

BIOGRAPHICAL INFORMATION

Morris Kemper, P.E.
Project Manager
GE Energy

Specific Responsibilities

Joined GE in 2001. Responsible for business case development, project planning, and project management on a variety of GIS-based application implementations for electric and gas utilities.

Past Experience

Mr. Kemper has been involved in development and maintenance of GIS-based applications for a majority of his 17 years while employed at Xcel Energy in Denver, Colorado. Prior to that he worked in gas distribution, steam line, and pressure vessel engineering.

Educational Information

B.S. – Mechanical Engineering, Texas Tech University
M.B.A. – University of Colorado

Professional Memberships

Member, American Society of Mechanical Engineers

Changing to Integrated Solutions at NPPD

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ABSTRACT

Nebraska Public Power District, or "NPPD", has taken a direct and thorough approach to improving customer service within the electric distribution business area. The business process impact required significant change management. Integrating legacy applications with new GIS, CU database-driven graphic work design, and outage management solutions included message bus technology. Challenges, solutions, and the results of dealing with both human and technical issues will be detailed.

INTRODUCTION

Implementing GIS technology in a timely, cost-effective manner is challenging. During the late 1970's, software and hardware limitations presented significant barriers. Investments in the millions of dollars have, in some cases, required major revisions or replacements. As successful systems began to arrive, the challenge of integration was introduced. Finally, data conversion projects going over budget interfered with obtaining the benefits of GIS-based technologies.

In contrast, Nebraska Public Power District, or "NPPD", has recently implemented several GIS-based applications including graphical work design and an outage management system within a fifteen month time frame and within the project budget. This included integration with a major work management system, a compatible unit database, a customer information system, and a SCADA system.

Producing success while following an aggressive schedule required careful attention to both human and technical aspects of the project. Steps taken by NPPD to maximize benefits and minimize risk within the project will be explained.

BACKGROUND

NPPD manages electric production, transmission, and distribution (or "retail") facilities. They are directly responsible for approximately 85,000 retail customers and perform after hours electric operations management for an additional 80,000 customers. NPPD also performs electric distribution system design and construction for other utilities.

Prior to the project start, NPPD had several successful areas of process management supported by computer systems. Foremost was the work management system. While initially brought on line to support electric power plant management, the retail side of the business had effectively implemented the solution for customer request, work order, material, and asset management.

On the other hand, the independent nature of these systems prevented NPPD from providing consistent service levels. For example, in spite of having construction standards, some customers experienced significant deviations in construction estimates between different districts. The lack of integrated systems also impaired efforts to consolidate operations groups for the purpose of increasing efficiency during outage and emergency response activities.

PROPOSED SOLUTION

NPPD elected to acquire a tightly integrated suite of GIS-based applications. This included a scalable GIS package, GIS data validation tools, a web-based GIS viewing application, a graphical work design tool, use of a construction-standard-driven compatible unit database, a GIS-based thematic data analysis tool, an outage management system, and web-based outage management tools.

Thorough integration of these applications were then sought with the current NPPD customer information system, work management system, material management system, asset management system, network analysis application, property reporting application, trouble call taking application, and SCADA system.

Timeline targets for major systems included six months from project start for the GIS, ten months for the graphical work design, and twelve months for the outage management system. Each implementation required the associated interfaces and related applications. The system implementation was to be performed in parallel with data migration activities.

STEPS TAKEN TO MINIMIZE PROJECT RISK

Reaching a successful conclusion on projects such as this involves following a solid plan and preventing problems. Both were achieved by NPPD through rigorous efforts to minimize project risk. The key steps taken included:

Step 1: Business Case Development

Up front solution research was lead by managers from the business area. Significant presence at industry conferences, including participation as a member of GITA, provided access to multiple peer utilities and industry consultants. Development of an extensive compliance matrix within the request for proposal with the aid of an experienced industry consultant was leveraged throughout the project. Finally, the industry consulting firm was employed to build a quantitative business case upon which executive management made their decision to proceed.

