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In the next issue of
EDC Today:

EDC User Interviews

About EDC Management:

EDC Management is the leader in Clinical and Data Management and Electronic Data Capture (EDC) consulting services for the biopharmaceutical industry. EDC Management publishes well-researched and timely information about Electronic Data Capture technologies and processes through EDC Today[®] and EDC In Depth. We do not sell or endorse any specific EDC software application or vendor. Improve process today; position for tomorrow.

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A CDISC Give and Take

EDC Today is an independent publication on current information and issues in Electronic Clinical Systems (ECS) strategies and technologies for the Biotechnology and Pharmaceutical (Biopharma) industry. Each month we examine topics related to ECS theory, technology, practice, or implementation.

Recently, EDC Management published an update on CDISC in Issue 28, and a reader, who is the CDISC ODM team leader, responded with some very interesting comments, some of which were critical of our thoughts on CDISC. It seems only fair to share her thoughts with the readers of EDC Today.

In this issue, we do something a little different. After giving a brief summary of the highlights from Issue 28, “Update on CDISC,” we introduce Sally Cassells and Kirk Mousley, and then present Sally’s comments in the form of a discussion. We are sure you will find the discussion interesting and full of items to ponder. Ultimately, the discussion demonstrates the dynamics of interchanging ideas and points of view.

Introduction

Let us begin with a quote from Issue 28 that summarizes the heart of that issue:

“Biopharmas have long been involved in Clinical Data Interchange. Traditionally, clinical data has been transferred from Contract Research Organizations (CROs), Central Laboratory, and Remote Data Entry (RDE) systems to the study sponsor’s CDMS database. With the advent of electronic submissions to the FDA and Application Solution Provider-modeled EDC, additional needs for clinical data transfer have developed. Furthermore, the trend seems to indicate an additional interchange in the future, one between Hospital and Investigator Sites to Sponsor databases. To enable these interchanges, transfers of metadata might also be performed between the various databases that store clinical data over the life of a trial. Finally, when a study is over and all analysis is complete, the clinical data might be archived for undetermined future use.

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Given that there are several different clinical data interchange requirements, it is not surprising that there are a number of interchange standards being developed (or being fine-tuned) by CDISC.¹ Amongst these standards is the Operational Data Model (ODM) that supports the exchange of clinical data between databases. The ODM supports not only the transfer of clinical data, but also the transfer of metadata describing the database structures needed to store the clinical data that will be transferred. Obviously this model is a complex one as it is not only expected to cover the complete range of clinical data's intricacies (or is it idiosyncrasies?), it is expected to cover the metadata too. The only "shortcut" being taken in the development is that the model is vendor neutral and "only" supports metadata and data in a generic way. That is, metadata that contains vendor proprietary information (due to system architecture) like data entry screen layout data (X-Y locations, font, question wrapping, and so on) and record identifiers are not included in the model, and EDC Management believes there are good reasons for doing this.

What motivates the refinement of the ODM is its large potential. Potential uses include "simplified" interchanging of data between CROs and sponsor EDC and/or CDMS database; between EDC and CDMS databases; and possibly in the future, between Investigator Sites and CRO, EDC, and/or CDMS databases. The ODM is currently at version 1.2 which was released in January 2004."²

When we received an email from Sally Cassells (SC), we initially responded to her and thanked her for her points of view. However, it became apparent that we should share her comments with our readers. We asked Sally for permission to publish a give and take. She consented to participate and sent us the following information about herself:

"I am a Vice President at Lincoln Technologies — a company specializing in software solutions and services to the bio-pharmaceutical industry. I have worked with the pharmaceutical industry for the past 20 years primarily as a software developer. I spent many years at Domain Pharma — formerly known as BBN Software Products where I worked on the Clintrial team first as a software engineer and later as the Program Manager and Development Partner Technical Liaison for the Clintrial 4 program. Since leaving Domain in 1997, I have worked as the Executive Director of Consulting Services at Belmont Research (now CSS Informatics), as Interim VP of Development at PHT, as the principal in Lexington Clinical Data Systems and at Lincoln Technologies. In this time I have worked on a wide variety of projects at a broad range of pharmaceutical and biotechnology companies.

I became involved with CDISC in 1999 — when a group consisting of representatives from several major commercial EDC and CDM software companies convened to begin development of what we then called the Data Interchange and Archive Standard (DIAS). Based on my experience working closely with pharma based IT groups involved with systems and data integration projects, it seemed as if the impossible had happened. Software companies, who were normally each other's competitors, were willing to work together to develop a standard that would enable disparate and heterogeneous clinical systems to interoperate. Through the work of this talented and committed team became what we now call the Operational Data Model (ODM). I have been the leader of the ODM team since 2002."

