Multiservice billing system — a platform for the future

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Billing systems are key competitive weapons for telecommunications companies. BT is developing a new generation billing system under the auspices of its Billing 90s programme. The term adopted in this paper for the system is multiservice billing system (MSBS). The paper outlines the strategic business issues which have shaped the design of MSBS. It describes the scale and complexity of the problem which makes the construction of a multiservice platform such a difficult feat of software engineering. The concept of a common product model, which underpins the system’s design, is introduced. The later sections provide a brief outline of the architecture’s physical realisation.

1. Introduction

The telecommunications industry is characterised by increasingly fierce competition on a global scale. Deregulation and growing customer sophistication have revolutionised the role of the carrier in the marketplace. Technology is reforming the very nature of the industry as the boundaries between telephony, television and computers blur. These sweeping changes are placing carriers’ traditional support systems under enormous pressure. Over the next decade this pressure will be directed heavily on billing systems. The days when billing was a simple back-office administration function are long gone. The complexities and scale demanded of a modern telecommunications billing system make its construction a most challenging feat of software engineering.

BT is developing a new generation billing system under the auspices of its Billing 90s programme. The term adopted for the system is multiservice billing system (MSBS). This paper discusses the design concepts which underpin MSBS and their physical realisation. Firstly, some strategic business issues [1] which have shaped the MSBS design are discussed.

1.1 Rapid product launch

Billing has to become an enabler, rather than a barrier, in the product-launch process. Traditional billing systems are almost invariably designed to support a particular product. Two main approaches to billing for new products are commonly used today — either a completely new billing system is constructed, or else an existing one is forced to bill products it was never designed to handle. The first course of action leads to a proliferation of small-scale billing systems. The second approach places intolerable pressure on existing hub systems, causing their software to degrade at an alarming rate. The end result is the same in both cases — billing systems are notorious in the industry for inhibiting the launch of innovative products.

Much the same arguments can be applied to other operational support systems. However, billing has a unique link with product introduction. The demand from large customers for complete solutions is forcing carriers away from selling a relatively small set of fixed products. The new approach is called ‘application selling’. Here carriers package various elements of service together to produce customised offerings — tailored either for specific industries (like transport, energy, or medical) or for particular business functions (e.g. LAN connectivity). The basic network building blocks remain the same, it is the billing system which wraps them with customised pricing, discounting, and reporting structures.

So the real competitive weapons for carriers are devices like volume-sensitive pricing, term contracts, contributory and eligibility (C&E) discounting, pool contracts, and flexible payment plans. It is the billing system — perhaps even more than networks — which provides the firepower for the competitive battles which lie ahead. If flexible pricing and reporting mechanisms are not available to hand, it will take months or years — rather than days or weeks — to construct most products. It is therefore the sophistication of the billing system’s armory which will largely determine who wins the war.
1.2 Financial drivers

The changes being experienced by telcos are taking place in the context of an unrelenting downward pressure on costs. The greatest cost reductions will come through the use of common technology and processes. BT currently has scores of different billing systems. The aim is to reduce these drastically. Cost can also be reduced by tackling errors in the various bill pipes. Revenue leakage and the direct costs associated with manual intervention clearly need to be minimised. Well laid out, easily understood, invoices will reduce the number of bill queries — which currently account for about 40% of BT’s in-bound customer contact.

Financial drivers are not only about cost reduction. Third-party billing is a potentially lucrative service for carriers. For example, many large businesses employ significant numbers of staff to handle internal departmental accounting for communications. There is an opportunity to support the outsourcing of this function, provided that the telco’s billing system can be driven to produce internal charging reports. The same approach can be applied within the carrier’s own organisation. Some carriers have already adopted a retail/wholesale model, with financially accountable internal trading units. Initially the agreements between the various trading units will be at a fairly gross accounting level, but within a short period of time the trading units will demand operational systems which can implement genuine cost/price models. The danger for designers in all of this is that they start with too simplistic an abstraction of billing. Billing is not about managing the financial relationships between a single monolithic service provider and a set of customers. It models potentially recursive relationships between parties who may be service providers, customers, or both. The rate at which joint ventures and partnerships are springing up round the globe reinforces the point.

Perhaps the most exciting example of third-party billing relates to broadband intelligent networks [2]. Some form of third-party billing will be needed to manage the financial relationships between content providers, network operators, and customers (see Fig 1). So-called ‘cybercommerce’ challenges the traditional bill/pay paradigm used for the vast majority of telecommunication services. Singleton purchase — the most widespread financial model used on the Internet today — will not cope with high-volume usage services. However, other models exist — where financial brokers manage credit agreements between customers and service providers may one day supersede the old bill/pay method for some services. The carrier’s role in this scenario needs to be positioned with extreme care — the implications which flow from debates about ‘who will own debt on the Net’ have profound consequences for business strategy. Billing engineers must therefore design systems which are flexible enough to handle the potentially novel financial relationships between all the players in broadband intelligent networks.

![Fig 1 Players in broadband intelligent networks.](image)

1.3 Customer management

Billing platforms of the future must be built as marketing systems. Their abilities to perform mass customisation, monitor revenue by segment, provide sophisticated messaging, and support modelling tools are as important as the administrative functions. Many of these requirements presuppose that the new billing platform will eventually handle all customer segments. The idea of a ‘single solution’ for all segments is a difficult pre-supposition for the engineer to digest — the characteristics of huge multi-national business customers seem so incredibly different from the characteristics of the millions of low-usage residential customers. The goal of common technology, while an admirable one, can sometimes be impossible to achieve. The argument against a single solution is a powerful one, given the inherent complexities of billing. However the advantages of a single solution are much greater than the cost saving which arises from common technology.

An analogy from the car industry might be helpful at this point. Most of the features which are taken for granted in mid-range cars today (like electric front windows, air bags, or power steering) were originally launched only in top-range cars. The features then ‘trickled-down’ to cars aimed at different customer segments. A similar trickle-down principle can be seen in the UK mobile market. It will also apply to features like consolidated billing, account codes, loyalty programmes, and customised packaging. A single billing platform for all customer segments allows this principle to be realised without the trauma of managing different implementations of the same product across disparate platforms. By far the most compelling argument for a single platform relates to ‘affinity products’. The millions of residential PSTN customers are not completely autonomous beings with no relationships to each other or to the businesses in which they work. Affinity products will begin to weave increasingly complicated relationships between groups of residential customers, and between businesses, to the point where the cost-centre hierarchy of a large multi-national will not seem unduly complex.