Strategic Analysis of Global Telecoms Service Provision

Tom Lynch, Sonia Skelton and Michael H Lyons
Systems Research Division
BT Laboratories
Martlesham Heath
Ipswich
IP5 7RE, UK
Tel: +44 473 645024
Fax: +44 473 647410

Abstract

One of the largest growth areas in telecommunication is global business communications. In today global economy, companies want to communicate across the globe through a single service provide in a seamless manner between all their locations. For this to happen the service provider mu operate in markets which have differing cultures, regulatory frameworks and levels of competition.

We present here a systems dynamics model developed using the *IThink* software package, whic investigates some of the major issues of global service provision. The world is segmented into foı regions within which there can be distinctly different conditions. The model captures the complexi of obtaining a customer in a region and providing a global service in a time scale which will satis the requirements for connectivity between its world-wide locations. The degree to which customer's requirements can be met will be dependent on the presence the provider has througho the world.

Initial results indicate that the perception of a provider's service has a strong influence on mark share within its home region and also the other regions of the world. However, this can lead scenarios where a strategy to improve service offering without due regard to provisioning constrain can lead to a loss of market share.

The modelling activity delivered three major benefits: it has provided valuable insight into a k telecommunication market; it has demonstrated the applicability of systems dynamics telecommunications strategy, and; it has highlighted areas for development which will provide futu value.

Strategic Analysis of Global Telecoms Service Provision

Introduction

The telecommunications industry is currently in the process of great change in every aspect of its business. Many of the major telecoms players are no longer operating purely as domestic monopolies. In response to increasing liberalisation and competition in their traditional home markets, they are seeking to move into the global arena. Telecommunications services themselves are evolving from simple telephony to integrated voice, data and visual services, particularly for large business customers.

Large multi-national customers (MNCs) have traditionally constructed and managed their own corporate communications networks. More recently, the trend has been towards outsourcing, whereby corporate customers hand over responsibility for the entire telecommunications function to a specialised company. This presents a major opportunity for service providers. Major business customers, particularly those with a global presence, currently spend typically 2% to 4% of their revenues on communications. In certain sectors this percentage can be as much as 40%, notably finance. This expenditure is likely to increase as new services are introduced. For example, visual services, supported by new technology, offer a cost effective alternative to a proportion of international business travel.

Competition for this business is fierce and not confined to telcoms operators alone. Other players in the field include data network providers, computer companies, other utilities and consortia formed specifically to address this opportunity.

Cultural, geographic, regulatory and technical factors, within the context of this rapidly growing and dynamic market, give rise to considerable complexity. Systems dynamics was identified as a suitable approach for a modelling exercise. This paper describes the application of systems dynamics techniques, to construct a model for the analysis of providing a global service under a particular set of conditions.

Modelling Objectives

Global operators, such as BT, must provide high-quality solutions to enable multi-national companies (MNCs) to communicate with locations dispersed throughout the globe. The global provider must offer a seamless service across widely varying markets, regulatory regimes and network infrastructures, providing a uniform standard of accessibility and quality of service.

The success of a new service will depend on many things such as time to market, quality and control of service offering, price and feature richness. These factors will be influenced by the underlying platform over which they are offered. Choice of platform will also dictate when and how a service will become available. It will have cost and possible pricing implications.

Globalisation brings new complexity to strategic decision making. Different parts of the world have diverse networks, employing different technologies. Some operators have excellent infrastructures; others are poor, regulatory regimes vary; competition can be aggressive in liberalised and developed markets or non existent in countries with a single state owned monopoly operator.

Within BT, there was considerable interest in developing a systematic approach to assess how global service provision could be tackled. After consideration of the alternatives, systems dynamics was identified as the most appropriate technique for the initial, high level modelling exercise.

It was acknowledged that there were considerable difficulties rationalising legitimate concerns from different functional areas within the company. It was essential that if all the relevant issues were to be identified, a means of enabling co-operation and information exchange across functional boundaries must be found.

Therefore, the team developed a pictorial representation of the system of global service provision, featuring a fictitious company. This was developed at some level of abstraction to facilitate the open exchange of information and to enable people to discuss opinions freely. It helped the team discuss the same sorts of issues with a range of different people, and to captur their perspectives. In this way the map was modified and improved. A critical benefit arisin from the study, was seen to be the formulation of a system map that could embody the knowledg of experts from many functional areas in the company.

