

# *Modelling Customer Behaviour in a Competitive Environment*

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## **Abstract**

As telecoms markets around the world become increasingly competitive, customers are exercising their right to move freely between operators in order to secure the best possible deals. Consequently, operators are having to work harder to retain their market share.

This paper tries to understand the drivers behind customer behaviour in such a competitive market place, through the use of a Systems Dynamics model. This model investigates the relationship between customers, an incumbent operator and the largest national cable operator. The drivers behind a customer joining an operator (take-up) and a customer leaving an operator (churn) are explored. The model also investigates the impact of Quality of Service (QoS) and pricing strategies on customer behaviour.

A *Comparative Performance Indicator Chart* has been created for the incumbent and for the cable company. This chart is used as a benchmark for their QoS and to create a *QoS profile* for each operator. Both operators are assessed using 6 separate criteria: Bill Accuracy, Customer Complaints, Reported Faults, Faults Rectified/Time, Orders provided and Customer Satisfaction. *Attractiveness* for each operator is also calculated using the *QoS profile* and different pricing strategies.

All these factors are used to try to understand what makes a customer choose one service over another similar service. This paper does not try to give a definitive reason why a *specific* customer would switch operator, rather it shows the *trends* in customer behaviour in migrating from one operator to another.

## **Introduction**

Increased competition has forced firms to become more competitive in a rapidly changing technological and regulatory environment. This industry "free for all" will do much to expand the potential range of services a telecommunications company can offer, this may introduce additional competition into a company's markets whilst allowing the same company to expand into other markets. It is therefore crucial for such companies to understand current and prospective customers.

Telcos are constantly improving their service offerings, with new services and ideas to capture the customers' imagination. Although their products may be leading the market in terms of innovation, often it seems that the customer is dissatisfied with some aspects of the service and therefore, decides to churn to a competitor.

Trying to predict customer behaviour has always been a difficulty for telcos, many of whom have a reactive, rather than a pro-active strategy to customer churn. Trying to understand how customers think, is not the practical answer to solving these problems, rather improving the conditions under which a service or product is nurtured is one way of minimising churn and maximising customer retention.

This paper describes the methods used to develop a model that focuses on the residential telephony market and simulates factors leading to the migration of customers from one operator to another.

The model assumes that there are two operators in this market:

- Telco           The market leader
- Cable           The largest Cable operator

The simulation runs for a period of 20 years. In that time customers may move freely between operators. Each simulation run depends upon inputs from a *customer profile*.

The operators start with a percentage of the market depending on their position in the market place. They can attract new customers by changing the quality of service (QoS), attractiveness, tarrifing and service availability. All the variables are linked to a Comparable Performance Indicator (CPI), which calculates the operators perceived QoS, from the customers point of view.

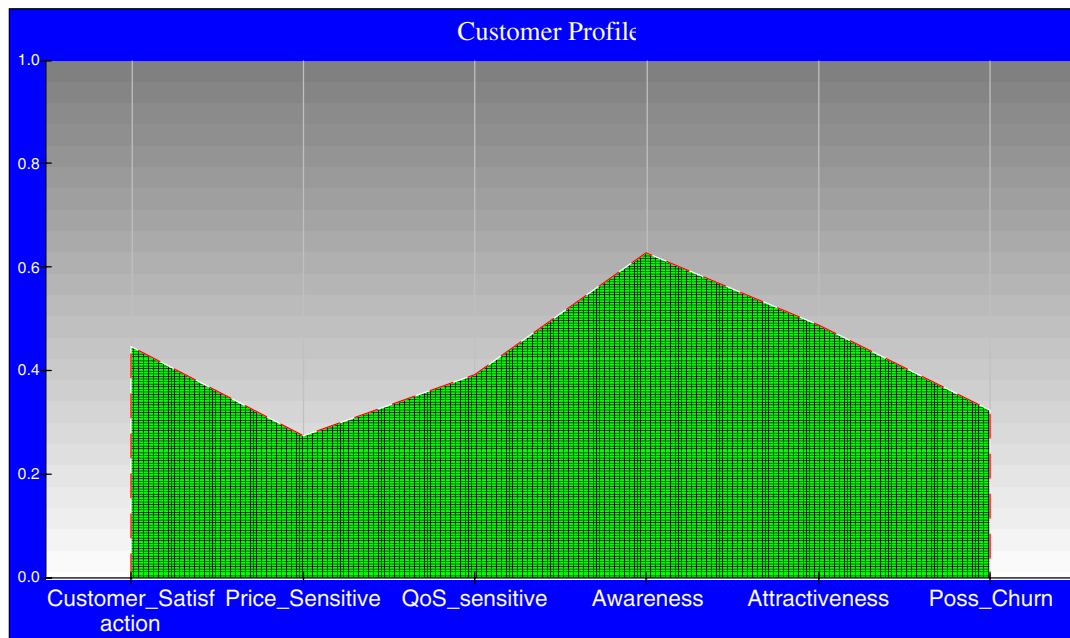
The purpose of the model is to assess which factors influence churn and which attributes of customer behaviour have a positive effect, i.e. reduce churn and those which increase churn.

