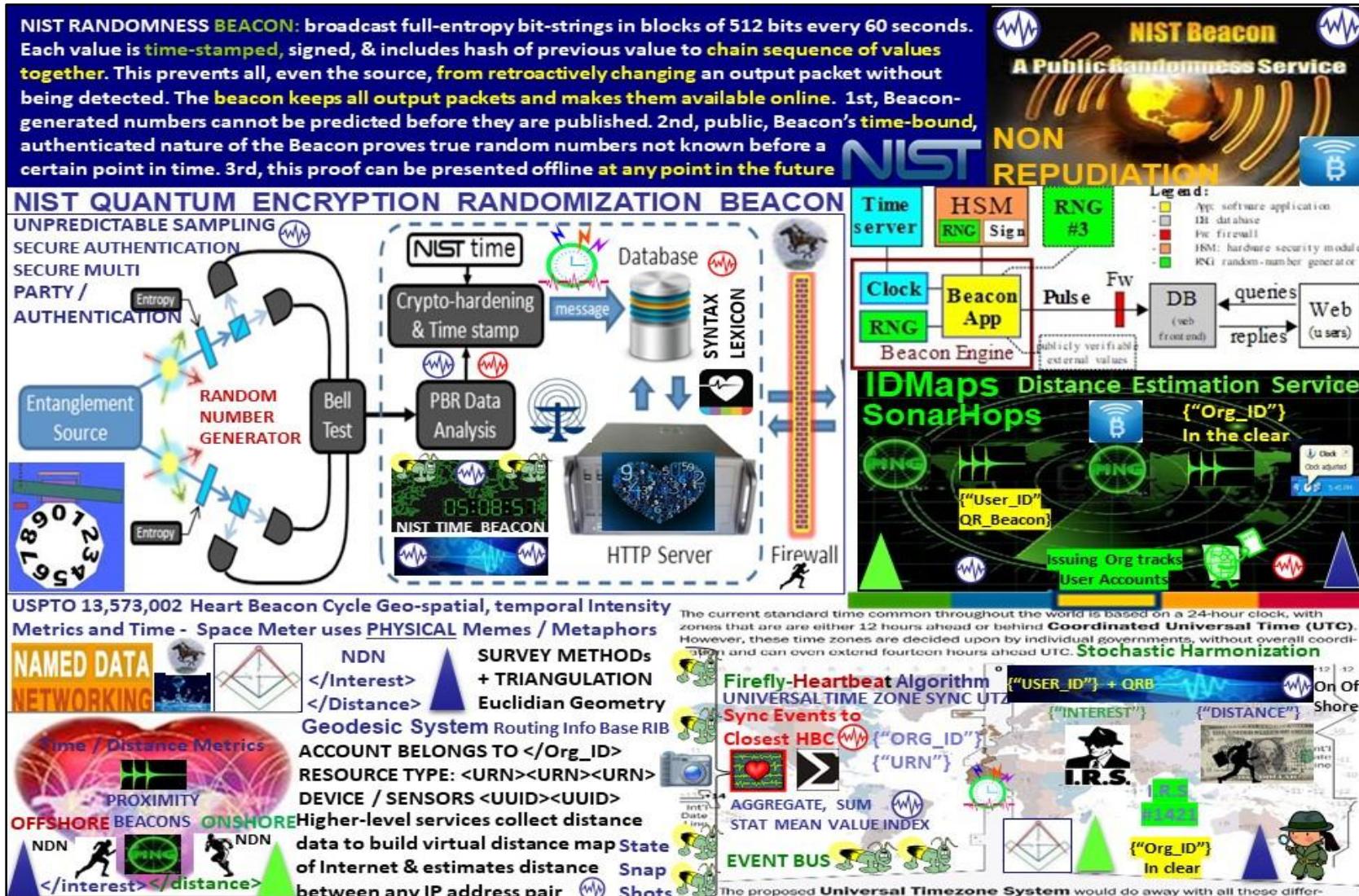


Figure 94: NIST QRNB Quantum Random Number Beacon / USPTO 13/573,002

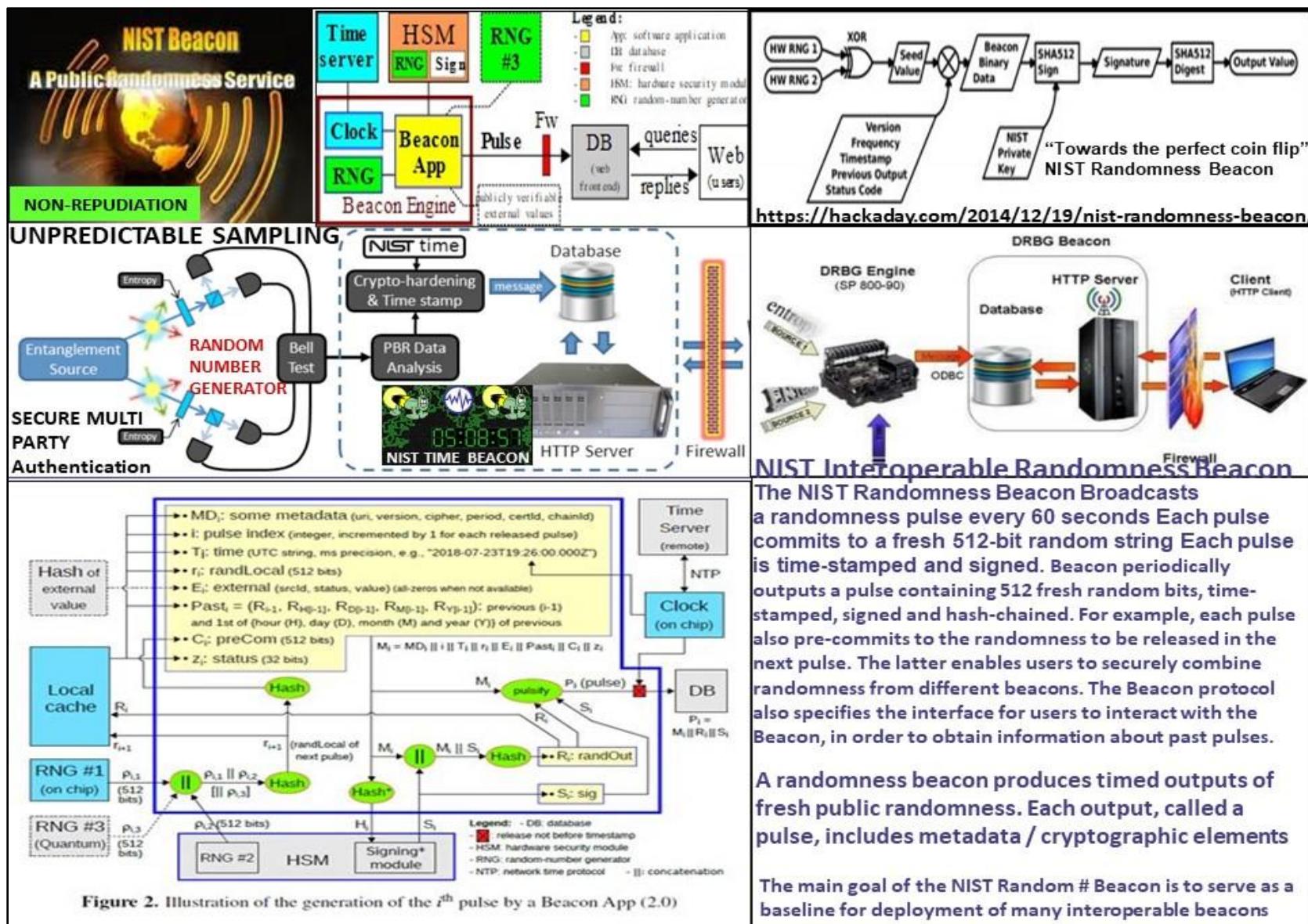


Figure 95: NIST QRNB Quantum Random Number Beacon Text Description

