AI-Driven Approaches to Indexing and Analytical Insights

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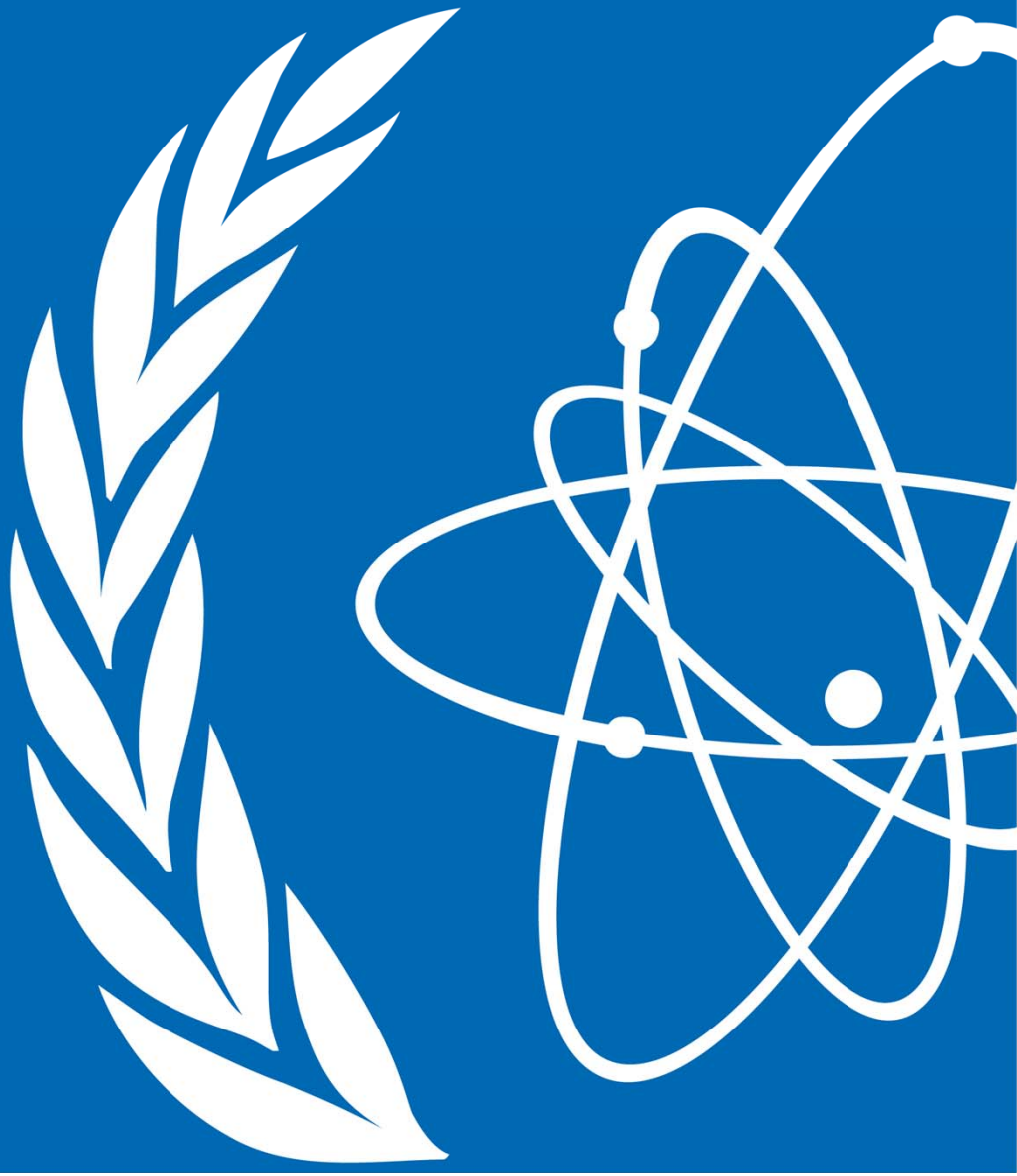

Agency Statute (1956):

"The Agency is Authorized…3. To foster the exchange of scientific and technical information on peaceful uses of atomic energy"


Information sharing and preservation
has great importance!

