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Applied to Life.™

3M Health Information Systems

A quick guide to 3M's natural language processing (NLP) platform

Making sense of NLP

NLP can often be complicated and even confusing. So it's not surprising that even IT-savvy healthcare professionals have difficulty digging out from under the avalanche of jargon when it comes to evaluating NLP.
As a result, organizations often struggle to understand NLP and how it meets their real-world needs, such as computer-assisted coding (CAC) and clinical documentation improvement (CDI).

This e-guide aims to:

- Demystify NLP
- Describe how it relates to healthcare information
- Demonstrate how it can benefit your organization

NLP and healthcare

NLP is the ability for computers to understand human speech. As NLP advances in CAC and CDI applications, clinicians can move away from speaking to computers in a coded language. Instead, they can talk in a human-to-human manner and achieve their goals just as effectively.

NLP in everyday life

Outside of healthcare, NLP helps power:

- Email spam detection
- Personal voice assistants, such as Siri®
- Language translation tools, such as Google Translate™
- Educational essay test-scoring systems

Three elements of successful NLP

For NLP to produce actionable outputs it must have three characteristics:

1. Knowledge: Trustworthy, reliable knowledge about the subject matter is required for NLP success. Coders use knowledge and expertise to help transform data into valuable information.

2. Language data: NLP platforms must understand concepts such as sentence structure and parts of speech. Human-written knowledge and rules don't cut it because no team of experts can capture every detail and complexity.

3. Machine learning: Algorithms and models allow machines to start with existing sources of knowledge, analyze new data, and improve their own capabilities. In short, the more an NLP platform is used, the smarter it gets.

What can NLP mean for CAC and CDI?

Today, we expect clinicians to talk to computers, degrading the quality of communication. We want them to be able to communicate as if they were talking to another clinician. NLP allows the computer to follow the more effective "human-to-human" communication.

So, what can this mean for coder productivity?

NLP can help coders make more effective use of trusted coding resources. And when CAC is NLP-enabled, it can propose useful codes for coders to verify or edit. Taking it a step further, NLP can also facilitate the critical process of clinical documentation improvement.

Common questions about NLP

Is there a "best" NLP?

Not really. NLP is a multi-faceted technology that precludes the notion of a "best" NLP. "Best" for NLP depends on the application it is used in and the context in which it is applied. Today's state-of-the-art NLP combines expert-driven rules, knowledge, large-scale data analysis and machine learning.

Is protected health information (PHI) a problem for NLP systems?

From the perspective of data-driven NLP, all patients are anonymous. Data from a patient's record—terms, phrases, concepts, codes or anything extracted from the learning process— ceases to be identifiable as belonging to any specific person or particular organization.

I hear about "precision and recall" in NLP. What does that mean?

Precision and recall are widely used to evaluate specificity and sensitivity in a medical diagnosis. Recall captures the extent to which you got all the codes you were supposed to, while precision measures the extent to which additional incorrect codes got mixed in.

Can systems really "understand" or "comprehend" clinical text?

No. Well-known NLP systems act as if they "understand" the human language, but getting computers to actually understand human language has been a dream of researchers since the earliest days of computing. Technologists know we are a long way from approaching true human understanding.

Why choose 3M's NLP platform?

3M's state-of-the-art statistical NLP combines expert-driven rules and knowledge, large-scale data analysis, and machine learning.

A couple other reasons our NLP platform is unique:

- Its content is supported by vast expertise and clinical data. 30 years' worth, to be exact.
- It's powered by the **3M™ Healthcare Data Dictionary,** a robust terminology mapping process to translate clinical terms to codes. The better the dictionary, the more accurate the results.
- It uses sophisticated language processing techniques, the basis of all NLP systems. This involves diagramming sentences, identifying parts of speech, negation, etc.

What 3M's NLP platform can do for your organization

- Processes simple text directly with computer apps – automated coding and documentation improvement
- Helps improve quality and reduce costs
- Leverages patient information in clinical documentation

Putting it all together

3M is the home of the coding knowledge pioneers who defined the DRG standards; the teams who designed and delivered the 3M™ Codefinder™ Software, which coders trust for accurate, complete and compliant coding of medical records; and a nosology support staff that even clients who use competing vendors come to for guidance.

3M has kept clients up to date with current regulatory changes and updates for over 30 years, never once missing an update. Its computer-assisted coding product, the 3M™ 360 Encompass™ System, leads the market with over 2,000 hospital sites in the United States and growing, and 3M has a long-standing history of working with clients to make sure they get what they need.

Putting it all together, 3M offers a clear path forward to coding productivity with state-of-the-art NLP and a solid track record of experience and trust.

To learn more about 3M's approach to NLP and CAC technology and how they can help your organization, contact your 3M representative today.

You can also call us at 800-367-2447 or visit www.3m.com/his.

For more information on how 3M software and services can assist your organization, contact your 3M sales representative, call us toll-free at **800-367-2447**, or visit us online at **www.3m.com/his**.

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