# Technical Report

## Topic:

Clinical Natural Language Technology for Health Care

### Introduction:

Clinical NLP automates the extraction of essential information from clinical notes, which are often lengthy and unstructured.Clinical NLP aids in standardizing medical terminologies within clinical notes. It can determine the association between a patient's medical condition and the prescribed treatment, offering insights into the patient's healthcare journey. NLP empowers data scientists to extract data-driven insights, discover patterns, and generate meaningful reports for research, clinical decision-making, and healthcare improvements.

### Past Approaches:

The NLP module actually works in two steps as shown in [Fig. 1](https://www.sciencedirect.com/science/article/pii/S1532046405001140" \l "fig1): a first step using MMTx to extract each potential medical problem and a second step to infer the state of each of those problems. MMTx lacks negation detection. An algorithm adapted described above and called NegEx, and implemented it in Java. The Improved version of NegEx was used, called NegEx 2.

### Present Trends:

Pytorch is a great framework for building flexible deep learning models for NLP, particularly when combined with libraries that remove boilerplate (e.g., pytorch lightning) and give easy access to cutting-edge pre-trained models (e.g., Hugging Face transformers).

### Future Directions:

The future for NLP is in multimodal modeling combining NLP and Computer Vision pushing the SOTA boundaries even further. Higher accuracies allow better integration in HIT systems and support interoperability merging member specific healthcare information.

### Opportunities & Threats:

From sources I analyzed some opportunities and threads of **Cotivity**

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| --- | --- |
| **Opportunity** | **Threads** |
| Making softwares more faster ate understanding medical text and images | People do not change so quickly. Making people people people adopt them is quite challenging |
| Be the first one to present state of the art | requires deep subject matter knowledge and integrating many separate pieces of context |

### Strategic Recommendations:

Offering a solution suite that allows non-technical users to execute on document intelligence. All pieces of an end-to-end pipeline are currently disjointed and very “as a service”-like. Also, here is the list strategic Recommendations to **Cotivity** from my side:

* Unified Platform
* Seamless Integration
* Simplified Interfaces
* Training & Support

### References:

<https://www.johnsnowlabs.com/clinical-nlp/#:~:text=Clinical%20NLP%20automates%20the%20extraction%20of%20essential%20information%20from%20clinical,swiftly%20access%20crucial%20data%20points.>

<https://www.sciencedirect.com/science/article/pii/S1532046405001140#fig1>

<https://medium.com/@annaanisin/nlp-in-healthcare-trends-and-challenges-in-2022-eb05e4510a1e>