Step 2: Effective Change Management

Significant change requires strong, steady leadership. NPPD personnel from the performance through executive levels provided this. The executive sponsors were heavily involved in evaluation of alternatives, review of progress, resolution of significant issues, communications with employees, and even project celebration activities. This began during business case development and continues today beyond implementation of solutions.

Business area leaders at the department level have participated at each stage of the project. These directors took the time at the beginning of the project to attend an industry conference along with the NPPD core team members. While gaining an appreciation of how the technology had been successfully applied from peers at other utilities, they also set aside time to clearly communicate their expectations to the core team members from NPPD. Expectations covered what was needed within the systems from a functional perspective and a vision of how it should result in positive change for NPPD.

Monthly advisory committee meetings were then led by the NPPD project manager. Key business stakeholders, department managers, and core team members received formal updates. These were highly structured meetings with good attendance covering progress, an opportunity to discuss/resolve issues, and an update on project budgets. At the earliest opportunity demonstrations of the systems to be implemented were provided. The NPPD project manager also invited system implementation and data migration vendor project managers to present progress reports to the group. Finally, corporate communications personnel attended to compile update reports for distribution within NPPD.

Experienced performance level employees played a part in change management in two key areas: process improvement and system acceptance. This was a significant resource loss for the groups from which the employees were selected. However, the benefits were worth it. A clear picture of how the new systems would be used was communicated to the entire business area. Process maps along with work instructions were built by these employees and then integrated into the training materials for the systems.

Participation by these experienced employees in system acceptance testing provided a high quality level in the scenarios tested. It also built familiarity and experience on the new systems so they could continue in their leadership roles upon return to the business areas.

Step 3: Integrated Technical Solution

NPPD was determined to set up successful system integration among all related legacy and new systems. Please see Figure 1 on the following page. Current data from work management, material management, customer information, and SCADA systems could be used within the new applications. Also new data being added by the GIS data migration and GIS-based applications would then be available to NPPD network analysis, work management, customer information, and property accounting systems.