Member States

knowledge products

IAEA INIS

Elsevier
Springer
Institute of Physics
etc.

INIS Collection Search

INIS adds **100 000** records per year

1.8 Million Unique Users (2023)

In the 54 years of INIS:

4.85 million
knowledge products

634 000
full texts

Data from the year 2023


Information management landscape, science, technologies are changing rapidly…
…challenge and opportunity presented by artificial intelligence and machine learning…
*…INIS has amassed **4.85 million** knowledge products, evaluated, curated, and indexed.*

Title

META

Strengthening program for nuclear cybersecurity at nuclear facilities

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2022

Citation | Export | ...

Abstract

[en] Threats to the safety and security of a facility could target the physical also cyber infrastructure aspects. Critical facilities such as nuclear facilities use cyber-physical systems in their operation has vulnerabilities. Nuclear facilities in Indonesia may become targets of cyberterrorism because there have been incidents of attacks in several countries related to nuclear terrorism for specific purposes that threaten the safety and security operations of the nuclear facilities. Similar threats may occur at other nuclear facilities as well as nuclear facilities in Indonesia. The purpose of this study is to propose a nuclear cybersecurity program with a qualitative approach to attract more attention in supporting the anticipation of increasing cybersecurity threats at nuclear facilities. The program was proposed based on the description of terms in nuclear safety and security and literature studies describing incidents of nuclear cyberterrorism attacks in the past. A cyber nuclear security program has been proposed through stakeholder collaboration, resource support, and capac