The objective of the work was to develop a system map by consensus and to populate it witl data, relationships and expert opinion to develop a model, which would give insight into the ke issues associated with this new area. This approach was taken to allow a wide range of issues to b investigated whilst maintaining a strategic focus, and describing the system in a manner that coul be readily understood and disseminated. This approach contrasts with most spreadshee modelling, which does not have a readily accessible graphical interface, and appears to encourag the modeller to acquire large sets of detailed data at an early stage.

After the model had been developed, it was proposed that a number of scenarios would b analysed and compared. In this way, different attributes of the market, the method o provisioning and the service offering could be investigated. The successful completion of thi work would provide the steer for further modelling directly related to BT. This would feature more detailed analysis of planned future services, critical success factors and strategic options.

Method of development

Two potential approaches to the modelling exercise were evaluated: the first sought to addres the dynamics of global markets; the second, to model internal processes undertaken whe offering a service. The former approach was selected; the aim was to produce a top-level view c a future global marketplace which would highlight areas for further investigation. By maintainin a level of abstraction, it was hoped that the tendency to become embroiled in the detaile practicalities of delivering a "real" service would be avoided and strategic high-level factors woul be to the fore.

To aid the process of information gathering, a "typical" videoconferencing service wa characterised in general terms. This was seen to be a good example of a global service, and on for which a number of market analyses are readily available. (Frost and Sullivan, 1991a, 1991t Ovum, 1993).

In parallel with the collation of information from reports, a number of small workshops wer held. The preliminary map was used to stimulate discussion and to bring out the many relevar issues as perceived by people from different parts of the business. Each of the workshops gav rise to further refinements of the map. They also helped to define some of the relationshir between likely modelling parameters. The workshops were supplemented by face to fac meetings with key players.

The major reason for adopting this method of data gathering and on-line map construction wa that an open and interactive exchange of ideas and opinions was essential if the modellin activity was to be credible. By involving key players during the earliest stages of the mappin and modelling process, they were able to have their input recognised and incorporated. Thi encouraged them to buy in to the modelling process and to have confidence in the behaviour c the model.

The authors, who facilitated the modelling work, also had an interest in its outcome. The intended to use it to explore a corporate future vision, and to analyse the impact of a number c service scenarios. In this respect, they were able to buy into the model and to bring som personal input to the modelling itself. This advantage was set against the accepted risk of conflict of interests between that of stakeholder and facilitator.

Structure and content of the model

The *IThink* software tool (Peterson, 1992) was used to develop the model. It supports graphical user interface for mapping which allows the rapid development of pictori representation of systems. These maps are subsequently used as the basis for building the model.

To give the model a global dimension, the market is split into four regions; North America, Far East and Asia, mainland Europe and the UK. The model illustrates how these markets will be serviced and the major players' market shares. Future enhancements would aim to disaggregate further some of these regions, particularly Europe, where there is a broad variation in terms of market size and regulation.

The company operates in this competitive environment. For the purposes of this modelling exercise, the competition is represented as a single entity in each region. It represents the best possible competitor and incorporates any restrictive regulatory constraints. The principle outputs of the model are the relative network investment and associated revenues of each possible scenario to support the global service.

Figure 1 outlines how the model has been designed and is intended to provide a route map through it.

