

The Transformation of Pricing Models on the Web: Examples from the Airline Industry

Stefan Klein

Department of IS, University of Muenster
Steinfurter Str. 109, D-48149 Muenster
stefan.klein@uni-muenster.de

Claudia Loebbecke

Department for Media Management, University of Cologne
Pohligstr. 1, D-50969 Koeln
claudia.loebbecke@uni-koeln.de

Abstract

The advent of the digital economy and the increasingly important role of various types of electronic market places provide unprecedented opportunity for suppliers of products and services to experiment with new pricing mechanisms and subsequent pricing models. Economic appropriateness, technical feasibility, and purposes of such pricing mechanisms depend mainly on product characteristics, customer groups, sales volume, and eventually the role of the three most important actors, 'suppliers', 'intermediaries', and 'consumers'. New information technologies not only enable businesses to charge flexible prices on the Internet, but also allow for new price setting mechanisms in which consumers specify their interests and requirements. This paper provides some conceptual background for developing net-based pricing models and reflects first empirical evidences against it.

1. Introduction

Literature acknowledges a wide range of business models in the e-commerce era. For instance, Timmers (1998 and 1999) distinguishes business models along two

dimensions: degree of innovation and functional integration. (For other distinctions see for example Kalakota, Whinston 1997; Treese, Stewart 1998.) More specifically, van Heck and Vervest (1998) differentiate types of Web-based auctions according to the respective number of buyers and sellers. Different from these options for 'making money on the Internet', this paper focuses *innovative price negotiation models* on the Web. We will mainly discuss *services pricing* that has drawn more attention recently (e.g. Berry and Yadav 1996). It is specifically challenging, as the value perceptions of services tend to vary considerably.

Furthermore, we limit this paper to pricing models for *selling to end-consumers*. Traditionally, selling to end-consumers is characterized by (a) suppliers or retailers stating a price (one-sided fixed offers) for goods or services or bundles thereof, and (b) consumers being left with 'take it or leave it' decisions. We will show that new forms of consumer involvement become available in the Web-era.

Cortese and Stepanek (1998) have used 'Good bye to fixed pricing' as headline for their Business Week Special on Electronic Commerce. Their message is that consumers will increasingly be confronted with models for flexible pricing and product differentiation. The Web has been heralded as a medium, which enables and requires companies to develop new or modified business models. Especially in the service industry, we have seen the emergence of new, Web-based pricing models. Even though these models are usually based on familiar coordination mechanisms, those mechanisms are used to a different effect in a Web environment. These models are often driven by intermediaries in an attempt to leverage communication cost differentials offered by the Web in order to facilitate customers' preferences for lower prices. The incentives for the suppliers are to boost sales or to improve the allocation of products or services with a limited shelf life, such as tickets.

The paper is organized as follows: Firstly, we will investigate the most common, traditional price setting features and their appearances in Internet-based transactions. In a second step, we will describe empirical evidence for Web-based pricing models. This will be followed by an analysis of their specific characteristics with a focus on the varying options and impact that the three most common groups of actors, 'suppliers', 'intermediaries', and 'consumers', have in the transaction process. In sum, this paper provides some conceptual background for developing net-based pricing models and reflects first empirical evidences against it.

2. Traditional Pricing Mechanisms

Microeconomic theory states that pricing depends heavily on the market structure for a certain product. In the classic case of perfectly competitive markets with many economic agents on each side, sellers are price takers and cannot influence prices (see for example Mansfield, 1996, for a detailed discussion). These findings are only correct under the assumption of perfect competition. Economists speak of perfect competition as a set of market conditions, namely homogeneous products, per-

fect market knowledge of each participant, atomism of market participants and mobility of resources (Browning, Zupan 1999).

In the real world, however, hardly any seller acts under conditions of perfect markets. Instead of having to accept the market price, sellers have to develop their own pricing strategies and price finding mechanisms aiming at public relation effects, market research insights, and optimally matching various customers'

According to the OECD (1998), "(m)ore and more products will be subject to differential pricing associated with customized products, fine market segmentation and auctions as it becomes easier to change prices." Empirical data shows that differential pricing is already ubiquitous in industries that exhibit large fixed costs like airlines, telecommunications or publishing (Varian 1996). Some market segments could not be served without differential pricing, and it can even be shown that differential pricing is expected to contribute to economic efficiency (see Pompl 1991 for the example of airline tickets).

