Connecting the Dots: Data-Driven Transformation

SCOTTSDALE INSTITUTE 2021 ANALYTICS VIRTUAL SUMMIT

September 8, 2021  |  Virtual Event

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Executive Summary

Shifting to a cloud infrastructure, incorporating analytics at point-of-care and discussing the future landscape of our healthcare data—these were just a few of the topics the Scottsdale Institute discussed at its virtual Analytics Summit, sponsored by Optum, on September 8, 2021. Convening 33 analytics professionals and guests from 28 SI Member and supporting organizations, Scottsdale queried whether analytics teams can truly know what’s working, and how well? Toward this end, Member participants discussed the tasks around:

- Defining analytics strategies and quantifiable goals,
- Juggling the ever-shifting talent and skills needed to complete analytics projects,
- Moving toward self-service analytics platforms, and
- Integrating analytics insights at the point-of-care.

SUMMIT OBJECTIVES

To connect the dots to achieve lasting change, Member organizations must consider the following:

- Shifting to cloud infrastructure to enable improved clinical and business outcomes,
- Facilitating data-driven Digital Transformation at myriad levels,
- Incorporating analytics at point-of-care,
- Considering the future of analytics—from consumer behavior to data commercialization to genomics and precision medicine,
- Adopting, comparing and leveraging analytics within Member organizations,
- Connecting with and recruiting new talent: peer-to-peer networking, collaborative brainstorming for solutions and strong support of the remote workforce, and
- Walking the line between analytics and IT.
SUMMIT PARTICIPANTS

Richard (Matt) Atkins, MD, Guest, CMIO, OU Health
Christine Brocato, MBA, System VP, Strategic Innovation, CommonSpirit Health
Deepesh Chandra, MS, Chief Analytics Officer, Bon Secours Mercy Health
Dylan Clark, Guest, AVP Analytics, OU Health
Meghan Cole, MPA, IT Director, Bronson Healthcare
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Albert Marinez, Chief Analytics Officer, Intermountain Healthcare
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Michael Parris, MBA, VP, Data & Analytics, Texas Health Resources
Tony Pastorino, VP, IS, IU Health
Justin Pestrue, Director of Analytics, Michigan Medicine
Juli Plack, VP, Information Delivery & Healthcare Analytics, OSF HealthCare System

Bernard Porter, AVP Analytics, Baptist Health
Graham Prellwitz, System Director, Decision Sciences, Memorial Health System
John Pyhtila, PhD, Chief Data & Analytics Officer, Mass General Brigham
Juan Rojas, MD, Medical Director, Analytics Interventions Unit, University of Chicago Medicine
Danny Sama, MBA, VP, Information Services & Chief Digital Executive, Northwestern Medicine
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Mike Von Bergen, RIO, Avera Health
Meng Wei, MBA, Chief of Clinical Analytics, UCLA Health
Brian Young, MD, MBA, MS, Enterprise Physician Informaticist, CommonSpirit Health

CONVENER

Scottsdale Institute: Janet Guptill, FACHE/President & CEO, Cynthia Schroers, Chuck Appleby, Janice Wurz, Karen Sjoblom, John Hendricks, Ricki Levitan, Margaret Shea, Courtney Olson, Genevieve Hedland-Hill, Shelby Olson, Nancy Navarrette

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Moderators: Tushar Mehrotra, MBA, SVP Analytic Services & David Jackson, VP Advisory Services; Adam Bauer, VP; Kate Myers Seitz, Analytics
Writer: Karen Sjoblom
Introduction: Connecting the Dots to Achieve Data-Driven Transformation

Peter Drucker, one of the most influential managerial gurus of our time, famously noted, “What gets measured gets managed.” Nowhere is this more important than in our healthcare systems today, where patient-care advances, medical innovations, pandemics, remote workforces, electronic health records (EHRs) and more intersect constantly with massive amounts of data: How can analytics teams truly know what’s working, and how well?

