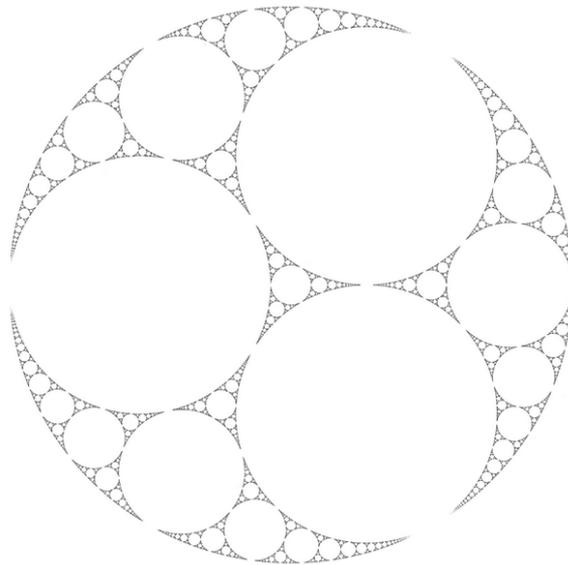
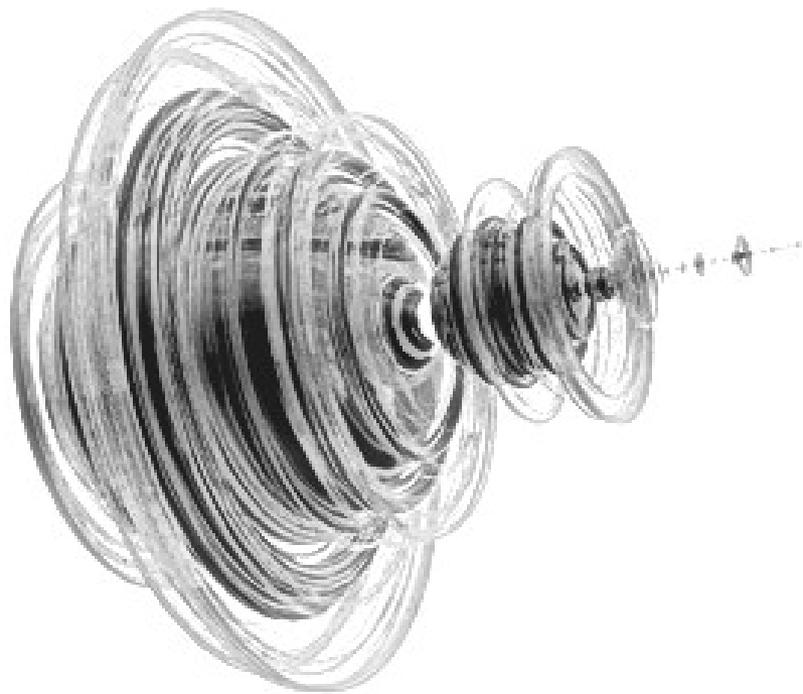


Commerce 2.0 + 1 an internet of qualities



by
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Fluxology SA

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Intro

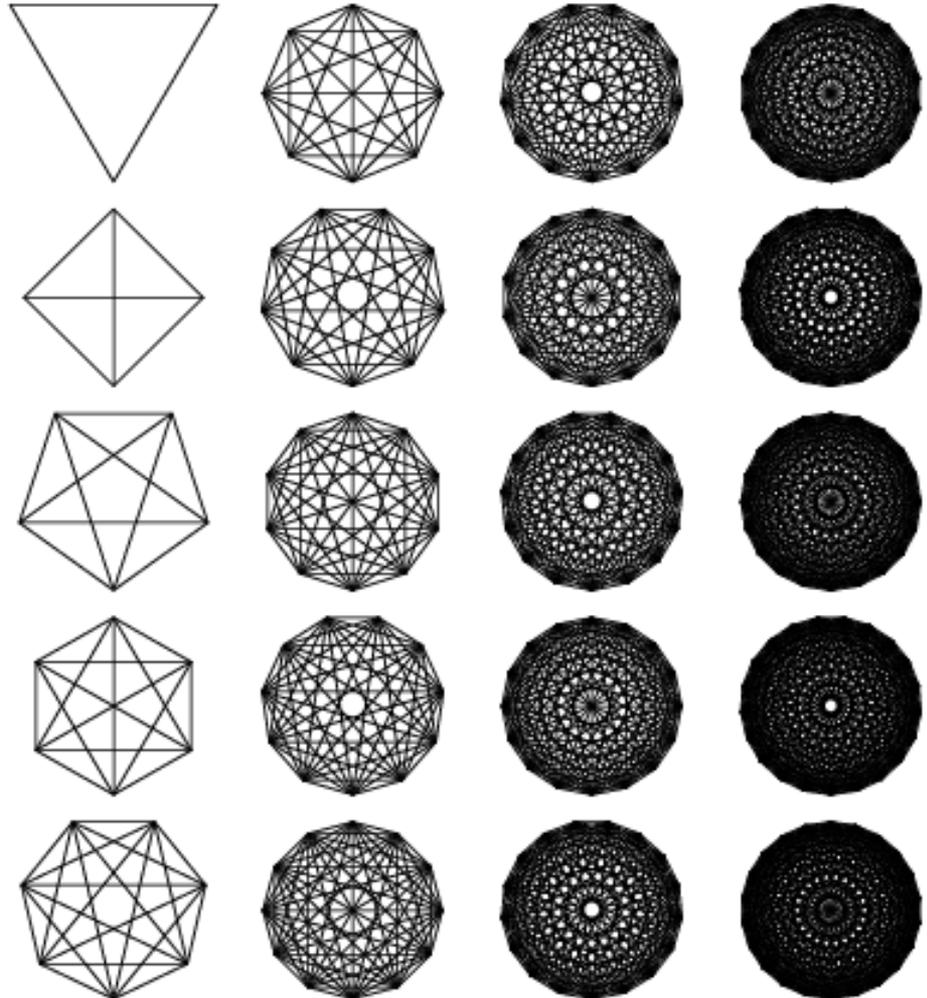
The nicest thing about standards is that there are so many of them to choose from.

