THE CHALLENGES IN ACHIEVING
A TRUE MODERN HEALTHCARE DATA PLATFORM

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WHITEPAPER

HYPOTHESIS

The heartbeat of modern healthcare is real-time data. However, a **staggering 74% of healthcare organizations grapple daily with real-time data integration,** while **another 68% face real-time interoperability issues.** Equally concerning, the same percentage of CIOs acknowledge that unifying their data platform for real-time analytics and AI is crucial but have struggled to achieve it in real time.

These challenges, exacerbated by the absence of universally adopted standards, not only impede the seamless real-time integration of all clinical data but also crucial non-clinical data that has real-time implications on healthcare outcomes. When it comes to patient health and well-being, there can be no compromises. Therefore, there can be no compromises in designing real-time solutions to capture and provide immediate access to vital information. Real-time decisions and intelligence are paramount in the quest for optimal healthcare outcomes

THE HEART OF OUR DESIGN AND BUILD PROCESS FOR THESE SOLUTIONS SHOULD BE **'REAL-TIME'**.

INTRODUCTION

Gartner highlights a future where a high-velocity care delivery model enabled by real-time data sharing across stakeholders aren't just a competitive edge, they're the defining feature of healthcare leaders. This is about velocity: the life-changing – or life-saving – speed at which data travels across the care continuum.

So, what if we rethink the way we handle healthcare data? Imagine a world where the immediacy of information flow isn't just an idea but a standard, where real-time data acquisition is paramount. Where all that information, encompassing healthcare data like Electronic Medical Records (EMRs), patient demographics, environmental factors, and social determinants of health, swiftly gets into the hands of the right people at the right time.

That's the 'platform thinking' revolution – transforming data from a static asset into a dynamic lifesaver. Today's healthcare landscape demands a seamless and real-time information exchange, accommodating the longitudinal aspect of patient data, where Electronic Medical Records (EMRs), population health insights, care management, utilization management, and external data integrations merge into a singular, cohesive platform. This comprehensive approach ensures that healthcare decisions are based on a holistic view of patients, incorporating both healthcare and broader contextual data for improved patient outcomes.

For healthcare leaders – CMOs, CIOs, CTOs, and enterprise architecture teams – this is a call to elevate from specialized systems to a robust, all-encompassing platform. It's about making the hard choices, recognizing that the allure of specialized tools pales in comparison to the vast potential of a unified data ecosystem.

It's time to assess solutions not by their surface-level features, but by their core architectural capability – their ability to scale, adapt, and respond in real-time to the diverse and complex needs of healthcare.

The healthcare sector lags significantly when it comes to modern data practices, and its needs are more evident than ever:

Real-time data acquisition from a spectrum of sources, including medical devices, EHRs, claims systems, genomics data

Instant access to transactional and analytical data points, whether it's patient admissions or population health metrics.

Embedded intelligence for timely interventions, e.g., clinical decision support alerts

Robust monitoring for streamlined DataOps, e.g., automated data pipeline/ETL monitoring

A single, longitudinal patient view that consolidates clinical narratives across providers

External data integration that enriches patient insights, for example, social determinants of health data

Automation to act on insights quickly, e.g., trigger care management based on risk model

THE SOLUTION? A FLEXIBLE, SCALABLE DATA PLATFORM ARCHITECTURE THAT DOESN'T JUST SUPPORT HEALTH CARE – BUT REDEFINES IT.

III. WHY IS THE HEALTHCARE INDUSTRY STILL HUNTING FOR A LEGITIMATE MODERN DATA PLATFORM?

Simple: healthcare organizations face a maze of complex challenges when building or choosing solutions. Diverse and multifaceted, these issues demand a thorough, no-nonsense look from all angles.

CHALLENGE 1 : **OVERCOMING STRATEGY MYOPIA**

88% of CIO respondents agree with the statement "working with disparate systems and applications complicates my job".

Source: 1

Healthcare executives face a tough call: go for a single-use solution like population health, care management, and disease management.
Or, think big with a multi-use platform; think Airbnb, Amazon, Uber–platforms uniting all players for various needs.

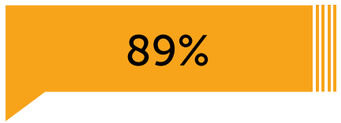
As per Bain, 7 out of 10 of the world's biggest companies thrive on platforms that connect users and transactions. Healthcare? Not there yet. It's still stuck with disjointed, manual interactions.

Source: 2

If you want to nail a real-time, 360-degree patient view with unifying data from all players (both clinical and non-clinical impacting healthcare) — not just to treat sick patients but to stop them from getting sick — platform thinking isn't just smart, it's the only move.
Accept no substitutes; this is the game-changer in healthcare.

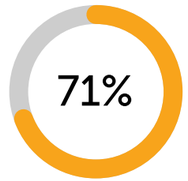
SOLUTION: **EMBRACE PLATFORM THINKING**

Source: 3



of healthcare providers say interoperability and connectivity capabilities were the main drivers in selecting a vendor platform over best-of-breed point solutions

Source: 4



of healthcare executives say a platform approach delivers significant improvements in patient experience versus a siloed point solutions model

While the healthcare industry may lack a single commercial platform like Uber or Amazon, it's vital to analyze the core underlying data platform architecture and capabilities that support industry leading specialized use-cases in the areas of care management, utilization management and population health (e.g., Gartner Evaluated - Aerial, MedCompass, CareAdvance, EPIC, GuidingCare, CareProminence, Incedo, Dynamics 365, Paga CM, Health Cloud, Helios, Affinite, Jiva, and TruCare), and how they address the challenges mentioned above.

