WHITE PAPER

The business intelligence and analytics imperatives for emerging diagnostics organizations

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The diagnostics industry is playing an influential role in healthcare's shift toward prevention and personalized care. Emerging diagnostics companies are tasked to find a sustainable competitive edge in a challenging market. The diagnostics industry is itself transforming through innovative technologies and a broadening role across the patient journey—from early detection to continuous monitoring and personalized treatment regimens.

FIGURE 1:

Industry trends and market opportunity

	Screening and diagnosis	Treatment	Long-term management
Industry trends	• Introduction of novel **pan-cancer screening tests** for early diagnosis • Shift toward minimally invasive **liquid biopsy tests** for diagnosis • Accelerated adoption of **point-of-care** (POC) tests for faster diagnosis • Development of **protein biomarkers** for differential diagnosis	• Acceleration of **companion diagnostics (CDx)** for personalized therapeutic interventions • Emergence of innovative techniques like **next-generation sequencing (NGS)** for monitoring treatment response in oncology • Growth of **precision medicine**	• Accelerated adoption of **continuous glucose monitoring (CGM)** for management of chronic diseases • Launch of sensors and wearables with **inbuilt ECG and mapping** of sleeping patterns
Market opportunity	• **Early diagnosis** of cancer could save U.S. $26 billion[1] annually and early diagnosis of **Alzheimer's** could save U.S. $7.9 trillion[2] • **Liquid biopsy** market is projected to grow at CAGR of 18% in next five years[3] • **POC** market is expected grow at CAGR of 5.9% from 2020-2025[4] • **Proteomics** market is estimated to grow at CAGR of 12% in next seven years[5]	• **CDx** market estimated to grow at 18% CAGR in next four years[6] • M&A deals for **NGS, genomics and biomarker** tests represent half of all molecular diagnostics deals from 2018-2021, showing high activity in the space[7] • **Precision medicine** market is expected to grow at 12% CAGR from 2021-2028[8]	• The number of **CGM users** is projected to jump 29% in 2022 • An estimated **67 million** people in the U.S. will be using wearables by 2022[10]

The ongoing industry transformation presents emerging players with tremendous opportunities and a plethora of challenges. Some obstacles emerging diagnostics organizations face include:

- The inability to gauge the **market opportunity** for novel technologies and identify target markets
- A limited understanding of **treatment paradigms** and patient management pathways
- A **low awareness** of novel technologies and a **staunch loyalty** to traditional protocols among providers and key opinion leaders
- **Limited payer access** and patient out-of-pocket costs' **stifling effect on reach** to target population
- **Insufficient budget and marketing** resources that further hinder reach

- **Low visibility** into performance, opportunities and bottlenecks, limiting the ability to be proactive with data-driven decisions
- An absence of market intelligence and a disincentive to improve existing business models and launch new products
- The inability to create commercial models that **monetize internal data**
- A weak grasp of **core customer behavior** that **hampers deep engagement** with target population

A business intelligence (BI) and analytics program can play a central role in helping organizations turn these challenges into opportunities.

- Pairing primary and secondary data analytics maximizes the impact of limited resources by estimating market potential, identifying the target population and guiding marketing strategies.
- Equipping the field team with advanced data insights guides strategic targeting and drives more meaningful engagements.
- Investing in the right digital and marketing content promotes awareness and adoption.
- Collaborating with patients and providers yields real-world evidence related to improved patient outcomes data.

These insights when shared with health systems and payers can influence pathways, enhance coverage and improve patient access.

The impact of BI and analytics programs

A structured business intelligence and analytics program is essential if the overarching objective is to grow and scale for long-term success. The good news is that industry trends have enabled companies to build this kind of program in ways that hadn't previously existed. BI and analytics can have a positive impact in the following ways:

