From the Editor

Encouraging the Use of Visualization Technology

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At the workshop on visual analytics in healthcare at the 2010 IEEE Conference on Visual Analytics Science and Technology, I had the privilege to report on the opportunities and challenges for advanced visualization tools and technologies in industry. The resulting discussions led me to believe that CG&A, with its role in both academia and industry, might be a suitable and possibly even more appropriate forum to communicate those thoughts. Both communities should be involved in rapidly transforming state-of-the-art science and research findings into industrial best practices.

A Slow Adoption Rate

My comments and recommendations are based on a recent, nearly four-year period in the healthcare industry in which my role included advocating the exploration, business-centered evaluation, and, ultimately, adoption of advanced visualization and analytics tools. During this period, I listened the visualization research community regularly discussing the need to better communicate their advances to potential application industries and thus increase their relevance from an industry perspective.

Despite public discussion on healthcare information exchange to enable better decision-making, which will require better analytics capabilities, we face many, almost quixotic, challenges. This industry’s adoption rate of new technologies is close to—if not occasionally more than—a decade. Such a slow rate is due to an antiquated infrastructure, notoriously small margins that prohibit continuously large IT investments, domination by IT enterprise systems providers whose business relies on the existence of legacy infrastructures, and a risk-averse culture.

Consequently, adopting new technologies and techniques requires significant support from the inside, which in turn depends on people understanding and supporting your cause. But what if there’s little to no awareness and, therefore, tolerance to listen to the value proposition you’re advocating? One answer is to establish a process of educating businesses, developing their awareness, and sensitizing them to look beyond their status quo so that, ultimately, they demand the technological advances from their enterprise vendors.

Laying the groundwork for such a process must

Thank You, Maureen Stone

I’m pleased to thank Maureen Stone for her long-time commitment to CG&A, where she filled various roles during her tenure from 1998 to 2010. Recruited by the late Bertram Herzog and introduced to the CG&A readership as guest editor of a special issue on the Virtual Reality Modeling Language, by 1999, Maureen assumed the newly created role of associate editor in chief for special issues. In this role, she created the process for expediting manuscripts from submission to publication, while ensuring the highest standards. She fortified this process from 1999 to 2007 under various different editors in chief, from Bert Herzog to Jim Thomas to John Dill.

Maureen subsequently became CG&A’s editor in chief and served in this role for another three years. Even after this appointment ended, Maureen’s loyalty to the magazine continued as she continued as the liaison to Computing Now (www.computer.org/portal/web/computingnow), which features IEEE Computer Society publications.

Maureen’s commitment to CG&A was characterized by defining newly created roles, exceeding expectations, and creating hard-to-fill voids whenever she vacated a position. A significant part of the magazine’s identity and excellent reputation is due to her. I thank her for her long-term perseverance, focus on excellence, and, most of all, patience and a supporting hand for new board members, many of whom she recruited over the years, including me.
be a concerted, coordinated effort between academic thought leaders, their graduates who dare to enter industry, and senior industry practitioners who own the current modus operandi in data analytics and reporting. To facilitate such efforts, we can do several things.

**Language and Literacy**

Meet potential users where they are. They don’t normally think in terms of visualization, and, if they do, they most likely relate visualization to implicit cognitive modeling rather than its data-analytics components. Basically, visualization is just a way to improve decision-making. So, the term “advanced analytics” might open more doors than, for instance, “visual analytics.”

To increase literacy, we must provide more opportunities for practitioners to educate themselves about analytics advances. Culturally speaking, businesses tend to seek out the typical offering from enterprise vendors, so those vendors might first need to be convinced to adopt new technologies. Recent graduates entering business environments should heed this encouragement: don’t adapt and don’t get assimilated. Many traditional businesses recognize the need to change, want to change, and have subscribed to “reverse mentoring,” in which the younger, early career hires get their senior counterparts, and even executives, up to speed. This isn’t only a great opportunity for creating in-house literacy and subsequently driving technology innovation; it also creates visibility and differentiation that can enhance career advancement.