Given the issues we've laid out, any future healthcare data platform better have these uncompromising capabilities

Rapid intake of diverse data - structured, unstructured, streaming - without breaking a sweat.

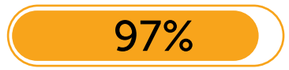
Instant access to transactional data to trigger timely interventions and analytical data to determine next best actions. No latency.

Embedded intelligence that continuously predicts clinical risks and orchestrates appropriate care.

End-to-end transparency through robust monitoring and metadata management. No blind spots.

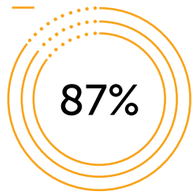
CHALLENGE 2: **REAL-TIME AND FLEXIBLE DATA INGESTION AND INTEGRATION (THE TOUGHEST NUT TO CRACK)**

Source: 5



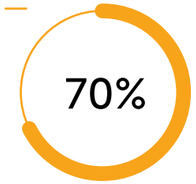
A Staggering 97% of healthcare executives stated that ingesting real-time clinical data is crucial to their enable ment – but only 3% haven't encountered any challenges when attempting to ingest clinical data into the cloud.

Source: 6



of healthcare providers reported challenges in fully integrating real-time patient data from disparate sources in 2020

Source: 7



of clinicians report lack of real-time data as a barrier to providing value-based care

Healthcare organizations spend months, even years, just trying to gather and integrate different data sets like membership, enrollment, providers, claims, and more. The complexity multiplies since payers use their own data formats. Therefore, the ability to flexibly ingest data from custom formats to standards like HL7 or FHIR without strict normalization is crucial.

This flexible data ingestion (without rigid schema on-write) means one disease, even when coded differently everywhere, can be easily analyzed. Modern analytics tools work directly with raw, semi-structured data like JSON and Parquet to extract insights from divergent coding schemes.

Real-time data in healthcare remains rare and challenging. The unreliability and unpredictable spikes of streaming data mean elasticity requirements can easily be 100x that of batch processing. But to enable timely decisions, we need to transform and analyze data on the fly, without delay from cumbersome pre-processing.

The days of rigid assumptions that data must be normalized in batches are fading. Modern architectures (think of lambda or now more modern kappa architectures) allow ingesting first, asking questions later - no longer balancing like a tightrope walker. So, we must wisely choose flexible data strategies.

SOLUTION: **HEALTHCARE REQUIRES REAL-TIME INGESTION, INTEGRATION, AND CONSOLIDATION, NOW**

The most optimal healthcare data platform requires a flexible, scalable architecture to ingest diverse data sources and formats, both batch and real-time.

Specifically, it needs:

A metadata-driven intake engine to easily onboard new data systems and schemas with out extensive recoding. Think plug-and-play for healthcare data.

Support for modern streaming intake alongside traditional protocols to enable event-driven care based on near real-time data.

Automated schema inference and mapping to harmonize the disparate standards and sche mas across sources into a unified analytics model.

Cloud-native implementation for cost-effective scale on demand during spikes and fluctuations in load.

With these capabilities, the platform can continuously ingest the full range of patient, provider, claims and clinical data. This provides access to real-time, consolidated data sources so care teams can take timely actions based on current healthcare events, not just retrospective reporting.

The aim is simplifying and automating a highly complex healthcare data integration process to drive faster access and improved care, leveraging the timeliest data avail able.

CHALLENGE 3: **LACK OF DATAOPS MONITORING**

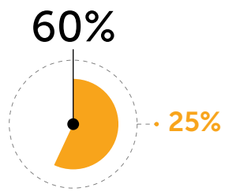
Source: 8

of healthcare organizations say improving data analytics and reporting is a top priority, but just 29% have adequate data monitoring and DataOps solutions in place.

Source: 9

of healthcare organizations lack documented data lineage across pipelines and transformation logic.

Source: 10



of data teams in healthcare spend more than **25%** of time doing manual monitoring versus high-value analytics activities

Building a Modern Healthcare Data Platform Without End-to-End DataOps Monitoring Is Like Constructing a State-of-the-Art Hospital Without Vital Signs Monitors.

Implementing end-to-end DataOps monitoring in healthcare isn't straightforward. It involves tackling some serious technical challenges head-on. Let's break some of these down:

Data quality control: guaranteeing the accuracy of critical patient data, like blood test results

Data security: protecting patient data, in line with HIPAA regulations, against cyber threats

Regulatory compliance: adhering to healthcare data reporting standards like FDA regulations

Scalability: handling increasing patient data, e.g., spikes during seasonal flu outbreaks

Real-time processing: providing instant access to data for decision making, e.g., in emergency care scenarios

User access management: controlling healthcare staff's access to patient records to ensure privacy

Data storage: securely storing large volumes of data, such as MRI scans, for long-term use

Continuous monitoring: keeping a constant watch over systems to detect anomalies, e.g., sudden spikes in in-patient admissions

SOLUTION: **UNCOMPROMISING END-TO-END DATA OBSERVABILITY – NO EXCUSES**

To enable data-driven care delivery and enhanced health outcomes, leading healthcare organizations are building modern cloud-based data platforms. These integrate diverse data sources like EHRs, genomics, claims, and real-time IoMT devices to provide a 360° patient view.

Comprehensive monitoring and observability across this complex technology stack is crucial to ensure patient data quality, provenance, and reliability.

Key data observability capabilities include:

Monitoring streaming and batch data ingestion capacity, validating schemas, detecting outliers, and tracking model performance on streaming data to maintain reliable, trustworthy data for care teams.

