Metaverse Roadmap

Pathways to the 3D Web
A Cross-Industry Public Foresight Project

and the

Metaverse Roadmap Summit

May 5-6, 2006
SRI International, Menlo Park, CA

SPONSORSHIP PROSPECTUS

Contents

To discuss becoming a Roadmap Sponsor, please contact:
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Metaverse Roadmap Summit

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Dear Potential Sponsor,

The Acceleration Studies Foundation (ASF) is a nonprofit organization that networks industry leaders, entrepreneurs and strategists seeking to better understand and manage accelerating technological change. This year ASF is embarking on a first-of-its-kind foresight project called the Metaverse Roadmap (MVR) and invites your company to be a Founding Partner.

Taking its name from the immersive virtual world ("metaverse") imagined by Neal Stephenson in his visionary novel, *Snow Crash*, the MVR is a comprehensive 10-year technology forecast and visioning survey of 3D Web technologies, markets, applications, and impacts. Areas of exploration include the convergence of networked and massively multi-player video games and virtual worlds, e-commerce and virtual economies, reputation and identity, groupware, e-learning and collaboration spaces, P2P, open source, next gen DRM, 3D animation, fabrication, avatars, GIS, digital maps, and the underlying trends in hardware, software, connectivity, business innovation and social adoption that will drive their transformation and development in the coming decade.

To do this the MVR will use established technology roadmap procedures and innovative graphical representations to create a living forecast regularly updated by an expert community from a range of technology, business, policy, and social science domains. The process kicks off with an invitational Metaverse Roadmap Summit May 5-6 at SRI International that will lay the groundwork for a concise and accessible public report, *The Metaverse Roadmap: Pathways to the 3D Web*, a companion website where the report and associated data will reside (metaverseroadmap.org), narrated Flash scenarios to summarize and promote key roadmap ideas, and a call for philanthropic support for a Metaverse Foresight Foundation in coming years.

The MVR has been made possible by generous start-up support from the **Electric Sheep Company**, and founding partnership of the **American Cancer Society**. Other strategic partners include virtual world economist Edward Castronova's Arden Institute at Indiana University and the State of Play conference on law, video games, and virtual worlds at the New York Law School. We hope you'll join us as well for the benefit of your company and the roadmap.

Sincerely,

Jerry Paffendorf, Research Director, ASF

Dear Foresight Leader,

Information technology performance curves support the expectation of far more realistic, powerful, intelligent, affordable, global, always-on, data- and sensor-rich virtual online environments in coming years. These will enable new platforms and business models in every sector of our economy, from resources, to products, to services.

Well-designed collaborative foresight projects can help us understand which technologies and applications are most likely to be beneficial first, which will be in greatest demand, which will enable others, and what are the current critical challenges and uncertainties. These insights in turn inform institutional vision, strategy, and research and development expenditures. We hope you'll join us in sponsoring the inaugural roadmap for this critically important and little-studied sector of our economy. As a Founding Partner, your leadership will help advance the state of industry understanding, and be widely recognized by a broad community of 3D web experts, organizational and business leaders, and the general public.

Sincerely,

John Smart, President, ASF

Metaverse Roadmap Overview

Roadmapping Definition

A roadmap is a collaborative foresight process that produces a broad set of plans and strategies to reach a future goal. Roadmaps include simple forecasts, scenarios, strategy and plans, but go beyond such tools in three ways: 1) they emerge in a collaboration network of multidisciplinary and competing experts, 2) they emphasize uncertainties and challenges as much as probable and preferred futures, and 3) they have long-term time horizons (five to fifteen years is common) by comparison to traditional forecasts and plans (e.g., NASA/NOAA's 15 year Solar Sail Development roadmap, picture right). For more on roadmaps and roadmapping see accelerating.org/roadmapping.
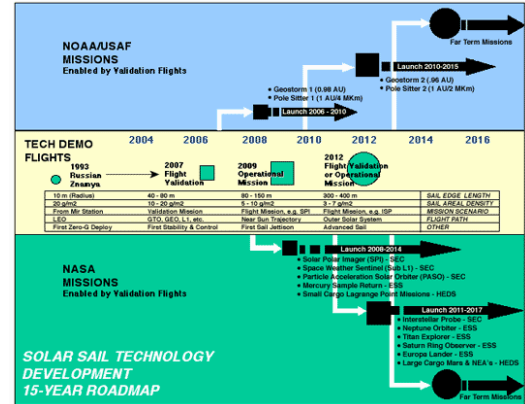
The Metaverse Roadmap: Pathways to the 3D Web

