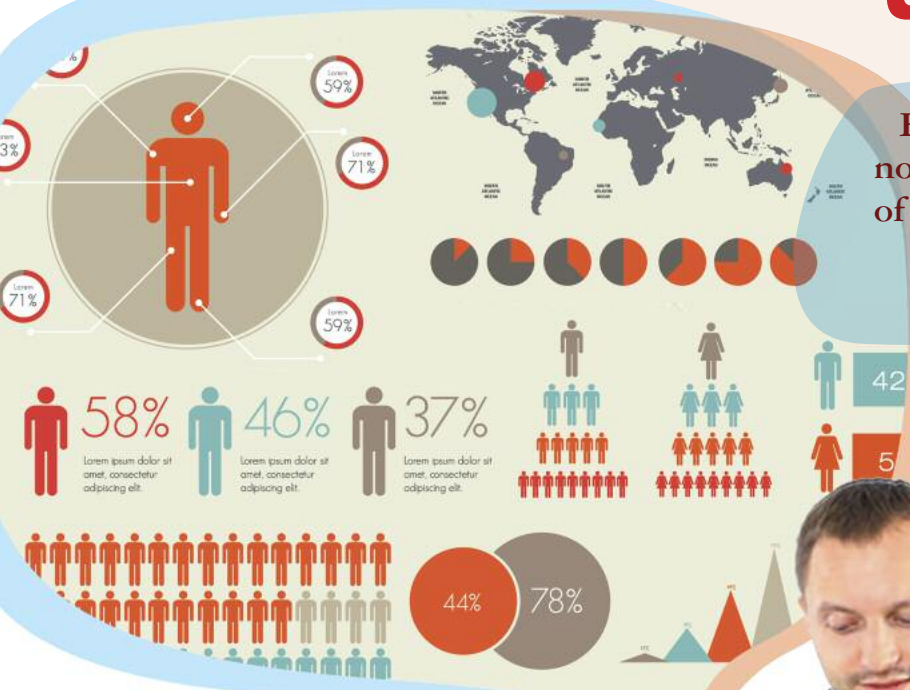
Denise Myshko

Clinical Trial Technology Continues to Evolve

Electronic processes for data collection are now widely used in clinical trials. But the use of technology and electronic processes for the operational side of trials is still lagging.



Ten years ago, when PharmaVOICE first started writing about clinical trial technologies, electronic data capture (EDC) was expected to be the magic bullet to address development inefficiencies. It was thought that paper would go away completely, that efficiencies and productivity would increase significantly, and pharma companies would be able to bring new drugs to market faster.

While some of the benefits of EDC have become a reality — accelerated study start up, reduced data errors, fewer queries, and faster database lock — technology adoption is lagging in other areas of clinical trials. This is especially true in the area of optimizing the business processes and the operations associated with trial execution. Many processes are still done manually with little integration of data from other areas. This, experts say, is hindering the ability to use data to drive decision-making. In fact, a survey last year by IDBS found that many pharma and healthcare research organizations are dealing with data silos and fragmented processes. Companies often have multiple departments and functions that suffer from data overload, and the No. 1 issue is getting control of data to simplify information sharing, which will in turn drive collaboration and increase innovation.

"There are a lot of places where the process of clinical trials is encumbered by older approaches and older technologies, not least of which is around clinical trial operations," says David Handelsman, senior manager, center for health analysis and insights at SAS. "The vast majority of time, effort, and costs of a clinical trial is around finding and enrolling sites and patients, all of which is largely manual."

The clinical trial process not only involves collecting data, but also many other activities before and after investigators sign up, including training, study startup activities, etc., all of which are required for ensuring quality and meeting regulatory compliance requirements, says Zikria Syed, CEO of NextDocs.

"For the structured data capture, the percentage of adoption of technology is high," he says. "But for collection of the supporting documents that are nonstructured data, such as CVs, certificates, contracts, enrollment forms, etc., the percentage of adoption of the technology is still low. and is still mostly paper based."

Mr. Syed says collecting data is technically more simple because Web data collection forms are common.

"Documents that require signatures — con-

> "We collect a lot of data. The question is: how can we be smart about the data we are collecting to capture the key elements and ensure that data are able to be reused across multiple systems and processes?"
>
> **MARK TROMBLEY** / Roche

tracts, non-disclosures, 1572s, etc. — require a different process, and this is more technically complex," he says. "Contributing to the complexity is having to ensure the documents are completed correctly, checked for quality, and meet CFR Part 11 requirements for regulatory compliance."