So far businesses have mainly differentiated their prices based on

- customer groups (group pricing),
- product features (versioning),
- sales volume (volume discounts) or
- customers' utility (value-based pricing).

2.1 Differential Pricing Based on Customer Characteristics

A common strategy is to distinguish prices on some customer characteristics (individual or group level). People who have certain personal characteristics, purchase histories, zip codes, or behaviour patterns are offered different prices. This is probably the most common practice of differential pricing. We speak about *group pricing* or – in the extreme case – *personalization* (also Pigou 1920).

In most markets, individual customer's Willingness-To-Pay (WTP) varies considerably. Thus, it is advantageous to charge different users different prices. For example, it is often thought that business users have higher WTP than educational users; hence many suppliers of books and journals have educational discounts. Similarly prices often depend on whether being domestic or foreign, senior citizens, member of a club, etc.

Sometimes, differential pricing is the only feasible way to ensure sufficient revenues to produce complex services such as scheduled flights. It leads to prices that reflect more closely the true market value. Two problems with differential pricing occur if we assume that customers are generally anonymous. First, a seller has to determine the WTP of different groups of buyers. Second, the seller has to prevent customers with a high WTP to purchase the product intended for customers with a lower WTP. This means the market and the services have to be separable, e.g. by naturally through some actual or imputed characteristics or by imposing boundaries. Also, trading or communication between market segments must be restricted.

Group pricing is already an accepted concept for selling on the Web. Like in traditional markets, suppliers use mechanisms like targeted promotions and loyalty programs in order to establish customer relationships and to distinguish their products and services from those of competitors. Unfortunately, in many cases it is rather difficult to find out about particularities of different customer groups. For example, in case of student discounts, it is cumbersome for a supplier to check student IDs without direct access to the University Information Systems. Moreover, often an individual's WTP is not correlated with any of the characteristics mentioned.

Personalization can be interpreted as an extreme form of group pricing. It is a familiar concept in marketing, gaining importance in electronic markets. Personalization aims at identifying potential customers and offering them the required products at the 'right' time, price and conditions. Theoretically, personalization assumes that suppliers know their customers' individual WTP and extract from each consumer the full value of his or her consumer surplus. Currently, comprehensive personalization is still rare. It can occur only in the few cases in which a firm has a small number of buyers and is able to guess the maximum prices those buyers are willing to accept (Luedi 1997). However, technologies are becoming increasingly available in order to gather and develop customer profiles or even to give customers the instruments to personalize suppliers' offerings (e.g. Bichler, Loebbecke 2000).

2.2 Differential Pricing Based on Product Features

Another strategy is to differentiate prices based on characteristics of the product or service like the quality or the time when it is shipped. Here we talk about *versioning* (e.g. Varian, Shapiro 1999). Versioning is based on the distinction of product features or attributes. With different versions of a product offered, customers position themselves into different groups according to their WTP for certain product attributes. In cases, where observable exogenous customer characteristics have little to do with their WTP, versioning can be a good strategy. In such a situation, the seller provides at least two versions of a product and determines associated prices. A specific form of versioning results from aggregation or product bundling, where products are sold together as a package. Many software packages (e.g. Microsoft Office) are bundles of individual components. Academic journals or newspapers are bundles of articles sold as a package and also subscriptions of magazines can be seen as product bundles of several issues (e.g. Loebbecke 1999). Even flight tickets can be considered as bundles of various product features such as 'on-board service', 'right to change booking', 'total travel time', etc. The pricing advantage of bundling goods can easily be demonstrated (Bakos, Brynjolfsson 1998).

2.3 Differential Pricing Based on Sales Volume

While price bundling refers to varying product configurations or added services, volume discounts apply to multiple purchases of the same good or single purchases

of large numbers. Volume discounts are motivated by the intention of sellers to increase their turnover and market share or by setting an incentive to increase the volume of purchases from individual buyers. Volume discounts may reflect economies of scale, a typical example are bulk sales of telecommunication bandwidth. However, it does not convert all consumer surpluses into profit like it is the case with perfect personalization, where the number of blocks would equal the number of customers.

