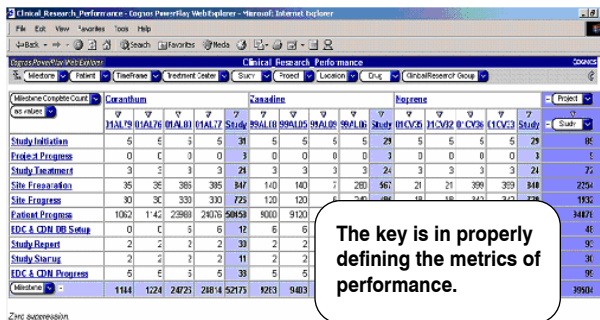


Optimizing Clinical Trials

By Peter Oudheusden President, 3C Company

Without stopwatches, would the 4 minute mile ever have been broken? The truth is, probably not. It is only by measuring our performance that we are able to set goals and drive for improvement. This has been found to be just as true in business as in sports, and ultimately will prove itself in the Research & Development world of life sciences organizations. To drive better R&D, we must first learn how to properly measure our performance.

The nature of scientific research by definition almost seems to defy measurement, for how can something that has never been done before be compared to anything that proceeded. Yet as drug compounds move through the pipeline and further into Clinical development, there truly is the opportunity for performance measurement. The key is in properly defining the metrics of performance. For example, the compound may be new, the protocol may be totally unique, and even the indication might be rare. But shared with other research is the fact that protocols are written, studies are initiated, treatment is completed, data analyzed and study reports written. These are all milestones along the path of research that are objective and meaningful markers of progress. So even with the most esoteric research, it is possible to define metrics such that performance can be measured.



The key is in properly defining the metrics of performance.

Milestone/Complete Count	Circumstance				Sawafine				Regence				Project	
	H1A79	H1A76	H1A73	H1A70	7	7	7	7	7	7	7	7		7
Study Initiation	5	5	5	5	31	5	5	5	5	29	5	5	5	29
Phase 1 Progress	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Study Treatment	3	3	3	3	28	3	3	3	3	24	3	3	3	24
Site Finalization	35	35	35	35	347	140	140	140	140	280	140	140	140	280
Site Progress	30	30	30	30	275	120	120	120	120	240	120	120	120	240
Phase 1 Progress	100%	100%	100%	100%	900	900	900	900	900	900	900	900	900	900
EDC & CDL DB Setup	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Study Report	2	2	2	2	33	2	2	2	2	33	2	2	2	33
Study Start	2	2	2	2	11	2	2	2	2	11	2	2	2	11
EDC & CDL Progress	5	5	5	5	33	5	5	5	5	33	5	5	5	33
Milestone	114	124	247	218	14	521	75	123	943					

Once the metrics for Clinical research have been determined, the next step is to collect the measurements. The way this is done can be the key difference between improving performance or actually hindering it.

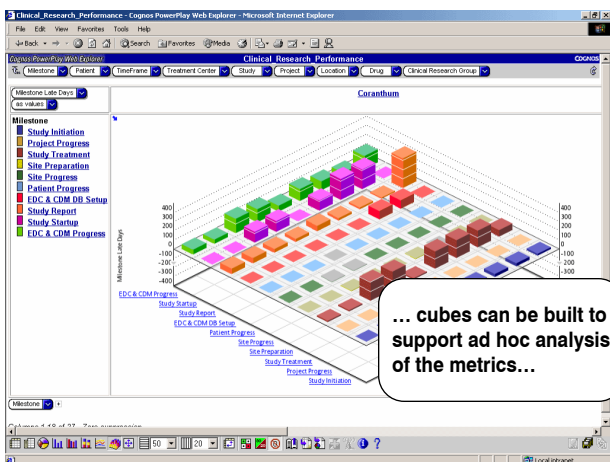
To go back to our sports analogy, the best stopwatch in the world would not help the runner who must stop racing to pull out a watch and mark their time. Similarly, we cannot expect study managers, site monitors and data managers to believe their performance will improve simply by them spending more time reporting progress to management. We must effectively leverage the datapoints already collected during the course of Clinical trials in order to minimize the negative impact on performance.

