Assessing Options, Costs versus Benefits and Implementation of a Mobile Work Management Solution

Denver Water – context:

• Colorado’s oldest water utility ~100 years

• Serving 25% of the population in Colorado
  • Over 1,300,000 people
  • 18 municipalities, 6 Counties

• Regional Water Resource manager

• Third largest landowner in the state
  • Total watershed > 4,000 sq. miles

• Semi-arid region
  • Droughts, Conservation, Reuse
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Smarter Mobile

Everyone “knows” the benefits of implementing mobile workforce management systems:

- Increased visibility into utility workers’ performance of tasks
- Reduced paper work
- Improved data capture & quality
- Faster emergency response
- Better customer service
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Our Situation & the World Around Us:

• Patchwork of legacy mobile workforce applications
  • Performed competently
  • Costly to maintain and evolve
  • Lots of Idiosyncrasies

• Smart Phones & Tablets
  • Amplifying user expectations
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More Mobile / Smarter-Mobile for:

• Customer-Service field work

• Transmission & Distribution (T&D) field work

At a Cross-Roads:

• Mobile & Geospatial technologies
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More Mobile / Smarter-Mobile – Objectives:

- Replacing water meter sets
- Isolating leaks
- Locating water infrastructure for the public
- Performing preventative maintenance tasks
- Performing water service turn-on’s and turn-off’s
- Responding to dozens of different types of customer service field requests
- Improving overall Asset Management with better Condition-Assessment and Asset-Failure reporting
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More Mobile / Smarter-Mobile – Objectives:

- Route work in real-time with location awareness
- Dynamically adjust work-loads among crews
- Rich User Interface
  - Multiple years’ worth of Consumption History
  - Work History at the customer’s address
  - Physical Equipment characteristics
  - Pipe Network details
    - geospatial views and design specifications
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Three Potential Options for Moving Forward:

• Double Down on our legacy vendor system
• Go to Market for other vendor solutions
• Chart a new course – Create our own mobile solution
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Option 2 - Go to Market:
- Similar costs, similar technologies
- Not very compelling

Option 1 – Double Down on legacy system:
- Known solution
- Predictable costs
- But; How could we deliver a better solution?
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Option 1 – Double Down on legacy system

FIGURE 1  Mobile work management program costs

- Software and maintenance
- Mobile application development
- Data integration
- Internal support
- Project overhead

DENVER WATER
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Option 1 – Double Down on legacy system

**FIGURE 2** Mobile work management project labor costs

- Mobile application development: 50%
- Data integration: 34%
- Internal support: 8%
- Project overhead: 8%
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Option 1 – Double Down on legacy system

**FIGURE 3** Inefficiencies in integration architecture

- Application services
- Integration services
- Mediation and business logic
- Integration queuing

Analysis and design to translate between application representations of work orders presented the largest share of integration spending.

*CIS*—customer information system, *ESB*—enterprise service bus, *WMMS*—work and maintenance management system
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Back to the Question: How could we do better?

- Lower integration complexity
- Easy over-the-air deployments
- Common tech skills to build and maintain the solution
- A richer, more purpose built user experience
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Developing our own solution was a risky proposition:

- It might not work any better – or even as well
  - Mitigate w/ technology Proofs of Concept

- Scope, Time & Money
  - Mitigate by changing the rules of engagement
  - Agile / Scrum
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Building a Cost Model for developing our own solution
• Less expensive than the legacy option

But, before committing, we did a Pilot project

Develop the monetized Benefit Estimates for the Customer-Service field mobile application:
• Some were obvious and estimable
• Others were Less obvious and harder to estimate
• Used averages
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Now we were ready to start Development:

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Continuing Enhancements & Deployments

Updated CBA at the end of 2013
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Beyond Mobile Customer-Service field work:

• Transmission & Distribution (T&D)

• Emergency Services

• Fire Flow Testing

• Water Use Enforcement

• Locates (refactored from Pilot version)
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Great – but not Great Enough:

- Tech refactoring (Silverlight → HTM5 & WPF
- Optimized database structure for real-time BI
- ArcGIS-Online
- Consolidated dispatch
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Concluding Take-away Points:

- New ways of thinking about building Business Infrastructure with Business Stakeholders
- Learned how to challenge old assumptions and spark innovation
- Let cost analysis drive IT decision making
- Always ask the question – How can we do better?
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Concluding Take-away Points:

• Look for easy benefits first – avoid fuzzy benefits
• Carve out Risks, Mitigate them with Proofs of Concepts
• Share the CBA with the Team to get their buy-in
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Concluding Take-away Points…

• Come to understand the efficiencies and improved effectiveness that IT enabled business infrastructure can provide.

• IT enabled business infrastructure is a foundational component of our aspirational goal to become the best water utility in the nation.
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Questions?