Far away in the heavenly abode of the great god Indra, there is a wonderful net which has been hung by some cunning artificer in such a manner that it stretches out indefinitely in all directions. In accordance with the extravagant tastes of the deities, the artificer has hung a single glittering jewel at the Net's every node, and since the net is infinite in dimension, the jewels are infinite in number. There hang the jewels, glittering like stars of the first magnitude, a wonderful sight to behold.

If we know arbitrarily select one of these jewels for inspection and look closely at it, we will discover that in it's polished surface there are reflected all the other jewels in the net, infinite in number.

Not only that, but each of the jewels reflected in this one jewel is also reflecting all the other jewels, so that the process of reflection is infinite.

Avatamsaka Sutra





Overview

While computing capacity keep on increasing, the costs and effort of virtualization continue to minimize, allowing systems and applications to become less tied down by physical limitations and more logical. By now companies are starting to appreciate the fading distinction between *business* and *IT*, and smart use of technological possibilities often translate into a myriad of new businesses. Whereas occasional waves of gradual abstraction cycle through the OSI layers causing jumps in the industry as a whole, it may be time to revisit the promise of “Open Systems” and hold it against the light of the 21st century. Interoperable, portability and open standards persist as the core potential, yet most new initiatives present novel idealized models to which participants should adhere to. The following design is meant to avoid this approach and allow for the large many differences while at the same time facilitating such new models. Lessons from the unmanageable proliferated world of Web Services, which has overtaken and even replacing, the precise and organized world of Business-to-Business hubs, have been taken seriously in providing a solution which allows for both these approaches, while also aiding in easy ways to retrofit some order in infrastructures which did not manage to escape from spaghetti code.

- Slide 4 + 5: Logical components of the infrastructure
- Slide 6: Interfacing considerations, ease of use for design- and run-time
- Slide 7: Impressions on a nearby future where physical reality and the internet merge
- Slide 8: Probable scenario forecasts to be confronted by near-future solutions
- Slide 9 - 12: The four functional components of the platform/infrastructure
- Slide 13: One of Gartner’s visions, made possibly by this infrastructure
- Slide 14 - 15: Some present-day economics, highlighting the effects feedback in horizontal and vertical cooperation along and across the supply - and demand chains (1-dimensional network).
- Slide 16: Different ‘attractors’ for the infrastructure’s activity, with likely use cases
- Slide 17 - 18: The basics of trade and commerce, and everything, except maybe mainstream economics
- Slide 19: Ways to enforce security, exclusivity and organizational hierarchies
- Slide 20: The ‘client’
- Slide 21: Relation to existing initiatives, i.e. <http://www.future-internet.eu/>
- Slide 22: What does the platform itself have to offer, the brain behind the facade