## **The Customer**

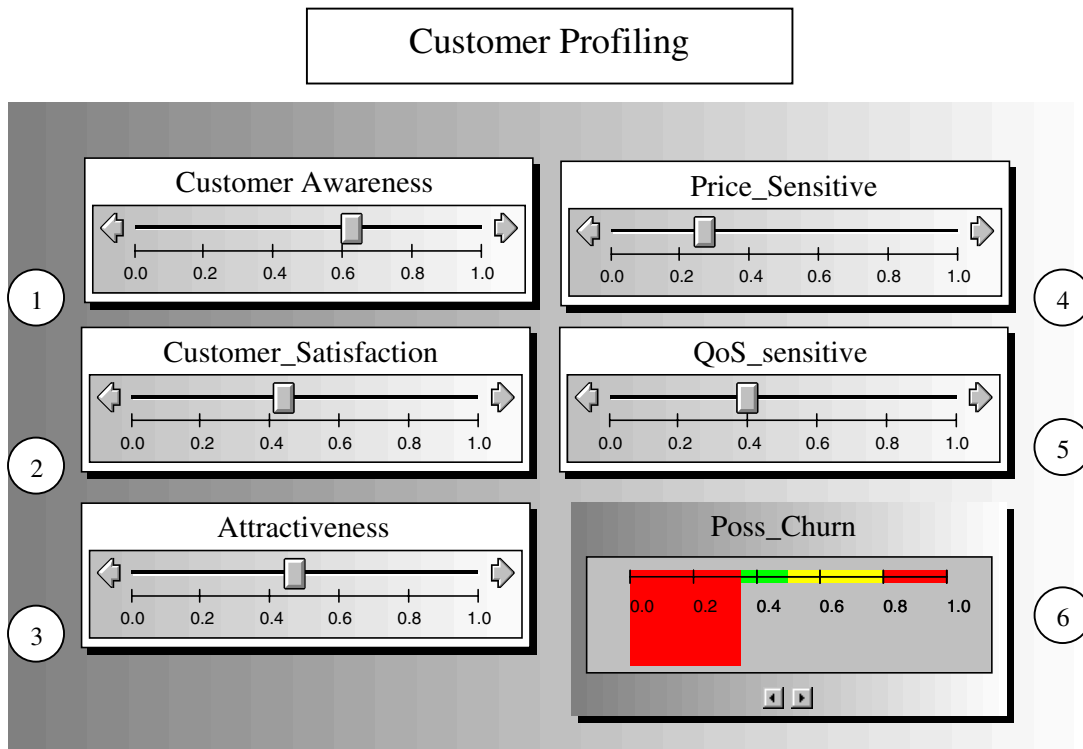
For the purpose of this simulation it was decided that it would be beneficial if we could create individual customer profiles. It is also possible to create group profiles by segmenting customers according to wealth. Slider bars are used to set up the customer profile. The default profile is that of a middle income individual who is price sensitive, that is to say a 20% or more increase in the cost of his/her service package will increase their propensity to churn.

Figure 1 shows a typical customer profile ready for a *scenario run*.

