SO YOU WANT INNOVATION!

by Dr. Keith McDowell

Dong.

The sound of an email arriving in my new i-Phone. Dong. What do you mean I have to create a UT System research continuity plan? Dong. You're kidding! Weekly ARRA reporting to the state on all proposals and all grant awards? Dong. Don't worry, all the animals survived the vivarium fire. Dong. You have been selected for a random document retention audit. Dong. Two companies in the incubator have declared bankruptcy. Dong. Help Desk, how do I turn off the dong?

Innovation!

You've gotta love it. It's produced instant gratification for information. We're electronically wired 24x7. Of course, you might not like the message. But innovation is essential for America to maintain its dominance in global competition. No one disagrees with that premise. The issue is how do we maintain and accelerate innovation in the context of the university research enterprise, given its history as the engine of basic research and the current drive to make universities engines of commercialization and economic development. Are such missions compatible? What is the role of research administration?

As a newly minted vice president for research in 2001 at The University of Texas at Arlington, my first question was "where is the gold key?" I naively started the job expecting to be handed the gold key that opened doors to the inner sanctum of senior administration – the putative smoke filled rooms where real decisions are made. Instead, I met with an audit team who informed me that I must undergo a change of management audit. "How can this be," I muttered? "It's my first day on the job." Little did I know!

But then, I had a secret weapon that few possess. I had Dr. Marianne Woods, the 2009 winner of the NCURA Outstanding Achievement in Research Administration Award, as my Associate Vice President for Research. Without her, I would have accomplished next to nothing. As a result, I learned the first and most important lesson about being a Vice President for Research: if you don't already have a top research administrator, hire one. Even more important, I would convert this into my first recommendation for improving innovation in America: enhance the professional status of research and technology commercialization administrators. Without this core of professionals, innovation will creep along at best.

How serious is America when it comes to accelerating innovation? How serious are universities? We are all aware of the rapid transformation and expansion of university culture to move from technology transfer to embrace technology commercialization. My goodness, we've even taken the bold step in many universities of changing the name of the Technology Transfer Office to the Office of Technology Commercialization under the pretense that we know the difference. What is the difference and what do we mean by technology commercialization?

Technology commercialization has become a catchall phrase to describe the role played by universities in knowledge transfer from the laboratory to industry. A specific element is traditional technology transfer through licensing of intellectual property (IP). But technology commercialization encompasses much more including marketing of IP in the innovation marketplace, formation and mentoring of startup companies, creation and management of business incubators, partnering through public-private partnerships, and creation of research or innovation parks. Technology commercialization professionals must possess a wide range of skills and the ability to interact with a spectrum of people from faculty, university administrators, venture capitalists, angel investors, entrepreneurs, business leaders, government officials, politicians, and, yes, lawyers. It presents a daunting array of challenges. But what about research administrators? How will you be affected by this ongoing commercialization transformation?

The Future Ain't What It Used To Be – Yogi Berra

As universities engage in technology commercialization, my crystal ball tells me to expect some changes in strategy and practice that will affect research administration. Here is my list with some explanation as to what they are and the potential consequences.

Integration across university offices

One of the prominent, emerging strategies for technology commercialization, especially tailored for industry, is the notion of building a long-term, trust relationship – not just engaging in deal by deal interactions. The goal is to build a network of relationships. In some measure this strategy is a response to the negative press generated by industry, venture capital, entrepreneurs and politicians about how difficult they claim it is to work with universities. These claims mostly arise from anecdotal stories as opposed to case analysis, but they are effective as a message. On the other hand, the relational network approach is a powerful strategy in its own right and one that I advocate. It requires that the office of sponsored projects and office of technology commercialization work with the outreach or development offices to generate an integrated and planned

interaction with external entities, including companies and venture capital, to achieve the creation of new inventions or innovations and their enhanced commercialization as university intellectual property. Although some research administrators are currently engaged in such activity, it is going to increase significantly in the future. Integration to achieve commercialization is a great concept, but how one structurally accomplishes it is a challenge with no clear best practice at present.