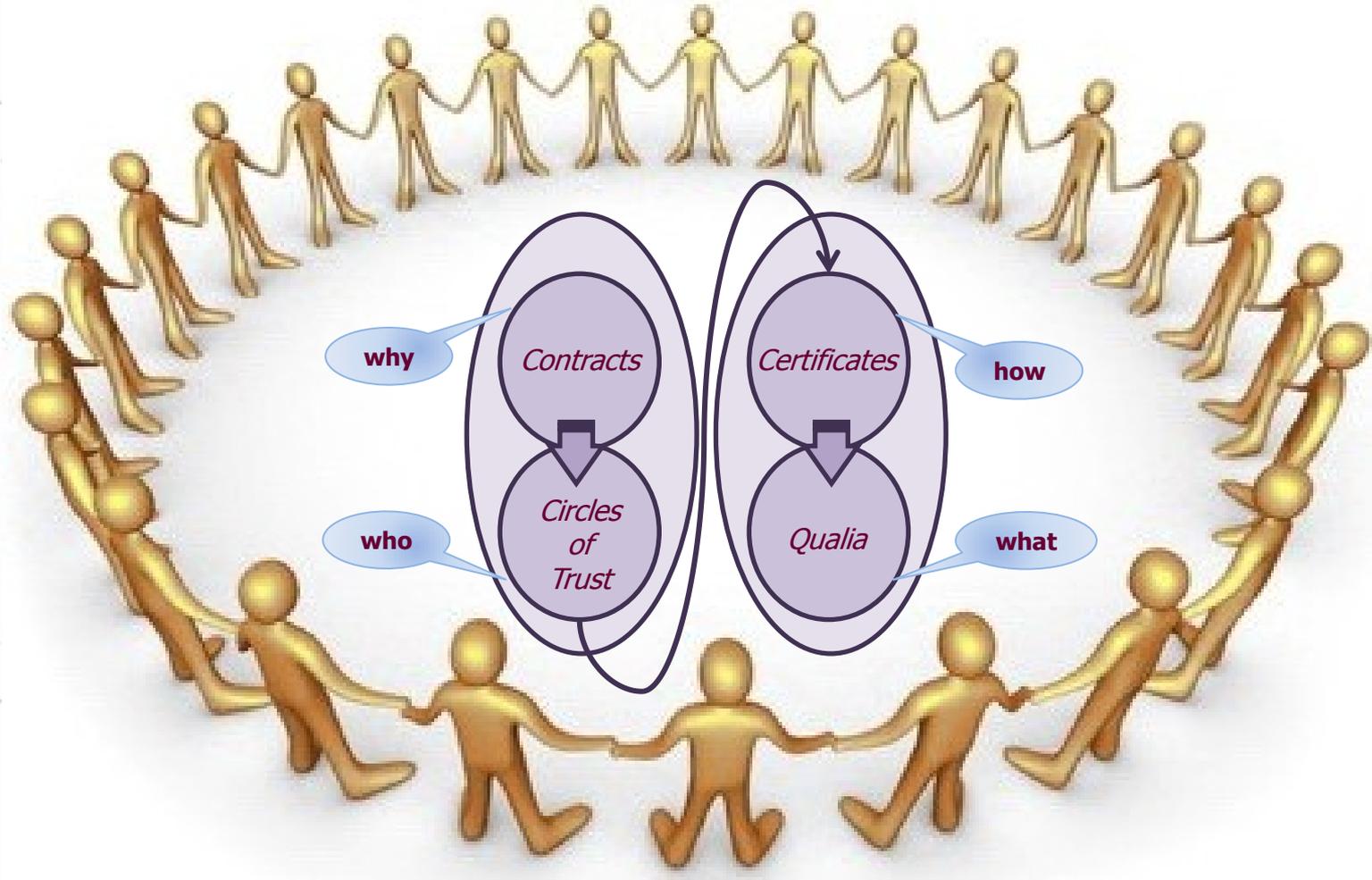
Federation: virtual reunion

A centralized smart registry of

- **Contracts** one or more statements of intent
 - **Circles of Trust** among one or more consortiums
 - **Certificates** adhering to one or more frameworks
 - **Qualities** concerning one or more subjective standards
-
- To register any form of agreements
 - To form alliance networks of varied trust policies and security 'strengths'
 - To associate on any set of electronic specifications
 - To detail any combination of utilitarian qualities
 - To enable ad-hoc federation, syndication, normalization and interoperability
 - To enable cooperative, collaborative, coopetitive and competitive structures among people, companies, applications and machines
 - To trade in an augmented world.



assemblies across multiple sources





WHY LIKE THIS?

- One centralized registry to deal with universal non-uniform legalities, privacy, security, interoperability, normalization, translation, transformation.
- Global-scale service provisioning *should* follow these ubiquitous principles:
 - Universal Accessibility: every entity *should* be made accessible anywhere-anytime
 - Universal Identification and Naming: every entity *should* be uniquely identifiable
 - Universal Explorability: every entity *should* be self-describing
 - Universal Data: all data exchanged between applications *should* be self-describing
 - Trustworthiness customization: every entity *should* be able to adjust or to expose adjustment rules regarding security, privacy, integrity, compliancy and certification aspects based on the interactions in which it operates
 - Non-Functional Aspects: elementary non-functional aspects such as quality, governance, accountability, resilience, availability, and integrity *should* be properly supported in various degrees
- To realize above *shoulds* and get from the A to B and onwards to B2B2B2 ..
- A *Virtual Enterprise* is a temporary alliance of enterprises that come together to share skills or core competencies and resources in order to better respond to business opportunities, and whose cooperation is supported by computer networks. It is a manifestation of Collaborative Networked Organizations and Distributed Collaborative Working.



An infrastructure for augmented commerce solutions





WHY

- **Ubiquitous Computing / Pervasive Systems / Ambient Intelligence / Internet of Things / Things that Think..**
'By 2020 tiny specks of smart dust dropped through ventilation grills on office equipment will allow interception of data before it even gets to an encryption device.' – Ian Pearson, Futurologist.
- **Deep Personalization**
The natural evolution of networking lies in qualitative differentiation and diversification. Increasingly commoditized goods and services fade into fungible background noise, not so much decreasing in importance as infrastructural enablers, but as substantially equivalent, interchangeable and mutually substitutable artefacts the utilitarian benefits are not distinctive enough for advantageous competition. Even complementary goods relying on joint demand and joint supply, such printers with ink and paper, are increasing subject to this shift in diminished interdependence. Much of the future economical dynamics will occur on the edges of customization and personalization, combining evolutionary forces of standardization, which increases a more widespread yet slower adoption, and specialization, which allows a faster time-to-market at rapid innovation cycles. Not only humans will benefit from an electronic ID, but so will machines, cars, parcels, services, locations, and whereas current trend seems to be about federated identities the more likely future lies in federated identification, composite assemblies of authentication, using whichever viable means available. Using such approaches, solutions such as effective use of virtual credit cards in the real world are within the reach of a few clicks.
- **Rise of the machines**
Converging trends in different technological branches, bio-tech, nano-tech, robotics, artificial intelligence and information technology fuse and accelerate each other. Current forecasts predict machines equivalent of human intelligence within a 5 to 10 year time horizon. Not just a smart chess program, but a self-aware learning machine, a conscious virtual organism. As most simple manual labour tasks have already been automated, increasingly complex human tasks will gradually be replaced, such as chatbots which are already replacing helpdesks, with customer satisfaction ratings outperforming regular off-shoring. Designed in a modular way with impromptu cohesive congregation such virtual organism can gather knowledge by connecting with a pre-defined ontology of some domain. As adaptive learning machines they will replace front-, middle- and back-office functions, such as administrative secretaries, accounting, project managers. Enter 2015, imagine a virtual accountant, as-a Service, working 24x7, 130 IQ, a redundant array of 100 brain-halves of which half are sleeping, day-dreaming, learning, and the rest is working, and always online. Subscription fee for a virtual FTE costs at a quarter of employing a human. AI generations do not take twenty years, due to positive feedback loops of the converging and cross-fertilizing technologies they may realistically be just four months, three generations per year, with a capacity doubling every generation, which gives an eight-fold on a yearly basis. If the first year it could replace one FTE, the next year it can replace eight. Yet also CPU power doubles every two years and network capacity slightly faster, which gives a capacity increase of about sixteen per year. So, in 2015, for the price of one average business analyst, you get four virtual in return. In 2016 that is 64 bots, 2017 gives 1024 bots, 2018 16.384, 262.144 in 2019.. and by 2020 you can have 4.194.304 virtual business analysts working for the price of one real. And how about a virtual MBA? Virtual management consultants? Not only will machines require civil rights, so will humans..