ASF is developing a roadmapping competency in industries and technologies that are experiencing rapidly accelerating rates of improvement, have potential for great social and economic impact, and are understudied relative to their potential. The emerging metaverse (3D web social spaces, economies, and technologies) is a prime candidate for collaborative foresight activity at the present time.

The metaverse roadmap is designed to be regularly updated and critiqued by a diverse community of leaders and experts at biennial summits, in a Wisdom of Crowds model. ASF's MVR listserves, online forum, and workshops at select technology, business, and social foresight conferences will also solicit input beyond the founding summit this May, and prior to the next summit in 2008.

In areas where future uncertainties exist, we will seek clarifying data for the map. When controversies persist in the face of best available data, we will represent competing forecasts and their assumptions in Schools of Thought format. We'll also seek to identify data and outcomes that would resolve current uncertainties and controversies in the future. **Enabling and inhibiting factors** relevant to MVR development include:

Science and Technology	Economic and Social
3D collaboration and management tools, groupware, product lifecycle management 3D design and animation tools, CAD, avatars 3D manufacturing, CAM, fabrication 3D operating systems and application spaces 3G and 4G networks, internet 2 Artificial life, evolutionary computing Conversational interface, NLP, voice rec, translation, text-to-speech Databases, semantic web, data mining Display devices, HD, OLED Geospatial web, GIS, augmented reality Industrial and process automation, robotics IP television, VOD, PVRs, home media centers, video game consoles Interoperability, standards Open source, P2P Molecular modeling, drug design Security, secure digital identity, micropayments Semiconductors, memory Sensor networks, transparency, RFID, EPC Synthetic worlds, video games, MMOGs Virtual reality, haptics VoIP telephony, video conferencing Wearable, Wireless	Accounting (financial and cost), finance (public, private, micro) Adoption curves, commoditization thresholds Business automation, supply chain mgmt, ERP, SFA, CRM, e-Commerce Demographics, immigration Developmental convergences (positive and negative) DRM and patent law Economic forecasts and indicators Failure scenarios, risk management Game design and culture Government regulation, taxation, subsidy, policy Globalization, outsourcing, insourcing, HR strategy IPTV and telecommunications regulation Learning/experience curves, market growth curves Management strategy, business models Marketing (personalized and mass), advertising analytics, SEO Organizational learning and innovation Polling, group democracy Social networks, reputation systems, online community Social preferences, culture, fashion Tech support networks, education Tipping, inflection, and saturation points User created content, profiles, metatagging, collaboration strategy

Metaverse Roadmap Thesis
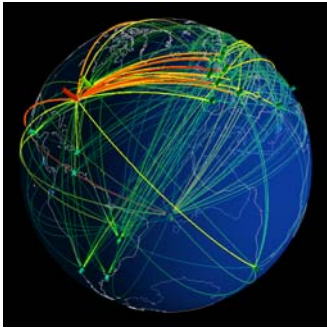
The emerging "metaverse sector" of the global economy is resources, products, and services managed through 2D and 3D virtual and augmented reality environments.

As the density of our network accelerates on a planet with finite surface area, and as our online and physical environments become increasingly intelligent, automated, networked, and transparent, major new developmental emergences must occur.