In preparing for this Virtual Summit, Scottsdale Institute (SI) and moderators from Optum queried analytics professionals as to their current state of affairs. Of those responding, 87 percent claimed a defined analytics strategy and quantifiable goals, but 62 percent didn’t feel they had the analytics talent and staff to achieve those goals. Further, nearly two-thirds stated they’re moving toward self-service analytics platforms, but an equal number didn’t believe they’re effectively integrating analytics insights at the point-of-care. So, which is it: Are we moving successfully toward measurable and manageable analytics, or are we not yet where we need to be? Or both?

“Truth is, when we work with clients around the country, we don’t find 87 percent saying they have a defined strategy, so it’s great that we’re all championing moving beyond analytics as a support function,” explained Tushar Mehrotra, Optum’s SVP, Analytics Services. “Analytics is driving real change, but we’re hearing a constant theme, too, of not having a single place to access, govern or manage data effectively. It’s not structured the right way.”

Away from the numbers themselves, David Jackson, Optum’s VP, Advisory Services, considered the other critical piece of this puzzle: People. “Talent needs to evolve over time. What you needed five years ago is not what you need today…and what you need today is not what you’ll need five years from now.”

To connect the dots for lasting change, Member organizations must consider the following:

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- Considering the future of analytics—from consumer behavior to data commercialization to genomics and precision medicine.

ON HUMAN RESOURCES

We’re all looking for talent to meet our goals; there’s never been a time in my career that I didn’t have a need for more—and different—staff. It’s always a moot point…and I’m surprised only 62 percent agreed on this.

-Michael Parris, MBA, VP, Data & Analytics, Texas Health Resources

The aspect that intrigues me the most is developing and maintaining talent. We don’t want people coming and going, so how can we effectively build a culture in which people feel they’re a part of something, a place they want to stay, a clear path? With new capabilities coming online, careers will look different than a couple years ago…and we need to make sure people see a vision of what theirs will look like.

-Bernie Porter, AVP, Analytics, Baptist Health

Richard (Matt) Atkins, MD, Guest, CMIO, OU Health
Christine Brocato, MBA, System VP, Strategic Innovation, CommonSpirit Health
Deepesh Chandra, MS, Chief Analytics Officer, Bon Secours Mercy Health
“After migrating from a holding company to an operating company so our hospitals could work more closely together, we’re moving to enterprise-wide analytics that span our different locations,” explained John Pyhtila, PhD, Chief Data & Analytics Officer, Mass General Brigham (MGB). “The shift to the cloud is a natural next step; it’s not so much a tech-enablement exercise so much as how to support the overall vision of the organization.”

MGB emerged in November 2019 from Partners HealthCare, which was founded by Brigham and Women’s Hospital and Massachusetts General Hospital with respective histories back to 1832 and 1811. Today, MGB’s 16 member institutions represent a range of healthcare organizations—academic medical centers, specialty and community hospitals, a rehabilitation network, a health insurance plan and myriad urgent and community care locales—and comprise a massive network whose function depends largely on analytics.

Toward this end, MGB’s enterprise data and analytics platform acts as the digital-transformation hub aimed at the following goals (see figure):

- Creating a trusted, scalable and efficient platform,
- Utilizing AI/ML to transform data into insights that support clinical and administrative duties,
- Offering a one-stop shop for data consumers system-wide to operationalize insights, accelerate innovation and strengthen outcomes, and
- Provide the catalyst for new applications of data internally and with industry partners, supported by the Azure cloud.

“With our data infrastructure, it’s also about how to leverage those analytics—bots, apps and the like—in different ways to glean highly important insights.”

MGB’s decision to move to the cloud by partnering with Microsoft and its Azure product elevates the organization’s
analytics capabilities while greatly reducing the team’s administrative burden. Confirmed as the wisest investment both by internal experts and a third-party review, MGB will use its hybrid platform to build the next-gen solution in Azure while offering high leveragability of its existing Office 365 and on-premise applications. Utilizing the cloud enables scalability and elasticity to meet growing demand, differentiated security, insight delivery versus system growth/maintenance, and net positive cash flow and neutral OpEx after five years. Further, MGB’s choice of Microsoft Azure brings complementary benefits: it leverages current infrastructures, fits with the current team’s skills and training, integrates with Office 365 and existing enterprise solutions, and lowers the risk of direct competition while bringing a strong reputation and commitment to the healthcare space.