Figure 2 shows the *customer profile* input screen.



**Figure 1: Graph of a Generated Customer Profile**



**Figure 2: Inputs to Customer Profile**

### **Customer Profile Input Screen**

1. Customer awareness. Used to set the level of awareness the customer has about the operator or any of the operators' products. A high score here is a good indication that the customer is willing to stay loyal to the operator.
2. Customer satisfaction. A high score here indicates that the customer will be more likely to churn if the operators' performance indicator falls below this threshold.
3. Attractiveness. This slider bar shares links with price sensitive and QoS sensitive sliders (4 & 5). The settings on sliders 4 & 5 effectively sets how *sticky* the customer is likely to be to an operator who has high QoS. The slider can then be adjusted to fine-tune the attractiveness (stickiness).
4. Price sensitive. This determines how much of a price change will affect the customers' decision to churn. A high score is here indicates a customer is more likely to switch operators.
5. QoS sensitive. This works in the same way as Price sensitivity, again a high score here could result in customer churn.

Once the profile has been set, a scenario run can take place. The model takes the customer profile and feeds it into the Comparable Performance Indicator (CPI).

## **Comparable Performance Indicator (CPI)**

Increasingly, households in the UK can now choose the operator from which they can buy telecommunications services. This means that customers need to be able to compare the performance of the different telephone (or telecommunications) companies offering services in their area, so as to check that they are receiving the best deal available.

To help customers make their choice, the telecommunications companies and several consumer organisations, with support from OFTEL, the industry regulator, have developed a set of comparable performance indicators for a range of telecommunications services.

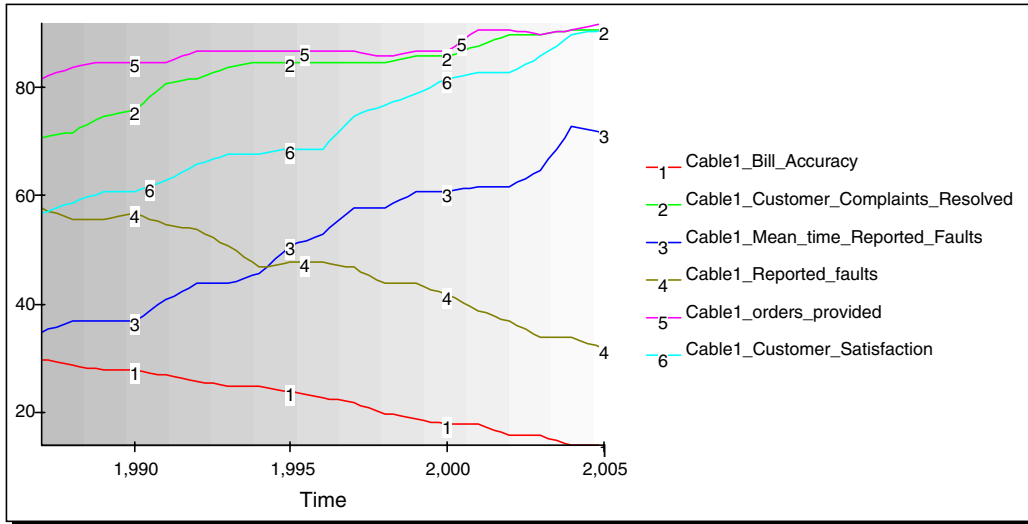
The performance indicators currently used are described briefly in the following table:

<i><b>Indicator</b></i>	<i><b>What is Measured</b></i>
Service Provision	Operators ability to provide services.
Customer-Reported Faults	The reliability of the company's network
Fault Repairs	The ability to repair faults within target times
Complaint Handling	How promptly complaints are dealt with
Billing	The accuracy of billing information
Customer Satisfaction	The perceived QoS by the customer

