Yield management, dynamic pricing and CRM in telecommunications

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Abstract
Purpose – The purpose of this paper is to show how yield management and dynamic pricing, which originated in the airline industry, are now diffusing in other service industries. The aim is to demonstrate that these techniques can be profitably applied to telecommunications and similar sectors and to examine the particular conditions of their implementation, development and efficiency.

Design/methodology/approach – The main concepts of yield management, dynamic pricing and CRM are carefully scrutinized. Also discussed is the concept of natural demand curve that aims at reaching a better compromise between the capacity of a company and the demand in an environment where services cannot be sold in advance. In order to sustain the analysis and demonstrate its managerial implications, five case studies are presented that exemplify some aspects of yield management techniques in the telecommunication sector.

Findings – Since the telecommunications are undergoing a process of increased competition and dynamic convergence, yield management techniques can help telecom operators to optimize the benefits they can derive from a subtle management of information networks and partnerships. However, such an approach is more difficult to implement in the telecommunication industry than in the airlines sector because of the difficulty to control (and sometimes refuse) network access to customers.

Originality/value – Capacity and revenue management become critical differentiation factors in improving service quality, loyalty and profitability. Given the increase in competitive pressure, the main objective of operators to sell customer access database to potential partners represents a radical change in the nature of financial and information flows and leads to a “customized management of services supply”.

Keywords Yield management, Customer relations, Telecommunications, Services marketing

Paper type Research paper

An executive summary for managers and executive readers can be found at the end of this article.

Introduction

Firms struggling in highly dynamic and “hyper competitive” industries (D’Aveni, 1994) are often requested to resort to “smart” management and marketing strategies as to avoid the dangerous “traps” of price wars and to preserve or even increase profitability.

When a firm wants to preserve or increase profitability, the ability to manage pricing strategies becomes critical (Monroe, 2003). We can try to distinguish two main (and non necessary alternative) options a firm has to act on price and preserve profitability. The first one is to act mainly on its “capacity” in a sort of “supply based perspective”: in this case, firms can resort to yield management strategies and yield pricing. Simply, yield management is the process of allocating the right type of capacity or inventory unit to the right kind of customer at the right price so as to maximise revenue or yield (Kimes, 1989, 1997). The second one is to act mainly on customers’ different value perceptions, even irrespectively from capacity, and to differentiate pricing accordingly: in this case, firms can resort to dynamic pricing. Again in a very simple way, dynamic pricing is a sophisticated form of price discrimination and it refers to a fluid pricing scheme between the buyer and the seller, rather than the more traditional fixed pricing approach: in this fluid scheme the price is the result of the match between demand and offer and depends mainly on the customers’ different willingness to pay.

In other words, yield management and dynamic pricing are very useful for solving the problem of adaptation of supply to demand when the dysfunctions brought about by the impossibility of storing services are critical. Managers, in this case, are requested to regulate demand by a pricing policy that is not directed by the same criteria as for tangible products (George and Barksdale, 1974; Reichheld and Sasser, 1990; Normann, 1993; Desiraju and Shugan, 1999). As a matter of fact, when a firm owns a fixed capacity of a resource that is consumed in the production or delivery of multiple
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Are yield management and dynamic pricing devised only for the industries where they were first developed or can they be applied to other industries as well? Is there the possibility, in some industries, to link yield management and dynamic pricing to CRM strategies?

In this article we will argue that yield management and dynamic pricing could be profitably applied to telecommunications and similar industries, under particular conditions (Ancian et al., 1996). In fact, as voice, content and data transmission gradually merge, these industries are now facing a process of competitive convergence and increasing competition (e.g. Yoffie, 1997). As a consequence, capacity and revenue management become critical differentiation factors as to improve service quality, increase loyalty and preserve profitability. Moreover, in converging and ever demanding competitive environments – like the telecommunications industry – it is a question of strategic importance to manage not only yield management, but also dynamic pricing and to integrate it with a full command of its database and CRM strategies. In this respect at least, firms competing in the telecommunications industry can be considered as a best practice in CRM. In order to exploit the full potential of yield management and dynamic pricing strategies, telecommunication firms are requested to leverage the existing knowledge of their customer base and to improve it through adequate CRM activities (Ferris and Oshima, 2004). As a consequence, demand calibration is very important before a telecommunication company thinks of optimizing revenue -as it is the case for traditional yield management. In telecommunications, the first step when implementing demand-calibrating methods is to reconstruct the “natural demand” curve (Ancian et al., 1996). “Natural demand” is the way users would phone if there were no price discrimination (peak/off peak hours, working days/weekends...). Demand calibration is then usually defined as a function of price elasticity, time elasticity (length of time consumers could wait before placing their phone call) and time volatility (consumers’ tendency to accept changes in rates over time).

To conclude our paper, we present the concept of “customized management of services supply” that actually enables a company to preserve and develop its control over the final market as well as its global profitability.

Figure 1 links in a simplified way the main concepts of yield management, dynamic pricing, CRM/customized...
management of services supply to the managerial issue of preserving and increasing profitability.

Yield management and dynamic pricing: definitions and review

The subject of yield management and dynamic pricing is related to that of price discrimination, that is to take the profit opportunity of pricing according to different customer perceived value.

In order to further illustrate the concepts presented in the introduction in a better and deeper way, we have conducted a literature review to understand, through the definitions offered by the literature, the constituent elements of these strategies.

Yield management

When reviewing relevant literature on yield management (for a synthesis, see Table I), a common feature emerging is the focus of yield management on capacity issues, its internal (supply-side) focus and its origin in airline and capacity-related industries.

The term yield management originated in the airline industry to mean yield per available seat mile. Kimes (1997) gives a general overview of yield management practice in the hotel industry; he states that the term has been applied to other industries by altering it to yield per available inventory unit. Simply, yield management is the process of allocating the right type of capacity or inventory unit to the right kind of customer at the right time so as to maximise revenue or yield (Kimes, 1989, 1997). In such areas as ski lifts, golf courses, theatres, museums, visitor attractions, however, the potential to use yield management exists but has not yet been explored extensively. Desiraju and Shugan (1999) provide a conceptual foundation for the strategic pricing of capacity constrained services viewing yield management strategies only as tools for implementing an optimal multi-period pricing strategy where each price is a function of forecasted excess capacity. In that respect, yield management strategies employ a pricing strategy involving discounting early prices but reserving some capacity for later sale at a higher price. Their analysis shows that costly, complex multi-period yield management strategies are far more profitable when a service provider faces different market segments arriving at different times to purchase the service.