**Value Proposition**

Why is it that at a typical academic conference, the impression of “yet another visualization technique based on an atomic feature” seems to sneak up on you during many of the presentations? It’s hard to create a business-relevant value proposition around atomic features and techniques that can’t be generalized.

On a different note, proof of effectiveness is more credible if it’s based on realistic data and backed by a domain expert. So, the many multidisciplinary collaborations that the US National Science Foundation and the US National Institutes of Health sponsor and the visualization community embraces are right on. They should be maintained, developed, and deepened such that those domain experts feel comfortable “eating their own dog food” in terms of regularly using the developed tools and techniques. This will create visibility and demand in adjacent industries and hence among enterprise vendors.

**Design and Implementation**

Guess what? Industry won’t adopt technology that a graduate student developed by hacking yet another tool while focusing on minimal implementation cost and effort. Open source platforms should be further employed and developed to avoid redundancies, continuously improve the components most valuable to the community, accelerate advances, and give original-equipment-manufacturer developers the opportunity to quickly integrate advances with their enterprise platforms. In return, commercial providers should open their platforms somewhat to academia as free platforms for development. The widespread concern regarding intellectual property is understandable, but it doesn’t apply as long as we
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speculate as to the value of atomic features based on irrelevant platforms that the true end user can’t use in the foreseeable future.

Commercialization
Why are advanced-analytics and business-intelligence components for enterprise systems so expensive that getting buy-in on such a large strategic investment requires a fundamental internal awareness of potential business value? Remember, internal decision-makers often don’t know what they don’t know and might never get there if the price tag is too high. Furthermore, this high cost puts those technological advances into the category of special-purpose procurements, limiting their scope to a small audience of analytics experts. This also further limits the opportunity for broader, business-wide advocacy and literacy regarding the value proposition of advanced-analytics techniques such as interactive visualization.

What if those components were free, allowing internal visionaries throughout the enterprise (yes, those do exist) to explore business applications without risk, demonstrate business-specific value, and thus increase the relevance of otherwise purely academic advances? It might actually provide more business justification as well as increase demand throughout the enterprise for such technology and, consequently, for the underlying enterprise infrastructure. The result might well be a win-win-win situation between academia, industry, and enterprise vendors. I’m sure I’m oversimplifying—or am I?

Communication
If somebody asked who had the biggest impact on creating industry awareness and interest for interactive visualization, one predominant bipartisan answer would be Al Gore. This isn’t because he presented environmental-trend data at the IEEE Visualization Conference or was an ACM Siggraph keynote speaker. It’s because he used mundane visualization technology to tell a story at a venue that many business decision-makers and executives have embraced as a setting to get up to speed on the newest and coolest from academia and industry—the Technology, Entertainment, and Design (TED) conference. Similarly, many industry representatives who would never be associated with visualization technology and applications know Hans Rosling and his use of animated visualizations to tell insightful data-driven stories. (www.ted.com/speakers/hans_rosling.html).

So, even academic researchers and scientists should more actively pursue those venues that are frequented by the end users they’re trying to reach. Admittedly, this might involve a certain amount of discomfort based on the lack of technical depth and scientific exchange at those gatherings, which are more oriented toward networking, creating visibility, and even salesmanship. For interactive technologies, it might be TED; for medical technologies, TEDMED; for social media technologies, South by Southwest; and for multimedia, the Consumer Electronics Show. However, what they all have in common is that the right people are there to engage with and to turn into industry advocates for adopting interactive visualization in the real world.

Similarly, those business executives don’t read IEEE journals but trust the maturity of a technology once Bloomberg Businessweek, The Wall Street Journal, or the Harvard Business Review have reported on it. So, besides the tenure-relevant academic publications, publishing in these and other more popular science-oriented magazines will do a better job of getting the word out and supporting the uphill battle that internal advocates are already fighting.

In technology innovation—defined as putting scientific advances to real-world use—the traditional handshake model between academia and industry is leading to far too many dropped batons and extended laps, which are not acceptable anymore considering the speed at which technology is changing and innovation is needed. A more integrative approach based on mutual understanding and exchange might not only accelerate innovation in the first place, but likely even result in the identification of new exciting research challenges to fuel the innovation pipeline of the future.

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