Constructing an Analytics Strategy

October 4–5, 2017 | Chicago, IL

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Executive Summary

The Scottsdale Institute convened data, analytics and information executives from across the country for the 2017 SI Business Analytics Fall Summit in Chicago on October 4-5, 2017. Attendees—representing large academic medical centers, multi-regional health systems, rural hospitals and clinics—gathered to share strategies, concerns, insights and lessons learned on the journey towards an "analytics utopia" with specific focus on the governance, staffing, and management of data and analytics in an ever-changing healthcare environment.

Participants were guided through a series of questions and topics, and asked to weigh in on how analytics is deployed and leveraged by their organizations to deliver value, their views of the marketspace, and their strategies for evolving their analytics ecosystems in order to respond to market, regulatory and organizational pressures.

ANALYTICS FALL SUMMIT PARTICIPANTS

> **Stephen Ameen**
IT Director of Revenue Cycle Systems
Houston Methodist

> **Rick Howard**
VP, Data & Insights, & Chief Data Officer
Ascension Information Services

> **Ben Isenhour**
Regional Chief Information Officer/
VP of Advanced Analytics and Architecture
Eastern Maine Healthcare Systems

> **Brett MacLaren**
VP, Enterprise Analytics
Sharp HealthCare

> **Julia Swanson**
VP, Performance Analytics & Improvement
Henry Ford Health System

> **Yohan Vetteth**
Chief Analytics Officer
Stanford Health Care

> **Michael Wall**, PharmD
Chief Analytics Officer
University of Chicago Medicine

> **Glenn Wasson**, PhD
Administrator of Analytics and
Performance Measurement
University of Virginia

> **Christine Watts**
(Former) Chief Enterprise Architect
University of Chicago Medicine

> **Kerri Webster**
(Former) Director Information Technology
Centura Health

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Current State & Data Delivery: Data Rich, Information Poor

The Summit kicked off with participants sharing their insights regarding current state and data delivery methodologies. All feel reasonably successful in assembling and acquiring data, yet providing meaningful data continued to prove elusive. As expressed by Stephen Ameen, IT Director of Revenue Cycle Systems, Houston Methodist, "We find ourselves 'data rich' yet 'information poor.' We are not getting the intended value from our data." Yet there was agreement that this quandary also represents significant opportunity. Participants viewed their organizations as ready to leverage data to assist with decision making—and believed they are "data-ready" if not yet "data-driven."

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>
> — **Stephen Ameen**, IT Director of Revenue Cycle Systems, Houston Methodist

DOES YOUR ORGANIZATION TRUST YOUR DATA?

Level of trust is dependent upon the available data, its stakeholders, the problem itself, and who is asking the question. Business and financial users are more comfortable with data; clinicians (particularly physicians) are more likely to question validity.

The primary challenge with clinical data is that it is less structured for data collection. For example, data elements such as blood pressure are documented in numerous, different places in the medical record making standardization difficult.

> "Trust is also contextual. Many times data may be slightly wrong, but it is the same 'wrong' for everyone, therefore it can still be directionally correct."
>
> — **Rick Howard**, VP, Data & Insights, & Chief Data Officer, Ascension Information Services

"Trust is also contextual," Rick Howard, VP, Data & Insights & Chief Data Officer, Ascension Information Services, commented. "Many times data may be slightly wrong, but it is the same 'wrong' for everyone, therefore it can still be directionally correct" and can help foster better business decisions. Yohan Vetteth expanded on that line of thinking, saying, "You can gain incrementally more value from improving the data standardization process, however, it is not always necessary to wait for data to be completely accurate to make a valid and useful decision."

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UChicago Medicine

"Creators and consumers of data should work together to define the needed data definitions."

– **Christine Watts**, (Former) Chief Enterprise Architect, University of Chicago Medicine

Engaging users as "co-owners" of data remains critical to improving trust. Trust gets established during stakeholder conversations when data is being assembled and metrics are being developed. "Creators and consumers of data should work together to define the needed data definitions," noted Christine Watts, (former) Chief Enterprise Architect, University of Chicago Medicine. Documenting and communicating data sources also fosters trust.

