Event Knowledge: From the Haystack to the Desktop

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ABSTRACT

It has been well established that biomedical society scientific meetings are a forum for the best and brightest education and research in a given field, and thus represent great educational value to those who are exposed to it. Despite its immense impact and importance to the global clinical and research community, event knowledge – meeting abstracts, posters, and oral presentations – is extremely difficult for librarians, information professionals, and the researchers and physicians they serve to locate. Through the digital capture, archiving, and online delivery of event knowledge, an important and much-needed educational resource is realized, one that delivers the science in a rich media and timely manner.

Online access to aggregated event knowledge is of great value to institutions and the global medical community as it decreases lost time due to research duplication, increases peer collaboration, and presents an all-encompassing, rich media educational resource. Despite the importance of event knowledge, studies have shown that less than half of the abstracts accepted for presentation at biomedical meetings eventually go to publication, and that it could take upwards of six years for this to occur. Therefore, the digital capture and timely dissemination of event knowledge, and preservation of the *totality* of research being done and presented in a given biomedical field, is of utmost importance.

This paper focuses on the benefits of digitally capturing and disseminating event knowledge, and its importance as an educational resource for institutions and the global biomedical community. Additionally, the current state of event knowledge capture will be discussed, as well as a proprietary event knowledge dissemination platform named Ekatius™.

Introduction

Knowledge presented at annual biomedical meetings can be an important complement to the biomedical information found in peer-reviewed journals, providing the fullest view of research in a given area; however, in its current state, event knowledge is difficult to locate, thus making it an undiscovered needle in the haystack of biomedical information resources.

Thus, it is suggested herein that event knowledge is of great importance to the biomedical armamentarium, and that information professionals consider seeking out event knowledge for their existing print and electronic collections, as well as advocate for more systematic indexing of these digital materials.

Static versus Dynamic Event Knowledge

Association-led meetings have been occurring for many years, providing a means for discussing and imparting knowledge amongst the attendees of a meeting. Until recently, there was no means by which to effectively capture and disseminate the knowledge presented at a given meeting, and this, in part, could help explain the deficiency in acknowledging and adopting event knowledge as a useful tool in the biomedical armamentarium.

Prior to the internet boom in the early 1990s, nearly all event knowledge that came out of biomedical meetings was primarily static and text-based in nature. The knowledge that came of out biomedical meetings prior to the internet consisted mainly of abstract books, conference proceedings, or select papers that were presented at a meeting. Today, with the advent and widespread adoption of the internet coupled with the technological proliferation of recording and presentation devices, event knowledge – now including rich media presentations - can be digitally captured and disseminated online to a global audience.

The distinction, and various implications, between a static and dynamic means of information creation and dissemination are important to consider for biomedical meetings. The static nature of print does not allow for it to be easily or continually updated to reflect new knowledge about a particular subject. Further, the print medium involves a tremendous amount of time and money to produce, edit and deliver, which severely limits the timely delivery and dissemination of the knowledge therein. By the time a print volume of event knowledge is compiled, proofed, printed, and shipped much time may have elapsed, severely limiting the *timely* impact of that knowledge for those seeking it.

In contrast to this, the dynamic nature of rich media information presentation through online channels greatly enhances an association's ability to create, edit, and disseminate their event knowledge in a timelier and ongoing manner. Event knowledge that is digitally captured can be compiled and proofed in a few weeks, and later disseminated to a global audience with the click of button. This timely dissemination ensures that the librarians, information professionals, and the researchers and physicians they serve can access the latest knowledge from a biomedical meeting within weeks of its presentation.

The distinction between static and dynamic information creation and dissemination is not to suggest that one type is better or more effective than the other, but to instead suggest that, when used in conjunction, they provide a more powerful, timely, and all-inclusive view of the latest knowledge on a given subject.

Current State of Event Knowledge

Currently, most event knowledge is still primarily text-based, however, this trend appears to be changing as more organizations are digitally capturing their event knowledge. It is important to note, however, that although event knowledge continues to gain recognition for its importance to the biomedical community, there is currently no central database or resource available to access rich media event knowledge.

Currently, if one was seeking out a particular event knowledge element, they would have to first identify and then explore the holdings of an individual provider of a certain element such as

BIOSIS Previews (abstracts) [1]; PapersFirst (conference papers) [2]; Proceedings First (conference proceedings) [3]; and Conference Archives (presentations) [4]. These presentations, papers, and abstracts can be difficult and time-consuming to locate due to the fragmented and non-uniform nature of their current state and storage.