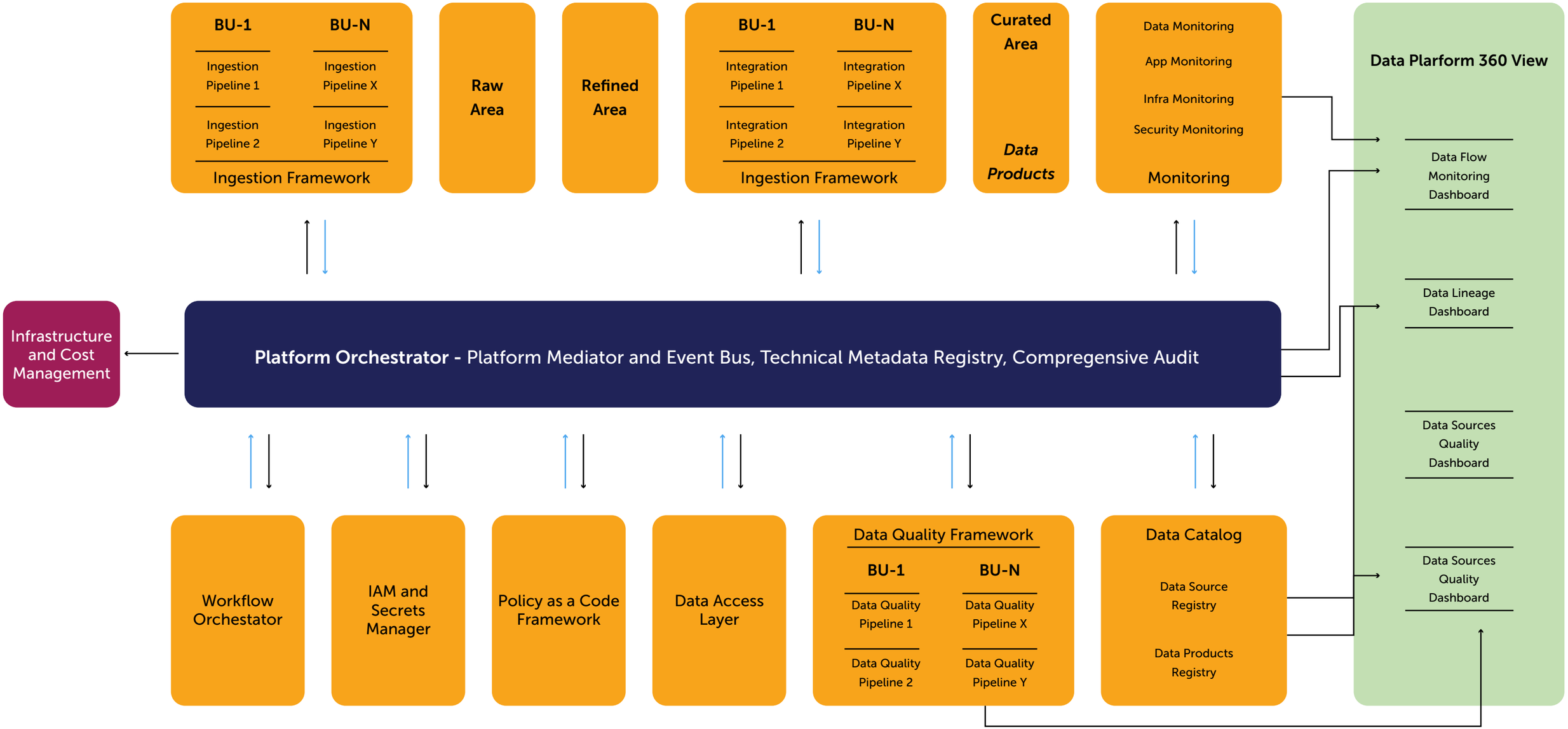
Workflow orchestration for visibility into pipeline SLAs, data flows, failures and retries. This enables optimization of the data supply chain feeding into ML and advanced analytics.

Cataloging key metadata like definitions, standards, lineage across data transformation and the lake. This accelerates governed data discovery.

Role-based dashboards delivering tailored visibility into data timeliness, model metrics and KPIs for rapid issue triage by consumers.

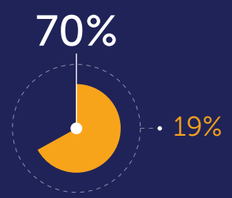
By correlating metrics across ingestion, processing, and access, modern healthcare data platforms provide complete data lifecycle observability. If the future of healthcare is data-driven, then modern platforms require end-to-end transparency to get there.

Here's a blueprint on what a DataOps monitoring framework should look like:



CHALLENGE 4: **LACK OF BUILT-IN CARE INTELLIGENCE (IT'S LIKE A BODY WITHOUT A CENTRAL NERVOUS SYSTEM)**

Source: 11



of healthcare payers say identifying adverse events in real-time is critical for improved outcomes, but only 19% have implemented real-time intelligence capabilities

Source: 12

of healthcare systems report needing intelligent real-time response capabilities versus traditional alert overload

Building a solution that brings next-generation advancements to healthcare is fraught with challenges, particularly in delivering insights that are not only timely but also highly valuable. Here are some key challenges to consider:

Integration of specialized intelligence: most platforms can churn out population health reports and dashboards, identifying high-cost and high-risk patient groups. However, integrating advanced intelligence directly into the data platform, which is essential for more sophisticated tasks, remains a challenge.

Real-time capabilities: many solutions fall short in offering real-time features. For instance, identifying specific patients who could benefit from care management programs requires capabilities beyond standard reporting – it demands real-time 'next-best action' solutions.

Sophistication of Care Intelligence: The presence of sophisticated care intelligence capabilities is crucial. This goes beyond basic data analytics; it involves predictive modeling, patient behavior analysis, and proactive healthcare management.