Abstract

Categories

Tags/Descriptors

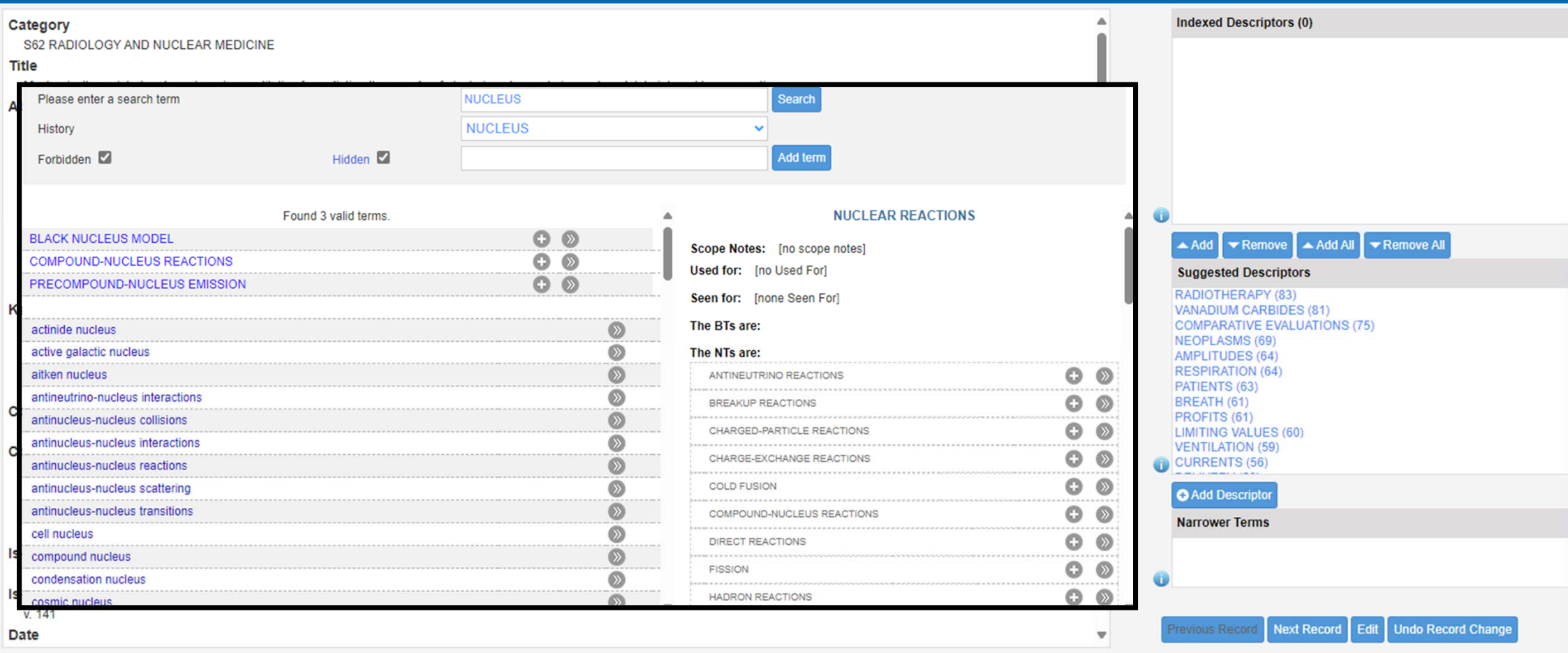
Original Title	Program penguatan keamanan siber nuklir di fasilitas nu
Primary Subject	GENERAL STUDIES OF NUCLEAR REACTORS (S22)
Source	15 refs.; 2 tabs.; 1 fig.
Record Type	Journal Article
Journal	Jurnal Sains dan Teknologi Nuklir Indonesia; ISSN 1411-3
Country of publication	Indonesia
Descriptors (DEI)	ACCIDENTS, CYBERNETICS, INDONESIA, NUCLEAR FACILITIES, NUCLEAR WEAPONS, SAFEGUARDS, SAFETY, SECURITY, VULNERABILITY
Descriptors (DEC)	ASIA, DEVELOPING COUNTRIES, ISLANDS, WEAPONS
Language	English
Reference Number	54118350
INIS Volume	54
INIS Issue	48

Browse INIS Multilingual Thesaurus

English | accide

- ACCIDENT INSURANCE
- ACCIDENT MANAGEMENT
- ACCIDENT-TOLERANT NUCLEAR FUELS
- ACCIDENTAL INTAKE
- ACCIDENTAL IRRADIATION
- ACCIDENTS

