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Immediacy Versus Accuracy

Michael T. Eismann



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I recently received an Amazon Echo as a gift from my family and have been experimenting with it a little in my free time. I must admit that I have not yet integrated it into my behavior patterns. As a typical example, I occasionally ask my wife or daughters about the weather forecast. Instead of answering, they simply say, “Alexa, what is the weather forecast for tomorrow?” and let me listen for the answer. Generally, it is just as accurate as any meteorologist’s forecast. Alexa is regularly called upon to mediate disagreements about facts, but this is not always successful as she is sometimes unsure or even simply incorrect. For example, I inquired during the NCAA basketball championships, “Who is the basketball coach for the Ohio State University.” She answered, “The football coach for the Ohio State University is Urban Meyer.” No matter how I rephrased the question, she was determined to tell me about Urban Meyer.

As a portal to the Internet, Alexa shares its inherent characteristics: immediate access to a wealth of information intermingled with irrelevant data and misinformation, sometimes by intent. While it provides tremendous potential for learning, there is also substantial risk for misguidance. It is unparalleled for immediacy, but sometimes lacking in relevance and accuracy.

As I consider recent trends in scientific publishing, I feel that the same caution applies. Driven by the accelerating

pace of technological change, authors are placing great emphasis on immediacy and access. These pressures have given rise to numerous Internet sites that serve as repositories for scientific articles, typically without peer review, providing immediate access. Some argue that this is the trend of the future, and that traditional journals will eventually become obsolete. While I agree that journals need to continually evolve to minimize publication timelines, maximize accessibility, and broaden their digital presence, I disagree with the premise of this argument. It is not all about immediacy and access. Quality and accuracy are critical, and science will be doomed if we fail to prioritize these attributes.

Thorough and objective peer review is the best avenue for achieving quality and accuracy in scientific publishing, and this simply takes time and effort. So the tradeoff that traditional journals like *Optical Engineering* make to ensure originality, significance, and scientific quality in published articles is important, even as it may limit immediacy and access. My primary concern as an editor is not that we delay the publication process through peer review, but that our reviewers are providing the thoroughness that this critical task demands. As reviewers perform this service voluntarily amidst competing demands of a world biased toward expediency, I am concerned with a drift away from the old-school principles of a thorough manuscript review: ensuring that the scientific process is rigorously applied, the theory is correctly developed, the experimental methods are sound, and the conclusions logically follow from the results. The true value of the traditional journal model — authenticated accuracy — is dependent on adherence to these principles.

Just for fun, I asked Alexa, “What are the latest developments in self-mixing interferometry?” She replied, “Sorry, I’m not sure.” If you are interested in the answer to this question, it resides in the *Optical Engineering* special section this month. Enjoy!

Michael T. Eismann
Editor-in-Chief