

# NATURAL LANGUAGE PROCESSING

GLIMPSES INTO THE FUTURE  
OF UNSTRUCTURED DATA MINING

KLAS® | APRIL 2016 | PERCEPTION REPORT



# NATURAL LANGUAGE PROCESSING

## GLIMPSES INTO THE FUTURE OF UNSTRUCTURED DATA MINING

In many ways, the current healthcare climate has created the perfect storm for a surge in provider mindshare toward leveraging NLP to help improve patient care. However, providers currently face challenges evaluating the different NLP offerings and how they will perform in specific contexts. Additionally, providers note that current NLP solutions face significant challenges in unraveling the complexities of medical language. KLAS spoke with academic facilities, large IDNs, and known NLP users to provide an overview of the NLP market, provider strategies, and NLP use cases and a very early look at what vendors are offering in NLP solutions.

While most providers are introduced to **NATURAL LANGUAGE PROCESSING (NLP)** in healthcare through computer-assisted coding (CAC) applications, NLP is now being utilized to address provider needs in **five general areas** with varying degrees of market maturity:

### 1 Vendor-Assisted Research/Population Health

1

**DEFINITION:** Vendor-developed software used to mine data to identify at-risk populations, to aid in research, and for regulatory and quality compliance.



PROS

Ability to extract insights and trends from free text to monitor patient populations; less need for internal experts

CONS

Not an out-of-the-box solution; initial accuracy and reliability low; vendor controls customization

#### VENDORS

Apixio  
Cerner  
Digital Reasoning  
Health Fidelity  
IBM  
Linguamatics  
medCPU  
M\*Modal  
Nuance  
Oracle  
QPID Health  
Wired Informatics

### 2 Patient Summaries

2

**DEFINITION:** Mining free text to identify patient data and/or combine into structured documentation.



PROS

Ability to search free text to find matching patients; creates structured documentation from notes and free text

CONS

Search results can be inaccurate or non-specific to current/past conditions; requires resources to choose what to include

#### VENDORS

3M  
Cerner  
Epic  
Health Fidelity  
IBM  
Linguamatics  
M\*Modal  
Nuance  
QPID Health

### 3 CAPD

3

**DEFINITION:** Computer-assisted physician documentation in which software solutions provide real-time documentation suggestions to physicians.



PROS

Increased documentation accuracy in real time; financial benefits from reducing resources and increasing code capture; improved care from reducing errors

CONS

Changes physician workflow, which may challenge adoption; possible alert fatigue; new technology that is as of yet unproven

#### VENDORS

3M  
M\*Modal  
Nuance

### 4 CAC/CDI

4

**DEFINITION:** Computer-assisted coding and clinical documentation improvement in which NLP analyzes documentation to produce medical codes and suggest queries.



PROS

Increased productivity, accuracy, and claims capture; improved documentation

CONS

Low coder adoption due to perceived errors and necessity of NLP tuning; complex implementations; does best in highly electronic organizations

#### VENDORS

3M  
Dolbey  
ezDI  
MedKoder  
M\*Modal  
Nuance  
Optum360  
MedAssets-Precyse

### 5 Homegrown Research/Population Health

5

**DEFINITION:** Usually open-source NLP solution driven by dedicated, in-house resources to mine unstructured data.



PROS

Ability to identify at-risk patient populations from free text; highly customizable

CONS

Requires highly trained resources to administer; accuracy dependent on input and adaptations from resources

#### VENDORS

Historically homegrown from open-source software; each case is unique

## DEPTH OF VALIDATED NLP USE

### Considering

Not currently live with NLP

### Preliminary

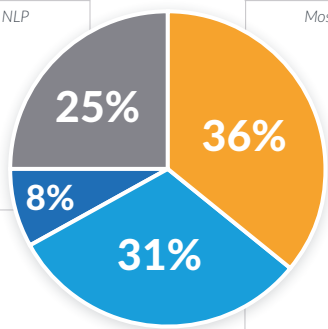
Most using NLP for CAC, CDI, or patient-summary applications and/or for a single use case only