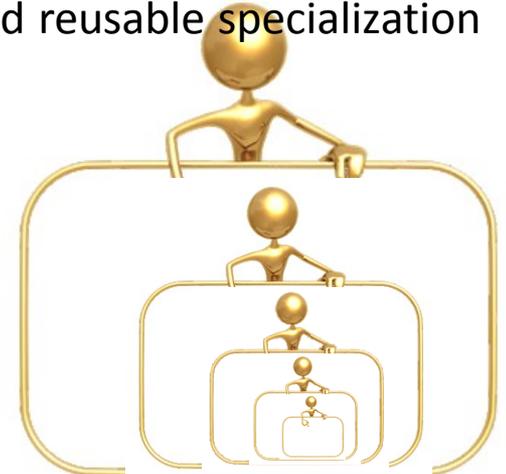
Qualia: irreducible functionalities

- Circles of trust / alliance networks are qualities
- Contracted agreements are qualities
- Certificate frameworks are qualities
- Trust policies prescribing a circle's strength are qualities
- Trust, privacy, integrity, fidelity, ethics are qualities
- Geography, geo-location and duration are qualities
- Demographic profiles are qualities
- ISO standards are qualities
- eBusiness frameworks are qualities
- SWIFT standards are qualities
- Brands and reputation are qualities
- Online booking behaviour are qualities
- Personal records of click-behaviour are qualities
- Psychographic profiles are qualities
- Open interoperability standards are qualities
- Monetary currencies are qualities
- The gold and silver standards are qualities
- Device display resolution and colour profiles are qualities
- Different means of identification are qualities
- Different systems of Units of Measure are qualities
- Some quantities are qualities



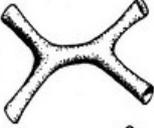
Certificates: Object-Oriented e-documents

- Mix of security and service level agreements
 - Define and enforce encryption baseline among a Circle of Trust infrastructure
 - Specify infrastructural strengths (force, cheer, allow, never) mixing Public Key Infrastructures with Certificate Authorities, decentralized Webs of Trust and Single Sign-On temporary bindings..
 - Specify trust and fidelity policies (tit-for-tat, tit-for-two-tats, laissez faire)
- Universal digital certificates with Object Oriented features
 - Dynamic dispatch: negotiable lookup of registry address preceding repository search of either descriptors or backup snapshots
 - Encapsulation: scope controlled abstraction, visibility, access and bundling
 - Inheritance: delegated hierarchical taxonomies for decoupled reusable specialization
- Where central and delegated control meet
 - Act as lookup - and recommendation service on qualities
 - Act as client-side security and service level certificates
 - Act as server-side security and service level certificates
 - Credential propagation for dynamic security constructs



Circles of Trust

- An *alliance* is an agreement between two or more parties, made in order to advance common goals and to secure common interests
- A *consortium* is an association of two or more individuals, machines, companies, organizations or governments with the objective of participating in a common activity or pooling their resources for achieving a common goal
- Temporary cooperative, collaborative, coopetitive and competitive networks where participants can join, leave or spin off alone, or in groups, depending on the goals and rules set out in the certificates referred to. As a particular Circle of Trust can be registered as a quality, circles themselves can act as a autonomous participating party as well, combining with other Circles.
- Identity Federation and Syndicated Authentication
 - Facilitated self-provisioning
 - Provisional Identification
 - Identity Verification
 - Weak Identification
 - Strong Identification
 - Authorization Propagation
 - Cascading Credentials

	Δ^0	Point (0-simplex)
	Δ^1	Line segment (1-simplex)
	Δ^2	Triangle (2-simplex)
	Δ^3	Tetrahedron (3-simplex)
	Δ^4	Pentachoron (4-simplex)
	Δ^5	Hexateron Hexa-5-tope (5-simplex)
	Δ^6	Heptapeton Hepta-6-tope (6-simplex)
	Δ^7	Octaexon Octa-7-tope (7-simplex)
	Δ^8	Enneazetton Ennea-8-tope (8-simplex)
	Δ^9	Decayotton Deca-9-tope (9-simplex)
	Δ^{10}	Hendeca-10-tope (10-simplex)

Contracts

- General purpose *Memorandum of Understanding* or *Letter of Intent* non-binding contracts referring to the immediate participants, a consortium representative of a wider Circle of Trust and the quality certificates to comply with.
- Allowing, supporting and enforcing trust-based non-equity strategic alliances.
- Automatically registered at a central general accepted legal authority, or a consortium thereof.
- Potentially enforceable by law, depending on the qualities referred to.
- Tweet-contracts: Contractual credits / IOUs which may be used for management, planning, billing, reputation verification or other purposes. Real-time credits are delivered concurrently with the consumption of the resources, e.g. micro-payments. Batch credit is saved until it is delivered at a later time, e.g. micro-credit.