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As most of our readers are aware, EDC Management's Kirk Mousley (KM) has been an author or co-author of the EDC Today® technical bulletin and a frequent conference speaker. Kirk says this about himself:

“I received my B.S. and M.S. degrees in Electrical Engineering from MIT and my Ph.D. in Computer Science from Lehigh University. I have been the President of Mousley Consulting, Inc. since its founding in 1993 and Vice President and CTO of EDC Management since its founding in 2001. I have directed both company's efforts in the areas of clinical database design, data editing/cleaning, document management, and submissions. Most recently, I have expanded Mousley Consulting's role in the areas of process improvement and have lead EDC Management's Electronic Data Capture consulting services.

Among my significant accomplishments are a complete Oracle based Edit-check application used by Centocor for several drug products including ReoPro and Remicade; preparation of electronic submission materials for the FDA for approval of Remicade; data cleaning programs for Merck for several products including Crixivan, Aggrastat, Fosamax, Vioxx, and Propecia.

Before focusing primarily on clinical research computerization issues, I worked for diverse clients as GE, AT&T, Rabbit Software, Liberty Technology, and General Signal. I have been involved with all phases of computer development, including both hardware and software.

My wide-ranging research interests include natural language processing, speech recognition, intelligent database applications, and man-machine interfaces. I have also published several articles related to machine processing of spoken language.”

Discussion Point 1: Value of the ODM Model

SC: A colleague passed along a copy of your EDC Today® newsletter. As you may know, one of the hats I wear is that I am the leader of the CDISC ODM team and so I was at least a little disappointed that your newsletter was so negative about the ODM model.

KM: I think negative is a strong word. Our view was more that it was the one model that we could see the least use for. I would be delighted if you could elaborate on why you feel it is useful.

SC: I would have preferred to see some more like ‘Although the ODM provides long term benefits for the industry, we can see that it will be adopted more slowly by established EDC and CDMS vendors.’ A statement like ‘...unfortunately we feel that there is little reason for established EDC and CDMS vendors to fully support this model’ suggests that the model itself has no value.

KM: We certainly didn't mean to imply or suggest the model had no value. On the other hand we aren't convinced that established EDC and CDMS vendors will fully adopt the model, even slowly. We think the model has far more value to new EDC and CDMS vendors. Going beyond that we think the ODM has a lot of value in other areas, such as archival, data transfer, and e-submissions.

SC: Even established EDC and CDMS vendors need new customers. Providing easy ways to access an ODM based archive may be of value to established vendors who need to re-sell to old customers, say, as a result of a merger.

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Discussion Point 2: Valid Uses of ODM

SC: While I won't dispute that for traditional CDMS and EDC vendors there is little incentive to add CDISC Export and Import capability - in a sense it would be a little like Gillette supporting a universal standard for replacement razor blades. However, from my viewpoint, I would like to have seen more discussion of the potential benefits the ODM provides for the Biopharma industry - especially for CROs.

KM: I would love to see what you think these benefits are. Our take is that beyond archival, and the ability to change between systems (which we are not sure why you would want to), it was hard to come up with a true use.

SC: I know of several pharmas who use different EDC vendors in different parts of their organization. This situation has increased over the past few years as we hear more from 'boutique' EDC vendors - who specialize in, say, Phase IV trials. A good deal of the value of the data these tools collect is lost because it cannot be readily combined with other data sources. If sponsors get data back in ODM format they leverage data warehousing technology to combine information collected for the entire lifecycle of the drug.

KM: Some of us here at EDC Management view having different EDC vendors in different parts of an organization as a business inefficiency that should be addressed by senior management of the company. Management should attempt to determine what software best works for the *entire* business as to reduce costs, such as system software and hardware, support needs, training needs, and in general the lost productivity caused by simply changing from system to system. Imagine a company using 10 different accounting or email systems across divisions.

Granted, Phase IV trials often seem to be treated like unwanted stepchildren and are often run outside the CDM group that handles Phase I - Phase III trials. This is perhaps more of an organizational failing than an opening that begs for an alternate data capture methodology.

As far as boutique vendors goes, the ODM may have insurance value in the case a vendor goes out of business and a Biopharma needs to replace a solution with another, especially during a study. Note: We are not saying that ODM support per se will cause an EDC vendor to fail, but rather the fact is that new startup firms often fail, and it is the new startup firms that are more likely to offer ODM support. If a vendor truly believed in their product they would offer ODM import functionality in order to be able "take the business away from another vendor". Offering ODM export functionality could expose the vendor to a loss of business risk that a vendor would have to trade off against customers that need to have such support. If such is the case, vendors might want to offer the export feature as an additional cost item.

SC: A vendor who provides both ODM import and export is making it easier for their customer to use their system. ODM import provides a quick way to get started with a new EDC package and allows the customer to easily apply their data standards starting with the first study. ODM export makes it easy for the customer to use the output from the EDC system for down stream processing. Making your system easy to use seems like a good way for new vendors to distinguish themselves.