2.4 Differential Pricing Based on Customer Utility (Value-based Pricing)

Several surveys have shown that customers' satisfaction with service quality and pricing is fairly low (for examples see Berry, Yadav 1996). Part of this dissatisfaction can be attributed to unclear valuations of the service quality and opaque calculation mechanisms. "Services in general, and credence services in particular invite pricing and performance abuses." (Berry, Yadav 1996, p. 43) Suppliers who pursue a strategy of value-based pricing typically try to reduce customers' (perception of) uncertainties, to encourage long-term relationships, and share with the customers cost savings that result from a better integration with the customer (e.g. Berry, Yadav 1996).

While value-based pricing may comprehend different pricing mechanism such as flat rate pricing and price bundling, it may also involve service guarantees or long-term contracts. The major contribution of value-based pricing is that it takes customers' perceptions and uncertainties seriously and attempts to communicate the value, which companies provide (for a more comprehensive discussion of service pricing, see Schlissel, Chasin 1991).

3. The Emergence of New Pricing Models on the Web: Where is the Innovation?

Two price-related phenomena have drawn considerable attention in Electronic Commerce:

In order to compete successfully with traditional distribution channels, the Web has to offer a clear value proposition to customers: price advantages are one of the popular value propositions. Online suppliers and vendors are looking for innovative ways for differential pricing in order to be able to offer lower prices on the Web

without undermining their overall price policy and their traditional distribution channels.¹

As the Web lowers information cost and in particular price comparison costs, it increases price transparency. Hence the price competition on the Web is increasing. Yet at the same time empirical evidence suggests that consumers are willing to pay different prices for the same product or service in different online settings. For instance Vakrat and Seidmann (1999) have shown that prices in online catalogs are significantly higher than in online auctions.

The first phenomenon raises the question which pricing models are used to offer relatively lower prices on the Web, the second raises the question, how different price levels can be maintained on the Web, despite minimal search costs for the consumers.

We have tried to identify at least one typical example of a pricing model on the Web, which correspond to the four pricing models of the section. As product and service characteristics have a significant influence on pricing strategies, we focus on one type of product, namely tickets for scheduled flights.

Table 1 gives a stylised summary of their main characteristics in economic terms.

Characteristics	Tickets for scheduled flight
Initial production cost	High level of fixed cost (aircraft, crew, fuel, etc.).
Marginal cost for additional product	15-20% of overall costs are related to the number of passengers (ground service, food, etc.) within a given contingent of seats.
Individualization cost	Fixed cost for setting-up yield management and booking systems, low variable cost for price discrimination based on service level and contractual features: right to return or change ticket, advance booking, restrictions regarding timing etc.
"Shelf-life"	Flight schedule defines the shelf life, after the gate has closed the over-stocked seats are worthless.

Table 1: Product Characteristics of Airline Tickets

3.1 Customer Characteristics: Weblining

Traditional group pricing often uses customer characteristics, which are fairly simple to identify, such as status (e.g. student) or demographic attributes (e.g. age, gender etc.), as means of price differentiation. Grouping approaches based on predefined customer characteristics such as age, student status or nationality lose impor-

¹ In some countries there are even legal limits to giving discounts. E.g. in Germany existing legislation (Rabattgesetz and Zugabenverordnung) restricts the offering of discounts or additional give-aways.

tance in the era of the Web mainly for two reasons: the characteristics are difficult to verify in an online environment and they do not offer a sufficient amount of customer differentiation. Student status and even age can barely be proven in cyberspace. Another example are textbook prices differentiated by buyer location or nationality. While it is well-known that textbooks are more expensive in Europe or the US compared to the same book in India or China, it remains interesting to observe how and for how long such strategies can be upheld when buyers search for their products on the global marketplace. On the second aspect we see a drastically increasing trend towards one-to-one marketing or at least towards customized marketing. As the Web has been identified as an efficient tool to collect enormous amounts of customer information, companies have started to pursue much more differentiated approaches for group pricing (Shapiro, Varian 1999). Depending on customers' profiles (generally speaking searching and buying patterns), vendors differentiate product offers and prices.

Weblining, a combination of the Web and redlining, i.e. the differentiation of offers based on customer profiles, denotes a pricing strategy, which is based on customer profiles and automatically differentiates Web-based offerings (Stepanek 2000). It encompasses two elements:

Based on detailed information about the customers - mostly transaction profiles -, companies evaluate and forecast the individual customer's (present and/ or future) value (micro-segmentation).