As most medical librarians know, conference proceedings and abstracts can be difficult to locate, and finding a rich media presentation may be even more challenging. This is a critical deficiency since much of the knowledge presented at biomedical meetings offers perspectives not found in the journal literature, and, if not published, later becomes 'dark data' [5]. As noted on the JMLA website, "Papers presented at meetings often contain the seeds of excellent journal articles" [6], and yet less than half of abstracts presented at biomedical meetings, on average, are published as full reports [7].

A 2003 article published in BMC Medical Research Methodology, wherein the authors analyzed 19,123 abstracts from 234 meetings held from 1957-1999, concluded that "it has been estimated that about 45% of abstracts that are accepted for presentation at biomedical meetings will subsequently be published in full"[7]. With respect to the time it takes for an abstract to be published, the authors used a "survival-type analysis," for a "subgroup of 6383 abstracts or 33% of all abstracts" that had "average follow-up intervals [of] ≤ 1 year" [7]. The resulting analysis yielded estimates "that 27% were published after two, 41% after four, and 44% after six years." A review of the literature supports these estimates as publication rates from various biomedical meetings fall between 32-66% [8 -17]. These findings suggest considerable variability with respect to the publication of abstracts accepted for presentation at biomedical meetings.

It is also interesting to note that for randomized controlled trials (RCTs) presented at biomedical meetings, discrepancies in meeting abstract results and the final paper results are common [18]; however, abstracts are vital nonetheless as "non-publication breaks the contract that investigators make with trial participants, funding agencies, and ethics boards" [19].

Although biomedical abstract publication ratios average 45% [7], the lack of publication for all abstracts does not appear to be a result of poor science, but instead a lack of time on the part of the authors [20-23]. The importance of this 'lost' knowledge or 'dark data' cannot be overstated, as it may provide a basis for future studies or a 'missing link' for another scientist's study [5]. The aforementioned study in BMC Medical Research Methodology states that it can take up to *six* years for event knowledge to be published, a delay that detracts considerably from its value [24]. The critical aspect of event knowledge is its preservation and timely delivery, which technology now makes possible.

Value of Event Knowledge

As technology continues to allow for the creation and mass dissemination of new and unique information resources, the value of event knowledge as a biomedical resource will only increase for several reasons.

Digitally archiving event knowledge - the act of capturing conference abstracts, posters and presentations for later use - creates two distinct advantages that add to the value of event

knowledge. One major advantage of digitally archiving event knowledge is that it gives the science presented at a meeting a longer shelf-life, and makes the event knowledge easily accessible to anyone in the world with an internet connection. Without archiving, the presentations delivered at a meeting are only exposed to a live audience; however, with archiving, this content can be preserved, aggregated, and disseminated to a larger audience *beyond* the physical confines of a given meeting.

A second advantage of digitally archiving event knowledge is that it helps alleviate the loss of any knowledge imparted at a meeting. From a practical point of view for an attendee, it is physically impossible to go to all relevant sessions when attending a conference since most conferences have concurrent sessions. Additionally, medical professionals who are unable to attend a conference due to scheduling conflicts, travel restrictions or cost may not immediately receive communications about discoveries or new ideas that have been discussed and debated. However, through the digital capture, archival, and dissemination of nearly all the event knowledge of a meeting, the global impact of that knowledge can be realized more quickly, efficiently, and effectively.

Adding to the increasing value of rich media event knowledge is its positive alignment with the changing learning habits of medical professionals and students. According to reports published by the American Association of Medical Colleges (AAMC) in 2006, 82.9% of all graduating U.S. medical students were between 24-29 years of age [25], which places them in the "Millennial Generation" [26], a group that relies heavily on the internet and audiovisual materials to stay informed. Currently, 18.8% of the physician workforce in the U.S. is under the age of 40, a figure that will only increase with the retirement of the "Baby Boomer" generation [27].

Shifting physician demographics also signal a noticeable change in the learning methods of medical students, who are our future medical professionals. According to Jennifer Moody, Principal, AmeriMed Consulting, "Millennials" are a generation of "tech-savvy" web-users that are "open and receptive to change," and express a need for "communication through multiple mediums" [26]. Moody further notes that Millennials represent the greatest opportunity for change in medicine since the Baby Boomers, as "this subgroup is poised to take on technological change and the 'new' workplace" [26].

Adding to this, studies have shown that new medical students have a preference for multiple modes of "information presentation." A recent study by Lujan et al, found that "most students (63.8%) preferred multiple modes [2 modes (24.5%), 3 modes (32.1%), or 4 modes (43.4%) of information presentation" [28].

