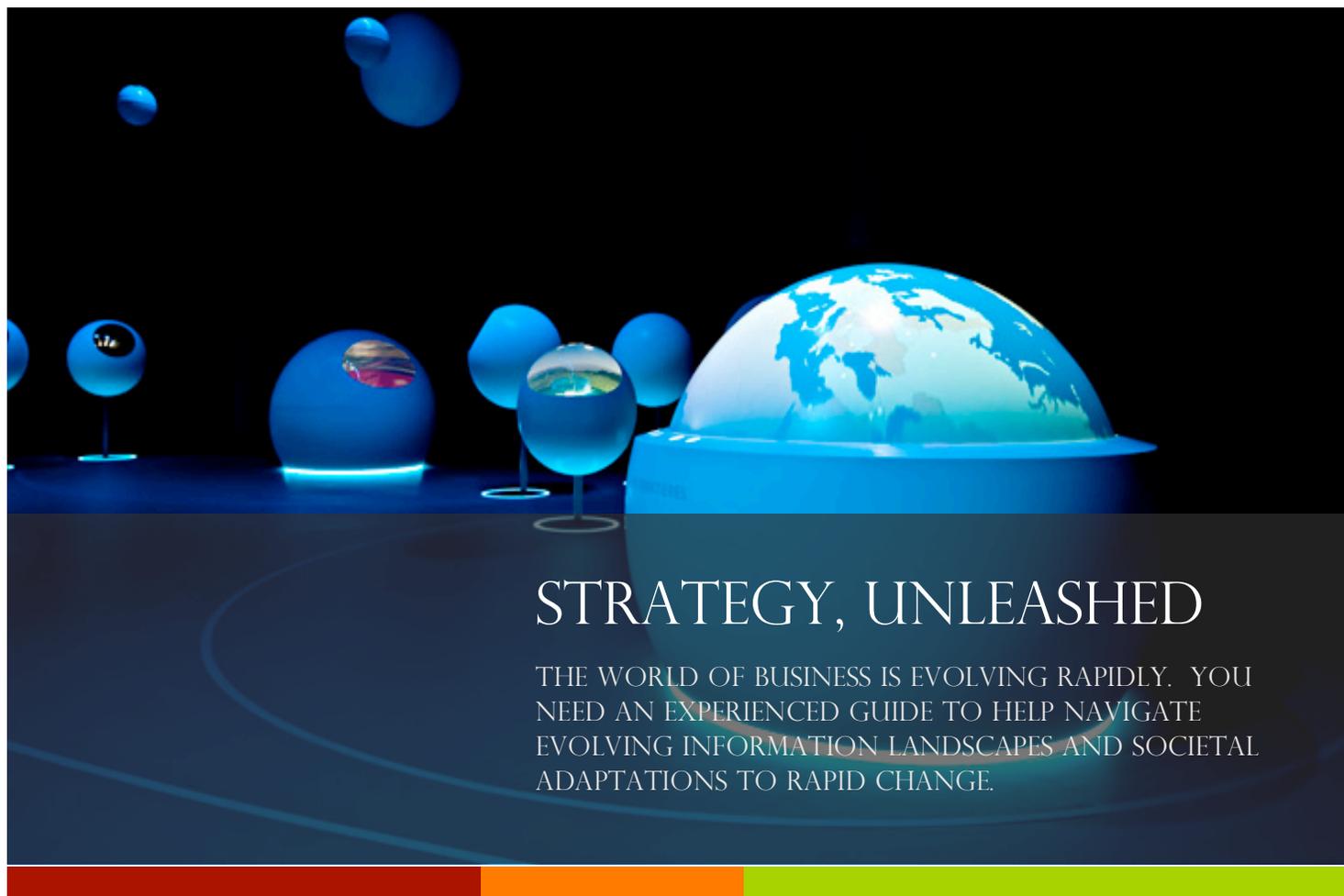


GREG NEWBY

STRATEGY, UNLEASHED



Bringing Purpose to your Organization

Does your organization need an “intrapreneur,” who will use entrepreneurial energy to drive innovation inside the larger organization?

Markets today are responding positively to purpose-driven innovation, where values drive progress. Your organization needs a moral compass, to navigate the uncertainty created by unbridled technological euphoria. Guidance can come from consideration of a more diverse bottom line. In quadruple bottom line, profits are only part of the picture.

