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ABSTRACT

Southern Company is a premier energy company in the southeast and a leading U.S. producer of electricity. The company owns five electric utilities in four states, as well as a retail natural gas business, and a fiber optics and wireless business. Recently, Southern Company undertook an initiative to bring about an enterprise GIS approach for all its five electric utilities. Recognizing the potential of an Enterprise GIS and the real benefits it could generate, the company kicked off its Enterprise GIS (E-GIS) strategy development project with the goal of exploring the benefits of an enterprise GIS and to develop a plan to achieve those goals. This paper will highlight the challenges, findings, and lessons learned as Southern Company completed its detailed Business Case for E-GIS; identifying and quantifying the operational and financial considerations related to an enterprise approach to GIS.

INTRODUCTION AND BACKGROUND

Overview of E-GIS Project

Southern Company embarked on an exercise in 2003 to develop an optimal strategic vision for the adoption, use, and support of Geographic Information System (GIS) technology. The project objective was to leverage common business requirements, centralized information technology architecture, and collaborative investments toward a shared Southern Company goal of an Enterprise GIS (E-GIS) to meet the needs of the whole organization, thus optimizing the business unit and IT GIS investments. In addition, the E-GIS Project would set the foundation for future optimization of business processes throughout the five operating companies to improve customer service, cost containment, and profitability. In order to meet these project goals, a GIS Core Strategy Team comprising of management representatives from all of the operating companies as well as Southern Company's Information Technology was formed, reporting directly to the Southern Company Information Technology Steering committee. In 2003, a number of key achievements were made in support of these GIS goals. Southern Company:

- Developed a collaborative Strategic Vision for the emerging GIS technologies
- Unified business units in a strategic vision regarding GIS

- Finalized an enterprise site license for ESRI GIS software
- Supported a number of other collaborative efforts pertaining to GIS

Building on these accomplishments, in 2004, Southern Company enlisted the consulting services of Enspiria Solutions™, Inc. and began to develop a detailed business case based on the Enterprise GIS strategy. The business case looked at the options for consolidating the hardware and software environments of the operating companies into a common enterprise architecture and support structure, and the costs involved in this effort, from both an expenditure and future cost avoidance point of view. The business case analysis compared the costs of maintaining a "business-as-usual" environment and moving to an enterprise GIS, as well as, providing both the quantifiable and non-quantifiable benefits of such a transition. A recommendation was made and an associated implementation plan was provided to Executive Management.

SOUTHERN COMPANY GIS STRATEGIC VISION

Adopt, implement and maintain an enterprise approach related to Southern Company's GIS resources regarding Governance, Technologies and Support in order to further extend business unit operational efficiencies and capabilities.

Project Goals and Business Issues
Southern Company currently invests substantial resources in the continuing operation of existing GIS environments at the various operating companies. The aim of the E-GIS project was to look at consolidating this investment to support a common architecture and support structure, leverage operating costs, and better provide value to each operating company, while improving the opportunities for further development and support of the business in the future.

Based on the cooperation model shown below, Southern Company is committed to the increased efficiency and associated cost savings available by progressing down the path towards an integrated business and GIS technology environment at Southern Company.

Southern Company Model
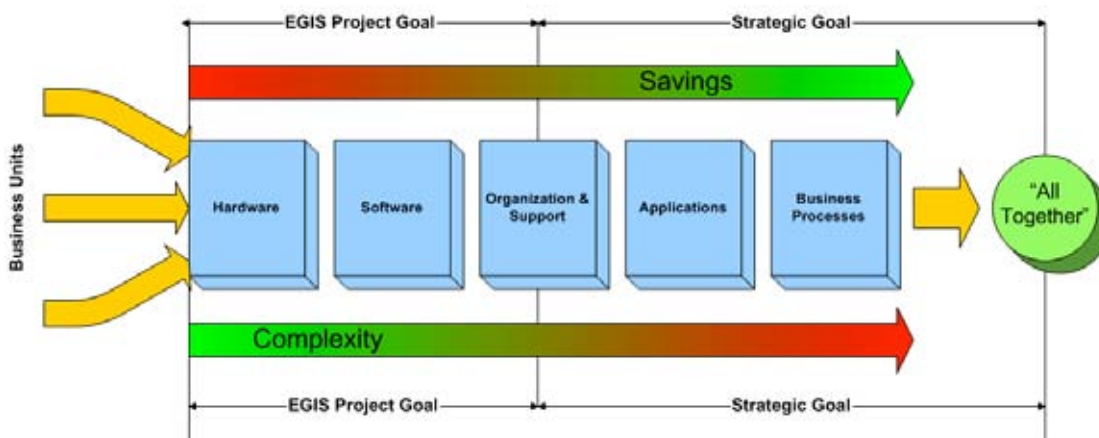
The Model provides a continuum of cooperation and is useful in establishing cooperation levels between organizations in respect to automation projects. The Model basically outlines the

