National Aeronautics and Space Administration

Multi-User Investigation Organizer

Data storage, access and visualization for accident investigations

This invention is available for licensing out of NASA's space program to benefit U.S. industry.

In many organizations, accident and incident investigations are performed without the benefit of standardized tools to assist investigators and enforce established policies and procedures. Tools that can improve the effectiveness and efficiency of investigations, as well as the quality of their results, are not only desirable but vital. InvestigationOrganizer (IO) fills this need and has already demonstrated its usefulness and significance in real, complex investigations such as the NASA Space Shuttle Columbia accident and the Comet Nucleus Tour (CONTOUR) mishap. IO is a web based collaborative information system that integrates the functionality of a database, a document repository, a semantic hypermedia browser, and a rule based inference system with specialized modeling and visualization functionality to support accident investigation teams. This system allows investigators to make explicit, shared, and meaningful links among evidence, casual models, findings, and recommendations. The key objective of this technology is to enable distributed teams to better organize and analyze investigation evidence, and integrate and visualize the evidence within the context of various types of graphically-depicted analytic mishap models.

BENEFITS

- **Tailored information storage and retrieval framework for mishap investigations**
- **Simultaneous evidence gathering at multiple, geographically distributed sites**
- **Time critical data collection, searching, and analysis**
- **Graphical Interface supports easy navigation, visualization**

technology opportunity

Multi-User Investigation Organizer: Technology Detail

InvestigationOrganizer (IO) features a storage and access component underpinned by a customizable ontology. The ontology encodes a vocabulary that defines investigation concepts, properties, and relationships. Ontology concepts include people, places, events, causes, systems, and a range of information products relevant to accident investigations. The ontology also describes important properties of each concept and details the potential relationships among concepts. Users can set properties of instantiated concepts and can associate a relevant file with an instance. Users can also establish links between concept instances based on the relationships defined in the ontology, and the items can be viewed within a hypermedia-style ontology browser, using the established links to navigate through the space of interrelated items. In addition to providing repository functionality, users can create and view overarching analysis models that specify causal factors or hypothesized event sequences leading up to the mishap. The causal models are linked to repository items that provide evidence to support or refute the hypothesized causes. The models can be viewed with linear, hierarchical, and network diagrams displayed by the user interface. The Investigation Organizer system was built as a customized application of the NASA Organizer semantic hypermedia system.

APPLICATIONS

- **Agencies & businesses handling engineering investigations**
- **Criminal, security, andaccident related investigations**
- **Aircraft manufacturers, operators and safety investigations**

Patents

This technology has been patented (U.S. Patent 7,590,606).
Reference: ARC-15073-1.

Licensing and Partnering Opportunities

NASA's Technology Transfer Program seeks to transfer this technology out of NASA's space program to benefit U.S. industry. NASA invites companies to inquire about licensing possibilities for this technology for commercial applications.

Learn More
For more information on this technology, and to discuss licensing and partnering opportunities, please contact:
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