Dynamic pricing

We also reviewed related literature on dynamic pricing, searching for the different definitions of the concept. Table II offers a synthetive view of definitions in relevant literature. All the definitions converge towards the consideration of dynamic pricing as a sophisticated version of price discrimination, based on different customers’ value perceptions and willingness to pay and facilitated by the huge databases firms are creating on their customers thanks to the diffusion of the Internet and of CRM practices.

Table 1 A review of definitions of yield management

<table>
<thead>
<tr>
<th>Definition</th>
<th>Author, reference</th>
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<tbody>
<tr>
<td><strong>Yield management</strong></td>
<td></td>
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<tr>
<td>A broad term describing various methods for managing the relatively fixed</td>
<td>Barth (2002)</td>
</tr>
<tr>
<td>capacity of many kinds of services more profitably</td>
<td></td>
</tr>
<tr>
<td>Revenue management of a perishable product with a fixed stock over a</td>
<td>Feng and Xiao (2000)</td>
</tr>
<tr>
<td>fixed time period</td>
<td></td>
</tr>
<tr>
<td>Optimal revenue management of perishable assets through price segmentation</td>
<td>Weatherford and Bodily (1992)</td>
</tr>
<tr>
<td>Yield management deals with sales of perishable products such as capacity</td>
<td>Wang and Regan (2005); Edgar (1997)</td>
</tr>
<tr>
<td>and time for revenue maximization</td>
<td></td>
</tr>
<tr>
<td>A revenue maximization technique which aims to increase net yield through</td>
<td>Donaghy et al. (1995)</td>
</tr>
<tr>
<td>the predicted allocation of available bedroom capacity to pre-determined</td>
<td></td>
</tr>
<tr>
<td>market segments at optimum price</td>
<td>Lieberman (1993)</td>
</tr>
<tr>
<td>A tool with the capacity to yield a net result of enhanced revenue and</td>
<td></td>
</tr>
<tr>
<td>customer service through a melding of information-systems, technology,</td>
<td></td>
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<tr>
<td>probability, statistics, organizational theory, and business experience</td>
<td></td>
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<tr>
<td>and knowledge</td>
<td></td>
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<tr>
<td>A strategy which endeavour to maximize guest room rates when demand</td>
<td>Jones and Hamilton (1992)</td>
</tr>
<tr>
<td>exceeds supply and to maximize occupancy when supply exceeds demand</td>
<td></td>
</tr>
<tr>
<td>An integrated, continuous and systematic approach to maximizing revenue</td>
<td>Jauncey et al. (1995)</td>
</tr>
<tr>
<td>through the manipulation of products’ price in response to forecast</td>
<td></td>
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<tr>
<td>patterns of demand</td>
<td>Kimes (2002)</td>
</tr>
<tr>
<td>Yield management is a method that can assist an organization to sell the</td>
<td>Desiraju and Shugan (1999)</td>
</tr>
<tr>
<td>right inventory or product unit to the right type of customer, at the</td>
<td></td>
</tr>
<tr>
<td>right time and for the right price</td>
<td></td>
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<tr>
<td>The basic objective of yield management systems (YMS) is to adjust price</td>
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<td>over time to fill all available capacity, given a small marginal cost for</td>
<td></td>
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<tr>
<td>serving an additional customer, YMS tend to fill capacity by partitioning</td>
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<tr>
<td>time into discrete periods, charging discount prices in early periods, and</td>
<td></td>
</tr>
<tr>
<td>releasing capacity by restricting sales in these periods. YMS is an optimal</td>
<td></td>
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<tr>
<td>multi-period pricing strategy where each price is a function of forecast</td>
<td></td>
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<tr>
<td>excess capacity. This pricing strategy involves discounting early prices</td>
<td></td>
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<tr>
<td>but reserving some capacity for later sale at a higher price</td>
<td></td>
</tr>
<tr>
<td><strong>Yield pricing</strong></td>
<td></td>
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<tr>
<td>Yield management pricing is a broad term that describes how a service</td>
<td>Berman (2005)</td>
</tr>
<tr>
<td>provider can secure higher revenues from its relatively fixed capacity. Its</td>
<td></td>
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<tr>
<td>basic principle is that a marketer must continuously update its price levels</td>
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<tr>
<td>based on evaluating reservations for future purchases in a specific time</td>
<td></td>
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<tr>
<td>slot against a projection of demand for each time slot</td>
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</table>
Dynamic pricing refers to a fluid pricing scheme between the buyer and the seller, rather than the more traditional fixed pricing approach. Today and thanks also to the internet, dynamic pricing, once the domain of few industries, is now entering the worlds of mass retailing and services, both online and offline (Sinha, 2000). The advances in computer sciences and database marketing are facilitating this process of gradual expansion of dynamic pricing (Sahay, 2003). The Internet is offering smart firms the opportunity of increasing their “smart pricing” strategies (Sinha, 2000), transforming the Internet in a possible pricers’ paradise (Ancarani, 2002): online auctions, reverse auctions, negotiations and group buying are now available for this purpose. As a result, firms can dynamically change their prices accordingly to customers’ perceived values, which they know very well due to their database and CRM activities. In the “traditional” market, the flower market is a good example of dynamic pricing; the “flower market” in Amsterdam has been widely studied for understanding the mechanism of direct (English), reverse and Dutch auctions (Kambil and Van Heck, 2001) where prices form dynamically as a result of the interaction of demand and supply. Cross (1997) reports another interesting example of dynamic pricing in very traditional markets: some producers of vending machines are introducing a sensor into their products in order to change the price of the beverage they according to the external temperature (and thus the customer’s willingness to pay). More recently, almost all the firms doing business on the internet are resorting to dynamic pricing: for example, Dell is changing very frequently the prices of the product sold through its web site.

Reinartz (2001) considers yield pricing systems as a “weak form” of dynamic pricing, since prices do change only depending on time, whereas in real dynamic pricing systems they change also depending on other value components. As far as fairness is concerned; the application of yield pricing and dynamic pricing has many implications, and the practice of dynamic pricing as well as those of discrimination strategies obviously pose many legal and ethical questions (Bolton et al., 2003). Marketers should therefore be very gifted in avoiding the risk of alienating customers with non-smart strategies (Sinha, 2000; Sahay, 2003); that is why their integration with CRM activities, definitely less transactional and more oriented to the long term value of the relationship with a customer could be very useful.