various steps of cooperation from left to right, moving from "separate" projects on the left to "one big project" on the right. The boxes represent different milestones of cooperation. By actively progressing along each stage of the Model, from hardware through to standardized business processes, dramatic cost savings, in addition to a corporation that is truly "one," can be achieved. As an organization progresses from the relatively simpler tasks of standardizing on such things as hardware and software, the complexity of the change, in terms of management and implementation increases exponentially. This results in few organizations being able to realize their vision of a truly cooperative organization. To address the risk of such an approach, Southern Company limited the scope of the E-GIS project to address specifically the first three stages — hardware, software, and organization and support. This provided a solid foundation from which to build and maximize the return on investments in future years through further incremental progression along this path. In addition, current investment in GIS technology can be maximized, increasing the value to Southern Company without increasing the cost.

Project Goals
The goals of the E-GIS project can be summarized by making the right decisions and doing the right things for Southern Company as a whole through a:

- Common vision and strategy
- Common governance structure
- Common policies and standards
- System wide view on project prioritization
- Defined and consistent support models
- Shared resources, infrastructure and data

PROJECT METHODOLOGY

By utilizing the work already done within Southern Company as part of past efforts towards an Enterprise GIS strategy, the business case project was able to get a substantial head start in terms of data gathering and analysis. The strategy and vision defined as part of this work provided the direction for the business case and the data captured previously was used as the foundation for the data contained in the business case. In order to meet the requirements of the E-GIS business case project, the overall Phase I team was broken into three sub-teams to streamline the data gathering and analysis required to provide input into the business case. Each team was tasked with their own deliverables, which would then be consolidated to provide the necessary information for a complete business case review of the GIS environment, and a suitable long-term implementation plan.

Due to a lack of available business unit and IT resources, and extensive time commitments on other projects, industry consultants were engaged in the E-GIS Project. Enspiria Solutions led two of the sub-teams — Business and Financial, and Technology and Architecture; while Michael J. Baker led the Data sub-team. This allowed Southern Company resources to provide input in a concentrated format while minimizing their time requirements.

Existing data was collected and utilized where possible to develop a complete picture of the existing environment. Focused workshops were held with business units from the operating companies to validate the existing picture, and develop the strategies needed for moving forward. The results of each workshop were then sent back to the business unit representatives for validation prior to being incorporated into this report.

The sub-teams formed to complete the data gathering and analysis were concentrated on the following areas:
- Business and Financial
- Technology and Architecture
- Data

Business and Finance
The Business and Financial Sub Team was charged with identifying, qualifying, and quantifying the business benefits and increased capabilities of which an Enterprise GIS provides.

   Deliverables:
   - Define Service Level Expectations (SLE) for Existing and Future Systems
   - Identify Enterprise GIS Business Benefits and Increased Capabilities
   - Identify Enterprise GIS Implementation Option(s) Financials

Data Team
The Data Team was focused on the enterprise conceptual data model(s) evaluating and identifying data sets which can be rolled up and shared across the enterprise, evaluate data storage requirements.

   Deliverables:
   - Define Enterprise Data Architecture

♦ Define Meta Data Standards

Technology and Architecture Team

The Technology and Architecture was tasked with developing a detailed system design of application architecture, infrastructure optimization (E-GIS Server Farms), and identifying technical options for Enterprise GIS.

