

# **A Dynamic Model for Understanding Individual's Interactive and Communications Requirements in a Telecoms Environment**

**Jo Osborne**

BT Laboratories

Admin 2 OP7, BT Labs, Martlesham Heath,

Ipswich, Suffolk. IP5 3RE

Tel: + 44 (0) 1473 643677 Fax: + 44 (0) 1473 643392

E-mail: [jo.osborne@bt.com](mailto:jo.osborne@bt.com)

*As the telecommunications evolution accelerates, innovation will be in even greater demand. So, it will be important to quickly and accurately understand and respond to our customers ever changing needs and requirements.*

*This paper will discuss the techniques developed using System Dynamics methodology and modelling to assist in the understanding of customers and their needs as individuals. That is, rather than treating customers as an amorphous mass of people, it examines their communications requirements on an individual level. Taking this approach, we can better understand to whom we should be targeting our marketing strategies. The paper will focus particularly on the model structure and the research undertaken to create such a model.*

*By doing this we can identify an individual's interactive and non-interactive periods during any one 24-hour period. By allocating an Activity Scoring Index based on the inter-activity of different types of everyday activities, marketers can identify opportunities for offering each customer new telecoms services, which are based on the recognised requirements of the individual. A computer simulation based on SD allows marketers, to examine an individual's activities, (telecoms and non-telecoms related), throughout the day.*

*The Activity Scoring Index has been developed to assist marketers in categorising individuals into previously unrelated market segments, as well as supporting marketing strategies and initiatives. Service providers are then able to direct their marketing at these new segments, with communications services which are matched to the customer's lifestyle.*

## **1 Introduction**

The changing media and communications environment in which we live requires telecoms operators to understand the needs and requirements of their customers to a greater extent, in order to cater to their changing needs. The telecommunications environment has, particularly in the UK, become a commodity market in which consumers have little brand loyalty and are simply seeking the best service / products to suit their needs, at a competitive price. It must also be noted at this stage that the decision to purchase a product or service is not purely based on price. Consequently, there is now a greater need to supply customers with more than just a product or service: it is imperative to cater to their needs and requirements on an individual level. This will help to maintain a customer base, through creating brand loyalty by providing the customer with what he or she wants, rather than what the service provider wishes to supply to them. Frequently, when attempting to segment telecommunications markets there has been a tendency to simply group people into historically defined, recognised groups. Such groups are normally based on a set of age ranges and the different gender types.

The modelling technique described in this paper, uses *customer lifestyle patterns* to assist in the generation of a more realistic segmentation of the market and also to help identify opportunities to offer products and services to previously un-investigated market segments. This has allowed us to explore, using the modelling software Powersim, when and where new products and services can be offered to consumers, so as to cater to their individual requirements as telecoms consumers.

This paper outlines the modelling technique, which is purely related to telecommunications products and services. However, this technique is generic and could be readily adapted for use within other industries offering differing products and services.

## **2 Individual's Lifestyles**

Lifestyles differ from individual to individual, but obviously we are not able to treat our millions of customers each as individuals. Therefore, the aim is to identify where similar activities conducted by different individuals can be grouped together to form complementary lifestyle patterns. To do this we acquired evidence of individuals' activities throughout the day.

### **2.1 Understanding Individuals' Lifestyle Patterns**

To understand an individual's lifestyle pattern, we have gathered a record of their activities during any oneday. This has been achieved by asking the individual's on a research panel to complete time-use diaries. These diaries are divided into 15-minute slots, in which the consumer writes their activity for that 15-minute period. The panellists kept these diaries for one week within a larger one-year study. They consisted of individuals of both genders and a broad cross-section of ages. These participants were a randomly selected cross section of the UK population. From the time-use diaries, we are able to generate consumer lifestyle patterns. Figure 2.1.1 shows a snap shot of a typical early morning for an individual.

<i>Individual ID</i>	<i>Day</i>	<i>07:30</i>	<i>07:45</i>	<i>08:00</i>	<i>08:15</i>	<i>08:30</i>	<i>08:45</i>
1197	Monday	Sleep	Sleep	Eating	Eating	Washing	Washing

**Figure 2.1.1 Example of Diary Data**

## 2.2 Lifestyle Patterns

Some initial cluster analysis was performed on the diary data, to better understand the data and to assess how it could be best used within the model. The cluster analysis was completed using rules that grouped similar activities. From the analysis of the data, four lifestyle patterns emerged.