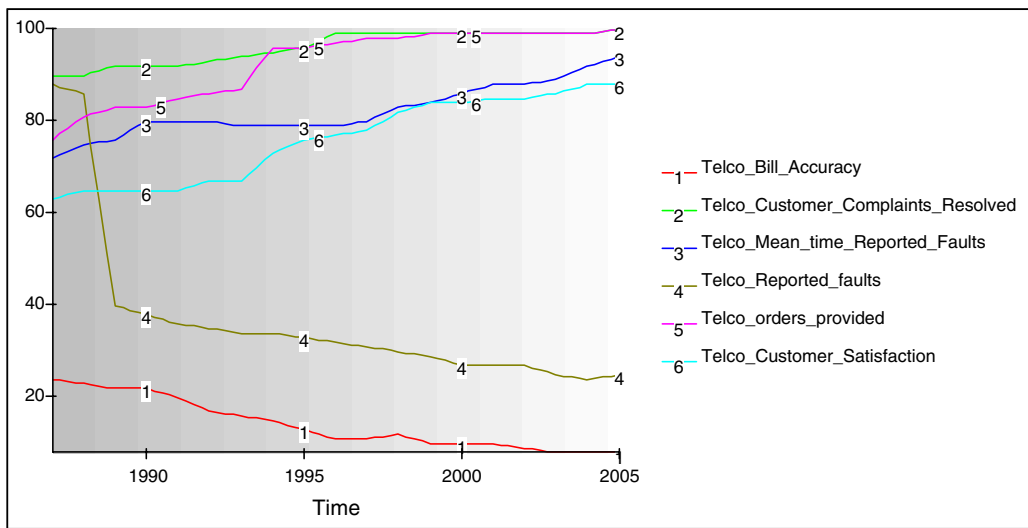
**Table 1. Description of CPI's**

## CPI Profiles

Figures 3 & 4, below, show a run generated by calculating the CPI for both the operators.

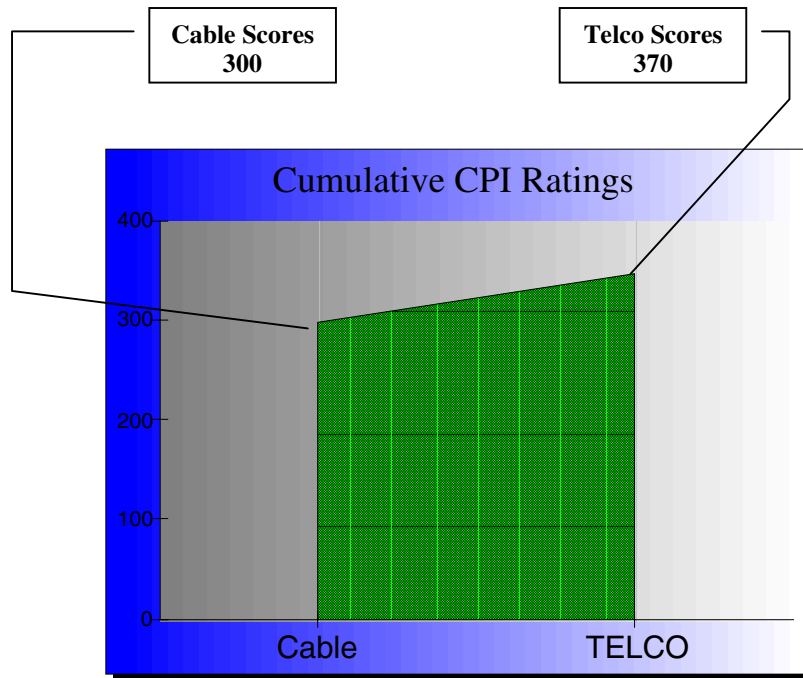


**Figure 3. Cable CPI**



**Figure 4. Telco CPI**

Careful examination of figures 3 & 4, shows that Telco has a superior CPI rating. This is shown more clearly in the cumulative CPI rating chart below Figure 5.