The customer's value is then used to automatically differentiate a company's offerings on the Web. As soon as a customer identifies him- or herself, the presentation of the Web offerings will be adapted according to the company's policy.

Both steps have become easier and more widely used as a result of the proliferation of the Web. Companies use their Web sites to collect customer information and to build detailed customer profiles either in a traditional way and/ or online. Based on those profiles, offerings are distinguished. Such a segmentation and differentiation is highly powerful and efficient when it is applied to online transactions.

Weblining is far more differentiated than redlining and leads to micro-segmentation of the customer base. For customers, this strategy becomes more opaque as segmentation criteria are complex and usually not known to customers.

While Weblining is currently used primarily in financial services (credit card companies and banks) as well as in retailing, airlines have used redlining techniques in the past to decide whom to give preferential treatment, such as getting a seat on board over-booked flights.

3.2 Product Features

Two examples from the travel and tourism industry show, how flexible pricing strategies are combined with the differentiation of product features by the supplier (Lufthansa) or the customer (TravelBids). Both examples represent a specific type

of web auction. Web auctions have become a popular and widespread instrument for flexible pricing (Heck and Vervest 1998; Klein 1997). Strategic rationale and impact, however, vary significantly with the range of products and the design of the auctions.

3.2.1 Sales Auctions: The Example of Lufthansa

Since August 1997, Lufthansa has been regularly auctioning off selected flight tickets via their Web site InfoFlyway (<http://www.lufthansa.com>) Once a month, auctions run for a full day from 10 a.m. till 10 p.m. Fifty separate auctions take place during an auction day. During one auction, which lasts for approximately ten minutes, one set of tickets is auctioned off. On average, there are 120 participants in the virtual auction room; about twenty of them are active bidders. An auctioneer is trying to induce participants to continue the competitive bidding process. The Lufthansa auction is an English auction with ascending prices, the ticket list price, however, is taken as an upper limit. Successful bidders are called after the auction in order to confirm the price and verify the credit card information. Typical bidders are participants in Lufthansa's frequent flyer program Miles & More and customers who use Lufthansa's Web site regularly. The offered tickets are for carefully selected seats on less frequented flights to attractive destinations. Auction tickets, which often are sold with a significant discount, are frequently used for an additional weekend trip or as presents. Lufthansa has included offerings from their partners, like holiday packages, in the auctions and is exporting the auction to countries outside Germany.

3.2.2 Reverse Auctions: The Example of TravelBids

Van Heck and Vervest (1998) distinguish between sales and procurement auctions. While the Lufthansa auction is a typical case of a sales auction, calls for tenders are traditional examples for procurement auctions. Customers advertise specifications of their needs and ask potential suppliers to submit competing bids. So far, procurement auctions, also referred to as reverse auctions, have mainly been limited to business markets. The economic rationale for this is the high cost of advertising the call for tender and selecting the best bid for the customer and costs for submitting bids for the (potential) supplier. Reverse auctions for consumer goods are a rather new pricing model that has become operational as a result of the Internet.

TravelBids (<http://www.travelbids.com>) is an example of such a reverse auction. Customers' requests are posted on TravelBids, which is a specialized electronic market. While in the Lufthansa auction (potential) customers submit bids for flights, in reverse auctions, travel agents submit bids for customer orders. In contrast to the Lufthansa auction, customers using Travelbids have a wide range of attributes,

which they can specify or intentionally leave open. They take an active role by specifying their preferences for touristy offerings.

On this market, all bids are visible for everyone to see; hence prospective customers can view other listings and see the results. The bidding period can be set up to 72 hours, unsuccessful bids can be repeated. TravelBids' fee of USD 10 for successful bids is split between the travel agent and the customer. On the supplier side, travel agents bid to fulfil the demand. They use their knowledge to identify flights that fit the customers' preferences and use part of their commission in order to gain additional orders.

3.3 Demand Pooling Systems: The Example of Accompany

Demand pooling systems are an application of volume discounts for a heterogeneous group of customers who decide to pool their demand within a limited period of time. Different kinds of buyer cartels have existed in traditional markets; the range of demand pooling, however, has been limited by the cost of coordinating multiple customers. While individual buyers could look for peers who have the same need, the Web has emerged as a platform for intermediaries who negotiate volume discounts with suppliers and advertise these offers efficiently in order to aggregate a high number of buyers. In addition to coordinating between buyers and sellers, demand pooling systems typically organize order fulfilment, i.e. payment and logistics services.