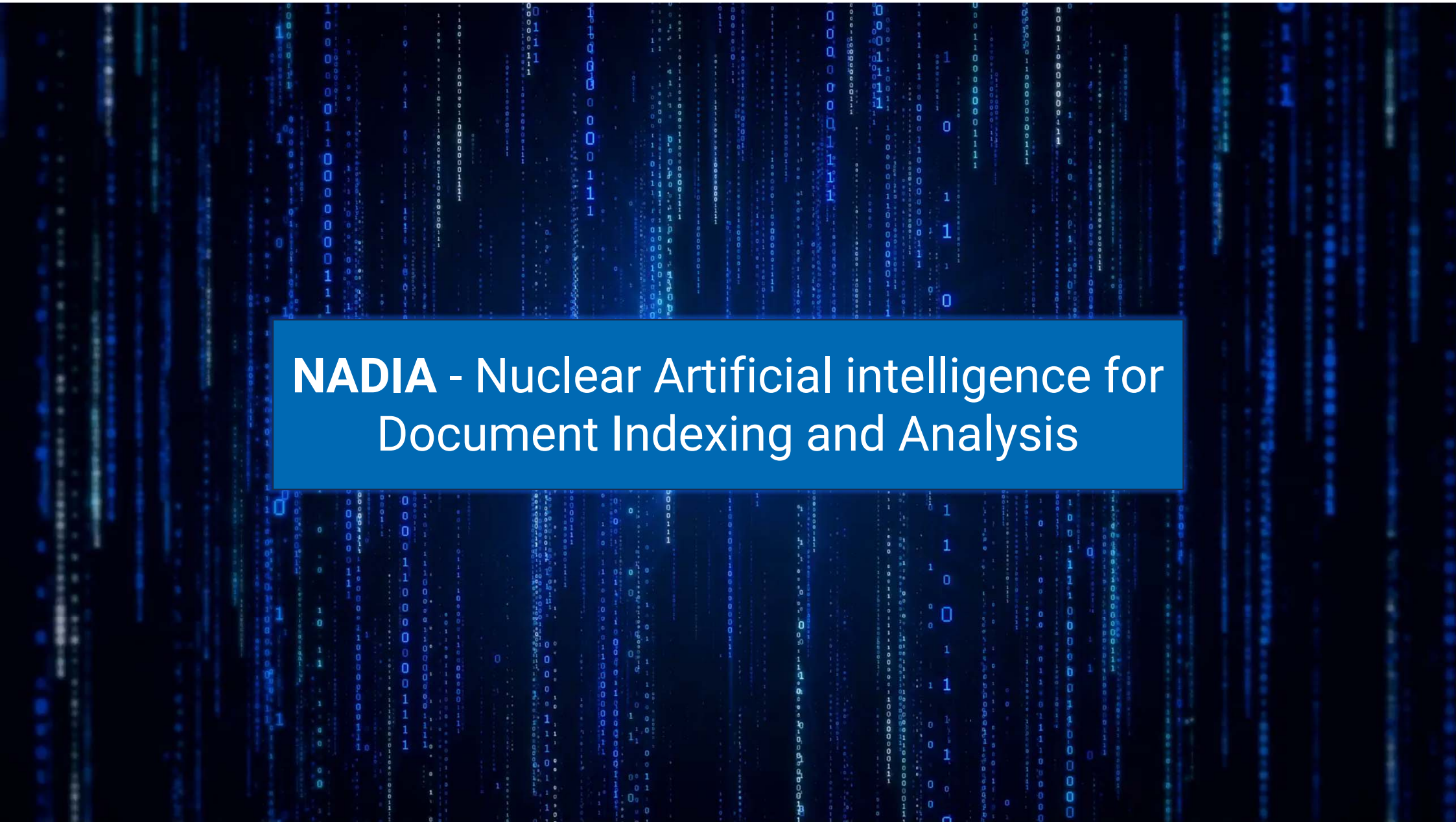
Human labor in action - Example



Natural language + machine learning categorization project

↓

Replace human labour with automation


NADIA - Nuclear Artificial intelligence for Document Indexing and Analysis

Some criteria for a successful machine learning project:

- A lot of data for training
- Data should be well-described
- Project should replace a repetitive, unrewarding task


