IT'S NOT EASY TO START A FOREST FIRE

Maps are inherently wrong because they are simplifications of reality. Nevertheless, maps can be very useful. Furthermore, different maps can highlight different information and yield different insights.

The same is true of models. All models are wrong; some are useful. Our model of word of mouth marketing, for instance, is useful in that it describes how contacts among potential customers and customers over time combined with positive probabilities of referral and persuasion can combine to stimulate the rapid accumulation of customers. This is reflected in the characteristic S-shaped growth curve in which growth in the number of customers starts slow, then grows very rapidly, and then slows again as the market becomes saturated.

Harnessing the power of social networks through word of mouth is exciting because it offers the potential for rapid buying rates, relatively low cost, and a reduction in the time it takes you to reach break even cash flow. That said, it's important to realize that embedded within the model is an important simplification.

Given a total market population consisting of customers and potential customers, the model assumes that everybody is connected to everybody else. Not only are they connected technologically, they are connected socially. What that means is if you assume A, the people in your target market talk with each other, B, there's at least some chance that customers will say positive things about your product, and C, there is a non-zero probability that such referrals will persuade a potential customer to buy, then given enough time, all of your potential customers will become customers.

Let me say that again. Adoption of your product may occur more quickly or more slowly depending on the likelihood of a persuasive referral, but the universal connectivity assumed in this model means that all of your potential customers will - sooner or later - buy your product.

This model seems realistic in that it generally assumes that it is not certain that contacts between customers and potential customers will result in a persuasive referral. That is, the referral fraction and/or the persuasion fraction are less than 100%. In other words, not everybody who receives your viral word of mouth marketing message will become infected right away.

However, the model also assumes that if potential customers are exposed to your message for enough time, they will eventually succumb. That inevitability is due to the baked-in assumption of 100% connectivity among members of your total market.

What if we were to turn the model on its head? For instance, instead of assuming certain connectivity and uncertain persuasion through word of mouth, we assume the opposite. What if the connectivity among members of your target market was uncertain, but persuasion was certain when a customer contacted a potential customer?

In marketing, we talk about a product going viral to describe rapid widespread adoption. Our basic marketing model, in fact, was borrowed from epidemiology. It's a model of how disease spreads throughout a population. We also talk about how a product or market "catches fire" to describe a cascade of adoption.

Let me introduce the forest fire model. Imagine a forest of trees growing in a square plot. Each green pixel represents a healthy tree. Black pixels are plots with no trees. The density slider controls the number of trees relative to the total size of the forest.

A density of 15%, for instance, means that 15 of 100 pixels, or plots in the forest, contain a tree. Now, let's say you start a fire along the left edge of the forest, indicated by this red line of dots. Fire, represented by the red square in the center of this three by three pixel plot, can spread if there is an unburned tree to the north, south, east, or west.

In this example, the fire could spread to the north or south, but not to the east, where the pixel contains no tree, nor to the west which has previously been burned as indicated by the red-brown pixel. A simplifying feature of this model is that the fire cannot spread diagonally.

The trees in our forest fire model correspond to potential customers, and the size of the forest corresponds to the total market population. The spread of fire is analogous to the rate at which potential customers decide to buy because of word of mouth, and the initial line of fire is equivalent to the market seed of customers.

If a tree or potential customer is exposed to fire - in other words, comes into contact with a customer - then the potential customer catches fire, too, and becomes a customer. Put differently, the referral fraction and persuasion fraction in the forest fire model are assumed to be 100%. However, the density of the forest, which is a measure of the degree of connectivity among the total market population, can be set to less than 100% in the forest fire model.

Let's move the density slider to 99%, which corresponds to almost complete connectivity across your target market, and light a fire along the left edge of the forest by pressing the Go button. Not surprisingly, the entire forest is engulfed in flame, which is indicated by the 100% burned indicator.

When your market is totally connected and your marketing message is irresistible, all of your potential customers will eventually become customers. All of the forest will burn. Equally unsurprising is what happens when density is low.

Let's reset the density to 10% and light the fire. Almost nothing happens. Only 0.4% of the forest burns. This is what happens when your existing customers absolutely love your product but are isolated from the rest of the market. They want to spread the word, but they don't have access to anybody with whom to share their enthusiasm. Word of mouth doesn't carry very far if you're in the middle of nowhere on the social landscape.

What do you think will happen if density is set to an intermediate level - 50% for example? This is where things get interesting. As you can see, nothing much happens again. Only 2.1% of the forest burned in this run.

Let's run that again just to make sure that it wasn't a quirk. Nope. Still only 2% of the forest is burned. I find that counterintuitive to the point of being shocking. Even with a 50% density, which seems like a pretty high level of connectivity, and an irresistible word of mouth message, total market penetration from a pure word of mouth strategy doesn't amount to much.

It gets even weirder. Let's bump up the density to 60% and light the fire. Eventually, nearly two thirds of the forest burns! What seems like a relatively small change in forest density results in a huge change in the amount of the forest burned.

If we plot density on the horizontal axis and the percent of the forest burned on the vertical axis, it's easy to see how small changes in density between 55% and 65% make an enormous difference in the outcome. In other words, the extent of the spread of the fire is extremely sensitive to the density condition.

Likewise, the degree to which potential customers will buy because of word of mouth can be very sensitive to the extent to which members of your target market are interconnected.

In short, the stock flow model tells us the rate at which people decide to buy is determined by the frequency of contacts between potential customers and customers, the fraction of contacts that result in positive referrals, and the persuasiveness of such referrals.

You can influence those variables to some degree, which is why we pay so much attention to them in marketing. On the other hand, our forest fire model tells us that the connectivity among members of our total market population matters a great deal. Even if we construct a perfectly persuasive word of mouth marketing message, it won't spread very far at all unless the members of our target market are connected beyond some tipping point threshold.

That presents a dilemma. If you are trying to increase the rate of buying in order to decrease the time it takes you to reach break even cash flow, a pure advertising strategy is limited to linear growth and could be quite expensive. If you increase your fixed and variable expenditures faster

than the rate at which potential customers decide to buy, you end up chasing a rainbow as your break even point recedes into the distance the faster you run after it.

A pure word of mouth strategy, on the other hand, offers the potential for inexpensive, very rapid customer growth, but growth can take a long while to kick in. Furthermore, if the people in your target market aren't sufficiently connected, you aren't likely to achieve much market penetration.

However, what if you lit a lot of matches and drop them all over your forest of potential customers? How might that change the probability of your starting a real forest fire of adoption of your product? I'll tackle that question in another lesson. Until then, this is Dave Bayless for Human Scale Business.