OWNERSHIP VS. STEWARDSHIP: DATA GOVERNANCE

All agreed that collaboration among operational and technical stakeholders is required for data analytics to be successful. Yet there was some misalignment in defining the roles of data "steward" vs. data "owner." Some organizations use the terms interchangeably; others align them to IT and operations. Those differentiating the two felt business owners, who understand the challenges the particular data are supposed to resolve, are best defined as data owners, while data stewards would be those accountable for the data definition and appropriate use of the data by the organization, and usually affiliated with IT. The group observed that distinguishing between these two roles reflects evolving views toward data governance—looking beyond the traditional centralized governance model to more hybrid federated models.

Glenn Wasson, PhD, Administrator of Analytics and Performance Measurement, University of Virginia, expressed that progress can often be encumbered when business units are not standardized, and services not unified. Finding a reasonable way to ensure everyone is using the same data, and same data definitions, poses a significant challenge. This cascades to ensuring that data standards and data governance become foundational structures as organizations evolve their analytics capabilities.

Participants shared insights on their various governance structures with most involving Clinical, Finance, and Operational subgroups as well as combinations of operational and technical stakeholders. Julia Swanson, VP, Performance Analytics & Improvement, Henry Ford Health System, noted that

Henry Ford HEALTH SYSTEM

"It must be a collaboration; we need a communication model so that decisions are not made in a vacuum."

– **Julia Swanson**, VP, Performance Analytics & Improvement, Henry Ford Health System

the two sides agree (maybe) 75% of the time: "It must be a collaboration; we need a communication model so that decisions are not made in a vacuum." The primary objective for governance is to create and adopt organizational data definitions. This process can be time consuming (one participant remarked it took five months for the clinical team to define "visit") with some engaging consultants to help expedite the creation of data definitions. Once agreed upon, governance must hold firm on consistent use of the adopted definitions across the organization.

The group also felt the lack of adoption of available industry standards was a hurdle, remarking, "Our lab providers don't use LOINC," and, "The federal government doesn't adhere to the standards they help create." As a result, many stakeholders develop their own standards, struggling to remain consistent not only within their own governance functions, but amidst the constant changes in healthcare.

Reinventing Analytics: Shadow IT/Hybrid Models, Staffing, and Demand Management

In response to the changing healthcare market, several attendees noted recent restructuring of their analytics teams, either reinventing their governance models or remodeling their organizational structures to accommodate evolving needs. In addition to the constant pressure to do more with less, early analytics adopters are maturing and shifting their approaches to maximize effectiveness. Stephen Ameen acknowledged this common sentiment, "It is a different skillset to interpret the data than it is to create the reports."

Understanding staffing options has become a priority for analytics leaders—as well as how to simplify data delivery to the organization. A key question articulated by Julia Swanson, "How do we give people the right tools to take the burden of an ad-hoc request off the analytics team?" Stephen Ameen echoed, "We need tools that provide self-service—giving individuals the ability to get information themselves." If empowered, people can find and interpret the data they need to answer their own questions.

Many noted the development of "shadow IT" or "shadow analytics" groups as a functional outcome of users' thirst for data, coupled with a time sensitivity for data-driven answers. This was not necessarily viewed negatively. Attendees agreed shadow IT can be leveraged, but it needs to have structure in order to be successful. Furthermore, critical initiatives need to have a third set of eyes—as Kerri Webster, (former) Director Information Technology, Centura Health, related, "Users shouldn't attempt a self-service pro forma on a $3M deal."

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"Users shouldn't attempt a self-service pro forma on a $3M deal."

– **Kerri Webster**, (Former) Director Information Technology, Centura Health

The importance of providing timely data led the group to a lively discussion regarding the difficulty of staffing analytics teams, and particularly data scientists to respond to requests.

Many experienced long-standing openings—data scientists, data architects, data visualization specialists—all in very high demand, and very scarce individuals. Furthermore, other industries (such as tech startups) are pricing these skillsets out of the reach of most healthcare organizations. Indeed Yohan Vetteth, Chief Analytics Officer Stanford Health Care, located in Silicon Valley, sees staff attrition mainly to startups and not as much to other healthcare organizations. "It is hard to compete with startups for data analysts purely on salary so we look for people who believe in our mission and want to make a difference."

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>
> – **Brett MacLaren**, VP, Enterprise Analytics, Sharp HealthCare

Instead, some consider establishing partnerships with those startups as a way to offset risk, primarily because analytics experts employed by hospital systems find themselves without a career growth path. "We would train them, they would learn healthcare and related technologies, and then they would go work for a healthcare data/technology vendor or startup," said Brett MacLaren, VP, Enterprise Analytics, Sharp HealthCare. "The healthcare data space is one of the hottest markets out there!" Being creative, and sharing employee expertise with start-ups, may be ways for hospitals to maintain access to individuals possessing high-demand analytics skill sets.

