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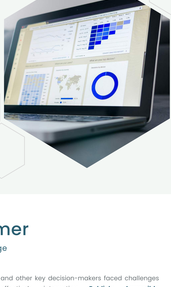


# Case Study

International Security Assessment and Analytics Capabilities for Army Geospatial Center

## The Customer

### And Their Challenge

**The Army Geospatial Center (AGC)** provides geospatial information, tools, and support to the Army and other Department of Defense (DoD) components, as well as federal agencies and international partners. They play a crucial role in collecting, analyzing, and disseminating geospatial intelligence to support military operations, mission planning, and decision-making.

AGC and other key decision-makers faced challenges in effectively integrating **Publicly Accessible Information (PAI), Artificial Intelligence (AI) and Natural Language Processing (NLP)** with cognitive technologies to analyze threats and regional security cooperation environments.


Their legacy technologies lacked the capability to efficiently ingest and interpret Publicly Accessible Information (PAI) as Big Data. Specifically, US Military and Special Operation Forces (SOF) planners and decision makers lacked a tool to evaluate the critical characteristics of adversarial activities using open-source information. The ability to compile and analyze available information, thereby bolstering operational planning to counter such activities, was deemed indispensable for strategic planning.


## The Solution

### ISAAC-ISR Prototype

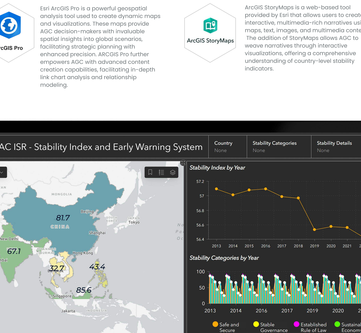
In response to the pressing challenges faced by the **Army Geospatial Center (AGC)**, i3Solutions embarked on a transformative endeavor to develop the International Security Assessment and Analytics Capability – Intelligence, Surveillance & Reconnaissance (ISAAC-ISR) prototype. This pioneering solution represents a paradigm shift in AGC's approach to intelligence analysis, offering a comprehensive framework to tackle the complexities of modern warfare and global security. ISAAC provides near real time ISR to detect, observe, analyze, and assess the civil environment, which is key to bringing stability to partnered nations while also exploiting weaknesses in competitors and adversaries.

**ISAAC-ISR** is a holistic system designed to address the multifaceted challenges confronting AGC. At its core, ISAAC-ISR aims to bridge the gap between the overwhelming volume of Publicly Accessible Information (PAI) and actionable intelligence. By leveraging cutting-edge technologies such as Machine Learning (ML), Natural Language Processing (NLP), geospatial analysis, and statistical modeling, i3Solutions crafted a solution that empowers AGC to extract valuable insights from large amounts of disparate data.

Employing state-of-the-art data collection, feature extraction, and visualization solutions, i3solutions developed and trained over 20 machine learning models. These models are designed to gather and organize information sourced from hundreds of thousands of news articles, files, documents, and both public and private databases. Various NLP tools then perform sentiment analysis, language translation and frequency analysis needed to calculate the stability index of various countries.

**ISAAC uses a diverse array of outputs to enhance decision support, encompassing geospatial displays, timelines, network graphs, question and answer search, and 'baseball cards'.** These 'baseball cards' integrate multiple data sources into a unified display, facilitating more comprehensive analysis and informed decision making.

The significance of ISAAC-ISR extends beyond mere data processing; it represents a strategic advantage for AGC in navigating the complexities of modern warfare. Real-time intelligence, Surveillance & Reconnaissance (ISR) capabilities facilitate rapid responses to emerging threats, enhancing situational awareness and operational effectiveness. Predictive analysis enabled by Artificial Intelligence (AI) enables AGC to anticipate future scenarios, facilitating proactive strategy formulation and threat mitigation.




## Technologies

### Used in the Solution

Generative AI and Large Language Models (LLMs) aid in deciphering textual data from diverse sources. Generative AI simulates potential threat scenarios, providing AGC with foresight into future challenges. LLM, on the other hand, delves into the depths of language nuances, extracting meaningful insights from the vast textual corpus. This deep contextual analysis, coupled with machine learning and Natural Language Processing (NLP), empowers AGC to uncover hidden patterns and trends within a vast amount of data.

