Adventures in the Art of Enterprise Artificial Intelligence Transformation[*]

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Abstract. Organizations are looking for ways to implement Artificial Intelligence (AI) in a scalable, sustainable, cost-effective way without retooling. The MITRE Embedded Intelligence Framework represents our experience and lessons learned from a three-year, enterprise AI adventure. It provides a tested, end-to-end approach to implementing a semantic transformation ecosystem that infuses AI into enterprise systems without disrupting current processes, or practices. We will demonstrate how we combine commercial AI cloud services with best of breed open source tools and Semantic Web technologies to manage the AI lifecycle, share AI artifacts and deliver AI services that can converse with us in natural language, interpret our needs, and provide quick answers our questions. Examples include AI-driven search, a publication recommender, an intelligent chatbot, and a voice-enabled virtual assistant with robotic process automation.

Keywords: Knowledge Graphs, SHACL, NLP, Machine Learning, RDF, Enterprise AI, SKOS, RDFS.

1 Description

AI-driven applications can streamline customer service, increase staff productivity, and improve customer satisfaction. However, a major barrier to adoption of AI in the enterprise is the lack of holistic approaches and best practices for implementing it in a scalable, sustainable, and cost-effective way. Organizations need new, non-intrusive AI transformation approaches that maximize flexibility, reuse, and automation while fitting into the context of current operations and budget constraints.

The MITRE Embedded Intelligence Framework, depicted in Figure 1, represents our experience and lessons learned from a three-year, enterprise AI implementation adventure. We will describe how we combine commercial AI cloud services with best of breed open source tools and Semantic Web technologies to extract insights from unstructured text, manage the AI lifecycle, share AI artifacts and deliver AI services that converse with us in natural language, interpret our needs, and provide quick an-

swers our questions. Examples of AI-embedded applications include AI-driven search, a publication recommender, an intelligent chatbot, and a voice-enabled virtual assistant with robotic process automation.
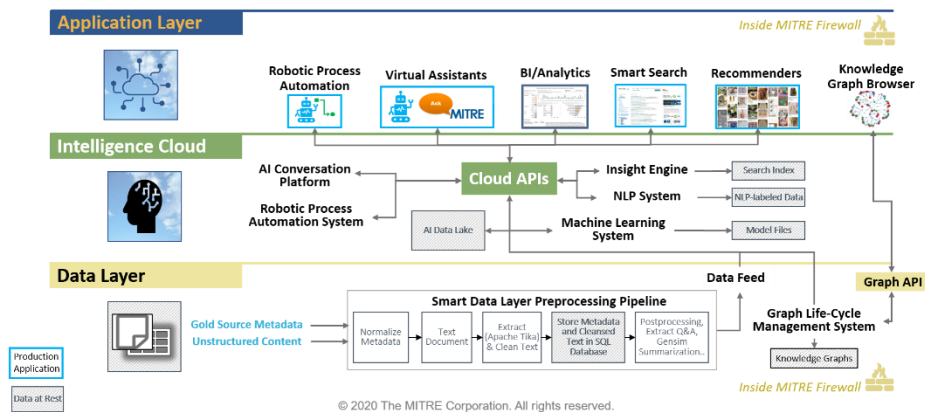
MITRE Embedded Intelligence Framework

Fig. 1. MITRE Embedded Intelligence Framework, a semantic transformation ecosystem for embedding artificial intelligence in enterprise applications.

2   Why Semantic Web Technologies?

Semantic Web technologies are unique in their ability to represent rich relations in powerful, easily extensible W3C standards, like the Simple Knowledge Organization System (SKOS) [1], Resource Description Framework (RDF) [2] and RDF Schema (RDFS) [3]. We use these technologies to link data that is extracted from unstructured MITRE content and labeled using machine learning and natural language processing. By capturing relations between entities like organizations, people, topic areas, and locations, this highly interconnected graph provides a cross-sectional view of the enterprise uncovering new insights not previously possible without locating and reading the content from multiple sources. Encoding our graphs using W3C standards also makes them compatible with a large cache of shared vocabularies, data sets, and tools that can further enrich potential use cases and facilitate reuse.

References

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