Outsourcing is another staffing option considered to help meet demand—including offshore engagements for report developers and the monitoring of nightly data processes. This could free on-site staff to focus on more complex projects and communication. "We have been outsourcing this type of 'commodity' work, improving our speed-to-market and managing our professional services costs. The more strategic and creative work is kept in-house—we want our employees to be driving those solutions," said Christine Watts. Yet the group cautioned that while external support may address the need for specialized skills, it is not always less expensive.

Some are solving the demand problem by sharing specialized skill sets across business units. "Data Scientists are highly skilled (and rare) individuals, with a different bag of tricks from IT," said Glenn Wasson. "We spread their skills around." He shared that UVA Data Scientists are distributed among the operational groups

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so they can share their critical thinking: "Partnering the analytics team with the operational-based Data Scientists has been a great model, with the latter serving as 'data visualization designers' for high volume data areas." However, Glenn Wasson warned that success breeds increased demand, potentially exacerbating the problem of limited staff resources.

"Demand management across a federated organization can seem virtually impossible," noted Mike Wall, PharmD, Chief Analytics Officer, University of Chicago Medicine, who convenes his governance team monthly to review and prioritize new requests. Christine Watts noted that, "People get tired of waiting for IT and so they are creating their own analytics shops (shadow IT for data) because IT resources are shrinking." Communicating the status of demands with stakeholders helps ease some of these tensions.

Glenn Wasson noted this seems to be a swinging pendulum, as he sees his distributed model returning shadow IT back into formal IT purview. To stay focused, his team concentrates on six specific organizational measures, developing work plans to service those specific challenges. Yohan Vetteth concurred with this strategic approach for his team as well, yet he also shared an interesting model which sparked lengthy debate among attendees. Yohan Vetteth provides end users direct access to their data warehouse and data marts. Users must be application-certified for data access, pass a test for technical competency in SQL and other tools, and secure leadership sign-off on an agreed "Rules of the Road" around how the data should be used. These users are monitored like the analytics group for appropriate data use aligned with compliance standards. This approach provides autonomy and speed of data access for shadow users while keeping data in compliance, as the analytics team retains its function as data publishers. Others in the group were less comfortable with such an open approach, advocating for more traditional user roles, using data sources fully vetted and owned by analytics teams.

Glenn Wasson said that giving shadow teams access to the data isn't usually enough, as providing too much data can distract people. Brett MacLaren agreed, noting there is still a gap between what analytics can provide and what end users want—and that gap will naturally fill with shadow IT. "Data will find a way," he said.

Ben Isenhour, Regional Chief Information Officer/VP of Advanced Analytics and Architecture, Eastern Maine Healthcare Systems, noted he is "jump-starting his organization's analytics capabilities with a new Data Warehouse that will leverage the core EHR ecosystem data stores." However, facilitating increased accessibility presents new challenges around who will monitor users and ensure they keep up with any required training and qualifications.

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Overall, the group advocated for providing guidelines—or technical "guard rails"—for such distributed analytics roles. The function of analytics remains a tenuous balancing act between giving end users self-service tools, along with the responsibility for accurate interpretation of the data. The group felt there were good tools available, yet advanced analytics functions were still needed. Brett MacLaren related: "With self-service, we are helping users answer questions they don't know how to ask. We need a platform for self-service data access—and not just SQL but 'point and click' so anyone can use it. We haven't found that one tool—yet."

Data Delivery: Analytics Wins and the Value of Quality

In addition to the challenges of facilitating self-service and maximizing staffing, the group shared insight on their recent successes and discussed organizational expectations around data quality, predictive and prescriptive analysis and master data management (MDM).

In particular, self-service was not only cited as a challenge—but also listed by many as a recent "win." Shifting the data warehouse strategy to promote accessibility, analytics tools adoption, and enterprise dashboard utilization topped the list of successful initiatives. Additional wins include continuous improvement efforts for clinical transformation outcomes, quality measure reporting, and analytical insight such as robust revenue-cycle process improvement, readmission analysis, core executive metrics and clinical variability analysis.