Making the shift to electronic processes, however, can be cost-effective, Mr. Syed says. He points to Sanofi, which expects to save an estimated 10,000 working days — valued at $9 million — in time wasted managing documents. Sanofi deployed a digitalized version of its paper-based process. The solution is based on the clinical portal solution from NextDocs.

The Standards Issue

Experts say the development of standards in data collection is one area where there has been progress, but more work is needed to address adoption.

"CDISC brought to the forefront the need for research data to be standardized," Mr. Handelsman says. "When delivering data to the FDA, there is an expectation that it will adhere to CDISC standards."

"At each step during clinical trial execution, there are important decisions to be made, but often there is limited visibility into the data to make those decision," says Tom Grundstrom, VP, integrated processes and technologies at Quintiles, and global head, Quintiles Infosario. "Because the industry has retained some services for trial execution in-house and outsourced others, having horizontal access to the data is tricky. One partner might have the EDC data, another partner might have the pharmacovigilance data, a third party has ECG data, and the operational CTMS data might reside in the pharma company. All of this plays a significant part in protocol feasibility, study start up, patient recruitment, monitoring activities, through to database lock."

> "Companies have to change their business processes and require evidence-based data driven insights for decision-making."
>
> **DAVID HANDELSMAN** / SAS

Greg Moody, director, clinical informatics, at Millennium: The Takeda Oncology Company, says the industry as a whole continues to evolve the relationships with CROs from a service provider relationship to strategic partnerships or alliances, and, as a result, the needs of sponsors have changed.

"We are now looking to leverage technologies such as data warehouses and visualization platforms not to streamline our ability to perform the day-to-day operational tasks, but rather to provide us with tools that allow us the proper oversight and governance with our partners," he says.

To enable the organization to realize the benefits of an outsourced model, data standards provide a level of abstraction from differing technology platforms from outsourcing partners, says David Roberts, director, medical informatics and information management, at Millennium.

"Data standards also enable the ability to provide study oversight and to maintain control over studies; reduce the need for personnel to be trained on CRO systems; reduce the need for CRO training on Millennium systems; reduce impact of CRO turnover; and provide standardization of data from multiple CROs providing a level of efficiency for the organization across partners/studies," he says. "The downstream effect of changes at the CROs are minimized, thus allowing us to execute our pipeline in the most efficient manner possible."

> "By having immediate access to information through the cloud, study coordinators or sponsors have the ability to see trial and documentation status in real time and make decisions accordingly."
>
> **JENNIFER GOLDSMITH** / Veeva Systems

Data Integration Can Lead to Business Insights

Experts agree integration is critical because multiple partners are working on different domains in the clinical development process.

In addition, disparate systems in company silos can create challenges, says Andrea McGonigle, managing director, life sciences, at Microsoft.

"If there is a common platform, we can remove some of the complexity, making it easier to gather business intelligence and analytics around the data," she says.

Mark Trombley, business solution manager, e-clinical, at Roche, says he'd like to see vendors work more closely together on supporting the idea of a single platform that could support multiple technologies.

"I hope in five years there will be more plug-and-play technologies for clinical trials," he says. "Companies need to have a way to have an overall solution work with multiple vendors. This is where integration becomes critical. And this is why standards have to drive the solution."

Already, some technology suppliers are starting to address this issue. Microsoft's

SOUND BITES FROM THE FIELD

Industry experts discuss best practices for integrating data, enabling communications, and optimizing clinical trial operations.

AMY FURLONG is Executive VP, Cardiac Safety Operations, ERT, a global technology-driven provider of health outcomes research services and medical devices supporting biopharmaceutical sponsors and CROs. For more information, visit ert.com.

"Defining data requirements and standards with regard to both parameters and structure at a program level facilitates the ability to integrate data across all phases of the clinical research process. Further, standardization of the critical data elements across various safety and efficacy parameters allows digital data to be aggregated through business intelligence tools for early decision-making. There are often considerable resources deployed to define study-specific data structures and edit checks, and the data are then not usable with other data collected. The use of proven technology for digital data collection, processing, and reporting, which are enforced with a core set of reliable vendors, can save considerable time and valuable resources while improving the overall quality of the data to make important clinical decisions in a timely manner."

