

*Invoice Magic: Business Intelligence  
Telecommunications  
Expense Management Solution*

*Award Category  
Data, Information and Knowledge Management*

*Michigan Department of Information Technology*

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Billing Services Section

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## ***B. Executive Summary***

### **Michigan taps innovative data mining solution to challenge budget shortfalls**

In the worst of times, unique solutions take root. In Michigan and in more than 20 other states, budgetary struggles have sparked the search for customer-oriented solutions capable of delivering sustained benefits. *Invoice Magic*, a modest but robust in-house developed application, utilizes business intelligence and telecommunication expense management (TEM) strategies to deliver managerial controls across the state enterprise.

In 2007, Michigan Governor Jennifer Granholm called for tightened internal management with Executive Directive 2007-5 (ED 2007-5) stipulating a 10% reduction in telecommunication expenditures. The economic climate cast a shadow on virtually every aspect of government as legislators and departmental managers searched for belt-tightening.

With this backdrop, *Invoice Magic*, a multi-faceted IT business intelligence solution, unfolded. Developed within the Michigan Department of Information Technology (MDIT), Invoice Magic enables managers and staff to mine a vast amount of data and manage resources more efficiently. Today, staff members across the enterprise tap this application for a transparent view into their agency's telecommunication expenditures—a solution that has helped reduce agency charges by **\$250,000 annually** and a projected **\$1.3 million** over the next five years.

For most businesses in the United States, telecommunication costs rank among the top ten expenses and for some it falls in the top five, according to many industry experts. The amount of funding earmarked for voice and data network services is estimated at 1% - 3% and can be up to 10 percent of an organization's total revenue. Governments experience similar costs. In Michigan, state agencies spend approximately **\$30 million** per year for enterprise voice and data services—a substantial figure requiring oversight, but like private industry, Michigan needed better tools for expense management.

Within the State of Michigan, the Telecommunications Division acts as a “telephone company” for state agencies. By nature, telecom invoices are complex with multiple levels of data and information. Traditionally, invoices were created for low-level analytics whereas, with technology, greater analytics are possible. Using standardized desktop software, MDIT innovatively tapped MS Access to create a portable application easily shared with agencies. Given its MS Access roots, the concept can be replicated by other telecom organizations that utilize rated services. Invoice Magic is an innovative business intelligence solution that utilizes IT to drive action, decisions and projections for State of Michigan enterprise telecommunications.

This business intelligence application effectively supports MDIT's 2008-2012 Strategic Plan through its data mining capability and standardized tools. As a business intelligence solution, Invoice Magic provides users with an excellent resource planning and tracking tool.

**C. Project Description:** Invoice Magic is a modest but far reaching enterprise approach that cost effectively redefines enterprise-wide expense management for telecommunications within the State of Michigan. Launched in March of 2007, the internally developed application utilizes existing technology and contemporary information management to effectively push more data to users. From a management vantage, the tool enables clients to customize reporting, monitor telecom expenses and identify cost avoidance opportunities as well as ongoing managerial efficiencies.

**Invoice Functionality:**

➤ Identify Underutilized Lines	➤ Improve Accuracy of Billing
➤ Manage Voice & Network Inventory	➤ Locate Frequently Dialed Numbers
➤ Reduce Use of More Costly Items	➤ Identify Long Holding Times
➤ Streamline Directory Listings	➤ Minimize Directory Assistance Use

**The Business Problem and Solution:** The story behind this solution began with necessity. Whenever an under-managed environment exists, even modest solutions can result in significant returns. Such was the landscape of Michigan’s one-dimensional expense management process prior to 2007. Client agencies struggled with paper billing which eventually gave way to invoices available in portable document format, downloaded from a website. The ability to interpret, disseminate and manage expenses, however, was limited due to pdf formatted documents. Telecom invoices afforded agencies and departments with no window into operational controls.

**Economic and Public Policy Drivers:** Michigan’s challenged economy and shrinking tax base culminated in 2007 with a \$3 billion budgetary deficit and legislative standoff. Though other states were just beginning to feel an economic strain, Michigan was already searching for solutions. At the executive level, public policy turned to operational efficiencies and the call went out for innovation. A Cabinet Action Plan edict set the stage for better government and with it, a series of Executive Directives added the necessary punch, including a mandate for a 10% reduction in telecommunication expenditures.

**Answering The Call for Innovation:** In conjunction with the Governor’s call for a 10% reduction in telecom expenditures, MDIT’s Billing Services team quickly developed the necessary tool to help meet this gubernatorial directive. The field of options was surveyed, including external solutions, but ultimately MS Access was chosen to create a relatively portable application capable of being easily shared with agencies across the enterprise as an expense management tool. MS Access is authorized as a standard database management application within the State of Michigan and therefore required no additional software purchase. It is virtually on *every* desktop within state government.