**Yield management as a major strategic tool in the airline and related service industries**

By introducing generalized access to markets and putting an end to fare controls, the deregulation of air transportation in the USA allowed the emergence of a large number of small companies with more favorable cost structures than the traditional large companies. These small companies made the most of this advantage by offering competitive prices and by increasing their market share at the expense of the “Majors”. Yield management was the best answer of the “Majors” confronted with this unexpected competition; it also precipitated the death of the charter companies in the USA.

The main aspects of yield management reside not only in pricing but also in the relationship between market share and demand. Thus, yield management may be a powerful tool for capacity management:

- Yield management allows a company to take advantage of its under-capacity (when demand exceeds supply), while increasing its market share or protecting it from potential entrants.

- In a situation of over-capacity, the need for revenue usually leads to a stronger competition. In this case, yield management may also be very useful to protect high-income market share, while allowing the company to sell its surplus capacity at lower prices.

- Thanks to this technique – and if its capacity matches demand – a company may become more profitable than its competitors.

In service activities, capacity has to be managed so as to alleviate the difficulty of stocking. Standard methods of capacity management are used to deal with peaks and troughs in demand. In this perspective, some authors (Cote et al., 2003) consider four main management techniques:

1. The first method consists in limiting the number of customers who can be satisfied (airplane reservations, high-speed trains, hotel, and restaurant). The advantage of this method consists in offering permanent good quality service; but this limits the possibilities of development -in particular during peak periods. Moreover, reservations
may create perverse phenomena such as “no-shows” (where the customer fails to check-in).

The second method is to “stock” the customer to match the real shape of demand (airport shuttle buses, doctor’s waiting room, hair dresser’s parlor...).

The third method consists in downgrading the quality of service during peak hours so as to allow access to the largest possible number of customers (standing room for train passengers, extra beds in hospital wards...). Of course, the negative impact of such practices on the image of the service should not be neglected.

The fourth method allows – by rendering information public- to adapt demand to the available capacity (road traffic information centers, truck bans on certain days...).

These traditional procedures of adaptation of supply to demand only partially make up for the dysfunctions brought about by the impossibility of storing services. Managers, and particularly the marketing manager, must try and regulate demand by other means than those described above, and in particular by a pricing policy which is not directed by the same criteria as for tangible products (George and Barksdale, 1974; Reichheld and Sasser, 1990; Normann, 1993; Desiraju and Shugan, 1999).

The simultaneous management of price and capacity allows companies to deal with a demand that is no longer limited by capacity but determined by seasonal variations. To implement this (Brown et al., 1990), companies use pricing policies that are consistent with their objectives (fare supplements during the most attractive time slots, discounts for specific customer segments during certain periods...).

Nevertheless, this practice is not wholly satisfactory, as it relies on seat allotments that were determined at the beginning of the season, on the basis of the previous year's figures.

In this perspective, one often encounters “waste” – defined as the loss due to a non-sale- or “loss” – defined as the loss in a sale that could have been made at a higher price.

The main tools of yield management all contribute to the maximization of global income with constant capacity, that is to say with relatively fixed costs, taking into account the fact that generally, in the services sector, variable costs are weak in comparison with fixed costs (Irons, 1994). Yield management relies on the attractiveness of prices that will transfer customer segments from one service to another and match capacity “just in time” with the largest possible demand.

Yield management decisions focus on the level of available capacity (number of seats) that must be sold at a certain price level so that firms successfully exploit customers’ willingness to pay while making optimum use of available capacity. This is how airlines determine the number of business class seats according to the expected booking quantity. Specific criteria such as advance booking deadlines in economy class ensure that well-heeled business travelers buy business class tickets and accept higher prices (Lieberman, 1993; Desiraju and Shugan, 1999; Feiler et al., 2003).

To be effective, yield management must meet certain criteria. Even if these methods may be extended to fields that are very different from air transportation (minor surgical acts, banks, discontinuous production processes...), the technical specificities and management constraints of each of these fields bear important consequences on the chosen methods of optimization and on the best process of implementing yield management.

According to some authors (e.g. Kimes, 1989), the following elements affect yield management:

- fluctuating demand;
- limited supply or capacity;
- the possibility to sell a product in advance;
- the possibility to postpone a purchase;
- independent segments, defined according to their price elasticity; and
- maximization of profit as a priority.

Considering these characteristics, yield management mainly applies to service activities that are linked to tourism and leisure, like air transportation, railways transportation, hotels, car rental, and tour operating.

Yield management applied to telecommunications: towards new modes of optimizing demand

Mobile telecommunications is facing the traditional challenges experienced by many established service industries with high fixed costs and investments (transport, hotels, tourism...). Buying and operating airplanes is expensive, as is building a telecommunications network (Feiler et al., 2003). As telecommunication companies are increasingly competing in the converging arena of information and communication technologies (ICT), their networks have to support not only voice transmission but also data and content transmission. This new technological, converging and ever-demanding competitive environment requires much larger capacity storage and access speed and poses a lot of questions not only related to capacity and yield management but also to market constraints and competitive pressures.

The telecommunications sector resembles air transportation in many ways and it shares many of the constraints that plague airlines[1]. At the same time, it also has specificities that must be taken into account from a managerial perspective:

Phone consumption can be managed in a more flexible way and is less constrained by “non-negotiable time slots”

Mobile telecommunications are facing the traditional challenges experienced by many established industries with high fixed costs and investments, such as aviation, transport, and tourism. Buying and operating airplanes is expensive, as is building a Universal Mobile Telecommunications System (UMTS) network. Capacity limits play a key role: if airlines work on the basis of specific seat quotas, the success of mobile operators in the age of General Packet Radio Service (GPRS) and UMTS hinges on their capacity and speed of data transmission (Feiler et al., 2003). Nevertheless, phone consumption is often less constricting than managing an air fleet, as the latter is subject to strong logistics and organizational constraints (plane maintenance, availability of crew members, destinations offered, time slots...) as well as to constraints that exceed the strict context of transportation activities and concern the whole business (capacity of airport structures, travel agencies’ marketing policies...). As a consequence, an airline company has far less freedom than a telecommunications company to smoothen its demand.

Telecommunications operators are sometimes in a situation of partial monopoly in their distribution activity, and are thus not only freer, but also in direct contact with their subscribers: there is no intermediary between the provider and the
consumer. However, this situation seems to be changing rapidly as alternative communication technologies (VoIP, land lines, cellular communications, satellite communications, etc.) are providing new realms of competition. Following the example of energy distribution companies which, by means of their meters (which can switch electricity on or off and measure consumption), keep full control of their “command” function, telecommunication operators are permanently able to control, follow and direct the behavior of their customers, providing it is not too restrictive with them and lives up to their expectations. By imitating the model set by some electricity service providers’ invoicing policy (peak period cancellation system for example), a telecommunications operator could sometimes restrict the number of calls during certain peak hours or, on the contrary, encourage telephone consumption during periods of low demand. In the early months of 2005, Enel – the former monopolistic company of power distribution in Italy – widely advertised its price discrimination strategy based on the fact that it was possible for every customer having a digital meter at home to save up to 16 percent per megawatt by using power during peak off hours (namely from 10 p.m. to 6 a.m.).