CLOSER = < Infrastructure
= CHEAPER SLA

ElectroMagnetic waveforms

SCALAR, LONGITUDINAL, STANDING WAVE

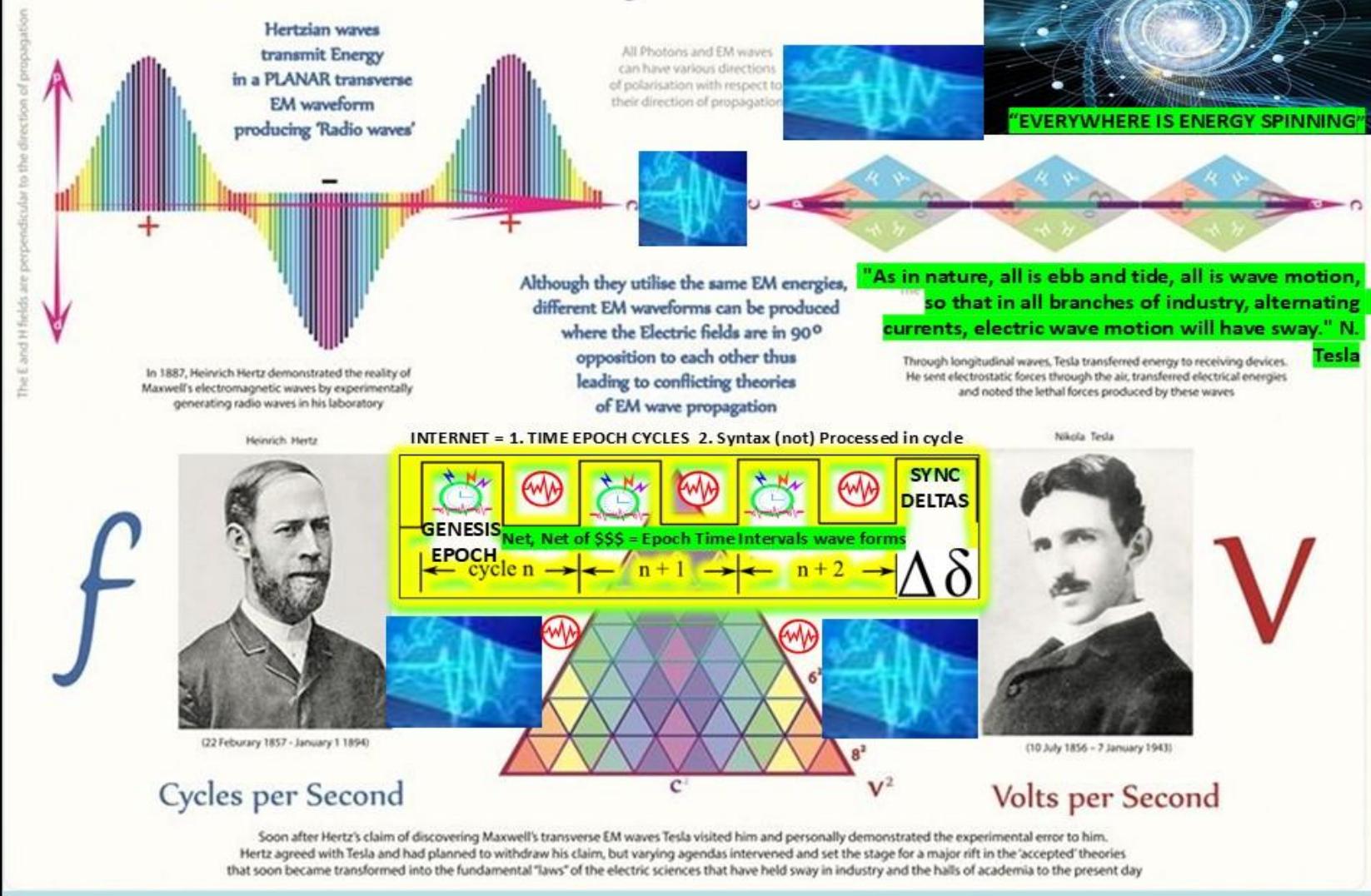
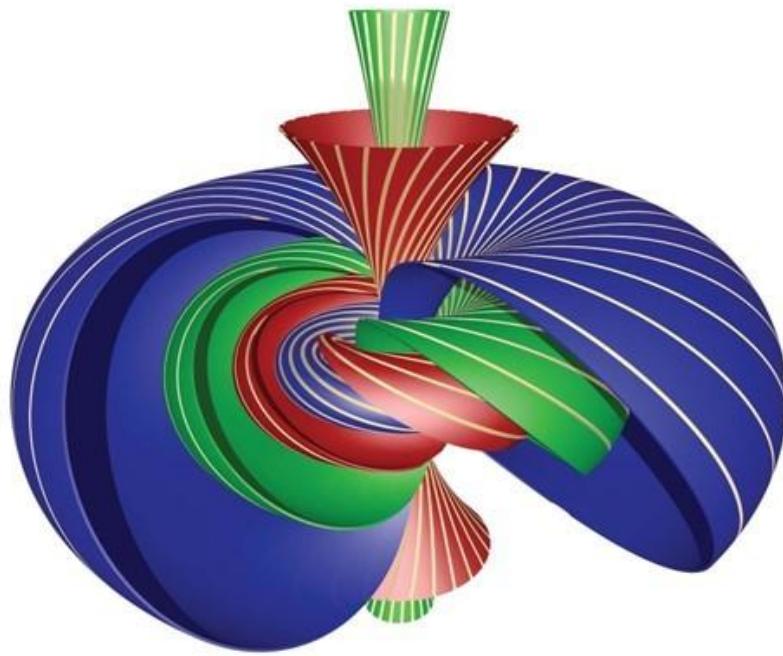