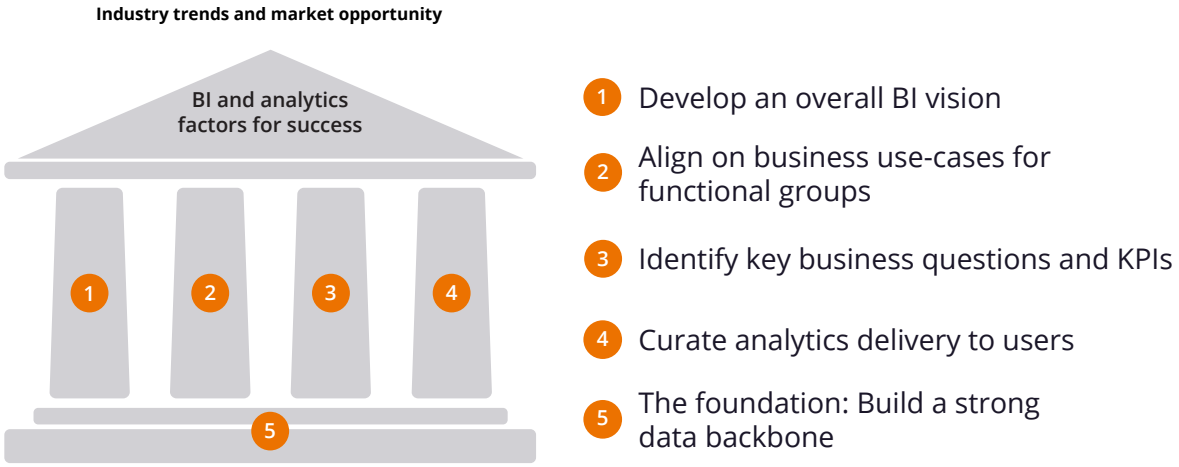
- Building a **consumer-centric** culture by equipping commercial groups with the right insights
- Aligning with a **common source of truth** for customer intelligence, market data, performance monitoring and operations tracking
- Empowering sales and marketing to convey a compelling **value proposition** that raises awareness among HCPs and patients
- Monitoring **key performance indicators** continuously to identify challenges, risks and bottlenecks in a proactive fashion rather than a reactive one

Building blocks of a BI and analytics program

Developing a BI and analytics program requires a structured methodology to ensure it is comprehensive and facilitates all functional groups within the organization. A strong data foundation and major pillars (defined in Figure 2) are essential to support current needs as well as new needs that arise in the future.

FIGURE 2:

Architecture for an effective BI and analytics program



Pillar 1: Develop an overall BI vision

Creating an analytics program starts with an examination of the organization's high-level objectives. A solid grasp of overarching organizational goals and guiding principles is essential. A BI program aligned to those goals can deliver actionable insights to help steer the organization toward the direction they want to go.

Pillar 2: Align on business use-cases for functional groups

Key functional groups that need to be supported to drive a successful product portfolio include:

- Sales
- Clinical operations
- Customer experience
- Market access
- Marketing
- Sales effectiveness
- Business operations
- Business development
- Medical affairs

Each functional group would identify and articulate objectives and key use-cases. A strong understanding of these use cases and expected business outcomes is the first step toward identifying data and analytics needs.

CASE STUDY: TAILORING BI PRE-LAUNCH

A diagnostics player in the early-stage cancer screening market approached ZS to establish a business intelligence capability.

Step 1: The business unit desired to build a robust BI program to support the launch. ZS identified four key functional areas to target: commercial effectiveness, operations, customer experience and clinical.

