PREPAID CUSTOMER SEGMENTATION IN TELECOMMUNICATIONS

AN OVERVIEW OF COMMON PRACTICES

There are number of frustrating factors for marketers who work with prepaid customers in telecommunications. This white paper summarizes the pros and cons of common segmentation strategies in prepaid markets.

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INTRODUCTION

We all know the common marketing maxim that "one must know one's customers very well". This is easier said than done in telecommunications – for the obvious reason that when the number of customers goes beyond several hundred, marketers are forced to deal with imperfect summaries of the real world in the form of charts, data tables and averages.

There are many questions marketers ask about segmentation:

- Do I really need to segment my customer base?
- How many segments?
- If I already track my base by rate plan, handset, tenure, etc. – is this a good way to segment?
- How does segmentation work together with predictive analytics and propensity models?

A prepaid customer at a telecommunications company is often anonymous. Despite attempts to add descriptive properties to them (for example, by encouraging self-registration online), the majority of the customers usually stay anonymous or provide very little identifying information.

Therefore, it's hard for marketers working with prepaid customers to find easily understandable customer segments like "women aged between 24 and 36, living in a city with higher than average income, 2 kids and full family". The only way to obtain such information is to periodically conduct customer surveys and extrapolate from that.

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As a consequence, telecommunications companies often build their prepaid segmentation around actual customer behaviour as observed via their networks and systems. In general, segmentation can be best understood as a summarized description of a large number of customers that "zooms in" on only a few aspects that enable action, and commonly serves one of **5 key purposes:**

1 **TO UNDERSTAND CUSTOMER NEEDS AND BEHAVIOUR**
Such segmentation shows if there are any distinct groupings of customers that might be better addressed with differentiated products, services or communication.

2 **TO PRIORITIZE ALLOCATION OF SCARCE MARKETING RESOURCES**
This one focuses activities (acquisition, up-sell or retention) on specific customer groups that generate the most revenue, margin or traffic.

3 **TO SEGMENT FOR TACTICAL PURPOSES**
Segmenting by recency frequency monetary and modifications thereof - a classical approach originating in retail - focuses on customer behaviour that is directly linked to revenue.

4 **TO TRACK THE CHANGES IN THE CUSTOMER BASE**
This approach monitors the customer base composition over time.

5 **TO NUDGE PREDICTIVE MODELS INTO FOCUSING ON DESIRED CUSTOMER GROUPS**
Propensity models are great at finding customers with a specific behavioural patterns, but their focus can be made sharper by segmenting the customer base before modelling.

Let's discuss each of these in turn, as they are usually addressed by different segmentation techniques that are complementary.

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1. SEGMENTING TO UNDERSTAND THE CUSTOMER BASE COMPOSITION

When trying to understand customer base composition, we are essentially starting from the customer perspective. We are looking at their needs and displayed behaviours. This is the foundation of the "needs-based segmentation" approach.

The biggest challenge in this approach is deciding how to identify customer needs. You may use surveys, industry research, focus groups – but all of these approaches try to extrapolate too many conclusions from a small amount of   data. One of the most interesting techniques that help to understand the true composition of the customer base is to start with mathematical clustering of customer base by its behaviour. This segmentation approach grounds the needs-based segmentation in a firm foundation, because it has no assumptions beyond the data that is available about the customers and their actual behaviour. When using this technique in prepaid, cluster the base using the metrics that are easy to interpret and clearly describe customer behaviour. As an example:

> *number of outgoing calls, number of incoming calls, number of outgoing text messages, number of incoming text messages, number of data sessions, number of megabytes downloaded, number of outgoing international calls.*

The clustering algorithms will suggest many ways to cluster customers based on this usage information. There may be 5, 15 or 25 different clusters even when starting with a few simple input metrics. It's best to start working with a small number of groups, it is recommended to start with 5 instead of 25 group until you understand each group very well. Each group should be interpreted by looking at its other characteristics such as the revenue, lifetime or rate plans. At this point you may consider running surveys on a sample of each group to gain further insight into their existing needs, how well you are meeting them and the potential for growth.