Accompany (<http://www.accompany.com>) is an early example of a demand pooling system; in the meantime multiple imitators have emerged such as Powershopping (<http://www.powershopping.de>) or Letsbuyit (<http://www.letsbuyit.com>). Accompany is trying to initiate virtual customer pools so that individual customers can benefit from volume discounts offered by suppliers. Discounts are thus not the result of negotiations, but of Web-enabled pooling and aggregation of demand. Accompany contributes to shifting bargaining power to customers while at the same time provides safeguards against frictions in the service delivery. For running pooling processes, the time limit for joining is made transparent on the Web. Email notification is offered. The business model of Accompany is not restricted to particular product features, but rather to markets where suppliers are offering volume discounts and where customer preferences can be pooled. Accompany is negotiating with suppliers to identify and get volume discounts on popular products.

As airline tickets are personalized contracts, they do not immediately fit for demand pooling. However, seat contingents on a scheduled flight can be traded and might be sold via a demand pooling Web site.

3.4 Value-based Pricing

To examples for value-based pricing are given. While the example of Rosenbluth shows, how value-based pricing strategies can be extended onto the Web, Priceline gives evidence for a new type of value-based strategy, where customers explicitly express their individual valuation of the products and services.

3.4.1 Extending Value-based Pricing on to the Web: The Example of Rosenbluth

Faced with an increasing (price) competition from airlines, some travel agents are looking for innovative ways to ensure their market position. Rosenbluth is one of the largest US travel agencies with a focus on the business traveller segment. They have a long tradition in providing a best fare analysis and rebooking customers in order to secure the best deals. Moreover, they pursue a strategy of combining customer relationship management with innovative applications of IT, "to be people-focused and technologically savvy".

The current price strategy reflects an overall strategic reorientation: In order to underscore the notion of a comprehensive travel management and long-term customer benefits, Rosenbluth is charging their customers the net ticket price (without the travel agent's commission) and add a service fee (<http://www.rosenbluth.com>, Rosenbluth and McFerrin 1998). By this means the customer gains more transparency and a better insight into the cost structure and how he or she can influence costs. (For a comparison of German travel agents' strategies, see Klesse 1999.) While this strategy is not restricted to an online channel, service fees reflect the underlying cost structure and are lower for online transactions. Customers are offered several features online, which enables them to monitor their account and integrate Rosenbluth offerings into their internal processes.

3.4.2 Demand Collection Systems: The Example of Priceline

In most markets, consumers have little opportunity to signal the amount of money they are willing to pay before they actually make a purchase. This leads either to consumers' surplus when the actual price is below the customers' WTP or to dead-weight loss when it is above their WTP (Bakos, Brynjolfsson 1998). The Web makes pricing strategies feasible, which combine personalization and versioning. So-called demand collection systems facilitate a platform for consumers to signal their price preferences for a class of products using certain specification criteria. Those signals are forwarded to suppliers who can decide individually whether they can and want to fulfil those limited purchase requests.

Based on the assumption that supplier-side fixed prices do not always lead to an optimal allocation of products and services, Priceline (<http://www.priceline.com>) has set-up a market platform initially for airline tickets. The product range is continually expanded and includes by now e.g. hotel rooms, new cars and mortgages. Customers can specify their preferences including the price. Priceline then advertises these offers to airlines, car companies, or financial services companies who can decide whether they want to fulfil this additional demand at the listed price. Airline customers do, however, not give a detailed specification, but specify only day, place of departure and place of arrival, and request a flight operated by a major airline. In this way, airlines have sufficient scope to fulfil the demand if they wish so to do, and chances are increased that the offers are met. Priceline earns a commission for every sold ticket of USD 10-20.

The specified offers are forwarded sequentially in a highly efficient and patented process to potential suppliers. Customers' offers are binding and have been substantiated by a credit card authorization. Airlines decide depending on their current load factor and price policy whether they want to take additional customers at the listed price. Feedback is given to the customers within hours.

