Artificial Intelligence in the Operational Management of Large-scale IT Systems
Research and technology monitoring report
Key Findings
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eu**LISA**
European Union Agency for the Operational Management of Large-Scale
IT Systems in the Area of Freedom, Security and Justice (eu-LISA)

Why Artificial Intelligence?

Over the last few years the debate around AI in the EU has picked up pace. Widespread adoption of AI across the economy and society, including the public sector, brings along a wide range of benefits, but also challenges and risks. Therefore, the EU has initiated the development of a European approach to AI. It is in this context that eu-LISA has been developing its approach to AI and the specific role the Agency can play in advancing the adoption of AI in the EU. This research and technology monitoring report focuses on applications of AI where ethical and legal considerations are less relevant; namely on those applications where the implementation of solutions based on AI or machine learning (ML) technologies can have an immediate effect on the performance of eu-LISA as an IT service provider.

Domains of possible application

eu-LISA operates large-scale IT systems with strict requirements for technical solutions in relation to security, availability and business continuity, hence the application of new technologies at scale requires careful evaluation. AI and ML technologies can be successfully deployed in a wide range of applications, including:

- **IT infrastructure and service management**. Application performance monitoring, IT infrastructure and network monitoring as well as diagnostics, IT event analytics and IT service desk operations are the areas where deploying AI can improve performance and, at the same time, significantly reduce workload.
- **Conversational agents, virtual assistants and chatbots** are another important class of AI tools in the context of eu-LISA's core business. Chatbots can be effectively deployed in a number of areas, including user support and training (EES and ETIAS), or acting as the first contact point of the IT service desk.
- **Protection of IT systems from cyber attacks.** On the most basic level, AI and ML can be effectively deployed in automating cyber threat intelligence. An advanced application of AI could be in network analysis and intrusion detection. On an even higher level, AI could be used in the creation of autonomous cyber security systems capable of threat detection and response.
- **Optimising energy performance of data centre infrastructures.** Modern data centre infrastructure consumes significant amounts of energy. Deploying AI and ML can help optimise the use of both computational resources and cooling infrastructure, thus potentially improving performance and reducing operational costs.

Technology outlook and conclusions

Although AI has a great transformative potential, it does not come without challenges and risks. When considering using AI or ML, organisations should take into account the following factors: 1) Development of AI systems requires **large volumes of data**, and a **robust approach to data governance and curation**; 2) Development and implementation of AI systems needs **substantial computational resources**, hence, a **collaborative approach to shared computational infrastructure** should be considered, especially in applications requiring high levels of security, where conventional cloud solutions cannot be used; 3) **AI systems are dynamic, necessitating regular updates in order to remain accurate**. Therefore, resource estimates need to be done taking into account requirements for the **long-term maintenance of deployed solutions**. This has direct implications on the procurement of such systems, as well as the potential need for one's own staff to support the continuous maintenance of such systems; 4) It is important to consider where AI can have a **significant effect without substantial barriers to its implementation**. Such 'low hanging fruits' can help legitimise AI within the organisation and gain management support. They are also a good way to get the staff of the organisation acquainted with AI systems, which will help to gradually develop and deploy more sophisticated systems should they be deemed necessary.

This report is the first step for eu-LISA in its exploration of the full potential of AI with regard to enhancing the performance of the Agency. We will continue monitoring developments in AI and look deeper into some of the use cases as part of our future research and technology monitoring activities.

The report is publicly available on eu-LISA's website https://eulisa.europa.eu
Scan the QR code to read the full report!