

From: Bahram Ravani [<mailto:bravani@ucdavis.edu>]  
Sent: Thursday, October 25, 2012 6:16 PM  
To: nnmi\_comments  
Cc: [bahramravani@hotmail.com](mailto:bahramravani@hotmail.com)  
Subject: NNMI Comments

Dear NIST Office:

I am pleased to provide the following response to RFI entitled: "NNMI Comments" on behalf of the College of Engineering at the University of California-Davis.

Bahram Ravani, PhD

Professor, Department of Mechanical and Aerospace Engineering Electrical and Computer Engineering  
Graduate Group Biomedical Engineering Graduate Group Co-Director, AHMCT Research Center  
University of California Davis One Shields Avenue Davis, CA 95616

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UC Davis Response to "Request for Information on Proposed New Program: National Network for Manufacturing Innovation"

10-25-2012

Technologies with broad impact

1. What criteria should be used to select technology focus areas?

Technology focus areas should include those in which the US has research-related international dominance and in which there can be cross fertilization into manufacturing. Such areas include aerospace, computers, information technology, and medicine. Focus areas should also include those that are relevant to national security broadly defined including those relevant to water and other natural resources, agricultural and food production, and energy efficiency and alternative energy to reduce dependence on non-renewable energy resources.

2. What technology focus areas that meet these criteria would you be willing to invest in?

The UC-Davis Northern California Institute would like to take advantage of digital manufacturing techniques that will improve efficiency and accuracy and reduce the need for physical prototypes and would have broad applicability for technologies related to sustainability and security.

3. What measures could demonstrate that Institute technology activities assist U.S. manufacturing?

Measures that would demonstrate that an Institute is successful in assisting US manufacturing include the adaptation by industries of technology and tools developed by the Institute, an increased

manufacturing workforce, a decrease in US dependence of products manufactured overseas, and translational effects of the work of the Institute in business incubation and start-ups.

#### 4. What measures could assess the performance and impact of Institutes?

Measures that would assess the performance and impact of Institutes include an increase in regional employment in manufacturing, attraction of top quality students into manufacturing educational programs, and an increase in the training and retraining of manufacturing specialists and technicians.

#### Institute Structure and Governance

#### 5. What business models would be effective for the Institutes to manage business decisions?

Individual Institutes should have a prime host with sub-awards to the partner organizations (rather than individual awards made to each member of an Institute's consortium). This structure of a single prime with multiple sub-awards will allow for the highest degree of quality control and accountability by the prime, and will allow concurrent flow-through of funding with IP terms and conditions from the prime to the subs.

Individual consortium members should not be required to contribute co-investments, even if there is a minimum co-investment threshold for the Institute as a whole.

Unfunded partners should be allowed to participate in consortia and should be subject to the IP arrangements of the consortium.

#### 6. What governance models would be effective for the Institutes to manage governance decisions?

Institutes should develop a "manufacturing extension" program analogous to the "agricultural extension" program present in most states. The agricultural extension programs have been very successful in the past and if a similar structure can be envisioned for manufacturing there will be high potential for success.

#### 7. What membership and participation structure would be effective for the Institutes, such as financial and intellectual property obligations, access, and licensing?

The Institutes and Network should include terms and conditions that are not in conflict with the Bayh-Dohl Act of 1980, as it pertains to non-profit organizations and public research and education institutions. Such terms and conditions should include retaining the right to disclose information and freedom to publish, and the right to own intellectual property that was solely developed at an organization. There should not be any clauses that would allow blanket access to background IP or that would conflict with public institution policies regarding copyright ownership. Any IP plan should accommodate the likely event of visitors among any of the consortium members (universities, for-profit companies, national laboratories, etc.) for example that ownership follows inventor-ship and that there is co-ownership of IP that was jointly invented.

#### 8. How should a network of institutes optimally operate?

A distributed hub approach (as opposed to central hub) in which there are several (5-10) main nodes (Institutes) that function semi-independently within the Network, each managing a team of partners yet with the capacity to redistribute resources to other nodes of the Network when necessary.