### Established

Using mostly homegrown NLP for research and population health applications in multiple use cases; cutting-edge use of NLP

### Developing

Using NLP for CAPD, patient summaries, population health, or research; usually using for more than one use case



# 1

## PROVIDERS SKEPTICAL ABOUT IBM HYPE

While IBM is the most-mentioned NLP vendor, providers are cautious about IBM's NLP potential; they report that IBM's tools are challenging to use and have limited functionality. While providers acknowledge IBM is working hard to provide NLP capable of decision support, they are concerned about the product's accuracy and its application with complex healthcare language. IBM will face significant challenges in overcoming provider skepticism that Watson will prove to be a competitive option.



*"The things Watson did for Jeopardy were very slick, but they do not really extend out to the complexities of medicine. It is not clear to me whether Watson is really going to do what people want. Watson seems better for figuring out the best treatment for a patient or other possible diagnoses for a patient given certain findings. Whereas a lot of people, especially on the research side, have 500 or 5,000 patients with colon cancer, and they want to abstract information about how many have had adverse events, how many have had difficulty breathing, or how many have fallen and fractured their leg after chemotherapy."* CMIO

# 2

## M\*MODAL'S AND NUANCE'S FRONT-END CAPABILITIES DRIVING CAPD ENERGY

Providers are demonstrating early interest in M\*Modal's and Nuance's computer-assisted physician documentation (CAPD) solutions to complement front-end speech applications at the point of care. The solutions are as yet unproven, but early feedback from providers live with CAPD solutions includes admiration for M\*Modal's context-driven NLP engine. Additionally, providers are excited about the benefits of both Nuance's and M\*Modal's ability to offer real-time NLP feedback to improve the quality of physician documentation.

## NLP USE CASES

■ KLAS-Validated Live Use  
■ Validated Sales Consideration  
■ Vendor-Identified Offering

### Coding and Documentation

### Research and Population Health

	CAC/CDI	Coding Reconciliation (Retroactive)	CAPD	Patient Summary/Reconciliation	Research Cohort ID/Clinical Trials	Decision Support	At-Risk Patients/Risk Adjustment	Regulatory Reporting
3M	■	■		■			■	
Apixio						■	■	■
Cerner		■		■			■	■
Digital Reasoning						■		
Dolbey	■							
Epic*	■			■			■	■
ezDI	■							
Health Fidelity				■	■	■	■	
IBM		■		■	■	■	■	■
Linguamatics				■	■		■	
medCPU						■		
MedKoder	■							
M*Modal	■	■	■	■		■	■	■
Nuance	■	■	■	■		■	■	■
Optum360	■							
Oracle					■			
MedAssets-Precyse	■					■		
QPID Health				■		■		■
Wired Informatics		■			■		■	

\* Epic is mentioned by providers considering Epic NoteReader in conjunction with third-party NLP solutions.



## 3 APIXIO, HEALTH FIDELITY, AND LINGUAMATICS OFFER EARLY SUCCESS FOR POPULATION HEALTH USE CASES

Many providers are looking to NLP engines to help drive population health initiatives by mining unstructured data. In early conversations with providers using NLP in this area, Apixio, Health Fidelity, and Linguamatics demonstrate early promise. One provider reported Apixio as having maturing algorithms that are used to address risk adjustment. Health Fidelity is developing a reputation for having an engine that can go beyond open-source tools to parse text at a deep level. Similarly, providers see Linguamatics as an emerging product that has potential for applications that offer real-time clinical decision support.