University mission

There are many who believe that universities should remain pure – an ivory tower free of external influences and encumbrances including commercialization. My comment to the purist is "get over it." It's a done deal. It happened while you were deeply engaged in the pursuit of knowledge and understanding. Universities have become major players in regional innovation ecosystems. Indeed, institutions in The University of Texas System are required by the Board of Regents to include commercialization language in their mission statements.

Regional knowledge and innovation ecosystems

There are some who believe that globalization will diminish the need and the power of regional ecosystems. Others believe that universities must step forward and fuel the growth of regions through alignment of their programs and the spinout of their knowledge into startup companies. Whatever the future specifically holds in store for us, it is clear to me that regional engagement by universities will become a key component of their mission. How will that engagement play out?

Traditionally, universities have participated in standard economic development by helping to attract and retain industry through the educated workforce they provide and through various forms of research or industrial parks. More recently, university incubators, startup mentoring, and entrepreneurial programs have gained in prominence. But the future will involve more complex and fluid dynamics. Instead of ecosystems that reflect a gatekeeper control and command structure, regional ecosystems will reflect more the character of self-assembled and constantly changing organisms that adapt and mutate to meet a turbo-charged timescale. Gateways rather than gatekeepers will be the norm. Notwithstanding this rapid and dynamic systemics, there will always be the need for the core functions of research administration and technology transfer. How will those functions be organized and administered as universities create and dissolve partnerships, especially as universities assume a dominant and leadership role in managing research and technology transfer activities? How loose will the boundaries between the university and self-assembled entities become? Lest we forget, compliance and accountability are not going to disappear simply to make America more agile and the world leader in innovation.

Public-Private Partnerships

The President's Council of Advisors on Science and Technology produced a report in November 2008 entitled University-Private Sector Research Partnerships in the Innovation Ecosystem. It stressed that public-private partnerships are a "critical component of the innovation ecosystem." I agree. So, why don't we have more? Have our offices of sponsored programs and technology commercialization become gatekeepers instead of gateways as some have argued? Are universities to blame when regional economies falter or fail? No, of course not! Public-private partnerships are complex undertakings that are part of the warp and woof of regional ecosystems, but not the only factor. There is no simple rule or process that ensures growth of the partnerships, nor their sustainability. Nonetheless, universities must encourage and participate in public-private partnerships, determine what works and what does not, and reform the culture of research administration and technology commercialization to make sure they become gateways to innovation.

National Innovation Foundation (NIF)

Do we need an innovation czar? Do we need a foundation to manage the innovation ecosystem through both policy and funding? We clearly need policy and funding already exists. The SBIR and STTR programs along with the Manufacturing Extension Program are examples that could be characterized as innovation programs. Many others have been identified in the innovation literature. As President Obama stated on August 5, 2009, "Innovation is more important than ever." Many believe that the formation of an NIF is a natural extension of the Vannevar Bush model that has informed science and technology policy since World War II. Only time will tell whether America takes this step.

Tenure and promotion guidelines

While tenure and promotion committees have long considered invention disclosures and patents in their decisions – although perhaps in a casual manner, the inclusion of commercialization activities such as marketing of intellectual property or participation in the formation of startup companies is now being adopted. For example, The University of Texas System Board of Regents in March, 2008, formally accepted invention disclosures, patents, and commercialization activities as appropriate metrics for tenure and promotion. The net effect of this culture change is to put increased pressure on research administration to work with faculty to achieve greater success in commercialization, especially by helping to build relationships through sponsored research agreements with industry or through public-private partnerships.