Some of the most readily available datapoints relate to the actual treatment phase of the trials. Certainly data management has full details embedded in the CRFs and edc forms that tell us when studies enrolled their first patients, when sites completed treatment, and when all discrepancies were resolved. But just as the runner is pushed to new limits by getting performance feedback during the race, performance in Clinical research can be driven by more timely measurements as well. For example, randomization centers are an ideal source for up to the minute enrollment metrics. Central labs are great for patient progress metrics as kits are shipped in from the investigator sites. And often tapping into the clinical data management system will yield timely data discrepancy metrics. Beyond patient progress, many organizations have clinical trial management systems that capture milestones such as investigator selection, IRBs and site initiations. Clinical supply systems may provide key metrics such as drug availability and supply shipments to sites. By spending some time analyzing current research processes, often ways can be found to capture performance metrics without adversely impacting the team.

Once the organization has identified suitable metrics and methods to collect measurements, the next step is to aggregate this information into a single source for purposes of reporting and analyzing. This aggregation has a clear benefit of pulling information together from multiple sources into one definitive repository of business intelligence.

This step of building a clinical metrics data mart has the added benefit of providing a level of isolation between the operational Clinical systems and the metrics that will be used to drive the business. This is critical to allow the underlying research systems to be replaced with improved technologies as they become available, without fear of disrupting the entire organization.

The Cognos toolset can now unlock the Clinical business intelligence embedded in the metrics of the data mart. Software cubes can be built to support ad hoc analysis of the Clinical metrics, so that correlations can be drawn between performance for a given metric and performance of the study. For example, it might be uncovered that as long as setting up an edc database takes less than 68 days, then the study will be faster than a paper-based trial. This process of exploring the cubes and finding correlations is integral to the next step, which is to identify the Key Performance Indicators, or KPIs. Identifying these key metrics is an essential step in the process of performance improvement, as it focuses the business on specifically those metrics, which affect final outcome. These KPIs can then be delivered to every level of the R&D organization through Impromptu Web Reports that allow monitors to look at KPIs just for their sites; study managers can get a global view for an entire study or just one country; medical directors can keep track of their compounds; and Clinical operations can identify top performers across all products and therapy areas.



Successful delivery of Clinical business intelligence to the organization requires strategically applying Cognos tools to KPIs aligned with the business.

The specific PowerPlay cubes and IWR reports will vary from organization to organization, but there is consistency in essential focus. The intelligence needs of Clinical organizations can be categorized into 5 focal areas that capture the essence of R&D performance: speed, timeliness, data quality, investigator performance and sponsor staff performance.

The first category, speed, in many ways is the performance differentiator of development organizations. Clinical has little direct influence over the safety or efficacy of a drug. Regulatory bodies set standards for delivering drug to market. In the end what Clinical affects most is getting the good drugs to market, faster. By looking at the durations of a particular study, or a project that combines multiple studies for regulatory approval, the Clinical organization answer questions such as Based on comparisons to our other programs, how long will it take to develop this drug for market? Are the EDC studies really saving us the time we had hoped? Which countries complete enrollment more quickly for this indication? What will be the effect on our submission date if we amend the protocol? The study and project duration metrics can drive decision making for the entire organization.

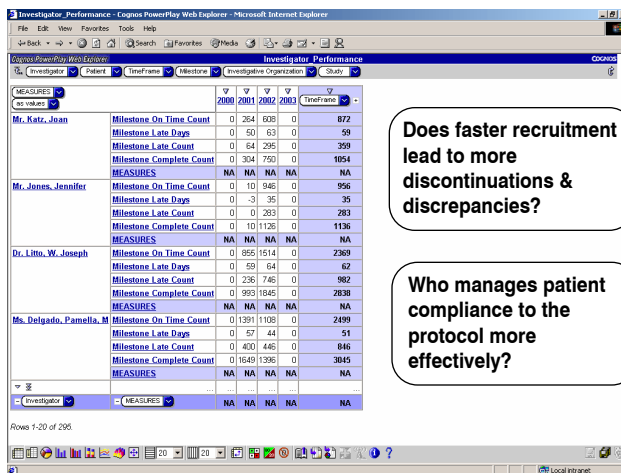
A second category for focusing Cognos is the timeliness, or on time performance versus plan, across all levels of the organization. Capturing the planned completion date of milestones in the research process, and then later capturing the actual completion dates when they happen, provides insight into organizational effectiveness and allow for improved product delivery forecasting. Clinical can then ask questions such as How timely has this product area been at completing submissions? Is our Pre-Clinical team completing their study reports on time? Are we getting better at planning? Are protocol translations delaying study startup in our subsidiaries? Based on past performance, what is the likelihood we will meet our target dates, with how much variance? Analyzing on time performance metrics within Clinical Research will result in better performance management.