We are in the early years of an unprecedented transformation in our relationship to information technology. As visual-spatial and linguistic (right brain and left brain) creatures, we use complex visual-spatial and language interfaces to interact with each other. Soon our 2D+ (geospatial, augmented reality, etc.) and 3D online worlds will become as visually and data rich as the physical world. We are also gaining the ability to talk to our computers (as well as type) in increasingly natural human language. These developments will produce profound new individual and collective abilities, as well as new risks to be mitigated.

Classic economic theory charts development from resources, to products, to services sectors over time. "Structural change" occurs when GDP (or for the world, GWP) or employment in one sector grows to exceed another.

We contend the metaverse sector, growing from today's mostly 2D and early 3D digital media (including film, games, geospatial web, television, and wireless), will encompass and redefine each traditional economic sector in coming decades, the way each has done in its own historical emergence. Providing plausible indicators and examples of metaverse sector development is a major goal of our roadmap.

Affected Economic Sectors

Resources Sector

- agriculture
- mining, forestry, fishing

Products Sector

- energy
- construction, architecture
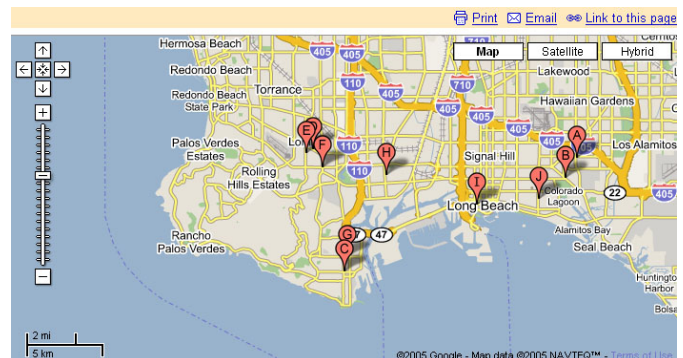- manufacturing, business and consumer products

Services Sector

- government and law
- military, security, first responders
- health, medicine
- education, entertainment, media
- banking, finance, insurance
- transportation, travel, tourism
- retail, wholesale
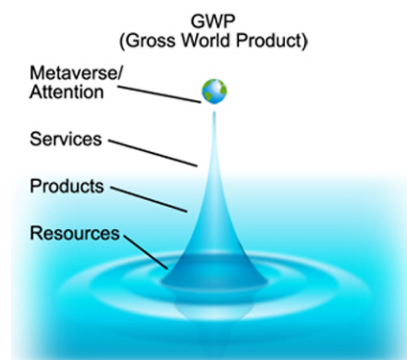- NGOs, nonprofit, philanthropy, development
- science, R&D

Google Map for computer repair services in San Pedro, CA, 2006.

Metaverse/Attention/IT Sector

Encompassing all of the above into an attention-mediated intelligent 3D virtual and augmented reality management environment, via the following industries:

- information technology and computer science
    — applications, automation (industrial and process)
    — databases, architectures
    — hardware and physical infrastructure
    — languages, protocols, standards
    — machine learning, artificial intelligence
    — natural language processing, CUI, linguistic interface
    — virtualization, cyberspace, visual interface
- networking, communication
- sensors, haptics, transparency
- effectors, robotics, fabrication

Quantitative and Qualitative Input

The roadmap will emerge in a dynamic group foresight process that includes both quantitative and qualitative input.
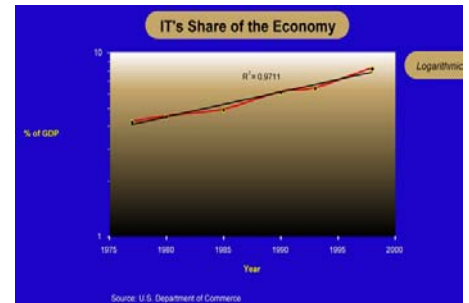
Quantitative Data and Trends

Examples of quantitative input include statistical data, forecasts, and trends, including technical capacity growth trends enabling metaverse development.
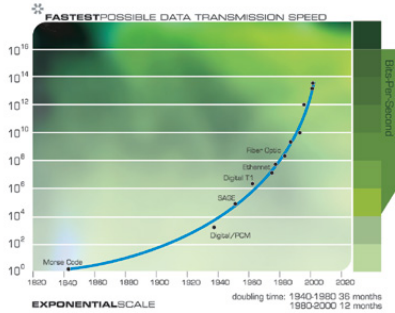
Historical growth in IT capacity and IT-related economics can help us understand when disruptive new emergences are likely to occur.

