

The future of surveying will be what we make it.

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Concerned by the declining number of persons taking both the Fundamentals of Surveying (FS) and the Professional Surveying (PS) exams, the National Council of Examiners for Engineering and Surveying (NCEES) hosted a “Forum on the Future of Surveying” at San Diego, California on January 22, 2016. A link to a summary of the meeting as posted by NCEES is:

<http://ncees.org/about-ncees/news/ncees-hosts-forum-to-strengthen-future-of-surveying-profession/>

This article is a continuation of the Disruptive Innovation article appearing in the January 2016 issue of NMPS Benchmarks. That article was written with knowledge of the planned Forum but I did not know then that I would be invited to attend. As it turns out, after reading the Disruptive Innovation item, the President of the American Association of Geodetic Surveying (AAGS) asked me to represent AAGS at the NCEES Forum. But, the reader should understand, the views expressed herein are mine and do not necessarily reflect those of any other person or organization.

The NCEES summary correctly identifies issues considered by attendees and those issues deserve additional discussion by interested persons in the broader professional community. But, I am not convinced those are the only relevant issues. I believe that there are issues not covered during the Forum that should be discussed along with NCEES’s carefully scripted agenda. That being the case, I believe it is possible for the surveying profession to both survive and thrive in the future.

A mistake to be avoided is making the measure the objective. I readily concede that the declining number of persons taking the NCEES exams is a legitimate concern. It could be said those declining numbers provide justification of the allocation of resources to host the Forum. And, Forum organizers are to be commended for looking beyond the measure. It was a very productive session and quite beneficial on several levels. But, discussion at the Forum was incomplete. What was missing?

“Pre-reads” distributed prior to the Forum included a well-written 2011 article by Richard Vannozzi on “Perspectives on the Future of the Surveying Profession”

<https://s3.amazonaws.com/webapps.esri.com/esri-proceedings/proc11/papers/4045.pdf>

He makes a number of excellent points in the article but the one I’d like to highlight is his description of the excitement and opportunities afforded surveying practitioners by the digital revolution. In order to enjoy those benefits, we need to (collectively) embrace education, learn to use new technologies, and interact with other disciplines in a proactive manner. If nothing

else, read his conclusions. An implication of a declining number of persons taking the NCEES exams is that surveying is dying or will become irrelevant. Vannozzi's conclusions paint a different picture.

The Forum pre-reads also included the "Disruptive Innovation" item that I wrote for the January 2016 issue of Benchmarks. I am grateful for that. Different ones have commented to me on the insight and description of the challenges involved – of course, I concur. My disappointment at the Forum was that disruptive innovation and implications of the digital revolution, possibly a root cause of the decline in the number of NCEES exams being taken, was not brought up or discussed. FYI, a link to the Disruptive Innovations article is:

<http://www.globalcogo.com/DisruptiveInnovation.pdf>.

Separately, prior to the Forum, there was also an exchange of emails sent back and forth between attendees recommending various ideas and resources for consideration. Those emails included significant relevant information but Forum organizers appropriately curtailed the exchange before it got out of hand. The point is, given the time constraints of the 1-day Forum, there were many good ideas floating around that simply could not be considered and discussed. To credit of Forum organizers, the meeting was focused and conducted very efficiently. The summary provided by NCEES is, I believe, quite accurate.

On the other hand, following the Forum Dr. William (Bill) Hazelton, representing the Surveying & Geomatics Educators Society (SaGES), submitted a response in which he shared his insight. On the heels of an impressive career in Australia, Dr. Hazelton has spent the past 20 year in the United States and has taught at a number of surveying programs here in the US. He has participated from the educational perspective in various efforts to rejuvenate surveying. He questions the effectiveness of recruitment, branding, and marketing. He suggests instead that professional leaders need to investigate the consequences of generational changes. To me, that is a different way of saying that the profession needs to investigate and attempt to better understand the implications of disruptive innovation.

