Webmenus Proof of Concept Research Project
Introduction

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Company History

- Formed in 1998
- Arizona based company
- Focused on DOT and Utility industry clients:
  - LDOTD - Louisiana
  - NMDOT – New Mexico
  - ADOT - Arizona
  - UDOT - Utah
  - KDOT - Kansas
  - Palo Verde Nuclear Generating Station
Company Offerings

- **Experience:**
  - **Analysis** = Feasibility studies, ROI, Assessments
  - **Development** = programming, CADD standards, etc.
  - **Implementation** = ProjectWise, AutoCAD and MicroStation deployment, custom applications
  - **Documentation** = Training manuals, CADD Standards manuals, Workflow documentation
  - **Training** = ProjectWise, MicroStation, AutoCAD
  - **Support** = on-site & remote support, deployment coaching
Company Products

- **Training Material:**
  - ProjectWise XM User
  - ProjectWise XM Administrator
  - ProjectWise v8i User
  - ProjectWise v8i Administrator
  - Microstation XM Update
Company Products

- Software Solutions:
  - StandardsMenu 1.0
  - MicroStation or AutoCAD
Presentation Focus

CADD Menus

Research Department – Research Project
Introduction to CADD Menu
Who is familiar with what a CADD Menus is?
Getting Started

Who has ever used MicroStation or AutoCAD?
Who has ever Managed CADD Menus?
What is a CADD Menu?

A menubar or menu system used to invoke or force commands within the CADD system

CADD system = MicroStation or AutoCAD
Bill Steinbock (Bentley) developed a barmenu application to easily populate a menu with user specific fields driven from an ASCII text.
Bar Menu Makeup

- MDL = MicroStation Development Language
- barmenu.ma
Bar Menu Makeup

- Compiled code files = **barmenu.mc** including other code file
Bar Menu Makeup

- Ascii Text file **DOT.mdf** containing pulldown menu definitions
Sample DOT Menus

New Mexico – MCDOT – Mississippi DOT
The Use of CADD Menus in DOT’s

- To simplify CADD standards compliance
  - ByLevel/Layer control
  - Cell Library loading
  - Custom program loading
  - Etc.
The Use of CADD Menus in DOT’s

- To disseminate agency CADD standards to consultants
- To enable custom automated programs necessary for DOT standardization
- Simplify and standardize agency menu’s
  - Familiarity with agency menu
Typical CADD Menu makeup

- Horizontal orientation
- Discipline or Departmentally segregated
- Pulldown menus
- Text Description
CADD Menu technology

- Bentley Menus = MDL, MVBA
- AutoCAD = LISP
- Client application driven
  - MDL or LISP menus are typically run locally or within an organizations LAN
- Compiling source code is required
Research Project
Why Research?

- Evaluate and Test first
- Determine if it can or cannot be done?
- Compare options first
  - OTS = Off the Shelf solutions
  - Custom solution developed externally
  - Custom solution developed internally
- Build consensus within staff and management
- Utilize Federal technology transfer funding
Research Makes Sense

- Current climate of State funding shortfalls
- Typical Research agency funding surpasses $1,000,000 of federal research $$$
- State contribution matching (10% in some cases)
- Use it or lose it
- Research projects make way for Technology Transfers (purchasing of software or development)
Who can utilize Research?

- Contact your research department
- Typically Department heads or Bureau Chiefs must sponsor
- Board approval
- RFP process
- Sole Source
- Educational research selection (LSU, etc.)
“DOT is adversely challenged with effectively supporting and maintaining internally and externally distributed CADD Standard Menu’s”
Why the Challenge?

**Reasons:**
- Multiple copies of menus (too numerous to determine)
- Proprietary code structure, MDL, MVBA, Macros (No in-house experienced MDL, MVBA programmers)
- Multiple installed CADD versions requiring version compiled menu’s (MicroStation v7, 8.5 2004, XM, and v8i)
Project Purpose

“To create a single (1) proof of concept CADD menu that is Web-based”
Project Objective

- Utilize industry standard code structures
- Must be DOT maintainable
- Must be cost effective to implement and maintain
What is a CADD Webmenu?

“An internet web-based menu system used to distribute CADD standard commands”
Functional Specifications

- Menu to look and function similar to the current CADD menu

- All updates to the menu will be in one location in order to reduce Administrative overhead
Current Menu

- Client based C:\ drive
- Multiple copies
- Proprietary code structure
- CADD version specific
Proof of Concept
CADD Webmenu

Roadway
- Pavement Edge
- Centerline Strip
- Major Dirt Road

Text 10
- Text 15
- Curb, Curb & Gutter
- Text 10
CADD Standards files store on the DOT Webserver
  - Cell libraries
  - Font resource files
  - Custom Linestyles
Files are downloaded (back end) at request via menu item
Configurations are set “on the fly” when necessary
Network Architecture

[Diagram of network architecture]
Functional Process

1. Download and extract install.exe
2. open MicroStation CADD engine
3. Select to Load the DOT menu item or parsed keyin
4. Select command from the Webmenu
5. Commands Execute in CADD engine seamlessly
File Structures

- Java Script
- HTML
- Standard web components .css (cascading style sheets)
- .ico (icon image files)
Feasibility Test of CADD Web Menus: SPR-683

Final Report

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September 2009

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Study

Project goals:

The study consisted of two primary phases, which included the actual CADD proof of concept testing and the supporting project documentation. The proof of concept phase consisted of preparing, and testing of the menus to look and function similar to the existing ADOT menus. The documentation phase consisted of developing research material necessary to fulfill all equipment/procurement/contracting requirements for the CADD Web Menu. A migration plan intended (or how the WebMenu system would be in the future) was also developed. Research and material necessary for documenting the anomaly of the project. Develop a final report capturing all project knowledge and a Research Council presentation.

Mood:

Long Code

Application

Using Research Material

Initial testing:

One of this project was to research and procure programming code capable of supporting two primary objectives. The first was that the code needed to look and function like the current ADOT CADD menus and the second was to enable the CADD menu to be in one single location.

With the initial testing resulted in the decision to utilize JavaScript and base HTML programming languages for this project. Several examples of Java-based IDEs existed in the industry and made it the most logically supported and equivalent to the current ADOT CADD menus.

Consisted of coding menus that looked and responded similar to the current system with enhanced features equal to the ADOT CADD menu production. Testing consisted of transferring developed code to an external testing the interaction with the web-based menus within the CADD design. The most challenging task was determining the functional process and running mini programs (access and MUI) applications from the web and the CADD programs. This challenge was overcome with the creation of an HTML utilized “behind the scenes” FTP for direct file transfer.
Research Results

- Proved existing technology capable of enabling a Web-based Menu system
- Proved Menus can “look and feel” like current DOT Menus
- Proved Menus are easy to maintain
- Proved Menus can be located in 1 single location for ALL users
- Proved Menus can run “mini” programs as needed
Questions