Greg Newby is a strategic thinker and intrapreneur, who can apply his deep background in technology, business and the academy to transform your organization. Return on Investment (ROI) considerations can be converted from being driven by revenues to instead having a full range of principles as guide.

The Quadruple Bottom Line: Whether your organization is for-profit, non-profit, government, academic or has any combination of products, services and stakeholders, you need to be differentiated in the marketplace. A key strategy is to look beyond products and services, to the larger social role of the organization.

- **People:** What social good does your organization’s products create? What is your strategy for personnel – their career paths, their loyalties, their creativity, and their industriousness?
- **Planet:** How can you differentiate yourself in the market through a sincere devotion to the world we share? What metrics will yield compelling evidence that this stewardship makes you deserving of increased market share?
- **Profit:** What is your strategy for sustainable growth, resiliency in the face of change, and meeting stakeholder needs?
- **Purpose:** Articulate the social role the organization seeks to fulfill. Be honest concerning current status, and courageous in your aspirations.



Project Synopsis: The Business of Energy in U.S Academic Research Computing

In 2014, Newby completed a 9-month project on U.S. academic research computing. It was done under the sponsorship of the Coalition for Academic Scientific Computation (CASC). The project explored two main areas. First was the applicability of business concepts to the industry of academic supercomputing. Second was an exploration of energy as utilized within the industry. The major deliverables of the project were an online monograph and an accompanying spreadsheet. Both are freely available online at hpcbiz.readingroo.ms.

In the area of business concepts, the monograph includes an industry analysis, discussion of key productivity indicators (KPIs) and stakeholders, discussion of employee development, and other topics. The premise of the discussion is that HPC managers are frequently required to justify the return on investment created by their centers. Grounding in the language and concepts of modern business is useful for making the case for a strong ROI. The spreadsheet provides a template for tracking ROI for a high performance computing (HPC) center within a particular institutional environment, along with weighted aggregations of measures for presentation to management and other stakeholders.

In the area of energy, the analysis starts with assessing electricity use by high performance computing systems, and the fact that digital computation, by its nature, produces waste heat that must be removed. The spreadsheet includes a calculator for total lifetime energy costs for operation. Additional calculators estimate the embedded energy (the energy required to produce the system) and the mix of raw materials in the system. These energy values are input to another calculator, which estimates carbon dioxide output due to generating the electricity used throughout the lifetime of the system. Major outcomes emerging from the project include:

1. The value of maintaining return on investment (ROI) estimates for an HPC center, where calculations are based on outcomes deemed pertinent for the host institution. Such outcomes are often non-financial. However, they may be measured, tracked over time, and compared to other organizations at the institution.
2. Applying business concepts for staff development within a center, even without explicit direction from the host institution, can yield improvements to employee career path options and employee retention.
3. It is straightforward to quantify the approximate ongoing costs of operating a supercomputer, such that those costs may be compared for different scenarios of systems upgrades or acquisitions. Because costs per unit of computation (e.g., dollars per gigaFLOP) decrease over time as technologies improve, a new computer's costs are offset by decreased energy use.
4. A decision to upgrade components (i.e., system boards and interconnect), versus replacing an entire system (including the metal chassis, cabinets, and other physical superstructure) can yield significant savings in total embedded energy.

Critical Thinking

Ability to apply practical framework for analyzing and assessing systems



Engaging Challenges Under Ambiguous Conditions

ENERGY MATTERS

HOW TO MAINTAIN EFFECTIVE ROI,
WHILE ASSESSING THE TRUE COSTS
AND IMPACT OF ENERGY TO BUILD
AND OPERATE SUPERCOMPUTERS

A rich and diverse background. Newby is a computational scientist and a social scientist, and was an early actor in pursuing the promise of networked information.

GREG NEWBY was born in Montreal, and moved to the New York metropolitan area at the age of eight. He is a naturalized American citizen and native English speaker, and retains Canadian citizenship.

Newby studied communication and psychology as an undergraduate, with emphasis on mass media and individual human behavior and cognition. He received a master of arts in organizational communication. He then took his long-time interests in computing and networking technologies to an innovative doctoral program in information transfer, at Syracuse University. His Ph.D. has deep emphasis in four study areas: computer science and information technologies; human communication; management; and information science. The outcome is that [Newby has post-graduate training and experience in social science and computer science.](#)

After his Ph.D., Newby took a faculty position in the Graduate School of Library and Information Science at the University of Illinois in Urbana-Champaign. He had a joint appointment as a senior research scientist at the National Center for Supercomputing Applications. Newby worked extensively to update the information technology curriculum and technology education for students. At UIUC, he founded Prairienet, a public community computing system. He was given responsibility as Assistant Dean to develop a [new technology-based distance education MS degree](#) option. Then, from 1997-2003 Newby was at the School of Information and Library Science at the University of North Carolina in Chapel Hill. Research there focused on information retrieval, human-computer interaction, and new electronic media. He led the development and implementation of a new minor and a new major in information science.