- Full time workers - Most of the people in this group work for more than 23 hours a week.
- Couch potatoes - This cluster watch a lot of TV, sleep quite a lot, but do not do much paid work.
- Home makers - These people do not do much paid work but do quite a lot of housework and also watch a fair amount of TV
- Part-time workers - This cluster do not do much paid work but do some housework. They watch some TV but not nearly as much as the Couch Potatoes. They also sleep more than the other clusters and spend more time eating at home.

The results obtained from the analysis helped to create the structure of the model, and allowed the initial segmentation of the data. Selections from this data were then imported into the model.

## 3 Activity Profile

An *Activity Scoring Index* has been developed for this model which has been based on allocating a score for each of the individuals' activities depending upon whether that activity can be either substituted or replaced by a complementary telecoms product or service. The scoring system ranges from zero to ten, zero represents an *activity* with no potential *inter-activity* possibilities and ten represents an *activity* that has the most potential *inter-activity* possibilities.

An example would be cooking, as people can *conduct other activities at the same time*, such as using the phone, or surfing the Internet for recipes or ingredients. So, cooking would be an activity with a high interactivity score. A point to note here is that a different *Activity Scoring Index* would be used for different telecoms products and services.

There are 35 different activities that the individual can mark down as being performed: of which a subset is shown in Figure 3.0.1, together with its *Activity Score*.

Activity No.	Activity Description	Activity Score
1	Sleeping	0
2	Washing / Dressing	4
3	Cooking / Baking	6
.	.	.
.	.	.
.	.	.
7	Paid Work at normal place of work	5
8	Paid work away from normal place	3
9	Paid work at home - Home	7
.	.	.
.	.	.
.	.	.
19	Visiting Friends	4
20	Sports participation / Keeping fit	3
21	TV	8
.	.	.
.	.	.
.	.	.
33	PC Work Related	9
34	Doing Nothing	10
35	Other	7

**Figure 3.0.1. Activity Scoring Index Table**

### 3.1 Activity Scoring Index

The 35 activities have been sectioned into 4 groupings. These groupings have been based upon whether the individual could use a telecommunications product/service whilst they are involved in their main activity:

- 1001 - Could be using a telecoms product/service or not (choice)
- 1002 - Definitely using a telecoms product/service
- 1003 - Out of the household but could be using mobile services (choice)
- 1004 - Definitely not using a telecoms product/service

We shall now consider each of these in turn.

Group 1001 includes activities that normally occur in the home environment and do not require 100% of a person's attention. Which would in turn allow them to be engaged in their main activity but also be partaking in a secondary activity for the whole or part period of time they are conducting the activity. For example, a person who is eating at home could quite easily be watching the TV/Cable/Satellite or using the telephone or surfing the Internet. Examples of activities in Group 1001 and the corresponding *Activity Score* are given below.

<b>Activity No.</b>	<b>Activity Description</b>	<b>Activity Score</b>
<b>2</b>	Washing / Dressing	4
<b>3</b>	Cooking / Baking	6
.	.	.
.	.	.
<b>20</b>	Sports participation / Keeping fit	3
<b>21</b>	TV	8
.	.	.
.	.	.
<b>34</b>	Doing Nothing	10
<b>35</b>	Other	7

Group 1002 includes activities that could already be provided by a telecoms operator. Such activities are engrossive and stop the individual from partaking in other activities concurrently with the main activity, as shown below.

<b>Activity No.</b>	<b>Activity Description</b>	<b>Activity Score</b>
.	.	.
<b>33</b>	PC Work Related	9
.	.	.
.	.	.

Group 1003 includes activities that are conducted outside of the home environment, which ultimately means that the only telecoms activity they can do concurrently with the main activity, (for which they personally would pay), is to use a mobile service. Examples are shown below.

<b>Activity No.</b>	<b>Activity Description</b>	<b>Activity Score</b>
<b>7</b>	Paid work at normal place of work	5
<b>8</b>	Paid work away from normal place of work	3
.	.	.
.	.	.
<b>19</b>	Visiting Friends	4

Group 1004 is the group that incorporates the activities for which it would be impossible for the individual to be partaking in any activity other than the main activity. The only activity that occurs in this category is sleeping, for obvious reasons.