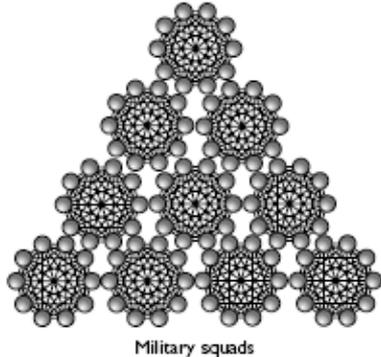
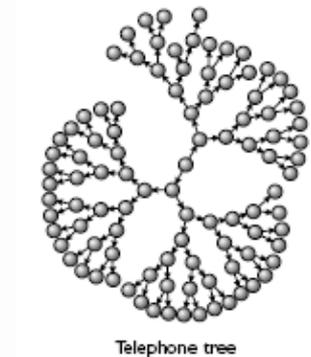
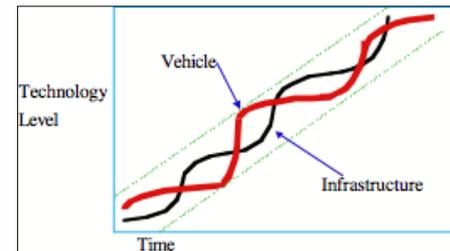
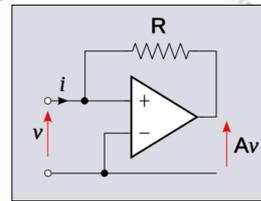
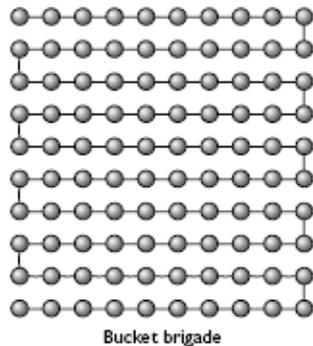
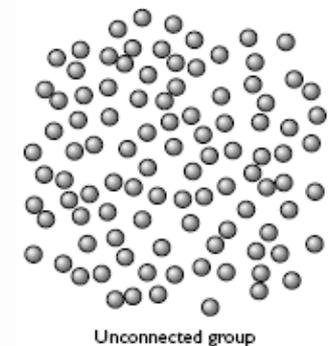
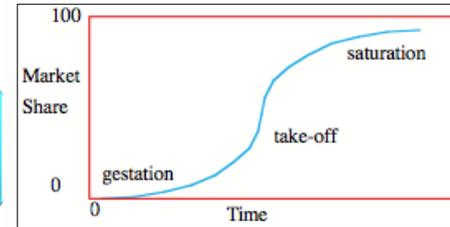
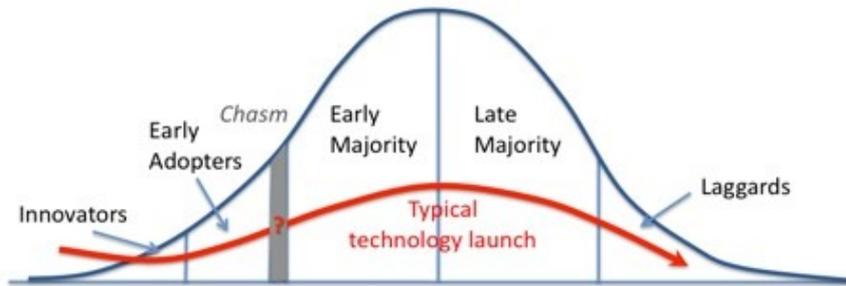


WHY TOO

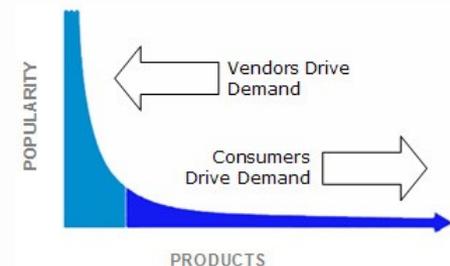
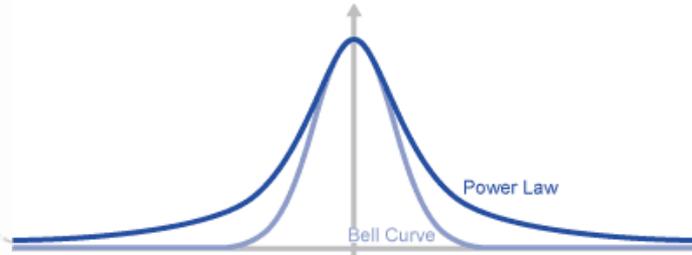
Advisory firms such as Forrester, McKinsey and Gartner foresee and advocate the end of widespread commoditization and the rise of Collaborative Innovation Networks. The following highlights are from Gartner's future vision for the World of "work":

1. *De-routinization of Work*: The core value that people add is in non-routine skills.
2. *Work Swarms*: A work style characterized by a flurry of collective activity. Swarming is an agile response to an observed increase in ad hoc action requirements, as ad hoc activities continue to displace structured, bureaucratic situations.
3. *Weak Links*: In swarms, individuals may barely know each other. Weak links are indirect indicators and rely, in part, on the confidence others have in their knowledge of people.
4. *Working With the Collective*: Informal groups of people, outside the direct control of the organization, who can impact the success or failure of the organization. Smart business executives discern how to live in a business ecosystem they cannot control; one they can only influence, which requires understanding the collectives, as well as the key people in those external groups.
5. *Work Sketch-Ups*: Most non-routine processes will also be highly informal, and although work patterns for more non-routine work will emerge over time, in the meantime most process models will remain simple "sketch-ups," created on the fly.
6. *Spontaneous Work*: Reactive activity and proactive work such as seeking out new opportunities and creating new designs and models.
7. *Simulation and Experimentation*: Active engagement environments for interacting with n-dimensional virtual data representations.
8. *Pattern Sensitivity*: Gartner expects to see a significant growth in the number of organizations that create groups specifically charged with detecting divergent emerging patterns, evaluating those patterns, developing various forecasting scenarios and proposing to senior executives new ways of exploiting (or protecting from) the changes to which they are now more sensitive.
9. *Hyperconnected*: Uncontrollably many multi-channel communications will lead to a push for more work to occur in both formal and informal relationships across enterprise boundaries, has implications for how people work and how IT supports or augments that work.
10. *My Place*: Individualized ways to deal with an increasingly virtual workplace, across time zones, organizations and with fairly unknown participants, with neither a company-provided physical office nor a desk, and work which will increasingly happen 24x7. The lines between personal, professional, social and family matters, along with organization subjects, will disappear.

