AF TOPIC FOR SBIR 15.1 SOLICITATION – FINAL APPROVED BY AF AND OSBP 1/8/15

Topic Number: AF151-194
Topic Title: Cognitive Computing Application for Defense Contracting

TD/Center: Information
Technology Areas: Information Systems

OBJECTIVE: Create a natural language query system that leverages commercial sector advances in cognitive computing algorithms to provide users insights into Defense contracting statutes, regulations, practices, and policies.

DESCRIPTION: A 2006 GAO report (GAO-06-533SP) commented that "… the challenge of operating in accordance with complex federal acquisition regulations discourages small and innovative businesses from partnering with the government in emerging markets". A significant barrier to partnering with small and innovative companies in emerging areas of research could be removed by providing a clear and intuitive system to understand the requirements of and flexibility within the DoD contracting statutes, regulations, practices, and policies.

Machine learning, natural language processing, computer architectures and enabling technologies are advancing at a rapid pace. Most publicly, IBM Watson competed on the popular game show Jeopardy!, and won decisively. Cognitive computing services are becoming available which provide web-accessible platforms for building interfaces to and front-end applications on, and to which application users can directly query. A cognitive computing application could be developed to address the challenge of making Air Force and DoD contracting more accessible to internal and external customers. Developing such an application would be abetted by leveraging recent commercial and academia cognitive computing advances.

Data sources such as the Federal Acquisition Regulations (FAR), Defense Federal Acquisition Regulation Supplement (DFARS), DoD 5000 series, the Joint Capabilities Integration Development System (JCIDS), systems engineering guidance, Defense Acquisition University training material, relevant sections of U.S.C Title 10, and/or other material as appropriate should be considered as a part of an overall system. Other data sources such as prior contracts, solicitations (e.g. FedBizOpps, grants.gov), and requirements specifications could also be considered.

The perceived initial beneficiaries of this cognitive computing application are likely to be the program managers and contracting personnel of new entrants to the DoD contracting sector. Nontraditional defense contractors and new small businesses could use such a tool to better understand the federal acquisition regulatory requirements. Program managers could benefit from more informed and automated processes related to important areas such as warfighter requirements, systems engineering and risk management. Contracting officers could quickly find answers to difficult questions so that they can focus on creating agreements and use the flexibility available in the procurement regulations. Experienced DoD contractors could use this application to verify their current DoD contracting procedures. Commercialization of this application could involve selling the final product or other developed systems based on the underlying algorithms.

PHASE I: Develop a design architectural concept for an application that uses cognitive computing to provide users answers to natural language questions about the Defense contracting system. The concept should identify possible data sources such as the Federal Acquisition Regulations (FAR), Defense Federal Acquisition Regulation Supplement (DFARS), etc.

PHASE II: Validate by development and demonstration the Phase I design. Evaluate system performance: meaningful answers to a naïve user's questions, evidence presented to support those answers, the answers clarity, and the response speed. Phase II deliverables: (1) working web-based interface prototype, (2) mobile platform interface design, (3) user testing results, and (4) future design iteration improvements. The prototype's latency, scalability and resource trade space shall be measured.

PHASE III and DUAL USE APPLICATIONS: Develop a ready-for-deployment app. Expand the data sources to increase query range. Expand system support to all defense acquisition process phases and milestones, from user needs to system ops and support. Expand the user base from small businesses to large prime contractors.

REFERENCES:
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KEYWORDS: cognitive computing, natural language processing, machine learning, defense acquisition, defense contracting

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