

AIDA- Building an artificially intelligent diagnostic assistant for gastric inflammation

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Beneficial AI

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WHY?

Gastric inflammation and Gastric cancer clinical pathway

Point of no return

**Normal
mucosa**

**Superficial
leading to
chronic
gastritis**

**Atrophic
gastritis**

**Intestinal
metaplasia**

Dysplasia

Carcinoma



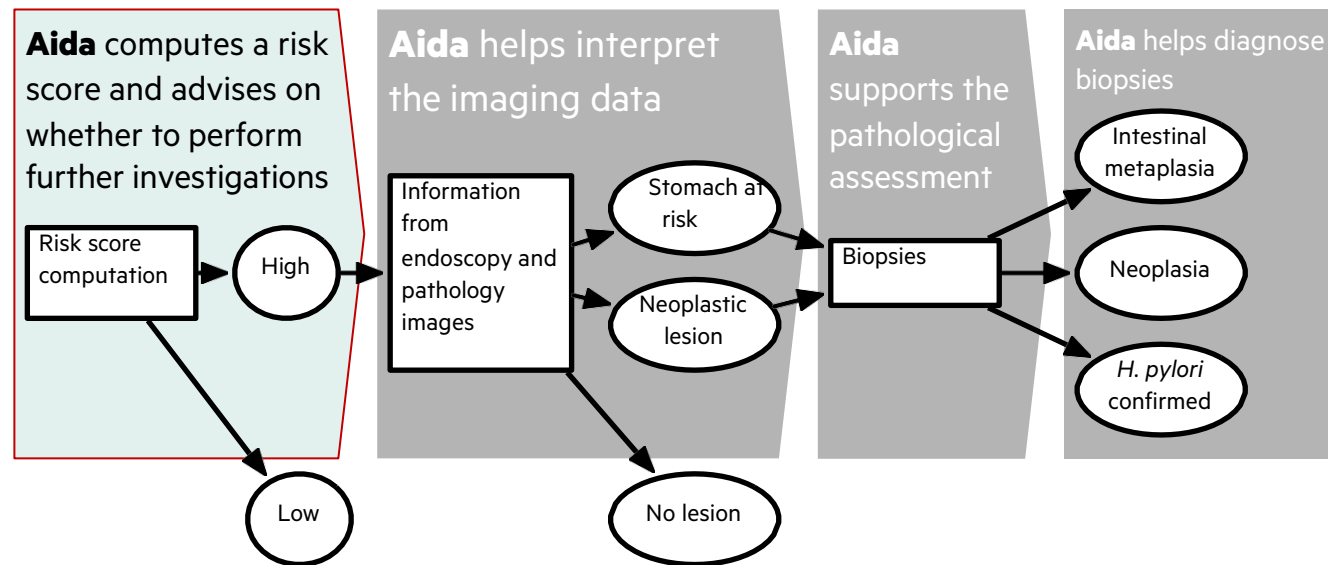
HOW IT WORKS?



An AI powered assistant to prevent diseases by helping clinicians to establish a risk profile and give a more accurate diagnosis