9. What measures could assess effectiveness of Network structure and governance?

Sustainability and expansion in membership and member participation, effectiveness in the extension activities to local and regional industry can be some of the measures.

#### Strategies for Sustainable Institute Operations

10. How should initial funding co-investments of the Federal government and others be organized by types and proportions?

The federal government should provide core funding for an initial sustained period, with no co-investment required for the first few years. Federal government share should decline over the performance period. The performance period should be long enough (i.e. more than 5 years) to allow for substantial penetration of the activities into the regional industrial sector. Using the funding model for the agricultural extension programs can be a model.

States and state-funded organizations should not be required to co-invest although such investments can be welcomed.

11. What arrangements for co-investment proportions and types could help an institute become self-sustaining?

If co-investment is to occur, all forms of co-investment should be permitted including cash and in-kind (salaries, equipment, lab space, internships).

In order to encourage the greatest number of partners to participate in an Institute, tiered membership for partners in the consortium should be permitted and encouraged, based on the level of involvement of partners in the Institute.

In order to ensure that job growth is encouraged in those regions that have been hardest hit by the economic downturn, co-investment should be proportional to the economic health of the region in which the manufacturing sector will be developed. Similarly, co-investment by private sector, for-profit organizations should be proportional to the size of those organizations.

12. What measures could assess progress of an Institute towards being self-sustaining?

Institutes should be assessed on their ability to evolve to an enterprise model over a 10-year period.

13. What actions or conditions could improve how Institute operations support domestic manufacturing facilities while maintaining consistency with our international obligations?

Again a model like agricultural extension programs can provide a basis to consider.

14. How should Institutes engage other manufacturing related programs and networks?

Institutes should demonstrate tangible partnerships with university-based business schools and schools of management. They should propose new or engage existing programs that provide entrepreneurship training and business development training.

15. How should Institutes interact with state and local economic development authorities?

Economic development authorities should be partners in the Institutes and should be encouraged to provide in-kind co-investment for example in the form of workshops and incubator space.

16. What measures could assess Institute contributions to long term national security and competitiveness?

Assessment of an Institute's contributions to long-term national security and competitiveness can be made by measuring its impact on employment, training and attraction of young talent into the manufacturing sector.

#### Education and Workforce Development

17. How could Institutes support advanced manufacturing workforce development at all educational levels?

Institutes could support advanced manufacturing workforce development at all educational levels by requiring that that a key partner (or even prime contractor) be an institute of higher education. Other

required membership could include community colleges, technical institutions, or 4-year colleges.

18. How could Institutes ensure that advanced manufacturing workforce development activities address industry needs?

If much of the work of the institute is through extension activities like agricultural extensions then institute members will be traveling and working with local and regional industries and would be able to program their workforce development activities to satisfy the needs observed during these extension activities.

19. How could Institutes and the NNMI leverage and complement other education and workforce development programs?

Involving institutes of higher education with BS, MS and PhD programs, Universities with BS and MS programs, and junior colleges would allow leveraging the skilled work force development activities.

20. What measures could assess Institute performance and impact on education and workforce development?

Increase in the number of graduates or trained professionals at different levels who enter manufacturing jobs as well as the number of students and retraining professionals attracted to specialize in the manufacturing field.

21. How might institutes integrate R&D activities and education to best prepare the current and future workforce?

Institutes should include education and workforce development plans that engage all levels of education from K-12, through associate,

bachelor, and graduate degrees, as well as retraining a technical workforce.

Bahram Ravani, PhD  
Professor, Department of Mechanical and Aerospace Engineering  
Electrical and Computer Engineering Graduate Group  
Biomedical Engineering Graduate Group  
Co-Director, AHMCT Research Center  
University of California Davis  
One Shields Avenue  
Davis, CA 95616

Chief Technical Editor  
ASME Journal of Computing and Information Science in Engineering

Email: [bravani@ucdavis.edu](mailto:bravani@ucdavis.edu)  
Office: 1013 Academic Surge Building  
Voice: (530) 754-6130  
FAX: (530) 752-6714