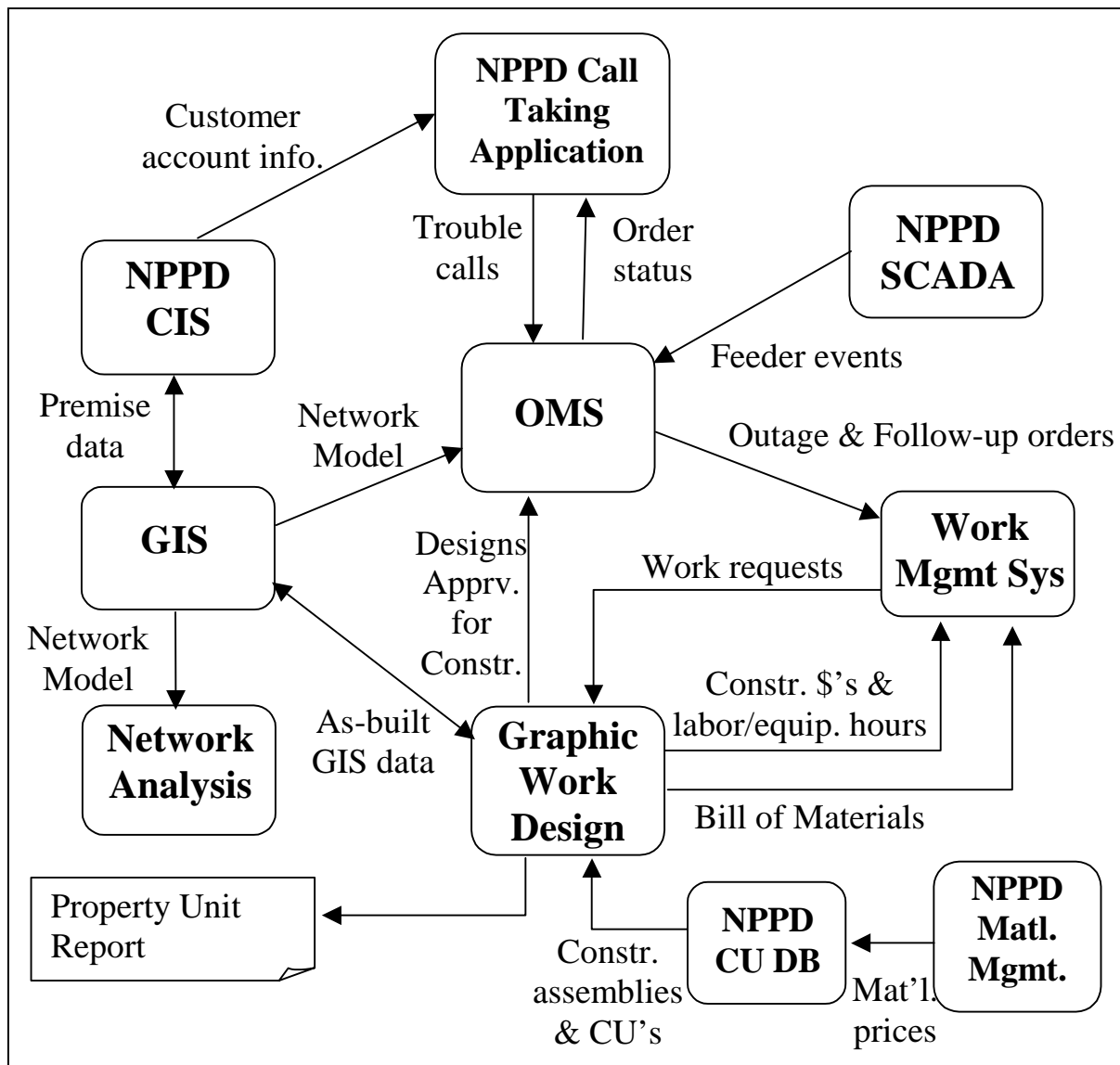


Figure 1: NPPD Interface Overview

The next decision for NPPD was to select an approach to integrating such a large number of systems and tools. A message bus architecture was selected. This included selection of a loosely couple message service. It provided a good deal of flexibility for the systems being impacted and allows NPPD to easily replace components of the interfaces at the future if desired.

NPPD also attempted to use a message protocol developed by the NRECA. There were some interfaces where this was possible. However, with respect to interfaces to the graphical work design tool, custom protocols were required.

Step 4: Effective Project Management

The NPPD project manager built a solid foundation for success by focusing initially upon the core team of NPPD employees. The manager was careful during the selection to target high performing, experienced employees to represent mapping, engineering, operations, construction standards, and information technology groups. This core team of six employees received appropriate training early in the project, rigorous communication on progress/issues, coaching on the need for ownership & success, and recognition of their successes.

Use of one detailed, integrated project plan for data migration, system implementation, and process change was a requirement. A key policy of the NPPD project manager was to keep system interface tasks off of the critical path. If this required additional resources from either NPPD or the system implementation vendor, the expectation was set from the project start to provide this. Weekly progress reporting included special emphasis on lists of past-due & near due tasks. This also provided an opportunity to spot potential issues as soon as possible to minimize impact on the project schedule.

A two pronged approach to implementation was then followed. First, close attention was given to data quality during all phases of the data migration. This reduced the amount of data rework later in the project. Then an aggressive approach was taken for system implementation in the business areas. By not waiting until the data migration was completed to exercise the applications, remaining data and system issues were brought to light and resolved.

RESULTS

The largest investment in change management came in the form of communications. Status meetings, advisory committee meetings, process change meetings, and general meetings with affected employees were tedious. However, the result was a majority of employees being involved in, informed about, and prepared for the change.

System integration has been successful. Data is making the "complete trip" from work request portion of work management & the material management system through the design tool, back to the work management system for asset management support, and ultimately to the outage management system.

Project management techniques have kept the project schedule within one to two months of original plans for each of the major applications. The project was kept on budget with approximately five percent spent on change orders.

Within the business area training has been carried out on schedule for initial groups of engineers and dispatchers/operators. Initial acceptance has been successful with a majority of the end users. Dispatch center consolidation steps are underway with planned completion in March of 2004. Detailed lessons learned from key stakeholders will be shared during the presentation at the GITA conference via PowerPoint slides.