Data Driven: The Analytics Journey in Health Care and Life Sciences

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Featuring:

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Introduction

Analysis of electronic medical records can detect misdiagnoses, monitor medication compliance and better assess risks to provide the best therapeutic interventions.

Analytics is being used to design better clinical development programs that identify effective drugs more quickly, and also to identify subgroups of patients for whom a therapy will work particularly well.

Pharmaceutical companies are creating collaboratives and consortiums to share their clinical trial data and integrate it with real-world evidence to accelerate scientific discovery.

Sophisticated analytic techniques are uncovering secrets in the human genetic code that bring us closer to the ideal of personalized medicine.

The health care and life sciences industry has made dramatic progress in using big data and analytics to advance the proverbial triple aim – better health, better care experience and lower costs. Technologies such as cloud computing, high-performance analytics and visual analytics have redefined what is possible, how fast it can be done and how readily it can be shared.

However, much potential remains untapped because many organizations lack a culture where people understand, value and demand fact-based decisions and strategies. That needs to change. Smart, lean operational decisions become ever more critical as we bring more people onto the health care rolls and transform the health care system from a fee-for-service model to pay for performance.

Ten Steps to Creating an Analytic Culture

In a panel discussion at the 12th annual SAS Health Analytics Executive Forum in May 2015, leaders from Dignity Health, Horizon Blue Cross Blue Shield of New Jersey, Janssen Pharmaceuticals and SAS shared what they have done to prove the value of analytics to their business leaders – and what has worked for them as they developed an analytic culture in their organizations and put analytic insights to work.

1. Curate and govern the data.

The corollary to the adage, "garbage in, garbage out" is "value in, value out." "Unless you have an accurate and credible data environment, all the analytics you do are for naught," said Jason Cooper, Vice President and Chief Analytics Officer at Horizon Blue Cross Blue Shield of New Jersey. "We hear a lot of conversations about big data, and it's always formed in the three V's – volume, velocity and variety. But the two bookends that people often miss are veracity and value. To get value, you have to start with the veracity. What's the truth level of your data?
How clean is it?"

It's an assertion no one disputes. "The source of the data is the source of truth," said Joseph Colorafi, MD, Vice President and Chief Medical Information Officer at Dignity Health. "You don't want to ask one question in the organization and get many answers."

A key missing element of the data foundation is a 360-degree view of the patient over time, Colorafi noted. At every entry point into the health care system – outpatient or inpatient – a new medical record is spawned, accelerated by electronic records generation. "It's very important to have some type of unified master patient index and provider index [to link those events together]," said Colorafi. "Without that, we really don't have a longitudinal view of a patient."

Why does this matter? Without that longitudinal view, you won't know if you're ordering redundant tests on a patient. You won't know if a cost-saving decision made now (such as choosing a less costly cocktail of prescriptions in the short term) will lead to more costly care down the road. You can't make the best care decisions based on a long-term view. In the end, costs go up while patient safety goes down – exactly what health care providers and payers cannot afford under the emerging value model.

A master patient index that is coupled with a master provider index enables the ability to see a patient's history across all points of care. "At birth, every person should have a universal medical identifier (something other than Social Security number) that we can use to do information exchange," said Cooper.

2. Apply the right analytic techniques.

You can start with the best and brightest data and still muck it up along the way, Cooper noted. "Statisticians, epidemiologists and others [quantitative specialists] know that if you torture the data long enough, it will confess to anything. So it's really important to use analytical methods to dial out the truth and understand what is and is not veracity."

Analytic tools run the gamut from descriptive statistics to predictive analytics to optimization and high-end machine learning. The power comes from matching the approach to the question at hand, said Curtis Smith, Vice President of Commercial Analytics and Operations at Janssen Pharmaceuticals. "It has less to do with the technique and more to do with how you're applying it. Are you applying good analytic problem-solving capabilities in identifying the problem statement, coming up with a great design and then executing that design?"

Getting it right requires an alliance between IT and the business, said Cooper. "When you marry analytics with IT technology and the business acumen, you get a strong data governance organization. A shared ownership model is really important." Shared ownership provides the necessary perspectives to answer the fundamental questions of an analytic culture, such as:

• Why are we doing the analytics, to what end for the business?

• What technology components are we using?

• Is the information environment set up for minimum time on data prep and maximum time for analysis?

• Are we providing appropriate safeguards for the data?

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Those overarching governance issues should be guided by steering committees and working groups, especially as health care analytics moves to the cloud, the Internet and health information exchanges.

3. Start from the outside in.

Many analytic projects (especially the doomed ones) begin from the inside out. The thinking is, "We have all this great data in-house, let's figure out some great applications we can develop to use it."