**PINPOINTING DATA LOCATIONS**

MGB faced challenges similar to many other sprawling health systems. Siloed data spread across various businesses and managed by differing entities. By moving to the cloud, MGB’s operational model entails bringing together both teams and core master data toward a united platform approach. Ultimately, the team aims to leverage the cloud to bring previously siloed data together in one place, utilizing centralized platform management to enable timely clinical- and business-focused insight delivery. Such a centralized platform also helps drive standardization, enterprise-grade solutions and cost-effectiveness while governance helps align technical decisions within the broader platform.

“We’re moving from a hospital vertical to a more functional point of view, but this also entails talent and talent investment,” Pyhtila noted. “We are making a heavy talent investment across the stack, bringing in people with skills in new areas, such as Azure, and relying on consultants to augment the work we’re doing. Now the question becomes how do we continue to offer internal development and also progress our talent up to ultimately be more self-sufficient?”

**ENABLING BETTER CARE**

Similar to MGB’s setup, Bon Secours Mercy Health (BSMH) comprises about 50 hospitals and over 1,200 sites of care across several states and Ireland. In its mission to serve its communities and those in need, BSMH has made bold investments in digital capability and data and analytics.

“It’s incredibly important to get teams to work together to deliver the right level of value,” reported Deepesh Chandra, BSMH Chief Analytics Officer. “Further, we see digital and analytics as a core enabler—not just growth, but rather a focused investment as a key business enabler.”

BSMH has outlined its four key areas of analytics:

- **Scalable modern analytics core**, which leverages a cloud-native, secure, scalable and cost-effective analytics platform for data management and advanced analytics.

- **Healthcare analytics talent**, which comprises a multi-disciplinary analytics team with deep healthcare experience and technical expertise.
To coalesce its efforts, BSMH introduced Helix—a purpose-built, secure, multi-tenant, scalable cloud data-management platform that boasts a common set of tools. Providing a unified experience toward accessing data and insights cross-organizationally while ensuring data are trusted, available and protected, Helix can be extended to support future growth objectives (including full-stack digital project development). In order of priority, the use cases for analytics enablement and delivery include Supply Chain, Clinical Ops, Marketing and Managed Care—all with local accessibility. But then Helix’s technical foundation includes a common data-ingestion framework, common data-management framework and policy, and common analytics toolkit/workbench—all with global consistency. The full workflow is as follows:

**Cloud native building blocks to deliver next-gen analytics capabilities**

Purpose-built, HITRUST certified, multi-tenant, scalable – leveraging MSFT Azure and other solutions

- **Strategic partnerships**, which entail ready-to-go innovation partnerships with Microsoft, Truveta, H2O.ai, Trilliant, Cognizant and other top provider analytics thought leaders, and

- **Agile ways of service delivery**, which include Agile and Scrum to afford rapid scalability toward delivering the best customer experience.

“Our goal is to strike the right level of partnerships because, given the explosion of demand, we can centralize everything but then it becomes a chokepoint,” cautioned Chandra. “How should we scale up? We’ve been bold to deploy a new operating model for analytics—hub and spoke—allowing to decentralize and fragment ourselves in the right ways so we can bring scale and cross-collaboration to the table.”
"We look at analytics as a multidisciplinary job. To do it properly, in a scalable way, we need five or six knowledgeable people to come together. When we look at a business unit, we may not have the skillsets we need all on the same team. So, we study our current team and talents. As a central hub, we look at what roles exist in the spokes, run it through the hub and use that as a blueprint for how things should operate," Chandra explained.

"Moving to 100-percent cloud has been a journey. With our selective strategic partners, we’ve experienced a very fast speed-to-deployment and big speed-to-value. We started this in July 2020, asking, ‘What are our business cases?’ We wanted to solve the use cases that had a distinct business case and impact, so we have a clear eye about how such a change is delivering value,” he added.

"Does your organization have a chief digital role named? I think we’re going to find ourselves as a key influencer in that conversation. The way I define digital (as deploying digital solutions to key business problems) is impossible to do without data,” described Danny Sama, VP, Information Services & Chief Digital Executive, Northwestern Medicine (NM). “We’re asking why we need a digital platform, which solutions we intend to deploy, whether we need a separate data warehouse, and how we should organize teams for maximum value.”