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Discussion Point 3: Challenges and Benefits of Integrating ODM

SC: One statement that I am particularly puzzled by is the assertion that “Unfortunately, development of the ODM may unintentionally offer new EDC vendors a business advantage over their established competitors”. Why would this be a problem for EDC management? It is my view that the potential for the Biopharma industry to use a broad array of best of breed software components is exactly why the ODM is important.

KM: What we meant, is that for an established vendor like eRT or even for PhaseForward and Clintrials, changing existing software is much harder than having a new company start with the CDISC model and build a system tailored to it.

SC: I think it is actually relatively trivial at a technical level for software companies like eRT, PhaseForward and Oracle to implement ODM Import and Export. I think they are essentially playing an extended ‘blink first’ game. I think the ‘complexity’ of the ODM is over-rated. Programmers, especially those with Clinical Data systems experience, get it almost instantly.

KM: Its not a matter of the programmers ‘getting it’ as much as it is often more difficult to retrofit new functionality into existing system code than it is to write the code from scratch. Fully featured CDMSs are very complicated systems. In your own experience at BBN as a software engineer, you probably encountered situations where embedding a new feature, such as “Notes” was a fairly major undertaking.

A straightforward export of clinical trial data in and of itself shouldn’t be a difficult task, but a complete metadata transfer and data would be more difficult. The CDMS export feature would have to include vendor specific extensions to the ODM in order to transfer needed underlying system architectural information - such as how to display the transferred data on a maintenance screen. An item like record identifier, which is used ‘outside of the clinical data’ within system (non-trials data) tables would need some careful handling in a transfer. Importing data without maintenance screens and the metadata needed to drive them and perhaps even edit checks is less difficult, but also far less useful.

SC: I stand by my claim that all of this is supported by the ODM and is within the capabilities of the programmers who develop the major commercial systems.

Discussion Point 4: Development of Support for the ODM Model

SC: Finally, in your extensive discussion of the role EDC vendors play in CDISC, the fact is that the ODM was actually developed by companies you list as Corporate Sponsors - Oracle, PhaseForward, Formedix and PHT.

KM: What do you think was their reason they helped to develop it? I would be interested in knowing.

SC: They wanted to be sure that when/if the time comes that they have to support it, it would work with their systems. It allows them to say they ‘support’ it when pressed by their customers.

KM: Well, they probably should support the export of data if their customers plan on submitting electronic data to the FDA. Our understanding is the SDS is basically an outgrowth of the ODM.

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SC: As many readers already know, Define.xml is a standard, derived from the ODM, for transmission of computable metadata for submissions. We are starting now to look into ways of supporting SDTM data transmissions as well.

Conclusion

Sally does raise interesting points. One of the most interesting points that Sally makes is that she feels the level of skill required by the programming staff should be minimal for implementing the changes called for by the ODM. We would be interested in hearing from our readers what they feel about this particular topic. If the programming is in fact straight forward, then perhaps the biopharma community needs to pressure EDC vendors into providing more CDISC support.

The issue of boutique vendors has always been a challenging one. Part of me says it is nice to have a large number of “best of breed” products that one can choose from. Certainly, such an approach forces vendors to distinguish themselves as the best at a particular functionality to have people purchase their software.

However, it still seems to me that using so many different software packages would place a large burden on training. From an investigator site perspective, it can be too much. I remember conducting a training session at an investigator meeting on a particular EDC application. One of the women from the investigator sites commented to me that this was the fourth EDC package she had been trained on in the last three months.

Perhaps ease of use of all the products in the market could enhance a boutique approach. It will have to be a strategic decision on the part of each EDC vendor to decide if they want to embrace such a market.

We should make it clear: We have not been in the past and are not currently in any way negative about CDISC. We are also firm supporters of standardization. EDC Management was, and remains, enthused by, appreciative, and supportive of the efforts of CDISC. We hope that the great promise shown by their efforts will continue to bear fruit and to further evolve as the technology allows.

Resources

¹ <http://www.cdisc.org/standards/index.html>

² *EDC Today*[™], Issue 28, “CDISC Update”.



Who's behind the research?

Our lead researcher, Kirk Mousley, PhD received BS and MS degrees in Electrical Engineering from MIT and a PhD in Computer Science from Lehigh University. He has been the President of Mousley Consulting, Inc. since its founding in 1993 and has directed the company's efforts in the areas of clinical database design, data editing/cleaning, document management, and submissions.

Karl Mousley received his BS in Mechanical Engineering from Rose-Hulman Institute of Technology and a MS in Computer Science from Villanova University. He has been a senior member of the technical staff at Mousley Consulting, Inc. since 1993. Among his significant accomplishments are the investigation, evaluation, and implementation of new computer technologies for clinical data management systems and developing strategic plans for integrating these technologies into current systems. He has extensive experience preparing Standard Operating Procedures (SOPs).



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