Funding Opportunity Announcement No. DE-FOA-0003446 HARMONY: Human-Centric Analytics for Resilient & Modernized POwer sYstems Texas A&M University and SRC Digital Insurance Services

Title:	Expanding the XBRL Taxonomy for Compliance with DOGE Section Four
Topic Area:	Risk Analytics
Summary:	Funding request is for expanding the XBRL taxonomy to include four specific data sets which enable a digital ecosystem that promotes and supports the development of innovations for next generation infrastructure, based on probabilistic risk analysis and metrics within an integrated framework of open standards; and of basic, applied, & actionable data, information, & knowledge.
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Team Member Organizations:	Texas A&M University, College of Architecture SRC Digital Insurance Services
Participant Pool:	Extensive group of entities, trade associations plus technical subject matter experts will be engaged and will provide letters of engagement and support for the formal March submission.
Project Location:	Texas A&M University, College Station, TX 77843, and Various trade association events
Confidentiality:	None
Funding Request:	\$1,250,000
Cost Share:	NA
Project Period:	6 Months

<u>Overview</u>

Funding is sought for expanding the federally recognized XBRL taxonomy to support a public/private digital ecosystem that enables next generation infrastructure by incorporating the following four data elements into the XBRL taxonomy: (1) "Applicant Qualification Profile"; (2) "Surety Bond"; (3) "Agreement"; & (4) "Application for Payment".

Those four key data sets in XBRL will accelerate implementation of the emerging digital ecosystem that aligns two federal initiatives and complies with DOGE section four that mandates data interoperability between agencies: (1) the <u>DOE Orange Button</u>; and (2) the <u>Advanced Digital Construction Management Systems</u> (ADCMS).

Make Infrastructure Great Again

The individual data elements in the XBRL taxonomy by themselves are just data crumbs.

This funding request is for more data crumbs that when taken together create a powerful foundation for next generation infrastructure enabled by applied and actionable data.

The nation's infrastructure is undergoing a seismic shift, and a collaborative approach is required from us all.

The nation's infrastructure is decades old with processes that are also decades old that need to be modernized.

The built environment in its early years represented the greatest infrastructure the world has ever seen.

Next generation-built environment will rely on data, data interoperability and require data standards.

Next generation platforms will innovate new risk analytical tools and enable new products and services for predictive analytics that better manage risk.

There is a transformational shift from a disaggregated paper based analog history for the built environment - to a future digital ecosystem that enables data interoperability, empowers AI that will result in significant operational gains from multiple innovations.

The executive order that establishes The *Department of Government Efficiency* (DOGE) section #4 calls for "*inter-operability between agency networks and systems, ensure data integrity, and facilitate responsible data collection and synchronization*".

Expanding the XBRL taxonomy to enable next generation infrastructure will help *Make Infrastructure Great Again*.

<u>Background</u>

The concept of "*actionable information*" has been a recurring theme in numerous studies, engagements, and discussions across various market sectors, as well as among trade associations focused on building next-generation infrastructure, including the nation's energy grid.

A cohesive strategy for achieving actionable information cannot emerge from isolated research alone. Instead, it must build upon the extensive work already undertaken across diverse initiatives. These efforts aim to create clarity and a universally accepted roadmap for a wide range of stakeholders.

Central to implementing such a strategy is the establishment of a robust digital ecosystem that ensures reliable and high-quality data interoperability. This foundation is essential to fostering innovation, encouraging competition, and generating actionable insights for all stakeholders.

One noteworthy initiative contributing to this vision is the DOE Orange Button program, which has facilitated collaborations that produce actionable information through tools such as SolarApp, the AHJ Registry, and the Project Registry. These efforts have standardized critical data elements and expanded the range of stakeholders to include capital markets for finance, insurance, and surety.

Capital markets play a pivotal role in aggregating vast amounts of information for underwriting projects of all scales and complexities, both public and private. Through partnerships with trade associations and academia, these collaborations can lay the groundwork for outreach, education, and the development of best practices. This roadmap will necessitate a reliable digital ecosystem built on standardized data elements that can be leveraged by AI to enhance underwriting processes, situational awareness, and risk management.

Our proposed concept is to build upon and expand existing collaborative efforts by developing a digital ecosystem grounded in federally recognized, machine-readable data standards such as XBRL. This approach ensures accessibility for all stakeholders, free from the constraints of proprietary systems, exclusivity, or endorsements.