Data-Driven Digital Transformation: From Chief Data/Analytics to Chief Digital Executive

According to Gartner, a business’ digital technology platform should focus on improving how fact-based, data-driven decisions are made; such a focus elevates data and analytics to a vital digital business enabler. But even as data and analytics leaders are poised for success, risk and uncertain futures remain: The role of the D&A leader will either succeed by delivering business transformation or fail by overly focusing on tactical and responsive concerns.

"If your CIO can be Switzerland at a strategic level, there are so many benefits for analytics to be within IT. It eliminates hostility and increases the necessary collaboration to execute our strategy.

-Danny Sama

For us, Digital mostly means patient-facing activity and marketing; our data platform work is separate. That does mean there’s duplication of work with the Digital Innovation team, and there’s some overlap in the data being maintained; however, that team has a skillset of building consumer-grade tools that are user-friendly—a skill that hasn’t been cultivated or pursued on the data & analytics team.

-Tristan Markwell, Principal Strategic Scientist, Providence

Good Data management tends to be centralized, but analytics functions can be centralized or decentralized. It’s been my observation that data-management functions tend to be more centralized than analytics or last-mile functions. Lots of organizations distribute analytics, but very few organizations decentralize data management.

-David Torgerson, VP Enterprise Analytics, Sentara Healthcare

We have a tight relationship with Marketing and the CMO, and also aligned our digital solutions group with the analytics team. It was very important to ensure we had strong branding and a strong user experience that’s very much data-driven.

-Craig Schwabl, VP, Digital Solutions & Enterprise Analytics, University Hospitals

Hosted-to-hosted has significant limitations—I’ve got a half a dozen strategies to overcome it, but it’s a lot of effort.

-Jon McManus, VP Enterprise Analytics, Sharp HealthCare

On the Advanced Analytics side of the analytics team, we develop predictive models, NLP and automations, and the leader works well with IT to move things along. On the digital platform/innovation side, the goal is to utilize an agile methodology, but it is not always possible while working through the IT approval/acceptance process for new technology. I believe we’ve been as successful as we have with development because we report through the Chief Strategy Officer, but we partner with IT, have a close relationship with them and work well with them.

-Juli Plack, VP, Information Delivery & Healthcare Analytics, OSF HealthCare System

I directly report to our health system CMO and partner with IT. My team has co-developed self-service platforms with business owners by leveraging the data and tools provided by IT.”

-Meng Wei, Chief of Clinical Analytics, UCLA Health
**FACILITATING INTERACTION**

For NM’s digital platform, Sama and his team will leverage cloud services to interact with service records from Epic, PeopleSoft and the like. Per the following diagram, each box depicts capabilities being developed, around which digital products will be built. According to Sama, NM has built out about 50 percent of the following capabilities, which include ingesting data, processing those messages and utilizing a repository to produce the outputs on the right (Orchestration Center, API Management, ML and Analytical Data Marts).

**NM Digital Platform**

Systems of Record Interact with Cloud Capabilities to Deploy Digital Products

“We need API management as an enterprise capability versus one-off solutions. Same goes for Machine Learning. We know we need to invest in democratizing ML: How will we label and deploy it?” asked Sama. “For our analytical data marts, the data lake will be the repository, and we’ll use Azure Synapse for curated data for decision-making. Finally, all these capabilities will interact with each other—it doesn’t make sense to isolate.”

Sama provided a salient example concerning patient wearables: Suppose the device relays data reporting an elevated blood-pressure reading. Following the above model, NM’s cloud would ingest that data, route a message to the event engine and store it in the data lake. Then, the event engine would process the message and publish it as a topic (“Elevated Blood Pressure”) in the enterprise data repository. Next, the AI model would be triggered by the elevated blood-pressure topic to calculate the patient’s risk score, sending that information as a new event and thereby notifying the provider. Ultimately, this EDR, ML risk score and event data would be consumed by myriad downstream products (e.g., Epic integration, MyNM app, EDW dashboards, etc.).
“This example illustrates the interconnectedness of all this information. It’s almost impossible to execute digital solutions without such data, and without thinking about how to re-use it,” Sama explained. “COVID jumpstarted a lot of this—we had to do things and build things very quickly, but that created a lot of redundancy. So now we’re asking ourselves how can we re-use versus build?”

