INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

MagicDraw API for MBSA&E

TECHNOLOGY NUMBER: 2025-425

OVERVIEW

Seamless interoperability between MagicDraw models and JSON data for systems engineering

- Enables automated model creation, updates, and exporting between MagicDraw and external tools
- Model-driven engineering, multidisciplinary analysis, toolchain integration, collaborative systems architecture

BACKGROUND

Model-based systems engineering tools like MagicDraw are critical for designing complex systems, but historically, data exchange between these tools and external software has been cumbersome. Traditionally, conversion required manual intervention or the use of proprietary formats, resulting in inefficiencies, errors, and lost productivity. Previous solutions often lacked generality, focusing on either import or export—not both—and provided limited support for updating existing models dynamically. With increasing demand for multidisciplinary analysis and seamless toolchain integration, these shortcomings have hampered efforts to streamline workflows and ensure consistent data sharing across engineering domains. As collaborative and iterative design becomes the norm, there is a strong need for a transparent, automated method to synchronize and translate information between MagicDraw and universally understood formats like JSON, which supports interoperability with a wide range of modern analysis and visualization tools.

Technology ID

2025-425

Category

Software

MOSS - Michigan Open Source Support

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INNOVATION

This invention introduces a robust API that bridges MagicDraw (Magic System of Systems Architect) with JSON, facilitating automated model exchange and synchronization. The API allows users to create new MagicDraw models from structured JSON files, update existing models with revised data, and export MagicDraw architectures as JSON for consumption by other analytical tools. Technically, the API abstracts translation and mapping between MagicDraw's proprietary model structure and the widely used JSON format, supporting both unidirectional and bidirectional data flows. This innovation dramatically simplifies multidisciplinary workflows, enabling engineering teams to integrate MagicDraw seamlessly into broader toolchains, automate repetitive tasks, and maintain data integrity across platforms. Real-world applications include streamlined systems design, rapid scenario prototyping, agile requirements management, and enhanced multidisciplinary collaboration in aerospace, automotive, and defense industries.

ADDITIONAL INFORMATION

PROJECT LINKS:

DEPARTMENT/LAB:

- Gökçin Çınar, Aerospace Engineering

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