Capacity limits
Traditionally the exception and not the rule with the use of satellites and the modernization of fixed network systems now become more and more an issue in the field of mobile telecommunications and the provision of services (Ancian et al., 1996). As customers more and more often demand value added services (VAS) that are based on data and content rather than on voice, capacity becomes an increasingly important issue. Even if very few customers would appreciate being restricted in their calling patterns even in exchange of lower prices, there are now many mobile-enabled applications with special features and services which customers may be willing to pay a premium for: VAS are the best way for mobile companies to maintain their profitability indeed – especially in the business customer segment. For example, service and sales force automation (SSFA) are enabled applications with special features and services which customers may be willing to pay a premium for: VAS are the best way for mobile companies to maintain their profitability indeed – especially in the business customer segment. For example, service and sales force automation (SSFA) are applications through which salespeople can access corporate data while at the customer’s office. In the context of CRM, a crucial success factor for SSFA applications is the speed at which data is transmitted. If the transmission rate is too low, data may be unavailable or too slow for sales negotiations with clients. Dedicated resources for high-yield customers go hand in hand with higher transmission rates (Feiler et al., 2003). As a consequence, many mobile operators have begun to price their VAS according to the amount of content downloaded (e.g. KB or MB) instead of to the time length of the connection.

Briefly described below are the cases of NTT DoCoMo I-Mode and H3G, their increasingly bundled offers of voice and data and their pricing approach for data services. This situation is very similar to the one of the airline industry where increasing competition forces companies to focus on highly profitable services and, at the same time, on revenue and capacity management to compensate the decrease in profits due to price wars.

**NTT DoCoMo and H3G**

**The competitive dynamics in the mobile telecommunications industry at a**

**global level is drastically reducing profitability on voice services. As**

**a consequence, the operators seek other profit alternatives, mainly in**

**data services and also in value added services (VAS): the most common**

**VAS are SMS (Short Message System), MMS (Multimedia Message System),**

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Videophone, Web browsing on mobile phones and push e-mail on mobile phones. This has generated great interest in the success of the business model of NTT DoCoMo and its I-mode in Japan. NTT DoCoMo constructed a platform, operating on GSM network as well as UMTS network, on which many suppliers of content can come together. At the same time, it offered to customers mobile e-mail services and an always-on access. NTT has however decided to charge these VAS services not with a traditional pricing scheme, based on the connection time (in terms of hours and minutes), but with a pricing system based on the quantity of information downloaded, thus working on the possibilities offered by its capacity and stimulated customers to use and appreciate its VAS services. The I-mode platform permits NTT DoCoMo to develop close relationships with content suppliers as well as with its own customer base. At the same time, it allows the development of R&D activities with a selected number of terminal providers (handset providers), permitting the growing improvement necessary to support the value added services supplied. The success rate of I-mode and NTT DoCoMo in Japan are interesting: 40,3 million clients in March 2004 utilized the service.

NTT DoCoMo stays in the middle of handset vendors, content providers and portal providers, offering them an interesting way to the consumer. Anyway, DoCoMo is far from being a simple carrier. The I-mode platform, in fact, is a portal site hosting plenty of contents especially designed for this architecture and accessible directly from the I-mode menu bar. Besides, the BOBO (Billing On Behalf Of) function provides a typical billing mechanism for the official content and service providers, which can totally rely on DoCoMo for the information charge collecting process, just by paying a 9% commission for handling all billing.

H3G is a relatively new player in the mobile market and is the first 3G video network operator in Europe offering services that merge voice, content and video services at a sustainable price. H3G has created a new network, with new rules that changes the whole mobile proposition: the 3G network gives the possibility to offer basic voice and data at much lower prices than the other operators.

3 is a Hutchinson Whampoa’s mobile company and is offering its customers mobile services based only on 3G standard and operating in the UK, Sweden, Italy, Denmark, Ireland, Austria, Australia and Hong Kong.

Also H3G has innovatively changed the pricing structure, by working on the quantity of information downloaded more than the connection time. For example, in many tariff plans, H3G offers a fixed monthly rate for a bundle of services based on voice, video, data, ranging from a simple “voice call” to “video call” to data transmission to access to 3 mobile portal, to download of contents and music, to the possibility to watch some TV channels on the mobile phone. For example, in Italy one tariff plan offers for 96 € monthly the following opportunities on a weekly basis: 5 hours for voice calls, 5 hours for video calls, 50 SMS, 50 MMS, 30 MB of Internet data traffic, 3 contents for free to download from 3 mobile portal.[2]

This highly profitable provision of services quickly develops itself and constitutes the most promising sector for the future. Capacity management thus becomes the operator’s major constraint and (partially) the condition on which perceived service quality -as well as the company’s global competitiveness- depends.

**The field of telecommunications**

It is impossible to sell services in advance because the number of calls is hard to evaluate a priori by users and even more by operators. Contrary to what happens in air transportation, this makes forecasts intricate. Services are sold “just in time”. One of the main conditions for yield management — i.e. sales by anticipation — is strongly called into question in the field of telecommunications as well as in some other service activities (electricity supply, catering…).

The glaring absence of independence between segments

An imperative rule set by yield management specialists (e.g. Cote et al., 2003) – compels telecommunications companies to manage and optimize their capacity rather than their profits in a strict sense. The marketing implications of this are extremely important and affect the strategic approach as much as the operational implementation of yield management.
Making it work: capacity management in telecommunications

In spite of some particular features, telecommunications operators meet some of the above-mentioned characteristics for yield management application:

- Capacity constraints do not have the same effect on every telecommunications company. In general, capacity constraints are a real issue for mobile networks where expert teams keep on increasing the size of their network in major cities to avoid (or at least limit) saturation during peak hours and where the real value moves from voice to data and content (Jallat et al., 1996). Of course, such capacity issues tend to disappear on fixed networks (introduction of optical fibers for transmission and ATM for switching). Fastweb for example – a leading operator offering telecommunication services to residential and business customers located in large cities in Italy – is using fixed networks working with optical fibers technology. Due to the technical features of its network, Fastweb is able to have a 75-80 percent ratio of network utilization without resorting to yield or capacity management techniques. As the number of customers increases, the network is upgraded in the same way in order to keep the ratio constant.