Deliverables:
♦ Develop Detailed Future Application Architecture
♦ Define E-GIS Infrastructure Models
♦ Identify E-GIS Future Labor Resources

The deliverable items from each of these teams were consolidated to form the findings and recommendations of the final report to Management.

INITIAL FINDINGS

Existing GIS Architecture/Organization by Company

As the project got underway, the first step was to asses the current GIS architecture. Each business unit (i.e., Distribution, Transmission, Land, Economic Development, Marketing, etc.) within Southern Company had been operating at a relatively independent level regarding GIS Technology. This was largely due to the fact that each business unit had specific business requirements that drove their day-to-day activities. Each business unit continued to standardize, build on best-practices, and drive costs out of the business through gained efficiencies across the operating companies. One example was the Distribution business unit. Distribution had worked together on mapping and GIS issues over the years and had adopted a common data model for their business. They also had a plan to consolidate Distribution GIS servers over the next few years. Another example was Transmission. Transmission was in the process of implementing a common GIS tool called TransView for all the operating companies. However, the sharing of GIS resources (i.e., data, architecture, software tools, training, contracts, vendor management, etc.) was very limited across the multiple units (i.e., Between Distribution and Transmission). This cross business unit coordination/communication was a gap Southern Company's current state regarding GIS technology.

Financial Analysis

In 2003 and revised in 2004, costs for current operations without the benefit of enterprise E-GIS were projected through the year 2009. These were used as the baseline for all financial analysis for the E-GIS project. The participants in the GIS cost analysis included the Distribution, Transmission, Land, Corporate Real Estate, and Economic Development business units from each of the 5 operating companies. Interviews conducted during the second quarter of 2004 for this study revealed that these business units had varying degrees of interaction between themselves or duplication of efforts (i.e., Between Distribution and Transmission).

The costs identified show some duplication of efforts across operating companies and business units for: IT Hardware (servers), software purchase costs, software licensing costs, software development, and system and hardware support for each business unit for GIS applications. It is the expectation that an Enterprise GIS effort, as proposed, will affect and reduce several of these costs through coordination of efforts.

To identify the impact of Enterprise GIS on the operating companies, the business units and Southern Company Services IT, the "Business-as-Usual" cost projections through 2009 are analyzed against projected costs with Enterprise GIS for those items that were In-Scope.

Within each of the above categories, the dollars were allocated and proposed expenditures identified for the following areas:

- Labor for:
  - o Business unit
  - o Southern Company Services IT support
  - o Contract
- Capital expenses
- IT Provided Infrastructure (SAN, Servers, Other Equipment)
- IT Provided PCs, Peripherals and Devices (Desktop, Laptop, Tablet and Pocket PCs, Plotters, and Printers)
- Consulting
- Maintenance – Hardware
- Maintenance - Software / Data
- Non IT Provided PCs, Peripherals and Devices (Desktop, Laptop, Tablet and Pocket PCs, Plotters, and Printers)
- Software / Data Purchase
- Training
- Travel

Summary
Given the current state that exists within Southern Company, there was substantial missed opportunity for consolidation of efforts to provide a more business focused and streamlined approach to utilizing GIS within Southern Company (across the business units; i.e. Transmission, Distribution, Land, and Economic Development). Substantial cost saving and knowledge-sharing opportunities are missed, which directly impact the Southern Company's bottom line.

Perhaps more critical is the fact that continuing with the current method of independently supporting the business unit GIS initiatives will further exacerbate the current state issues. The further each business unit goes down their own path, the harder and obviously more expensive it will be to pull everything back together into a consolidated environment necessary to extract the available cost savings and business efficiencies.

