

Develop Tomorrow's Winning Products Today

Using Latent Class Mixture Models

By Albert Fitzgerald

Identifying unmet customer needs is critical for developing breakthrough new product and services. This paper discusses why current market research techniques, especially focus groups and one-on-one interviews, are incapable of identifying unmet user needs. The paper describes a new and proven approach to identify unmet needs. These unmet needs are those that customers are unable to articulate. The paper describes how these “unarticulated” or “latent” needs are identified through the use of latent class modeling.

Introduction

For telecommunications firms to be successful, they need to develop new products and services. This constant need for product innovation is required in order to generate tomorrow's revenues. With product life cycles for telecommunications products and services becoming shorter all the time, it is becoming disproportionately critical to successfully replace revenues generated by today's products and services with the products and services of tomorrow.

A practical approach to understanding customers' subconscious needs

It has often been said that 90% of a product's success is being first to market. The vanguard often reaps the reward as a new product or service concept gains tremendous free publicity and the potential to set an industry standard. But how does a firm consistently ensure that it is ahead of the curve? How can a telecommunications firm identify Tomorrows Winning Products Today?

Traditional market research techniques have been limited in their ability to identify truly “new” product ideas. These market research techniques have been limited in predicting breakthrough new products and services. Our traditional primary market research methodologies are also limited in understanding how best to communicate the features of our current products.

The main market research techniques that attempt to identify customer needs and new ideas typically rely on well known techniques such as focus groups and on in-depth one-on-one interviews. Newer techniques such as ethnography have gained in popularity as firms recognize that traditional techniques do not produce the results needed. **While traditional qualitative market research techniques are well suited to identifying evolutionary product modifications, they are not suited for identifying revolutionary new product ideas.**

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Limitations of relying on qualitative research to find your answer

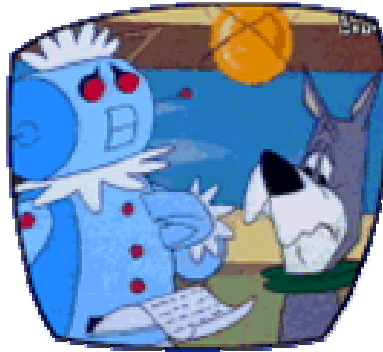
Traditional techniques such as focus groups or one-on-one interviews tend to generate two types of ideas from respondents. First are the very “tactical” suggestions that are typically very obvious. These would include making a product faster, cheaper and smaller. The second type are “Pie-in-the-sky” products or services that would likely sell well but are impossible to develop today! We can think of the type of wild-eyed inventions from the cartoon series *George Jetson* – robotic maids, flying chairs and push button dinners.

Three Critical Elements for Successful Product Development

We need to identify product ideas that are both innovative AND that can be developed with today’s technology. These three elements need to be addressed concurrently when we think of developing tomorrow’s winning products today.

1. First, we want to develop innovative products and services to get a competitive edge over our competitors. In order to do this we need to (a) understand customers’ needs and (b) anticipate what they will buy—but can customers describe products before they exist? This is a classic problem of traditional market research techniques which try to get customers to tell us what products they want before they have any idea of what these products are.
2. Second, we need to logically group features or services to best communicate the benefits of newly developed telecommunications offerings. Many telecommunications products and services today have numerous features or offerings. BUT these features are only interesting and important to customers when they fulfill a customer need. We need a way to “bundle” or group features in such a way that the bundle of features captures the customer interest. What “hot buttons” should we lead with in our advertising and promotion?
3. Third, we need to find out what messages resonate from a marketing communications / advertising perspective.

tive. What is the best way to communicate all of these new features? What are the benefits that the customer is seeking? A classic mistake of many high technology companies – especially telecommunications firms – is the tendency to overwhelm customers with features rather than explaining how a group of features meets the customer’s needs.



Focus groups fail to meet the three critical elements for successful product development

Traditional focus groups are often the primary method used to help identify unmet customer wants and needs. After all, if we can identify the unmet customer wants and needs, we can develop successful products, right? Well it is easier said than done. Focus groups explicitly ask respondents to tell us what their needs are. The main reason this does not work is that most unmet needs are subconscious. These are often referred to as “unarticulated” or “latent” needs. We need a method that allows us to *derive* these needs because customers are unable to directly tell us about needs which they have but which they are not consciously aware. We need to use a methodology that allows us to derive customer needs even if the customer cannot describe them. A methodology that succeeds is latent class modeling. We will describe this methodology now.

Steps Required to Successfully Develop Breakthrough Products and Services

1. First, we want to develop innovative products and services to get an edge over our competitors. But customers find it nearly impossible to conceive of products and services that do not yet exist. When asked about how to improve a product, customers refer to their knowledge of how products have

been improved in the past. This is why we typically get needs of “faster, smaller, and cheaper.” Instead, we need to focus on what benefits customers see in products and services. This is our first step.