Moreover, capacity issues for fixed networks will be more and more affected in the near future by the use of Voice Over the Internet Protocol (VOIP), whose adoption will not only affect the use of capacity by telecommunications operators but will also move the network from a PSTN approach to an IP one. In this respect, the acquisition of Skype made by Ebay in September 2005 will probably have major effects on the market.

- Purchases can be postponed during the day or even the week (most personal calls can be made in the evening or during the week-end rather than during peak hours of working days).

- Some of the services that are provided by phone companies can be booked in advance. For example, a call to a booking number ensures the possibility of having a phone meeting at a scheduled time. Moreover, many mobile companies are selling “pre-paid” phone cards to their customers.

Yield management can be helpful to manage capacity-related issues and to maximize profits. In order to make the most of their existing network, telecom operators have to take into account the flexibility of people who are ready to postpone their calls in order to get a better deal. Moreover it appears that most residential customers are not looking for better quality or value added services, but for cheaper calls (e.g. the success of the low cost strategy of the Swedish company Tele2 all over Europe). So, telecom operators have to adjust their prices depending on the flexibility of users and on capacity constraints. If we want to be more precise, they will have to adjust charges to each type of user and to each area (destination of calls and/or area where calls are made).

In practice, this is done at two levels: network and consumer equipment optimization. Moreover, estimation of “natural demand curve” could be critical.

Network optimization

When a marketing team tries to apply yield management techniques in order to optimize the relation between market demand and capacity constraints, it has to be fully aware of the way infrastructure costs evolve. The key point is to avoid the “peaks” that saturate the network. In order to find an optimum time pricing system, telecom companies use a model that may be considered to be similar to classical yield management.

With such management systems, incremental costs become one of the key factors. In fact, yield management almost requires a case-by-case analysis in order to be efficient. It means that if one wants to optimize profits, one also has to deal with the incremental costs evolution on a case-by-case basis. This may be easy when the evolution of costs is linear. However, if we look at mobile telecom networks, we may find we are far away from such a configuration (see Figure 2).

If we add traffic to a mobile network, the incremental cost of the capacity expansion may vary very different levels. This cost will depend on the existing network configuration. If we refer to a simplified theoretical mobile network architecture - not taking into account BSCs (Base Station Controllers), transmission networks (microwaves for example), and radio engineering issues (radio frequency planning) - the additional equipment required to transmit an additional unit of traffic may range from nothing to a complete Mobile Switch Center (MSC). And the associated costs (i.e. the incremental costs) are mentioned in Table III.

Table III shows how different the incremental cost can be – depending on the level of saturation of the existing network. Theoretical variation may cost from $ 0 to $ 2,000,000 for a similar capacity expansion. The non-linear evolution of the incremental cost of a mobile network underlines the risk – as well as the gains – that the introduction of a yield management system can bring.

Consumer equipment optimization

In the last paragraph, we considered the company’s capacity but it is also possible to optimize capacity at consumer level.

Figure 2 Cost structures in telecommunications

Table III Incremental costs for additional equipment

<table>
<thead>
<tr>
<th>Additional equipment required</th>
<th>Direct cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>$0</td>
</tr>
<tr>
<td>Radio channel (TRX)</td>
<td>$1,000</td>
</tr>
<tr>
<td>Sectors</td>
<td>$60,000</td>
</tr>
<tr>
<td>Site and BTS (Base Transceiver Station)</td>
<td>$400,000</td>
</tr>
<tr>
<td>MSC (Switch)</td>
<td>$2,000,000</td>
</tr>
</tbody>
</table>
For example, we can take the case of a family with children. It is well known that teenagers like to spend a lot of time on the phone. It could be interesting for telecom companies to provide — even free of charge — a second phone with a separate line that could be dedicated to the children of the family. As in the traditional yield management approach, two problems must be solved. The first problem is that people without children have to be barred from getting this free line (they could use it for a fax machine...) and the second is that one has to optimize revenue. A free line implies a cost on which the telecom operator would like to get a return. As a consequence, one should give a free line to families where the children have limited access to the family’s phone because often kept busy by the parents. A way of doing this is to provide a free line to families with high phone consumption.

*Estimating natural demand curve*

It is obvious that an operator knows its traffic curve depends on the time of the day and on the day of the week. But this curve represents the demand that corresponds to the existing pricing terms. The natural demand curve could be estimated with formal and very sophisticated models. A most usual (and empirical) way to extrapolate the “natural demand” is to compare all the traffic curves before and after changes in rates. Historical data will give indication on demand elasticity (longer calls or more frequent ones) as well as on flexibility (ability to postpone some calls). The problem is the availability of such data. Even so, a problem of comparison arises. Moreover, if these rates are too old, it is difficult to take into account the way the users’ behavior has evolved (Ancian et al., 1996).

Another way to approximate natural demand is to remove existing pricing constraints, in order to make users free to communicate the way they “naturally” want to. This is something rather easy to do for the telecom industry compared to other industries. It is what British Telecom (BT) understood when they decided to launch “special offers”, as explained below.

*The BT experience for estimating natural demand*

In the 90’s, BT proposed the following discounts to its subscribers:

- “Sunday special”: every Sunday during two months, national calls within the UK were charged at the local cheap fare. As BT advertised: “this will mean that no matter where you ring in the UK, even if it’s from Land’s End to John O’Groats, it will only cost the price of a local cheap rate call”.
- “The BT down-under Special”: price cuts for calls to Australia and New Zealand (on Saturdays, for one month only). This offer follows “the BT Euro Special”, a similar offer for calls to Europe.
- “Double summertime” — also called “the BT Local Special”: Twice as much time for the same price regarding off-peak local calls (during one month).
- “The BT North America Special”: reduction for each call to Canada and the USA (every weekend during one month).

This was of course a way to face competition, to improve BT’s image and to cope with Oftel Price Cap but it was also a good way to let customers give vent to their “natural trends” of communication on these routes, and/or at these moments. The addition of all BT’s “special offers” provided a large panel of calls -either local, national or international (including Europe, the USA and Canada, Australia and New Zealand). It also provided related traffic conditions.

Moreover, it can be noted that BT conducted these experiments when its network had spare capacity. In other words, BT carried them out whenever the implementation of yield management results could be efficient. Consequently, all these “special offers” enabled BT to construct an approximate “natural demand” curve in a nine months period only.