Cluster analysis reveals a number of groups with sharply different usage profiles and suggests what the true "services basket" in each group is.

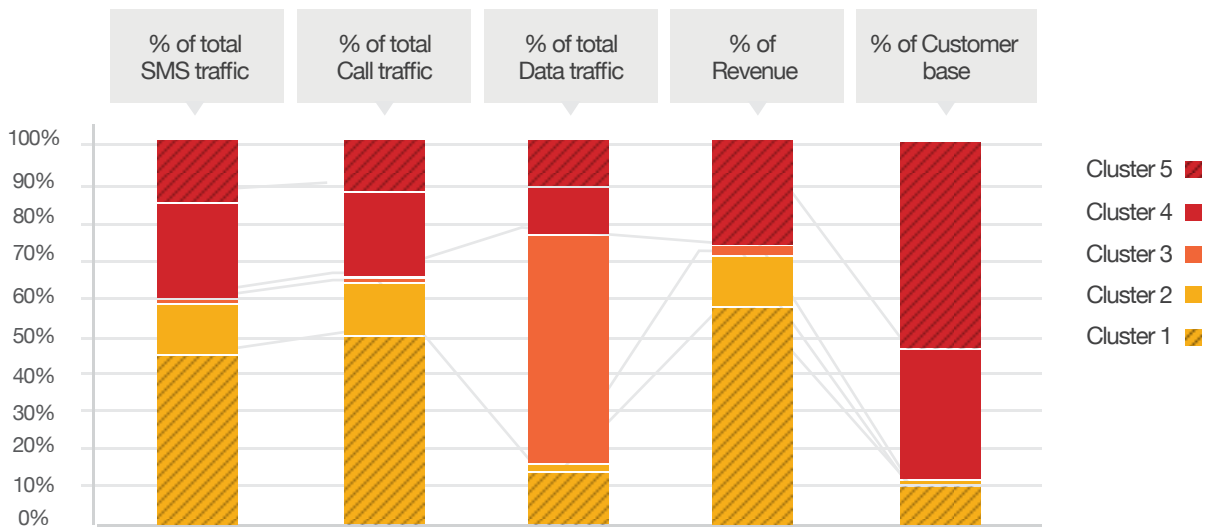| % of total SMS traffic	% of total Call traffic	% of total Data traffic	% of Revenue	% of Customer base

Chart 1.1

In the example provided in Chart 1.1, 5 clusters named 1, 2, 3, 4 & 5 display markedly different usage profiles and each is distinguished in terms of relative revenue and size. Group #1 accounts for 54% of revenue and is a below-average data user – let's call them the "Classical VIP customers group". Group #5 generates almost no revenues, while using very little – they can be called "The Passives". Group #3 is an exceptionally heavy data user, accounting for 57% of all data traffic and just 2% of all customer base – we can call these the "Data hogs". Group #4 & Group #2 are not entirely distinctive and merit further investigation.

A need based segmentation described above creates a pragmatic way to differentiate in a highly competitive market by looking at each group and creating Unique Selling Propositions for each cluster.

Advanced ways to generate and explore these groups of customers are now available in Big Data Telco Analytics with solutions such as Exacaster. There are many more possibilities created by adding distinct device/handset profiles mobility metrics, geographical and product purchase histories.

As the main purpose of such segmentation is to understand the customers and their behaviour, the segmentation can be used to guide rate plan design, communication and search for propositions that serve each group better. While such segmentation can be used to guide business strategy execution, there's a special segmentation approach designed to do just that: segmenting to prioritize resource allocation.