0	100	200	300	400
Poor	Average	Good	High	

**Figure 5. Cumulative CPI Rating for Telco & Cable**

## Generating a Scenario Run

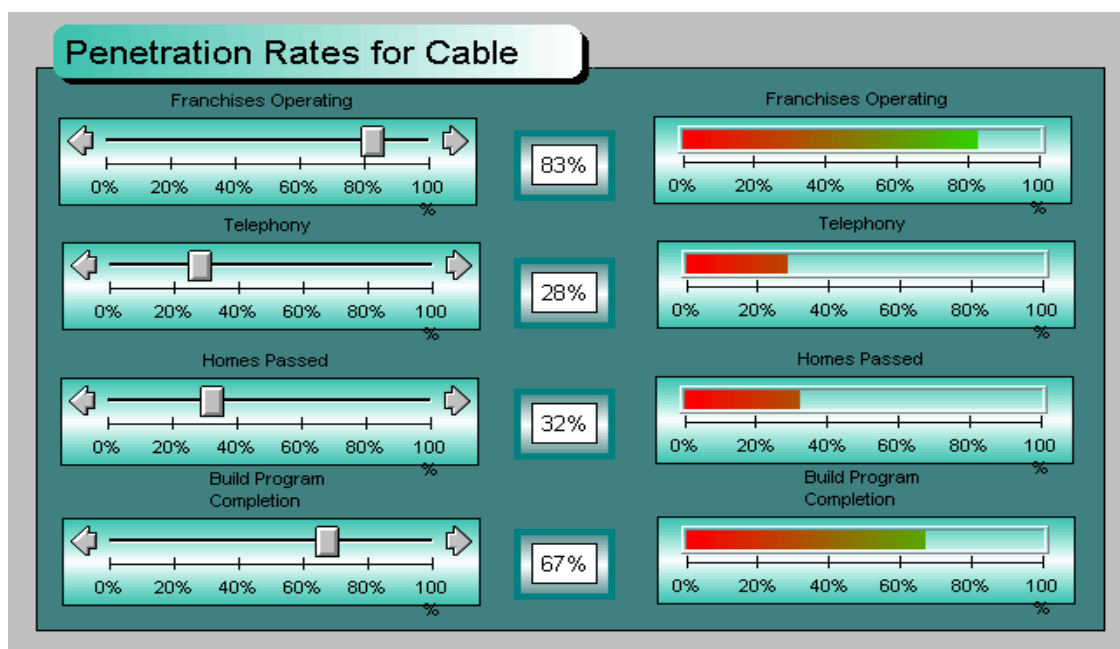
The next step in determining the migration of the customer, is to generate a scenario run.

Firstly we must set-up the rules under which the scenario run will take place, this is done by configuring the Telco & Cable profiles.

The user can flex key parameters in order to alter the outcome of the simulation run. Parameters are flexed using slider bars and outputs are in the form of graphs and other visual indicators.

### Key Parameters

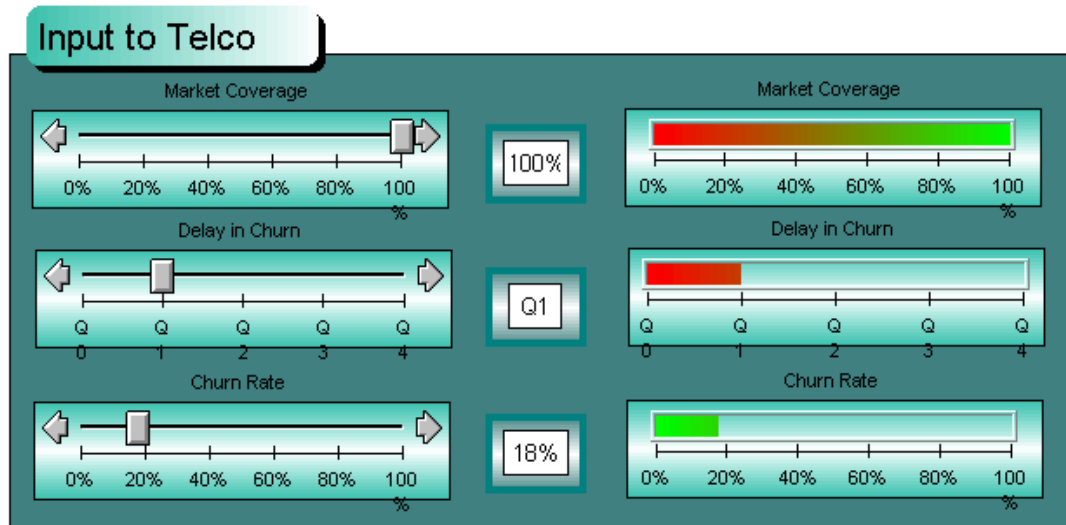
The model has a 20 year simulation period and the key input parameters for Cable are shown below in Figure 6.