To the left is a log curve of fastest wired data transmission speed, 1940-2000. Average doubling time from 1940-1980 was 3 years (24% annual growth), and from 1980-2000, 1 year (72% annual growth). To the right is a log curve of U.S. Dept. of Commerce statistics for growth in IT's share of the U.S. economy, 1975-2000. Current doubling time, 23 years (3% annual growth). Graphs courtesy Ray Kurzweil.

Qualitative Assessments

Examples of qualitative input include subjective assessments, rankings, forecasts, and scenarios. Below is a qualitative forecast in one economic sector, telecom. Many such inputs will be evaluated in the MVR.

Avatar-Mediated Communication in 2016

Ananova, world's first virtual newscaster, 2000.

As broadband and VoIP gain market share, allowing next generation IP-enabled communications platforms (IM, chat, email, telephony, conferencing, television) to begin to arrive, we forecast users will increasingly associate personal avatars with their public personas, and use them to mediate contact with the world.

Avatars are more friendly, personalized, and interactive relative to static images or linear narratives (slides, movies), and will become increasingly useful as they are able to encode personal interests of the user, and direct inquiries to the user's data (avatar-as-search-interface). Automation will accelerate this transition via personal database and email mining advances. Tomorrow's keyword and interest mining will improve context-specific search, social networking, education and training, personality modeling, and other online activities.

Given trends in automated knowledge discovery, knowledge management, and natural language processing, within ten years a caller should be able to have a primitive yet useful natural conversation with an avatar and gain significant personal information about the represented individual. This will include simple information about the user's background, interests, present location, availability status, and future plans, as well as the ability to schedule meetings with trusted parties, answer FAQs, manage e-commerce, and perform other simple transactions.

Consistent with trends toward an increasingly visually and verbally automated, user-centric, and accelerated "Metaverse/Attention Economy," we can expect avatars to become first-pass communication screeners, with social network access, product, and service delivery increasingly qualified by simple human-to-avatar and trusted avatar-to-avatar "conversations." Semi-asynchronous avatar-mediated chat may even become the preferred first communication layer for those seeking greater creativity, novelty, productivity, privacy, or security.

Phil the avatar in Apple's Knowledge Navigator ad, 1987.

See imvu.com for an example of avatar-mediated chat, already achieving adoption in today's youth culture.

Current Summit 2006 Participants

Partners with the Metaverse Roadmap join a growing network of technologists, researchers, creatives and visionaries who imagine and shape the pathways to the 3D web. This group has been carefully chosen to include the important diversity of knowledge base required to create a solid, collaborative outcome.

We select our networking community from three primary groups: Academia, Industry, and Future-Oriented Analysts/Authors. Academicians tend to be strong in providing historical context and data to the foresight process. Analysts/Authors tend to provide visionary and strategic perspectives for evaluation. Industry leaders and technology developers are coaxed by the first two groups to consider their present development opportunities and challenges in light of past performance and future possibility.

