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# MAKING BI EFFECTIVE

## INNOVATIVE APPROACHES TO MAXIMIZE BI ROI

Author: Nilesh Patil

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# OVERVIEW

Healthcare organizations are going through a technology and data revolution today, and healthcare services revolve around IT. A wide range of sources of healthcare data builds additional pressure on IT, forcing both providers and health plans to look at their data and technology investments in innovative ways. This is necessary to gain maximum return on investment (ROI) for business intelligence (BI) initiatives. Healthcare BI can help organizations use data to improve quality of care, increase financial effectiveness and operative efficiency, conduct research, and satisfy regulatory requirements. BI and analytics have consistently proven effective tools to define patient behavior and risks associated by using data from various streams such as claims, clinical systems, lab records and social channels.

Hospitals have made significant investments in electronic health record (EHR) technology, along with related updates to hospital billing, materials management, pricing and quality systems, but they find that the promised analytics and reporting are not adequate. To tie together data from these disparate systems and optimize access to the data within an integrated system, a BI strategy is needed. A typical BI strategy encompasses data governance; data staging and warehousing; tools for query, reporting, and dashboards; and a staffing model to build the initial framework and expand the architecture to serve changing business needs.

Many healthcare enterprises including providers, payers, health plans and independent services providers have made massive investments on the BI front by acquiring BI tools, technologies, platforms, hardwares and solutions. But ineffectively utilized BI infrastructure impacts ROI directly.

Measuring the ROI for BI technology acquisitions is seen as a key management process that many companies ignore because calculations can be complex. New BI investments generally have direct, indirect and related expenses, so calculating the appropriate investment can be tricky. Calculating benefits and return is also a challenge. Once again, IT projects generally have both tangible and intangible benefits. And many of the benefits may not be easily assigned a monetary value. To top that, many CIOs and BI leaders face the challenge of utilizing existing BI infrastructure rather than buying a new one.

Healthcare organizations and healthcare tech solution providers can maximize BI ROI with innovative and optimal usage of existing BI infrastructure with the right approach.

# CAUSES FOR LOW BI ROI

Before companies can optimize BI spend and increase ROI, it is necessary to first understand what causes low BI ROI. There are several areas to consider:

**Data silos**: Fragmented information lies in various EHRs, which limits data that is extracted for analysis.

**High setup and maintenance costs**: Choosing an expensive BI solution for your company, especially for small to medium-sized businesses, is problematic.

**Missing, undefined or changing BI vision**: Uncharted BI vision increases the IT overhead for operations and ongoing change management. It is also impacts the prolonged development cycle, which puts BI projects at risk.

**Too many BI tools/infrastructures**: BI tools are expensive and require additional hardware infrastructure. Each tool needs a set of administrative efforts that are typically not considered while procuring the BI tools.

**Mortality rates of analytical algorithms**: It takes a long time to develop clinical algorithms, and mortality associated is very high.

**Lack of automated data**: Lack of automation on data quality checks leads to manual data corrections, and bad data leads to bad analytics and faulty conclusions.

**Substandard ETL and BI coding**: Code developed using substandard data increases maintenance efforts and has a high operational cost. Many organizations spend 40–50 percent of their available capacity on either maintaining or keeping BI live.

**Underestimating existing capabilities**: Failing to understand how current IT infrastructure and resources could be leveraged to reduce cost estimates causes a missed opportunity to make a project more attractive to business executives.

**Forgetting that change is constant**: Regardless of the accuracy of the initial project estimates, the numbers should be updated and communicated to reflect reality.