Aside from the aforementioned benefits, event knowledge has additional scientific value when looking at systematic reviews, which are a summarization of "all pertinent evidence on a defined health question" and "occupy the highest position in currently proposed hierarchies of evidence" [29]. According to a study by Scherer et al, "Less than half of all studies, and about 60% of randomized or controlled clinical trials, initially presented as summaries or abstracts at professional meetings are subsequently published as peer-reviewed journal articles" [29].

The study went on to note that studies with 'positive' results were more frequently published than not 'positive' studies, and that the presence of 'positive' results was an "important factor appearing to influence whether a study described in an abstract" would be published or not [29]. The authors concluded that this publication bias "creates problems for those conducting systematic reviews or relying on the published literature for evidence" and that any systematic review "will tend to over-estimate treatment effects" as a result of this bias [29].

Current Options for Finding Event Knowledge

As aforementioned, there is currently no central database or resource available to access event knowledge, and these presentations, papers, and abstracts can, as most health science librarians will attest, be difficult and time-consuming to locate. Currently, individuals seeking event knowledge may need to check the website of a particular vendor (depending on the type of knowledge desired) or association to determine if the desired content is available.

In recognition of this resource need, Conference Archives has developed Ekatius™, an online platform that aggregates and disseminates rich media, hard-to-find, event knowledge elements such as abstracts, posters, and rich media presentations. In addition to the aggregation and dissemination of event knowledge elements, Ekatius™ has social networking capabilities such as social bookmarking, which allows users to bookmark and share their bookmarks with others on popular social bookmarking sites such as Digg or Del.icio.us.

Additionally, the Ekatius™ platform has advanced search functionalities that allow users to search for event knowledge elements either within a specific event or across several events, thus yielding a cross-disciplinary view of the latest knowledge on a given topic. Also, secure online workgroup functionalities in Ekatius™ facilitate communication and collaboration among users.

Conclusion

Accelerated access to a more *complete* view of the knowledge, research, and evidence presented at biomedical meetings is critical for the global medical community, especially when considering the low publication rate for abstracts presented at biomedical meetings. By promoting access to event knowledge and advocating for its enhanced access and discovery, information professionals will be able to deliver a more complete view of the knowledge needed by the global medical community in order to meet their goals for the improvement of patient care, as well as continued advances in research and technology.

REFERENCES

1. BIOSIS Previews. Thomson Scientific. [Web document]. [cited 29 Nov 2007]. < http://scientific.thomson.com/products/bp/ >.

2. PapersFirst. OCLC Worldwide. [Web document]. [cited 29 Nov 2007]. <http://www.oclc.org/support/documentation/firstsearch/databases/dbdetails/details/PapersFirst.htm>.

3. Proceedings First. OCLC Worldwide. [Web document]. [cited 29 Nov 2007]. <http://www.oclc.org/support/documentation/FirstSearch/databases/dbdetails/details/Proceedings.htm>.

4. Conference Archives. [Web document]. [cited 29 Nov 2007]. <http://www.conferencearchives.com>.

5. Goetz T. It's time to free the Dark Data of failed scientific experiments. [Web Document]. New York, NY: Wired Magazine, 2007. [rev. 25 Aug 2007; cited 2 Oct 2007]. <http://www.wired.com/science/discoveries/magazine/15-10/st_essay>.

6. Medical Library Association. JMLA guidelines for converting an oral presentation to a manuscript for publication. [Web document]. Chicago, IL: The Association, 2007. [rev. 2 Oct 2007; cited 2 Oct 2007]. < http://www.mlanet.org/publications/jmla/convert.html>.

7. Elm E, Costanza M, Walder B, Tramèr M. More insight into the fate of biomedical meeting abstracts: a systematic review. BMC Medical Research Methodology 2003 Jul;3:12. doi:10.1186/1471-2288-3-12.

8. Sanossian N, Ohanian A, Saver J, Kim L, Ovbiagele B. Frequency and determinants of nonpublication of research in the stroke literature. Stroke 2006 Oct;37(10):2588-92.

9. Arrivé L, Boelle PY, Dono P, Lewin M, Monnier-Cholley L, Tubiana JM. Subsequent publication of orally presented original studies within 5 years after 1995 RSNA Scientific Assembly. Radiology 2004 Jul;232(1):101-6. doi: 10.1148/radiol.2321030819.

10. Autorino R, Quarto G, Di Lorenzo G, De Sio M, Damiano R. Are abstracts presented at the EAU meeting followed by publication in peer-reviewed journals? A critical analysis. Eur Urol. 2007 Mar;51(3):833-40; discussion 840. Epub 2006 Oct 25.