The question of how data quality is valued was posed to the group, particularly whether high demand for data reduces the need for validity and reliability. While stakeholders often desire immediate access to high-quality data, providing sufficient resources to validate data often remains difficult, especially considering the fiscal challenges of the current healthcare market.

Delivering useful information to make effective decisions requires understanding what degree of data quality is needed. One factor to consider is time—if an immediate answer is required, then a less robust, but "directionally correct" answer may suffice. AHIMA offers a guide, yet organizations need to decide how they will operationalize quality, and how many resources (and dollars) they will devote to ensuring robust data.

> **"We cannot sacrifice good for perfect. The quality of data input leads us to what analytics we can produce—and we know that can change over time."**

Data life cycle must also be considered. At times, data can be allowed to mature—auditing for financial validity for example may allow for retroactive reporting, when immediacy is not required. Rick Howard said it best: "We cannot sacrifice good for perfect. The quality of data input leads us to what analytics we can produce—and we know that can change over time." Real-time data delivery may be essential at times, but may not be necessary for all cases.

The complexity of data processing can also affect data availability. The group agreed that data preparation can be a significant barrier—especially with clinical information—as semantic normalization is often required to ensure users have all the data they need and expect. Another gap identified was the need for a comprehensive, easy-to-use data catalog that is able to enhance and leverage any collected metadata.

Participants shared their experiences exploring predictive and prescriptive analysis. While there are vendors that can help with algorithms, operational engagement was identified as the key to success. Some found they can make predictions but that clinical and operational leadership weren't ready to act upon any obtained insights. Success stories included using real-time EKG information to predict cardiac arrest; discharge predictions for staff scheduling and room-control adjustments; care coordinator interventions; and readmissions.

Teams are also investigating use of geographic analyses and public data to predict diagnosis, but debate remains as to how much and what types of external data should be allowed to drive care plans. For example, is it appropriate for a physician to know a patient ate at McDonald's three times this week? Julia Swanson added, "Spatial analytics across areas is important as well. Internal as well as external (location) data can be combined to help organizations understand what is happening to patients in their primary service areas." There is extensive potential in this area, and organizations are likely to leverage these techniques as they pursue clinical excellence and enhancing the digital patient experience.

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– **Michael Wall**, PharmD, Chief Analytics Officer, University of Chicago Medicine

Similarly, analytics teams continue to hone their MDM processes. Everyone agreed refinement of Master Patient Indices and patient identification remains an ongoing priority, along with an accurate Master Provider Index. Other targeted data sets include organizational hierarchy, patient placement and terminology mapping/ontology exposure. "Ideally, we want to have the history of the patient across all visits," said Mike Wall. "Good master data will let us reconstruct patient care and operations, so we can improve it."

The group defined "data exhaust" as using data for a secondary purpose. Not to be confused with "data fatigue," in which users are overwhelmed with too much data, data exhaust represents the extended use of data, often for a purpose not originally envisioned. For example, RFID data could potentially be extended to offer insight into patient care activities. It could be compiled to provide statistics showing the number of nurse visits to rooms, how quickly transport arrived or how long patients have to wait. These secondary data points could then be leveraged to facilitate staffing decisions, improve quality metrics and so on.

Overall, the group felt their work was respected. Data, once trusted, is typically seen as very valuable to the organization. And the desire for more sophisticated insight continues to rise.

Responding to Market Dynamics

The group discussed how their programs were responding to market needs regarding involvement with planning and contract negotiations, pay for performance (P4P) initiatives and potential mergers and acquisitions (M&A).

Most agreed they are there—or getting there—regarding P4P. Challenges here are usually due to externally sourced data, and how to best establish ownership and responsibility (identification of "data owners" and "data stewards") for that data, and whether the analytics team should assume this accountability. Rick Howard noted his team accepts accountability when data is accepted into the organization's data lake. "We take accountability when it goes into our data

repository," he said, and emphasized the need for standards to ensure an appropriate level of quality, such as source-system edits to help improve physician data entry.

Most attendees, at least on the IT side, are engaged in contract review. Mike Wall has been reviewing more vendor agreements related to data sharing—especially around defining de-identified patient information. Kerri Webster stated Centura is including more performance metrics into contracts to ensure achievement of contractual objectives. The group agreed the analytics team should be involved in contract negotiations in order to advise on any required reporting commitments and to ensure organizational data can support capturing all required metrics.