**Figure 6. Key Input Parameters for Cable profile**

The Cable Input parameters determine the share of the market they control and therefore, the number of customers they can target. This is a flexible of method getting values, as the cable operators' profile can be changed to reflect their position in the market place.

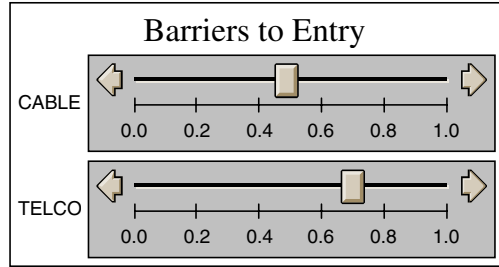
The key input parameters for Telco are shown in figure 7.



**Figure 7. Key Input Parameters for Telco Profile**

## Global Variables

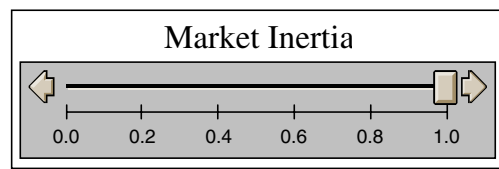
The following inputs affect the *climate* under which the model is run.  
Barriers to Entry



**Figure 8. Barriers to Entry.**

This slider can be set between 0 & 1. The higher the value, the more difficult it is for both operators to pick up any new customers.

Market Inertia



**Figure 9. Market Inertia**

This slider decides customers' reluctance to change operators. Here 0 represents that customers will readily change operators; 1 represents that the customers will not change operators no matter how favourable a competitors services may appear.

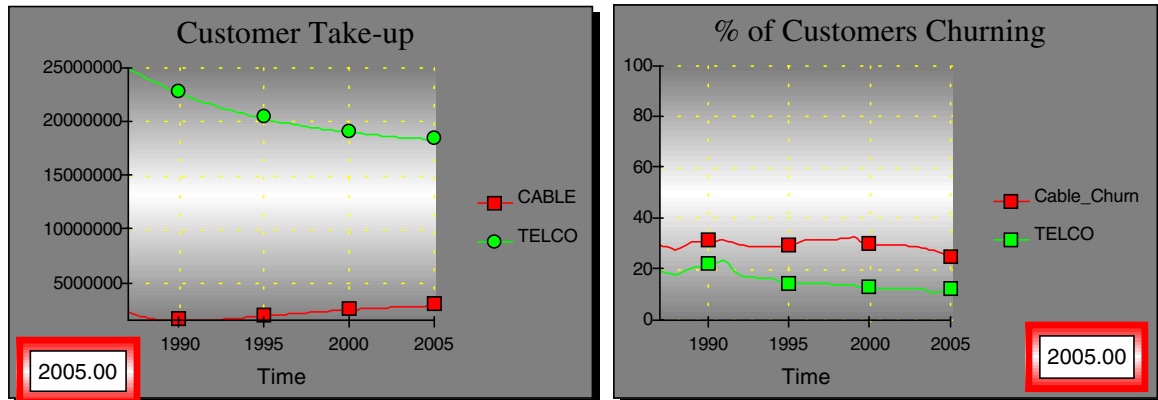


## Model Outputs

Once all the profiles have been created the model is put through a simulation run. The simulation period can be varied from 2 years (minimum) to 20 years (Maximum).

The model dynamically simulates a competitive environment, using historical, (therefore unchangeable) data, for years 1985 to 1998. It gives a visual alert once the thresholds have been reached for your customer profiles. The model then migrates (churns) the customers to the operators.