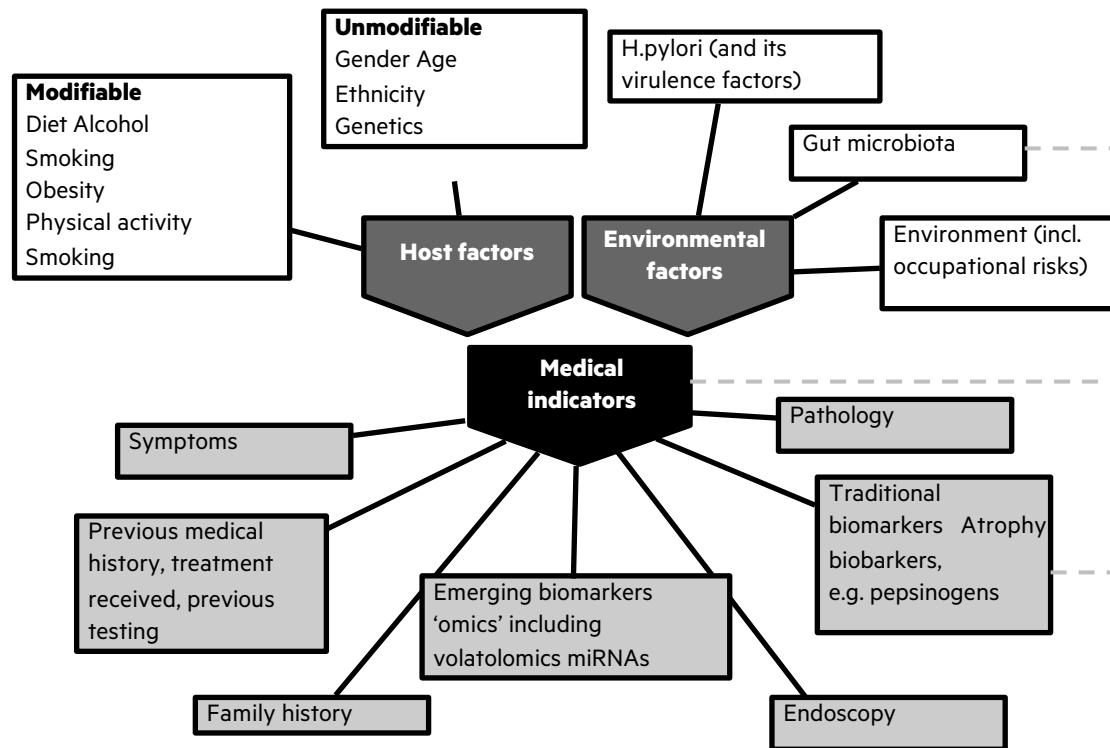
**To interpretation of patient information and
recommendation on diagnosis, additional analysis,
course of treatment**

**From multiple
data sources**



WHAT IT NEEDS?

Step 1- Data- Much data is available on the factors that enter into an individual's chance of developing gastric cancer.



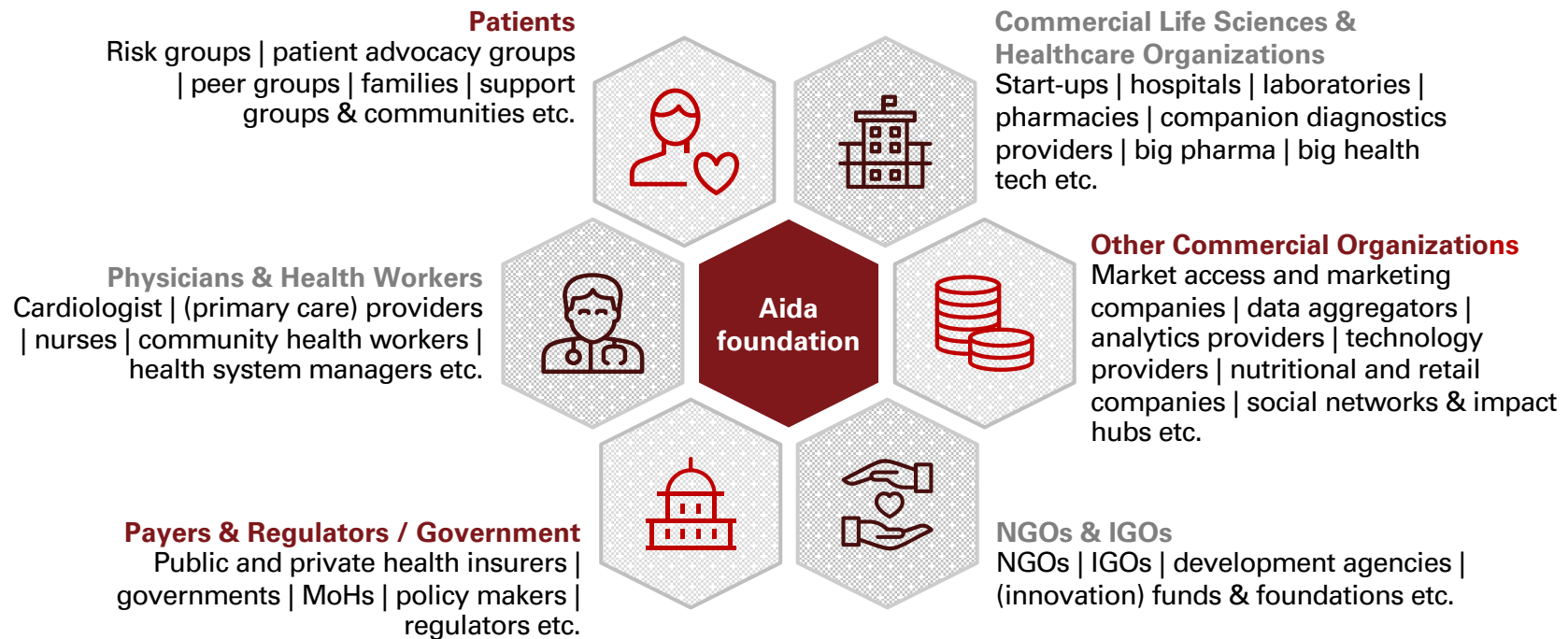
1. The datasets will come from various research institutes, medical centres, universities across different countries