**The Solution:** The result was a relatively portable application developed in-house called *Invoice Magic*. The application is a menu-driven, intuitive desktop-based application that provides a timely turn-around for data analysis-- days rather than weeks, thereby reducing staff hours and opening the window to better management of telecom expenses. The advantage with this application is the transparency it provides in expense management. With the click of a mouse, budget and

financial analysts, client services directors, auditors, and agency telecom representatives can now actively manage charges right down to specific users and locations, and in turn provide cost effective services to Michigan's citizens.

**Barriers and Challenges:** With the spending reduction requirement from the Executive Office, MDIT developed a highly functional telecom expenditure management tool. With no MS Access developer and no money to hire one, innovation drove the solution. Turning inward, the department leveraged the talents of Billing Services staff who accepted the challenge and made it happen. Subsequently, the developer was awarded the Michigan Information Systems Association (MISA) Annual Excellence Award. Once the application was operational, the focus turned to usability hurdles. In response, the organization quickly developed training classes, reference and user manuals and an easy delivery methodology.

**Metrics and Measures:** Though developed and launched with minimal cost, Invoice Magic is providing the State of Michigan significant returns. Now in its second year of use, the application transforms thousands of pages of data into a relational database that can be used for data mining. The value of the application translates most notably through its ability to help agencies immediately identify potential telecom cost reductions:

- 8,356 lines requiring further investigation
- Between March 2007 and March 2008, actual reduction in total lines was a total of 1,215 lines or an average of approximately \$21,000/month with a projected annual agency billing reduction of \$250,000

**Leverage and Transferability:** Invoice Magic is a replicable concept utilizing data mining functionality. The application utilizes standard industry concepts for telecommunication expense management. The team was able to customize the data presentation to the State's existing financial reporting structure allowing agencies to quickly adapt. The application presented a transparent view of their underutilized lines and associated potential savings.

By using standard Microsoft tools, the conceptual methodology can be easily adapted by others using much of the same coding and scripting ideas. Moving from "why" to "how" taps three primary factors for leveraging the application across the enterprise:

- Standard database application software development
- Standard data file formats
- Existing web architecture

Such factors make Invoice Magic a seamless application easily integrated within the State of Michigan's IT environment.

**Communication Plan:** The path from idea to implementation relies critically on the appreciation of user needs and the development of key user support mechanisms. Invoice Magic was introduced to agency leadership as a component of the telecommunications cost reduction effort as required by the Governor's Executive Directive 2007-5. To ensure the success of Invoice

Magic, MDIT developed lab-based training classes along with training materials for all 19 departments. Though Invoice Magic is easy to use right out of the box, MDIT has formally trained representatives from eight departments and provides ongoing informal training, business and technical support to users. Rollout of Invoice Magic involved user buy-in, user training, and the availability of ongoing support.

***D. Significance:*** The significance of Invoice Magic is its ability to mine data, control resources, prevent abuse and manage overall expenses. Essentially, it empowers agencies to better manage their telecom environment. The application, training and documentation were developed and sustained by using existing internal resources.

**Policy Alignment:** Invoice Magic, an in-house solution, was developed as a stand-alone application to assist agencies in responding to budgetary constraints in the year 2007. In March of 2007, in response to Governor Jennifer Granholm's [Executive Directive 2007-5](#), a fully featured version of Invoice Magic was released for use by State of Michigan agencies. By giving agencies a fully functional tool to be able to manage inventories, telephone and data line usage and intra-agency distribution, agencies were positioned to help meet the Governor's directive.

**Beneficiary Groups:** This replicable MS Access approach provides benefits to every agency and department, including MDIT that taps the information for budget development and rated services. On a broad scale, its beneficiaries include those who monitor telecom expenses, including **financial analysts, auditors, budget personnel, agency telecom representatives, program and service managers.** Through transparency in billing, these key players can drill down to specific charges, locations and even individuals. With this ability comes better control of expenses – a benefit that ultimately serves our **state and citizens.**

- Financial Analysts: Monitor usage trends, analyze enterprise programs, rate development
- Auditors: Validate usage and compliance, invoice reconciliation
- Budget Personnel: Project agency telecom spending
- Agency Telecom Representatives: Order fulfillment
- Program Service Managers: Expense management and planning
- Executive Managers: Increased policy options

**Operational Benefits:** Agencies quickly realized the value of Invoice Magic beyond budget line item savings. The benefits range from business to operations to technology deployment and management.