Figure 96: Nikola Tesla "all is wave form motion"

The Hopf Fibration

Edmund Harriss



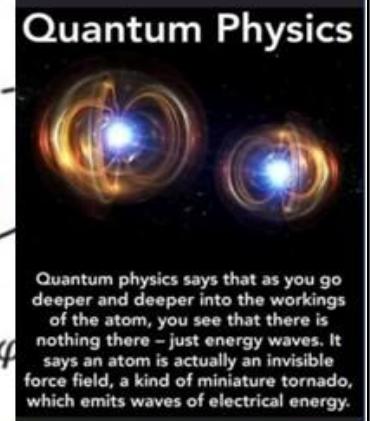
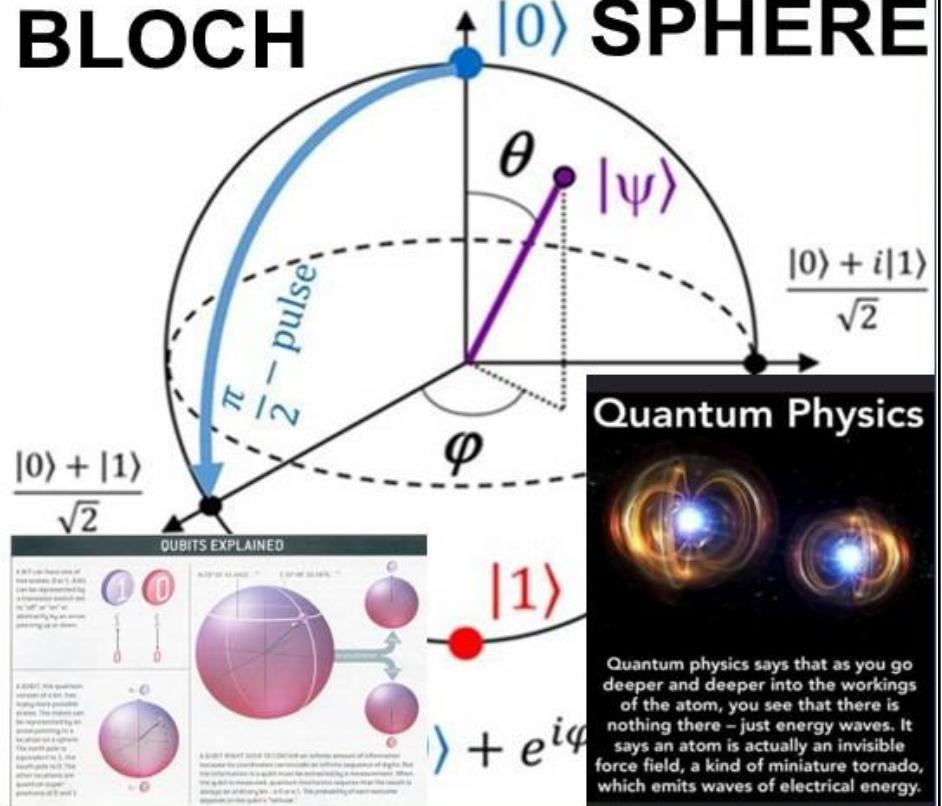
Hopf Fibration / #Bloch sphere

"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.

