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Molecular Economics Technology

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General Description of Concept and History:

This paper is a call for the establishment of global, econometric technology standards that are compatible with legacy systems and which provide a long-term basis for software companies and systems integrators to build around.

This report lists technology components that are already-developed, pre-paid and resident inside U.S. National labs, universities and in private industry! But today, these potential components (of a potentially wonderful solution capability) have simply not been investigated-- as to their ability to be "connected" into an econometric system solution that is the basis of a global standard.

The name, "Molecular Economics Technology" describes the reality that all real wealth in the world, first comes from the Earth... unit-by-unit. Following extraction, these economic units are then manufactured or otherwise transformed into units of production. The units of production are consumed and ultimately disposed of. The "Technology" component of the name describes the fact that the needed research (to define a global standard) is one of systems engineering: Involving networking, scalable computational resources and distributed intelligence.

A focused research effort, combining private industry, university and government labs would help ensure the long-term, efficient utilization of global natural resources and more-efficient economies, worldwide (enabling middle class population increases to occur more rapidly, enhancing global economic, political and regional military stability.

HERE IS AN "EVERYDAY" EXAMPLE OF USE:

Imagine that you are the owner of a shoe store on "Main Street". You sit down at your office computer and type in a simple question (into a highly sophisticated search engine that resides on your computer. Based on your past use of the system, your computer has defined a custom set of "search rules"-- that stored on your machine.

Your question is, "Where are the 300 pairs of school girl shoes that I ordered from Ajax Shoe Company last June?". The computer system then finds your order, searches the globe, focuses on the Chinese manufacturer, queries its database and responds that 200 pairs of shoes from your order have (just that day) arrived in Oakland, CA; And 100 more are arriving in Oakland in two days on another ship (the proposed research of this concept would seek to define how much access to shiping manifests and transportation details, the shoe store owner-- or any other user of the system-- would be entitled to; And to what degree of specificity, any user's inquiry might enable).

Obviously, it's one thing for a user of the system to be a shoe store owner, interested in tracking an order for 300 pairs of shoes-- and it's another thing for a researcher at the Federal Reserve in Washington to ask the system, "How many children's shoes, made in China, were imported last year, based on actual shipments?"

Presumably, the same databases and protocols could answer both levels of inquiry-- but with some filtering of data, to ensure personal and company secrets and security. These are things that need research-based definition, to be enabled as global standards.

In early 2001, "Molecular Economics Technology" was published by the Center for Nonlinear Dynamics in Economics and Finance; a graduate school at the University of Amsterdam. Now, this report and concept are under review-- across the entire Department of Energy complex of U.S. National Laboratories-- by the Albuquerque field office of the DoE. The author's work has been recognized by the Vice President, Mr Cheney. And the author of the report wants to give it to America and place it into the public domain, as his small contribution to securing a more stable and capable global civilization. The author is confident that anyone smart enough to make use of this concept, will be also smart enough to hire the guy who dreamed it up.

This system solution would also provide valuable security capabilities-- based on observation and modeling of economic activity (with safeguards for protecting personal privacy--short of court order for surveillance-- and company secrets).

Molecular Economics would also enable non-invasive surveillance of sensitive economic activities. And it would enable global monitoring of those people who are of interest to international law enforcement. With Molecular Economics, detection of criminal behavior comes observations of unusual economic activity-- not from any invasive surveillance of a person! For Molecular Economics, identifying and tracking a network of terror like Al-Qaeda would be easy!

For example, the system's components were chosen by the author to enable the detection of much harder terrorist to find than Osama binLaden: The lone guy in Kansas,

whose "object" in the computer network, is associated with the purchase of a ton and half of explosive fertalizer-- yet his object isn't "attached" to any detected farm "molecule". So why is this guy buying a ton and half of potential explosives? Law enforcement can then get a warrant and the system reveal all his curious economic activities...and those of others that he's in touch with.