BT launched large advertising campaigns for each “special offer”. This was a way for BT to test the impact of its different advertising campaigns as a “warm-up” before any full-scale yield management implementation. As such, this “special offers” system was both a quick way to construct a “natural demand” curve and a useful test for advertising campaign impacts before setting up a complete yield management system[3].

Telecom operators have to be very careful when implementing yield management (even a basic one). When an airline company can limit the number of “discount seats” in order to secure a seat and provide a better service to the customers who can pay full-price, a telecom operator cannot easily prevent a “discount customer” from connecting to the network. If yield management can help telecom operators to optimize the benefits they can derive from an existing network, such a system however is more difficult to implement in the telecommunications industry than in the airline sector because of the difficulty to control — or even refuse — network access to consumers.

**Yield management, dynamic pricing and customer relationship marketing in telecommunications: a complex and powerful integration**

*Complex consumer behavior*

As appears from previous descriptions, yield management in telecommunications consists in finding a good compromise between the natural demand of consumers and network capacity. In airline companies, compromise is struck between capacity and revenue. Where does this difference come from? It seems that the explanation can be found in that an airline company is able to keep segments independent one from the other. In telecommunications, this is impossible. A lot of phone calls can be cancelled easily. That is the reason why it is very important to understand consumer behavior as much as possible. This is the case in any yield project, but in telecommunications this seems to be even more difficult. The difficulty stems from the complexity of the product and the fact that consumers are free to use the network or not.

*Impact on communication and promotion*

Telecom companies do not know their customers’ behavior very well. And they try to reduce the great variability observed among customers in order to obtain a set of well-controlled behaviors. This is one of the main reasons why their communication is very price-oriented. In a more competitive multi-media environment, pricing and discount strategies are also ways to promote their business among various stakeholders and lobby (see the case of Bouygues Telecom below).

**Short message system (SMS) pricing strategies and communication – The case of Bouygues Telecom**

Given the maturity stage of the market and the competitive pressure on voice services, French operators have tried to develop some associated services in order to push mobile phones’ usage, increase the average revenue per user (ARPU) and develop more profitable global packages. In 2004, Bouygues Telecom launched two new forerunners (Millenium SMS and Option Texto) based on unlimited SMS during weekends.

Apart from a typical marketing incentive devoted to develop final users’ consumption levels and ARPU, these new pricing offers / forerunners applied on SMS have been a way to counter aggressive campaigns from consumer lobbies as well as legal pressures from the national regulation authorities. As a matter of fact — and even if the price of SMS is usually perceived to be much lower than the price of voice services by final users— the profitability of SMS (in terms of final price %) is much higher than the one of many other telecommunication services.

As such, Millennium SMS and Option Texto were not so much driven by yield management opportunities or available capacity considerations than by communication and lobbying purposes: the main objective here was to be able to decrease the SMS average “promoted price” (e.g. prices shown in advertising campaigns and promoted through mass media) as well as to address some of the legal requirements of the French authorities (large access to services for the general public...)[4].
Impact on segmentation processes
Well designed, yield and capacity management systems can help mobile telecommunication firms to segment the market better and increase the efficiency and the effectiveness of their marketing strategies. If we consider a network for mobile services with a given capacity used at the same time by private and business users; the more the firm is able to manage capacity and segment the same time, the more efficient and effective its approach to the market. As a consequence, the more the firm is able to create different segments – with different profiles of services created on the basis of the capacity (e.g. Profile A: dedicated capacity for business users with guaranteed bandwidth, high basic fee and euro X per MB downloaded; Profile B: residual capacity for private users with no guaranteed bandwidth, low basic fee but euro X + Y per MB downloaded) the more it is able to analyze perceived value, increase satisfaction and loyalty from different customers and increase yield per unit of capacity at the same time.

“Customized management of services supply”: an application for mobile phones
In the last few years, telecommunication companies (both fixed and mobile) have invested a lot in creating huge databases on their customers and developing sophisticated CRM strategies. As a matter of fact, these companies understand that their customers are among their main assets and that they have to invest on a long-term relationship with them. This is even more critical in present time, when intense competition is dominating the industry and when revenues (ARPU – Average Revenue Per User) are declining over voice services (now becoming a commodity), forcing firms to invest on large bandwidth networks and on the related value added services (VAS). As a consequence, the Telco industry is now very interesting industry in which yield and dynamic pricing strategies as well as CRM strategies are taking place and could be integrated.

Moreover, thanks to the expansion of information highways, it is now (almost) possible for telecom operators to communicate through a multimedia interface with each of their customers. New technologies are indeed closing the gap between traditional market research methodologies, such as customer satisfaction surveys, and highly targeted one-to-one marketing. Leading mobile telecommunication companies are therefore a benchmark for companies interested in understanding how to create, develop and benefit from huge customer databases. Increasingly, consumer learning happens in real-time and is used to immediately re-orientate outbound marketing efforts (see the minicase “CRM and the use of wireless technology in Japan”).

CRM and the use of wireless technology in Japan
Japan has the world’s most advanced mobile telecommunications infrastructure and unsurprisingly leads the world in this domain. Around half the population of the country is connected to the Internet 24/7 via their mobile phones. The case study of a national video rental store outline how customer satisfaction is moving to mobile-CRM and the role that wireless technology has in facilitating this evolution in Japan. Have you ever been to the local video/DVD/CD rental store and the title you want is just never there? Or you really would like to be able to get some direction on what good movies are coming our or are available in the genre that you desire …

One of the largest video franchise in Japan (which also offers rental) understands that frustration and has innovatively come up with a mobile solution. As is the case in any video rental store, there is the ability to actively collect a large database of clients and a top-tier of personal level information.

This case based on the very advanced mobile space in Japan shows how the issues of time, representation of the market and integration with marketing initiatives that usually challenge market researchers have been addressed by this video franchise. Moreover, the company has successfully utilized the mobile solution to achieve dynamic tracking of its customer base and its behavior: up-to-date consumer understanding facilitates both improved inventory control and marketing activities. Therefore, we may soon observe the emergence of a “customer yield management” or, as we will name it later on in this article, a “customized management of services supply” – the idea being to optimize profit by making each customer more satisfied in providing him with many customized services bundling.

An equivalent of this “customer yield management” could be derived from selective advertising on cable television. The future digital architectures of television networks will allow customizing advertising to the consumer’s taste. At the same time, advertising will becomes a better economic proposition for companies using it: they will reach their marketing target with increased efficiency. This system has to be implemented with a very efficient yield management program: which ad has to be sent to which target consumers, knowing that the time during which consumers watch ads is very restricted.