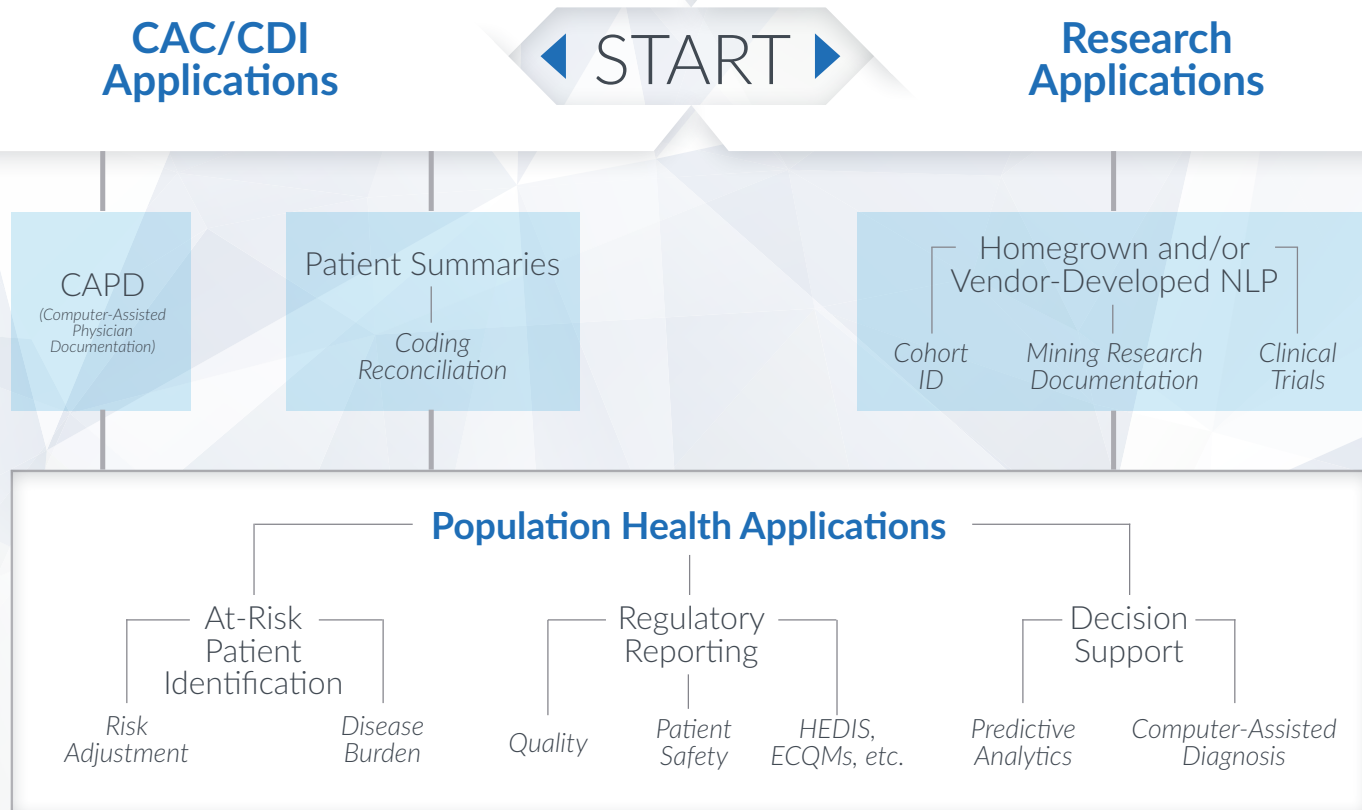
## 4 CERNER EXPANDS NLP FUNCTIONALITY WHILE EPIC ALLOWS THIRD-PARTY INTEGRATION

Cerner and Epic customers looking to leverage solutions from their core vendors will find that current NLP solutions are focused on front-end documentation. Cerner's NLP solution allows providers to mine EMR data for patient summaries, coding reconciliation, and regulatory use cases. Epic's NoteReader function is receiving consideration for providing an interface to allow third-party NLP solutions to mine Epic EMR data. While Epic currently focuses on allowing users to partner with outside vendors for NLP needs, providers express optimism about Cerner's willingness to continue to expand NLP capabilities for future use cases.



*We are very interested in NLP. I feel that a lot of places are not focusing on the use case in NLP. They are trying to build the best hammer and then find a nail. Our first task is to figure out where our needs are and what our strategies are for ACOs and population health, and then we need to see what the best tool is for our needs."* CHIO

### PROVIDER PATHS THROUGH PROGRESSIVE NLP USE



# REPORT INFORMATION



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## KLAS

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