Addressing these challenges is pivotal for any solution aspiring to revolutionize healthcare through data-driven insights and actions.

Consider this scenario,

A care management solution provider understands the payer's goal of improving patient outcomes while reducing costs. We recognize that traditional solutions identify high-risk patient groups but lack real-time insights.

For instance, they can identify a diabetic patient, John, but cannot offer real-time recommendations. With our care intelligence, when John's vital signs worsen, our system instantly alerts his care manager with specific next steps. This real-time, personalized guidance helps prevent emergencies and improves care quality, making a care management solution an asset in enhancing care coordination and outcomes for your members.

SOLUTION: **POWERING INTELLIGENT HEALTHCARE WITH REAL-TIME DATA ORCHESTRATION (RULES-ENGINE AND CARE INTELLIGENCE CAPABILITY)**

While ingesting and processing real-time data is important, healthcare organizations must also implement sophisticated rules and orchestration engines to harness that data for actionable insights.

Key requirements include:

Low latency stream processing to analyze and score streaming data as it is generated in near real-time. This requires frameworks like Apache Spark Streaming, Flink, or cloud-native services like AWS Kinesis Analytics.

Real-time data enrichment to augment raw streams with contextual data like patient profiles, risk models, and reference data, enables holistic evaluation per patient.

Complex event processing (CEP) and stateful rules to correlate conditions, risk factors, trends across time series data streams. This provides real-time situation awareness.

Orchestration engines to trigger multi-step care interventions based on risk model outcomes, change events, and temporal rules should integrate with existing care management systems.

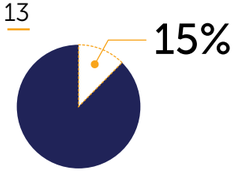
Horizontal scalability to handle high-volume streams and rules. Auto-scaling on cloud infrastructure can provide this flexibly.

Standardized APIs for feeding real-time data into rules and surfacing orchestration directives securely to downstream care systems.

With these capabilities, healthcare organizations can detect adverse events and risks as they occur, trigger interventions prescriptively, and continuously tailor care to optimize outcomes. This is the foundation for precision, data-driven healthcare delivery.

CHALLENGE 5: **STUCK IN THE PAST – THE REAL TRAGEDY OF NO REAL-TIME DATA ACCESS**

Source: 13

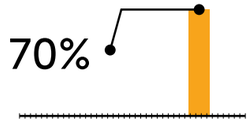


of healthcare organizations can deliver analytics and insights in real-time across their enterpris

Source: 14

of healthcare organizations currently refresh their data warehouses for analytics on a daily or longer basis (Healthcare IT)

Source: 15



of clinicians report lack of real-time data as a top barrier to value-based and preventative care models

Just gulping down data in all shapes and sizes real-time? That's just the start. You need that data ready to roll in your data warehouse, sparking insights and dictating the next best actions on the fly. But here's the kicker: most platforms are stuck in the stone age with their once-in-a-blue-moon data refreshes. Is this even possible? For this to happen a solution must overcome the following hurdles:

Ingesting high-volume, heterogeneous data from multiple sources into scalable streaming pipelines.

Processing raw data on the fly using technologies like Spark to filter, validate, normalize, and transform.

Consolidating disparate data systems into interoperable formats like FHIR.

Implementing lightweight, optimized security protocols to encrypt in motion.

Automating governance including consent, controls, audits embedded in data flows.

Caching, compressing, and limiting data transmission to manage bandwidth limitations.

Retrofitting legacy systems lacking modern APIs and streaming mechanisms.

Leveraging advanced analytics and NLP for unstructured data like images and notes.

Achieving computational speed and scale for real-time analytics and machine learning.

In the end an all-API strategy for data sharing. This way, your business apps and external services snap together, sharing data like best friends.

Picture this: a payer needs to manage member health and resources, right? They crave fresh claims data, enrollment info, patient history, labs, prescriptions, real-time EHR events, patient reported outcomes - and they want it yesterday. But if their platform's snoozing on pure data refreshes, they're flying blind.

SOLUTION: **THE NEED FOR SUB-SECOND ANALYTICS IN HEALTHCARE - INSTANT ACCESS TO TRANSACTIONAL AND ANALYTICAL DATASETS**

Traditionally, healthcare organizations have faced analytics latency of days or even weeks. Source transactional data is batched on a schedule into data warehouses or lakes. Analytics dashboards and datasets are then refreshed on a daily or weekly basis.

This severely delays insights and actions. In a world of real-time health data from wearables, genome sequencing, and IoMT devices, batch cycles measured in weeks are no longer acceptable.

To truly enable responsive data-driven care, analytics latency needs to be reduced to minutes or even seconds. Healthcare data platforms must leverage:

Streaming data intake from sources like medical devices, EHRs, and claims, to capture data as it's generated

Stream processors and in-memory stores to analyze and aggregate data in real-time

Fast APIs to access latest analytics results, on-demand, instead of waiting for overnight updates

Cloud infrastructure that provides virtually unlimited, low latency processing

With these technical capabilities, care providers can get real-time access to critical patient metrics, lab results, and predictive risk models as the data is created. They can spot adverse trends, prevent avoidable readmissions, and personalize care using insights that are minutes or seconds old, not days or weeks stale.

By re-architecting batch pipelines as real-time streams, healthcare can finally achieve the speed and agility required to deliver true data-driven care. The technology exists – the time to embrace it is now.

CHALLENGE 6: **DISCONNECTED HEALTHCARE – FAILURE TO INTEGRATE ALL CLINICAL DATA SOURCES IN REAL-TIME**

Source: 16

87%

Despite the push for real-time data integration, 87% of healthcare providers reported challenges in fully integrating patient data from disparate sources as of 2020.