2. Data and AI will help to infer medical metrics from the original datasets

3. Report and applications can be defined on top of the identified metrics



A data collaborative ecosystem allows participation from diverse organisations ensuring broad involvement and scalability of results



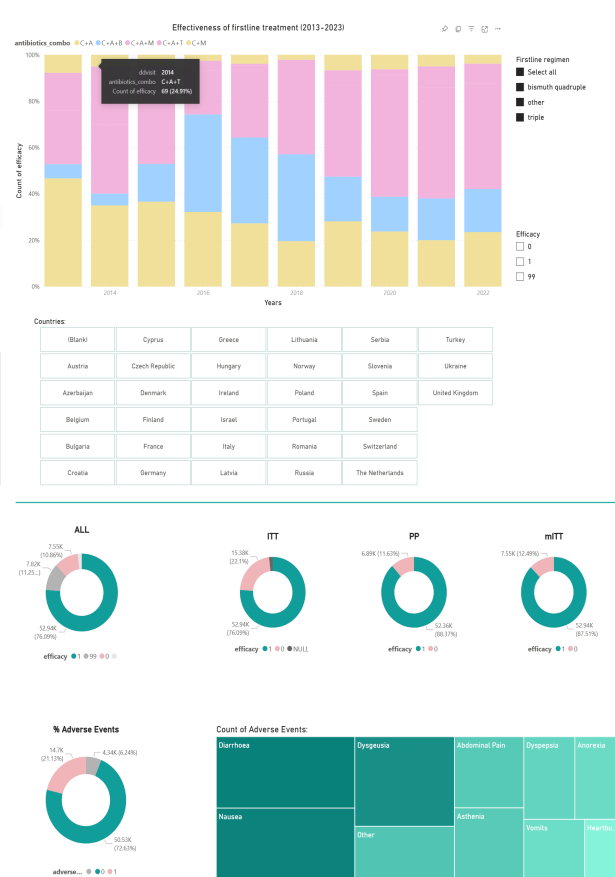
Data governance is the frameworks, processes, and practices used by an organization to manage its data assets formally

