Key Drivers of Analytical Maturity Among Healthcare Providers

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Executive Summary

Firms of all shapes and sizes today are confronted with the question of how well they are leveraging data and analytics to transform their organizations. While still an early-stage effort for many, a growing group of high-performers are seeing a measurable return on the time and resource investment they have made in data as an asset, and the analytical systems and processes to turn data into compelling insights.

Ongoing research by IIA points to an increase in the number of healthcare providers that are intentionally building and funding analytics and data programs, and dedicated functional teams. Further, IIA's analytics benchmarking results from the healthcare provider sector points to increasing attention by hospitals toward tracking analytics maturity over time using maturity frameworks like the DELTA Model and the Five Stages of Analytical Maturity.

Within the healthcare provider sector, IIA's benchmarking results point to a few important conclusions:

- The analytics and data maturity across healthcare lags other industries, but the opportunity to positively impact clinical and operational outcomes is significant.
- While the majority of hospitals rank data management and access of top importance, effectiveness lags significantly, particularly among analytically immature providers.
- In particular, most high performers excel in the way they capture, manage, store and utilize data (the D of DELTA).

Generally, hospitals that show the highest analytical maturity tend to score well and focus attention on the following data-related activities:

- Data capture
- Data quality
- Data integration
- Use of external data sources
- Data governance

Lying at the heart of the "analytical hospital" is a commitment to treating data as a valuable asset that must be managed over time and constantly improved. Savvy analytical healthcare leaders are not waiting for all of their data woes to be solved through a far-reaching data governance program before embarking on analytics projects. Instead, they invest early on in consistent quality, transparency, and lineage of relevant data sources on a project-by-project basis. This strategy allows for quick, targeted analytical solutions that can be put into practice by clinicians and operating staff immediately.

Measuring Analytical Maturity

There is mounting evidence that healthcare provider organizations who invest time and resources into their data and analytics capabilities are seeing a compelling return on that investment within an acceptable investment time horizon.[1] Senior leaders and governing boards are increasingly including how their firms capture, manage, store and utilize their data assets in the list of more traditional competitive differentiators such as price, product features, location, distribution, supply chain, etc. Tom Davenport's original roadmap of an analytical company, *Competing on Analytics* is now playing out in action inside organizations that understand the power of data and analytics to gain advantages in their markets, and enter new markets.

The International Institute for Analytics (IIA) has been tracking for five years the intentional steps high-performing firms are taking to build out their analytics programs, and to track improvements in analytical maturity. 2014 has turned out to be an inflection point year in this trend as evidenced by the number of Chief Analytics and Chief Data officers being appointed, and the number of large, public investment initiatives being announced by organizations making long-term commitments to data and analytics.[2]

A result of this new commitment is a hunger for a thorough and consistent method for measuring the robustness and maturity of the data and analytics capabilities and culture over time. All firms are eager to show progress against their own internal expectations, and many are beginning to measure maturity against their industry peers, and against a short list of high performers, mostly drawn from the collection of "digital natives."

A group of analytics maturity frameworks has emerged, both industry-specific and agnostic, to help organizations assess their capabilities. In particular, attention toward analytics maturity has been growing in healthcare, particularly in the healthcare provider sector.
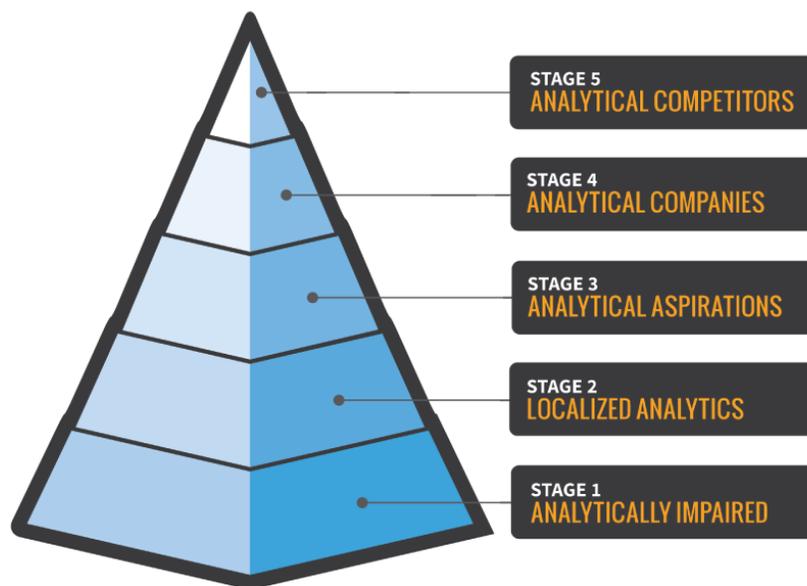
Benchmark results from the healthcare provider sector are presented below. These results are drawn from IIA's proprietary assessment tool, *The Analytics Benchmark (TAB)*, which uses as its foundation, two maturity frameworks first introduced in *Analytics at Work*. Taken together, the **Five Stages of Analytics Maturity** and the **DELTA Model** measure both tactical competencies, particularly related to data, while also measuring culture and leadership necessary for data-driven decision-making to become ubiquitous inside firms.