Source: 17

90%

of care managers report better outcomes when coordinating cross-facility patient transitions using unified records

Source: 18

of care managers report missing key patient medical history details that influence care plans

Patients experience various healthcare events across multiple locations – homes, doctor's offices, hospitals, labs, pharmacies, and through remote monitoring devices or wearables. To capture and integrate data from these diverse sources effectively, it's crucial to collaborate with the right partners. This collaboration is key to constructing a comprehensive, longitudinal and 360° real-time view of a patient's health journey.

Integrating healthcare data from diverse sources poses several key technical challenges:

- **Diverse data hassles:** managing varied healthcare data types is a headache
- **Format frustration:** different standards and formats create compatibility nightmares
- **Interoperability issues:** getting systems to talk to each other is a tough problem to crack
- **Volume and speed strain:** handling massive, fast-flowing data is overwhelming
- **Accuracy anxieties:** ensuring data is correct and complete is crucial yet challenging
- **Privacy and security stress:** safeguarding sensitive patient data is paramount
- **Real-time rigors:** delivering insights instantly demands high technical capability
- **Normalization nightmares:** making diverse data play nice together is complex
- **Scalability and flexibility fights:** adapting to growing data and changing sources is tough
- **Cost and complexity conundrums:** integration is expensive and technically daunting

For example, having real-time integration with some industry leading data aggregators and QHINs (like Health Gorilla, Konza, Kno2) can provide up to date information on clinical health events to address the potential care coordination needs of a patient.

SOLUTION: **EVOLVE BEYOND LEGACY DATA – EMBRACE EXTERNAL CLINICAL DATA REAL-TIME INTEGRATION**

While most healthcare data platforms focus on ingesting common batch datasets, truly innovative solutions also integrate real-time data streams from external aggregators. This enables a more holistic patient view

Key enablers include:

- Flexible APIs and normalized schemas to incorporate new data sources like RPM devices and EHR feeds from exchanges, e.g., Health Gorilla, Epic, Konza, eHealthExchange
- Event-driven architecture for streaming data intake, enrichment, and routing to downstream consumers
- Scalable cloud infrastructure for high throughput, low latency message handling even at peak loads
- Unified data store for operational analytics combining real-time events with existing structured records
- Complex event processing and predictive models to act on real-time data through personalized interventions

With these capabilities, payers can unlock the potential of disparate clinical data sources in near real-time to improve members' health journeys. CIOs/CMOs evaluating platforms should demand proven integrations with major aggregators and the technical underpinnings to harness real-time data at scale.

According to a recent Chilmark Research report, only 15% of healthcare payers surveyed actively integrate and analyze real-time data from health information exchanges and aggregators. The other 85% rely solely on retrospective, batched data for analytics and care coordination.

This represents a massive, missed opportunity to leverage real-time clinical insights. Modern data architectures are required to truly activate holistic insights.

CHALLENGE 7: **MISSING REAL-TIME LINK TO EXTERNAL THIRD PARTY NON-CLINICAL SOURCES AND SERVICES**

Source: 19

of a person's health is driven by social, environmental, and behavioral factors outside the clinic

Source: 20

Access to transportation accounts for an estimated 3.6 million missed or delayed medical appointments each year in the US

Source: 21

Incorporating lifestyle data could prevent over 70% of heart disease cases and 80% of type 2 diabetes cases

Source: 22

Poor access to mental health services data leads to nearly 60% of mental health needs going unmet for vulnerable populations

Integrating clinical data in real time is just the tip of the iceberg. Many healthcare organizations overlook non-clinical data sources, which are crucial for understanding patients' access to healthcare. Integrating with sources that provide information on social determinants of health is essential to fully grasp patients' needs. This step, often missed, poses a significant technical challenge but is vital for a comprehensive healthcare perspective.

Integrating non-clinical data into healthcare presents unique challenges, each with distinct healthcare-related implications:

Diverse formats and standards: non-clinical data like socio-economic status might be collected via surveys or social services, varying widely in format. Unlike clinical data, which often follows standards like HL7 or FHIR, non-clinical data might not conform to any healthcare-specific format.

Data Quality and Consistency: Data from community organizations or patient-reported outcomes may vary in accuracy and completeness compared to standardized clinical tests, affecting the reliability of insights derived from them.
Interoperability: While clinical systems may struggle with compatibility, non-clinical systems, like those tracking housing stability or food access, use even more diverse and potentially incompatible systems.

Privacy and Compliance: Patient health information is governed by laws like HIPAA, but non-clinical data might fall under different privacy regulations. Merging this with clinical data requires careful compliance considerations.
Infrastructure Needs: Clinical data systems are designed for health-related information. Non-clinical data, such as transportation access or employment status, might require additional infrastructure to capture and integrate effectively.

Real-Time Processing: Clinical data like lab results is often processed in real-time, but non-clinical data, for instance, updates from social service interventions, might not be set up for real-time updates, posing a challenge for timely healthcare interventions.

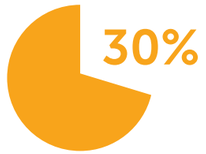
Interpretation and contextualization: while clinical data is directly health-related, non-clinical data such as neighborhood crime rates or education levels require careful interpretation to understand their impact on health outcomes.

Each point highlights the nuanced complexities in integrating non-clinical data into healthcare, emphasizing the need for tailored approaches to ensure effective and meaningful use of this data in healthcare settings.

For example, visionary solution providers anticipate the ability of patients with chronic conditions on lower SHoH index to follow-up on appointments after a serious health event (think hospitalization) and initiate transportation services through Uber Health.