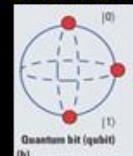


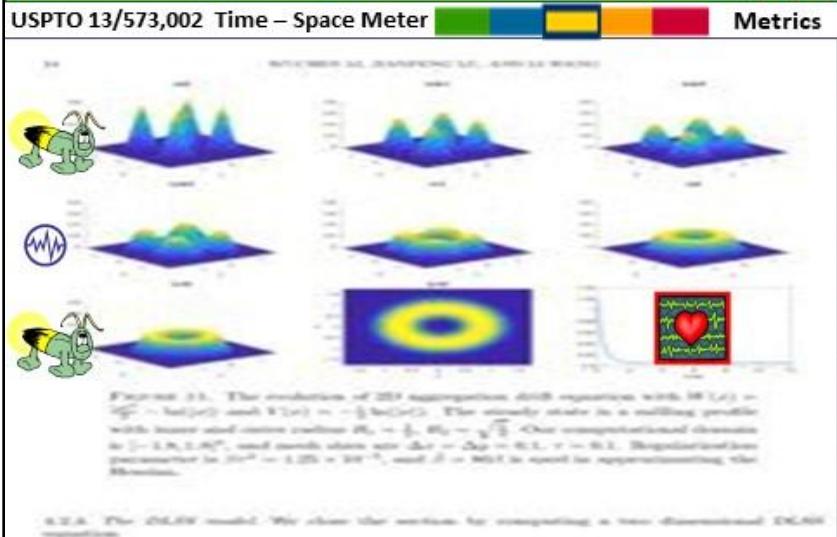
Figure 97: Hopf Fibration / Bloch sphere

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. θ of...
the log-likelihood function of θ given observed value of X

$$\Delta\delta \quad \mathcal{I}(\theta) = \text{Var}\left(\frac{\partial}{\partial\theta} \ell(\theta | X)\right)$$



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.

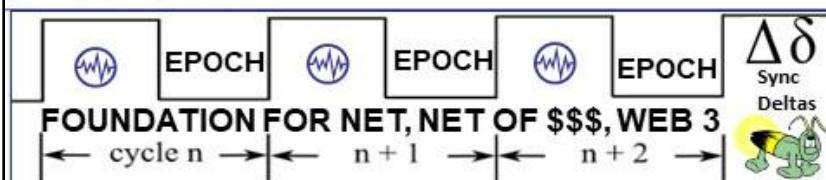
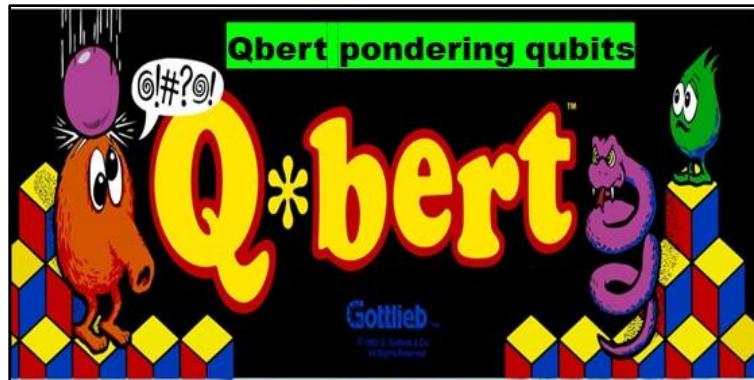


Figure 98: Fisher Information flux flow waves



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 ???

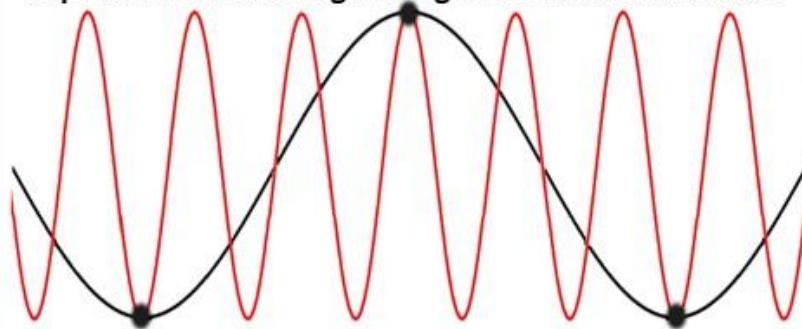
A bit is a unit for measuring information		
Classical bits	Quantum bits (Qubits)	
Bit 1 	Bit 2 	Qubit 1
Empty = "0" Filled = "1"		$\frac{1}{3}$ of "0" and $\frac{2}{3}$ of "1"
20 red beads ="0"	20 blue beads ="1"	8/20 of "0" and 12/20 of "1"
Head = "0"	Tail = "1"	50% chance of landing on "0" 50% chance of landing on "1"

FIGURE 99: QUBIT = non-existant notional construct = group think contrived expected outcome

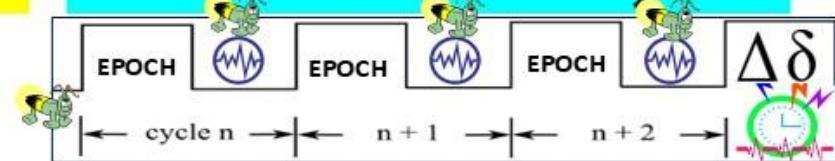
ACOUSTIC PHONON

USPTO 13/573,002

in-phase motion of neighboring ions in a lattice vibration

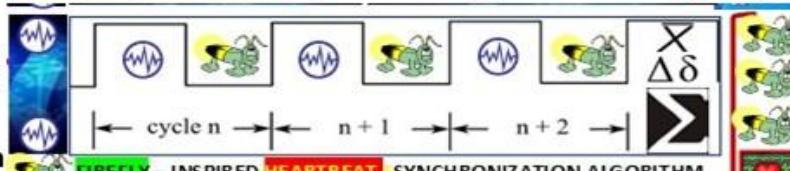
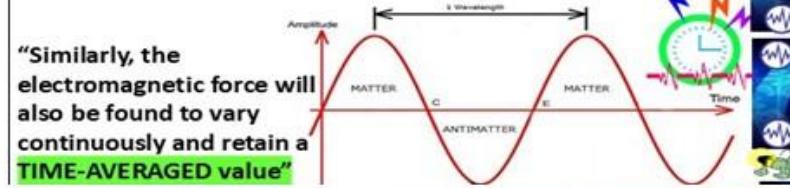