Word Vectorization
2-3 dimensions → 768 dimensions
INIS Nuclear BERT

Need for Evenly Distributed Data

INIS case

"Materials Science"
632 000 times

"Tidal and Wave power"
408 times

greater than 99.9% accuracy score

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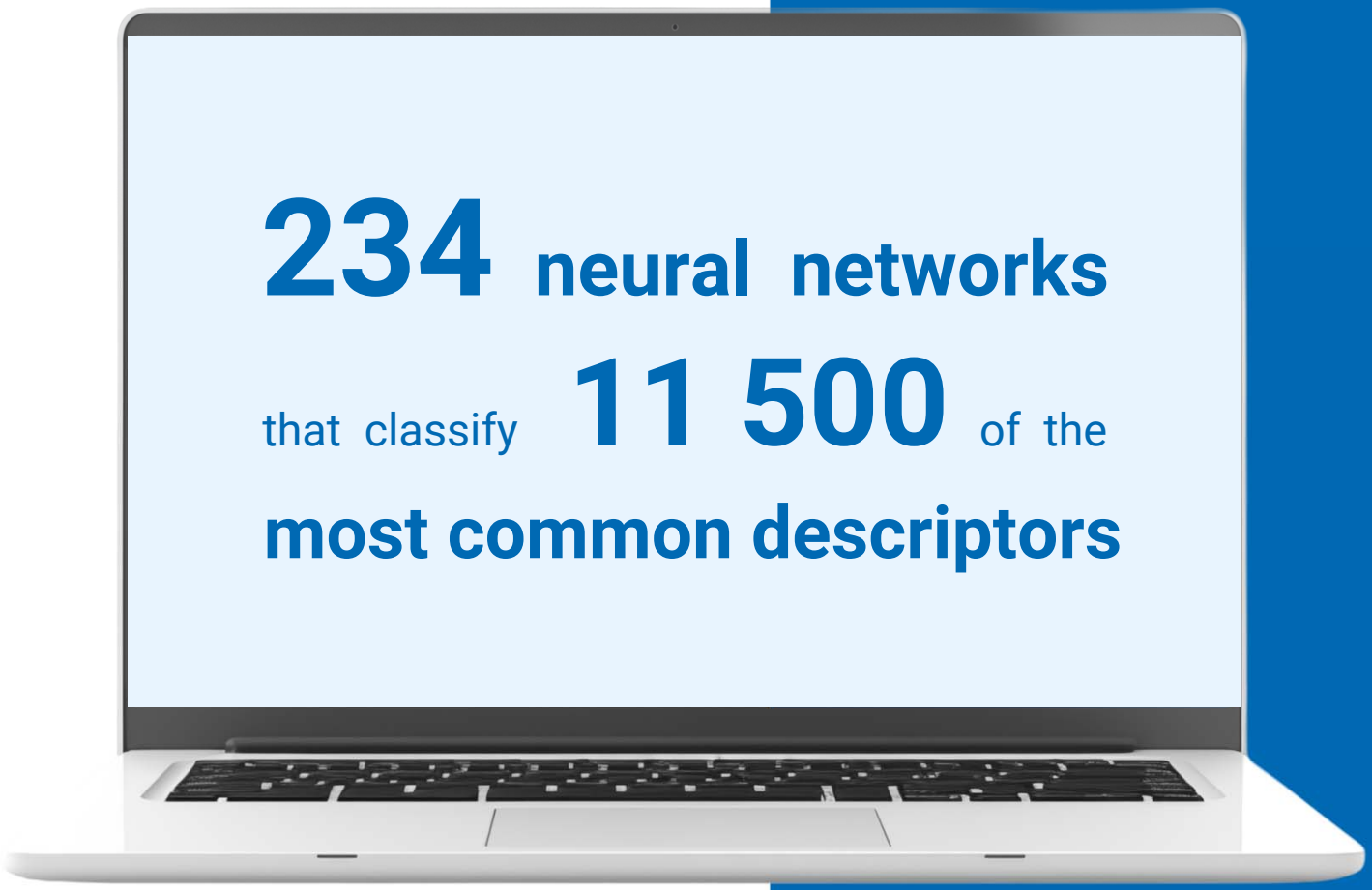


NADIA in Action - Example

Input

Title & abstract

This paper analyzed the results of the thyroid screening test of 'Fukushima Health Management Survey' announced by Fukushima Prefecture on June 5, 2017. The aggregated data as of March 31, 2017 was separately shown for the preceding examination (first examination) and the second examination, together with the results of external comparison. In comparison with the data as of December 31, 2016, the results of the preceding examination (first examination) did not change, and in the second examination of full-scale examination, 2 cases of cytodiagnosis positive that means the number of cancer or cancer-suspected patients increased (from 69 to 71). In the third round of full-scale testing and examination, 4 cases were cytodiagnosis positive, and a total of 191 cases (1 out of which was benign) were detected. According to NHK report on March 30, 2017, it was found that a 4-year old child at the time of accident was found to have leaked from the aggregate in the Prefectural Health Management Survey, even though this child received the thyroid examination of Prefectural Health Management Survey. This 4-year old thyroid cancer case was included in 2719 medical follow-up patients of the thyroid examination of Prefectural Health Management Survey. However, this was not counted as cytodiagnosis positive (or cancer suspect) or cancer confirmed case. It was clarified that there is the possibility of underestimating the number of cancer detection cases.