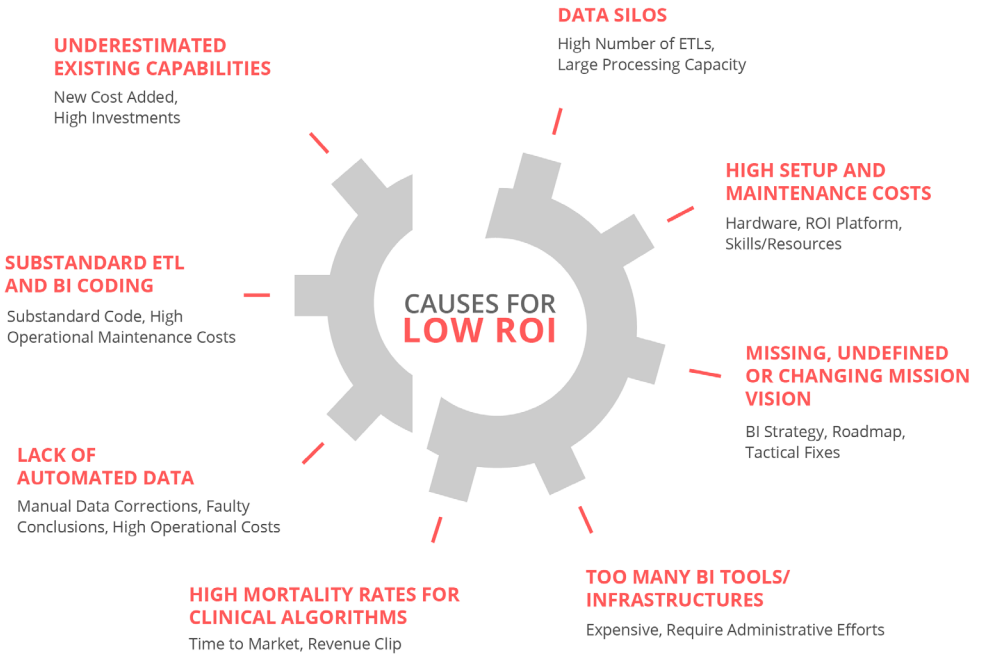



*Figure 1: Causes for Low BI ROI*

# MAKING BI MORE EFFECTIVE AND MAXIMIZING ROI

## EVALUATE CURRENT BI CAPABILITY

Historically, the major cost of implementing BI solutions has been the massive overhead of buying necessary technology and expertise, which discourages many organizations from pursuing BI. Knowing that the project will demand more and more funding does not improve matters and that makes it difficult for CIOs and IT leaders to sell the BI solutions to business decision-makers.

The best way to cut costs here is to use existing BI and data warehousing infrastructures that run on standard, commodity hardware. Organizations can use any excess initial capacity for processing other jobs, and then shop around for more hardware and software as needed without purchasing new infrastructure.

Evaluation of current BI capabilities involves reviewing tools, hardware, human resources and methodologies currently being used. It is also important to compare licensing and maintenance costs for each of these parameters.

## CONSOLIDATE BI SOLUTIONS

Multiple BI systems may keep users happy, but they create an added burden for IT staff who must manage all the disparate apps. Plus, maintenance and licensing costs can quickly add up to big bucks.

Companies, in an effort to reduce costs and complexity, are considering consolidating or standardizing to one or two BI systems. But the task is not as easy as it sounds. In addition to the technical implications, there are personal and political considerations, too.

Consolidation of BI solutions also brings additional change management, which needs to be considered as a soft impact on BI ROI.

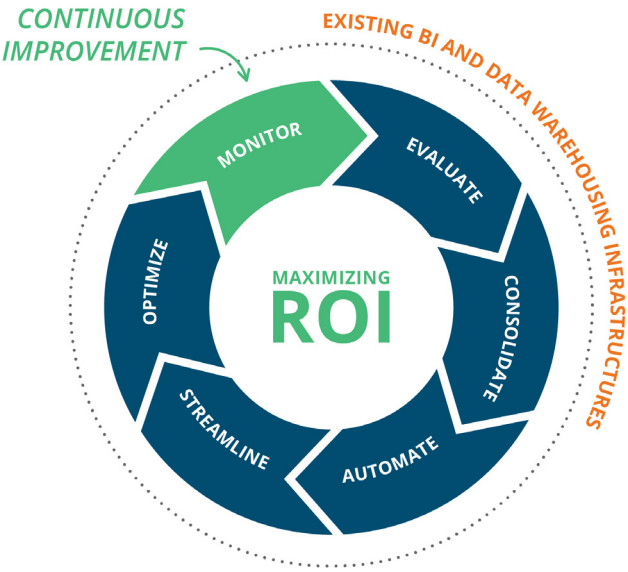



*Figure 2: Maximizing ROI*

## IMPLEMENT AUTOMATION

BI operational dashboards and automated alerts can reduce monitoring costs. This will not only allow users to receive alerts, but also will help in evaluating and measuring operational effectiveness, which in turn allows IT executives to determine the right capacity required for the operational team to maintain the BI solutions.

Automation in generating ETL code could reduce high development costs.

## REMOVE REDUNDANCY

As BI evolved, many organizations built solutions on incremental basis, which led to duplication of functionality within or across tools. It is important to identify the redundant functionalities and remove or consolidate them. Data warehouses and data marts are designed such that there is some level of redundancy. But duplication of data such as patient name, provider, physician, etc., can impact business decisions.

## OPTIMIZE SYSTEMS

It is important to optimize the current data warehouse, data management processes and technology components to provide operational effectiveness. Operations teams typically either lack competency or capacity to perform the optimization of existing infrastructures, which impacts end user satisfaction and the organizations' ability to provide budgets for future BI projects. Optimization should not be limited to the ETL, report and databases, but should also include the organization processes to get a holistic view of opportunities for improvements.