Long Tail: 80/20 revisited (1)



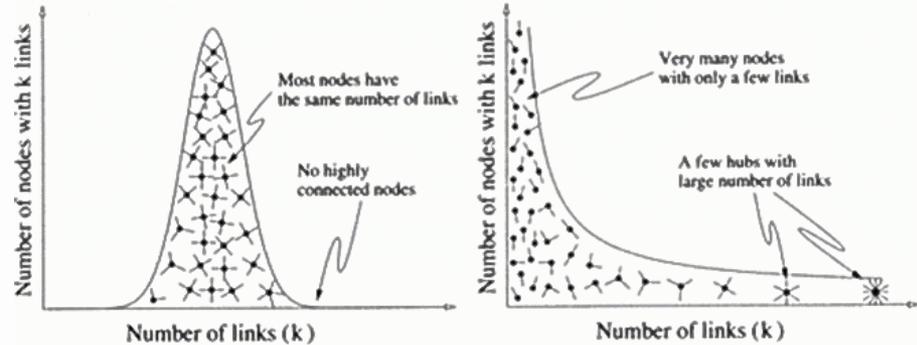
The Bell Curve vs. the Power Law: The Importance of "Fat Tails"



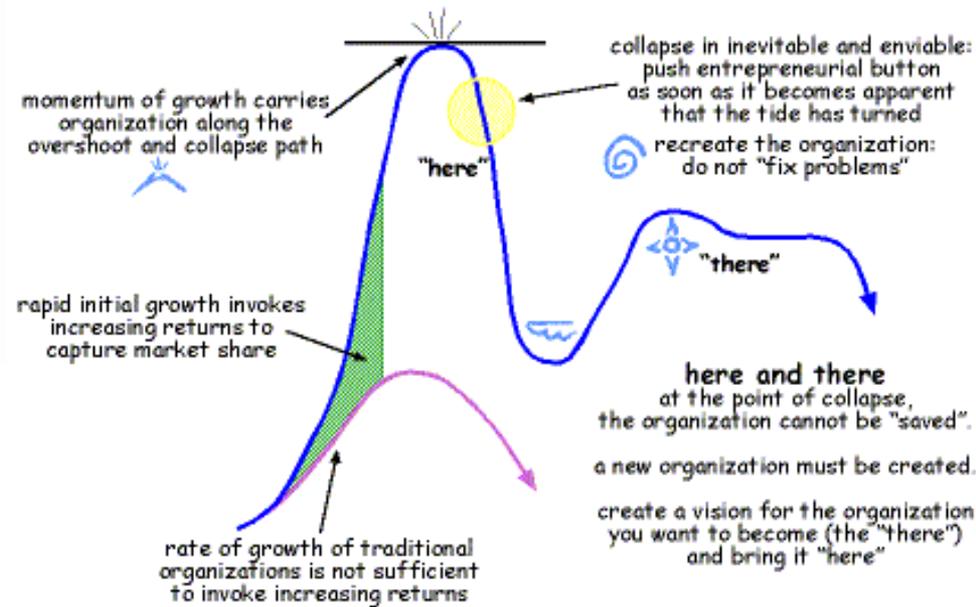
Long Tail: 80/20 revisited (2.0)

Bell Curve

Power Law Distribution



stages of enterprise and increasing returns

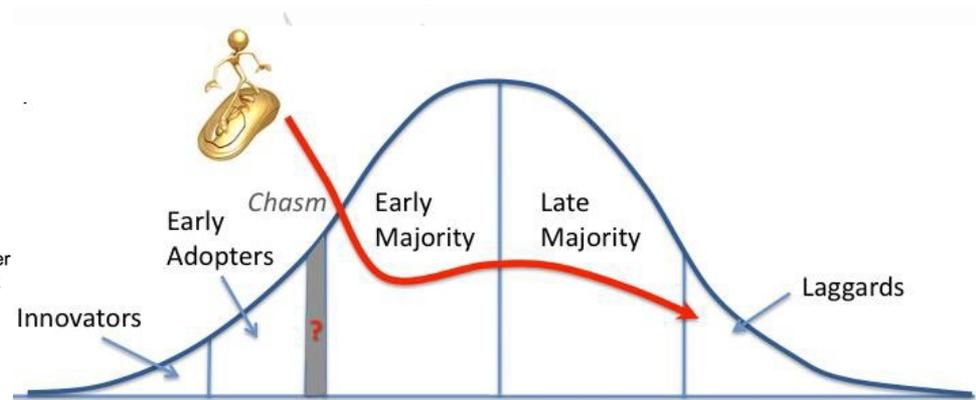
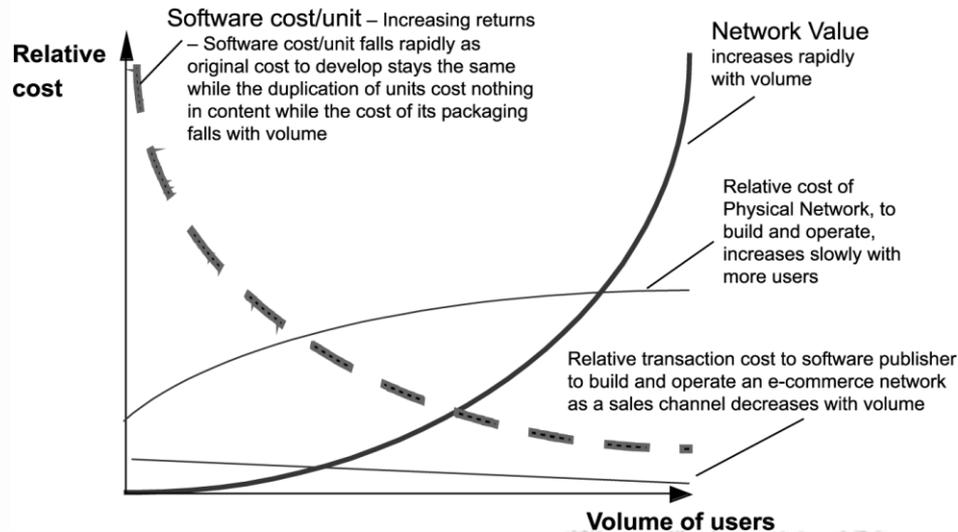


