The Computerworld Honors Program

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LOCATION:
Washington, DC, US

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STATUS:
Laureate

CATEGORY:
Environment

ORGANIZATION:
Royal Netherlands Institute for Sea Research (NIOZ)

ORGANIZATION URL:
http://www.nioz.nl/

PROJECT NAME:
Sea Research Data Warehouse

PROJECT OVERVIEW

The Royal Netherlands Institute for Sea Research (NIOZ) collects and communicates scientific information regarding seas and oceans providing both a better understanding of and sustainable management of our planet. This organization also manages the national facilities for sea research and supports sea research and marine education in the Netherlands and Europe. The NIOZ is located on Texel Island and, with a staff of over 200, comprises part of the Netherlands Organization for Scientific Research (NWO). The research areas of NIOZ are divided into five areas: mudflats and coastal seas, open oceans, dynamic sea floors, sea and climate, and biodiversity. “Hundreds of institutes in over 60 countries work together in the field of sea research data management,” says Taco de Bruin, data management coordinator. “Most countries manage all research data in one centralized national data center. In our country, multiple organizations have collected and managed information separately for scientific marine research since this field began.” Within the National Oceanographic Data Commission (NODC), research institutes for fundamental and applied research work closely with government agencies in the area of data management and exchange. De Bruin explains, “Some twenty years ago, the NIOZ made key choices and laid the basis for what is still a contemporary vision of distributed data management. That vision has since been achieved on a national scale by the NODC and on a European scale within the SeaDataNet project. SeaDataNet is aimed at managing and sharing marine research information throughout all of Europe.” In order to be able to use, manage and archive the large volumes of ocean data effectively, NOIZ created a Data Management Group (DMG). The DMG is the data center for the national boating program carried out by research institutes and universities aboard special research vessels. The final product of scientific research is virtually always a publication in the form of an article or report. Until it comes out officially, the existence of the research data is announced, but the actual data are often not yet accessible to everyone. After publication, all the collected data must be easily accessible for verification and reuse in other projects. “When we first developed the DMG, we needed a solution for complex data models and the capability to

protect data sets from unauthorized users in a flexible manner, and likewise be able to choose who views this data," Ronald de Koster Senior System Developer and Database Administrator at NIOZ explains. "The collection and processing of data for fundamental or applied sea research is very costly because special ships with highly educated, around-the-clock crews are required. That alone can cost around USD $25,000 a day. Collecting data from floating instruments and platforms is also expensive because of the specialized equipment that is required. The two primary business reasons behind our database selection included absolutely no loss of the collected data, and reducing unnecessary costs for data collection by reusing collected data in other projects. So data efficiency and protection were key."

SOCIETAL BENEFITS

NIOZ is enabling scientists access to the data they need to make important evaluations about our oceans. Collection, organization and accessibility of this data are vital to researchers' ability to contribute to the overall advancement of environmental research and promotes sustainable management of our planet.

PROJECT BENEFIT EXAMPLE

The research territory of NIOZ extends to the disciplines of biology, geology, physics and chemistry. The organization is interested in learning about every aspect of the vast ocean world including, sea-life, color, composition and light reflection through the water, the temperature profile, flow, bottom sediment, etc. "From one platform with light sensors alone, we receive some 6,500 readings for our optical database every quarter hour," de Koster says. "All data collected from a large number of various measurement instruments must of course be properly entered, ordered in data tables, analyzed with models we have developed and regularly entered into different applications." However, at NIOZ, the quantity of data has less influence on the operational management branch than the complexity of the data models used. Over the course of years, various interfaces and scripts have been developed with Sybase PowerDesigner to streamline the checking, importing and exchanging of data. "Although when our department was in its infancy, nobody asked for it, from the outset, Ronald de Koster had the vision that the exchange of scientific information would become very important in the future, and he also foresaw the way in which that would occur," says de Bruin. "A vision that was definitive for both our choice of solution and for further system development. In the meantime, that vision not only became reality, but it has even given our organization a leading position in the oceanographic data management world." After visiting the Woods Hole Oceanographic Institution (WHOI) as part of the World Ocean Circulation Experiment program, de Koster developed his data management plan. "When I returned to the Netherlands, I wrote a plan and submitted an investment proposal to start managing all our research data the same way," de Koster says. "I had been given a hard copy of the data models they used at WHOI. The most important functional reasons we opted for Sybase ASE, are the data views and the bulk copy program. We also heard from our colleagues that this system was very stable and simple to manage. Compared to the financial industry, it is not so much that we have many data changes due to transactions, but rather a great deal of data import from a large number of sources and complex analyses. Those are performed very quickly and reliably."

IS THIS PROJECT AN INNOVATION, BEST PRACTICE? Yes