Machine Learning (ML) focuses on enabling systems to learn from data and make predictions or decisions without being explicitly programmed. i3solutions created and trained ML models to collect and collate information from hundreds of thousands of sources, facilitating the extraction of valuable insights and patterns from vast datasets. NLP encompasses a variety of tasks, including text classification, sentiment analysis, machine translation, named entity recognition, and question-answering to create country stability indexes for AGC.

Retrieval Augmented Generation (RAG) sifts through the vast expanse of PAI, retrieving relevant information and transforming it into coherent, analytical insights. This ensures that ISAAC-ISR's analysis remains anchored in the most pertinent data, facilitating informed decision-making for AGC stakeholders.

MongoDB stores data in flexible, schema-less documents, allowing for easy storage and retrieval of complex data structures. Within ISAAC, it serves as the central repository for the overall data catalogue and stores tabular data formats, including CSV files.

ArcGIS Knowledge integrates graph and spatial analytics to support data discovery, collaborative investigations, link analysis, and information sharing. By dissecting information and establishing intricate relationships between entities, ArcGIS Knowledge enables AGC to extract complex relationships from seemingly disparate data sources. i3solutions accomplished the first ever deployment of ArcGIS Knowledge within the Department of Defense (DoD), marking a significant milestone in leveraging GIS capabilities within the organization.

Neo4j is a highly scalable and native graph database management system, designed to store, retrieve, and manage graph-based data. Combined with ArcGIS Knowledge, Neo4j empowers AGC to unlock deeper insights from their spatial data by leveraging built in tools and libraries for data visualization and analytics.

Esri ArcGIS Pro is a powerful geospatial analysis tool used to create dynamic maps and visualizations. These maps provide AGC decision-makers with invaluable spatial insights into global scenarios, facilitating strategic planning with enhanced precision. ARCGIS Pro further empowers AGC with advanced content creation capabilities, facilitating in-depth link chart analysis and relationship modeling.

ArcGIS StoryMaps is a web-based tool provided by Esri that allows users to create interactive, multimedia-rich narratives using maps, text, images, and multimedia content. The addition of StoryMaps allows AGC to weave narratives through interactive visualizations, offering a comprehensive understanding of country-level stability indicators.




## Measurable Benefits and Business Impact

### Enhanced Strategic Awareness

By enhancing assessment capabilities, ISAAC gives AGC a clearer understanding of the dynamics, capabilities, and intentions of rival Great Powers, enabling better-informed strategic decisions. This heightened clarity allows the AGC to anticipate potential challenges, capitalize on emerging opportunities, and effectively shape its policies and responses in the dynamic arena of global geopolitics.

### Advanced Analytic Capabilities

ISAAC employs advanced analytical tools, including artificial intelligence and machine learning algorithms, to process and analyse complex data sets rapidly. These tools enable AGC analysts to identify patterns, correlations, and emerging trends that might not be apparent through traditional methods.

### Innovative Geospatial Analysis

i3Solutions' intervention at AGC led to significant advancements in geospatial analysis, facilitated by the utilization of Esri's sophisticated tools. This enables AGC to visualize and comprehend complex data sets, providing a clearer understanding of spatial relationships and patterns. By laying the groundwork for informed decision-making, AGC can strategically leverage geographical insights to optimize various aspects of their operations, from resource allocation to risk assessment.

### Comprehensive Data Integration

ISAAC aggregates and synthesizes vast amounts of data from various sources through the utilization of advanced LLM. This enables AGC to transform vast amounts of raw textual data into actionable intelligence, extracting valuable insights and trends that were previously hidden. By enhancing data interpretation processes, AGC can make more informed decisions and respond more effectively to evolving situations, ultimately improving operational efficiency and agility.

### Real-time Monitoring

ISAAC provides real-time monitoring of key developments and events related to Great Power Competition, enabling AGC to react swiftly to emerging threats or opportunities. This proactive stance ensures that AGC remains agile and adaptive in its decision-making process.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