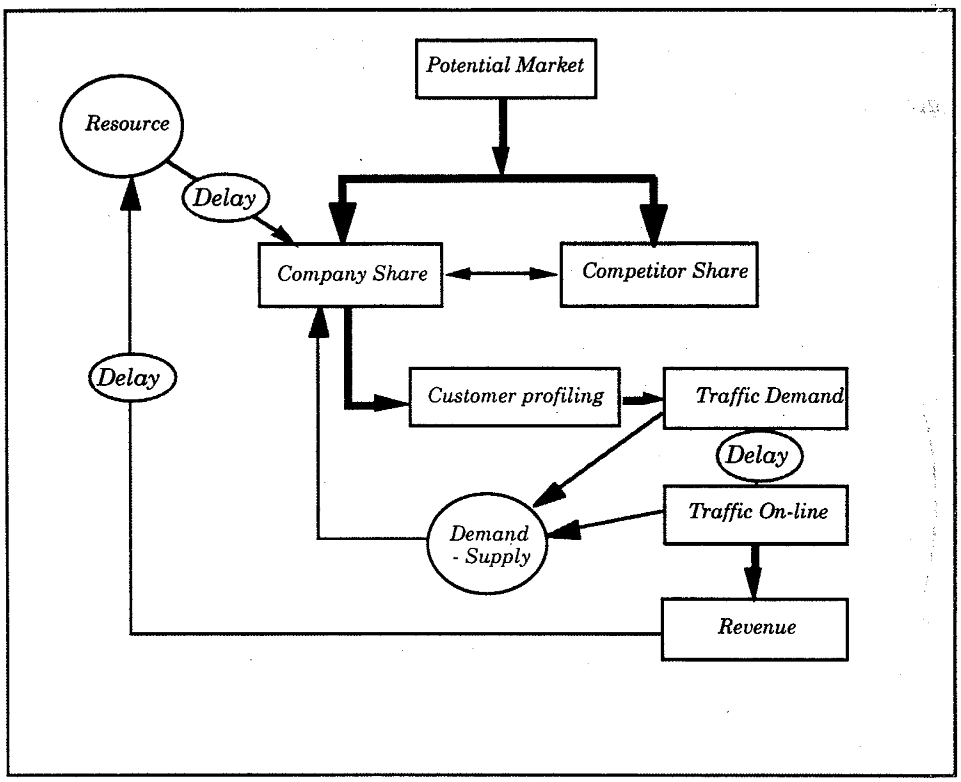

Figure 1 Global Service Model

The diagram represents the structure of one of the regions. This same structure is identical across all four regions although parameters and constants are region specific. An MNC will go to either the fictitious company or to a competitor. This decision will depend on the attractiveness of the service offering relative to the competition. Having taken up a service, an MNC may decide to leave its existing supplier and go to the competitor, and vice versa. The model can be considered to consist of two sub-models: a market share sub-model and; a capacity provisioning sub-model. These are described in more detail below.

Market Share

This sub-model combines the effects of growth in market share and the effects of competition. The market for global services is young and is expected to grow rapidly in the early years. Therefore initially, there will be competition to win customers who do not have a comparable existing system. As the market matures, there will be increasing competition to win existing customers from the other operator.

There are several market models which combine these effects of diffusion and competition. From the many possible, the Bass model and its numerous variants is the most popular (Mahajan, Muller 1979, Mahajan, Muller, Bass 1990). The original Bass model (Bass 1969) defines tw types of customers; the innovator and the imitator. The innovator will make a purchas independently of the number of existing users. Imitators, on the other hand, will make a decisio based on the popularity of the service. Within the context of this model, the innovator can b equated to those customers who will make a purchase based predominantly on the servic providers perceived offering. Factors such as the technical specification, experience of th supplier, brand image, customer service attributes and other soft factors can be included in thi category. The imitator will be influenced to a lesser extent by these factors and will look mor towards the popularity of the service.

Lyons (1994) has developed a model to consider telecommunications services interactions. Thi was combined with the Bass model to represent a market, incorporating diffusion of a new servic and competitive effects.

Figure 2 gives an illustration of the *IThink* representation of this model for each of the region: The model is essentially a closed system, although there is provision for some market growtl This will have a small effect as the numbers of multinational companies are not assumed to var greatly over the time frame under consideration.