Human-added categories

RADIATION, THERMAL, AND OTHER ENVIRONMENTAL POLLUTANT EFFECTS ON LIVING ORGANISMS AND BIOLOGICAL MATERIALS

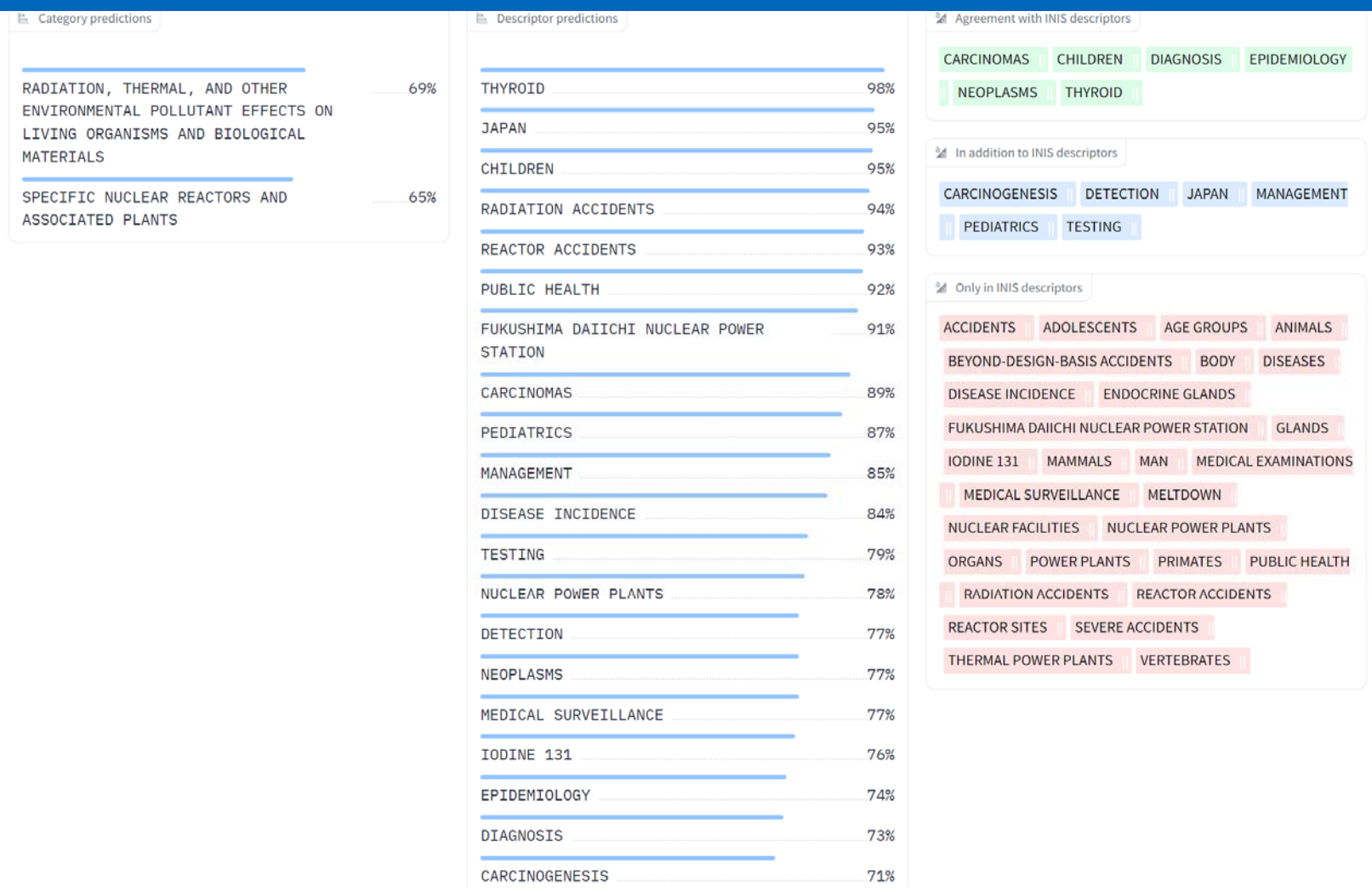
Human-added descriptors

ADOLESCENTS | CARCINOMAS | CHILDREN | DIAGNOSIS | DISEASE INCIDENCE | EPIDEMIOLOGY | FUKUSHIMA DAIICHI NUCLEAR POWER STATION | MEDICAL EXAMINATIONS | MELTDOWN | NUCLEAR POWER PLANTS | THYROID

Computer-added descriptors