CONCLUSION

E-GIS Architecture
The recommended E-GIS Plan Architecture developed as a result of the project has been designed with the following principles in mind:

- **Support**: To enable Southern Company to better support the business units requirements across operating companies in an efficient, effective and consistent manner, while consolidating and optimizing the infrastructure (both hardware and software)

- **Scalability**: To enable Southern Company to easily scale and grow with little or no disruption to ongoing operations either rapidly or gradually depending on requirements, and provide the ability to support multiple business unit growth requirements

simultaneously. (I.e. Adding a server supporting additional users from various business units)

- **Maintainability**: To enable Southern Company to carry out standard maintenance, upgrade and backup and recovery procedures in a consistent repeatable fashion across business units and operating companies

- **Performance**: To better position Southern Company to take advantage of performance enhancements (software/hardware/network) and offer its own customers better performance, and improve performance on a global company level

- **Reliability**: To better position Southern Company to take advantage of technology advances in the areas of fail-over and clustering technology associated with sharing resources, and in turn offer better reliability to their customers

- **Extensibility**: To better position Southern Company to expand functionality, whether through applications, integration, further consolidation or otherwise, on a global rather than business unit level, and reduce the effort and risk of deployment which often is the least considered and yet most critical aspect in many IT projects

- **Accessibility**: To better position Southern Company to offer these applications (and data) to a wider pool of resources when required, and do so from a central and more manageable source

- **Monitoring**: To better position Southern Company to monitor the usage, performance and other infrastructure issues on a global scale and respond more quickly to these than would be possible in isolated environments

- **Security**: To better position to provide a global and stable security infrastructure than in isolated environments

Qualitative and Strategic Benefits

In projects of this nature, benefits can be categorized as either being of a tangible nature — measurable or operational, or intangible — difficult to quantify and typically strategic.

The benefits that will be realized, both tangible and intangible, by Southern Company from the Enterprise GIS program will be felt across the organization and sustained over time. By building the underlying infrastructure for the Enterprise GIS, benefits, in terms of effective use of the network infrastructure, data management and sharing, applications development, support, and training will provide cost avoidance over the continued "business-as-usual."

These benefits will especially result in positive improvements to the effectiveness of both personnel and infrastructure. These two core benefits alone should suffice in justifying the Enterprise GIS, however a wealth of additional benefits is obtained well beyond the immediate timeframe.

Tangible Benefits

The following high-level tangible benefits have been identified as immediate benefits resulting from the Enterprise GIS project:

- Reduced IT server costs, when identified across both business unit and IT

- Reduced Oracle license and maintenance costs

- Reduced IT Server Support costs

- Reduced application acquisition costs and licensing fees

- Creation of a system-wide User Acceptance/Disaster Recovery Site for GIS applications, which does not exist today

Intangible Benefits

Strategic or intangible benefits are improvements that are difficult to quantify but important to document.

The following high level <u>intangible</u> benefits have been identified as immediate benefits:

- Improved overall IT support

- Improved Coordination between Business Units — The level of communication between operating companies and business units will improve with the introduction of corporate wide governance and change control.

- Technology Scaling and Consolidation – bringing together the hardware infrastructure enables the ability to administer and improve systems company-wide through improved scaling, centralized administration, and sharing of costs common upgrade paths where feasible.

Future Benefits

In addition to the above immediate benefits, Southern Companies will enjoy future benefits that would not be available or are more easily attained as a result of the Enterprise GIS project. These include:

- Lowered application development and interface costs - develop common applications once for potential users, instead of developing multiple different versions that address the same business requirement. (i.e., A Transmission Viewer and a Distribution Viewer).

- Data sharing across all channels (reduced data costs) through the identification of duplicate data sources, and an architecture that can facilitate sharing of common data sources.

- Consistency across business units — Positions Southern Company to leverage future business process improvements in the following areas

  - Mobile Workforce – integrating GIS data with a Mobile Workforce System can improve crew/order performance by enabling better routing and crew allocation optimization

  - Work managements/Engineering Design – integrating a GIS-based Engineering Design system with a Work Management or Job Estimating system in future would enable Engineers to estimate the cost of certain designs, create alternatives, and create Bill of Materials (BOMS) from within the GIS.

  - Better materials management – related to the Work Management / Job Estimating benefits, along with estimation of work, by integrating a GIS-based Engineering Design System with a Materials Management tool could allow better tracking of materials and inventory, and provide the ability to reserve materials and issue truck re-stock requests.

  - Better Asset management – using a GIS to associate traditional asset information (manufacturer, technical specifications) with data from other systems, such as number of operations/outages from Outage Management System, to support better maintenance planning and reporting on assets.