<b>Activity No.</b>	<b>Activity Description</b>	<b>Activity Score</b>
<b>1</b>	Sleeping	0

#### **4 Telecommunications Generic Products and Services**

The list below suggests some of the telecommunications services that could be used by the individuals to substitute or supplement their current activities.

1. Three way calling
2. Fast Internet
3. Internet
4. On-line Games
5. Mobile

## 6. Education Internet

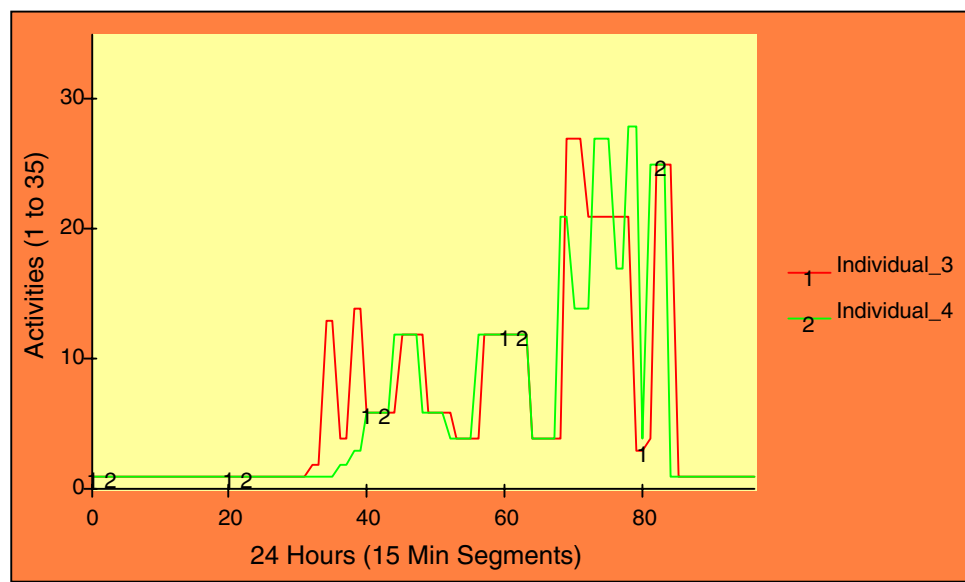
By substituting the activities of the individuals, (based on their *interactivity* scoring index), with the telecoms products and services most likely to be used by them, we can generate revenues and traffic patterns. This information can be used to structure the tariffs for these different services with different time-of-day fees so as to make the services attractive and maximise revenues.

### 5 Using System Dynamics to generate Lifestyle Patterns

The diary information about the individuals is in the form of a stream of data for each person. The data streams for all the individuals are imported into the System Dynamics modelling software from an Excel spreadsheet. The data streams are then used to simulate the individuals daily routines/*lifestyle patterns*. Using the *Scoring Index* the *lifestyle patterns* are converted into 24-Hour *Activity Profiles* for each of the four groupings of people. The 24-Hour *Activity Profiles* are an output from the modelling and are explained in the next section.

### 6 Outputs from the modelling technique

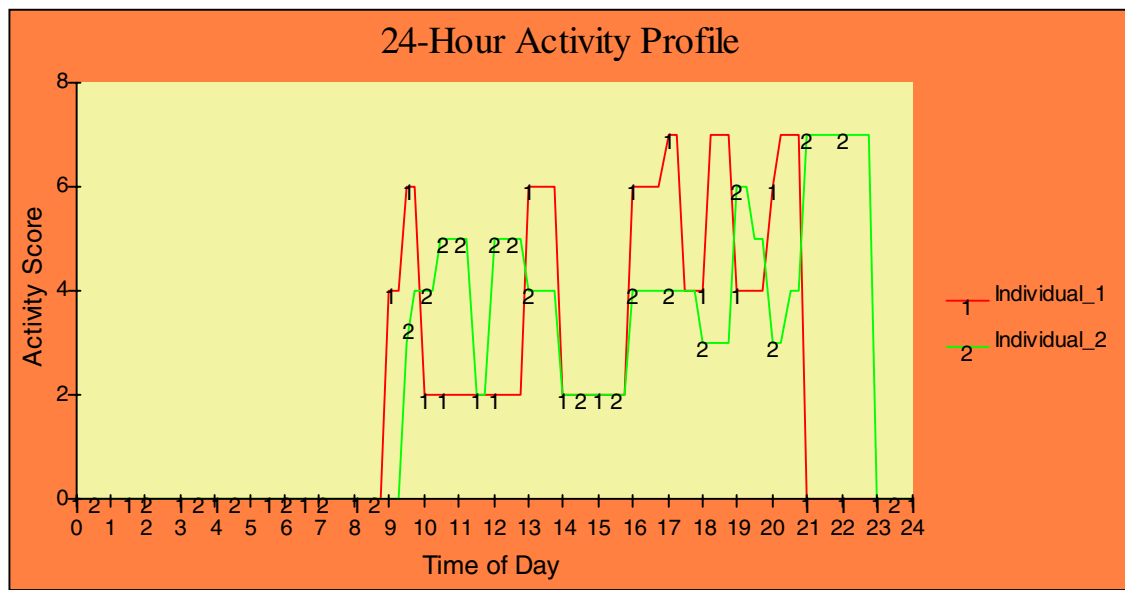
Firstly, the model provides outputs that are presented as graphs depicting the *Activity Index Profile* for the different *individual* types, as explained in section 2.2. Figure 6.0.1 shows an *Activity Index Profile* for two individuals. This graphical representation shows the differences and similarities between these two *individuals* based on the different activities they perform during any one 24-hour period.