ACCIDENTS | AGE GROUPS | ANIMALS | BEYOND-DESIGN-BASIS ACCIDENTS | BODY | DISEASES | ENDOCRINE GLANDS | GLANDS | MAMMALS | MAN | MEDICAL SURVEILLANCE | NEOPLASMS | NUCLEAR FACILITIES | ORGANS | POWER PLANTS | PRIMATES | REACTOR ACCIDENTS | REACTOR SITES | SEVERE ACCIDENTS | THERMAL POWER PLANTS | VERTEBRATES

NADIA in Action - Example



NADIA - Advantages

Consistent and reliable tagging – 90% is well done

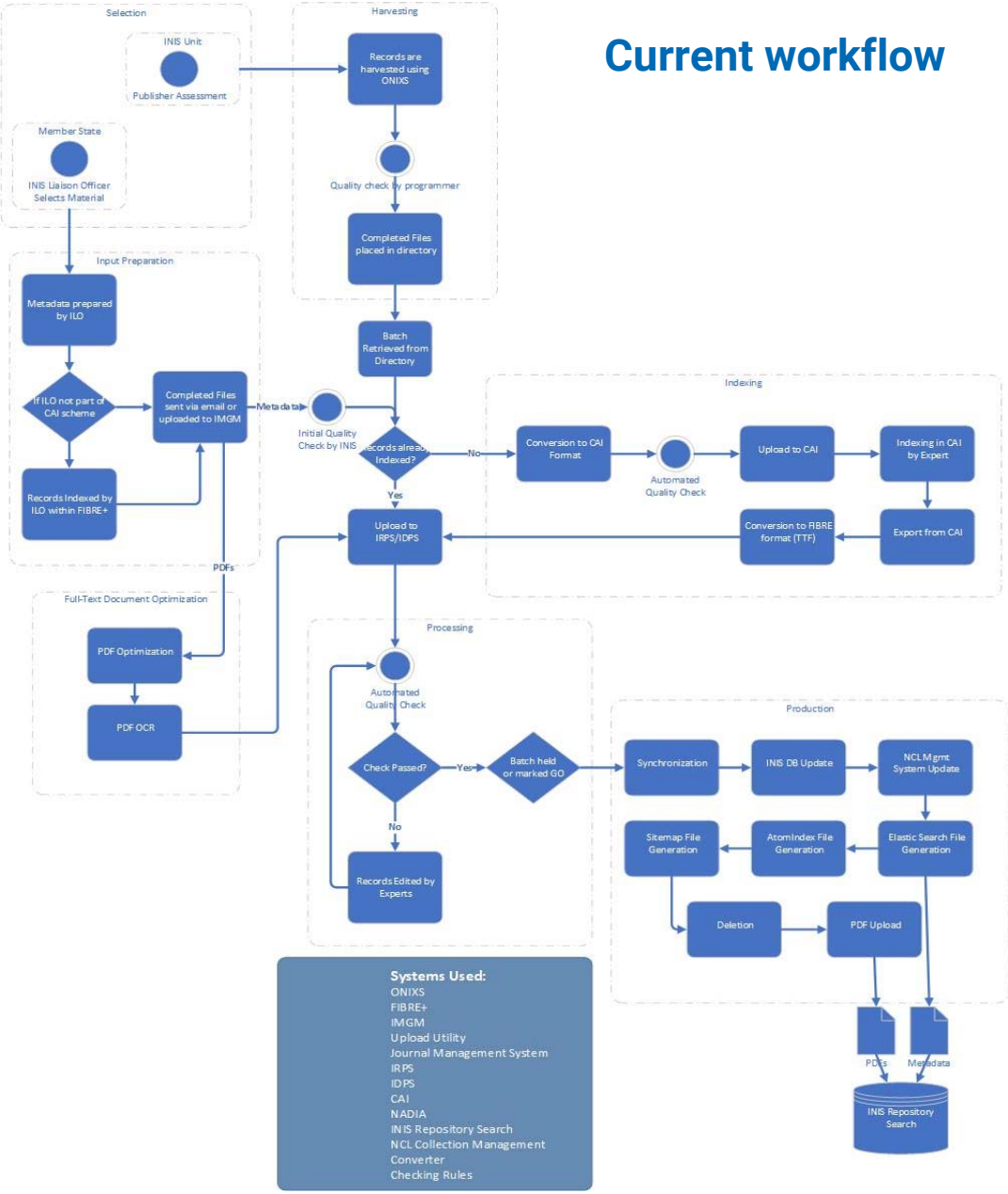
Automation frees up experts to perform other tasks