In contrast to auctions, Priceline has set-up a private market. The demand is actively advertised to airlines, but neither the offers nor the deals are made public. Suppliers can decide based on internal policies; they do not risk any kind of signalling effect that a flexible price strategy otherwise might send to the market. Priceline is called a demand collection system because it functions as an intermediary, which collects customers' requests for products and services at a different than the advertised price. This demand typically is not articulated and could thus not be fulfilled. Priceline was granted a US patent for their business model.

Initially, Priceline does not appear like the typical model for value-based pricing, because it does not reflect an active seller's pricing strategy. However, considering that individual customers specify their price preference for a basic service or product (without control over all of the specific product features), this explicit preference can be taken as an expression of the customer's individual valuation of the product or service. By differentiating prices based on the customers' explicit price preferences, Priceline achieves a high level of allocation efficiency. The customers, however, face the risk of receiving products or services whose features (except for the price) do not exactly meet their expectations.

4. An Analysis of the Transformation of Pricing Models

The description of the examples have shown that traditional pricing models have been used and extended into the online environment, often combining traditional and new ways of doing business. *Table 2* highlights the changes and innovations in the mentioned models, which at least for some customers lead to lower prices.

Differential pricing based on ...	Online examples	Notable changes and innovations ...
Customer characteristics	Weblining	Micro-segmentation based on customer profiling (Weblining) Differential pricing is opaque for the customer, market participants do not have access to comprehensive price information. Or they cannot change there characteristics ...
Product features	a) Lufthansa auction b) TravelBids	Product characteristics are defined by supplier (a) or customer (b). Dynamic price building driven by competing customers (a) or travel agents (b).
Sales volume	Accompany	Initiative and responsibility for demand pooling are shifting from suppliers or vendors to intermediaries or customers However difficult to apply to airline tickets because the reference group for any single flight is fairly small.
Customer utility	a) Rosenbluth b) Priceline	Differentiation of service fees, high degree of price and cost transparency. Customer is enabled to influence the price by selecting the service level (customer-initiated service customization). Technology is used to support travel management and in particular customer processes. Customers express their individual valuation of products and services.

Table 2: The Transformation of Pricing Models

As major changes relate to the roles of the various actors, a more detailed comparison of the sketched business models will focus on three dimensions.

- the actors' influence on determining the price,
- the actors' influence on specifying product or service parameters, and
- the respective benefits and risks.

4.1 Determining the Price

Table 3 summarizes the different players' influence on the price. The actor with the highest influence on the price in the respective models is set in bold letters. The analysis shows that the parameter settings of the respective business models have a considerable influence on the resulting price. Vakrat and Seidmann (1999) have studied the impact of parameter settings on auction results. Intermediaries, for example, have an influence on the breadth and depth of the market by setting fees,

admission rules etc., and hence the level of competition. The fees, which they are charging for their services, have to be regarded as a price component.

Model	Lufthansa	TravelBids	Accompany	Rosenbluth	Priceline
Actor					
Supplier	Sets minimum bid.	Submits a bid with a specified price.	Sets volume discounts.	Defines base price and probably additional incentives for travel agent.	Decides about accepting the price set by the customer.
Intermediary	Affects price levels by setting auction parameters, such as bid increments, volume of auctioned goods etc.	Has an influence on the breadth of the market and hence (indirectly) on the price. By setting auction parameters, such as number of bids and the commission, price levels will be affected.	Sets its commission for coordinating customers and fulfillment.	Defines (in collaboration with customer) service modules and sets prices.	Affects the price through its commission, through mechanisms, which allow customers to announce a higher price, e.g. a fee for signing a credit card, and through the efficiency of the process.
Customer	Engages in a bidding competition (assuming that collusion can be successfully avoided), which determines the closing price.	Specifies needs; affects the price via numerous parameter settings.	May expect further price reductions (if next volume level is achieved) depending on the time of the decision.	Selects services and has extended control over his account.	Sets price for a loosely defined service.

Table 3: Actors' Influence on Price Setting

The analysis of price setting reveals that there are two major price determinants in the pricing models: coordination of demand in the auction and the demand pooling, and specification of the requested services in the reverse auction and the demand collection system.

