Subject: Review and Comment on "Computer-Aided Dispatch – (CAD) Business Requirements"
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Date: 2/28/2012
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This paper documents my comments regarding the February 5, 2012 version of the iRWIn published paper titled "Computer-Aided Dispatch – (CAD) Business Requirements. This study utilizes a Use Case Approach to determining the Business Requirements for a CAD System. This study is based on review of the WildCAD System. No other CAD Systems were reviewed or discussed in the study.

WildCAD is used in Dispatch Offices primarily within the Bureau of Land Management and US Forest Service, and mostly in the Western US. Users agree that WildCAD provides a good approach for a CAD System. Users have been concerned for many years that WildCAD is not seamlessly integrated with the Interagency Resource Ordering and Status System (ROSS). Some areas of concern within the study include:

- The study is not comprehensive and does not include enough information to serve as a basis for further investment in a CAD System.
- The Context Diagram and Detail Description on Page 5 seems to focus on a much larger project scope which includes development of an Operational Data Store (ODS) and interfaces to multiple systems. This is not discussed in the study.
- Data sharing with the ODS is at a high level and in the case of ROSS, it is incorrect and will not work as portrayed. There is need for more understanding of the functionality of the ODS interfaces with external systems.
- The study includes no recognition of other CAD Systems in use in the wildland community such as the California Altaris CAD System or the very successful CAD Integration approach used throughout California and its potential to serve as a model or possibly an alternative for this effort.

If the US Forest Service is to invest in a CAD System for Interagency Use, the decision must be done with a complete understanding of the scope and requirements of the project. The study is lacking the necessary information which serves as a basis for agency decision or budget estimation. To make an appropriate decision on an enterprise CAD System will require:

1. Comprehensive Business Requirements Definition – Using the iRWIn paper as foundational information, further discovery and requirements documentation is necessary to completely understand and define the scope of a system for general use nationwide.
2. System Architecture Requirements Definition – This document describes the infrastructure and software architecture for the system. Requirements include definition of : Client Platforms, Servers, Network, Application and Database Redundancy, Network, Software Product Approach, and others.
3. Security Requirements – System and Application security is a major cost center. Requirements must demonstrate how the system can meet and maintain the National Institute of Standards and Technology (NIST) Special Publication 800-53. The requirements must also demonstrate how the system will achieve Security Certification and Accreditation which results in a "Authority to Operate" (ATO) certificate.

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4. <u>Interface Scope and Requirements</u> – System interfaces with external systems are complex. Interfaces with external systems are really a series of projects with each resulting new communications interfaces. This is a major cost center. The scope and requirements for all interfaces must be fully documented. A major consideration that should be addressed is how will the system interface with other CAD Systems used in the wildland community?

5. <u>Deployment Considerations</u> – What is the scope of use for the system? Who will the users be?

6. <u>Alternatives for Procurement of a CAD System</u> – There are 3 broad approaches to procuring a system such as CAD. These include: a) Custom Development, b) Commercial Off The Shelf Purchase (COTS), and c) COTS plus Customization. A review of each of these approaches is critical. The review must weigh out merits of each to meet developed criteria which addresses documented requirements. Ability for systems such as WildCAD and others to meet the requirements should be factored in to the alternatives.

7. <u>Cost Estimation</u> – A comprehensive life-cycle cost estimate must be completed for alternative considered. The cost estimate must include:
   a. *Project Management* – This includes all costs of managing the project including: Planning, Scheduling, Tracking, Budgeting, Communications.
   b. *Software Costs* – This includes procurement, development/customization (includes detailed requirements, design, code, and test), quality control and assurance, and user acceptance testing. This estimate must be developed using a commercial estimation tool (e.g. Cost xPert) which can utilize inputs from studies such as the study reviewed. A quality approach will use a Function Point Analysis approach.
   c. *Infrastructure Investment* – This includes procurement, installation, configuration, and initialization of server hardware, network design, storage, redundancy, computer system host facilities, burn-in, application smoke testing, and application deployment at the server level.
   d. *Documentation* – This includes development of Technical, System, and User Documentation.
   e. *User Training and Certification* – This include formal training and certification of all users.

8. <u>Annual Operations and Maintenance Requirements</u> – This includes support staffing, helpdesk, training, system and software maintenance costs, and periodic technical refresh.

In summary, the study is a good start but should not be considered the basis for decision to invest in a CAD System. The study is lacking the substance and robustness required. In a time when funds for a major project are difficult to obtain, it is critical that decisions to fund a project are made using complete information. From an historical perspective, the decisions to fund projects such as : ICBS and ROSS were made after significant documentation and analysis of requirements, alternative, and complete understanding of the life-cycle costs. In the end, the result was successful and within the cost estimates provided up-front.