Revenue Management with the world's largest Travel Agency

A Co-Worker called "Forecasting"

At TUI, information technology occupies a strategic position: Around 25,000 travel agency clerks are hooked up to the TUI reservations system. Once the contract has been concluded, the relevant travel information is then transmitted to the service providers. This operational data is drawn on to supply information to the TUI data warehouse, which is used as a basis for detailed analyses.

IN A NUTSHELL

- Service providers need detailed sales analyses
- Different forecasts for Revenue Management
- Data replication from Data Warehouse into DB2

The travel agency market has been undergoing drastic change in the last few years. The key features of this change are: exchangeability of products, a low level of brand profiling, growing price sensitivity accompanied by a trend towards booking at short notice, increased marketing costs, and a reduction in revenues. This has resulted in smaller margins for travel agents and decreasing sales profits. Travel products can be noted for their perishability, partly flexible capacities with high fixed costs, by uncertainty of demand and advance booking of the service. In this situation just described, it is clear that coordinating supply and demand is one remaining potential optimization factor. One main task of Thinking Networks consists of finding and improving efficient methods to predict demand. The optimal balance between supply and demand has to be achieved. Thus, prediction of booking demand and related management techniques are prerequisites for profit maximization.

Customers are booking more on short notice

The illustration shows two schematic booking curves. The cross line leads to the suppression of demand. Because demand was higher than capacity in February, a higher price could be charged. However, because capacity was lacking (the foreground may show that it has been sold off at emergency prices), no supply could be found to match the high level of demand. Therefore, the goal of Revenue Management in this case is to profit from the high level of demand.

The second curve leads to cost-intensive unused capacity. The cause of this may be that in expectation of increasing prices, free capacity has only been hesitantly brought on stream and now demand is lagging behind expectations.

"Customer behavior has changed in recent years to short-term booking, so that short-term business is now an increasingly important factor in our success," says Stefan Wesseler, Project Manager for Integrated Planning and Forecasting at TUI. "In this regard, flexible bid management is increasingly playing a major part." The value of products is being determined more and more by the purchasing market, and less by costs.

"Effective enterprise planning and management, database marketing, risk analyses and tools like financial projections have become essential success factors for service providers and goods suppliers. "Accordingly, multi-dimensional analytical tools and intelligent statistical algorithms

are needed for controlling and marketing, in order to bring together and evaluate large or heterogeneous quantities of data." says the TUI Project Manager.

The right forecasts

The main thing needed to achieve the best result was the use of modern forecasting techniques. In the opinion of TUI, TN Planning from Thinking Networks does just this. "TN Planning offers an integrated suite, from OLAP to data mining. It enables us to produce plans and forecasts within a single environment. When it came down to rapid information retrieval, adaptability and flexibility, of all the OLAP tools we looked at, we found TN Planning persuading us of its total capability over and over," says Stefan Wesseler.

Forecasts had to be produced for each prototype and each booking category, and also for short-term and long-term prediction periods:

- **Market Management:** The process begins with strategic marketing planning that researches customer behavior over the coming years. Using the most important parameters, probable demand is then calculated. Based on this, capacities dedicated to individual services are either expanded or reduced. Demand is predicted in aggregation across the number of different service groups.
- **Product Management:** Before a travel product can be included in the catalog, take-up rates for the different services offered have to be estimated. Based on any available real-life numbers, services will also be aggregated. The detailed variant for a particular service, e.g. half board with a sea view, is calculated using a distribution key.
- **Integrated Planning and Analysis:** Rapid access to large volumes of data is essential for supporting Product Management. It is in this area that TN Planning's efficient MOLAP functions are used for forecasting.
- **Transaction Management:** Once bookings have been released, the capacities that have been created in this way are then arranged/managed, relying on updated booking patterns. This process takes place based on the deadline for providing services and the transportation situation. After this, the conditional forecast of the final booking situation is carried out. Using this information, supply and demand are adjusted to provide the required cover.

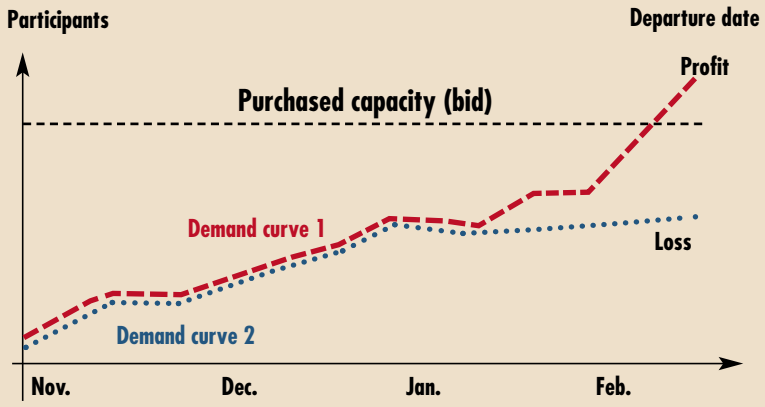
Forecasting procedures are the main way to obtain this kind of information. The forecasting models investigated can be divided up into three different categories: Time-series analyses, causal models, and reference curve procedures. In designing its forecasting software, Thinking Networks successfully exploited the latest statistical and neural procedures, and used simulations to precision-estimate demand behaviors.

From 3,000 to 40,000 models

Based on historical data, prediction models were created and then evaluated both before and after the relevant events. Both the prognosis models and the historical data served as a rich source for relevant market research. Thus, TN Planning, in addition to supplying all the information necessary for Revenue Management, also enables more expensive analyses to be carried out (e.g. consideration of local price elasticity). The seamless integration of the different prognosis models makes it possible to carry out consistent planning and arrangement/management of capacities and prices.

Revenue management includes methods such as nesting, fencing, class mapping, prognosis, pricing, overbooking and optimization in order to implement its objective. Using price/quantity control, TN Planning enables the last bed and/or airline seat to be sold to the highest-paying customer.

Two booking curves



About the customer

The TUI GROUP is part of the tourism division of the Preussag Group. Among the company's trademark names are TUI Schöne Ferien!, airtours, and 1-2-FLY, as well as hotel chains such as RIU and ROBINSON, and FIRST travel agencies. In total, the TUI GROUP encompasses around 400 associate companies and a large number of additional, well-renowned brands. Together with sister companies Hapag Lloyd airline and travel agencies, as well as Great Britain's Thomson Travel Group, the TUI GROUP is the largest tourism company in the world.
Hard at work building up a new brand – World of TUI – the TUI GROUP currently employs 9,200 people, who work at the company's Hanover headquarters and in hotels around the world.

The TN Planning software at TUI is installed on Windows NT clients and Unix servers. The data are replicated from the data warehouse host and administrated locally in an IBM DB2 Universal Database. Access to the database occurs via ODBC and its native SQL. Operations are administrated in scripts that are generated via a graphical user interface. Additionally, the system contains a number of graphical and tabular evaluation mechanisms with reporting functionality.

"Automated prognosis today is an integral component of our operations. Our 'forecasting colleague', as our managing clerks call it, has turned into a valuable source of information. In fact, we are so satisfied with the previous 3,000 prognosis models that 40,000 are scheduled for the next phase. Large scale automation will, of course, play a central role in the scheme of things," says Wesseler on future project plans. *dk*