"[The analytic process] begins and ends at the business," said Cooper. Company leaders must understand why the organization needs to be empowered by analytics. Analysts need to think at the macro level of the company. They must understand the business well enough to have the right conversations and to find the information gap that is keeping business users from making a data-driven decision."

The process starts with business consultation, then moves to data preparation and data cleansing, then to using the right analytic methods to accurately answer that question. To close the loop, analytic insights are delivered consultatively to the business to help clarify the analysis that was done and how to interpret the results.

4. Cultivate passionate ambassadors.

"It's great to have the information and insights, but you have to have a realistic approach to operationalizing it," said Colorafi. "Who's going to own that? Suppose we have a predictive algorithm for neonatal intensive care that helps us avoid a terrible complication in a small minority of our newborns. Who's going to own that? As exciting as an area might be to us, if there isn't anyone who has the passion to own it, you might need to look at another area where there is the passion for someone to own.

"Another way to ask the question is, what risks are you wanting to manage in the organization? Health outcome risk, patient experience risk, legal risk, compliance risk? Take your pick." Find out who in the organization lies awake at night worrying about that risk, and you'll find your passionate stakeholder.

Panelists also encouraged the inclusion of existing data stewards, the ones who are not organized at the federated level but rather at the application level. "If you have the opportunity to aggregate your data and you're thinking about creating a data warehouse or platform to do analytics, make sure that in your data governance model you include those data stewards who are using these disparate applications," said Colorafi. "Get them involved in the project; let them use their [preferred] tools. And then without really changing the organizational structure, those data stewards become matrixed into your new aggregated data warehouse for that project. Be inclusive. We've addressed it this way with our data stewards, and then transition them over to other tools."

5. Build analytic expertise.

With the surge in demand for analytic expertise, even large and well-funded organizations have major talent gaps. Skilled data scientists are in short supply. Those with a hybrid background in analytics as well as health care and life sciences are rare.

"Asking the right business question means you're using consultative business practices with your business partners and you have some level of business acumen."

Jason Cooper,
Horizon Blue Cross Blue Shield
of New Jersey

Rarer still are those with the necessary diversity of analytic skills, said Smith. "It's easy to build an analytic plan around hypotheses, where you have a pretty good guess that this is how the marketplace is working," said Smith. That's only part of the analytic picture. "The real innovation often comes from the exploratory work, the 'I don't even know what I don't know,' and 'I never would have thought this is how it would happen.'

"You find yourself working in lots of different areas as you start to do more and more analytic work, including areas that I wouldn't classify as classic analytics. The data science work, the exploratory work, the machine learning work – that's an entirely different skill set from a process standpoint. … If someone has done a lifetime of regression analysis, it doesn't necessarily set them up well to do neural networks. It's something that we've had to go outside and hire for, and supplement with internal training."

While some gaps can be filled to a certain extent with tools, there's still a need for people who know how to do exploratory analysis in a way that leads to commercial innovation.

6. Maximize and focus your analytic expertise.

Most organizations have pockets of analytic expertise, but you gain great synergies and economies of scale by bringing your brightest stars together to focus on the most important analytical approaches and problems.

"If you have silos, every silo is going to tell you their 10 things are most important," said Cooper. "But if you look at all 100 of those things, there are probably several that are very low- to no-value work that need to be put on hold or mothballed, while other things come to the top because they're a higher priority at the organizational level. Unless you have a centralized analytic organization driving that enterprisewide governance and prioritization conversation, you may actually be focusing a fair amount on very low- to no-value work when you consider everything in totality."

Pooling analytic expertise into a central hub does have its limits, Cooper cautioned. "Centralization has value as long as you don't pull the people too far inward and lose the business acumen [specific to a business unit]. If you're doing pharmacy analysis or case management analysis or medical home analysis, individuals need to understand how those units actually work and how the information would be plugged into the workflow. … So I like to think of analytics centralization as a hub-and-spoke model, where you have a hub of central analytics, but you spoke out to the business verticals where the deeper business acumen is."

7. Make analytics business as usual.

"Analytics is not a one-off project or an annual project where you look at a particular issue," said Smith. "It becomes an integrated ecosystem of tracking, analyzing in real time, and turning that back into strategies for your business. Unless [analytics] gets integrated into the very fabric and fiber of how your business operates, then you're missing a tremendous opportunity.

"At Janssen, we saw that if we continued delivering on project-based analytic work, the best we could do was one-and-a-half times [ROI], and that does not pan out in the marketplace. We are trying to make analytics less of a project-based delivery and more

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of an ongoing way we do business. … It's an incredible investment in time, effort and money to get the data infrastructure and governance in place, but that has to happen or we won't be able to deliver on the promise."