From 2003-2014, Dr. Newby was a research faculty member in the [Arctic Region Supercomputing Center \(ARSC\)](#) at the University of Alaska Fairbanks. Research there has focused on data-intensive computing, information retrieval and grids, federated search, data mining and fusion, integration of large-scale systems, and manipulation and presentation of massive collections of text. He developed a number of outreach campaigns, and led undergraduate and graduate intern programs. He was appointed Chief Scientist in 2007, then Director of ARSC in 2011.

As Director of ARSC, Newby had full oversight of up to [26 staff members and faculty and a multi-million dollar annual budget.](#) He led scientific activities and guided the direction of the Center's computational science. This included technology planning and technology refresh. As a member of the UAF executive team, Newby positioned ARSC services relative to the University and the State, including large-scale computing, storage, outreach, and infrastructure.

In 2014, Newby departed UAF for the [King Abdullah University of Science and Technology \(KAUST\) in Thuwal, Saudi Arabia.](#) He is Manager of the KAUST Supercomputing Laboratory (KSL), one of eight world-class laboratories on the campus. Activities there include leadership of computationally based science and engineering at KAUST, working with constituents from the Core Labs, Research Centers, and academic divisions, as well as universities and industrial partners from the Kingdom, the region, and internationally. Newby is responsible for KAUST's procurement of a new supercomputer, "Shaheen II," among the fastest in the world.

Newby is married, with 39 sled dogs.

Prospectus: Crowdsourced Pervasive Counter-Surveillance

“SUNLIGHT IS
THE BEST
DISINFECTANT”
– LOUIS
BRANDEIS

For decades, surveillance of innocent civilians has been persistent, pervasive, protected and hidden. Whistleblower’s revelations in the past few years have demonstrated that the modern tools of high-speed networks, monstrous data repositories, data analytics, and recording devices have been put to illegitimate uses by governments and corporations of the world, led by the United States.

A new vision is arising in which the watched may become the watchers. Numerous technologies are making this possible, including:

- Ad-hoc wireless mesh networks.
- Harnessing the hundreds of teraflops of computing power, and millions of terabytes of storage, on billions of mobile devices in the world today.
- There are over 3 billion cameras in the world today, most of which can shoot digital video.
- Publicly available information sources let us keep track of who our lawmakers and law enforcement personnel are, where they are, and what they’ve done. The transgressions of the few bad players can be subject to public analysis.

More importantly, *changing attitudes are making this possible*. What are your strategies for maintaining the conceptual high ground that eludes so many of today’s leaders, and leading organizations?

Today, competitive advantage is emerging from bottom-up, people- and purpose-driven sentiments. There is immediate opportunity for organizations to take a stance and exercise leadership regarding pervasive surveillance.

Within the broad international community of technologists, scientists, government/legal experts and systems thinkers, there is expertise to repurpose existing technologies, and develop new ones, to shift the balance of power back towards the people.

The technological revolution is well into its sixth decade, but is in need of quadruple bottom line thinking, to shift towards emphasizing uses that make people and societies thrive.



Market Analysis: Getting to Scale with Innovations

Your organization is facing an uncertain world, characterized by Vulnerability, Uncertainty, Complexity and Ambiguity (VUCA). Each of these challenges needs a deliberate response, integrating your strategy while remaining flexible and responsive. Whether you thrive depends on how you turn today’s messes into tomorrow’s systems.