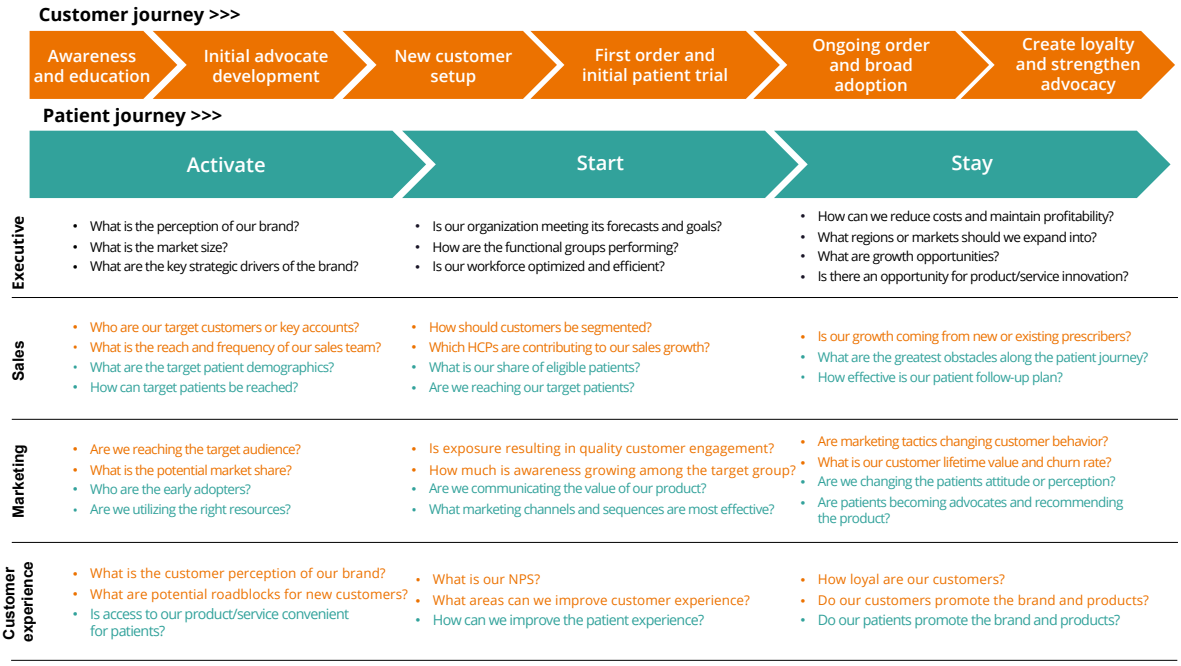
Step 2: Given the diverse roles of these functional groups, key objectives and data needs varied widely. While the commercial effectiveness team sought to raise awareness and maximize customer adoption, the operations group was focused on timely availability and smooth delivery of the test and services. With an understanding of unique needs, ZS designed and developed BI reports with intuitive user interfaces and actionable insights on a platform flexible enough to adapt to changing needs.

Pillar 3: Identify key business questions and KPIs

Following a thorough understanding of functional groups and their needs, the next step is thinking through the key business questions each group needs to answer. A detailed list of questions is compiled, representing the data and insight needs of each functional group. These business questions will vary across each phase of the customer and patient journey. To manage this process and design comprehensive reports, business questions are organized along the user journey maps to account for nuances and ensure completeness (Figure 3).

FIGURE 3:

Key business questions for stakeholders across functions



Once the key business questions are collated and mapped, quantifiable KPIs are defined to help track the progress of each objective. The business questions are paired with measurable KPIs that served as tangible indicators for success and continuous monitoring (Figure 4).

FIGURE 4:

Measurable KPIs across the customer and patient journey

Customer journey >>>

Awareness and education → Initial advocate development → New customer setup → First order and initial patient trial → Ongoing order and broad adoption → Create loyalty and strengthen advocacy

Patient journey >>>

	Activate	Start	Stay
Field org	• Targets reached/frequency of visits • Number of activities (lunch and learns, P2P, etc.) • Number of new patient orders • Number of new patient enquiries	• Number of high potential accounts reached • Number of orders/orders per new account • Number of new unique patient profiles • Percent of sales reps meeting quota	• Call plan adherence by segment • Time between orders for new accounts • Percent share of eligible patients (patient share) • Patient churn and retention rate
Mktg org	• Aided and unaided awareness • Percent of top decile PCP aware • Number of visits to website • Number of impressions	• Number of ad campaigns • Orders per HCP/site • Percent of orders not fulfilled • Number of missed appointments	• Customer lifetime value • Orders and channel (message performance) • Number of emails collected/ opt-ins
Clinical ops	• Number of lab service agreements and affiliated PCPs • Backlog of service agreements • Number of new patient registrations • Number of orders delayed	• Amount of patient balance bill • Third-party payment • Percent of inconclusive result • Order to report time • Defect rate	• Result delivery TAT • Utilization rate of lab • Days of inventory • Backlog of orders • Retest rate
HCPs and patients	• Percent of pilot accounts committed to early experience program • Number of publications and evidence generation studies • Number of target patient visits to PCP • Number of referrals from HCP	• NPS and satisfaction score • Orders per new account • Frequency HCPs reach out to interpret results • Number of lab draws completed • Calls to customer service	• Number of adopters and number of loyalists • Change in prescribing behavior • Number of follow up tests ordered • Customer feedback

Pillar 4: Curate analytics delivery to users

The data and insights from the KPIs are curated into various dashboards with varying degrees of granularity to serve the needs of stakeholders across different levels. For personalized analytics delivery, it's important to understand the different types of modes of analytics consumption that can be supported and map them to the right users. These modes are:

- **Dashboards and reports with natural language insights:** Deriving key takeaways based on the curated dashboards only
- **Guided exploration:** Stakeholders inclined toward reviewing related reports when prompted
- **Self-serving analytics:** Stakeholders go beyond curated dashboards to perform queries and generate reports on their own
- **Predictive and prescriptive insights:** Using analytics to suggest a range of prescribed actions and the potential results of each action
- **Analytics workbench:** Working hands-on to develop the raw data reports data visualizations and insights

Since user groups consume analytics differently, it's important to personalize the delivery based on user personas. The level of exposure for each user group toward the different analytics types will depend on their comfort with data and the type of insights they require. The dashboards for executive leadership entail high-level summaries of trends used to track the overall state of business objectives, thus warranting a higher need for curated dashboards and reports. Functional groups should be equipped with double-clicks to drill down into performance drivers and identify reasons for growth or decline. This functionality requires a higher degree of predictive analytics. Lastly, analysts and power users need an analytics workbench with raw data and granular insights to facilitate answering ad hoc business inquiries and building data visualizations.

FIGURE 5:

Analytics needs and consumption by user group

CASE STUDY: PERSONALIZED DATA DELIVERY FOR PHARMACEUTICAL

Partnering with a major pharmaceutical client, ZS conducted a survey of pharmaceutical customers in various roles to understand the different types of data users and the many ways they interact with data. Based on the findings, users were classified into three types:

- **Data consumers** (two primary user persona categories):
  - **"Tell me what I need to know":** Stakeholders with limited time, desire or ability to dive deep into the data
  - **"Let me analyze the data myself":** Stakeholders who believe analyzing the data is key to understanding and internalizing insights
- **Data analyzers:** Stakeholders deriving insights, sharing data with others, making it consumable
- **Data harvesters:** Stakeholders who respond to data needs and source or provide data the organization needs

The identification and classification of these user groups helped ZS create a personalized analytics delivery platform for the client that provided customized insights and data that catered to diverse needs.

The foundation: Build a strong data backbone

The final and most crucial step in developing a robust business intelligence and analytics program is to build a sound data foundation combining data from internal transactional systems and external sources (for example, Symphony, LIMS, Definitive Health, SFDC Portal, Komodo Health, DRG, Veeva, IQVIA, Voxx, LexisNexis). Building a data foundation starts with identifying the key stakeholders who create the data universe, such as patients, providers, payers and manufacturers. Once identified, data is captured to create a 360-degree view and plan for meaningful engagement. Each stakeholder is essential and adds an integral piece of data that fits together to form a complete universe of data. For example, prescription activity may come from hospitals, whereas behavioral data may originate from the patients. Mapping the data sources based on stakeholders and type of data serves as the starting point for building a strong foundation.

FIGURE 6:

Data breakdown by stakeholder

Ecosystem	Patient	HCP	Payer	Health system	Labs
Behavior	▪ EMR/EHR ▪ Social listening data ▪ Patient longitudinal claims	▪ Administrative claims ▪ EMR/EHR ▪ Social listening data	▪ Social listening data ▪ Patient longitudinal claims	▪ Social listening data	▪ Lab data aggregates
Demographics	▪ EMR/EHR ▪ Consumer health engagement data ▪ Patient profile data	▪ Provider claims ▪ Healthcare stakeholder databases ▪ Patient longitudinal claims	▪ Healthcare stakeholder databases ▪ Administrative claims	▪ Healthcare stakeholder databases ▪ Organization demographics data	***NA***
Procedures	▪ Patient longitudinal claims ▪ EMR/EHR	▪ Healthcare stakeholder databases ▪ Administrative claims ▪ EMR/EHR	***NA***	▪ Healthcare stakeholder databases ▪ Patient longitudinal claims	***NA***
Activity	▪ Administrative claims ▪ Patient longitudinal claims ▪ EMR/EHR ▪ Treatment algorithm data	▪ CRM data ▪ Ambulatory EHR data ▪ Patient longitudinal claims	▪ Social listening data ▪ Administrative claims	▪ Healthcare stakeholder databases ▪ Patient longitudinal claims ▪ Administrative claims	▪ Lab data aggregates ▪ EMR/EHR database
Promotions	***NA***	▪ CRM data	***NA***	***NA***	***NA***
Pricing	▪ Patient longitudinal claims ▪ EMR	▪ Commercial claims ▪ Government claims data	▪ Patient longitudinal claims ▪ Pharma Intelligence ▪ Truven	▪ Commercial claims ▪ Patient longitudinal claims ▪ Market access data	▪ Lab data aggregates
Reimbursement	▪ Patient longitudinal claims ▪ CMS	▪ Commercial claims ▪ Government claims data	▪ Patient longitudinal claims	▪ Commercial claims ▪ Patient longitudinal claims ▪ Market access data	***NA***
Medical history	▪ Labs ▪ EMR/EHR ▪ CMS	***NA***	***NA***	▪ EMR/EHR	▪ EMR/EHR
Sales	***NA***	▪ Patient longitudinal claims ▪ Provider claims	***NA***	▪ Claims data ▪ Hospital discharge data ▪ EHR	▪ Lab data aggregates ▪ EMR/EHR