Criticizing efforts of others should be avoided unless a better alternative is offered for consideration. NCEES is to be commended for hosting the Forum. Pre-reads were appropriate and very helpful. It appears that the Forum agenda was developed with some preconceived goals in mind and the discussion was carefully kept "on track." True, we saw evidence that un-monitored email exchanges can be counter-productive and that was handled graciously by organizers. However, given the scope of the challenge and the diversity of views represented by attendees, more time is needed for issues to be shared and discussed. Follow-up efforts are certainly warranted and anticipated by many. That said, I would like to offer the following:

1. Future efforts should include discussions of:
 - a. The importance of well qualified boundary surveying professionals. Michael Pallamary notes the contribution of Curtis M. Brown and provides excellent anecdotal evidence of what a successful surveying business can achieve. In my opinion, this component of

surveying is **absolutely essential**, but with regard to protecting the public, boundary surveying is but a small piece of the spatial data applications economic pie. How can (or should) that be reconciled in the policies of state boards and NCEES?

- b. The pre-read by Richard Vannozzi. We don't need to agree with all his points but the issues he raises deserve consideration.
 - c. Implications of Disruptive Innovation. The way professional practice is conducted has changed dramatically as a result of the digital revolution. Consequences are far-reaching.
2. The next steps listed in the NCEES Summary are good, but they are limited in that they reflect the views of those organizing and attending the Forum. Hopefully, additional "next steps" could be added to the list based on a discussion of "broader" issues. For example:
- a. The article on the Future of Surveying written for WestFed in 2011 contains both general and specific recommendations that surveyors can follow to establish a reputation for leadership in competent use of 3-D digital spatial data.

<http://www.globalcogo.com/WestFed.pdf>

- b. Accreditation criteria should be re-visited. ABET is to be commended for listening to the various professions and developing avenues of accommodation for a wide variety of goals for professional societies and educational institutions. The alternatives for evaluation of surveying programs in the Engineering Accreditation Commission (EAC), the Applied Science Accreditation Commission (ASAC), and the Engineering Technology Accreditation Commission (ETAC) accommodate a range of goals and program focus for many institutions. Regretfully, one size does not fit all with regard to criteria and the policy of granting one society (NSPS) undue responsibility for surveying criteria. The whole scope of surveying accreditation criteria needs to be revisited. Yes, boundary surveying is enormously important and programs devoted to preparing graduates for practice and licensure are evaluated by the ASAC. Many persons (including yours truly) have worked diligently in support those criteria and operation of the ASAC. However, engineering surveying has a broader focus (especially with regard to disruptive innovation) and the criteria for EAC surveying engineering programs should reflect reality. The goal is that persons graduating from an EAC surveying engineering program should be prepared for and expected to be able to pass the Fundamentals of Engineering exam. To that end, the Surveying Engineering Division of the ASCE Utility Engineering and Surveying Institute should assume responsibility for EAC criteria for surveying engineering programs. Surveyors have rightfully worried that, with boundary surveying being a smaller and smaller part of the total surveying economic pie that engineers and those involved in other spatial data applications will over-run the surveying profession. That must not be allowed to happen.
3. In keeping with the challenge of accommodating disruptive innovations, activities and trends affecting surveyors and the surveying profession that should not be ignored include:

- a. In February 2015, the Coalition of Geospatial Organizations (COGO) published a “Report Card on the U.S. National Spatial Data Infrastructure.” A link to the report is:

<http://www.globalcogo.com/A500.pdf>

I had the opportunity to present, review, and discuss implications of the COGO Report Card at the Fall 2015 New Mexico Joint Annual Conference of the American Planning Association (APA) and the American Society of Civil Engineers (ASCE) on September, 24, 2015, at the Las Cruces Convention Center. A link to that presentation is:

<http://www.globalcogo.com/APA-ASCE-Spatial.pdf>

- b. But, an absolutely profound opportunity to be pursued could be a recently published United Nations Study on “Future trends in geospatial information management.” A link to that document is:

<http://ggim.un.org/future-trends/>

In my opinion, this document is a “must-read” for anyone participating in discussions and voting on policies affecting the future of the surveying profession in the United States.