Participants in the first invitational Metaverse Roadmap Summit include:

- **Janna Anderson**, Director of Pew Internet's Imagining the Internet website; Assistant Professor of Communications and Director of Internet projects, Elon University; Author, *Imagining the Internet*

- **Jeremy Bailenson**, Ph.D, Director, Virtual Human Interaction Lab, Stanford University

- **Betsy Book,** Director of Product Management, There; Founder, Virtual Worlds Review

- **Corey Bridges**, Co-Founder, Multiverse

- **Jamais Cascio,** Futurist; Senior Contributing Editor, WorldChanging.com

- **Ted Castronova**, PhD, Associate Professor and the Director of Graduate Studies in the Department of Telecommunications at Indiana University, Bloomington; Founder, Arden Institute

- **Esther Dyson**, Editor, *Release 1.0*, CNET Networks (formerly EDventure Holdings)

- **Randall Farmer**, Co-Creator, Habitat; Community Strategist, Yahoo!

- **John Hanke**, General Manager, Google Earth

- **Will Harvey,** Founder and CEO, IMVU

- **Daniel James**, CEO, Three Rings Entertainment

- **C. Sven Johnson**, Independent Industrial Design Consultant; Author, Core77 and reBang

- **Joaquin Keller**, Lead Designer, Solipsis, France Telecom

- **Raph Koster**, CCO, Sony Online Entertainment

- **Julian Lombardi**, Ph.D., Assistant VP for Academic Services and Technology Support, Office of IT, Duke University; Adjunct Professor of Computer Science, Duke University; Principal Architect, Croquet Project

- **Chris Melissinos**, Chief Gaming Officer, Sun Microsystems

- **Randall Moss**, Manager of Futuring and Innovation Based Strategies, American Cancer Society

- **Beth Noveck**, Associate Professor of Law at New York Law School; Director, Institute for Information Law and Policy; Founder, State of Play Conference

- **Cory Ondrejka**, VP Product Development, Linden Lab, makers of Second Life

- **Byron Reeves**, Professor of Communication, Stanford University; Director, Media X Lab, Stanford University

- **Blake Ross**, Co-Creator, Firefox, Mozilla Foundation

- **David Smith,** Chief Software Architect, Open Croquet Project; CTO, 3Dsolve

- **Phillip Torrone**, Associate Editor, *MAKE Magazine*

- **Sibley Verbeck**, Founder and CEO, Electric Sheep Company

- **Mark Wallace**, Journalist; Author, *Only a Game: Online Worlds and the Virtual Journalist Who Knew too Much*

- **Ethan Zuckerman**, Research Fellow, Berkman Center for Internet and Society, Harvard University

Founding Partner Sponsorship ($10,000)

As a recognized leader in this space, we are inviting you to become one of a small number of $10,000 Founding Partners of the Metaverse Roadmap. Becoming a Founding Partner will publicly showcase your commitment to collective efforts to understand and advance the 3D-enabled web, and raise your visibility as a prominent agent in its development. The MVR will be the most accessible and comprehensive effort to date to identify and evaluate enablers and barriers to metaverse development, so there is special significance to the project.
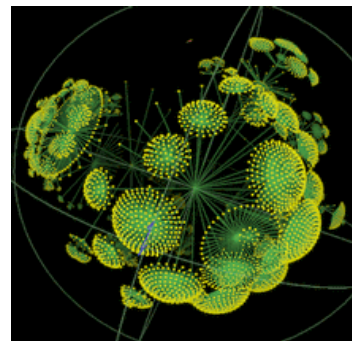
Sponsor Benefits

❖ Summit Attendance and Influence
Your attendance at the Metaverse Roadmap Summit provides you with an opportunity to network with and learn from a wide community of prominent change leaders. Founding Partners will be recognized and highlighted at the event with logo and company information on conference materials, as well as public thanks. You may also submit a topic of inquiry for participants to explore in depth; let us know and we'll include it in the summit agenda. In addition, your recommendations for additional summit participants will have preferential status.

❖ Prominent Website Recognition
Your logo, with a link to further organization information, will be listed on the front page of metaverseroadmap.org, the main page for both summit information and the permanent home of the roadmap and supporting documents. Ongoing presentations and updates of the work will ensure a continuing flow of site visitors.