## MONITOR FOR CONTINUOUS IMPROVEMENT

Many organizations fail to conduct assessments on existing BI platforms before starting new projects or post-completion. Assessing BI solutions for readiness and completion involves evaluating business needs, architecture, organizational skills and capabilities, data quality, project management, and development methodologies in use or those that will be used.

# HOW AN EXPERIENCED IT VENDOR CAN HELP

Over the last 15 years, emids has gained enormous experience and expertise in evaluating the maturity of health-care BI solutions and developing multi-year roadmaps aligned to healthcare trends for BI platform consolidation, modernization and maintenance. We develop robust healthcare BI solutions to meet immediate, near-term and long-term business needs to provide multiple benefits including but not limited to:

- Strategic roadmap and BI vision definition
- Cost reduction
- Operational stability
- User satisfaction
- Self-service BI to reduce IT overhead on developing new reports
- Improved data quality
- Optimization through innovative data management to eliminate waste

## EMIDS ASSESSMENT FRAMEWORK FOR BI

emids' understands BI projects are business projects, so our approach is to:

1. Emphasize the importance of business needs analysis at the outset to clarify immediate, near-term and long-term goals.

2. Analyze current BI solutions to meet these identified goals, identify potential gaps in technology architecture and their impact on the business if goals are not being achieved.

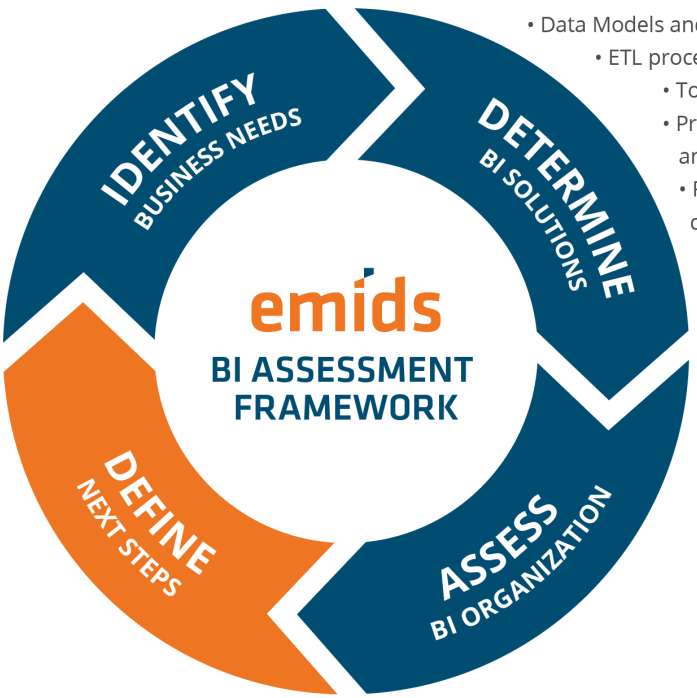
3. Evaluate BI organization for skills, capability and capacity, and identify skill gaps.

As Healthcare BI projects are different in nature, those projects need specialized project management methodologies. Data is core to BI and Healthcare organization's decision-making processes, hence conducting data analysis for validity and availability of data is critical. Detailed data analysis needs to be carried out to examine data quality, data integration and data availability. The emids ROI model can help you to determine the exact ROI for your BI investments.

**1** We analyze your BI organization, project methodology, data, architecture landscape to understand your business needs.

**2** **To determine the best BI solutions, we examine the following areas:**

- Execution methodology
- Governance
- Data Models and databases
- ETL procedures
- Tools and technologies
- Priority, impact and need analysis
- Roles, responsibilities and data stewards




**4** **We define the future state of your BI project by:**

- Identifying change imperatives and key challenges
- Documenting recommendations
- Signing off on change vision implementation plan

**3** **We assess your BI organization for skills and capability by:**

- Conducting interviews and brainstorming sessions
- Reviewing existing documentation, data and codebase
- Defining best practices, project plan and methodology
- Creating assessment reports

**Stages 2 and 3 includes working with Business Managers and Users, Data Architects, Healthcare SMEs, BI Practice Architects and Programs Managers.**

*Figure 3: emids BI Assessment Framework*

# CASE STUDY NO. 1: LARGE POPULATION HEALTH MANAGEMENT PLATFORM COMPANY

## BACKGROUND

A population health management customer had a healthcare customer relationship management (CRM) system that applied the advanced science of predictive analytics to big data to accurately determine which patients and prospects were most likely to develop a specific medical condition or use a medical service. With this information, hospital marketers were empowered to focus on patients that were likely to need care, cost-effectively grow service line revenue and proactively manage population health. The data update process included provisioning data of various types such as patient demographic data, contact information, contact center information and others.

