

A Document Suggestion System Increases Online Sales at IHS



Reasons for initiating the solution

Information Handling Services® (IHS) is the leading worldwide provider of technical content and information solutions for standards, regulations, parts data, design guides, and other technical information. The company employs more than 2,700 people worldwide. Global Engineering Documents® (Global) is a division of IHS. Global offers a broad base of engineering data from research and design to manufacturing and repair. Global is the world's most comprehensive source of technical industry standards and government and military standards.

Huge number of products

The Global database, which catalogs nearly a million active and historical standards documents, is the world's largest collection of standards information. Global has over 125,000 documents available for sale through a call center and e-commerce channels. The lack of guiding customers through the product selection process resulted in lost sales and dissatisfied customers, unable to find products of interest to them in predefined categories. This presented an opportunity to increase customer wallet share and improve customer satisfaction by providing relevant real-time product recommendations.

Business rules do not help

An additional challenge was posed by the fact that engineering projects can be very diverse: customers use products acquired from IHS in a great variety of ways. More than 60,000 customers in 120 countries rely on Global to provide documents from more than 460 technical societies around the world. Correspondingly, IHS could not utilize a system based collections of expert hand-keyed business rules and was seeking an unbiased data-driven recommendation solution.

Solution description and scope

To help customers identify related documents at the time of their online transaction, Global implemented the Document Suggestion System™ (DocSS) powered by X-SellAnalyst™, an advanced cross-sell analysis and product recommendation system from MEGAPUTER Intelligence. Based on years of sales data, DocSS immediately returns a list of documents that are most commonly purchased in conjunction with any given document in response to online product information requests. Recommendations are also available to call center customers. Global maintains a US-based call center of more than a dozen trained representatives as well as many international offices.

DocSS is trained periodically in a background regime on a large pool of historical data including extensive document database and purchase histories. Utilizing innovative Bayesian techniques, X-SellAnalyst identifies typical purchasing patterns and stores the

necessary intermediate results in a compact form, allowing on-the-fly production of recommendation rules in response to any transaction performed by customers. This "on-the-fly" recommendation rule technique is a unique feature of X-SellAnalyst, enabling the system to efficiently tackle very large selections of products and to make increasingly more accurate recommendations for customers who already purchased more than one product from the vendor.

To meet the challenge of an evolving product offering, when some products get discontinued and new products introduced, X-SellAnalyst offers an innovative mechanism for recommending new products based on product grouping, as assigned by the system manager at the time of the new product addition.

Another important benefit of X-SellAnalyst is its ability to take into account every product margin in addition to the predicted probability of the product to be purchased by the customer, which helps maximize the business value delivered by the system.

History of implementation

IHS implemented DocSS first at the Call Center and then at the B-to-C e-Commerce site. This enterprise-wide solution increased sales revenue and improved the customer shopping experience by offering relevant purchase recommendations. The solution implementation was carried out in two progressive stages and the results of the system operation were measured through the developed tracking mechanisms.

During the first stage of the project, DocSS was installed in December of 2001 at the Global's call center employing more than a dozen operators. Upon entering an order, a call center operator sees a short list of products that were of interest to customers with a similar basket of products. By furnishing unbiased recommendations, the system endowed call center operators with extra confidence when recommending possible cross-sell products to customers.

The solution was implemented during two weeks. For its training, the system utilized existing historical data from the IHS transactions database. Within the call center environment, the system was well received by call center operators, brought additional sales to the company, and paid for itself within two months of usage.

Building on the success of the call center implementation, DocSS was incorporated in the e-Commerce operation, the main document sales channel of IHS, in March of 2002. The solution was implemented during three weeks and was easy to integrate with existing information systems because the system was training directly on already existing transactions database and exporting results directly to the e-Commerce server.

Benefits for the implementation site

Benefits resulting from the implementation of the DocSS solution based on X-SellAnalyst are primarily two-fold:

Increased customer satisfaction and loyalty through offering customers relevant purchase recommendations when they place an order.

Increased wallet share of each individual customer. Cross-sell sales resulting directly from customers following recommendations made by DocSS now amount to 5.75% of the total volume of sales achieved by Global.

"The value of the recommendation system is that it helps people find related documents that may not be referenced. Some of the results are obvious, but others would be hard to determine without extensive research. This solution is a big gain for companies that want to maximize their competitive advantage," says IHS Online Marketing Manager, Jaren Green. "This project shows the value of data mining. Other document retailers can make suggestions, but only Global has the depth of information needed to provide statistically accurate suggestions to the majority of document researchers."

Solution effectiveness metrics

There are several key parameters that determine the effectiveness of the developed solution. IHS implemented the software tracking tools to monitor the system performance and its impact on document sales.

Return on investment. The business performance of the system was evaluated directly by tracking the volume of additional sales of products recommended by DocSS to existing customers at the time of placing their order. The solution paid for itself during the first two months of operation and provided an almost 6% increase in total sales.

Recommendation time. For a set of 125,000 SKUs offered by Global, the recommendation delivery time is a small fraction of a second, which represents a comfortable wait time even for an e-Commerce transaction.

Required maintenance. Since DocSS can be trained directly on historical transactions data and no business rules input is required for the system ongoing maintenance, the solution saved IHS hundreds of hours of the marketing manager time.

Adapt to changing business requirements and delivering long-term sustainable value

The solution can readily adapt to meet the growing business requirements due to the following factors:

Ultimate scalability. Megaputer's X-SellAnalyst scales very well to accommodate the growing number of products offered by Global and is virtually independent from the number of transactions used for the system initial training. This makes the system poised for future increase of documents offered by Global to customers.

X-SellAnalyst can work against data stored in any commercial database through its standard ODBC and OLEDB protocols and thus the DocSS solution can be swiftly migrated to work with a different database if necessary.

Cross-platform compatibility. While requiring a Microsoft Windows machine to support the analysis engine, X-SellAnalyst can readily access data being stored on UNIX or Linux platform and thus can be readily integrated into a heterogeneous IT environment.

Incorporation of business objectives. As the main recommendation probability calculation engine of X-SellAnalyst is implemented as a COM component, any

additional rules implementing changed business objectives can be easily deployed on top of this system.