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[1] See "The Age of Big Data," by Steve Lohr. February 11, 2012. The New York Times
[2] In 2014, IIA has tracked at least 15 CAO/CDO announcements. Among healthcare providers, for example, Ari Caroline was named Chief Analytics Officer at Memorial Sloan Kettering Cancer Center in early 2014.

Five Stages of Analytical Maturity

Organizations mature their analytical capabilities as they develop in the five areas of DELTA. The maturity model helps companies measure their growth across the five DELTA elements. This model enables an organization to assess which elements are strengths and which are weaknesses. For example, an organization may achieve a stage 5 in analytics leadership maturity, but only achieve a stage 3 in their management and use of data. This assessment enables targeted investment to mature analytic weaknesses based on the DELTA Model.

STAGE 5
ANALYTICAL COMPETITORS

STAGE 4
ANALYTICAL COMPANIES

STAGE 3
ANALYTICAL ASPIRATIONS

STAGE 2
LOCALIZED ANALYTICS

STAGE 1
ANALYTICALLY IMPAIRED

Stage 5: Analytical Competitors
"Analytical nirvana." Uses analytics across the enterprise as a competitive differentiator and in strategy.

Stage 4: Analytical Companies

"Good at analytics." Highly data oriented, has analytical tools, and makes wide use of analytics. Lacks commitment to fully compete or use strategically.

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Stage 3: Analytical Aspirations

"Sees the value of analytics." Struggles mobilizing the organization and becoming more analytical.

Stage 2: Localized Analytics

"Uses reporting." Analytics or reporting is in silos.

Stage 1: Analytically Impaired

"Not data-driven." Relies on gut feel and plans to keep doing so. Enterprise isn't asking analytics questions and/or lacks the data to answer them.

DELTA Model

There are five elements that must be in alignment for organizations to succeed with their analytics initiatives. Healthcare organizations run the risk of poor or limited results without alignment. The capabilities and assets of these elements must evolve and mature to make real progress and become a data-driven organization.

Data	For meaningful analytics, data must be clean, common, integrated and accessible
Enterprise	An enterprise approach to managing systems, data and people
Leadership	Leadership that fully embraces analytics and leads company culture towards data driven decision-making
Targets	Specific, strategic targets that are also aligned with corporate objectives
Analysts	Analytical talent with a range of skills from employees capable of basic spreadsheets to accomplished data scientists

Provider Analytics Competencies

Within the five categories outlined above, IIA has developed a set of 33 unique competencies specific to provider organizations that correlate to high performance in analytics and data, below is a sampling:

| **Data**	**Enterprise**	**Leadership**	**Targets**	**Analysts**
• Data capture	• Enterprise tech management	• Strategic input	• Predictive modeling	• Staffing level
• Data quality	• Organization of talent	• Executive advocacy	• Goal setting	• Consultative approach
• Data integration	• Funding adequacy	• Executive utilization	• Prioritization	• Business skills
• Use of external data	• Non-management utilization	• Management utilization	• Iterative approach	• Data science skills
• Data consistency	• Data scalability	• Enterprise collaboration	• Opportunity identification	• Career paths
• Data trustworthiness			• Experimentation	
• Analytical tools				
• "Big Data" utilization				

Across the 33 analytical competencies, how a firm captures, stores and manages its *data* sits at the heart of what is possible in terms of generating high-quality insights through analytics. Taken together, these data management practices form the backbone of an effective data governance program, which is the essential "refinery" step in the overall analytics production process.