Elements of data governance

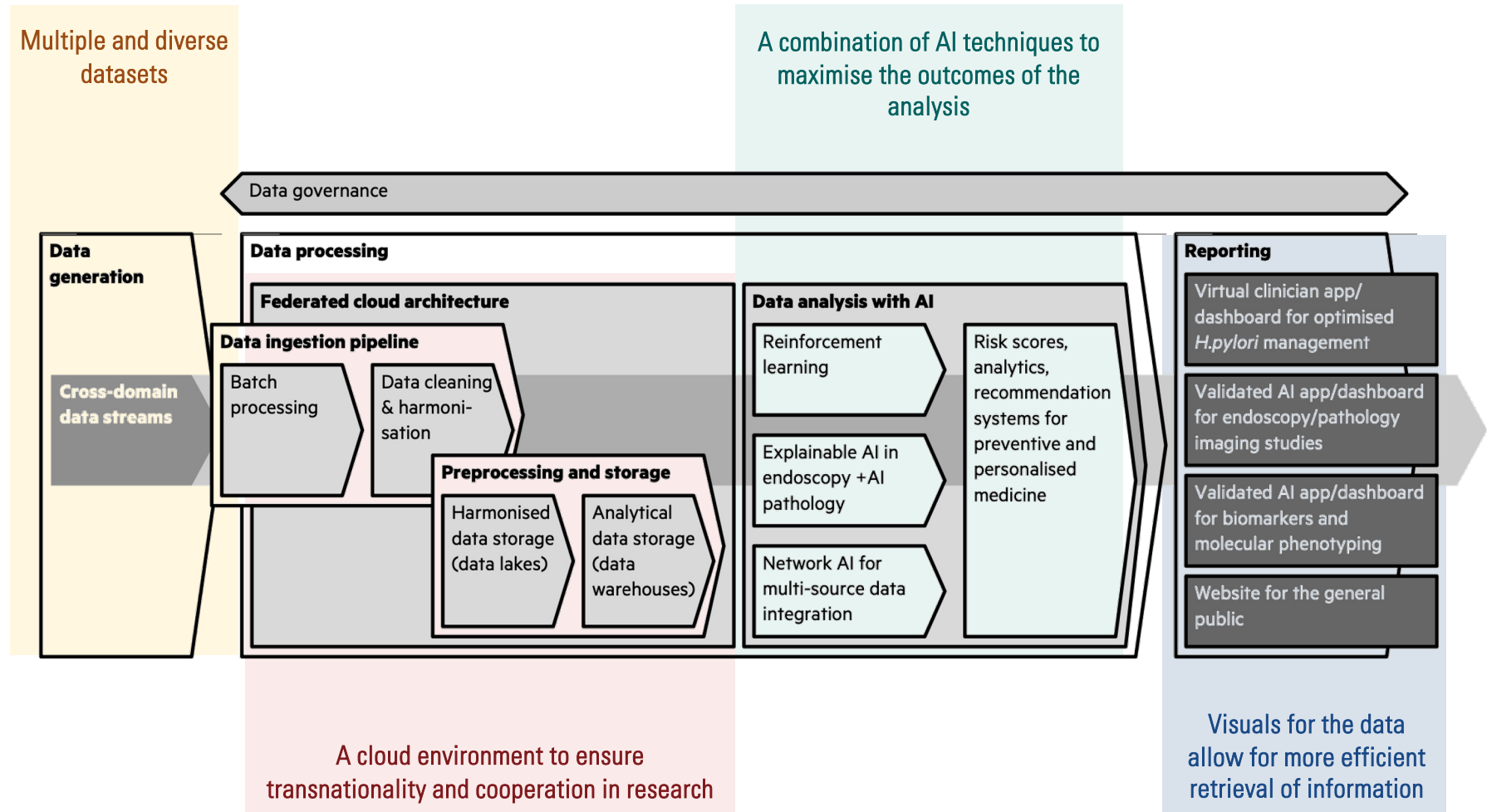
-  Research and Development
-  Trust and Transparency
-  Ethical considerations
-  Regulatory compliance
-  Patient Privacy and Data Security
- ★★★ Data quality and accuracy

Regulations to consider when drafting the data governance vary based on the regional location. In EU they include GDPR, **AI Act**, European Data Space framework.





Step 2- A platform based on a federate cloud architecture where data analysis is done with different AI techniques



Step 3- A combination of several AI techniques is used to analysed the diverse datasets and fine tune the model

Deep reinforcement learning

- Learn optimal treatment by analysing a myriad of treatment decisions
- Extract implicit knowledge from a vast amount of patient data
- Expand understanding of existing clinical protocols by autonomous exploration of treatment options

Generative Adversarial Networks (GANs) and Explainable AI

- Support clinicians in lesion detection and characterisation giving a second opinion in real time with an AI expert through deep neural networks
- Enhance quality of exams through landmark detection algorithms

Semi-supervised learning

- Train models and maintain high algorithmic performance exploiting available unannotated exams