2. SEGMENTING TO PRIORITIZE ALLOCATION OF SCARCE RESOURCES

Once we know how our customers behave and what they need, we still cannot go after each and every customer within these behaviour-based segments. To aid in the allocation of scarce resources, it is very common to find an additional business-centric segmentation approach, that is designed to help companies focus their activities. The action-oriented segmentation is of 2 kinds: segmentation **by customer lifecycle** and segmentation **by customer value.**

▶ Segmentation **by customer lifecycle**

Segmentation by customer lifecycle is a simple concept that groups customers by their tenure. Customers are new and growing, then mature and finally declining and churning. The mature and declining groups can be stable for a very long time (sometimes, 5 years or even more).

The key design factor in this segmentation is to decide on the duration of different lifecycle periods. For Prepaid markets, the durations should be adjusted from the suggested template below:

New	**Growing**	**Mature**	**Declining**
0 to 3 months	3 to 12 months	12 to 24 months	24+ months

Diagram 2.1

For Prepaid markets the "new" group is usually the one deserving most attention as it shows the quality of customer acquisition, and a lot of marketing activity is focused on helping this group become loyal. The "growth" stage is highly relevant when developing the revenue potential, with a plethora of up-sell offers.

It is typical to find the most loyal customers in the mature and declining stages, and the distinction between mature and declining groups is quite arbitrary.

▶ Segmentation **by customer value**

Segmentation by customer value is an approach that is used very often, as it enables marketers to see clearly which customers are contributing the most revenue and focus scarce resources on them.

A common best practice is to split customer base into 3-5 groups based on the total amount spent:

Bottom 25%	Middle 50%	Top 25%

Diagram 2.2

An important consideration when designing this segmentation approach is to decide on how often to refresh segment lists. In prepaid, the best practice centers around re-segmenting every 3 months by taking the total value of the last 3 months as the segmentation variable. If this period is made longer then the segmentation starts to lose it's freshness. If it is made shorter then the groups start to fluctuate too much.

A common enhancement is to use the margin instead of value.

Deciles (1-10) are also another way of classifying your base. This provides a much smarter way of focusing resources because you can create Very High value segments etc.

▶ Segmentation **by lifecycle and value**

A classical action-oriented prepaid segmentation combines the Lifecycle and Value approaches.

As all new customers still don't have 3 months worth of spending history to be segmented according to this approach, they are commonly placed in a separate segment „New", and sometimes an additional „Growth" segment. This puts the customers into 4 groups: new customers (for example, with the lifetime up to 100 days); low (lower 25% according to spending and lifetime above 100 days); middle (middle 50% according to spending and lifetime above 100 days); high value (upper 25% according to spending and lifetime above 100 days). This segmentation is simple to maintain and provides a good basic tracking mechanism for many purposes.

One of the main uses of action-oriented prepaid segmentation is to differentiate the campaigns according to different lifetime and value of customers: high value customers retained almost at all cost, receiving the best offers, personal service, communication via premium channels; low-value customers receiving mainly up-sell offers, less retention investment and communication via cheaper channels.

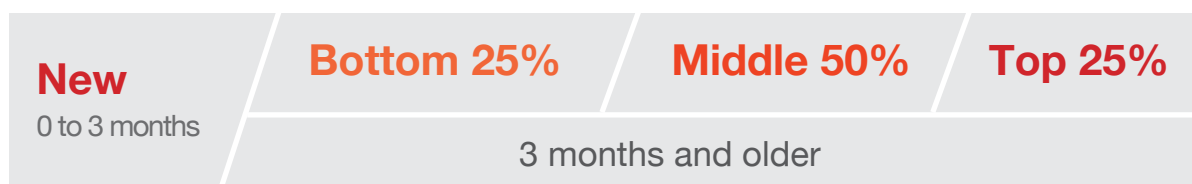| New	Bottom 25%	Middle 50%	Top 25%
0 to 3 months	3 months and older		

Diagram 2.3

Importantly, campaigns show different business impact when directed towards different segments, as illustrated in table 2.4. When the same product is offered to 4 different segments, the results are consistently different:

	Offer take rate	Offer impact on revenue	Offer impact on churn
New	7%	+5%	1% decrease
Bottom	13%	+2%	2% increase
Middle	12%	+0.5%	5% decrease
Top	12%	+8%	10% decrease

Table 2.4

As Table 2.4 shows, the same offer has quite unexpected revenue impact among newcomers, and an increasing retention impact among higher spenders.