Healthcare provider organizations (hospitals) represent a sector that is both far behind other industries in terms of analytics maturity and data practices, and has the potential to be transformed by small improvements to data management and governance.
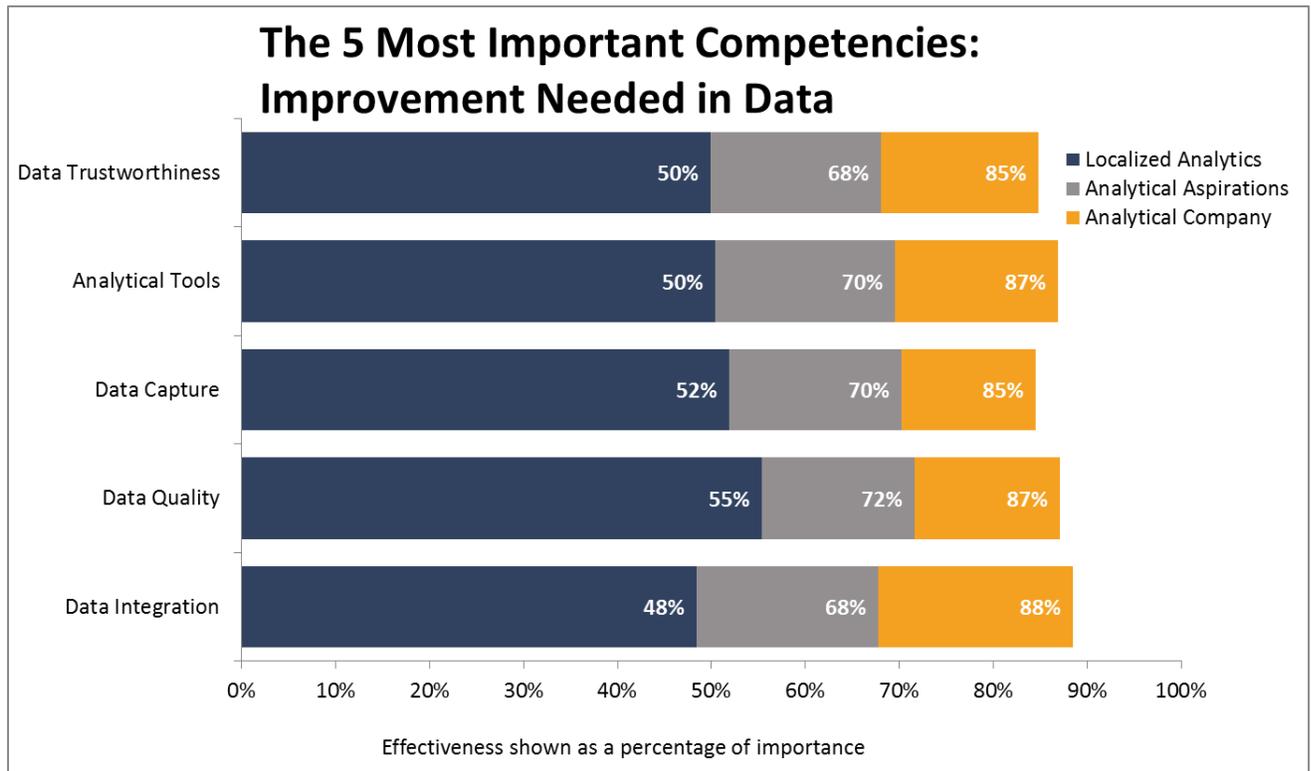
Analytical Maturity in Healthcare

IIA's benchmarking results from the healthcare provider sector show a performance gap compared against other data-dependent industries like retail, banking, insurance and manufacturing. Specifically, the majority of healthcare providers in the benchmark cohort view analytics as important, but have reached only moderate levels of maturity.

The pressure for operating, financial and clinical (outcome) improvements among healthcare providers has never been greater. Many hospitals have invested heavily in technology solutions related to electronic medical records (EMR), but still lag in terms of enterprise-wide use of analytics to operate more efficiently. Having implemented at least the core components of an EMR, healthcare providers have access to large amounts of data on their patients, processes and costs. They are increasing their investment in analytics in order to leverage their data to drive their business. However, IIA's benchmark results show these organizations have more to do in order to get the most use out of their data.