SOLUTION: **BRIDGING THE GAP – INTEGRATION WITH NON-CLINICAL DATA SOURCES**

Source: 23



of healthcare systems currently integrate any non-clinical data sources into their data analytics capabilities

Source: 24

95%

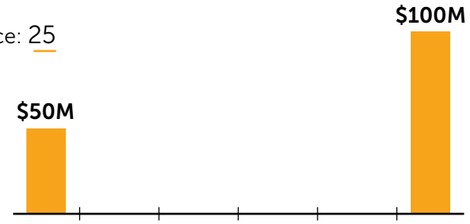
of healthcare executives agree that incorporating socioeconomic data leads to better models for predicting patient outcomes and risk factors

It's evident that non-clinical data sources having immense impact on an individual's health status cannot be discounted. The integration challenges can be addressed by creating specialized integration competencies, mapping non-clinical data elements into standardized medical terminologies such as SNOMED-CT, utilizing Natural Language Processing for deriving insights from unstructured narrative text, as well as instituting robust monitoring and notification to identify delays or problems with non-clinical data feeds which can trigger remediation workflows. These capabilities collectively facilitate assimilating both clinical and non-clinical data views for a more holistic patient perspective.

"IS BUILDING A TRUE MODERN HEALTHCARE DATA PLATFORM REALLY AN IMPOSSIBLE FEAT? WHY DOES IT SEEM LIKE NO ONE CAN CRACK THIS CODE?"

CHALLENGE 8: **STAGGERING COST AND COMPLEXITY – BUILDING A MODERN HEALTHCARE DATA PLATFORM TO TACKLE ALL THE ABOVE CHALLENGES WILL BURN A HOLE IN YOUR WALLET**

Source: 25



The typical total cost for a comprehensive healthcare enterprise data analytics platform ranges from $50 million to over $100 million

Source: 26

≈ $200-300M

The average 5-year total cost for a robust payer data management platform is $200-300 million

Healthcare organizations often use cloud-based platforms like Azure, AWS, GCP, IBM or Oracle to start building their own data platforms. However, traditional tech vendors struggle to meet healthcare-specific needs, leading to disjointed solutions. Building a platform requires deep domain knowledge, working with many vendors, buying licenses, and managing finances. All of this makes the process complex and sometimes ineffective in meeting the unique needs of healthcare. Just a glance at the cost estimates is enough to give most organizations a real scare.

SOLUTION: **BUILDING HEALTHCARE DATA PLATFORMS FROM SCRATCH IS COSTLY AND COMPLEX. BUYING PURPOSE-BUILT SOLUTIONS SAVES TIME AND MONEY**

While traditional technology vendors may struggle to meet the nuanced needs of healthcare, purpose-built data platforms designed specifically for the healthcare domain can help reduce costs and complexity in several ways:

Consolidated architecture with integrated capabilities rather than disjointed separate systems avoids the need to integrate disparate vendor products. This significantly reduces integration costs and technical complexity.

Embedded healthcare data models, terminologies, workflows and analytics accelerate development. This eliminates the need for extensive customization on top of generic platforms.

Pre-built connectors and APIs for healthcare data sources like EHR systems, medical devices, claims databases etc. jumpstart integration. This avoids lengthy technical integration projects.

Cloud-native implementation leverages infinite scalability and availability of cloud platforms. This reduces infrastructure costs by allowing usage-based pricing and automation.

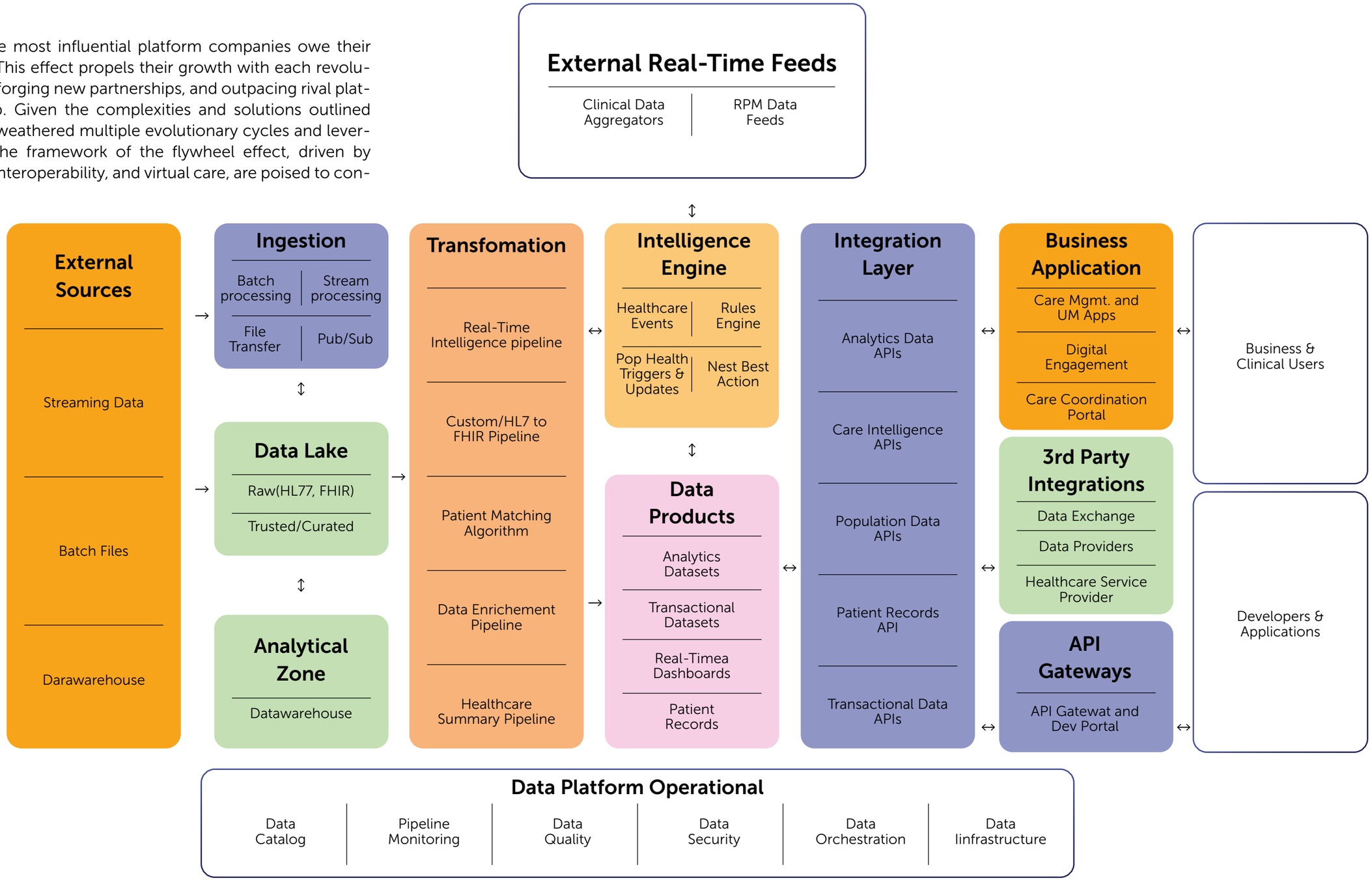
Platform vendor providing full lifecycle managed services from design through deployment and maintenance removes the need for extensive in-house technical resources.