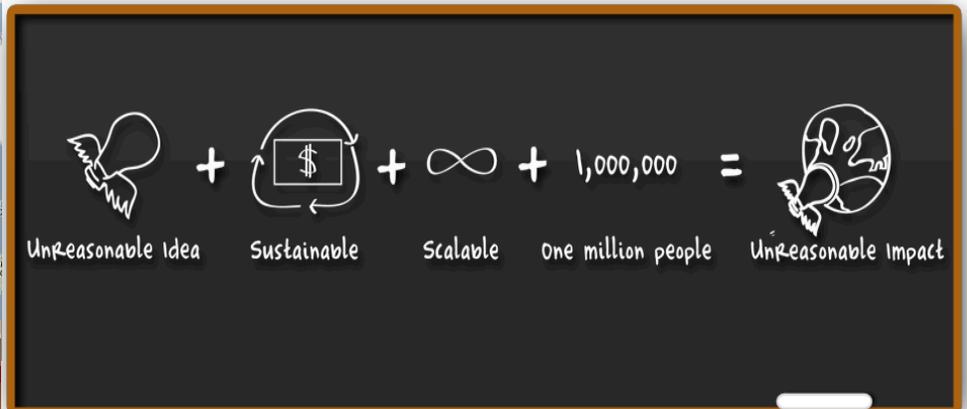
- Volatility → Vision
- Uncertainty → Understanding
- Complexity → Clarity
- Ambiguity → Agility

Newby’s expertise is rooted in higher education, thanks to 20+ years as a faculty member at research-intensive Universities. As he advanced through levels of university management, he decided to add an MBA degree to his 1993 Ph.D. This MBA in Sustainable Systems is a major market differentiator, since it is a rare university manager who has spent a career as an educator and researcher, and also has *bona fide* business credentials.

Newby has also worked extensively within the formal systems of governments and military. In Alaska, this included managing a large DoD contract via Lockheed Martin, working within DoD 8570 requirements for information assurance, and maintaining a security clearance. In Saudi Arabia, this included presenting high-level government and industrial partners with the rationale for investments in world-class computing and information technology, with positive and far-reaching outcomes.

Newby is adept at speaking truth to power, and has frequently been called upon to interact with lawmakers, corporate leaders, and major personalities in science and the public sphere. His integrity and deep commitment to the broader good provide an immediate frame of reference for identifying common ground, and building strong prospects for partnership.

Contact Greg Newby: gnewby@petascale.org



International and multicultural awareness and sensitivity is a must for today’s organizations. Newby was born in Canada, and retains US and Canadian citizenship. He’s visited dozens of countries, and 49 out of 50 US states. For over a decade, he has been standards editor for the Open Grid Forum, an international organization pursuing grid interoperability. Since 2014, Newby has lived and worked in Saudi Arabia at KAUST. KAUST has students from 80 countries, and Newby manages a multicultural, multilingual staff.

At all levels, Newby’s efforts are directed towards scalability, sustainability and resiliency. Long-range thinking and strategic planning are a must for today’s VUCA world.

INTERNATIONAL AND MULTICULTURAL AWARENESS AND SENSITIVITY IS A MUST FOR TODAY’S ORGANIZATIONS.

Sustained leadership is not a single act or qualification. It comes from decades of purpose-driven strategic thinking, innovation, and effort.



CREATIVE THINKER

Thorny problems require creative solutions. Newby is a serial innovator, who seeks combinations of available resources to address needs. Technologies are combined with organizations, policies, systems, people, funding, location, interpersonal connections, and other available resources, in order to achieve desired outcomes. He will help your organization to identify combinations of resources to address challenges.



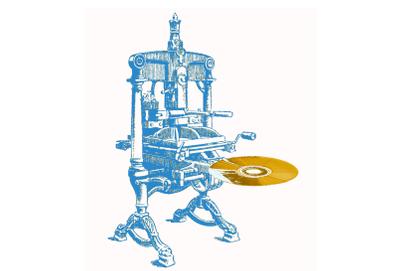
SERIAL INNOVATOR

Creative solutions require a diverse background, and the ability to lead teams with varied ability and background towards common goals. Newby is a listener, a builder and a do-er, with the technical acumen to rapidly analyze a situation, choose among options, plan a way forward, and guide implementation of that plan. Building and leveraging constituencies.