Most Healthcare Providers Benchmarked Have Analytical Aspirations, Some More Effective Than Others
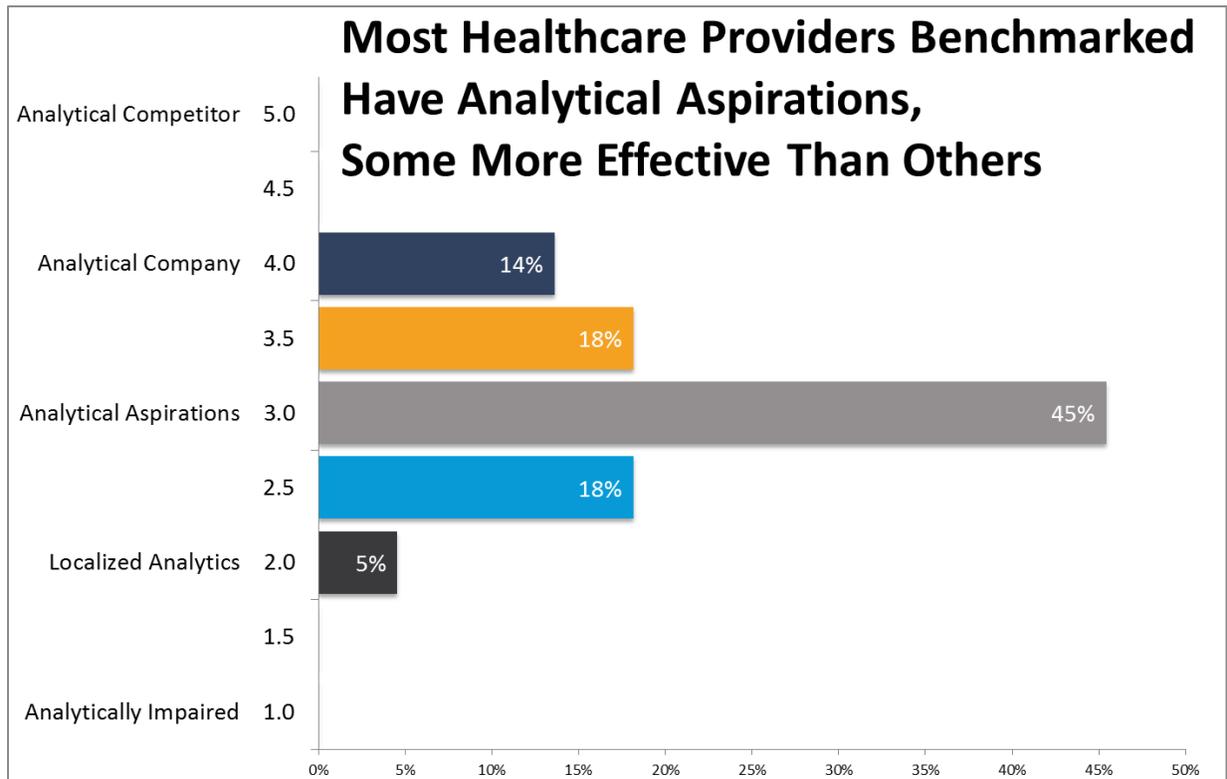
IIA's benchmark results show that 45 percent of participating organizations have reached the third stage of analytics maturity, that of "Analytical Aspirations," while another 18 percent are at the fourth stage, of "Analytical Companies." On the other end of the spectrum, 23 percent of organizations are in the second stage of maturity, what we call "Localized Analytics."

The 5 Most Important Competencies: Improvement Needed in Data

Competency	Localized Analytics	Analytical Aspirations	Analytical Company
Data Trustworthiness	50%	68%	85%
Analytical Tools	50%	70%	87%
Data Capture	52%	70%	85%
Data Quality	55%	72%	87%
Data Integration	48%	68%	88%

Effectiveness shown as a percentage of importance

Overall, Data competencies are consistently rated the most important analytical competencies. However, very few healthcare organizations rate their analytics programs as mature enough to meet the reported importance. On average, program effectiveness lags significantly behind importance.

This is especially true for organizations performing at the "Localized Analytics" level, which are performing in these competencies at 48 to 55 percent of the level desired by their organization. "Analytical Companies" are doing much better, performing at 85-89 percent of the desired level.

Interestingly, the use of big data is seen as one of the least important competencies by hospitals. In IIA's forthcoming Big Data and Analytics report, healthcare ranked among the lowest industries surveyed in terms of level of current or intended investment in big data. This varies greatly against other industries such as retail, financial services and manufacturing and may reflect the relative lack of analytics maturity in healthcare providers or the current focus on simply harnessing their own operational and clinical data.

Why Data Management and Governance Matter So Much in Healthcare

Among the provider organizations in IIA's healthcare benchmark sample, the highest performers have set a clear path toward bringing their *actual* data capabilities (effectiveness above) in line with their high data aspirations (importance above). This means a focus on all of the nine data competencies outlined above, with particular focus on the capabilities that have the highest correlation with analytical maturity. These are:

Data capture

Extent to which a provider is capturing and collecting the data it needs to conduct high-quality analysis.