Data quality is a third area of focus for leveraging Cognos to drive R&D performance. Clearly Clinical trials are not complete until the study data is clean, and how quickly this happens directly impacts the time it takes to get a product to market

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Capturing metrics on this aspect of Clinical research allows the business to ask questions like What percent of our queries to the sites are resolved vs. outstanding right now? How much of a delay is there between a patient's visit and entry of the data into the EDC system? How long does it take to collect CRFs from the site? What percent of data collected has initial discrepancies? Which studies have cleaner data? By focusing on the critical issue of Clinical data quality, Cognos allows organizations to use these metrics to drive process and performance improvements.

A fourth category of focus for Clinical organization is the performance of their staff and CROs. Different team members are going to excel in different areas, and by looking at individual performance the organization can place people in the roles that will most effectively leverage their strengths. Additionally programs of Best Practice will provide opportunities to mentor low performers while properly recognizing high performers. It becomes possible to ask What study monitors are better at getting top performance from sites? What percent of the time do our medical writers meet their dates versus the timeliness of our data managers? Which teams are best at resolving discrepancies? What countries consistently meet their enrollment quotas? Which CROs get better results? The metrics of on time performance, when applied to staff or contractors, can have an immediate effect on overall performance improvement.



MEASURES	2000	2001	2002	2003	Totals
Mr. Katz, Jean					
Milestone On Time Count	0	264	603	0	872
Milestone Late Days	0	50	63	0	59
Milestone Late Count	0	64	295	0	359
Milestone Complete Count	0	304	750	0	1054
MEASURES	NA	NA	NA	NA	NA
Ms. Jones, Jennifer					
Milestone On Time Count	0	10	945	0	956
Milestone Late Days	0	-3	35	0	35
Milestone Late Count	0	0	283	0	283
Milestone Complete Count	0	10	1120	0	1136
MEASURES	NA	NA	NA	NA	NA
Dr. Litta, W. Joseph					
Milestone On Time Count	0	855	1514	0	2369
Milestone Late Days	0	59	64	0	62
Milestone Late Count	0	236	746	0	982
Milestone Complete Count	0	993	1545	0	2538
MEASURES	NA	NA	NA	NA	NA
Ms. Delgado, Pamela, M					
Milestone On Time Count	0	1291	1139	0	2439
Milestone Late Days	0	57	44	0	51
Milestone Late Count	0	420	445	0	846
Milestone Complete Count	0	1649	1296	0	3045
MEASURES	NA	NA	NA	NA	NA
(Investigator)	NA	NA	NA	NA	NA

Does faster recruitment lead to more discontinuations & discrepancies?

Who manages patient compliance to the protocol more effectively?

But quicker recruitment with more data problems may not be a tradeoff worth making. Analyzing metrics of investigator timeliness & quality not only asks the basic question Which investigators recruit faster?, but also Can an investigator data quality rating help manage performance? What institutions meet dates? Does faster recruitment lead to more discontinuations & discrepancies? Who manages patient compliance to the protocol more effectively? Capturing investigator performance metrics such as these enable Clinical to reach another level of sophistication in their approach to developing drugs.

Clearly Cognos effectively delivers Clinical business intelligence to the R&D organization when strategically aligned with metrics focusing on speed, timeliness, quality and performance of staff & investigators.

KPIs specific to Clinical R&D will let the organization know where their performance stands, and will drive improvement. This alone is more than enough to warrant action, but the benefits do not stop here. Cognos Metrics Manager lets you interconnect these performance indicators, and model entire drug development plans and strategies. Coupling these Clinical metrics with metrics from Cognos solutions for Sales & Marketing, Metrics Manager is the first tool to deliver drug portfolio management to the desktops of the decision makers. Factoring drug development time into patent life to arrive at projected sales & marketing forecasts, using near real-time metrics, enables Pharmaceutical & Biotechnical organizations to put together sophisticated product strategies and then monitor corporate performance against the plans.

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Investigator timeliness & data quality is the fifth strategic area of focus for Clinical business intelligence. Historically an investigator's ability to recruit patients has been the sole metric available for choosing research partners.