



## AI Driven Intelligence

### Business Intelligence

Monitor operational efficiency and improve financial performance

### Clinical Intelligence

Drive quality and outcomes with Follow-up exams Management



### AI Performance

Monitor and assess real-time AI performance accuracy and quality analysis



## AI-driven intelligence for diagnostic imaging

**Bialogics' AI-driven, diagnostic imaging ecosystem goes over and above current analytics systems to improve performance**

Over the past 20 years, nearly every Diagnostic Imaging service in North America has become fully digital. Imaging departments have largely deployed PACS, RIS and EMRs to replace their paper and film-based workflows. The transition has brought about efficiencies and improvements but many of the old processes remain. Due to increasing workloads, there is tremendous pressure on imaging services to become more efficient by increasing productivity, speeding up access to timely results, and ultimately improving the cycle of patient care.



[www.bialogics.com](http://www.bialogics.com)  
[info@bialogics.com](mailto:info@bialogics.com)

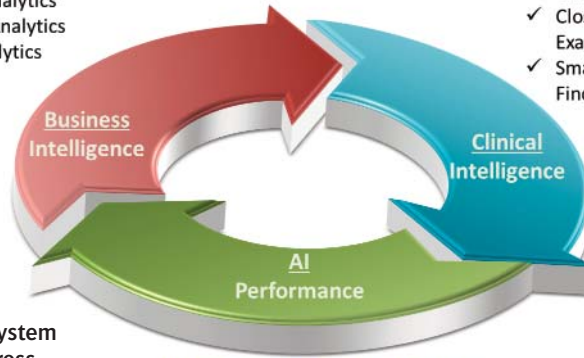
Biologics was created in response to the integration of digital information systems into Diagnostic Imaging departments. DI departments need a vendor-agnostic solution to better document, measure, and analyze their imaging workflows. To respond to increased workloads and budgetary pressures, they need to improve their management of the clinical knowledge associated with the PACS, RIS, and EMR systems

**Business Intelligence**

- ✓ Operational Analytics
- ✓ Performance Analytics
- ✓ Utilization Analytics

**Clinical Intelligence**

- ✓ Clinical Search
- ✓ Closed loop Follow up Exam
- ✓ Smart Summary Findings



Creating an ecosystem of intelligence across the lifecycle of data

**AI Performance Management**

- ✓ Cohort Identification
- ✓ Concordance/Discordance Reporting
- ✓ De-Identification and Image Preparation

Most hospitals and healthcare systems have acquired an analytics solution – usually from a large IT company or a current vendor. These solutions have limitations, but users are typically not aware of the shortcomings. Users are often not aware, moreover, that there are more advanced capabilities available that could positively impact their imaging performance.

In most cases, the analytics applications used by DI services today are provided as an integrated part of their EMR, RIS, or PACS system. As a result, they focus on measuring the activities within their specific application. This leaves gaps in capturing the data associated with the entire patient imaging process across multiple systems, as well as the productivity, performance and Quality Assurance reporting associated with the same Radiology imaging process. They miss out on the important operational data and the clinical value stored in the dictated Radiology reports that can provide important data for improving patient outcomes. Also absent, in many cases, are data sets such as Workflow and Worklist Management tools, Peer Review, Relative Value Units (RVU), and Radiologist Scheduling. They also do not analyze the important data required to drive the evolution of Radiology’s future use of AI algorithms.

The only way to comprehensively measure and improve the workflow in an imaging service is to integrate the data across EMR, RIS, and PACS, and other contributing sources, and to extract the clinical data embedded in the diagnostic report.

Accessing and integrating multiple sources of patient workflow data across the Diagnostic Imaging pipeline is difficult, time consuming and labour intensive. It costs health systems valuable resources, time, and money. Most analytics solutions today do not provide for self-service analytics managed by the in-house staff, and often rely on data scientists to create one-off SQL queries. In short, they’re not comprehensive, and they’re not easy to use.