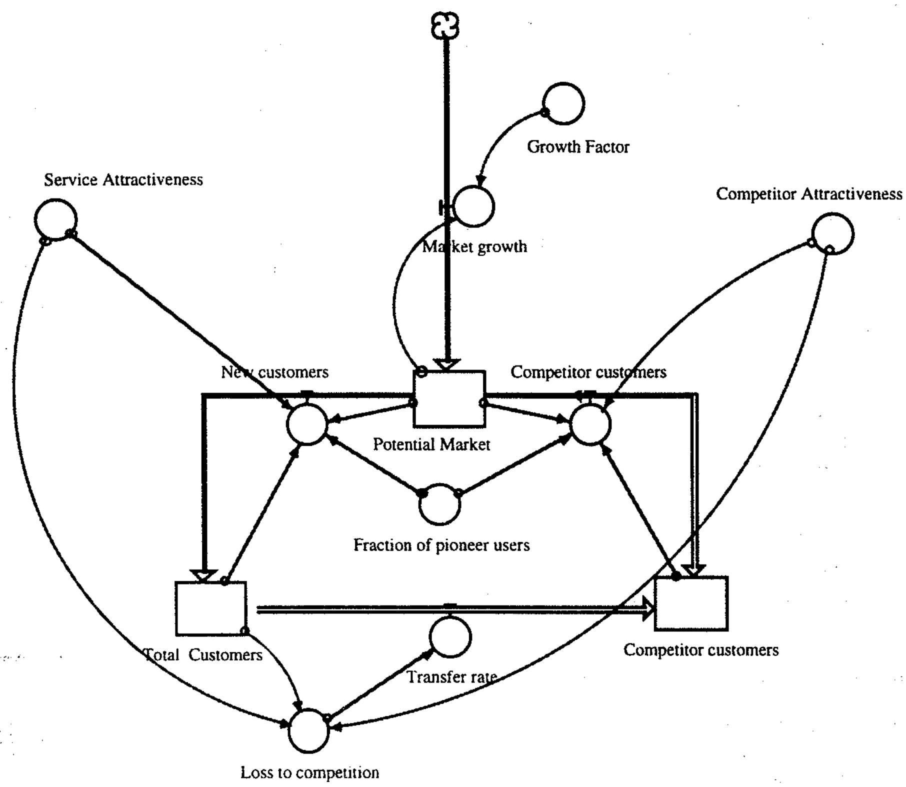

Figure 2: IThink map of one of the market share areas of the model. There are some min omissions due to reasons of confidentiality.

Figure 2 shows that the flows to or from the competition depend on the attractiveness of tł service and the number of pioneer users. Pioneer users equate to Bass innovators and tł remaining proportion of customers are imitators. This formulation of the market dynam allows flexibility in the factors which influence attractiveness. Duplication of this structu across each of the regions also allowed for distinctly different market conditions to prevail, whi maintaining a consistent approach.

Capacity provisioning

The other major part of the model focused on the strategies associated with satisfying tł telecommunications traffic demand. This was generated as a result of the marketing sub-mod and was used to generate revenue from the service. The traffic demand consists of two ma dynamics, one due to the growth in the number of customers from the marketing sub-model and the other due to the increased usage of the system. In the case of videoconferencing based services, this increased usage arises from growing acceptance of the service over time, as users become more familiar with this facility. In addition, as more people have the facility to be a party to a videoconference, the utility of the facility and its usage will increase. There are, therefore, multiple feedback loops to be represented in this area.

Once a MNC's business is gained, the service provider must ensure that it can provide the service to all the MNC's locations throughout the world. The distribution of sites will depend on the region of origin of the MNC. There will also be a distribution in the service usage for a particular MNC. These factors are taken into consideration and a traffic demand is calculated.

Rapid provisioning of capacity will obtain the maximum revenue. However, provisioning may be subject to delays depending on the particular strategy adopted. The gap between the traffic demand and the capacity on line will feedback and influence the attractiveness of the service. Therefore time to market and functionality of service offering will impact on ability to win and maintain a customer. Within the model, three possibilities for provisioning traffic have been considered: wholly own; correspond; collaborate. A wholly own solution would imply that a service provider acquires and places its own infrastructure in global markets. Alternatively, in certain markets, a relationship with an existing player could be established and use its networks to carry traffic via a revenue sharing arrangement. A collaborative route would indicate market entry via a strategic alliance, merger, acquisition or joint venture. An understanding of the detailed attributes of these alternatives is not essential in this context.

The impact of these decisions is in the relative delays and revenue shares associated with provisioning decisions, for example, a wholly owned solution. This would give the maximum potential share of revenues associated with the service but would involve, perhaps, a significant delay in bringing capacity on-line. A correspondent-based agreement, on the other hand, may allow for much quicker provisioning but the revenue will have to be shared in some form with the correspondent operator.

Once the capacity is on-line, revenue will be generated. The level of revenue will, at least indirectly, influence future investment. Investment may be made in improving overall service offering as well as in increasing capacity of the underlying network. Investment in service offering improvements will result in an increase in the attractiveness of the service independent of network strategy.

Although the model features a hypothetical company and is a simplified representation, it is inevitable when dealing with global strategies that parallels could be drawn with BT. For this reason it is not possible to include any greater detail of the structure of the model in this paper.

Illustrative results from scenario analysis

Within this section, a few examples are given to illustrate the results which the model can generate. This is intended to demonstrate the potential of the modelling technique, not to give a comprehensive review of all the possible outputs. In this model, competitor strategy is determined at the outset of a scenario run.

Potential & Actual Revenue

The following example depicts the potential and actual revenues for our company for a strategy where there is heavy on-going investment in the functionality of the service. Figure 3 shows the case where the decision is made to adopt a wholly own strategy. Here we can see that there is a large gap in the potential and actual cumulative revenues due to the delays involved in bringing enough capacity on-line. Investment in improving service attractiveness is bringing in more demand for capacity but, with the wholly own strategy, there will be significant delays in satisfying this.