Phonons: A phonon is a quantum of the lattice vibration, the collective motion of atoms constituting a crystal. There are two types of phonons: optical and acoustic. The optical phonon has high-frequency oscillation in the THz range and the unit cell center of mass does not move. It undergoes a dipole interaction with light. The acoustic phonon propagates at sound velocity, which is the first derivative of the phonon dispersion curve at the Γ -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 100: Acoustic Phonon



Figure 101: Trump Quantum computing speed bump



FIGURE 102: SPACESHIP EARTH OPERATING MANUAL SIGNALS ANNEX K

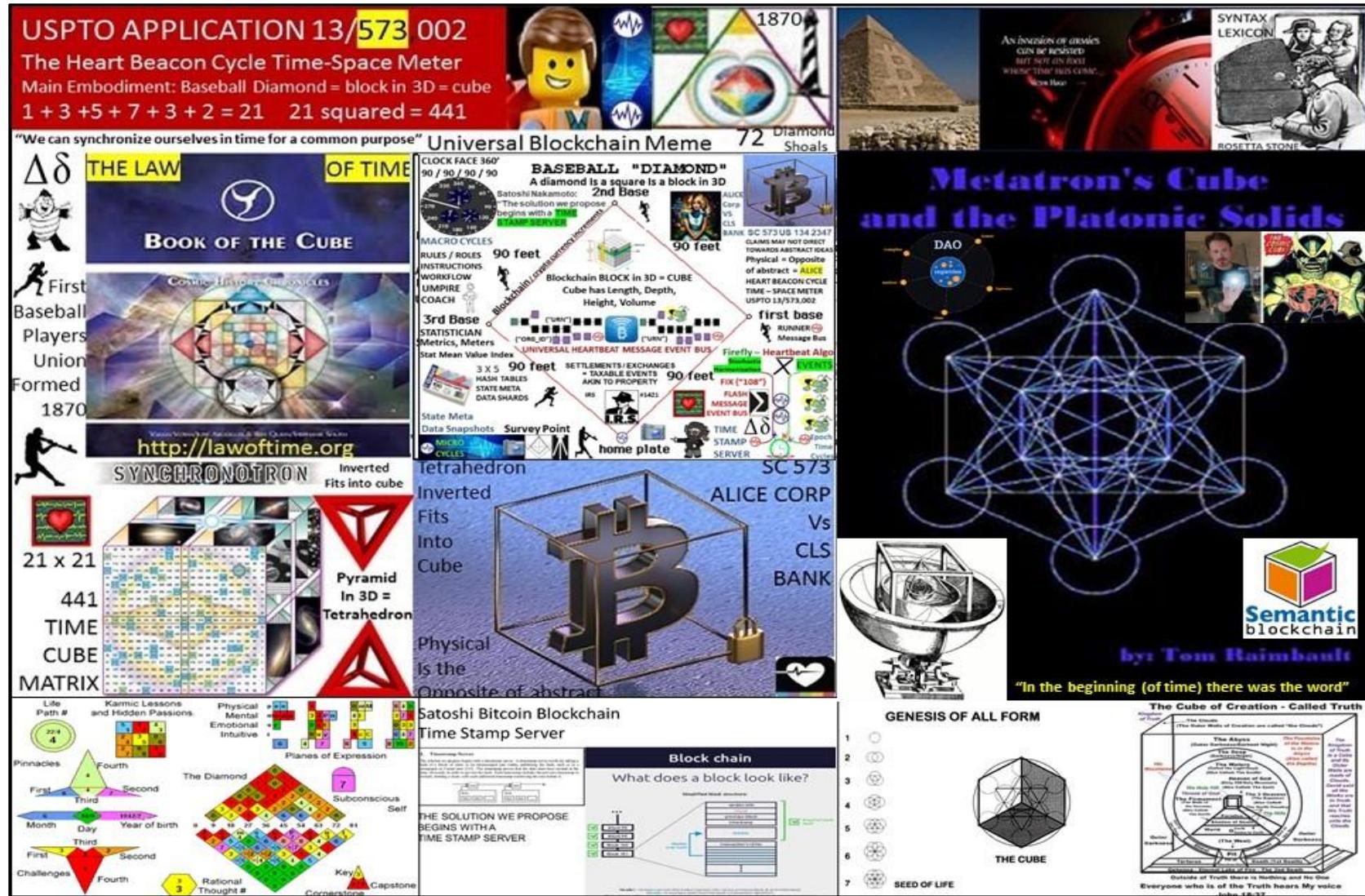


Figure 103: Programmable money through the lens of metaphysics / USPTO 13/573,002