In addition to customers having different reactions to the same offer, segmentation allows clear reasoning to be applied for the justification of business initiatives. It provides a structured plan for direct marketing activities:

- Defining core focus segments and segment objectives like churn, up-sell, acquisition and usage increase

- Defining offers allowed for different levels of customer value

- Outlining segment-oriented customer service strategy in call centers. For example, routing the calls of most valuable customers to priority lines and low-value customers to up-sell specialists.

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3. SEGMENTING FOR TACTICAL PURPOSES

We would like to remind prepaid marketers to use the recency, frequency and monetary (RFM) tactical segmentation and modifications thereof – a classical approach originating in retail and mail order catalogue marketing.

When segmenting prepaid customers by RFM, there are a number of segmentation design factors that need to be considered. First of all is the period – in the fast moving prepaid market, the two viable periods are weekly or monthly. Longer periods tend to have less use.

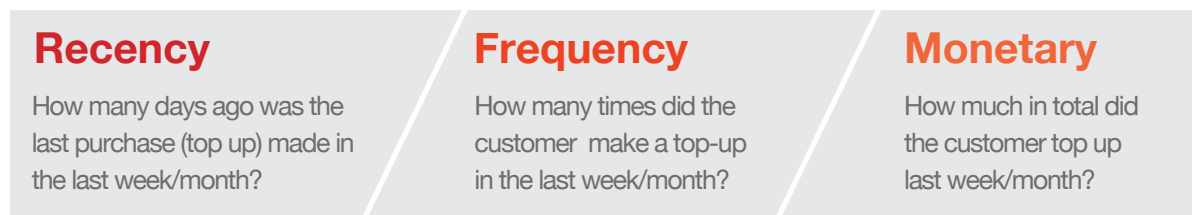| Recency	Frequency	Monetary
How many days ago was the last purchase (top up) made in the last week/month?	How many times did the customer make a top-up in the last week/month?	How much in total did the customer top up last week/month?

Diagram 3.1

As RFM segments are rebuilt often, they are best used tactically or trigger based activity to enable better responses to direct marketing activities. By running an RFM "ordering" of clients within a value-based or a needs-based segment, one can prioritize activities towards the clients most likely to respond within each group.
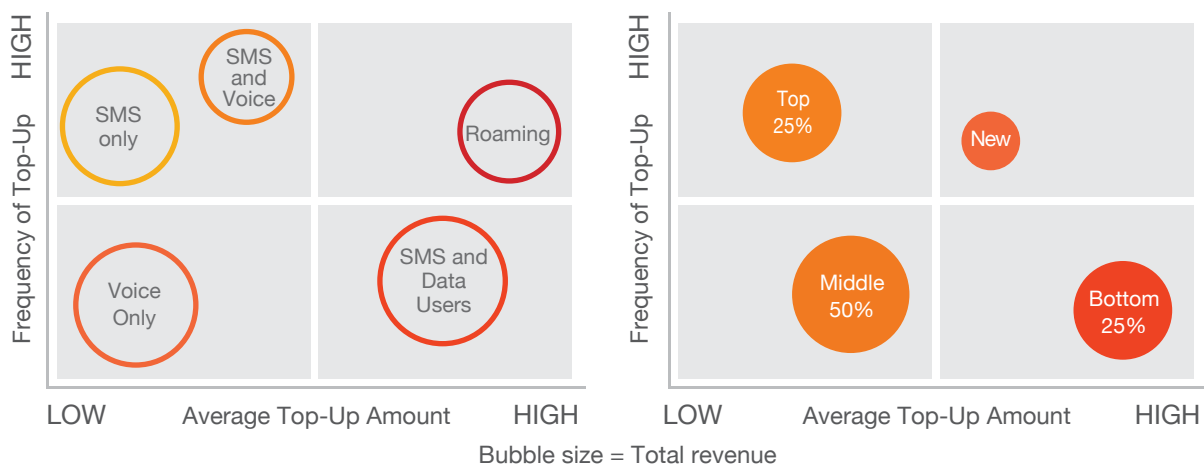

Diagram 3.2

4. TRACKING CHANGES IN CUSTOMER BASE OVER TIME

There are two popular ways to track how customer base evolves over time. **Cohorts** group customers who were acquired at the same time (same week, same month or same quarter) into a separate group for each period and compare the evolution of these groups over time. **Migration** trends of customer movement between value segments.