Mechanisms to detect inaccurate tagging and route those to humans (~10%)

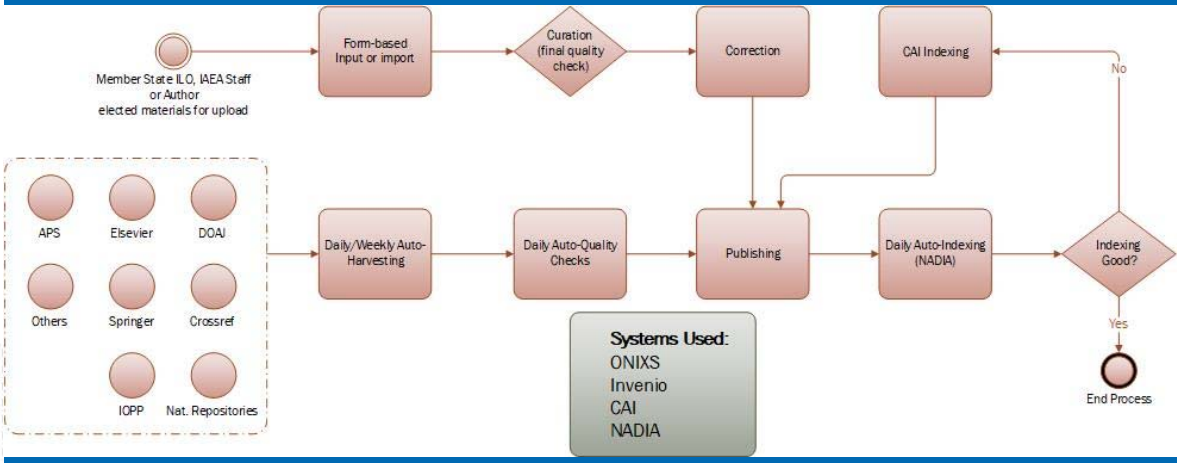
Updates to INIS Thesaurus are possible without model re-training

Runs on CPUs

Current workflow



Future workflow



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