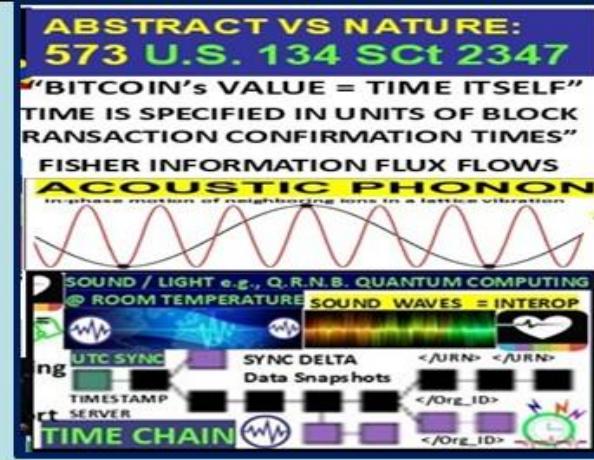
Circle USDC

[Investopedia](#)

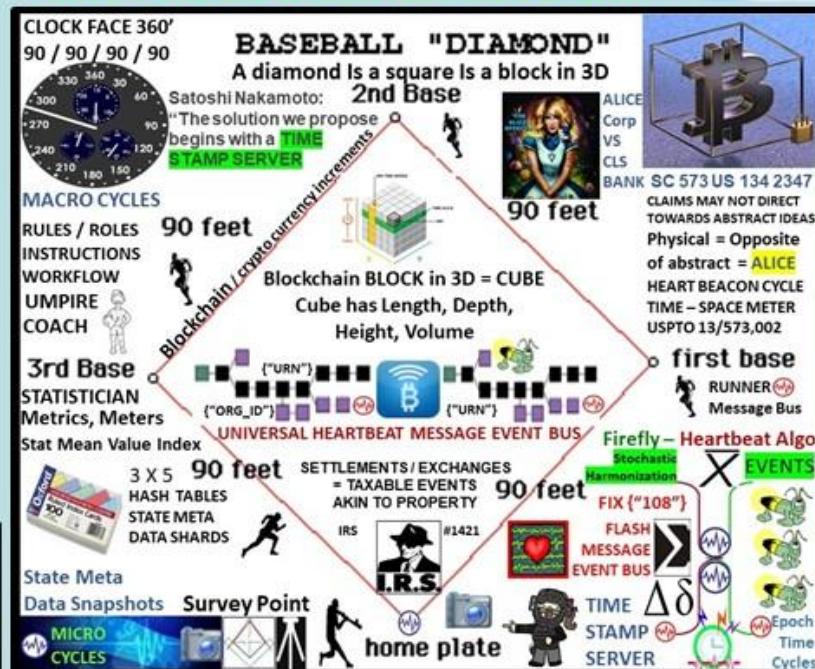
Stablecoins are cryptocurrencies whose value is pegged, or tied, to that of another currency, commodity, or financial instrument. Stablecoins aims to provide an alternative to the high volatility of the most popular cryptocurrencies, Source JDSUPRA



Circle 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



TESLA "ALL IS WAVE FORM MOVEMENT"



NOSTRADAMUS of FRANCE CENTURY 8: QUATRAIN 28:

"The copies of gold and silver inflated,
after the theft were thrown into the lake,
At the discovery that all is exhausted and
dissipated by the debt,
All scripts and bonds will be wiped out."



"THE FINANCIAL NOSTRADAMUS"
REGGIE MIDDLETON

Reggie Middleton
“Father of DeFi”
US11196566
US11895246
JP6813477

Figure 104: 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



LEADING ECONOMIC INDICATORS

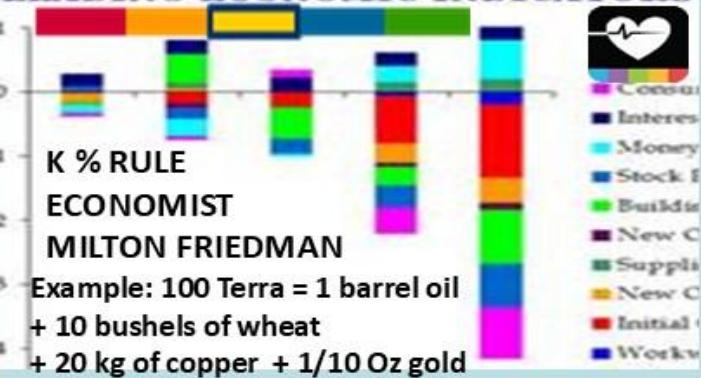


Figure 105: Numismatics: The Study of Currencies

World Game Annex K

Signals & Telemetry

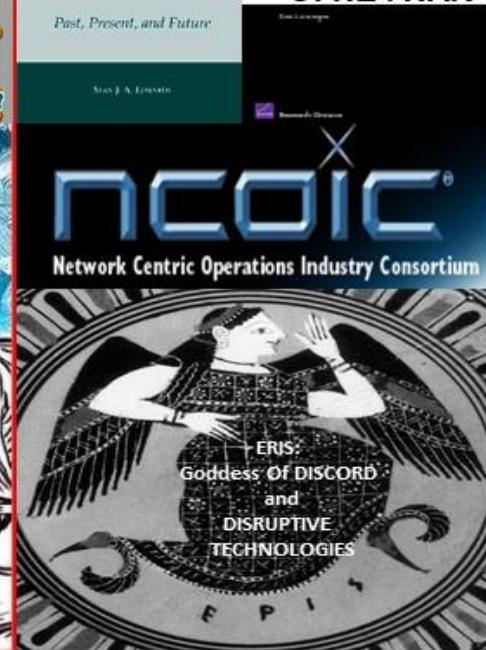


Figure 106: SUMMARY: USPTO 13/573,002: DeFi, Fintech foundation tech support framework