8. Deliver analytics to the front lines.

For analytics to have value, it must be delivered fast, said Smith. "The half-life of a business issue is about a week. If you don't have the analytic process in place to deliver against that, it greatly impedes the value you can deliver to the organization. It's about getting the information in the hands of the decision maker – whether it's the doctor or the business decision maker – when they have the need." Imagine the value of getting analytic insights into the exam room while the provider is with the patient, making care decisions. Or making timely adjustments to operational decisions to make the organization run with higher quality and efficiency.

With high-speed networking, shared data access and mobile devices, the best analytic insights can (and should) be right at hand. "You have an opportunity to automate and re-engineer how you're caring for patients," said Colorafi. "You are decreasing the number of middlemen that you need to get data from a record to the decision maker. … 'Here's the business use case; here's our evidence-based content, right here for you on your PC, Mac® or iPad®.' Cut out that whole middle process and associated information lag for getting information to your decision makers.

"I recently worked with an intensivist to re-engineer how we're managing sepsis, not only matching a smarter alert to prevent sepsis in the inpatient hospital setting, but then being able to continuously track the results. We found the outliers and identified the superstars. The physician asked me, 'Can I use the SAS® application and put that on my iPad, so I can show my colleagues that information?' The answer was yes. It sold itself, because it's a value add, and we make it easy for the decision makers."

"Some stakeholders will say, 'Just give me an Excel spreadsheet,' but there's a bit of death by spreadsheet," said Cooper. As we think about driving decisions to the trusted advisers in the health care system, we have to think about ease of use. "Unless we can push [analytic insights] comfortably into the clinical workflow of those who engage with patients and members on a day-in and day-out basis, we haven't yet met the charge we need to meet. … We have to find a way to integrate that into the clinical workflow; we don't want yet another application or another login."

"Our physicians and nurses are very good at taking the information, trying to separate the wheat from the chaff, and then having some of those hard conversations with the opportunities and outliers based on performance and so forth," said Colorafi. But they shouldn't have to go to multiple systems to find that information. "Why don't we create a registry for them, something that's easy to use? The value add is understanding how consumers want to use information and being able to say, 'It's all here for you.' For instance, get them involved with the design and testing of say, the group of dashboards or registries you're doing for a particular disease state or clinical trials. It's not a silver bullet, but it helps the recruitment and the credibility of the program."

9. Move from insight to action.

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Jason Cooper,
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"Analytics is not just a model create/test/validate/execute cycle, but a business analytics cycle in which 'success' is that we learned something. In a cyclical process, success is to learn fast, even if we learned that it's not something of interest."

Kimberly Nevala, SAS
Best Practices

You can have impeccable data and dazzling analytics, but if people aren't using the analytic insights – if nothing happens because of it – it really doesn't matter, said Kimberly Nevala, Director of Business Strategies, SAS Best Practices. "There's a lot of interesting stuff you can investigate and discover, but what is really germane? What are we willing and able to take action on?"

"We talk about the value – that two to three times improvement or savings – but you only get credit for what gets implemented," said Smith. "If you do a great analysis that could have driven $2 million of whatever, and it's not implemented, then you don't get credit for that."

"At Janssen, we have staff development courses in analytic methodologies but also in how to develop that relationship with business partners and learn how to get them to implement. We always challenge our analytics people to go beyond the findings to explicit recommendations. What are the five things that you would recommend the marketers or salespeople to do? Many times the analytic work I see gets to great findings, but those results [and what they should do with them] are not necessarily clear to the person you're delivering it to. They need to know, 'What should I do Monday morning?'"

That analytics-driven recommendation – leading to a decision that leads to action that changes the business for the better – is the goal. Analysis for its own sake is a waste of time and money, said Cooper. "That kind of governance conversation isn't always comfortable as you consult with the business community. Sometimes they want to say, 'I just want to know.'

"My reply would be, 'Well, you want me to do this analysis because you want to know, but how are you going to change your decision-making relative to the clinical workflow, financial analyses or some other business category?' If they don't have an answer for how I will either prove or disprove their hypothesis, then perhaps it's not the right time to do the analysis, because we may be wasting our resources."

10. Show the value.

"I'm going to guess that in most organizations, analytics is typically thought of as a cost center," quipped Cooper. "It's certainly not part of P&L, right? It's usually owned by market segments or other verticals in your organization. I don't like to think of analytics as a cost center; I like to think of analytics as a value center."

To convince the organization's leaders to think the same way, you have to offer credible proof points. "It's really important to focus on targets and KPIs that enable you to measure, monitor, track and prove the value of analytics to the organization," said Cooper. Any analytics organization should be able to show that investment in analytical knowledge workers and infrastructure has paid for itself three to five times over.

It will take time, Cooper concedes. "You can't flip a light switch and say, 'Oh, I'll get there tomorrow.' But in a two- to three-year analytic maturation model, you should be able to

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get to the point where you're no longer thought of as a cost center but as a value center, and a lot of really good things come with that conversation with your leadership."