► **Cohort segmentation**

Cohort segmentation is a great way to track evolution of prepaid customer base over time.

"Customer acquisition cohort" analysis groups customers into monthly groups with each group named according to the month of customer acquisition. These groups are then tracked over time. This analysis reveals structural changes in the acquisition of customers, where the customers acquired in one month start to behave dramatically different from customers who were acquired a few months before.

One of the ways to visualize these groups compares their behaviour over time:
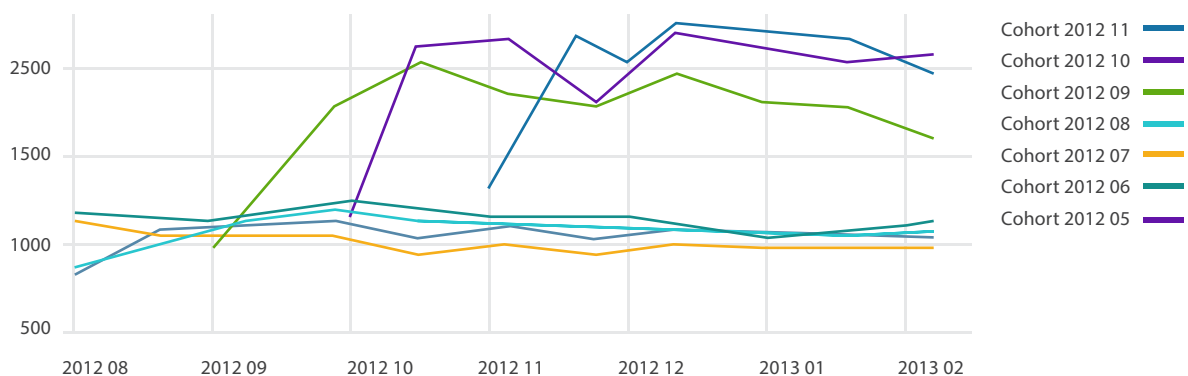

Chart 4.1 Total income per month from cohort

In the chart above, we see the 2012-09, 10 and 11 intake cohorts starting to show dramatic changes in usage when compared to groups acquired just a few months prior to this.

By applying the same logic, cohort analysis can be used to track Campaigns impact over time and many other aspects of behaviour interesting to marketers.