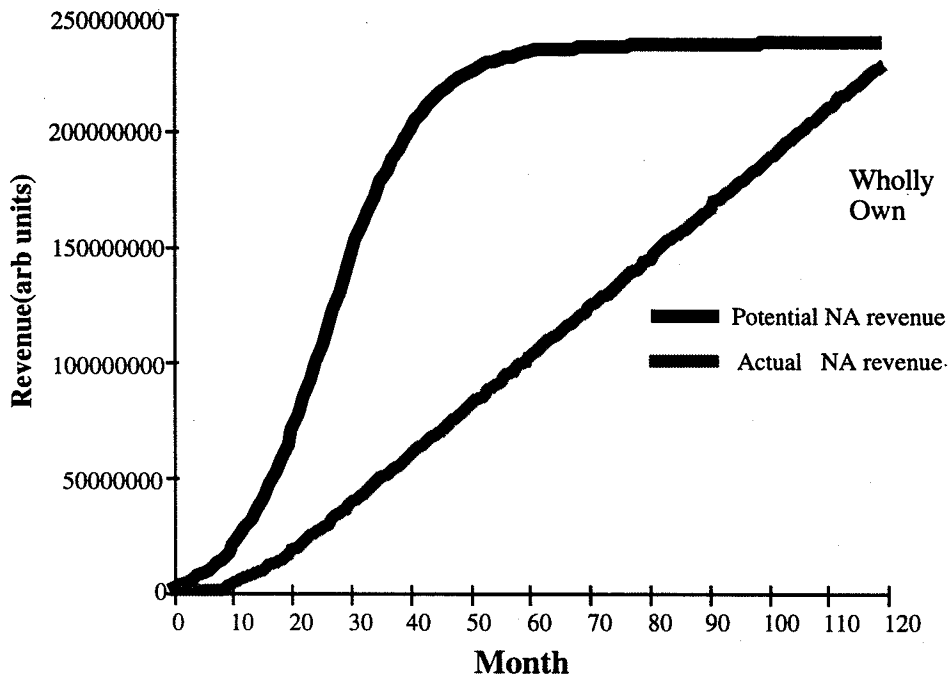

Figure 3: Potential and actual revenues for a wholly own strategy

Figure 4 represents the case where a correspondent-based strategy is adopted. The assumptio here is that there will be the ability to bring capacity on-line much quicker than in the previou case. As can be seen the gap in the potential and actual revenues is much reduced.

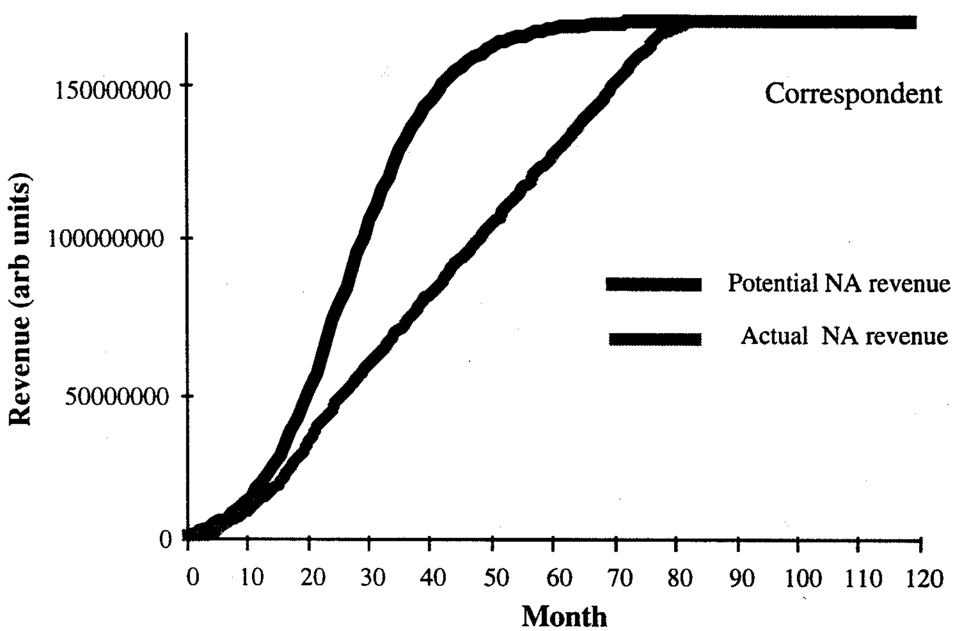

Figure 4 Potential and actual revenues for a corespondent based strategy.

Figures 3 and 4 illustrate one of the features of the model: the ability to 'gap engineer' t minimise the difference between actual and potential revenues.