Business leaders are all about investing where the returns are good. If you track and demonstrate the value of analytic resources, leadership will be more apt to invest in helping you. Instead of the analytics people begging for budget for some nebulous quantitative capabilities, the conversation turns to one where business leaders say, "Let's invest in different data assets and information sharing capabilities, and visualization capabilities for driving on-demand, self-service types of analytics out to the business community."

Once they've seen that analytic insights have led to an x percent reduction in hospital-acquired infections, or a y percent improvement in audit effectiveness, or a z percent reduction in time to market, for example, they'll be sold.

Closing Thoughts

"All of us realize that data and analytics are both a competitive differentiator in the marketplace as well as a strategic asset," said Cooper. "If you don't invest in and nurture them – by 'you' I mean all of us in the health care ecosystem – then we're not going to be able to transform health care the way we need it to be, which is moving from fee for service to fee for value and having conversations about quality outcomes. At the end of the day, this is about all of us leading healthier lives, and using data and analytics to enable that."

Analytics enables you to tell the story in a new and more compelling way – based on facts and logic rather than intuition and tradition. "It's a story that data science leaders such as myself have wished for all of our careers," said Colorafi, "to be able to tell the story not only through the stick, which has been cost … but also by the associated health outcomes. 'So if you decrease my formulary choices for antifungals in my hospital, do I get more meningitis, do I get more mortality?' To be able to tell that story with health outcomes and patient experience and not just cost – and if you can do that with your analytic program – you'll get stakeholders that are interested in change."

"As you build and manage an analytic capability within your organization, make sure you're always taking a long-term view," said Smith. "There are a lot of things that you can go after that look great, but it can create a lot of swerve in the organization. … We have to be very tied to the business. If we're not making an impact there, then we're not adding value and we're not getting to the three times to four times [ROI] that we intend to achieve."

"The speed of technology advancements, the expansion of health care participation, the proliferation of data require new levels of adaptability, flexibility and speed to market. You have to show value, so your leadership will invest to help you keep pace. It's a virtuous cycle of value creation."

Jason Cooper,
Horizon Blue Cross Blue
Shield of New Jersey

About the Presenters

Joseph Colorafi, MD, Vice President and Chief Medical Officer, Dignity Health

Colorafi's primary responsibilities include implementing electronic health records, improving safety and quality of patient care by using medical informatics technology, and leading the system to greater maturity in health analytics. He has more than 13 years of experience in medical informatics and a considerable amount of expertise in change management governance and effective methods of provider online and scenario-based learning. He has been very involved in an EMPI strategy, which would synchronize operational chart mergers with probabilistic matching algorithms for use in Dignity Health Insights. Colorafi has served on many informatics-related committees, including the AMIA Cerner's ICD10 Physician Workgroup, as well as Allscripts' Physician Advisory Board. He has practiced pulmonary and intensive care medicine for more than 20 years.

Jason Cooper, Vice President and Chief Analytics Officer, Horizon Blue Cross Blue Shield of New Jersey

Cooper is responsible for enterprisewide data analytics and informatics, including both commercial and government lines of business. He has more than 20 years of experience in analytics and informatics covering for-profit, nonprofit and government domains, including leading teams at Wellmark Blue Cross Blue Shield, Cigna and CVS Health, as well as experience with NASA spaceflight software analyses. Additionally, he is a member of the International Institute for Analytics and the American Medical Informatics Association and an editorial board member for the American Journal of Pharmacy Benefits.

Curtis Smith, Vice President of Commercial Analytics and Operations, Janssen Pharmaceuticals

Smith focuses on nurturing emerging capabilities in response to the changing external environment and oversees the development and deployment of critical value-gener-ating analytic capabilities. He has more than 25 years of experience developing and executing analytic plans to address complex, critical business issues across multiple industries and has extensive expertise in growing and leading business analytics func-tions within organizations. Prior to joining Janssen, he led the analytics function for McKinsey & Company and Henry Rak Consulting Partners. Smith has a track record for translating analytic plans and research into clear business insights and strategic direc-tion, resulting in significant business transformation.

Kimberly Nevala, Director of Business Strategies,
SAS Best Practices

A frequent writer and speaker, Nevala is responsible for industry education, key client strategies and market analysis in the areas of business intelligence and analytics, data governance and master data management for the SAS Best Practices team. She has more than 15 years of experience advising clients worldwide on the development of sustainable business strategies and the importance of culture and change management.

For More Information

View on-demand recordings from the 12th annual SAS Health Analytics Executive
Forum: sas.com/virtual15

Read the SAS health care and life sciences blog,
A Shot in the Arm: sas.com/content/hls

Learn more about SAS health analytics: sas.com/health-analytics