Innovation centers

The concept of an innovation center at a university is growing across America and is taking on many forms. Often the center is part of the regional ecosystem and located at a research park. For my purposes, I define an innovation center in the context and tight definition of innovation as adding commercial value to a discovery or invention following an invention disclosure. As such, the innovation center would house a group of professionals skilled in applied research and development as well as market analysis of intellectual property and the development of a business plan. The game would be to triage invention disclosures and process the ones in need of further development through the innovation center. Enabling technologies would be especially susceptible to this form of processing as new products could be envisioned and created. There are drawbacks to these centers such as the cost and questions about the use of students to perform thesis research on developmental projects. Issues of sponsored research and intellectual property rights can be problematic. However, a number of universities have created innovation centers and are seeing some success. The Alabama Innovation, Mentoring and Entrepreneurship center at The University of Alabama is an excellent example. ➤

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Innovation!

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Open-source publication

How long will peer-reviewed journals as they currently function continue to exist? Good question – you can get lots of debate on both sides of the issue. The current system is an authoritarian or gatekeeper system – one of control of what and who gets published. I have to admit that I come from the counterculture generation – one that never liked an authoritarian Establishment. I'm more at home with a system where researchers post their articles on an open source, internet site and fellow researchers blog or comment. The counter argument is that bad science will propagate or that science will become politicized. So, you really believe the peer review system stops that? What are we afraid of? Wikipedia has proven that such systems work and work well. It doesn't mean that some control is not essential, but I vote for innovation using gateways instead of gatekeepers. The younger generation will demand it, so get ready.

Grant system under stress

And now for some real controversy – how long will the peer-reviewed grant system continue to exist? Probably too long from the perspective of transformational research and disruptive innovation! Everybody talks about reforming the system to make sure young scientists, engineers, and health professionals are properly funded at that stage in their career when they are most likely to be transformational and disruptive, but we still have a long way to go. Nobel Laureate Roald Hoffmann recently suggested in Science magazine [Science, volume 325, page 528] that we stop funding graduate students on grants and instead fund them through fellowships, thereby providing an extra measure of flexibility and moving us away from "me to" research. I'll be more radical and suggest that we switch from a system that funds ideas that are acceptable to the Establishment one at a time to a system that directly funds people. If they crater and don't perform over time, we reduce or pull the plug on funding. While I'm personally conflicted on how best to manage the grants process, I believe the sheer weight and exponential growth of the present bureaucracy will force change, independent of the forces of economic development and global competition. Research administrators must be prepared for these inevitable changes.

The Challenge

The future of research administration and its overlap with technology commercialization presents both a challenge and an opportunity for universities. It is a future filled with new paradigms, new organizational structures, expanded regional interactions, complex deal-making, and pressure to excel in commercialization and economic development. I have complete faith in the ability of research administration professionals to rise to the occasion and provide the support needed for success. The challenge is to understand that change will occur and that its form will likely surprise us.

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A Poem: NSF Report

Now I lay me down to snore
So here's my NSF report.
If I should die before I wake
Just grab my cash and buy a cake.

It really wasn't quite so bad
To write this thing
But I'm so sad
I didn't write it long ago.
And failing that, I write these lines
In stark reminder of my crimes
And pecadillos that I know
Did victimize my friends and all
The granty people down the hall.
Who treat me far too well, and so
Should not put up with me at all.

I'll dine on water, and on gruel
Awaiting my next grant renewal.
The last I did, it seemed well written
At least it seemed when I was sittin'
With my 'top across my lap.
But then I woke up from my nap
To gaze upon my limpid screen
And see what I had never seen:
The text of mediocrity
The megalo-verbosity
The drivel that was oh, so clear
and seemed so clever and so droll
was not enough to make the roll
At NSF, who by design
Let pass a long and baleful time
Then failed to fund my grant last year.

And tho, unfunded, high and dry,
I never weep, or sniff, or cry.
I merely seek for that employ
That suits the bad-grant-writing boy,
Who cannot publish, write or speak,
And hit the skids downtown last week.
I do not care, I really don't
It doesn't bug me, so I won't
Complain at all. I don't, I'm not...
Hey! I'm just talkin' here, so what?

Another grant I must submit?
One more report, as yet unwrit?
I laugh, I cry, my sides are split.
Cut me some slack, I'm over it.

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