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## **Editorial: Moments of yield – the optimal sale of perishable products**

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### **1 Why it emerged**

The service sector is gaining increased importance in modern society. Service is a perishable product; it is lost unless requested by a customer upon the moment of production. In service industries, it is vital to make available the right mix and quantity of the service product. In the operational situation this means capacity control; the service product should be allocated to customer segments in order to maximize overall revenue or utility. Pricing is likewise an important concern since demand can be curbed, or boosted by the proper pricing strategies. The technical approach to these matters has become known as Yield Management, originally emerging from the airline and hotel industries. The precious moments of service are now carefully attended; spoilage has been reduced, and discount sales been subject to conscious business analysis. It is easy to find testimony of yield management projects of extremely high profitability. The profits also go to the customers; no passenger benefits from being rejected for a seat that remained empty, or maybe claimed by a standby zero-fare airline employee.

The Internet is today tying together producers and consumers; we are on the threshold of the global electronic market-place. For the airline product, computerized reservation systems (CRSS) have been providing this function for thirty years. Around 1970 it was already apparent that systematic overbooking and class allocation could be implemented in the CRS environment. The economical, statistical, and mathematical tools were available; and these techniques had already been applied to company in-house problems such as stock level control.

### **2 About the papers**

After some twenty years of implementation, Yield Management (or 'Revenue Management') is still going through rapid technical development. This Special Issue on 'Moments of Yield – the Optimal Sale of Perishable Products' features some applications oriented projects that are quite representative of what is done in industry. A couple of technical research reports are also included.

Systematic integration of pricing, capacity planning and capacity control is underway. Product properties such as booking restrictions must be understood and defined in order to achieve the proper fencing of market segments. Several papers present technical detail on these lines: Dr Fee-Seng Chou and Professor Shaul Ladany demonstrate how the effectiveness of segmentation can be analysed with due consideration to infiltration.

Professor Staffan Algers and Dr Muriel Beser discuss measurement of buy up and recapture in Northern Europe, using choice theory. Dr Steve Elkins shows how straightforward revenue management calculus can be used for coordination within the entire marketing function, thus ensuring attuned targets for capacity planning, capacity control, and sales.

Forecasting is basic in all Yield Management systems. Dr José Ramón Cancelo and Professor Antoni Espasa report on econometric time series analyses of the demand for electricity in Spain. A state of the art implementation issue is how to achieve origin-to-destination control. Professor Kalyan Talluri gives a theoretical formulation of this problem, then illustrates most of the effects found in practical decision situations. Professor Lawrence Weatherford shows in his paper that class allocation models can be extended to joint pricing and capacity optimization, pending measurement of the demand price schedule. Dr Ray Deitch, Dr Thin-Yin Leong, and Professor Shaul Ladany demonstrate how tour planning can be done for tourism (bus tours in Israel, cruise ship tours in the neighbourhood countries of Singapore) with accessible optimization software. Dr Jorge Santos and Professor Isabel Themido address the important problem of tracking the efficiency of a local unit delivering a perishable product; in their case it is secondary schools in Portugal. The paper demonstrates that Yield Management also can be applied to activities having several objectives, as is often the case for activities traditionally managed by the public sector. Finally, Dr Renwick Curry shows how game theoretical analyses can support strategic pricing decisions, pending availability of choice measurements. This paper exemplifies how Yield Management has escalated from short term overbooking to key strategic business issues.

### **3 The future**

The trade of perishable products will continue to develop. Unit costs for transport of people, goods, energy, and information products will in general decrease; the upsurge of world tourism, and of products distributed over the Internet, proves that there are optional customers as prices fall. This will cause a tremendous need for distribution of product prices and availability of the capacity produced.

It is very likely that the implementation experiences obtained by industries such as airlines, hotels, railways, cruise lines, suppliers of telecommunications, electrical power, radio and TV programs will be copied and developed on a larger scale. The rationale for such belief is that

- the trade of perishable products is increasing
- local, regional, and world-wide communications are making centralized coordination possible
- powerful computer hardware is available at low cost, which enables the operational decision maker to rely on extensive algorithmic calculations
- optimization and other software is proven and available

Of the hindrances and challenges, the following might be worth mentioning:

- objectives are sometimes settled amongst several stakeholders. This is often the case in the public sector: politics rule, and there are no profit centres. The objectives can be hard to quantify
- lack of education; there will be lags as management and staff acquire the understanding of how to work with new tools
- acceptance in the markets; it must be possible to verify the fairness of the business practices implied from yield management
- lack of technical expertise; ambitions must be kept at realistic levels in each stage of development

Yield Management undoubtedly offers much challenge for the researchers, for the strategy analysts, as well as for those assigned to the task of finding practical solutions in the operational environment. It is my hope that this Special Issue will attract interest not only in the research community. Functional management of service industries in the broad sense should find ideas and triggers for their continuing improvements. The Special Issue might also provide valuable inputs to those working with the important task of developing efficient control systems for the services of the public sector.

Without the support of the contributing authors, there would have been no Special Issue. My sincere thanks for your work and your patience. Thanks also to the referees, who improved quality by their careful scrutiny.