Today, the world's business and law enforcement communities are swamped in a variety of "relational" databases... many of which are not compatible with each other. If the United States or another country will research an "object" or "tagged" data standard (that could eventually replace the myrid relational databases) such a capability would become a de-facto global standard for computerized, economic data, worldwide, for decades to come.

Such a system solution would be much more efficient than today's hodgepodge of largely-incompatible relational databases. Such an effort on our part will also enable billions of people in emerging nations become "middle class", giving them (and their policy planners) the tools needed to maintain unprecendented economic expansion and enable intelligent analysis of future infrastructural improvements and natural resource utilization (based on the technology's anticipated ability to forecast economic behavior).

GENERAL RESEARCH OBJECTIVES

1. Survey a wide variety of computer science, social science and natural science disciplines: To identify the inter-related aspects of "Real world" activity which, in turn, must be software-encoded... network-transported... and graphically shown to the user (in terms that make sense TO the user-- regardless of the user's culture, etc).

2. Identify a practical and cost-effective configuration of hardware and software systems that would enable economic data collection (from the cash register... on up the supply chain for retail and wholesale business) and transport, store and enable the retrieval of this economic data in (near) real time.

3. The big research questions for the METRO investigation lies in defining the limits of USEFUL data collection-- so that the system isn't waisting its time, tracking individual paper clips or blades of grass. To the author's knowledge, no research has ever defined the useful limits of applied chaos theory-- to the task of modeling complex, econometric behaviors (at any level of system scalability--from the desktop to the warehouse, to the industry, the city, the region or global).

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Again, here's what the full METRO report includes

If you want the full report, you can make your request by *emailing Laser Radio*

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Specific Technology Research Elements

Ten, identified, multi-disciplinary areas of research for METRO "System synthesis":

Computer Sciences (as applied from the desktop and cash register-- to supercomputer):

Researching the benefits of (and parsing-from) various solutions like Barcode, Auto-ID, Radio-frequency ID, Search engine "templatics", SOAP, DB2, DSTP, CORBA, Java, JINI, XML, UDDI, SIP, WAP, EDI, EDIINT, RosettaNet, Value-Added Networking, Web Services Description language (WSDL), Neural Network Agents/ Neugents, PGP/MIME, MOSS, Instant Messaging, MS Hailstorm/.Net, Liberty Alliance, Advanced Encryption Standard (AES).

Very-long-instruction-word, SQL database management, datamining, networking, transport design, object-oriented software development, encryption, middleware, neural networks, parallel processing, fuzzy logic, distributed computing, embedded systems (by), image/pattern recognition, artificial intelligence and various algorithmic modeling methodologies (now in use in molecular, biological and other sciences). Field-Programmable Gate Arrays and other field-programmable logic.

AUTOMATED LEARNING SYSTEMS:
Including collaborative, collective and probabilistic learning (algorithms and applications) .
Evolution, learning and adaptation; And evolutionary computation.

DATA MINING:
Clustering and classification of objects and behaviors; Knowledge discovery; Internet protocols; Indexing and Retrieval Methods; Multi-model Data Analysis; Multivariate Data Visualization; Time series Analysis.

INTELLIGENT AGENTS:
Agent Architectures and protocols; Autonomous and multi-agent systems and applications.

USER INTERFACES:
Speech processing; Pattern Recognition; Image Processing; Feature extraction methods and applications. (emphasis on data display to maximize effective perceptual psychology and human cognition-- understanding-- of results by people of average intelligence; Parallel volume rendering of data)

SUPER COMPUTING/NETWORKING:
Optimized copilers for modern architectures; Debugging Parallel Programs; Intelligent Disaster Recovery; Matrix-matrix multiplies, based on low-cost graphics hardware; On-line parallel Tomography; Nimrod/O automatic optimization tool; SAGE (SAIC Adaptive Grid Eulerian hydrocode); Adaptive Mesh Refinement (AMR); SCALEA overhead analysis of coded regions

MATHEMATICS:
Algorithm-design; Chaos/complexity theory; Monte Carlo approach; Navier-Stokes equations; Kalman filtering; Markov processes; Lorenz and Strange Attractors in chaos; Space-Phase period relationships in chaos; Behavior of dynamic systems; Estimation theory and probability.