DANIEL O'CONNOR is CEO, InnovoCommerce LLC, which provides Microsoft SharePoint-based clinical and investigator portal solutions. For more information, visit innovocommerce.com.

"Clinical and investigator portal products now help sponsors manage complex, global clinical studies in an environment with expiring drug patents, increasing global competition, and greater regulatory oversight. To manage in this new world, sponsors are implementing programmatic changes to facilitate flexibility and agility and focus on core areas of clinical value generation. Presently, sponsor leadership must form strategies and accordingly reengineer corresponding processes to take advantage of new enabling technologies — such as enterprise clinical and investigator portals — to facilitate both centralization and localization and effectively manage CRO partnerships as well as global investigator sites."

RAJIV PHOUGAT is Client Technical Advisor, Life Sciences, IBM, which aims to help life-sciences organizations support patient-centered healthcare delivery and patient safety to drive better outcomes and an enhanced experience. For more information, visit ibm.com/lifesciences or email rajiv.phougat@us.ibm.com.

"A metadata repository of clinical trial data items enables the harmonization, cross-protocol integration, refuse of trial data, and standard adoption. Service oriented architecture (SOA) should be used to integrate various data sources and data consuming systems that make the integration flexible and agile. BPM technology enables automation, monitoring, and optimization of clinical trial processes across organizations. Social media collaboration tools are key enablers of collaboration within the organization as well as with external partners such as CROs. Cloud computing not only allows organizations to operate more efficiently by cutting their IT costs and accelerating the deployment of new technologies and processes, but also will help harmonize the entire life-sciences ecosystem by driving common data, common standards, and common processes."

RICK PIAZZA is VP, Product Management, at Medidata Solutions, a global provider of SaaS clinical development solutions that enhance the efficiency of customers' clinical trials. For more information, visit mdsol.com.

"Any plan to integrate data or to integrate applications needs to focus on automation and standardization to be scalable, repeatable, and timely. To the extent possible, resist the temptation of one-off integrations, avoid taking a short cut through manual data loads, and don't allow the spreadsheet to be your technology tool of choice. Optimize operations by reducing the overall number of different, independent tools used to do the job. Instead, seek interoperability that doesn't simply assemble technologies in one place, but instead supports the typical workflow of the user and best utilizes information across the platform of tools, creating a cohesive solution."

GEORGE WAIDELL is VP, Life Sciences Practice, at IntraLinks, a provider of information exchange solutions. For more information, visit intralinks.com.

"While clinical trial participants gain time through more instantaneous collaboration, businesses gain the ability to manage precious intellectual property. Control of access is critical given the size and scope of study participation and changing partnerships, and auditable records of access are essential to meeting regulatory requirements. When talking about information exchange, the key issue should not be ease-of-use or speed; those capabilities should be standard. The real challenge once information is distributed is maintaining control within a seamless process between all parties and being able to identify the study status to rapidly adapt to changes. Providing a secure platform via the cloud enables everyone involved in a trial to access and upload appropriate data for real-time collaboration. The effort must unify the process both within and outside of pharma development organizations and be capable of tying together diverse systems while managing tolerance for regulatory requirements globally. Real-time and compliant communications help prevent poorly designed trials and identify inefficiencies during study conduct, which have ramifications beyond simply failing to prove the desired endpoints. A poorly designed trial can jeopardize an entire research program because expected safety or efficacy is lacking."

SAMUEL WHITAKER is CEO and Co-Founder of Greenphire, a provider of clinical payment and communication technology solutions. For more information, visit greenphire.com.

"While new technologies have been developed to optimize many aspects of the clinical trials process — CTMS, EDC, IVRS, ePRO, etc. — the management and delivery of patient payments has remained a technological backwater. Manual check-based payment methods have resulted in 80% of research sites requiring four or more unique steps to deliver each patient payment. To offset this administrative burden, many sites have moved to quarterly payment delivery, further alienating cash-strapped patients and reducing patient satisfaction and retention. Companies must work to automate payment processes to reduce administration costs and enhance the patient's experience in the trial environment. New payment management technologies have only recently emerged to integrate reloadable debit card technology with centralized, Web-based platforms to automate payment delivery, tracking, and reporting."