By bringing together purpose-built architecture, embedded domain expertise, health- care data integrations, cloud-scale, and managed services, modern data platform vendors can significantly simplify and reduce the cost of realizing an enterprise-wide healthcare data foundation versus traditional piecemeal approaches.

IV. INCUMBENTS HIT ROADBLOCKS BUILDING THE MODERN HEALTHCARE DATA BACKBONE. EXCEPT ONE GAME-CHANGING PLATFORM SURGING AHEAD BY GOING BACK TO BASICS.

It's an undeniable truth that the most influential platform companies owe their success to the flywheel effect. This effect propels their growth with each revolution, unlocking fresh use cases, forging new partnerships, and outpacing rival platforms that struggle to keep up. Given the complexities and solutions outlined above, organizations that have weathered multiple evolutionary cycles and leveraged their experience within the framework of the flywheel effect, driven by movements like consumerism, interoperability, and virtual care, are poised to construct a cutting-edge data platform. This platform offers the unparalleled flexibility to ingest both cyclical and real-time data from clinical and non-clinical sources while delivering instant insights at the point of care. These organizations are unequivocally best positioned to outmaneuver the competition.

With this visionary perspective as our guiding star, **Medecision has undertaken a radical transformation in the way it engineered its data platform. Already, we are witnessing groundbreaking results. Understandably, there are no shortcuts to this kind of success, and any market players must unquestionably adhere to the blueprint of data platform capabilities outlined below.**



V. EXPERIENCING A DAY IN THE LIFE OF THIS GAME-CHANGING MODERN HEALTHCARE DATA PLATFORM

Meet Alice, a 55-year-old woman living with a chronic heart condition. Her health data is already integrated into a comprehensive care management solution through past claims ingestion processes, which have provided valuable insights into her medical history and condition management **(batch data ingestion capability)**. Alice receives regular remote patient monitoring (RPM) to track her vital signs and condition at home.

One evening, Alice experiences severe chest pain and is rushed to the hospital. Upon her arrival, the hospital's Electronic Health Records (EHR) system immediately notifies the care management solution in real-time, providing essential information about her hospitalization **(inbound real-time integration through external feeds via a health data aggregator/exchange that collects all EHR data).**

Simultaneously, the RPM data from Alice's wearable devices and home monitoring equipment streams real-time information about her heart rate, blood pressure, and other vital signs directly into the care management platform **(inbound real-time integration capability through external feeds, e.g., human APIs).** The system instantly analyzes this data and recognizes a significant deviation from her baseline, indicating a critical situation **(real-time rules engine and care intelligence capability).**

The care management solution, equipped with a sophisticated rules engine **(real-time rules engine and care intelligence capability)**, immediately springs into action. It combines Alice's historical health data, real-time RPM data, and the newly acquired EHR information. The rules engine processes this wealth of data to determine the next best actions **(care intelligence capability)** for Alice's care.

Here's how the rules engine leverages Alice's data:

Assessment of health status: the RPM data and EHR information reveal that Alice's condition has worsened, indicating a potential cardiac event (external real-time feeds integration).

Identification of transportation needs: by analyzing Alice's social determinants of health (SDoH) data, the system recognizes that she lacks reliable transportation to attend follow-up appointments and cardiac rehabilitation sessions (third party service API integration).

Real-time alert: the care management solution immediately notifies Alice's care team, including her primary care physician, cardiologist, and a care coordinator, about her hospitalization and the detected change in her condition (care intelligence capability).

Next best actions: based on Alice's condition and SDoH data, the rules engine generates a care plan that includes arranging transportation for her to attend follow-up appointments and rehabilitation. It also triggers alerts to ensure medication adherence and schedules regular check-ins with her care team (care intelligence capability).

Patient engagement: Alice receives automated messages on her smartphone, guiding her on post-discharge instructions, medication schedules, and transportation assistance options.