Graph neural network

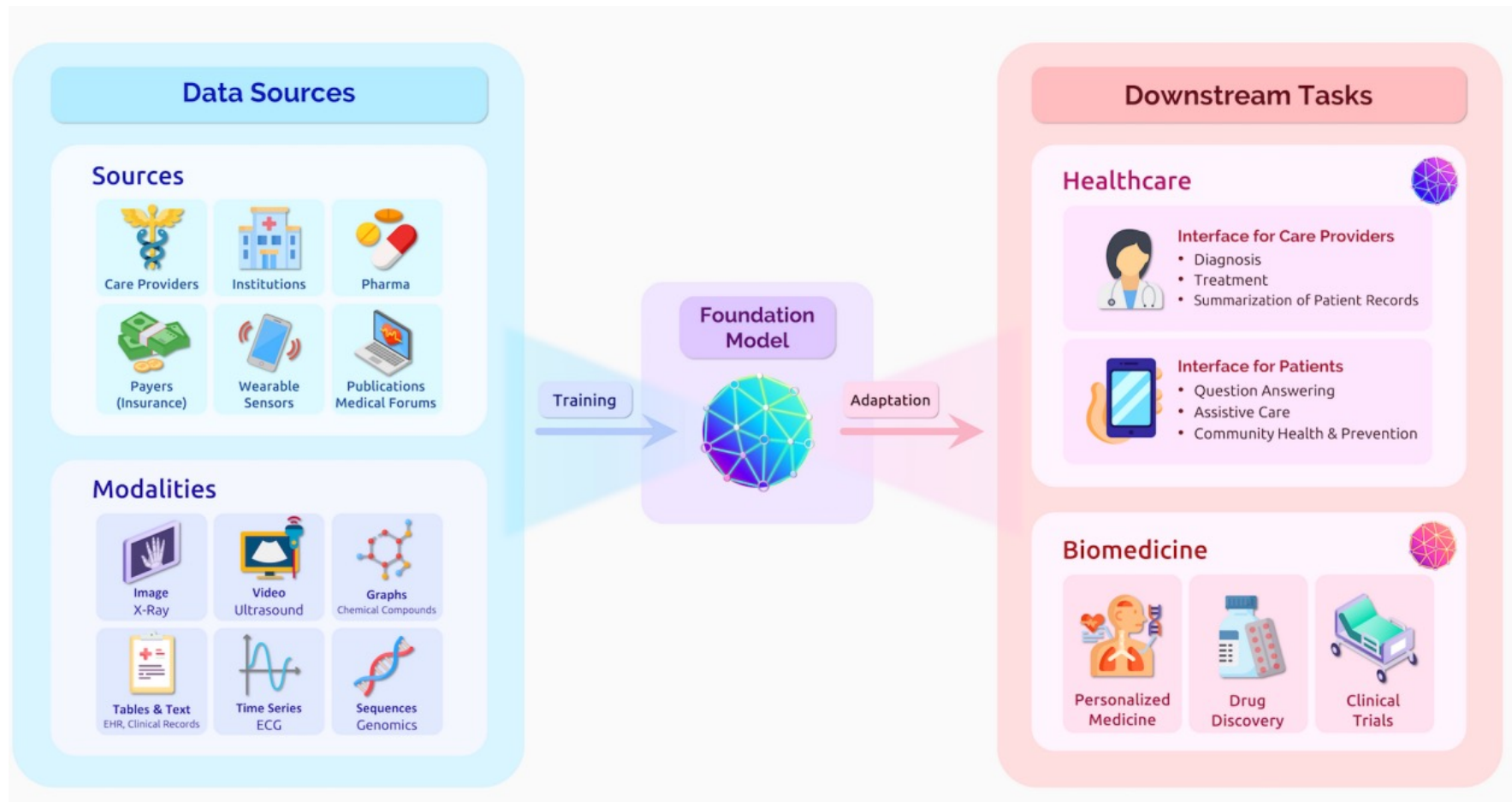
- Integrative analysis of large-scale omics data to improve patient's risk prediction and biomarker discovery

Large Language Models (LLMs)

- Analyse unstructured data



Exploring how LLMs models can offer enhanced medical research capabilities by quickly synthesizing vast amounts of medical literature, aiding in more efficient discovery and knowledge dissemination





An Artificially Intelligent
Diagnostic Assistant
for gastric inflammation

Large Language Models (LLMs),
such as the model behind ChatGPT,
enable the creation of digital
assistants in a faster and simpler
way.

