Innovative Approaches to Extreme Data Challenges: DataNexus Cluster

The Project Group

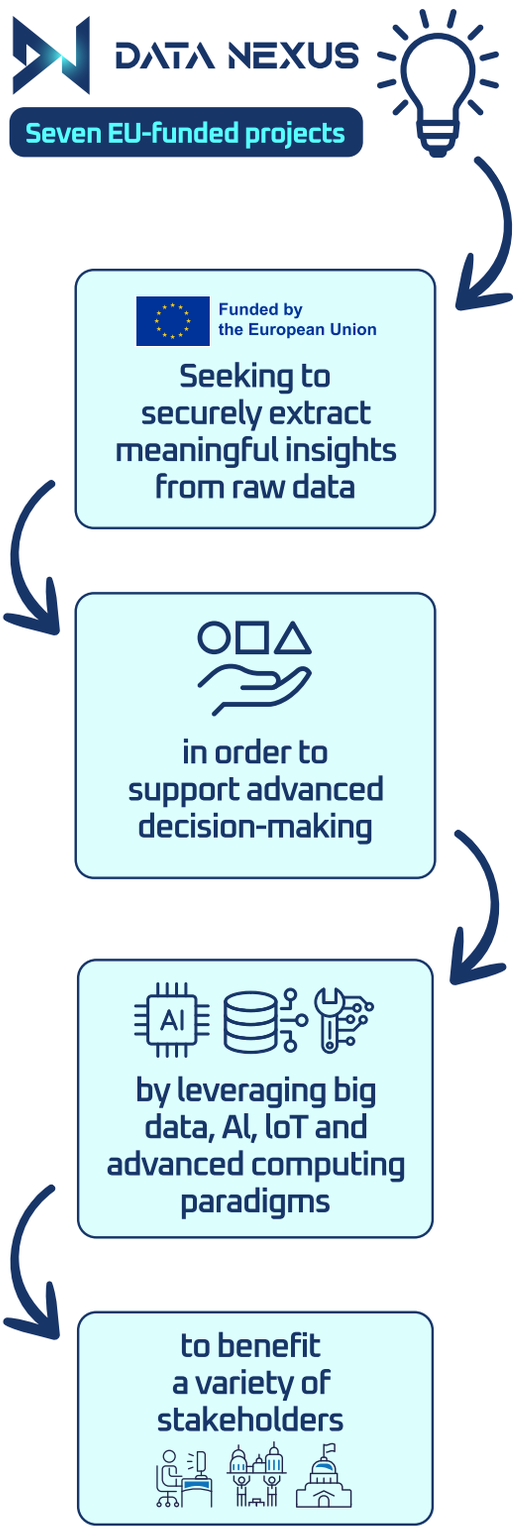
Seven EU-funded projects make up the DataNexus Cluster: Graph-Massivizer, EXTRACT, NEARDATA, EXA4MIND, EMERALDS, SYCLOPS, and EFRA. They seek to answer the Horizon Europe call for "Extreme data mining, aggregation and analytics technologies and solutions ". DataNexus projects develop solutions for managing extreme data- characterised by volume, speed, and complexity- to securely extract meaningful insights from raw data. These insights help support advanced decision-making, leveraging big data, artificial intelligence (AI), Internet of Things (IoTs) and advanced computing paradigms.

Tackling Extreme Data Challenges

Huge amounts of data are generated daily, and are expected to keep increasing. While this data can enhance decision-making, current technologies cannot adequately handle extreme data. Capturing, analysing, and visualising vast, diverse datasets promptly and effectively remains a significant challenge. DataNexus projects aim to overcome this by developing next-generation computing and data technologies, promoting trustworthy solutions that empower end-users.

Integrating Cutting-Edge Technologies

The seven projects in the DataNexus cluster combine innovative technologies and tools for data mining, analysis and visualisation to create robust frameworks that can manage and interpret data more effectively. AI, IoT, and advanced computing paradigms such as high-performance computing (HPC) and edge/fog/cloud computing converge to work seamlessly across the compute continuum, enabling real-time processing and analysis.



Researchers & Academia

Innovation Platforms & ICT Operators/ Service Providers

Governments & Emergency Services, Health Services, Manufacturing

The **HRB - Horizon Result Booster** is an initiative funded European Commission, Directorate General for Research and Innovation, Unit J5, Common Service for Horizon 2020 Information and Data.