> **“Data standards enable the ability to provide study oversight and to maintain control over studies from multiple CRO preferred providers.”**
>
> **DAVID ROBERTS** / Millennium

SharePoint, for example, is becoming a common platform on which life-sciences technology partners are creating their solutions. NextDoc’s document management solution uses SharePoint as a platform technology.

Mr. Grundstrom acknowledges that data integration is the biggest bottleneck in clinical development.

“When it comes time to integrate and move the data together, matching them up with similar studies, similar investigator sites, similar patients, and similar visits is really difficult,” he says. “Standards play a role here; CDISC has done a nice job all the way up to protocol design. But one thing that CDISDC doesn’t address are data in transit, data in the middle of the study. There are no standards around queries, status, or audit trails.”

Mr. Trombley says Roche is in the process of adopting CDISC standards at the point of collection and putting the data into an SDTM format that is universally accepted and that can then be used as a hook and carried through into other systems.

“For example, our EDC data also feed our safety systems and a trial master file,” he says. “Ultimately some of the data sets that we collect will tie into our clinical data warehouse.”

Mr. Trombley says Roche has implemented an initiative called Smart Information Management.

“We are looking to capture data once, reuse those data, and have those data flow through different systems by establishing standards and data mapping between our systems,” he says. “Being able to enter data once and not have to do double entry helps us to come to clinical conclusions sooner.”

Selected Clinical Trial Technologies


Pat Donnelly

» **Aptiv** launches AptivAdvantage, an integrated technology platform specifically designed to support the implementation and execution of adaptive clinical trials.

Pat Donnelly, chairman and CEO of Aptiv Solutions, says the company has seen a dramatic increase in sponsor interest in pursuing adaptive design clinical trials, in part because the technology continues to evolve.

AptivAdvantage is designed to meet the requirements specified in draft guidance from the FDA and EMA to ensure that trial integrity is maintained. The platform integrates randomization, EDC, and drug supply management and minimizes connection points in the data collection process to provide a flexible and seamless environment for data transfer and analysis.

For more information, visit aptivsolutions.com.

» **CRF Health** has released an online ePRO and patient management solution for global late-phase clinical studies, TrialMax Web. The solution has been developed to collect data directly from the patient. It allows data entry via patients’ computers and/or smartphones in the real-world setting of late-phase studies. The global solution is fully 21 CFR Part 11 and HIPAA compliant.

“Postapproval research is going through a tremendous change at the moment,” says Rachael King, CEO of CRF Health. “We appreciate the challenges of conducting studies in the real-world, and look forward to offering study teams a tool that not only provides them with data, but helps them keep patients connected to the study so they can achieve high-quality results.”


Rachael King

For more information, visit crfhealth.com.

» **PRI** has launched OnSite, a solution for building custom patient recruitment campaigns for individual clinical sites. Each OnSite program includes a strategic assessment and recommendation of the optimal recruitment strategies for that study and site-specific situation and execution of at least two modalities of patient recruitment support by PRI.

For more information, visit patientrecruiters.com.


Dr. Mike Wilkinson

» **PPD** is offering a virtual workplace communications platform. With user-customized avatars, PPD 3D connects PPD’s clinical research teams with clients in an immersive, 3-D environment. Users can talk, send instant messages, view and interact with presentation and media content, record notes, and access the Web.

“PPD 3D improves the way we train clinical research associates to monitor clinical trials, which is vital for enhancing the quality of site management and clinical monitoring for our clients’ research programs,” says Mike Wilkinson, Ph.D., executive VP and chief information officer for PPD.

PPD collaborated with ProtonMedia on its ProtoSphere platform to create PPD 3D, which won a Microsoft Life Sciences Innovation Award.

For more information, visit pddi.com.

» **Synteract**, a full-service CRO, has released upgrades to its SynCapture EDC system, providing customers with increased user functionality, including the ability to re-query investigative sites on data collected. In addition, SynCapture 1.5 brings enhanced audit trail legibility and functionality, useful to all project team members, as well as features that increase the ease and efficiency of the query resolution process

For more information, visit synteract.com.


Daniel Scanlon

» **Verdacom** has released VerdaCore Patient Diary module to help patients provide real-time data regarding their medication regimen and symptoms. VerdaCore allows sites to monitor user activity to make sure patients are recording data in a timely manner.