Implementing Analytics at Point-of-Care

“As a med student, I knew about a lot of predictive models used at bedside. Later, I fell in love with data science…but logistic regression always was the most common method used for developing predictive models,” recalls Juan Rojas, MD, Medical Director, Analytic Interventions Unit, University of Chicago Medicine. “Now, ML is on the rise, as it can develop more accurate models and is increasingly available for more granular datasets, which ultimately can improve efficiencies.”

To study how others were tackling predictive modeling, UChicago and SI partnered to query healthcare leaders with the most local knowledge of analytics activities. Comprised of a representative sample of key stakeholders locally and nationally, response rates were 60 percent (25/42) from non-academic SI Members and 30 percent (30/100) from the Vizient Academic Medical Centers. Key questions, subsequent topics of discussion and takeaways follow.

Do you need a team to ensure the safe deployment of point-of-care predictive analytics tools? If so, who should be on the team? (Answers collated from multiple Analytics Summit participants)

- We have an embedded data-science team and work with physician analyticists, similar to work on validation of vendor- and internal models.
- We’re making sure those development models go through intake- and continuing validation processes. It’s key to evaluate over time: Are things being used? Are they affecting outcomes?
- Vendor/out-of-the-box models will only be as good as the data they were framed on.
- It can take a lot of extra effort to work with an existing vendor

What does your predictive analytics team do? (Top survey answers included: facilitate the deployment of predictive algorithms, evaluate safety/accuracy of proposed algorithms in the local patient population, ID and develop algorithms of potential value)

- The least common answer was “evaluate the safety and accuracy of already implemented algorithms”—it’s not a “shiny object” but it’s the most important!
- As you get into higher levels of analytical maturity or self-service/AI, you have to develop a true model to really build in that safety and accuracy around it. The

After working with Scottsdale Institute, we sent this survey because we wanted to know what people were doing in this space across the country, whether they had someone specific focusing on these tools, and what their processes looked like.

—Juan Rojas, MD

Michael Parris, MBA, VP, Data & Analytics, Texas Health Resources

Tony Pastorino, VP, IS, IU Health

Justin Pestrue, Director of Analytics, Michigan Medicine
The Future of Analytics

“As Yogi Berra famously said, ‘The future ain’t what it used to be,’ and on the one hand, COVID created a forcing headwind—a shock to the system—when we think of the future,” said Brian Young, MD, MBA, MSPA, Enterprise Physician Informaticist at CommonSpirit Health. “The COVID stressor changed our relationship with technology, so now we’re far more aware of analytics’ role in supporting our response to challenges. On the other hand is the notion that AI and ML will solve everything…but that belief is short-sighted and incomplete.”

Echoing mathematician Alan Turing’s belief that even though we can see only a short distance ahead, we also can see plenty that needs to be done, Young emphasized that, collectively, we can improve healthcare a great deal with just a short reach. CommonSpirit Health itself is a fairly new venture, formed into a single ministry in 2019 by aligning Catholic Health Initiatives and Dignity Health, yet it’s accomplished much in its short tenure—mobilizing tens of thousands of physicians, clinicians and staff to deliver healthcare across a system of over 140 hospitals and 1,000 care centers spanning 21 states. With such a large geographic footprint, CommonSpirit serves diverse populations with a mission to care for the most vulnerable by shifting from “sick care” to “well care” and advocating for social justice. But such lofty goals, in a complex system, must usually be achieved incrementally—just like the old adage about eating an elephant one bite at a time.

problem is that every data scientist wants to be a builder; they don’t want to continue to validate and ensure accuracy...but that’s a main function of the job.

- We almost always have a clinical stakeholder that helps with implementing models.

What are the greatest threats to point-of-care predictive analytic tools in the next five years? (Top survey answers included: acceptance by clinical teams, technology integration, limited generalizability of algorithms across institutions, concerns about data sharing with outside vendors and liability/regulatory issues)

- Within the “other” responses, we also are looking at equity. There’s some degree of bias built in, so we’re making sure the plans we have for the models don’t make it worse for some reason.