4.2 Actors' Benefits and Risks

The described models of flexible pricing are based on intermediated coordination processes among buyers and sellers in which each side specifies an incomplete set of attributes and lets the other side decide upon the complementary attributes. Lufthansa, e.g., decides on lot size and ticket attributes sets only an interval for the ticket price (minimum offer and list price as maximum offer). The incentives for sellers to relinquish part of their control over the attributes of the offer is to gain

market share, flexible allocation of overstocks or products with limited shelf-life, and market research into customers' preference patterns. The main risks for suppliers is increasing channel competition with adverse reactions from traditional distribution partners and consumer surplus in a sense that the different channels cannot be sufficiently be separated and customers with a higher WTP get access to low price offerings.

Intermediaries benefit from sales commissions as compensation for their activities. Furthermore, in a Web-based environment, they take advantage of potential advertising or collaboration revenues if they gain sufficient amount of customer traffic. They face a risk to be dis-intermediated or to fail all over because the generated income does not match the incurred costs and risks.

Incentives for the customers are even more obvious. They get a better price in return for a compromise on some of the product or transaction attributes, e.g. specification of airline, time and route of the flight in the case of Priceline or need to coordinate with other buyers in order to pool demand. Their risks represent varying degrees of sunk transaction cost, i.e. upfront investments in terms of resources to find out about offers, to specify request, take part in auctions etc., without any return. *Table 4* summarizes the respective players' benefits and risks.

The Web as global computer-mediated communication environment is a precondition for the emergence of pricing models based on flexible pricing and negotiations about product attributes. It facilitates low signalling cost and time on the suppliers' and the customers' side, and it enables last minute allocation of products and services.

As the Lufthansa case illustrates, suppliers as part of a direct sales and marketing strategy can use this effect. It has to be noted, however, that the Lufthansa auctions have been designed for fairly small numbers of offered tickets. The other models, in contrast, have been set-up and are operated by intermediaries, which are leveraging the structural advantages of the Web (Sarkar et al. 1995; Bailey and Bakos 1996). They have strategically positioned their applications in order to generate benefits for customers and suppliers, which are not feasible in a direct sales model. They

- reduce coordination and communication cost for buyers and sellers,
- generate volume for the suppliers,
- pool homogeneous demand in order to give individual customers access to suppliers' volume discounts,
- improve the likelihood for order fulfilment for the customers,
- separate or even isolate the coordination mechanism from other sales and distribution channels and by this way limit spill-over effects of price discounts, and
- operate with varying levels of transparency.

Model Actor	Lufthansa	TravelBids	Accompany	Rosebluth	Priceline
Supplier	<p><i>Benefit:</i> Auction as marketing event and for market research, sale of over-stocked tickets.</p> <p><i>Risk:</i> Competition with other channels and distribution partners; consumer surplus, i.e. customers who are prepared to pay a higher price get a bargain.</p>	<p><i>Benefit:</i> Travel agents act as supplier getting additional sales at a lower price and probably benefiting from higher sales volumes in terms of bonuses etc.</p> <p><i>Risk:</i> Unintended competition with traditional sales.</p>	<p><i>Benefit:</i> Has an additional option to sell his products at a customer-fixed price, can learn about customers' preferences.</p> <p><i>Risk:</i> Consumer surplus, i.e. customers who are prepared to pay a higher price get a bargain.</p>	<p><i>Benefit:</i> Gains sales volume.</p> <p><i>Risk:</i> -</p>	<p><i>Benefit:</i> Gains sales volume.</p> <p><i>Risk:</i> Competition with other channels and distribution partners.</p>
Intermediary	<p><i>Benefit:</i> Sales commission and potentially advertising or collaboration revenues.</p> <p><i>Risk:</i> Competition from last-minute agencies etc. with broader offerings and guaranteed price.</p>	<p><i>Benefit:</i> Sales commission and potentially advertising or collaboration revenues.</p> <p><i>Risk:</i> Depended on supplier cooperation, competition from Web-based intermediaries, which provide efficient configuration mechanisms.</p>	<p><i>Benefit:</i> Sales commission and potentially advertising or collaboration revenues.</p> <p><i>Risk:</i> Depended on supplier cooperation, competition from more efficient negotiation models, which allow customers to preview offerings before decision or select from several offerings with different prices.</p>	<p><i>Benefit:</i> Stable, value-based relationship.</p> <p><i>Risk:</i> Vulnerable to competing offering which might suit customers' needs better.</p>	<p><i>Benefit:</i> Sales commission and potentially advertising or collaboration revenues</p> <p><i>Risk:</i> Disintermediation by supplier, customers or logistics companies.</p>
Customer	<p><i>Benefit:</i> Access to low-price tickets.</p> <p><i>Risk:</i> Competing bids may win and transactions costs will be sunk costs, considerable restrictions in the number and selection of available tickets.</p>	<p><i>Benefit:</i> Can specify offers and might get small discounts.</p> <p><i>Risk:</i> No attractive offer is made and transaction costs become sunk cost.</p>	<p><i>Benefit:</i> Can specify offers with a fixed price and some flexibility regarding the other attributes.</p> <p><i>Risk:</i> No offer is made and transaction costs become sunk cost, binding offers are not attractive because of selected service attributes (airline, timing, connections etc.)</p>	<p><i>Benefit:</i> Comprehensive and customisable service offering. Cost structure fairly transparent</p> <p><i>Risk:</i> Relationship specific investments.</p>	<p><i>Benefit:</i> Access to significant volume discounts.</p> <p><i>Risk:</i> Level of price reduction is only known at the end of the pooling period. Customer has to adjust preferences in terms of product features and timing of purchase.</p>