Network effects

– the value and cost of the network diverge as volume of connected users grows and value outstrips costs

Coupled with

Software economics of increasing returns (profits) multiplied together produce increasing profits with pricing power given by the progress to market dominance with increasing numbers of customers



Expected distribution effects

Eight distinct market segments with the following characteristics are expected to evolve:

- Many low-value contracts with small circles
- Many open circles with simple certificates
- Many low-security certificates with a few qualia
- Many optional qualia specifying public circles
- Few high-value contracts with large circles
- Few closed circles with complex certificates
- Few high-security certificates with many qualia
- Few mandatory qualia specifying private circles

With the following potential use-cases..

- Nano-credits, micro-services, promise enforcement, restitutionary obligations, parliamentary agendas
- Friend-of-a-friend, reputation, recommendation webs, brands, copyright, task delegation
- Impromptu interoperable frameworks, security baseline overlay, composite identification
- Semiotic alphabets (audio / visual / textual), ontologies, medical dictionaries, UK English usage
- Jurisdictions, use of the Euro, use of a bartering system, certified corporate social responsibility
- Industrial agreements, supply chain key performance indicators, Fairtrade, agreement assemblage
- Trading networks, financial processing, ad-hoc marketplaces, internet trade fairs, qualification certificates
- Privilege clubs, certification authorities, legal institutes, ISO, OASIS, W3C, corporate partner ecosystem

- “Innovate on demand”





WHY THREE

Trust

noun

1. Firm reliance on the integrity, ability, or character of a person or thing.
2. Custody; care, supervision, and control exerted by one in charge..
3. Something committed into the care of another; charge, to impose a duty, responsibility, or obligation on.
 - a. The condition and resulting obligation of having confidence placed in one: *violated a public trust*.
 - b. One in which confidence is placed.
4. Reliance on something in the future; hope.
5. Reliance on the intention and ability of a purchaser to pay in the future; credit.
6. *Law*
 - a. A legal title to property held by one party for the benefit of another.
 - b. The confidence reposed in a trustee when giving the trustee legal title to property to administer for another, together with the trustee's obligation regarding that property and the beneficiary.
 - c. The property so held.
7. A combination of corporations for the purpose of reducing competition and price control throughout a business or an industry.

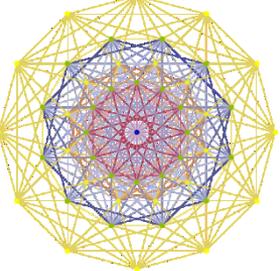
verb transitive, trust-ed, trust-ing, trusts.

1. To have or place confidence in; depend on.
2. To expect with assurance; assume: *I trust that you will be on time.*
3. To believe: *I trust what you say.*
4. To place in the care of another; entrust.
5. To grant discretion to confidently: *Can I trust them with the boat?*
6. To extend credit to.

Trust/Faith/Confidence/Reliance/Dependence

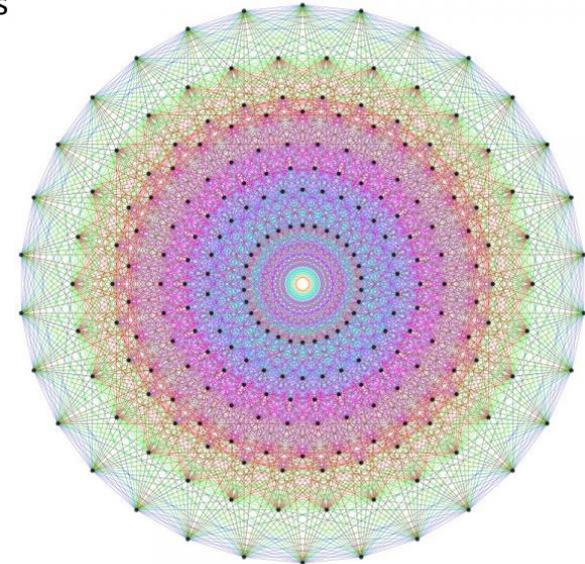
- The attitude of expecting good performance from another party, whether in terms of loyalty, goodwill, truth, or promises. The importance of trust as a kind of invisible glue that binds society together is most visible when it is lost. Trust involves an element of risk, and epistemologists can have trouble categorizing it as rational, since it works best in advance, for example to motivate performance on occasions when defection may be to the advantage of the person trusted. Economically trust is precious, enabling parties to bypass the costly precautions and safeguards needed in transactions with parties whom one does not trust. Trustworthiness is a virtue, subsuming varieties such as truthfulness and fidelity.
- Trust is an individual's placement of confidence in another to fulfill their promises or to be consistent in their policies, in their ethical codes, and/or with the law.
- Placement of trust allows actions that otherwise are not possible, i.e. trust allows actions to be conducted based on incomplete information on the case in hand
- If the person in whom trust is placed (trustee) is trustworthy, then the trustor will be better off than if he or she had not trusted. Conversely, if the trustee is not trustworthy, then the trustor will be worse off than if he or she had not trusted
- An action involves a voluntary transfer of resources (physical, financial, intellectual, or temporal) from the trustor to the trustee with no real commitment from the trustee
- A time lag exists between the extension of trust and the result of the trusting behavior





