

What's Coming – Whether We Like It or Not

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Oliver Wendell Holmes advised:

“I find the great thing in this world is not so much where we stand, as in what direction we are moving.”

Global Direction

The global direction ala OWH results from the:

- i. Power balances between countries,
- ii. Collected country strategies for prosperity and security, and
- iii. Global circumstances affecting all countries but outside of their individual control.

Global Directions during 3 periods

- The Cold War direction 1945 –1990
- Transition decade – the 1990s
- The 21st Century direction post – 2000

The Cold War Direction: 1945 - 1990

- Fear of nuclear annihilation was the paramount driver of national policy and anxiety.
- Big science raised the specter of additional new discoveries as or more devastating than nuclear weapons.
- National goal: US. must remain at the forefront of every area of science and engineering to provide for national security, health and welfare.

The Cold War Strategy: 1945 - 1990

- The 1945-1990 strategy was isolation of adversaries and control of their access to information and innovations for protecting national security and economic advantages in a global context of stability in principal features.
- In short: Isolation and control for protecting advantages in a stable global context

End of Cold War Transition: 1990s

- Where are we going?
- Many disruptive changes occurred globally –
politically, technologically, direction
- Many speculations about the next U.S. direction –
What will set the new direction?

The Transition: 1990s

- The capability to control and protect information and innovations for commercial and security advantages, a hallmark of the Cold War direction, **essentially collapsed**, along with the **stability** in global direction characterizing the Cold War.

The 21st Century Direction: 2000 +

The 21st century strategy is engagement in partnerships to accelerate capabilities for security, economic and other purposes in a context requiring adapting to continually changing global features.

- *Capabilities* derived from information and innovation
- *Partnerships* adapted to specific purposes, global and fixed term
- Adopted by industry about 2000
- Universities mixed behaviors
- U.S. government not there yet

The 21st Century Direction: 2000+

- The 21st century strategy is engagement in partnerships to accelerate capabilities while continuously adapting to a changing global context.

Cold War v. 21st Century: 180^o phase shift

- Pre 1990: Stable context, defensive strategy
- Post 2000: Adaptable context, offensive strategy

Sports Metaphor

- If your basketball team's defense is strong enough to ***prevent*** its opponent from scoring, it can win by playing ***defense***.
- If your team's defense ***cannot stop*** its opponent from scoring, then it can win only by playing ***offense*** and always being able to out-score its opponent.

Sports Metaphor

- Cold War strategy was to win by playing defense –
 - keep adversaries from “scoring” by controlling their capabilities through limiting their access to information and innovation.
- 21st Century strategy is to win by playing offense
 - engaging in partnerships globally to *accelerate* development and use of capabilities and *always* being able to “outscore” adversaries even as they catch up.

University Planning

We are well into the 21st century direction:

“engagement in partnerships to accelerate the creation and use of information and innovations in a context requiring adapting to change”

- Global and national direction
- University direction too
- Problem: need to move away from thinking stability
- Problem: need to move toward engagement in partnerships to accelerate capabilities and adaption

University Problem

Problem: Universities love stability

- Very successful for many years
- Continuing feature of university culture
- Tenure
- Few sunset clauses
- Diminished state funding
- Uncertain federal support for research
- Constraint of departmental and college silos
- Unit based responsibilities
- Changing role of continuing education

Speculation on Outcomes

If engagement in partnerships to accelerate the creation and use of information and innovations in a context of adapting to change, is the direction driving universities, what consequences of it should not surprise us?

FACULTY:

- Some faculty will seek multiple U/I/G appointments, possibly globally, where access to special facilities and like-minded colleagues will accelerate their work.
- Acceleration of interdisciplinary research partnerships for faculty and graduate students will be increasingly attractive especially across departments and colleges, and universities, and even countries.

Speculation on Outcomes

FACULTY:

- Tenure appointment will become less important, and may be passed over for a salary supplement or possibly a partial salary tenure appointment. Tenure is a manifestation of stability. Accelerating capabilities will be the driver.

UNIVERSITY:

- Universities must develop the mindset and processes to respond to disruptive, accelerating change. The surviving culture will weigh adaptability more highly and stability less so.
- Prominent universities will have faculty from all over the world on their rosters who seek partnerships to accelerate their work. They will not be tenure-track or full-time residents.

Speculation on Outcomes

UNIVERSITY:

- Engaging in partnerships will be central to the university's vision and will characterize university operations.
- Universities will focus leadership in particular higher education and research niches to ensure sufficient concentration to assume leadership in them.
- Faculty participation in global partnerships located "everywhere" will expand significantly.
- In-demand talent is a long-term issue. Universities should ensure priority attention is focused on nurturing in-demand talent as well as recruiting it. Talent is the coin of the global realm.

Speculation on Outcomes

UNIVERSITY:

- Because of accelerating change, a primary responsibility of universities will be to nurture working professionals in leadership, management and current skills.
- Partnerships bringing in unique capabilities will be in demand. These partnerships, domestic and international, will be fixed term and created to accelerate impact.

EDUCATION:

- Growth of on-line and blended instruction, which is adapting to student's needs and demands, will grow and reduce face-to-face instruction. Convenient access to material content is a key.

Speculation on Outcomes

EDUCATION:

- Students must be prepared to prosper in global careers by understanding cultural issues for global partnerships through first-hand experiences in “different” foreign cultures.
- Students seek to learn by doing and to engage in their learning through competitions (e.g., Solar Decathlon), service programs (e.g., EWB), prizes (e.g., Sikorski Prize), challenges (e.g., NAE Grand Challenges), internships, and international experiences.
- Access to education will accelerate as a priority as demonstrated by the attractiveness of MOOCs.

Speculation on Outcomes

EDUCATION:

- The drive to innovation is a characteristic of the 21st century direction.
- Innovation should be a feature of university education for *every* student from i) value creation through ii) understanding cultures of innovation to iii) innovative implementations.
- Universities are singularly poised to create university-wide cultures of innovation, reaching out to the entire community.
- An increasing need for re-training professional engineers to prepare them for positions in new fields will become a mainstream university responsibility rather than an auxiliary service.

Speculation on Outcomes

Charles Darwin paraphrase:

- “It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is most adaptable to change.”

- Universities need to fit into the direction of our time:

- **“engagement in partnerships to accelerate the creation and use of information and innovation while adapting continually to changing global features.”**

- Universities need to recognize that stability is dead and, taking Darwin’s counsel, they too must also become adaptable to change.

Closing

- Universities need to fit into the national direction of the time.
- Engagement in many forms of partnerships to accelerate capabilities is the direction of our time.
- Partnerships are not permanent but for fixed periods and purposes.
- Expect stability to be chipped away from our universities sooner rather than later. Think adaptability in policy and practice.
- Stability works against university achievement today.