Data quality

Extent to which data sets and elements can be verified as authentic to origin or source; consistency; granularity. Having high-quality data in areas that matter the most to our decision-making.

Data integration

Extent to which internal data emanating from multiple sources (clinical, financial and operations data) can be quickly and efficiently integrated (joined) to create consistent data sets for easy access.

Use of external data

Extent to which external and internal data sources are combined to facilitate high-value analysis.

Data governance

Beyond these critical data management competencies, a robust and well-considered data governance program is an essential ingredient to the long-term success of any analytics initiative.

The Master Data Management Institute defines data governance as:

> "The formal orchestration of people, processes, and technology to enable an organization to leverage data as an enterprise asset."

The Data Governance Institute defines data governance as:

> "A system of decision rights and accountabilities for information-related processes, executed according to agreed-upon models which describe who can take what actions with what information, and when, under what circumstances, using what methods."

Much has been written about the critical elements of a successful data governance program, but, in short, data governance programs enable their enterprises to:

- Share data broadly and leverage it for performance improvement and competitive advantage
- Manage data access and usage according to internal and external regulations
- Establish standard definitions for key metrics
- Reduce unnecessary redundancy of information
- Improve data integrity and remediate inconsistencies
- Implement Master Data Management and establish "gold standard" data
- Understand and promote the value of data assets

The central point for analytical leaders to take away from IIA's study of high-performance in the area of analytics is that data governance and master data management programs take hold over long periods of time. Particularly in healthcare, it can take years for these kinds of policies to actually effect change. Analytics and data leaders must establish governance programs early and be vigorous over time in cementing sound governance practices.

Case Study: Establishing Data Governance at UPMC

The many challenges facing healthcare providers today have one thing in common: a relentless demand for more and better and better integrated information. Under both governmental and competitive pressures, healthcare institutions need to accomplish in three or four years a data integration and management transformation that took other industries a decade. That transformation is as much an organizational challenge as a technical one, and success starts with strong data governance capability.

University of Pittsburgh Medical Center (UPMC) has stepped up to this challenge with a comprehensive multi-year, $100M initiative including:

- A Data Governance Program operates under the motto, "Better data is everyone's job!" Its mission is to collect, change, store, move, consume, and release UPMC data assets efficiently, accurately, appropriately, and legally.
- An Enterprise Analytics Leadership body sets priorities for information and analytics at UPMC, and a cross-functional Data Governance Council makes policy decisions and defines the data management strategy and enterprise-level standards.
- Enterprise-wide strategy is implemented locally through a network of business Information Owners and Data Stewards across the organization.
- An Enterprise Analytics Warehouse will be the foundation for consistent information delivery and advanced analytics across clinical, administrative, financial, research, and health plan domains.[3]

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[3] Excerpt from IIA Leading Practice Brief, "Establishing Data Governance at UPMC," May, 2013. www.iianalytics.com

Conclusion

Healthcare providers often cite their commitment to a clinical/care mission as their guiding operating principle. And yet, for providers to survive in today's regulated and highly scrutinized environment, they must utilize all assets they have at their disposal to compete effectively, while meeting their mission. Senior clinical and operating leaders are increasingly looking at the data their organizations use, generate and purchase as assets that must be managed and invested on par with investments in traditional operating activities.

As selected provider organizations commit to an analytical future by forming internal analytics communities, hiring dedicated data and analytics leaders and teams, and investing in data management and analytics tools, a new competitive playing field will emerge. The winners in this new era of competition will be providers who make clinical and business decisions exclusively with refined data and analytical processes rather than gut intuition.

While success in the world of analytics is driven by a variety of elements including data quality and management, leadership support, a data-driven culture, qualified analytics professionals, and an enterprise-wide approach, within healthcare success starts with sound data foundation. High performers selectively approach data management and governance rather than trying to solve all data issues before generating analytical insights.

Over the long-run, a well-documented data governance policy that addresses all stages of the data supply chain is a necessary ingredient for success within most provider settings. Astute analytical leaders invest in their data assets based on a list of prioritized analytics use cases. That investment in the quality, timeliness and reliability of data as well as the cultural governance and stewardship of data is critical toward becoming an analytical competitor.

Sources

"Establishing Data Governance at UPMC," by Robert Morison. Available to IIA research subscribers.

"The DELTA Primer," by IIA Faculty. Available to IIA research subscribers.

"The State of Analytics Maturity Among Healthcare Providers: The DELTA Powered Analytics Assessment Benchmark Report," jointly authored by IIA and HIMSS Analytics. Available at iianalytics.com

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