Large Language Models for Digital Assistant

ChatGPT

 Examples	 Capabilities	 Limitations
"Explain quantum computing in simple terms" →	Remembers what user said earlier in the conversation	May occasionally generate incorrect information
"Got any creative ideas for a 10 year old's birthday?" →	Allows user to provide follow-up corrections	May occasionally produce harmful instructions or biased content
"How do I make an HTTP request in Javascript?" →	Trained to decline inappropriate requests	Limited knowledge of world and events after 2021

Free Research Preview. ChatGPT may produce inaccurate information about people, places, or facts. [ChatGPT May 24 Version](#)



- The AIDA chatbot is specifically designed to respond to questions about gastric disease and the AIDA project.
- It tailors its responses based on the audience.
- It leverages a long-term memory that provides comprehensive information about the AIDA project. Additionally, it has access to the AIDA website to stay updated on project news.



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AIDA Chatbot – Features

By leveraging Large Language Models (LLMs), the AIDA chatbot has inherited several powerful features:

- Conversation context
- Multilanguage support
- Text summarization

The screenshot displays a chat interface with a light gray background. On the left, there are three orange circular avatars representing the AIDA chatbot. The chat history shows the following:

- AIDA 05:57 PM**
Hello, nice to meet you! How can I help you today?
- 05:57 PM**
What is the AIDA project?
- AIDA 05:57 PM**
The AIDA project aims to develop and validate a multidisciplinary AI-powered assistant that helps clinicians diagnose precancerous inflammation, suggests personalized therapeutic strategies for medical treatment and follow-up, and makes personalized recommendations for monitoring patient health status. This innovative approach focuses on improving the diagnosis and management of gastric pathologies, such as Helicobacter pylori infection and gastric cancer.
- 05:58 PM**
Can you translate it in japanese?
- AIDA 05:58 PM**
AIDAプロジェクトは、多分野にわたるAIを活用したアシスタントを開発・検証することを目指しており、これにより医師が前がん性炎症の診断を行い、個別化された治療戦略を提案し、患者の健康状態の監視に関する個別化された勧告を行うことができます。この革新的なアプローチは、ヘリコバクターピロリ感染や胃がんなどの胃病変の診断と管理の改善に焦点を当てています。

Step 4- Compliance- highly complex environment

Technical robustness

- The cloud systems used will comply to the highest standards for security, also specific for healthcare (ISO 27001, 27018, HITRUST, EU Cloud CoC, EU EN 301 549).

MDR and future AI Act

- Preparation for MDR certification under Class 2a in order to be used as a medically certified tool in clinical practice
- Compliance with AI Act as embedded in a product

GDPR

- Management of the consent for treating healthcare data

ALTAI

- Assessment List for Trustworthy Artificial Intelligence (ALTAI), to assess, mitigate and/or avoid potential risks of AI applications.

European healthcare data space

- Defining a strong system of data governance and rules for data exchange
- Building a strong infrastructure and interoperability

Gaia -X

- In case data are monetised



The consortium

Spain	Fundación para la Investigación del Hospital Clínico de la Comunitat Valenciana, Fundación INCLIVA
UK	Imperial College London
Latvia	Latvijas Universitate
Portugal	i3S - Instituto de investigação e Inovação em Saúde da Universidade do Porto
Spain	Servicio Madrilenio de Salud + Fundación Investigación Biomédica Hospital Universitario la Princesa
Spain	Fundación Clínic per la Recerca Biomèdica + Hospital Clinic Barcelona
France	Centre Hospitalier Universitaire de Nantes + Nantes Université
Lithuania	Hospital of Lithuanian University of Health Sciences Kaunas Clinics
Portugal	Instituto Portugues de Oncologia do Porto Francisco
Netherlands	Erasmus Medical Center Rotterdam
Belgium	Stratejai
Belgium	Digestive Cancers Europe



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