Despite data sources being available, diagnostics companies routinely face challenges in creating a data foundation. A high-level overview of some common data challenges include:

1. **Inadequate data pools** for diagnostics data, which is far less robust than pharmaceutical data pools
2. **Low coverage of individual databases** due to the fragmented nature of the diagnostics industry
3. Difficulty integrating EMR, genomic and clinical data **to provide a complete view of the patient** and their journey
4. **Lack of coordination between data owners and data users,** hampering effective use of internal data
   - Delay in supply of data from owners to users stalls decision-making
   - Inconsistencies, missing data and ambiguity in data captured and supplied
   - Lack of business context with data owners hinders effective data collection and transmission
5. Difficulty **triangulating data from multiple structured and unstructured data sources,** especially when determining the market opportunity for new technologies
6. **Inconsistency and variability of data** from different sources makes it extremely difficult to decipher information from such diverse and critical sources of data, integrate it with other information systems and enable a seamless flow of information from one system to the other

Companies must address these challenges strategically to achieve full commercial success. While data challenges pose a significant obstacle, they can be overcome by setting up best practices and standards around data access and availability, data ownership and siloed analysis mechanisms. A centralized information management system can also help address these challenges by creating a central repository of data that can be accessed by data users when required.

CASE STUDY: POC DIAGNOSTICS COMPANY CLEANS UP DATA TO DERIVE MORE VALUE OUT OF IT

A diagnostics company specializing in rapid point-of-care diagnostics tests relied on data from distributors to get visibility into their products' sales to hospitals and doctor offices. However, data was messy and time-consuming for analysts and finance personnel to collect, process and report.

To overcome these challenges and ensure effective utilization of data, the company partnered with ZS. The following outputs were implemented to solve for data challenges:

- Collaborating with the company to examine and rethink the data distributor collection and compensation process to incentivize data sharing
- Establishing metadata management for the entire organization
- Putting in place a new reporting platform that helped answer key questions around customers, revenue and sales performance

Future growth

A dynamic market landscape coupled with an ever-increasing need for insight-driven decision-making has put business intelligence and analytics at the forefront, especially for emerging diagnostic companies developing new technologies. The ability to unlock new opportunities and address unmet business needs has created a wave of digital transformation. Building and maintaining the continuity of a strong BI program has become the need of the hour, and the urgency is only expected to grow in years to come. Putting in place a structured BI and analytics program now will serve as a sustainable competitive advantage and pave the way for growth and scalability.

Endnotes:

1. Zura Kakushadze, Rakesh Raghubanshi and Willie Yu, "Estimated Cost Savings from Early Cancer Diagnosis."

2. Alzheimer's Association, "Alzheimer's Disease: Financial and Personal Benefits of Early Diagnosis."

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7. According to ZS research.

8. Persistence Market Research, "Global Market Study on Precision Medicine."

9. Ricky Zipp, "CGM Patients Seen Rising 38% in 2021 Fueled by Type 2 Diabetes: Poll."

10. Lilas Dagher et al., "Wearables in Cardiology: Here to Stay."

About ZS

ZS is a professional services firm that works side by side with companies to help develop and deliver products that drive customer value and company results. We leverage our deep industry expertise, leading-edge analytics, technology and strategy to create solutions that work in the real world. With more than 35 years of experience and 12,000-plus ZSers in 30 offices worldwide, we are passionately committed to helping companies and their customers thrive.

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