**Figure 6.0.1 Activity Index Profile**

The other main outputs of the model are graphical representations of an *individual's lifestyle pattern*. This pattern allows the user to see when an individual's *interactive* or *non-interactive* periods occur during the day.

An example of *Activity Profiles* for two individuals, (generated by the model based on the criteria from *the Activity Scoring Index* table in figure 3.0.1), is shown in figure 6.0.2.



**Figure 6.0.2. 24-Hour Activity Profile**

The graph in figure 6.0.2 shows where the *interactive* and *non-interactive* periods occur during the individuals' days. By incorporating the information from this type of graph with our knowledge of the customer's lifestyle from the *Activity Index Profile* graphs, (an example is shown in figure 6.0.1), we can substitute/complement the customers' activities with services from the list.

The graphs show us at what time of day the individuals could be using these telecoms services and for how long. The information, from the graphs, is used to create tables of data. These tables can be manipulated to depict the types of revenue streams these customer types could generate together, with the forecast take-up trends of the six telecoms services and the individual's simulated usage patterns of those services.

## 7 Future Development of the Activity Scoring Methodology

Future development of the *Activity Scoring Methodology* could include creating other *Activity Scoring Index* tables based on different sets of criteria. The *Activity Scoring Index* example shown in figure 3.0.1, is based on the criteria of the individuals being able to interact with telecoms products and services, whilst still partaking in their main *activity*. This therefore, suggests the possibility of the individuals being able to use products and services other than those that are telecoms related, whilst they are still involved in their main *activity*. This encourages the development of other *Activity Scoring Index* tables to examine the other fields. An example of this could be home entertainment.

Other possible *Activity Scoring Index* tables could be based on different sets of criteria. For example, one *Activity Scoring Index* could be used to assess the opportunity of individuals to interact with future telecoms products and services. This

would allow telecommunications companies to enter into a market without previous experience of that market and direct their marketing to the individuals/customer bases, which would appear to have the opportunity and the need for such services.

## **8 Summary**

The modelling of *Customer Lifestyle Patterns* to understand consumers on an *individual* level has provided a detailed insight into their behaviour and how they should be segmented. In many industries there is a tendency to put consumers into segments without considering their needs as individuals. This modelling work has given us the opportunity to identify the variations between different consumers who would normally be grouped together through traditional marketing segmentation processes.

The main output from the work, is an examination of the generated customer segmentations based upon *lifestyle patterns* rather than traditional segmentation methods. Together with an understanding of how everyday activities can be substituted or even complemented by generic telecoms products and services. It has also provided the opportunity to examine customers through their *actual lifestyles*, rather than using a *perception* of their *lifestyles*.

Through substituting/complementing individual's existing activities with telecoms products/services, we have also been able to generate possible take-up trends of the products and services offered. As a result, we are able to forecast usage patterns, because we know from the *Activity Index Profile* when they can use the service, and consequently generate revenues for the services they use. This has given us a better understanding of the opportunity to offer individuals products and services based on their lifestyles, which in turn encourages us to examine tariff structures for different types of services offered at specific times of the day.

## **9 Acknowledgements**

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