#### **Business**

- Monitor specific expense categories against budget
- Conduct trend analysis for cost projections
- Employ fewer staffing resources
- Project usage trends, budget expenditures and rate development
- Control inventory costs
- Assess costs by locations
- Provide data for dispute reconciliation
- Inventory assessment and identification of stranded assets

## **Operational**

- Provide a data repository of agency telecom assets
- Minimize data entry
- Provide a paperless environment
- Optimize usage such as local, long distance and directory assistance review
- Permits more precise service and installation requests
- Call analysis for frequency and duration
- Ensure security and privacy (data are delivered from a secured Web site)

## **Technology**

- Single platform application
- Remote support to the desktop for troubleshooting

## **Business Intelligence**

- Generate data that drives business actions, decisions and projections
- Maximizes the value of data by making it available
- Review specific category of charges by user, building, or type of service

From a management perspective, the tool provides a “one-stop-shop” for the oversight of enterprise agency telecommunication expenses. To Michigan and her citizens, Invoice Magic affords a key tool to track abuse, ensure accurate charges and manage equipment thereby translating to overall reduced costs to the state and her taxpayers. From inception to execution, this application is a public policy solution aligned to our governor’s priority that Michigan be a better-managed state government.

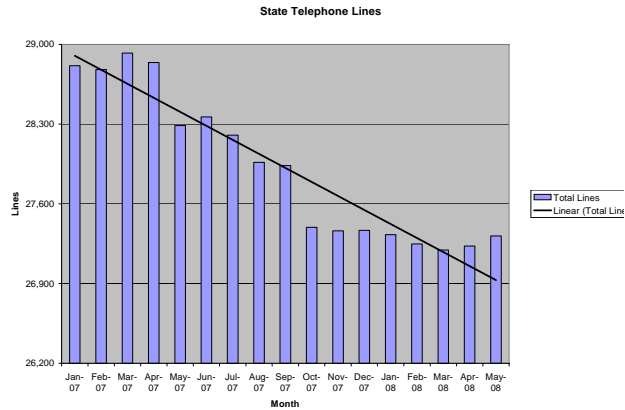
***E. The Benefits of the Project:*** Invoice Magic is a business intelligence solution that utilizes IT to drive action, decisions and projections for State of Michigan enterprise telecommunications. The financial savings and cost avoidance opportunities from this simple application are significant and sustainable.

Invoice Magic provides users with a customized view into telecom expenditures. With a simple click of a mouse, agencies can actively manage monthly charges right down to specific resources, users and locations, providing both financial and non-financial benefits.

## **Financial Return on Investment**

- Invoice Magic initially reported 8,356 lines across the enterprise as being stranded assets and worth agency scrutiny. One year later, agencies reduced telephone lines by 1,215 (see graph below), creating a projected **\$250,000** annual reduction in agency costs (projected **\$1.3 million** over the next five years).

- With this tool, agencies are able to reduce staff time to disseminate invoice detail for program scrutiny by up to 50%. Time saving features include:
  - Automatic email distribution to program areas
  - Intuitive, menu-driven application
  - Point and click query capability (reduces data capture time for analysis)



- Invoice Magic enables program managers to more efficiently capture and query data used for the following:
  - Manage network resources through agency profiles of network resources in a convergent environment. Network resources are a growing segment of telecom expenditures
  - Monitor and control voice services, including local, long distance charges, call frequency and duration
  - Assist in monthly invoice variance analysis
  - Budget projections through monitoring specific expense categories against budget
  - Project usage trends for rate development
- Reconciliation and auditing of invoices
- Track consumption of telecom services

**Non-Financial Return on Investment**

➤ Identify Underutilized Lines	➤ Improve Accuracy of Billing
➤ Manage Inventory	➤ Locate Frequently Dialed Numbers
➤ Reduce Use of More Costly Items	➤ Identify Long Holding Times
➤ Streamline Directory Listings	➤ Minimize Directory Assistance Use

- Creates opportunities for greater efficiencies through point and click filters and wild card searches (i.e., utilizing an asterisk to replace characters)
- Reduce risk of ongoing errors through more frequent invoice validation
- Monitor and ensure acceptable use of state resources per State of Michigan policy
- Provides ability to quickly create basic program telephone directory
- Links to policies, associated forms and procedures as well as other helpful information
- Allows program areas to create storage archives of invoice data.

Invoice Magic is a replicable concept utilizing data mining functionality. The application utilizes standard industry concepts for telecommunication expense management. The solution was customized to enable data presentation corresponding to the State’s existing financial reporting structure allowing agencies to quickly adapt.