▶ Segmenting customers according to migration trend

The starting point for this type of tracking is customer value. The goal is to track how customers are migrating from high, medium and low value groups to other groups. The results can be summarized as shown below:
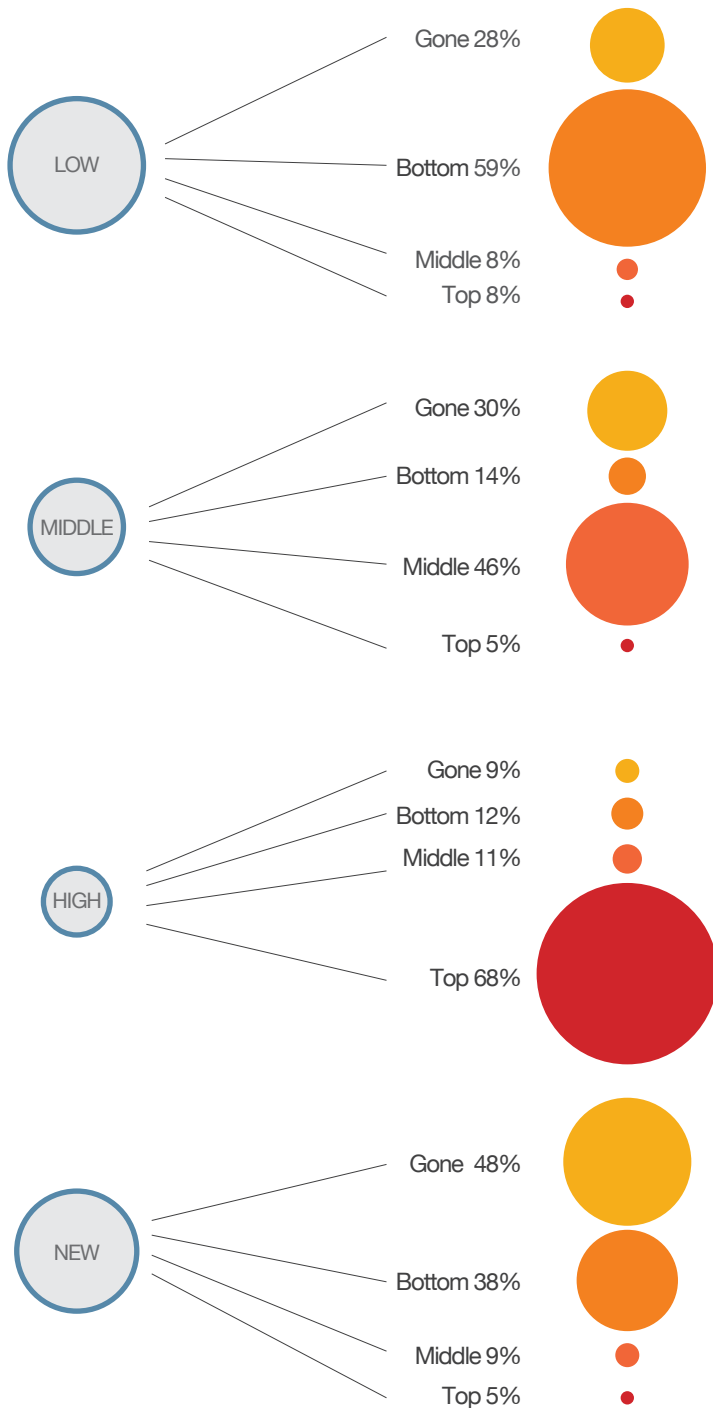
By tracking the High to High, High to Medium, High to Low, High to Gone and other similar groups separately, marketers can understand how their customer base is evolving over time from a value perspective.

This type of summary is very valuable & enables fine-grained focus on specific migration pathways, for example by creating special win-back packages for High-to-Low and High-to-Medium movers. The main draw-back of this approach is that it requires relatively complex processing to track.

Observation – another way to track your customer base that has useful campaign opportunities is to use activity buckets. This breaks the base down into fairly granular groups potentially spaced by 7 days (0-7, 8-15 etc…), from this you are able to see if there are any abnormal peaks of inactivity in the base that need to be addressed before it becomes churn.

LOW
- Gone 28%
- Bottom 59%
- Middle 8%
- Top 8%

MIDDLE
- Gone 30%
- Bottom 14%
- Middle 46%
- Top 5%

HIGH
- Gone 9%
- Bottom 12%
- Middle 11%
- Top 68%

NEW
- Gone 48%
- Bottom 38%
- Middle 9%
- Top 5%

Diagram 4.2

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5. INTEGRATING SEGMENTATION AND PREDICTIVE ANALYTICS

The segmentation approaches described above all serve one main need: to summarize large amounts of customer information in an intelligent way for the marketer.

Segmentation is not about building one tool or one set of segments. It is about building a multi-dimensional range of segmentation tools that give the marketeer a 360 degree view of the customer that when used smartly can deliver huge business benefits.

Additionally, machine learning algorithms can benefit from segmentation. Propensity models, powered by machine learning algorithms are great at finding customers with specific behavioural patterns, but their focus can be made sharper by segmenting the customer base before modelling.

