



Dupont Summit 2014

..... Science, Technology, and Environmental Policy Issues

December 5, 2014 ♦ Historic Whittemore House, Washington, DC

The Policy Studies Organization

Panel

"Quantum Computing, Viral Outbreaks and Needles in Haystacks"

Organizer: Martin J. Dudziak, *Institute for Innovative Study, TetraDyn Ltd.*

How we can align Great Challenges and Lesser Resources for the Greater Good

An examination from differing perspectives on how policies in the sciences, medicine and education can be synchronized to gain greater advantage for high-demand needs, with a focus upon the emerging field of quantum computing and its values today for public health and security in particular

Quantum computing is one example of a "Great Challenge" problem spanning physics, chemistry, computer science, mathematics and even biology. It is a methodology for solving certain types of computational problems that may otherwise require impractical resources and especially time, and in many cases the problems cannot be reliably solved otherwise. Some of these problems are among the most pressing of demands today, affected also by a cascade of cutbacks in budgets within the USA and globally. These include rapid response discovery and development of new drugs and vaccines, such as for emerging global-threat diseases like Ebola and new influenza strains. These also include the viral-like outbreaks of radical violent movements such as ISIS and the "lone-wolf" forms of terrorism and extreme violence. In both of these areas there is a "needle in the haystack" problem to find indicators, anomalies, and matchings that require massive computing resources and methods that in turn and to date require massive budget allocations and expenditures.

Or do they require such? Perhaps there is a "low-budget, mass-market" approach to support scientific, medical and national security related research that is at our fingertips and has not yet been tapped. The Panel will not direct itself to scientific and technical matters which are beyond the scope of the Summit, but rather, to social, economic, political, and other critical policy questions, issues and decisions, especially current action-items in both the public and private sectors, with an aim to generate discussion on some of these present-day and "outside the box" alternatives.

Through multiple presentations with opportunity for argument and discussion, we will achieve a clearer understanding of ways to change policies and practices, applying novel social and economic approaches. that can fuel and sustain research and discovery. The result yields strong benefits even more rapidly, simply, economically. Some of these involve a "crowd-sourcing" or "mass-engagement" method that has been used in the past for large-scale computing challenges, and also the development of creative learning and knowledge training programs for youth including children of pre-high-school ages.

We will discuss:

- how some very avant-garde and futuristic "STEM" like quantum computing may be essential, even critical, for solving problems in healthcare, epidemiology, counterterrorism, unconventional warfare and spontaneous social violence

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"Quantum Computing, Viral Outbreaks and Needles in Haystacks" (continued)

- privacy and the potential for intrusions, abuses, and cyberattacks using such powerful resources
- areas of greatest need and benefit that should receive the benefits of quantum computing power, and
- the prospects, benefits and challenges for some approaches, such as a major public+private Master Project (an equivalent in scope and impact to the Manhattan Project and/or the Apollo Space Program).
- alternative models to combine long-term research with useful short-term results by what the internet and social networks offer, combined with STEM-educational and social-ethical learning (SEL) that draws in a vast population resource and their computing - our children (40 Million strong in the USA alone)

Particular attention will be directed to how quantum computing and its crowd-space, crowd-source simulation today can benefit, enhance, and strengthen national interest with respect to public health and safety concerns with a focus on recent events with both Ebola and Islamic State.

Biographies

"Quantum Computing: a practical introduction and projection into the Crowd-Space of the Global Web"

"Integrating tomorrow's technology into today's society, business and government through the Innovators of tomorrow, ages 8 and up"

Martin Dudziak, *Institute for Innovative Study, TetraDyn Ltd.*

"ANTS - Doing artificial intelligence and simulating quantum computing today through social networks to uncover trends and movements"

Yuri Shestov, *Boston University*

"S.H.A.K.T.I. Warriors, Super Heroes and Virturealities - engaging children and youth in online communities to create a Movement and a "virtual quantum computer"

Lane JaBaay, *The H2 Group*

"Crowd-source style computing via social networks for finding anomalies, outliers and triggers of public health and security risks "

Peter Ross, *New York University*