Hardening the Circle

- **Jurisdictional Extensibility**
 - The jurisdiction(s) in which the Circle of Trust operates and the class of business (b2c, b2b, gov2b, gov2c, etc, and whether involved with sensitive personal data) which dictate what applicable laws and customs may apply, and whether and to what extent the parties can contractually agree to operate under an agreed upon choice of law.
 - The agreed upon economics to the Founders and Members, and associated tax consequences, may also drive the selection of the contractual framework.
 - Regional variations in applicable law may dictate that one approach should be favored over another for use in the jurisdiction.
- **Privacy and Security Requirements**
 - Establishment of privacy floor (minimum regarding data integrity, verification, options regarding use)
 - Rules for sharing and restrictions/directives on use of personal information
 - Rules for trans-border exchanges
 - Technical, operational and administrative security and authentication standards
 - Incident notification and response procedures
- **New Member Participation Eligibility Requirements**
 - Recommendations
 - Profiling
- **Business Rules**
 - Rights and obligations of each role/type of participant
 - Scope of authority and responsibility
 - Transparency, Audit/Verification standards
 - Risk allocation matters and enforcement procedures
 - Liability for non-conformance
 - Operational performance standards / service levels
 - Day to day governance



Universal Quality Certificate

- Privacy, encryption and fidelity specifications (mandatory ratings)
- Business Service Level Agreement
 - Parties
 - Provider + Identifier + Name
 - Requester + Identifier + Name
 - Parameters
 - Service Identifier
 - Service operations (Cost, Time, Availabilities, Throughput, Others)
 - Obligations
 - Service Level Objective (Cost, Time, Availabilities, Throughput, Others)
 - Action Guarantee
 - Terms
- Business Quality of Service
 - Unit Price
 - Performance Indicators
 - Processing time, activity window and latency
 - Provided throughput
 - Business Qualities
 - Attribute Name + Attribute Value
- Business Rating Listing
 - Credentials
 - Issuer
 - Value
 - Date of Rating
 - Rating reference



D'oh! Visions of a Future Internet

- An efficient, scalable and distributed *Service Repository* that will also support management and federation of various domains (public and private repositories).
- *Uniform naming resolution* for any Entity in the platform (services, things, devices, nodes, resources, etc.) that supports both public and private spaces, together with the ability to handle large number of entities.
- *Universal Certificates*: a common Application Communication Infrastructure that supports multiple paradigms, such as request/response, publish/subscribe, multicast, as well as transactional properties.
- *Service Repository services*:
 - Meta-data indexing and inference to enable Entity/Service Indexing, Searching and discovery
 - Modeling, composition, orchestration and execution of business processes and telco services
- *Portability and Interoperability*: enablers available for the creation will provide open interfaces that applications will employ in order to benefit from the provided services and functionality. They may also require that applications provide some data in compliance with some metadata definitions. Therefore;
 - A common communication model will be defined based on the requirements of the usage areas (e. g. Quality of Experience, mobility and security issues) and operational constraints following the next generation network architecture (data control, management plane).
 - A unified set of interface specifications – based on the communication model and where needed and appropriate- should be defined and adopted.
 - Interfaces must be invoked in a standard manner to ensure a sound model and a coherent usage of enablers.
 - Open standard metadata specifications have to be defined for all those pieces where standardization of metadata will be required to support portability and interoperability (e.g., service specifications to be used during marketplace registration)
- *Evolution and adaptability*: such a platform can be considered as a composition of enablers that supports a particular family of smart applications and services. This composition evolves over time, i.e. enablers can be added, removed, reconfigured, and managed in a continuous platform life-cycle. From an engineering perspective the focus must therefore be put on supporting the controlled evolution and change over time.



Platform Services

- Multi-medial user interfacing
 - Natural language processing and speech recognition
 - Optical scanning and handwriting recognition (e.g. to process faxes)
 - Face recognition (e.g. register a contract referring to a photo where both participants are shaking hands)
- Composite Authentication (procedural strengthening)
- Version control and change management, including standards and mechanism for acceptance of changes and procedures and standards for implementations of accepted changes
- Prepackaged Auditing and Verification Workflows
- Prepackaged role- and profile-based hierarchies for circles, such as delegates, resellers, agents
- Usage reporting, event-driven alerts and notifications
- Quality of service ratings, trend movements, impression management for reputation, goodwill and actuals
- Automated indexing, concept-mining and reasoning (identify uniqueness, overlay, differences)
- Automated classification and categorization (elastic holonomic ontologies and thesauri)
- Automated cross-correlation, cross-cutting and detection of multi-scale induced coherence (emergent entanglement)
- Directory services, search and recommendation on circles, certificates and qualities
- Advanced pattern matching for impact analysis, simulations, test-runs and possible loophole detection
- Generating automated transformation rules for interface and communication standards, or facilitating templates, to promote interoperable cooperation
- Generate personalized interpretation profiles and gestalt sets for lowlighting viral marketing and ambiguous information
- Generate personalized persuasion thresholds for adaptive sensory landscapes (e.g. which color profiles are good enough)
- On demand (near-real time) analytics e.g. for personalized insurance proposals matching with next-best alternatives
- Self-optimizing platform mixing service oriented multi-agent grids and self-determining leverage point modeling
- Universal accessible and explorable namespaces concerning every entity and their contextual interoperable morphisms

- Universal quality certificates: Web Sockets x Single Sign On x Virtual Private Networking to create secure internet bazaars, impromptu transaction tunnels, private corners in a world where physical reality and the mobile internet unite.

