Case Study: Improving Flight Safety Analysis

INTRODUCTION

In 1997 the United States Congress set a goal to improve flight safety by 80% within 10 years. As part of this goal the Federal Aviation Administration and NASA partnered with the Battelle Memorial Institute, a science and technology enterprise that develops innovations and solutions for the most successful companies in the world. Their task was to create the Aviation Performance Measuring System (APMS), a software project to be managed by NASA. The APMS mission is to increase flight safety by developing the next generation of advanced tools for flight data analysis and interpretation, and make those tools available to the industry.

THE CHALLENGE

APMS technologies enable airline carriers to analyze the flight data in order to identify safety trends and increase flight reliability. Human Flight Operations Quality Assurance (FOQA) analysts must monitor hundreds of daily flights for potentially significant events. The solution would need to provide understanding and insight into giga-bytes of flight data. Project leaders decided to include advanced data visualization technology as part of the APMS solution.

Seeking to add an additional level of technology and expertise, ProWorks was contacted by Battelle, the prime contractor on the project. ProWorks partnered with Battelle and joined the APMS team as a sub-contractor. Initially, ProWorks utilized their development proficiency and self designed data visualization technologies to contribute to the project. Later, the APMS project leaders recognized ProWorks' long term value to the project and assigned Gary Prothero, the president of ProWorks as the APMS Technical Lead.

HOW PROWORKS DELIVERED

ProWorks collaborated with Battelle and NASA to integrate advanced statistical science, real-world industry experience with Microsoft's latest .NET technology to develop The Morning Report, a leading-edge software system. The Morning Report receives giga-bytes of sensor data from flight recorders, aggregates that data, then executes advanced clustering and statistical data analysis that identifies flights which are statistically unique. The most extreme flights are ranked and presented on a daily basis in order of their atypicality through a user friendly interface. These needle-in-the-haystack flights may then be further investigated by Flight Operations Quality Assurance (FOQA) analysts. In addition, The Morning Report includes tools to assist the FOQA team with the identification of these atypical flights as operationally significant.

In the summer of 2004, Gary Prothero from ProWorks was on hand with Battelle and NASA officials to hand off The Morning Report solution to Sagem, a high technology enterprise with industry leading aviation products. Sagem is the first to license The Morning Report and will include it as part of their aviation solutions.

HIGH QUALITY SOLUTION

With The Morning Report, FOQA experts are able to more effectively identify potentially unsafe flights and more efficiently concentrate their attention and efforts. Analysts connect to thousands of flight records through a user friendly interface and are better able to understand the data through innovative data visualization techniques. The Morning Report project exemplifies ProWorks' capacity to team with other organizations in order to deliver leading edge solutions that drastically improve critical systems and processes.

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