Table 4: Actors' Benefits and Risks

5. Conclusions and Further Research

In this paper, we described several conceptually different innovative pricing models based on flexible pricing and changing roles and responsibilities of suppliers, customers, and intermediaries. While pricing has traditionally been a core element of any business strategy, we have shown examples in which not only intermediaries but in particular customers gain a more active role in price setting and product or service attribute specification. Reverse auctions and so-called demand collection systems are just two examples of Web-based intermediaries, which allow customers to specify their preferences for a flight and get the best offer. Alternatively, customers specify a price and day for a flight from A to B and get information in return whether an airline has been found that offers a seat at the given price and the details of the flight.

The applicability and success of the sketched solutions for innovative pricing models are based on the existence of a global computer-mediated communication environment and specialized intermediaries, who balance the interests of customers and suppliers. We have presented empirical evidence of Web-based pricing mechanisms, which aim at giving customers access to lower prices. Leveraging the benefits of the Web as a low-cost, information rich communication medium, intermediaries have in most cases established platforms to enable signalling of price preferences with varying degrees of product specification; extending the negotiation to complex bundles of attributes; and/or shifting power to the customer by pooling demand. The range of pricing schemes will get even broader and more sophisticated, as the Internet provides a variety of possibilities of selling, sharing and giving away.

Based on the experience and identified rationale of the described models, future developments can be envisioned which extend the *scale by involving more customers* and the *scope by adding* attributes or mechanisms of negotiations, such as increasing the number of cycles between customers and suppliers:

- *Customer-driven specification of service attributes:* In addition to specifying fixed attribute combinations, intermediaries can assist customers to specify trade-off functions (alternative parameter settings combined with different prices) which allow suppliers to respond even more flexibly.
- *Customer preference signalling and response:* While we have discussed different signalling solutions with more or less fixed offers, the communication platforms could be used by suppliers to signal alternatives which closely match the specification and negotiate about parameter settings.
- *Customer-driven service innovation:* A further step would be to facilitate customers to specify innovative attribute combinations they would cherish or to specify their preferences and requirements for future products (reverse marketing, Leenders, Blenkhorst 1988).

Our analysis has highlighted the impact of the Web on the emergence of new pricing models as well as the roles and potential importance of intermediaries in these models. It has outlined the benefits and risks for the different players and thus at-

tempted to improve our understanding of business transactions and the inherent limitations of those models. We expect a rising number of pricing models, which facilitate different types of products and services, different customer segments and different situational requirements.

The notion of 'negotiation as principle of discovery' (in addition to pure market mechanisms as principle of discovery, see Hayek 1969) is an old one. For instance, traditional markets like the oriental bazaar are places of negotiations between buyers and sellers in which complex sets of attributes, product bundles and price are considered. However, these negotiation and discovery processes so far have been very much restrained in consumer mass market. We are forecasting their renaissance and reinvention in the electronic market place (see also Brandtweiner, Scharl 1999) as negotiations can be handled more efficiently, customer signals can be processed and used more easily and effectively, and product and service bundles can be configured and adjusted more economically.

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