This real-time integration of EHR, RPM data, and SDoH information, coupled with the advanced rules engine, enables the care manage ment solution to provide timely and personalized care coordination for Alice. It not only addresses her immediate medical needs but also considers her social and logistical challenges, enhancing her overall healthcare experience and improving her long-term health outcomes.

VI. CONCLUSION

This whitepaper has detailed the complex challenges in healthcare data integration, con solidation, and analytics. It is evident these systemic constraints require a transformational solution. Incremental improvements to status quo systems cannot bridge clinical and non-clinical data silos, ingest real-time data at scale, or enable intelligent point-of-care insights. Half-measures cannot fully unleash real-time, person-centric analytics at the point of care.

Only a radically novel approach can reroute around systemic data blockages. The imperative now is pursuing platforms purpose-built for healthcare's data realities. The path forward necessitates architectures that synthesize multi faceted data in real-time and apply machine intelligence to guide personalized interventions.

In closing, the vision for healthcare's future is clear – real-time integration, consolidation, and analytics. **A true modern healthcare data platform – real-time information for real-time action, with real-time impact** is the only way forward. The time to act is now.

VII. CALL TO ACTION

If your organization finds itself on the cusp of a new era in healthcare data management, one that holds the promise of real-time insights, personalized care, and enhanced patient outcomes, we extend a warm invitation to connect with us. Reach out today to initiate a conversation that will delve deeper into the capabilities of our modern healthcare data platform, how it is the backbone of our core solution offering, and how it can drive transformative change within your organization.

Pavel Grebenshikov - CTO**,** Medecision

With more than 20 years of platform modernizations, cloud engineering and digital tech experience, Pavel leads Medecision's technology group to successfully deliver transformational platform solutions. This involves overseeing the product development cycle from strategy, enterprise architecture, solution design, implementation and testing to efficient production rollouts and operations. He also considers technology trends, evaluates internal and external impact, and anticipates and masterminds the creation of new Medecision products to generate new income streams. A member of the senior leadership team, Pavel advises other C-level executives about business strategies based on the technical expertise and serves as the public face of our technology group.
A graduate of Moscow State University with a B.S. in physics, Pavel recently served as Vice President of Technology Solutions and Cloud CTO for EPAM Systems, one of the global leaders in product development and digital platform engineering services. As a part of his past career at EPAM, he served the Head of Delivery for EPAM Systems' Healthcare and Life Science business unit, providing him with real industry experience and a strong understanding of the unique challenges and opportunities facing health IT companies.

About Medecision
Medecision® is a digital care management company whose solutions and services are used by leading health plans and care delivery organizations to support more than 42 million people nationwide.
Helping business leaders solve complex challenges and drive better performance, leaving organizations more capable, is at the center of everything we do.
Our healthcare solutions seamlessly connect the healthcare ecosystem to powerful data and insights that drive meaningful consumer engagement and experiences while creating efficiencies that help reduce costs and support more effective care.

LINKS AND SOURCES USED IN WHITEPAPER

1 https://www.symplr.com/press-releases/symplrs-2022-compass-survey-cios-reveals-operational-inefficiencies-technology-led-opportunities

2 https://mitsloan.mit.edu/ideas-made-to-matter/4-trends-driving-platform-adoption-health-care

3 https://klasresearch.com/report/interoperability-2018/1418

4 https://www.accenture.com/us-en/insights/health/technology-vision-for-health

5 https://www.redoxengine.com/blog/redox-survey-reveals-clinical-integration-challenges-slow-cloud-adoption/

6 https://blackbookmarketresearch.newswire.com/news/healthcare-providers-patient-data-exchange-20513552

7 https://www.definitivehc.com/blog/value-based-care-data-analytics-bi-tools)

8 https://www.idc.com/getdoc.jsp?containerId=US45679421)

9 https://www.himss.org/resources/new-himss-analytics-data-points-quality-data-healthcare

10 https://www.burtchworks.com/wp-content/uploads/2022/08/2022-Burtch-Works-Study_ES.pdf

11 https://www.optum.com/content/dam/optum3/optum/en/resources/ebooks/real-time-analytics-in-healthcare.pdf

12 https://www.clinicalarchitecture.com/press-releases/new-clinical-architecture-study-finds-too-many-medical-alerts-leading-to-alert-fatigue/

13 https://www.idc.com/getdoc.jsp?containerId=prUS45987919)

14 https://www.healthcareitnews.com/news/healthcare-slow-up-take-real-time-analytics)

15 https://skainfo.com/press-releases/majority-of-physicians-see-data-issues-hampering-move-to-value-based-care/)

16 https://blackbookmarketresearch.com/

17 https://blog.urac.org/care-coordination-benchmarking-study-results

18 https://www.himss.org/resources/challenges-fragmented-patient-data

19 https://stanmed.stanford.edu/2017spring/how-social-and-environmental-factors-affect-health.html

20 https://www.healthaffairs.org/do/10.1377/hpb20180817.901935/full/

21 https://www.cdc.gov/chronicdisease/resources/infographic/chronic-diseases.htm

22 https://www.kff.org/medicaid/issue-brief/the-implications-of-covid-19-for-mental-health-and-substance-use/

23 https://healthitanalytics.com/news/few-organizations-use-data-analytics-for-social-determinants-of-health

24 https://www.optum.com/business/resources/library/social-determinants-of-health.html

25 https://www.optum.com/solutions/data-analytics/cost-value-healthcare-analytics.html

https://businessinsights.bitdefender.com/case-study-kaiser-permanente

26 https://www2.deloitte.com/us/en/pages/life-sciences-and-health-care/articles/health-care-current-december12-2013.html