“Patients in clinical trials historically have low diary compliance results because of conventional data entry methods,” says Daniel Scanlon, Verdacom founder.

For more information, visit verdacom.com.

Clinical Trials in the Cloud

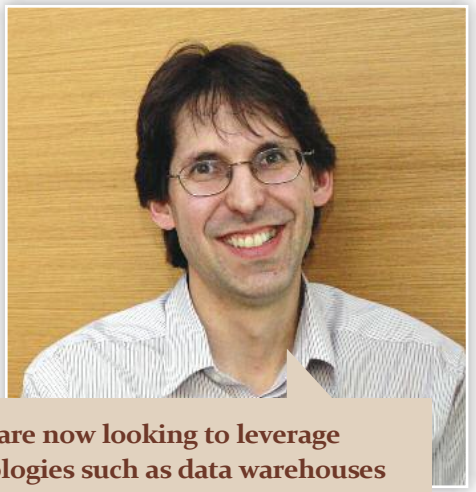
Experts suggest that five years from now, the clinical trials landscape will be almost unrecognizable. Disparate, on-premise, clinical trial support systems will be replaced by an integrated clinical trial process cloud, which is still in its early days. Researchers from Insight Pharma Reports say life-sciences organizations continue to increase their cloud use and the diversity of applications they run there.

Experts say cloud computing allows organizations to operate more efficiently by cutting their IT costs and accelerating the deployment of new technologies and processes. In fact, IBM's research suggests that many life-sciences organizations could save as much as 25% of their annual operating expenditures on clinical IT systems by using cloud computing. IBM analysts predict by 2015, most large biopharmaceutical companies will use multi-tenent clouds for many of their major business processes.

In the clinical trial area, experts say the cloud will focus on leveraging pre-integrated technologies to support the end-to-end clinical trials process, from study planning and start-up to creation and submission of the clinical study report. This will allow organizations to focus on the study and not on installing, maintaining, and integrating information systems.

"The cloud will revolutionize the way that clinical studies are conducted and the speed with which information can be shared to sites, sponsors, partners, and vendors, and data collection, in particular, will benefit from this technology," says Jennifer Goldsmith, VP of Veeva Vault at Veeva Systems. "By making the collection of data accessible from anywhere and available across multiple devices, including mobile, critical clinical information can be updated in real time within the cloud. This means that decisions about trial execution can occur more quickly and with better baseline information."

> "Although the industry has standardized systems, it hasn't yet standardized processes."
>
> **TOM GRUNDSTROM** / Quintiles



> "We are now looking to leverage technologies such as data warehouses and visualization platforms to provide the tools that allow for proper oversight and governance."
>
> **GREG MOODY** / Millennium

She says a great example of how the cloud can assist with the operational processes of trials is the ability to create, review, approve, and share trial master file information in the cloud.

"By combining secure document exchange, regulated content management, and collaboration capabilities in a cloud-based TMF system, all process participants, sites, investigators, study coordinators, CROs, sponsors, etc., will have immediate access to information, rather than waiting for a final archive file," Ms. Goldsmith says. "Because of this, study coordinators or sponsors have the ability to see trial and documentation status in real time and make decisions accordingly."

Roche's Mr. Trombley says his company is using software as a service solutions (SaaS) within some areas of the organization.

"There are advantages in the sense that we can access the data at any time anywhere," he says. "Another advantage is that the vendor is managing any upgrades to infrastructure as well as having a support service as part of the cloud environment."

But, he says, costs for cloud-type services can be challenging.

"The costs can still be quite expensive," Mr. Trombley says. "Another challenge is ensuring that the data being stored on the cloud can be easily accessed and flow through other systems. There needs to be an efficient and overall solution that can be partially supported by the cloud and partially by in-house solutions. This would allow data to flow easily between both models." PV

EXPERTS

JENNIFER GOLDSMITH. VP, Veeva Vault, Veeva Systems, which provides cloud-based business solutions for the global life-sciences industry. For more information, visit veevasystems.com.

TOM GRUNDSTROM. VP, Integrated Processes and Technologies, Quintiles and Global Head, Quintiles Infosario; Quintiles is a fully integrated biopharmaceutical services company offering clinical, commercial, consulting, and capital solutions worldwide. For more information, visit quintiles.com.

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