If we refer to what was said previously, it appears that it is difficult to maintain total independence between market segments in the telecommunications sector given that each segment benefits from the same services (or almost the same ones). It means that network access control and individual real time yield management systems would be necessary to improve the operator’s performance decisively – especially on very profitable market segments. The operator could inform all customers about the price to pay whenever they would like to place a call. The price would depend on the “access category” of the user. This “access category” would take into account the type of customer's subscription (Premium, Business, Low...). Class parameters could include various pricing tables and different types of periods (working days versus weekends and/or peak hours vs. off peak ones…). The “access category” could also refer to geographical segments.
In any case, access priority must be clearly defined for each level of subscription. In fact, the only way to have independent segments is to control access to the network. The Yield management system must be able to refuse access to “low users” in order to enable “premium subscribers” to connect to the network first.

Taking all these parameters into account, a mobile phone operator should use a network with a high performance information system. This system should provide data on each subscriber and on the state of the network everywhere, at any time so that when customers want to gain access to the operator’s services, the yield management system should decide whether it is possible or not. Then it should propose a price based on the level of saturation of the network between the caller and the person being called. The price could also depend on the characteristics of the customer (parameters relative to the range of subscription). The system may propose some alternative periods in the day for cheaper calls. This last point requires complex statistical data in order to predict “near-future” levels of saturation. It also needs data on the customers’ propensity to postpone calls.

Such a system may look rather utopian. However, there are today no major technological obstacles to build it. Before initiating any call, the current mobile phone network consults databases that include the characteristics of the subscriber who wants to make a call. Network capacity parameters can already be found in the various switches. The network is able to locate the subscribers. It is also able to send information to the user when he wants to call – such as signal strength, location, as well as any other information that is available on the network management system. The only technical obstacle today is the implementation of a yield management system that could be able to generate the right information on a real time basis. However, such systems already exist in the airline industry’s Global Distribution Systems (GDS).

In such a context it appears that we could soon see the birth of a Very Personal Communication System (VPCS) if the huge problems of subscribers’ behavior could be solved. First of all, it is unclear how will users react if they do not have a clear vision of the price they will pay for a call. Second, direct on-line price evaluation for each call may make customers “uncomfortable” with the VPCS: they may get the impression that they face a “black box” which obeys strange laws. Third, the new yield management system should be compatible with “visibility” and “transparency” requirements from the consumer.

The problem of indirect demand: keeping a direct link with the customer
In order to be effective in its yield management implementation, a firm requires a direct link to the customer. Customers must be aware of the services offered by a given operator and they must have an easy and direct access to them.

However – when keen competition occurs – each operator tends to optimize its trade structure. In this complex environment, new companies (intermediaries or brokers) are entering the market and offer to manage the users’ complete needs. This is, for example, the case of COLT in London. COLT is connected to long distance operators (such as BT, Mercury, Energis or Worldcom) and chooses to connect its customers to the cheapest one on a “call by call” basis (depending on the day of the week, time of the day, and destination of the call...).

The growing importance of intermediaries is not specific to telecommunications (Jallat and Capek, 2001). Developing direct contacts with the final consumer is one of the most efficient long-term strategies in other sectors as well (Glazer, 1991; Normann and Ramirez, 1993; Magretta, 1998; Ferris and Oshima, 2004).

Such contacts will become so important in the near future that subscriptions could be given for free as the main goal of telecommunications companies will be the creation of huge databases and extended partnerships. As shown in Figure 3, this is already the case in the airline industry where some players are much more profitable on information brokerage or “services bundling” than on transportation as such. Major players which manage computer reservation systems and information centers (GDS) are indeed able to choose their “service partners” and gain control over the final market.

Given the fast technological evolutions in telecommunications, there will soon be a large increase in the number of providers which could pass through the phone to sell and promote their services: the wired or mobile line will soon become the “highway” to the customer for selling many different products and services. As a consequence, the importance of long-term relationships is becoming further more important. The main objective of operators will thus be to sell a customer access database to these service providers in order for them to promote as many “packages” as possible (information services, tele-shopping, tele-education...) and increase their global profitability. For example, H3G, the Hutchison Whampoa mobile 3G company, is offering in Italy, in joint with Sky television, football championship goals in real time over the mobile telephone. The same is for Sky television news, for stock exchange and other financial news, for films previews and so on. Another example is given by TIM (Telecom Italia Mobile) which is offering its customers a credit card issued by a financial institution and the contents of a television company named La7.

Beyond the context of telecommunications, the current competitive environment actually compels companies to develop direct links with their customers (Reichheld and Sasser, 1990; Peppers and Rogers, 1993; Irons, 1994) or, at least, compels the organization to force or convince its intermediaries to keep the “umbilical cord” with the final market alive (Kay, 1993; Jallat and Capek, 2001). Examples like Zara in the textile sector, American Airlines’ Saber system in the field of tourism and air transportation, Dell in the computer industry show how the companies which are able to control commercial database and tap sophisticated marketing information dominate their market (Magretta, 1998; Ferris and Oshima, 2004). A similar evolution, as depicted at the beginning of this paragraph, is arising in the field of telecommunications: many mobile telecommunication operators are investing huge budgets in CRM activities. By doing so, they are creating very sophisticated databases from which they will be able to extract powerful information to sustain their dynamic pricing approaches as well as their CRM activities in a relational perspective. Vodafone company is investing a lot on CRM and is integrating pricing strategies in its CRM approach, having the increase in lifetime value of its customers as a critical objective. The sophisticated use of CRM data in pricing strategies by Vodafone is described below.

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Sophisticated use of CRM strategies by Vodafone

One interesting example of a sophisticated use of CRM data is offered by the case of the “Price Plan Review” adopted by Vodafone Omnitel in Italy. This program is based on a continuous profiling activity done by Vodafone Omnitel, which continually tracks its best customers and their phone and data consumption behaviour. Moreover, Vodafone has created software that enables it to “alert” them when another tariff profile (an existing or new one) is more convenient, before the customer himself or the competition can discover it. In many cases, the firm thereby loses margins in the short run but gains value and customer equity in the long run. The results of this program, as reported by Vodafone, are very positive. The churn rate has definitely decreased, the ARPU (Average Revenue per User) and the amount of traffic increased.

Similarly to Price Plan Review, Vodafone is offering automatically to its best existing and loyal customers the advantages given to new customers: this is done mainly through promotions offered as a premium for loyalty (e.g. Christmas Card, Summer Card).