2. Second, we need to logically group features to best communicate the benefits of newly developed products. Once we identify the benefits customers identify with current and new product features, we can use quantitative research to identify logical groupings of these features. Features that deliver the same benefits (from the customer’s perspective) should be grouped together.
3. Third, we need to find out what messages resonate from a marketing communications / advertising perspective. If we can identify which benefits group together, we will be able to see patterns in the responses which can lead to powerful marketing messages. These messages will be powerful because they are derived from actual benefits customer see. Latent class modeling allows us to identify benefits that *mathematically* group. In other words, we are able to ask respondents to describe features/services and the benefits they get from these features/services. We then process this massive amount of information using latent class modeling. The latent class technique helps us see patterns in the customers’ responses. The patterns show us how certain features and benefits mathematically go together. These patterns identify the needs that customers are unable to DIRECTLY describe. Through this process we have derived their subconscious needs and desires.

Why are focus groups so limited in helping us unearth unmet customer needs? To understand this we have to understand what defines a breakthrough new product. Breakthrough new products and services meet latent needs, not stated needs. Latent needs are those needs which customers have but do not recognize that they have. While these needs are very real, customers do not even realize that they have these needs because no current prod-

product satisfies this need. By using a mathematical technique (latent class modeling) we are able to identify patterns in how customers think about products and services. Once these patterns have been mathematically identified, we have, in effect, identified how customers think—we have seen into their subconscious mind.

Latent class modeling is an innovative way of unearthing latent customer needs. It can identify customer needs, even if they, themselves, cannot express them! It can show which features “naturally” group together in a customer’s mind. It is ideal for developing advertising messages, developing innovative new products and product bundles.

Steps in the Process

We start out with traditional qualitative research, but then take the results to the next level by quantifying the qualitative results and allowing the qualitative answers to be analyzed with a computer. This is done in two steps. First conducting qualitative research and second quantifying the results to identify unarticulated latent needs.

How the Process works:

Step One: Conduct one-on-one interviews.

We typically begin by conducting in-depth interviews from individual customers. Typically 20-40 customers are interviewed. Customers are probed for features and related benefits. A “mountain” of verbatim quotes is typically obtained from respondents. This huge volume of verbatim comments is not unusual and is one of the many problems with typical qualitative research – the unstructured nature and sheer volume of the verbatim responses is difficult to analyze.

For example, let us say that we are trying to identify possible telecommunication bundles and the marketing messages that will encourage customers to buy our bundle. We start by asking customers what benefits they see in a specific bundle of telecom services—such as a bundle of local and long-distance service. We get responses such as...

“Paying only one bill is less expensive – if you have to buy money orders to pay each bill, you have to pay more money to pay five bills than it would to pay only one.”

“No local place where we can pay our bill – this is important because we’re on fixed income, by the time our check arrives, we have to go to someplace local to pay the bill so we won’t get late charges on the bill (there’s no flexibility on when I pay my bill)”

“Comfortable in that the products will be more reliable”

“Get better service with only one company”

“Consistent delivery of the service they say they’re going to deliver”

“One company to deal with for payment”

“Simpler to have one company”

“Convenience of talking to one company when there are problems”

As you can see, there are lots of possible benefits to a bundle. In fact, we identified several hundred specific benefits. But how do we process this information? How do we identify the potential for additional bundles? How do we understand what are the real unmet needs?

To help minimize the sheer volume of responses we begin to organize the results. The verbatims are consolidated to a manageable number. Researchers meet with clients to choose which of the verbatim comments are most representative of all those collected. We eventually reduce hundreds or thousands of comments into a list typically with 50 or fewer verbatim responses. With classic qualitative research, results would now be drawn and conclusions rendered. The problem with ending here is that the voice of the customer is being filtered through the ears of the researcher! The researcher and client are inherently biased due to their knowledge of the market. Our client’s greatest strength is also his greatest weakness in analyzing this data – his knowledge of the telecommunications market! On the other hand a computer’s greatest weakness is

also its greatest strength – its LACK of knowledge about the telecommunications market!

Our goal is to find a way to take the qualitative results we obtained and have a computer analyze the data. A computer is excellent for identifying subtle patterns in data that we, as researchers, may not identify.

Step Two: Conduct a matrix survey.

In order to quantify the qualitative results we use a clever, but simple approach. Rather than continuing to speak with more and more respondents, probing about their telecommunications needs, we instead ask them to comment on what others have already stated. In other words, we now recruit several hundred respondents to take a quantitative survey. In this survey, we ask the respondents to rate their relative level or agreement/disagreement with what others have already told us in the qualitative phase. With this approach we are able to capture Likert scale ratings from hundreds of respondents. We have accomplished a great deal with this technique because now we can have a computer analyze the data for us.