## BUSINESS CHALLENGE

The data loading process was cumbersome and took the hospital an average of 5.6 days per data source. Data update cycle took 8–9 days for the top three customers in terms of data volume, and new data source onboarding took 90 calendar days.

## SOLUTION AND IMPACT

| | ASSESSMENT | RECOMMENDED ACTIONS | RESULTS |
|---|---|---|---|
| 1 | **Analyzed the indexing needs looking into ETL and procedures** | ✔ Avoid unnecessary load of database servers<br>✔ Increase the throughput of the servers<br>✔ Update application and data to be faster | ▼ 40-50% *Reduction in Loading Time* |
| 2 | **Deployed packages to integration server** | ✔ Effective usage of server resources<br>✔ Remove network and memory bottlenecks<br>✔ Remove manual intervention in executing packages | ▼ 10% *Reduction in Loading Time* |
| 3 | **Identified parallel processing needs and executed them** | ✔ Review Process<br>✔ Identify non-dependent task and execute those in parallel<br>✔ Effective usage of available loading window | ▼ 20-25% *Reduction in Loading Time* |
| 4 | **Defined partitions on existing tables** | ✔ Effective usage of storage system and effective retrieval<br>✔ Partitioning to optimize use of hardware resources | ▼ 25-30% *Reduction in Loading Time* |
| 5 | **Assessed current processes to reduce redundancy** | ✔ Eliminate redundancy (e.g. age calculation, eliminate for loops in batch processing)<br>✔ Analyze memory leakage situation<br>✔ Redesign ETLs wherever applicable | ▼ 5-10% *Reduction in Loading Time* |

**Original Load Time**
**9-10 Days**

**Reduction in Load Time**
**5-6 Days**
**60% Reduction**

**Current Load Time**
*with Ongoing Improvement*
**3-4 Days**

*Figure 4: emids Process for Optimizing Data Loads*

# CASE STUDY NO. 2: MIDSIZE STATE HEALTH PLAN

## BACKGROUND

A midsize state health plan with 200K members was facing challenges in data management and BI. The operational spending was difficult to justify considering customer dissatisfaction and inefficiencies in platform. Customer had made a multimillion-dollar investment on infrastructure, tool technology and resources, but the outcome was continuously dipping.

## BUSINESS CHALLENGE

The reactive approach to business reporting needs and an absence of data governance posed a challenge. There was a marked absence of self-service reporting ability for business users that led to low internal customer satisfaction. The data warehousing architecture was complex and not designed to scale.

## SOLUTION AND IMPACT

During assessment, emids defined the governance policy to eliminate data quality, ownership, and security and privacy challenges. emids provided foundational projects to eliminate waste in the current BI platform and operations. This included a transformation project designed to develop a new BI platform using existing technology stack, and value-realization projects designed to develop analytics and dashboards for executives and operation heads.

# SUMMARY

As the healthcare IT revolution marches forward, BI solutions become more important to help healthcare companies continue to operate effectively. But achieving maximum return on investment for BI initiatives can be difficult.

Many factors can result in low BI ROI, including: data silos; high setup and maintenance costs; missing, undefined or changing BI vision; too many BI tools and infrastructures; mortality rates of analytical algorithms; lack of automated data; substandard ETL and BI coding; underestimating existing BI capabilities; and forgetting that change is constant.

Fortunately, healthcare companies can make BI more effective with the help of a skilled IT vendor. Several steps can help maximize BI ROI, including evaluating current BI capabilities, consolidating BI solutions, implementing automation, removing redundancies, optimizing systems and monitoring for continuous improvement.

emids has gained in-depth BI experience over the past 15 years by handling BI system improvements and developing an innovate BI assessment framework. With this experience, emids has helped healthcare organizations achieve financial effectiveness, operational efficiency, improved quality of care and more.

## ABOUT THE AUTHOR

***Nilesh Patil, Director, Business Intelligence Practice, emids Technologies***

*Mr. Patil has more than 15 years of experience in data management, business intelligence and establishing data management platforms and practices for enterprises. He has successfully managed and delivered various master data management, data governance, data warehouse and BI projects.*

## About emids

emids is the premier provider of healthcare IT services and industry-leading solutions. Because we are grounded in deep technology expertise and an exclusive healthcare focus, our clients experience true partnership with us as together we navigate the challenges of a rapidly changing healthcare industry.