- Regarding unintended bias, we’ve spent a lot of energy looking at this from a health-equity perspective. It’s become part of our standard process now. If we’re building a model off a given patient population, we likely will run into some issues around bias.

- At the end of the day, the end game is to enable better care delivery, so if models don’t enable clinicians to make a different, “better” decision, you could argue you’ve not added value.

- If we can’t get people to do what’s recommended or document changes, it’s hard to tell if a model is good or bad; we just end up kicking it to the curb. We don’t want to push a model on anyone; the only way it will work is if people decide to adopt and adhere to it.

“Ultimately, our key point is model evaluation over time: Are things being used? Are they affecting outcomes? Should they be retired?” Rojas asked. “We have to have a team ensuring accuracy and safety, evaluating biases, promoting user-friendliness and adding value to our efforts.”

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Juli Plack, VP, Information Delivery & Healthcare Analytics, OSF HealthCare System

Bernard Porter, AVP Analytics, Baptist Health

Graham Prellwitz, System Director, Decision Sciences, Memorial Health System
INNOVATING NUMBERS

“We have a large footprint and associated governance, but it can be difficult to rein all that in,” Young admitted. “We have developed an org structure (above) that combines the efforts of our CEO and CMO to meet the needs of analytics creators and analytics customers, who tend to be consumers but also can drive innovations, too.”

Young also explained that with the digital team reforming under the CIO, there’s a larger budget in the coming years to focus on digital transformation. A common understanding, however, is that key partners must work together: There needs to be a dependency on the clinical side of the house to define the practice and get adoption and governance where they need to be…and yet, according to Young, IT hasn’t always understood that. “IT may hold the keys to the data kingdom, but I think we need to continue to break operational and clinical barriers.”
GETTING AHEAD OF THE FUTURE

While CommonSpirit executives acknowledge it’s tough to predict what future challenges may arise, they’re working to distill a singular source of truth and select and prioritize from the constellation of possible capabilities (Past, Near-, Medium-, and Long Term, below) while also determining the cloud infrastructure and platforms required for upcoming projects. Nationally, we’re still eating some of the key legacy elephants in the room—The Ghosts of Futures Past—one bite at a time.

With Amazon Cloud migration in process, CommonSpirit’s end goal is data-driven transformation. And in working to create a real-time health system, Young and his team developed its investment priorities and strategies for the next five years, beginning with growth into new foundation platform elements:

“Looking at our top concerns, we’re trying to execute the red-starred projects (below). While we could be further along if not for COVID, I believe with more work being completed remotely we’ll be able to find data scientists for what we need to accomplish; much of that will crystallize further in the next 12- to 24 months,” Young estimated.

“Also, if we can normalize data and put it in a common platform using Amazon Web Services...our data science folks are absolutely geeked-out excited about this.”
Regarding cloud migration, federated awareness and NLP/unstructured data-to-knowledge, CommonSpirit is looking a couple of years ahead, which impacts projects further downstream which depend on those earlier core platforms being implemented and operational, but it’s one of the few health systems with enough size and scale to contemplate such a wide array of initiatives.

“The items listed on the lower half of the figure depend on core platform elements—being in the cloud, scalable server and compute capabilities, distilling big data and more,” Young explained. “For healthcare nationwide, some organizations will be able to move on to some of these items faster than others. For CommonSpirit specifically, I’d prefer to see larger teams and more people than we have currently, but then we’d also have the growing pains associated with expanding our teams. But we need to line up people to achieve true data-driven transformation—not simply AI and ML as one-off solutions.”

ABOUT THE SPONSORS

The Scottsdale Institute (SI) is a not-for-profit membership organization of over 60 prominent, advanced, not-for-profit health systems and academic medical centers whose mission is to improve healthcare quality, efficiency and personal experience through IT-enabled transformation. Our North Star is thought leadership guided by SI’s Three Pillars of Collaboration, Education and Networking. We convene intimate, informal and collegial forums for senior healthcare executives, including but not limited to CEOs, CMOs, CIOs, CMIOs and CNIOs, to share knowledge, best practices and lessons learned. Our goal: Gather the right people to discuss the right topics at the right moment.

For more information, visit www.scottsdaleinstitute.org

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