Quantitative results are obtained by simply asking respondents to indicate the extent to which they agree/disagree with comments made by others. This allows the “mountain” of thoughts and ideas to be organized and rated through latent class / mixture analysis. Essentially what the computer is being asked to do is to look through the hundreds of ratings given by hundreds of respondents and tell us what patterns emerge. With latent class modeling we are able to identify patterns in respondents’ thought processes. We can identify ideas and concepts that are seen as similar *even if the respondents themselves do not notice this*. Groups of features with underlying wants and needs are categorized using statistical patterns in the results. The end product is a concise list of statistically valid latent needs and the features associate with those needs.

To continue with our example, we found that after testing dozens of benefits, the following four mathematically grouped together (there were many other groupings also, we simply chose one for this

example). We underlined certain words just for this example. There were no words underlined in the actual survey that respondents took.

- You will save yourself more time by buying several services from the same company than buying them from separate companies.
- The bills you receive will be more accurate & easier to understand.
- The services will run more smoothly and with fewer problems and headaches.
- You will have your needs met with less frustration by having all services delivered from one company.

We found that out of hundreds of statements, the four above grouped together. Now we ask ourselves, what it is about these four statements that are similar? Is there an underlying need that we may have identified? We think that there is. A key benefit of buying several services from the same telecommunications company is a desire to minimize stress. We call this the “aspirin effect.” In today’s busy world, where customers have so little time, the last thing they need is MORE headaches. Anything that minimizes stress, relieves anxiety and makes life easier is a huge benefit. If we had not been able to mathematically identify a pattern in these responses, we may have thought that “accuracy of bills” was an important need. We may have added pages to our bills to show additional information—and in so doing we may have made life more difficult for our customers because now it would take longer to review the bill!

How can we act on this newly identified need?

For product development, we can focus on simplifying services rather than adding every “bell and whistle” to a package. If we are developing new cell phones, we can focus on making them easier to use, simpler, more reliable with the aim that they are less frustrating to use. We have

seen a trend that all new cell phones keep have more and more features so that the user is now overwhelmed. Where is the “simple phone” that is easy to use? By identifying that a market need is to simplify life, reduce my headaches, and lower my frustrations levels, we can approach development of phones, design of bills and design of web sites very differently. We also have identified a powerful advertising message that will resonate with customers.

While our example, above, showed how we found benefits that mathematically (and subconsciously) group together, we can also use this technique to identify specific feature groupings.

Conclusion

A quantitative approach to identifying unmet customer needs meets the three critical elements for successful product development

1. First, we want to identify unmet and unarticulated customer needs. Once identified, we can develop innovative products and services to meet these needs. Latent class modeling does this by identifying the underlying (latent) needs customers have that cannot easily be stated because they are not recognized. When we identify these latent needs and how to meet them, we can inform customers of their existence and begin discussions on how to meet these needs.
2. Second, we need to logically group features to best communicate the benefits of newly developed products. This is successfully done by using a computer to identify related features rather than having those most knowledgeable about the industry subjectively group features.
3. Third, we need to find out what messages resonate from a marketing communications / advertising perspective. The previous example showed how we effectively identified a message that resonates with consumers. The message was derived using the consumers own words. Since the lan-

guage of the consumer is used, the message is easily understood.

Frequently asked questions and their answers:

Q. Will this give us actionable results or simply “pie-in-the-sky” product ideas?

A. This methodology gives highly actionable results. This is because we base the analysis on features that currently exist or that our clients indicate they are capable of developing. By starting off with pragmatic ideas, you are able to build product concepts which can be built and developed.

Q. How long will a study of this type take?

A. The qualitative phase can be accomplished very quickly due to the streamlined discussion guide format. Once our clients give us the list of 50–100 “features” to test we implement 20–30 one-on-one interviews. Total data collection is typically one to two weeks.

The quantitative phase can be recruited concurrently with the qualitative phase. Typical WEB implementation allows us to complete data collection in one week with analysis taking an additional one to two weeks. We have also successfully implemented this methodology using telephone interviews.

Q. What are typical sample sizes?

A. For the qualitative phase we typically complete 20–30 one-on-one interviews per target segment. Sometimes the target segment is the entire universe of customers for a given product line. Other times we focus on multiple sub-segments, such as small vs. large companies, etc.

For the quantitative questionnaire we recommend at least 200 completed surveys, although 400 to 600 completed surveys are more typical. Of course, the margin of sampling error will decrease with larger sample sizes. Also larger sample sizes would allow analysis to be conducted at the sub-segment level.