Attendees are also engaged in their organizations' planning activities—more so with operational efforts than strategic visioning at this time. Most felt current strategic decisions tended to be hypothesis-driven rather than data-driven, whereas operational decisions were more likely to include data as part of the process. Similarly, involvement with M&A also is viewed as a gap by participants who feel analytics teams typically aren't involved until later in the process. However, in some cases this seems to be changing. Kerri Webster related a situation where data analytics helped establish the need for her organization to conclude a joint venture with another organization. Consequently many feel progress is being made, and strategic decisions are beginning to rely on data analytics.

Participants agreed they can learn from other industries. Overall, the group felt financial and retail industries are more mature in their analytics capabilities, but were also experiencing similar problems to healthcare with governance, data ownership, self-service analytics and staffing. And as new and emerging technologies establish standards of performance (think Amazon or Google), consumers will begin expecting similar levels of sophistication from our healthcare technologies.

Optimization & Utopia: The Quest to be Data Driven

As the team discussed the future of analytics, the quest to be data-driven remains. Julia Swanson felt that the litmus test of a data driven organization is how often users focus on data. She said, "If users start their day—and run every management meeting—opening dashboards and reviewing results, then the organization is 'data-driven.'" Christine Watts summarized: "If I can ask any person how they contribute, and they answer (reduce risk, lower cost, improve engagement) based on data—then we are succeeding at becoming data driven."

Other attendees felt data-driven organizations were more elusive. Rick Howard said "data-informed" was a more accurate reflection of his organization, with clinical and operational decisions more likely to be data-driven, and strategic decisions more subjective and dependent on external insight. The group agreed that many decisions are still based on a hunch—or vendor provided information—with users retrospectively looking at data as a way to confirm the right decisions were made.

Finally, the group was asked, "Is Analytics 'Utopia' within reach? Their responses centered on the evolution of data, and especially consumer data and healthcare. Understanding and leveraging those new and unique data sources will be important, and making that data available to non-traditional users (consumers) will be our next frontier.

"Millennials are driving data from wearables and other consumer devices," Kerri Webster related. "We need to be responsive to their expectations and market pressure."

Yohan Vetteth agreed: "The medical record is not just what is in an EHR, it's bigger than that with all the potential apps and sensors adopted by people and publicly available population data… we need to be ready to use these sorts of non-traditional "healthcare" data to help clinicians and patients in the near future." Rick Howard added, "How do we use the power of the data we're collecting to inform and shape a care plan? We as an industry are not there yet—but we're getting close."

Stanford HEALTH CARE

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– **Yohan Vetteth**, Chief Analytics Officer, Stanford Health Care

Ben Isenhour felt current systems must evolve: "Getting information to the person providing care in a single pane of glass is challenged by the nature of our closed systems. We need to look at how we open that view."

Customized data—tailored to, and contextual to, each user—will be part of our future utopia. Kerri Webster noted, "We need real time data with graphical visualization and an AI engine that determines what is important to each consumer of data." Attendees referenced the Amazon prescriptive model where people who purchased one item then receive recommendations to consider additional, personally-targeted products, or the Facebook process for collecting "likes" as comparative examples of where healthcare might be headed.

The first step toward utopia is likely to provide self-service, and build upon existing data and associated metadata (a comprehensive data catalog). Steve Ameen acknowledged, "The report catalog with detail would be helpful; it isn't going to replace the human intervention but it's a start." Mike Wall proposed that if you have a perfect catalogue, you may not need human intervention. Julia Swanson offered, "We could have an Analyst concierge who helps operational end users navigate to answer their own questions. We can teach them to fish."

Said Christine Watts: "Yes—I believe that there is an analytics utopia that is in reach. But we have to think about a future that is beyond what we all know now (Big Data, Cloud, Data Warehousing); by the time we achieve that future, the rules and technologies will have changed. We need to think about what's next, 'Nextopia'!"

Conclusion

The SI Analytics Summit participants felt very positive about where their organizations stood in 2017—and more so, where they are headed. Most have successfully achieved significant degrees of integration and assembled large data repositories. With the availability of data itself no longer the main issue, focus has shifted to providing meaningful, timely, and accurate data for users, and leveraging tools to make data insight readily available for better clinical and business decisions.

Healthcare may not be there yet, but at least for the group assembled, there seems to be consensus that we're headed in the right direction, and that "utopia" was within reach.

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