New York City DOT Bridge Management System

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Summary

Paperless data collection and immediate, widespread, accessibility have long been sought after features of any Bridge Inspection System. In the fall of 2004 the New York City Department of Transportation set out to accomplish just that with its award of a task order contract to create a Bridge Data System or “BDS”. This contract included business process re-engineering and associated tools related to the NYCDOT Bridge Inspection Program. The new system would be both a replacement and expansion of its existing Bridge Inspection System. Based on its ScanPrint platform, Advitam delivered the BDS to the NYCDOT in 2006, and it has been used since then by the members of the Bridge Inspection / Research and Development Unit (BIR&D).This paper will provide a broad overview of the system & the functionalities included, and will focus on benefits of using the system for DOT as well as for consulting engineers working for the DOT.

Keywords: Bridge Inspection, Computerized Inspection, NBIS, AASTHO, Asset Management, NYCDOT, BDS, Software

1. Introduction

The New York City Bridge Inspection / Research and Development Unit (BIR&D) is tasked with inspection of approx. 800 bridges in New York City. The types of bridges within the DOT’s inventory vary widely from single span pedestrian bridges to some of the most complex, old and historic bridges, such as the Brooklyn Bridge. In a constant effort to increase the quality of the inspections, the BIR&D unit has been collecting data electronically since 1991, in 2004 it was decided to update the previous program to a better and more customizable application.

2. Bridge Data System (BDS) presentation

2.1 Inventory

A complete and powerful inventory is the backbone of BDS. Each bridge is defined using components and attributes. Given the large amount of data associated with a large bridge inventory and the associated components and attributes, information pertinent to each bridge is split into chapters and sub-chapters which can be viewed independently. As data may come from several sources, a versioning system is provided to allow the user to store different values for each attribute prior to resolution. To visually organize the configuration and hierarchy of the bridge, a customizable “tree view” of the bridge is created with each component detailed.

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2.2 Inspection Definition and Planning

Defining different inspections, of varying scope, for multiple bridges, of varying type and complexity, can be an extremely time consuming process. In order to streamline this process, Advitam programmed into the system the inspection check lists defined by the NYCDOT. The type of answer is defined (text, number, date) and its size. Once the Inspection Manager has defined the types of inspections, each bridge can be individually selected and a new inspection can be set-up for it. The system will also manage recurring occurrences.

2.3 Perform the inspection

Because the inspection screen is where the inspectors spend most of their time, great care was taken in the design in order to make it user friendly. Using a color-coded tree view, the user can quickly see which part of the bridge has already been inspected and rated and which part remains to be inspected. For each component the user can: answer the question defined, attach a comment and attach unlimited Pictures, Documents and flags.

2.4 Quality Control

Quality Control (QC) of the inspection process is particularly important within the NYCDOT. A QC review helps to ensure that nothing was forgotten or mis-rated in the field. During the initial design of BDS a strong workflow of the inspection and QC process was defined and incorporated into the system through a process called routing. This routing insures that an inspection sent to QC won't be inappropriately changed later by a different inspector, and eliminates timing errors.

2.5 Reporting

Since its first version, automated report generation is a key feature of Advitam's BDS system includes a report format that is customized for each client and includes any data from the database. The user can print the report at anytime to preview his work. If needed, only sections of the report can be printed.

3. Key learning and benefits observed

1 Computerized inspection is proven to save hours of work in reporting time. The automatic management of photos and the automatic reporting features in particular allow very important time savings for inspection teams.

2 Detailed visual inspection data organized in a database is a very efficient tool for engineers in charge of data analysis and bridge management.

3 The shift from paper based inspection to computerized inspections requires some flexibility of the inspection team, but involvement of the inspectors during design of the system is a guarantee of acceptance of the system and finally of success

4. Conclusion

Through the customization of an existing bridge inspection and management tool, the NYCDOT has been able to develop a comprehensive Bridge Data System suited specifically to their needs. The utilization of current information and data warehousing technologies provides an excellent platform for the development of future upgrades to address advancements in Asset Management Techniques and Information Technology. Most importantly, the BDS will facilitate the inspection processes and provide valuable decision support information to assist the Department in managing its inventory of critical and aging infrastructure.

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