❖ Contributing Authorship
Founding Partners are able to review drafts of the Metaverse Roadmap document and offer editorial advice. Your input, concerns and areas of interest will help shape what we release and you will be listed as a Contributing Author of the document.

❖ Press Contact
Press and media contact even within the planning stages of the MVR has been strong. Founding Partners designated press contacts will be listed on the site and document (unless requested otherwise) as affiliates willing to be interviewed and quoted about the project.

❖ "MVR on the Road" Conference Presence
The Roadmap is a collaborative creation and will continue to evolve in a "distributed conference" model. The MVR project outline and results will be presented for feedback both prior to and after the summit at 2006 conferences including GDC, Siggraph, State of Play, Supernova, O'Reilly Emerging Tech, Accelerating Change, and ASF's own Future Salons across the country. Founding partners will be recognized at each of these events.

❖ Continued Involvement
The Metaverse Roadmap is designed to be updated, and the Metaverse Roadmap Summit will be a recurring event. Founding Partners are guaranteed ongoing project involvement and first knowledge of MVR plans, including preferential invitation to future events. When the opportunity arises the MVR will seek to evolve into a Metaverse Foresight Foundation, an independent entity chartered to help the 3D web industry better foresee, frame and propose solutions to difficult technological, business, policy and social issues; to encourage innovation and cooperation towards open 3D standards, and to generally work towards the best possible future of a fun, flexible, empowering and fully 3D-enabled web: the metaverse. Your Founding Partnership would be recognized in that endeavor.

Supporting Partner Sponsorship ($3,000)

Supporting partners, contributing $3000 (or similar value in kind), provide valuable resources for roadmap production, and publicly affiliate themselves with this groundbreaking project.

Sponsor Benefits

❖ Summit Representation
Your organization's logo will be present on conference materials such as banners and handouts. In addition, your recommendations for additional summit participants will have preferential status.

❖ Website
Your logo with organization information will be listed on metaverseroadmap.org, both the main page for summit information and within the document. Ongoing presentations and updates of the work will ensure a continuing flow of site visitors.

❖ Key Reviewer Credit
Supporting partners will receive roadmap drafts for review and input, and will receive credit as Key Reviewer on the final document.

❖ Continuing Updates
The Metaverse Roadmap is designed to be updated, and the Metaverse Roadmap Summit will be a recurring event. When the opportunity arises the MVR will seek to evolve into a Metaverse Foresight Foundation, an independent entity chartered to help the 3D web industry better foresee, frame and propose solutions to difficult technological, business, policy and social issues; to encourage innovation and cooperation towards open 3D standards, and to generally work towards the best possible future of a fun, flexible, empowering and fully 3D-enabled web: the metaverse. Supporting partners will receive notification of future events before the general public.

Foresight and Philanthropic Leadership

Affiliating your organization with the inaugural Metaverse Roadmap is a strong statement of leadership, and provides a legacy of vision for others to emulate in coming years. Press interest in this project has been strong, and we expect the MVR to be referenced extensively by industry and opinion leaders interested in exploring this rapidly developing new economic sector.

Your financial contribution to the MVR not only supports this groundbreaking work, it puts your organization in a primary position for identifying potentially valuable commercial or research opportunities, both as they arise from direct interaction at the summit and as they emerge over the project life cycle.

The summit is small and invitational to provide a strong working atmosphere and to encourage deep levels of interaction, while the document itself will be inclusive of many distributed inputs. Being part of the core summit group will provide a unique opportunity to explore and create with innovators from diverse fields.

We hope you will join us at SRI International this May, and thank you for considering sponsorship of the Metaverse Roadmap project.

Footnote: Page 7-8 pictures are 3D hyperbolic graphs of Internet topology, created with the Walrus graph visualisation tool, developed by Young Hyun at the Cooperative Association for Internet Data Analysis (CAIDA). Inputs for topological structure were gathered by skitter, a CAIDA tool for large-scale collection and analysis of Internet traffic path data.