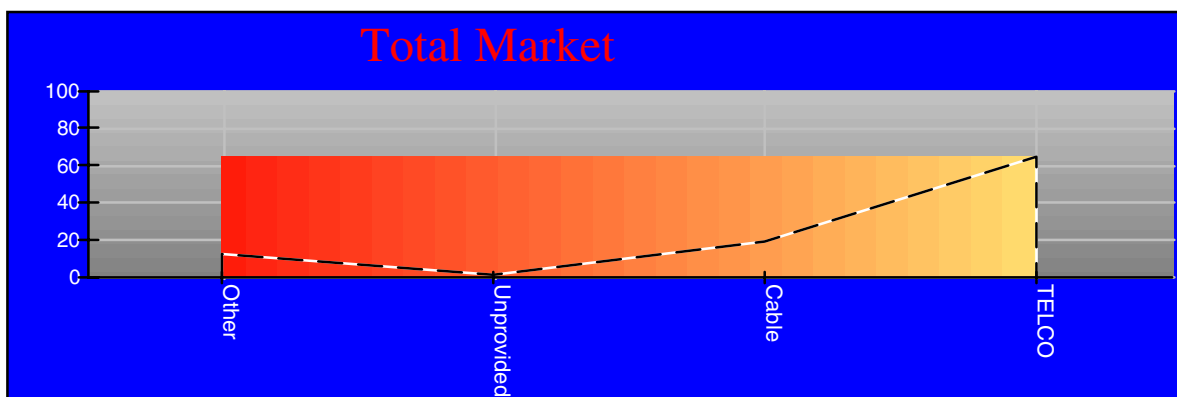
Figure 10 & 11, below, show final outputs from a simulation run.



**Figure 10. Outputs for Customer Take-up Vs Churn for Scenario Runs**

We can see a typical output here for the middle income\_price sensitive customer profile. All customers with this profile have contributed to an average churn rate of 16% from Telco, for the simulation period, and 22% churn from Cable. Although Telco has lost more customers in the same period than Cable, their customers have simply churned away to a default 'Other operator', and not migrated to Cable.

This simulation run shows that Telco's CPI ratings helped to reduce churn for them, and similarly the Cable CPI ratings help them to gain more customers in the simulation period, although their churn rating was higher.



**Figure 11. Market Share of Telco & Cable after Simulation Runs**

The graph shows the market position of the two main operators, compared to the rest of the market.

- Telco 65%
- Cable 20%
- Other 13%
- Unprovided Customers 2%

## **The Importance of Customer Behaviour**

Telecommunication markets around the world are becoming more competitive, and with technology improving leaps and bounds, telcos are finding it hard to hold onto their market share. The most important factor in the increase in competition is the removal of barriers between switching customers from one service provider to another.

Customers in the telecommunications market are no different to customers in any other commercial market place; they both expect a high level of service and reliability from their suppliers. It is becoming increasingly difficult to differentiate between the technologies the telcos use. The only indication the customer has that the operator they choose will provide an adequate level of service, is by advertising or word of mouth. Therefore a move towards some form of standardised performance ratings between operators will do much to improve customer choice.

## **Future Developments**

One of the most important aspects of this modelling work is trying to understand the drivers behind customer churn, and preventing it.

This model can be used to help reduce customer churn by:

- Identifying the most profitable customers and what can be done to maintain their loyalty
- Decreasing promotion costs by using only those promotion packages that are best at attracting those customers which will remain loyal after the promotion is over
- Targeting the most profitable segments of the market for the most aggressive promotions

Telcos can greatly reduce churn costs by isolating characteristics of customers likely to remain loyal to a product. When targeting new customers, a company can then choose the "right" customers to target. Also, models might suggest ways to treat current customers differently to induce them to remain loyal to your product. With a wealth of customer and market information, telecommunications companies can employ information they already have to reduce churn in their customer base and thereby lower customer acquisition costs.

## **SUMMARY**

A model has been developed to try to understand the reasons for customers joining a particular operator. The model does this by setting a typical customer profile and then setting varying levels of service for the operators, in order to determine which *mix* of factors persuade a customer to churn. If telcos can understand the reason behind *Churn* it will enable them to retain their customer base and be proactive in servicing the needs of their customers, and in the long term to reduce the costs incurred.

## **ACKNOWLEDGEMENTS**

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