DRIVING TOWARDS PURPOSEFUL CHANGE

Today's unprecedented opportunities have been created largely through advances in information technologies. These technologies have been put to beneficial use, and also to quash human spirit and initiative. Newby has demonstrated great strength at steering technologies and the systems they are embedded in – including organizational systems – towards broad social benefits



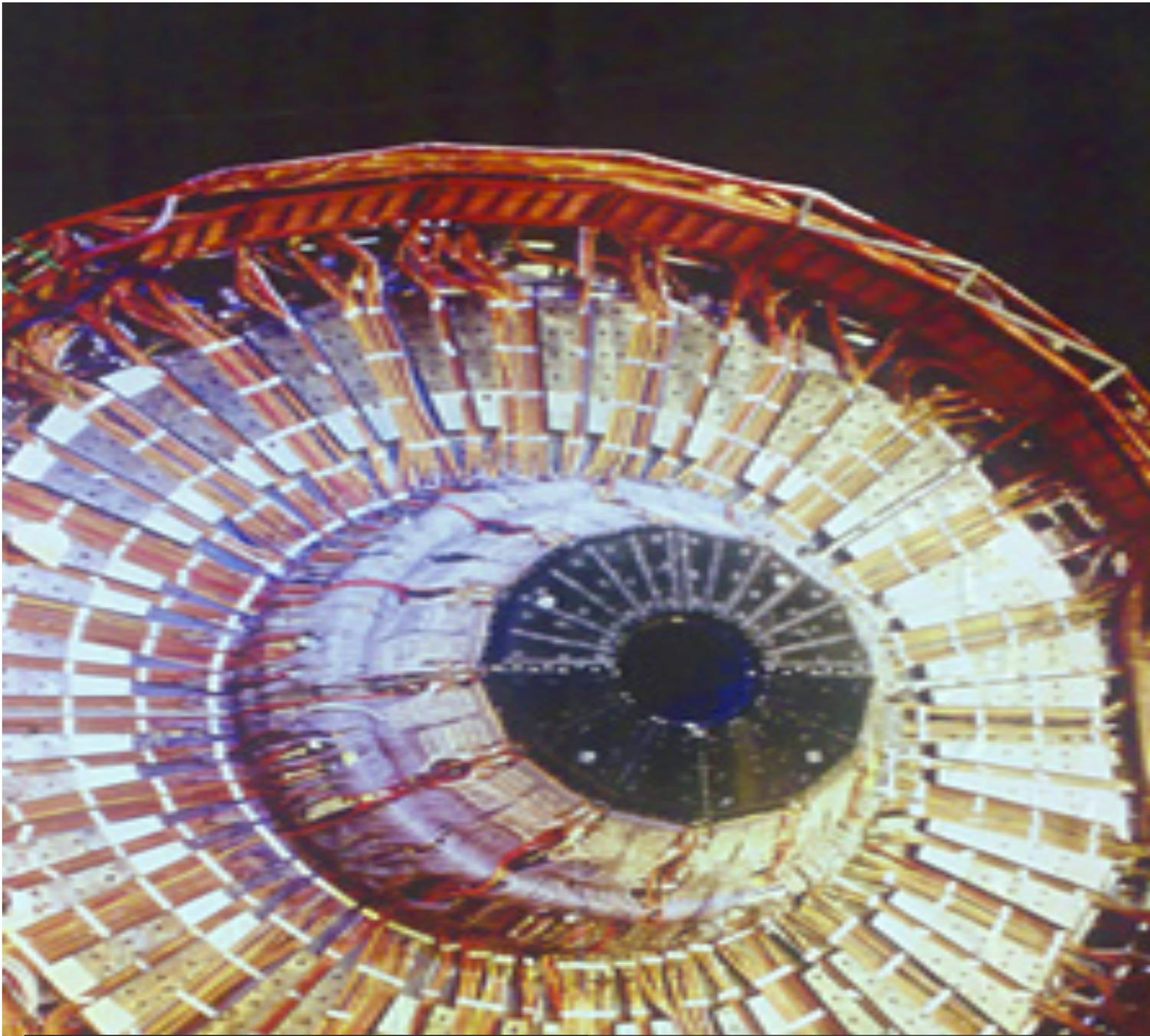
THE POWER OF THE PRINTED WORD

Since 1991, Newby has worked with Project Gutenberg to create and distribute free electronic books. In 2001, he took on the volunteer role as CEO of the Project Gutenberg Literary Archive Foundation. Since that time, he has led Project Gutenberg in new collaborative work and new data types, supervised personnel, sought and received funding, and worked to increase the size of the Project Gutenberg collection to over 46000 eBooks.



TURNING MESSSES INTO SYSTEMS

Complexity in systems and environments is no excuse for failure to act or failure to analyze. Strategic thinking includes consideration for unknown and unknowable factors, a high tolerance for ambiguity, and a flair for spotting novel solutions for irreconcilable quandaries. What are some challenges you are facing, and how might an expert problem-solver be of assistance?



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