Applicant qualifications, experience, and capabilities of the proposed project team

As a Tier 1 research institution, which also has the triple designations of Land/Sea/Space Grant Institution, Texas A&M University has an extensive capacity and experience in place for the conception, execution, and delivery of technical research projects, which generate basic, applied, and actionable data, information, and knowledge, to address and solve complex challenges, such as the need to develop innovations for next generation infrastructure within an integrated framework based on

making open standards, and basic/applied/actionable data/information/knowledge accessible to individuals/organizations involved in Infrastructure Planning, Design, Procurement, Construction, and Operations/Maintenance. In addition, SRC has extensive experience in expanding the XBRL taxonomy for risk management.

Technology Description

The essence of the technical description of the proposed project is highlighted next:

- The proposed technology, including its basic operating principles and how it is unique and innovative:
 Based on the dual premise that XBRL is not a technology (rather it enables technology) and that XBRL is not a product, (rather it enables innovations in products and services), the proposed project will provide an advanced technology-based platform based on universal adoption of data interoperability, combined with a set of basic operating principles that are unique and innovative.
- The proposed technology's target level of performance: The proposed XBRL technology-based platform can be utilized by all market segments: public and private, at local, state, national, and international scales.
- The current state of the art in the relevant field and application: XBRL does not have all the data elements that will be needed for financing, insuring, and bonding next generation infrastructure, but it does have a process for incorporating new data elements into the XBRL taxonomy.
- How the proposed technology will overcome the shortcomings, limitations, and challenges in the relevant field and application: The expanded XBRL taxonomy will promote innovations in risk management from multiple sources developing next generation products and services.
- The potential impact that the proposed project would have on the relevant field and application:
 Expanding the XBRL taxonomy will promote innovation across industries.
- How the proposed location of the proposed project will support technology development and long-term success:
 XBRL will provide the foundation for data interoperability and enable digital ecosystems that will result in long term success from multiple innovations.
- The key technical risks/issues associated with the proposed technology development plan: XBRL reduces technical risk by enabling the accurate aggregation of data from multiple perspectives and stakeholders.
- The impact that DOE funding would have on the proposed project: Given that XBRL is not a technology, but rather, it is an enabler of technology,

the <u>Return on Investment</u> (ROI¹), and in addition, the <u>Return on Impact</u> (ROI²) and the <u>Return on Influence</u> (ROI³) of DOE funding will be much broader.

 Potential engagement and impacts on Indian Tribes: XBRL can provide operational gains to everyone, including Indian Tribes. The project will engage with the three federally recognized tribes in the State of Texas has: Alabama-Coushatta in Polk County, Kickapoo Traditional in Maverick County, and Ysleta Del Sur Pueblo, as proof of concept extendible to other indigenous communities in the Nation.

Risk Analytics

The proposed project will address the topic area of Risk Analytics, through:

- Advancing the state-of-the-art in probabilistic risk analysis, and metrics, that reflect both epistemic and aleatory sources of uncertainty in power system operations and planning, while pushing the frontiers of knowledge in risk science that can provide an integrated framework for grid resilience under deep uncertainty:
 - XBRL is a foundation for actionable applied data, information, and knowledge that will support AI and will generate significant operational gains. XBRL enables innovation in predictive analytics and risk management.
- Characterizing and assessing centralized vs decentralized (agile/modular) control architecture's response to uncertainty.
 - XBRL enables both centralized vs decentralized applications and platforms.
- Developing novel assumption-deviation analytics to allow for effective communication of model's underlying assumptions to power system decision-makers.
 - XBRL enables all stakeholders to aggregate financial data to identify areas where risk could be better managed.

Enabling Framework

Three cornerstones that create the modern research ecosystem for the proposed project integrate seamlessly and cohesively: (1) a <u>collaboratory</u> framework; (2) <u>cyberinfrastructure</u> capabilities; and (3) an <u>observatory of basic/applied/actionable</u> <u>data/information/knowledge</u>. This research ecosystem creates a comprehensive platform where participants leverage distributed computing and communication technologies to interact with colleagues, access shared instruments and data regardless of physical location, while continuously tracking existing and emerging knowledge, research advances, and technological developments to support the proposed project.