DAO: Distributed Autonomous Organization

RAND term circa 2000 / The TAO OF THE DAO

SWARMING AND THE FUTURE OF CONFLICT



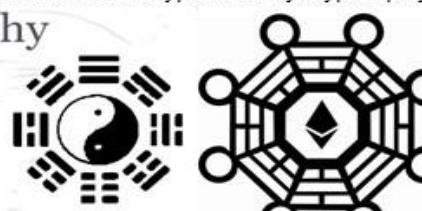
<http://cointelegraph.com/news/112077/the-new-frontier-after-cryptocurrency-cryptoequity>

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 107: The TAO of the DAO: Distributed Autonomous Organization = RAND Think Tank term



Figure 108: Curriculum Vitae: Steven McGee: The Wayward Scribe / Borderlands Time Keeper



Figure 109: Bill Murray Movies: Groundhogs Day / Limits of Control / City of Ember



FIGURE 110: LIST / PICTURES = THOUSANDS OF WORDS



FIGURE 111: Pictures: Thousands of Words

World Game (s) Fulcrum

Schelling point: a.k.a. focal point, is a solution people tend to choose by default in the absence of communication to avoid coordination failure

introduced by the economist Thomas Schelling in his book "The Strategy of Conflict" published in 1960.

Schelling points are particularly useful in multiplayer games where players respond based on what they think the other person's response will be.

Give me a lever long enough and a fulcrum on which to place it, and I shall move the world.
Archimedes

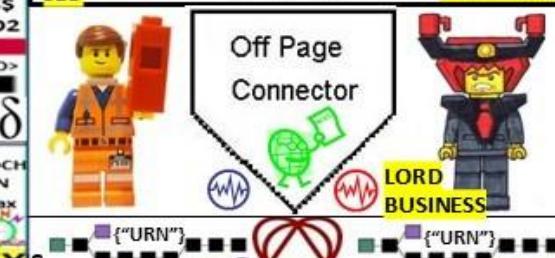
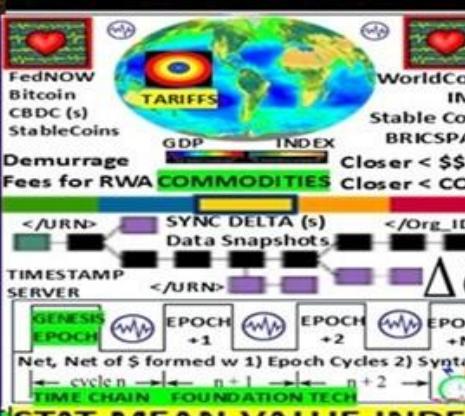
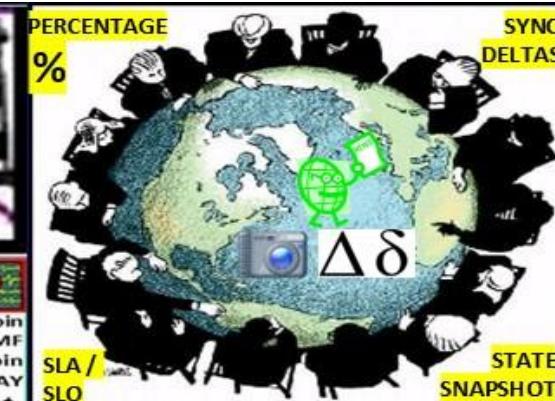


Figure 112: Economist Schelling's Schelling Point Fulcrum Price Discovery Algorithm for the New QFS