PHYSICS:
Quantum and relativistic studies (to establish thresholds of useless chaos for useful algorithm design).

BIOLOGICAL SYSTEMS:
Complex adaptive systems; Environmental and organism behavior theory; Algorithm design.

CHEMISTRY:
Organic and non-organic, molecular behavior modeling and simulation.

BEHAVIORAL SCIENCES:
Human psychology (cognitive and perceptual), neurosciences.

SOCIAL/ POLITICAL SCIENCES:
Group dynamics, competition theory, law enforcement; Taxation; Logistics and socio-economic databases;

BUSINESS AND ECONOMICS:
Economic theory (computational, empiracal, stochastic, equilibrium); Econometrics; Management information; Finance; Industrial marketing; Mapping, simulation and modeling.
Streamlined Sales Tax Project (SSTP)

The full report on METRO includes Laser Radio's analysis of:

Existing, Econometric system tools: Their strengths and weaknesses.

Survey of existing, "Molecular" technologies:

Including Non/Uniform Rational B-Spline Polynomial definitions of METRO econometric objects; And the encoding of object/set behavior(s) and the kalman filtering of random unknowns (of data phases, vectors and amplitudes) etc.

System-on-Chip, CPU logic-core, programmable gate-array and other microprocessor specifications for field-programmable iconization of economic and behavioral data.
Iconization/ Objectification Strategies (particularly re: attribute-oriented induction/ attribute focusing).
Also summarization, object-transport protocols (HTTP, NNTP, etc) and middleware standardization for transport and hierarchial storage.
Digital Signal Processing developments; with the anticipated potential (based on the emerging potential of 64 and 128-bit processing) for the METRO system to perform pattern-recognition of economic objects: Basically recognizing the "surface features" and underlying "hidden content" of the economic object as a heirarchial "multimedia" file.

Cash register (and other "economic interface") industry developments- relative to the developing market for embedded, System-on-Chip, METRO capabilities.
Smartcard utilization by the U.S. Government (Citibank); As a baseline for METRO Test and Evaluation field trials.
METRO system methodologies and timelines to field-deployment of METRO standards. DataMining methodologies (in particular,relating to Association, Clustering and Trend analysis)
Fuzzy logic (in particular relating to Rough sets and Clustering of unknowns)
Real-time Operating Systems
Network and data fault-tolerance and recovery
"Intelligent Agent" strategies for conducting searches
(particularly in regards to Plangent mobility and reflective metaplanning;
Also ontology of expertise, domain model, information source models, query processing, communications language and protocols, Artificial-Intelligence-assisted browsing, user's heuristic phrase-extraction and query-free

information retrieval by the system, itself).
Overall Network Design: Relative to satellite, fiber, hybrids; nodes, storage, protocols.
Security: Citing of mirrored-datamine sites, threats to databases, use of cryptography in data transport and threat countermeasures.

Social and political dynamics of METRO: From "selling" METRO as a research program... to establishing and protecting it as a (defacto?) standard... and to its implementation as a deployed technology. For example, METRO meets the need (as defined in April, 1999, by U.S. Treasury Secretary Rubin) for "transparency and disclosure" in the global investor knowledge base-- of economic activity underway in emerging world markets, etc).

Analysis of Governmental/ Agency/Military Involvement:

Especially in regards to the formation of policies, relating to strategies for the international deployment of METRO--vs (USA) tendency for "deregulation" and "market-driven natural selection".

Governmental benefits (Local, state, federal)

Intelligence Agency and Law Enforcement system requirements
Military command utilizations of METRO technology
National Lab involvements and their respective expertises

Other national governments: As Markets and as possible competitors

Select list of identified Researchers and Institutions

Select list of identified corporate research departments

Select list of identified Venture Capital funds and firms

Mission statement for formation of Cooperative Research and Development Agreement with U.S. National Lab.

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