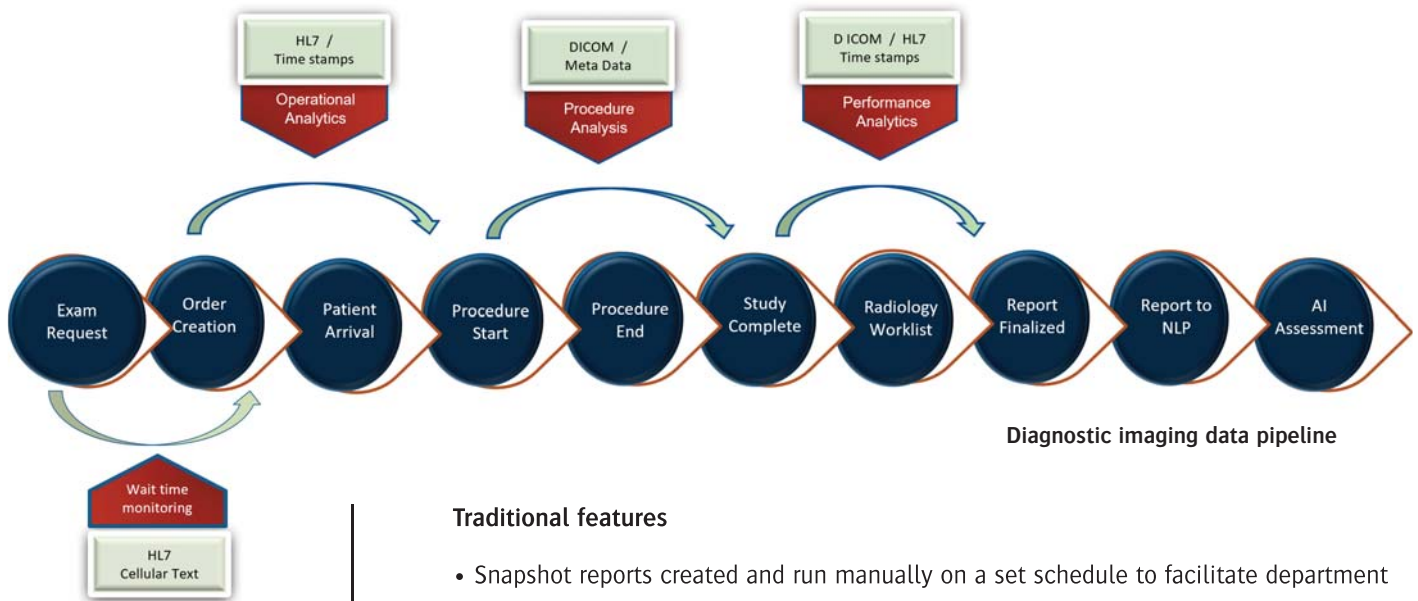
The creation of a user-friendly, imaging data ecosystem that integrates multiple sources of data into a single system would provide greater cross-functional use. It would allow wider engagement, as imaging staff would find meaningful insights to improve operational efficiency and performance leading to better patient outcomes. The Biologics platform answers these needs.

**Traditional RIS/PACS Analytics – Device Analytics:** Static reports provided by EMR, RIS and/or PACS vendors highlight the challenges associated with proprietary data and the use of single protocol data (HL7 or DICOM). Not analyzing all the available data places limits on the depth of analysis that can be performed. These solutions present one-off



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info@biologics.com

reports showing base operational data using only HL7 or DICOM source data to document basic analytics. This level of analytics is designed for the basic reporting applications of the PACS administrator



It is reported that actively monitoring of Patient Wait Times and report Turn Around Times can improve operational performance by 15%, generating greater customer satisfaction.

### Traditional features

- Snapshot reports created and run manually on a set schedule to facilitate department utilization statistics
- Mapping image demand from institution location, departments, modalities, and procedures
- Analysis of operational data with limited procedural analysis (i.e., Turn around Times)
- Analysis of imaging procedures by technologist, radiologist and referring physician
- The reports are generally run on-demand and do not provide real-time actionable information to the clinicians or administrators

**Business Intelligence:** Drive meaningful change with the integration and layering of multiple sources of Diagnostic Imaging and financial data into a single vendor agnostic platform. Use this platform to broaden and create dense analysis of real-time, operational and performance metrics to analyze and document findings and share seamlessly across teams and reporting authorities.

### Biologics features:

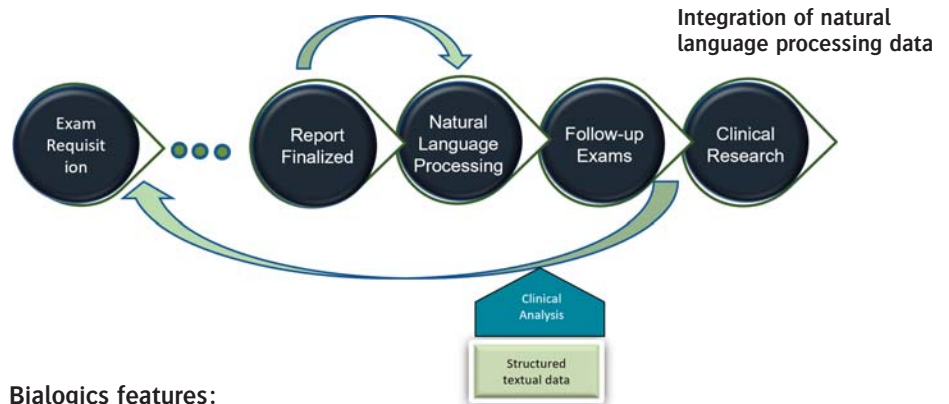
- The blending of HL7 and DICOM meta data and timestamps provides deeper analysis of the radiology workflow steps displayed in real-time
- Analysis of each assigned workflow step provides accurate radiology process and patient workflow analysis
- Integration of radiologists scheduling data provides detailed analysis of productivity reporting and efficiency monitoring by slot or sessions times
- Inclusion of RVU look up tables provides RVU generation and target RVU production tracking with financial productivity by RVU, subspecialty providing aggregated or individual Physician tracking dashboards



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Radiology routinely generates 10%-15% follow up exams, of which 35% of follow-up recommendations are never acted upon, negatively impacting patient care, and resulting in lost revenue opportunity.