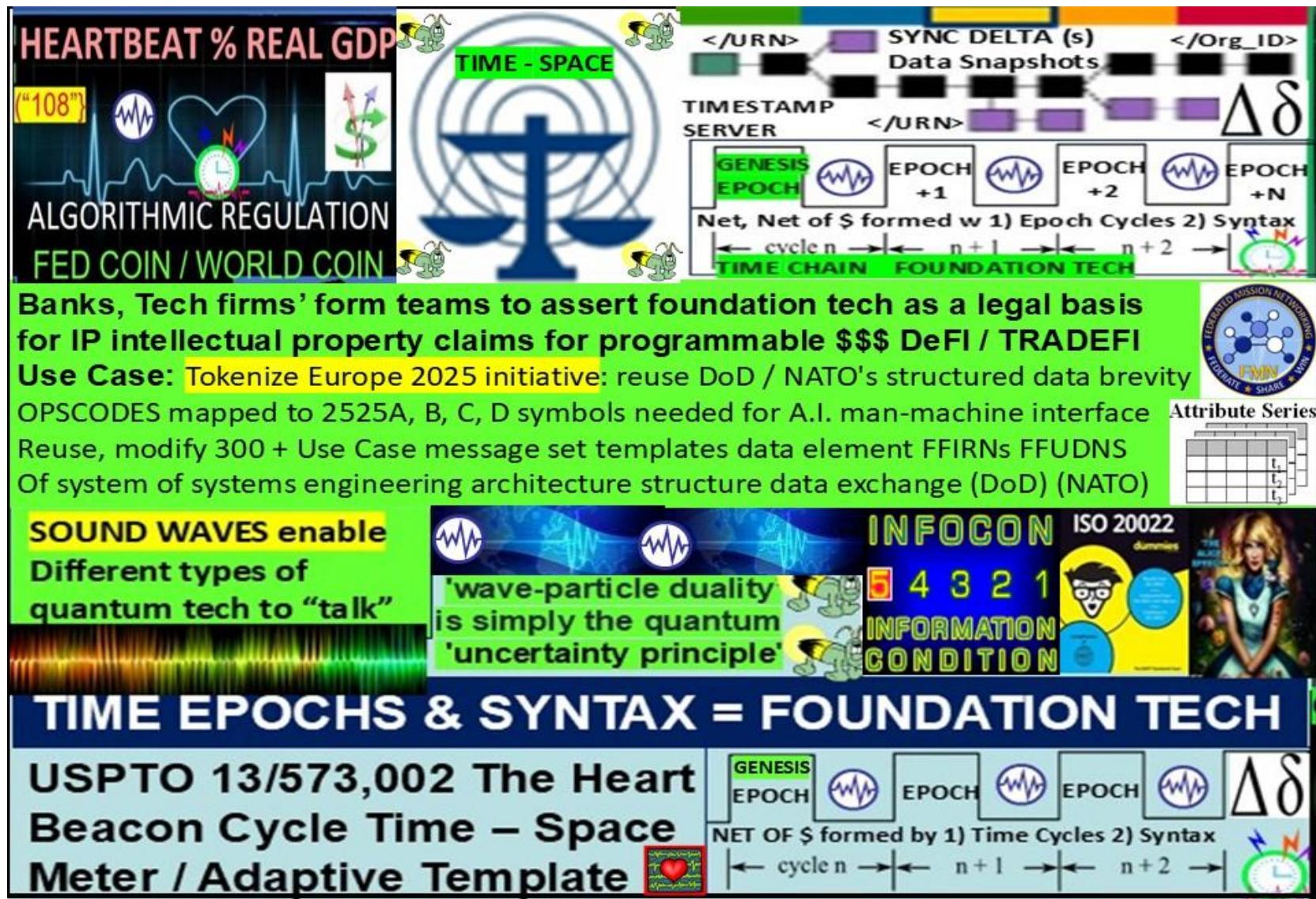


FIGURE 113: Tokenize Europe 2025 Initiative / USPTO 13/573,002



Figure 114: Inventor “FutureMan’s” Contact Information



Figure 115: “FutureMan” Scribe / Herald of the Aquarian Age (Someone has to be me)

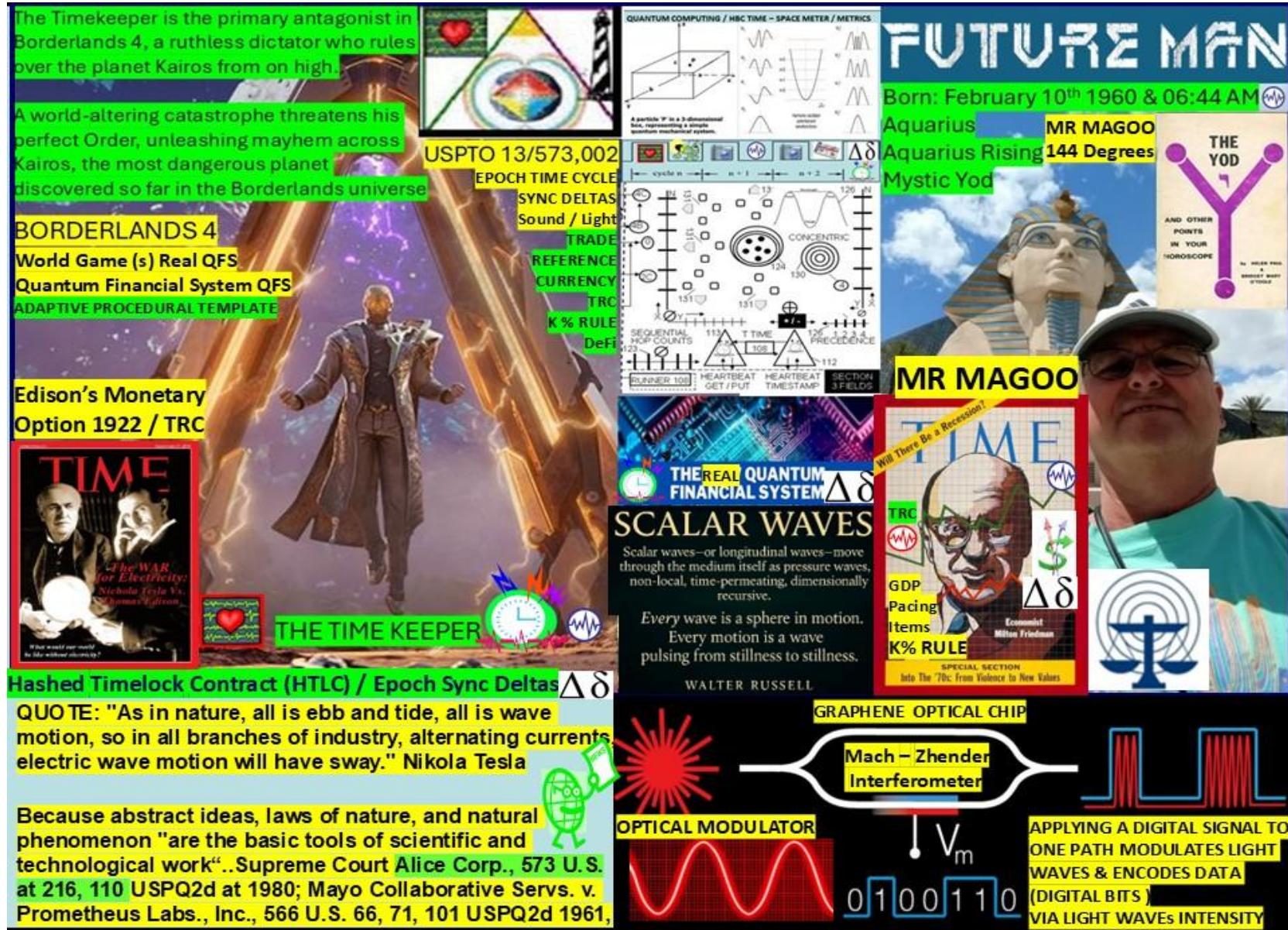


Figure 116: "End state = in the beginning state" "Start at end state & work backwards" FutureMan