11. Rosmarakis ES, Soteriades ES, Vergidis PI, Kasiakou SK, Falagas ME. From conference abstract to full paper: differences between data presented in conferences and journals. FASEB J. 2005 May;19(7):673-80.

12. Scherer RW, Dickersin K, Langenberg P. Full publication of results initially presented in abstracts. A meta-analysis. JAMA. 1994 Jul 13;272(2):158-62.

13. Wang JC, Yoo S, Delamarter RB. The publication rates of presentations at major Spine

Specialty Society meetings (NASS, SRS, ISSLS). Spine. 1999 Mar 1;24(5):425-7.

14. Larian B, Namazie A, Agha N, Azizzadeh B, Blackwell K, Wang MB. Publication rate of abstracts presented at the annual meeting of the American Academy of Otolaryngology-Head and Neck Surgery. Otolaryngol Head Neck Surg. 2001 Sep;125(3):166-9.

15. Bhandari M, Devereaux PJ, Guyatt GH, Cook DJ, Swiontkowski MF, Sprague S, Schemitsch EH. An observational study of orthopaedic abstracts and subsequent full-text publications. J Bone Joint Surg Am. 2002 Apr;84-A(4):615-21.

16. Castillo J, Garcia-Guasch R, Cifuentes I. Fate of abstracts from the Paris 1995 European Society of Anaesthesiologists meeting. Eur J of Anaesthesiology 2002 Dec;19(12): 888-893.

17. Glick N, MacDonald I, Knoll G, Brabant A, Gourishankar S. Factors associated with publication following presentation at a Transplantation Meeting. Amer J of Transplantation. 2006 Mar;6(3):552-556.

18. Toma M, McAlister F, Bialy L, Adams D, Vandermeer B, Armstrong PW. Transition from meeting abstract to full-length journal article for Randomized Controlled Trials. JAMA 2006 Jul;295(11):1281-1287.

19. Krzyzanowska M, Pintilie M, Tannock IF. Factors associated with failure to publish large Randomized Trials presented at an Oncology Meeting. JAMA 2003 Jul;290(4):495-501.

20. Krzyzanowska M, Pintilie M, Tannock IF. Factors associated with failure to publish large Randomized Trials presented at an Oncology Meeting. JAMA 2003 Jul;290(4):495-501.

21. Hartling L, Craig WR, Russell K, Stevens K, Klassen TP. Factors influencing the publication of Randomized Controlled Trials in Child Health Research. Arch Pediatr Adolesc Med 2004 Oct;158(10):983-987.

22. Camacho LH, Bacik J, Cheung A, Spriggs DR. Presentation and subsequent publication rates of phase I oncology clinical trials. Cancer 2005 Aug;104(7):1497-1504. doi: 10.1002/cncr.21337.

23. Sprague S, Bhandari M, Devereaux PJ, Swiontkowski MF, Tornetta P 3rd, Cook DJ, Dirschl D, Schemitsch EH, Guyatt GH. Barriers to full-text publication following presentation of abstracts at annual orthopaedic meetings. J Bone Joint Surg Am 2003 Jan;85-A(1):158-163.

24. Cheng K, Preston C, Ashby D, O'Hea U, Smyth RL. Time to publication as full reports of abstracts of randomized controlled trials in cystic fibrosis. Pediatr Pulmonol 1998 Aug;26(2):101-5.

25. American Association of Medical Colleges. 2006 Medical School Graduation Questionnaire. [Web document]. Washington, DC: The Association, 2006. [rev. 17 Jun 2007; cited 20 Jun 2007]. <http://www.aamc.org/data/gq/allschoolsreports/2006.pdf>.

26. Moody J. 2007. Communicating with the new generations – reaching generation X and

millennial physicians. Paper presented at the 7th Annual Forum on Continuing Medical Education (CME), June 18, in Philadelphia, PA.

27. American Association of Medical Colleges. 2007 State Physician Workforce Data Book. [Web document]. Washington, DC: The Association, 2007. [rev. 1 Nov 2007; cited 27 Nov 2007]. <http://www.aamc.org/workforce/statedatabooknov2007.pdf>.

28. Lujan HL, DiCarlo SE. First-year medical students prefer multiple learning styles. Adv Physiol Educ 2006 Mar;30(1):13-6. doi:10.1152/advan.00045.2005.

29. Scherer RW, Langenberg P, von Elm E. Full publication of results initially presented in abstracts. Cochrane Database of Systematic Reviews 2007 Apr; 2. doi:10.1002/14651858.MR000005.pub3.