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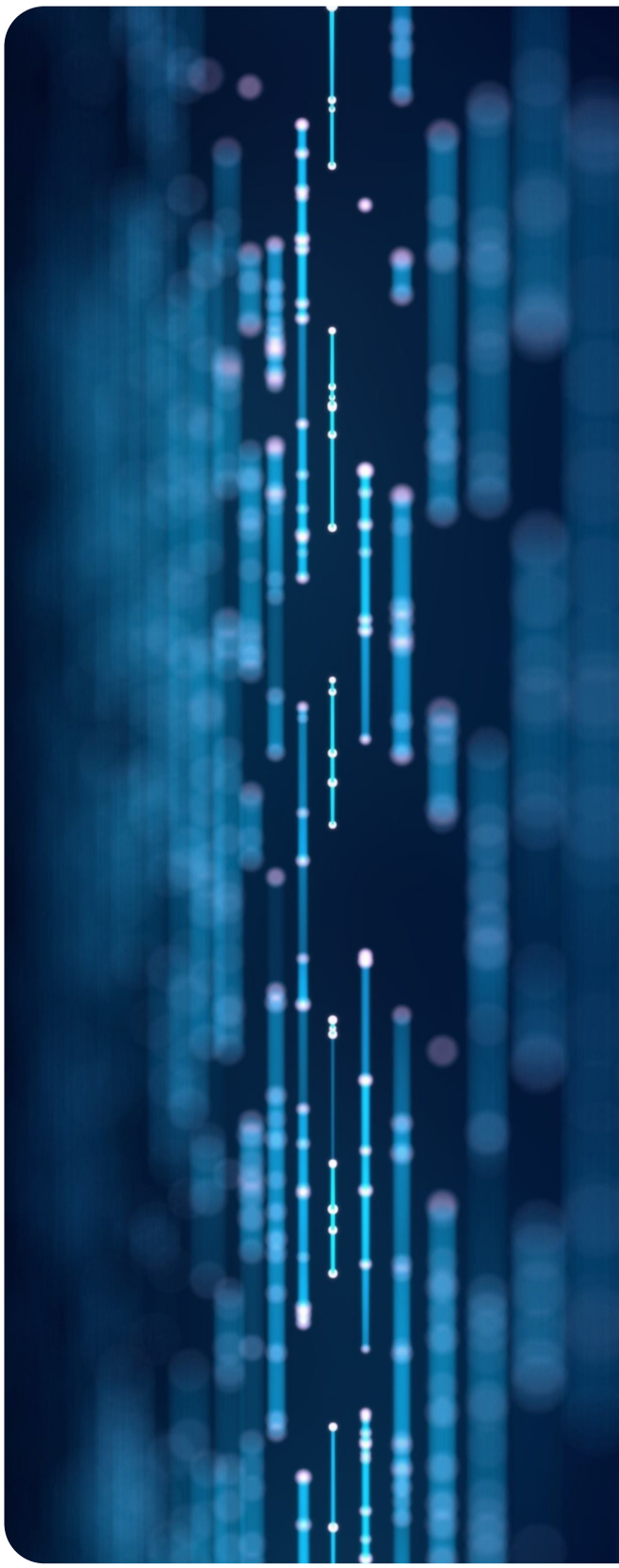
Achievements and Innovations

The projects are vastly improving data processing, analysis, and visualisation capabilities, enhancing the accuracy, speed, and usefulness of data for applications and users. These advancements will benefit various fields, including crisis management, healthcare, mobility, industry, environmental protection, and food security. Emphasising user-friendly, human-centric designs ensures the tools are practical and address relevant human factors.



DataNexus Cluster

Graph-Massivizer – Researches and develops a high-performance, scalable, and sustainable platform for information processing and reasoning based on the massive graph representation of extreme data. **graph-massivizer.eu**

EXTRACT – Delivering a data-driven open-source platform integrating cloud, edge and HPC technologies for trustworthy, accurate, fair and green data mining workflows for high-quality actionable knowledge. **extract-project.eu**

NEARDATA – Create an extreme data infrastructure mediating data flows between Object Storage and Data Analytics platforms across the Compute Continuum. **neardata.eu**

EXA4MIND – Building a platform for extreme data that enables advanced data analytics on supercomputers and automated data management with support for integration by design with EOSC and European data spaces. **exa4mind.eu**

EMERALDS – Design, develop and create an urban data-oriented Mobility Analytics as a Service (MAaaS) toolset to exploit the untapped potential of extreme urban mobility data and as a result, improve urban mobility decision making. **emeralds-horizon.eu**

SYCLOPS – Advancing AI/data mining for extremely large and diverse data for Europe and beyond, by democratizing its acceleration through open standards and a healthy, competitive, and innovating ecosystem. **www.syclops.org**

EFRA – Develop the first analytics-enabled, secure-by-design, green data space for AI-enabled food risk prevention. Our mission is to support EU's global leadership in the digital-led industry transition from reaction to food risk prevention. **efraproject.eu**

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