When running a single propensity model for the entire customer base, machine-learning algorithms will comb through the mountains of data, and find a group of customers that are likely to follow the desired behavioural pattern. For example, customers who spend less are normally the biggest part of the „risk to churn" group, and the propensity model, because of their large numbers, will be best adapted to find low-spender churners. What if we would like to identify potential churners in the high spender group? Quite often, we would like we would like to nudge our propensity models into giving a "fairer" representation of our customer base by their contribution to value.

The best way to integrate segmentation and predictive analysis is to run separate predictive models in each segment, as long as the groups are large and represent tens of thousands of customers each. As segments capture valuable business information, and help direct action on the business level, we can gain a sharper focus on each group. This allows the marketer to address each segment with a separate predictive model and, thus, accomplish different business objectives for each segment.

The diagram 5.1 below illustrates this dilemma and it's solution.

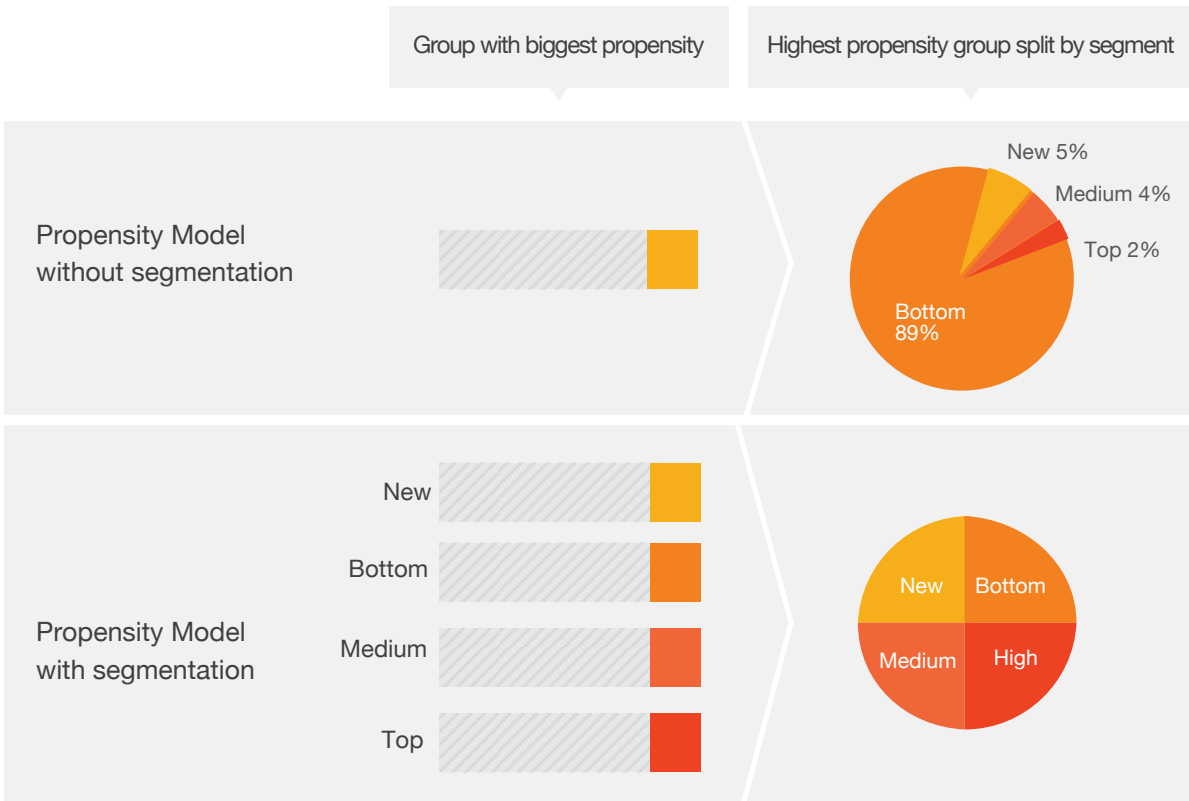|	Group with biggest propensity	Highest propensity group split by segment
Propensity Model without segmentation		New 5% Medium 4% Top 2% Bottom 89%
Propensity Model with segmentation	New Bottom Medium Top	New Bottom Medium High