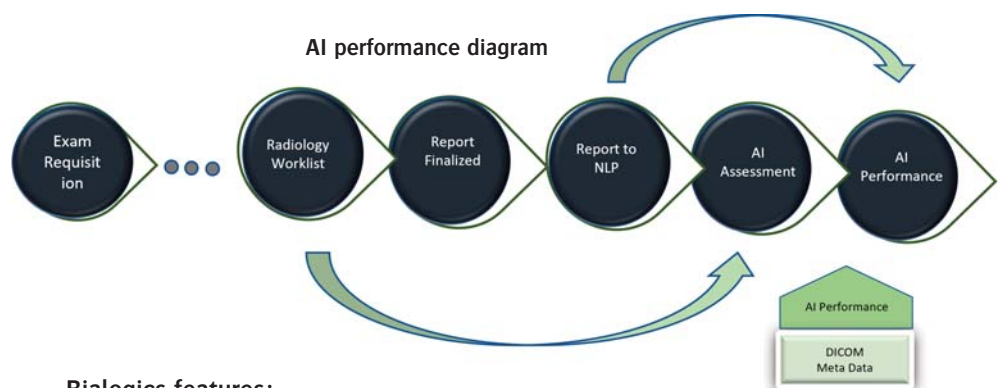
**Clinical Intelligence:** Process unstructured textual data from the finalized radiology reports into structured data elements using deep learning NLP to enable the convergence of operational analysis with reported findings for Critical Findings Reporting, Follow-up Exam Management, Quality Assurance, and Clinical Research Analysis.



**Biologics features:**

- Clinical Search for cohort identification based on Natural language Processing and Concept Search Criteria (SNOMED/Radlex, etc.)
- Pathology identification and measurement for tumor tracking
- Follow-up exam Tracking and Closed Loop Management
- Critical Findings Call Report tracking, and identification of potential missed critical findings
- Quality Assurance monitoring for Radiology and Referring Physicians for polarity, certainty and Image appropriateness

**AI Performance Reporting:** Comparing AI Output with Biologics Clinical Intelligence analysis of the diagnostic report, enables real time AI performance monitoring, with Concordance, Discordance, Sensitivity and Specificity tracking. Completing the data lifecycle with de-identifying clinical data extraction for AI and Machine Learning research.



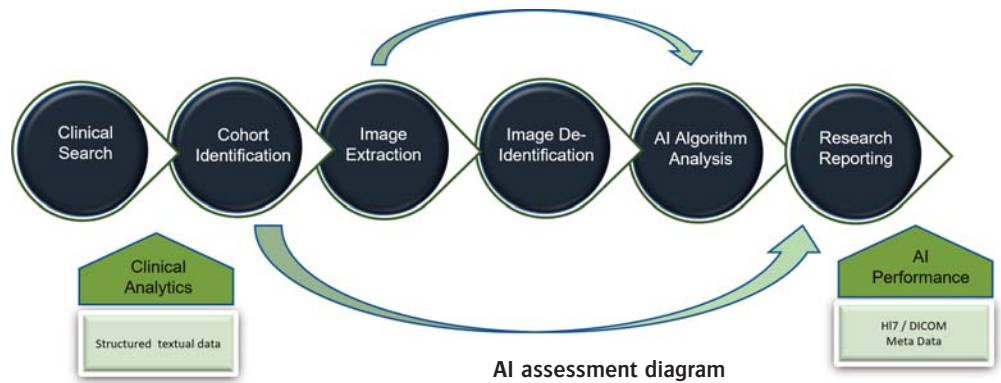
**Biologics features:**

- Concordance/Discordance accuracy by algorithm, Procedure, Radiologist
- Calculate Sensitivity (NPV) negative predictive value and Specificity (PPV) positive predictive values
- Creation through clinical research of a Cohort of patient reports to evaluate detailed clinical findings against a known data set

De-identification of medical record data refers to the removal or replacement of personal identifiers so that it would be difficult to re-establish a link between the individual and his or her data.

Anonymization refers to the irreversible removal of the link between the individual and his or her medical record data.

The final step in the Diagnostic Imaging data ecosystem is the protection of personal health information and preparing data appropriately for training and testing of an AI algorithm. This can be difficult and time-consuming, to meet privacy and security standards for all diagnostic data used for research purposes. AI Assessment provides for image anonymization and annotation tools and services to developers so they in turn can work with radiologists in a wide array of clinical settings to prepare images for use in AI development.



**Biologics features:**

- Data preparation
- DICOM Image de-identification
- Report Anonymization
- Extraction of image data sets for AI training or evaluation

The evolution of Diagnostic Imaging within the cycles of patient care continues to evolve and with much greater demand and complexity and so should the use of data to optimize the service delivery and ultimately the care of the patients.

**About Biologics:** Biologics is a leader in the precision analysis of Diagnostic Imaging data and patient workflows, creating a real-time ecosystem for driving the accelerated use of clinical and operational data to improve business performance, and clinical outcomes.

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