The Vodafone case is an interesting example of how yield and dynamic pricing strategies can be integrated in a more general and long term relationship based strategy of the company: the potential of integrating CRM and Revenue Management is very powerful and resides in the possibility to increase and maximize long term profits and stock value, by acting on customer equity (Wayland and Cole, 1997; Blattberg et al., 2001). In this article, we have called this new kind of relationship among possible yield management techniques in telecommunications, dynamic pricing approaches and CRM strategies, “customized management of services supply”, as shown in Table IV.

Conclusions

Since the telecommunications are undergoing a process of increasing competition and dynamic convergence, yield management and dynamic pricing strategies could be usefully applied to preserve and increase profitability. In this article we discussed the specificities that should be taken into account from an academic as well as from a managerial perspective in adopting yield management and dynamic pricing in industries different from those in which these concepts originated. We presented and discussed also the concept of natural demand curve which aims at reaching a better compromise between the capacity of a company and demand in an environment where services cannot be sold in advance (Ancian et al., 1996).

We tried to show how telecommunication companies should adopt yield management and dynamic pricing techniques and demonstrated the strategic importance for a company to have full command of its database and foster the integration with CRM strategies. We therefore put forward the idea that the issue of integration among yield management techniques and CRM strategies is increasingly a critical one for companies thinking in a long-term relational perspective. Given the large increase in the number of service providers, the main objective of operators could be to sell a customer access database to potential partners. This represents a radical change in the nature of financial and information flows and leads to a “customized management of services supply”.

Yield management techniques can help telecom operators and similar companies to optimize the benefits they can derive from a subtle management of information networks and partnerships. However, such an approach is more difficult to implement in the telecommunications industry than in the airlines sector because of the difficulty to control (and sometimes to refuse) network access to customers. Moreover,
Yield management, dynamic pricing and CRM in telecommunications
Frederic Jallat and Fabio Ancariani

ethical and fairness issues are critical in this regard and should be addressed by future research.

Notes

1 This paragraph has been rewritten taking into consideration one of the reviewer useful comments. The authors would like to express their sincere thanks.

2 This mini-case has been written drawing information mainly from the following references: Anwar (2002); Bradley and Sandoval (2002); Kodama (2002, 2003); Ratliff (2002); Shiina (2002); Williamson and Meegan (2002)

3 This minicase has been written relying mainly on internal France Telecom data and on the following reference: Ancian et al. (1996).

4 This minicase has been written drawing information from the following reference: Ferris and Oshima (2004)

5 This minicase has been written drawing information from the following reference: Addis et al. (2002).

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Further reading

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Executive summary and implications for managers and executives

This summary has been provided to allow managers and executives a rapid appreciation of the content of this article. Those with a particular interest in the topic covered may then read the article in toto to take advantage of the more comprehensive description of the research undertaken and its results to get the full benefits of the material present.

Imagine buying a cool drink from a vending machine on a hot, sunny afternoon and finding you have to pay more than you paid the previous day when the weather was cold. Or discovering the hot drinks suddenly become more expensive on chilly days.

That is what consumers might discover if vending machine producers successfully introduce sensors to change the price according to the external temperature. The assumption is that, if you are hot and thirsty, you will pay the higher price for the cold drink on a warm day, and vice-versa.

It is all about “dynamic pricing” which fixes a price as the result of the match between demand and offer, and which depends mainly on different customers’ willingness to pay. It is nothing new; a bit like ice-cream sellers hiking up their prices at summer holiday times or at carnival events, when there are crowds of families with young children ensuring demand.


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Together with “yield management” – maximizing profits by charging different customers different prices depending on demand and availability (for instance, for hotel room reservations, airline tickets) – these techniques try to optimize revenues.

The fact that both are forms of price discrimination – that is to take the profit opportunity of pricing according to different customer perceived value – companies need to be aware of any legal or ethical questions which might be posed by their adoption and, importantly, the risks of alienating customers.

Selling a more expensive ice-cream to a child’s parents, or inflating the price of a beer at a big sporting occasion might be regarded as understandable (even if resented) “one off” opportunities to keep profits healthy, but having resentful customers in businesses where you need them to come back again and again is more problematic. Hence the need to link such strategies with customer relationship management (CRM), so what you are doing and why is better explained and understood, and the customer can see a benefit for themselves.

While the airline and hotel industries’ systems of managing demand by charging more at peak times have a proven track record of both managing demand and pricing for maximum return, and of general acceptability among customers, Frédéric Jallat and Fabio Ancarani argue that they could be profitably applied to telecommunications and similar industries.

In fact, as voice, content and data transmission gradually merge, these industries are now facing a process of competitive convergence and increasing competition. As a consequence, capacity and revenue management become critical differentiation factors to improve service quality, increase loyalty and preserve profitability. Moreover, in converging and ever-demanding competitive environments (like the telecommunications industry), it is a question of strategic importance to manage not only yield management, but also dynamic pricing and to integrate it with a full command of its database and CRM strategies.

In order to exploit the full potential of yield management and dynamic pricing strategies, telecommunication firms are expected to leverage the existing knowledge of their customer base and to improve it through adequate CRM activities.

As a consequence, demand calibration is very important before a telecommunication company thinks of optimizing revenue. In telecommunications, the first step when implementing demand-calibrating methods is to reconstruct the “natural demand” curve – the way users would phone if there were no price discrimination (peak/off peak hours, working days/weekends etc). Demand calibration is then usually defined as a function of price elasticity, time elasticity (length of time consumers could wait before placing their phone call) and time volatility (consumers’ tendency to accept changes in rates over time).

Yield management can be helpful to manage capacity-related issues and to maximize profits. In order to make the most of their existing network, telecom operators have to take into account the flexibility of people who are ready to postpone their calls in order to get a better deal. It appears that most residential customers are not looking for better quality or value-added services, but for cheaper calls. So telecom operators have to adjust their prices depending on the flexibility of users and on capacity constraints. To be more precise, they will have to adjust charges to each type of user and to each area (destination of calls and/or area where calls are made).

Well-designed, yield and capacity management systems can help mobile telecommunication firms to segment the market better and increase the efficiency and the effectiveness of their marketing strategies. If we consider a network for mobile services with a given capacity used at the same time by private and business users; the more the firm is able to manage capacity and segment at the same time, the more efficient and effective its approach to the market. As a consequence, the more the firm is able to create different segments – with different profiles of services created on the basis of the capacity – the more it is able to analyze perceived value, increase satisfaction and loyalty from different customers and increase yield per unit of capacity at the same time.

(A précis of the article “Yield management, dynamic pricing and CRM in telecommunications”. Supplied by Marketing Consultants for Emerald.)