Diagram 5.1

Exacaster Big Data Analytics platform allows for the easy creation and management of segments and automatically builds desired propensity models for each segment. By automating a large amount of data processing work and maintaining up-to-date propensity scores every day, week or month Exacaster saves time and makes marketers more productive.

A FEW WORDS
ABOUT EXACASTER

80% of Big Data cost is data extraction, manipulation, aggregation. We've made it simple.
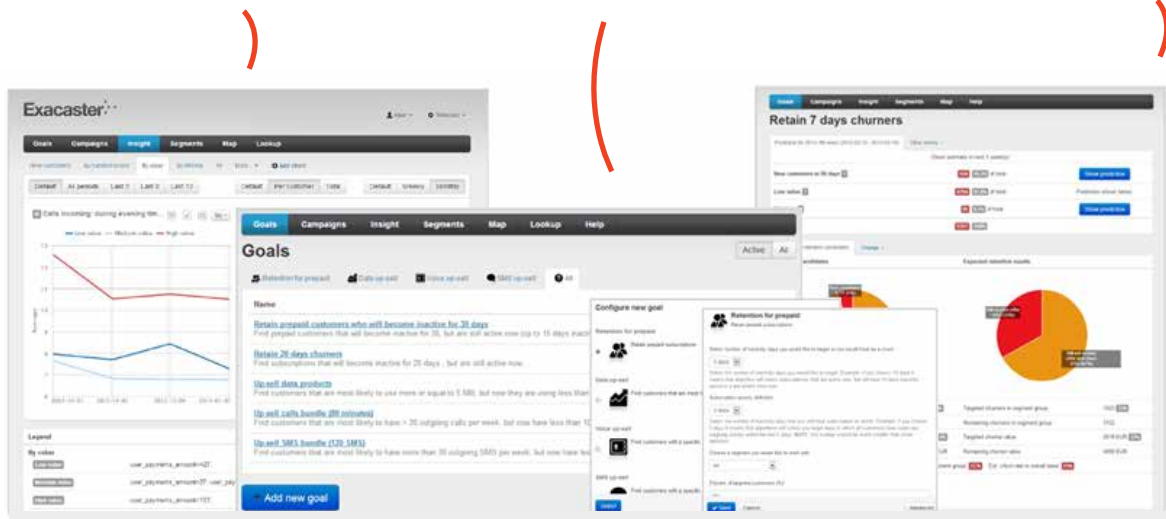
80% of predictive modelling is known best practice. We've built it in.

Even at **20%** of the cost, analytics is worthless without action. We bridge the gap with campaign automation and analytics.

Segment and
Understand Your Base

Anticipate Customer behaviour
by Creating Predictive Models

Select Predicted
Target Base

Exacaster is built on an open source Big Data stack of Cloudera Hadoop

It allows marketers to:

Reduce churn. Exacaster finds the best target groups for retention by analyzing historical customer behaviour and identifying the most risky customers, then measures the impact of different retention offers and allows selection of the best ones for each customer group.

Up-sell additional products/services. Exacaster creates a sound data-driven and statistically rigorous basis for all up-sell decisions by predicting customers with the best conversion rates for a particular product.

Identify the optimal additional products/services for a target group. Exacaster selects which offers should be sent to the desired target group optimizing for conversion rates, revenue increase or other goals.

Test the business case of new products/services by distributing an offer to a random group of customers, measuring the impact and establishing the potential in the remaining customer base.

Measure branding activities. By comparing customers who are exposed to branding activities vs. a control group, a clear value of brand activities can be established.

Our track record:

12 deployments in 3 continents - all in the last 24 months. Let's get started!

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