Modeling Mobile Market Share

Summary

I plan to design and implement a Netlogo model of the mobile market for two prominent competitors: iPhone and Android. This model will show the change in market share between these two competitors over time, and the factors which influence this change. The agents in this model will be the consumers.

What can be learned

The mobile market is greatly subject to the cumulative advantage--the more popular technology will gain customers faster, which will fund faster updates, which will then gain even more customers. It is common in this field for one technology to greatly surpass another. So how was it that Android managed to take such a significant market share from iPhones, when iPhones had such an early lead?

There are more factors that influence a customer's decision in choosing a technology other than what is the most popular at the time. Some of these factors may affect short term changes, and some may have long term and significant changes. From this model I wish to implement some realistic factors which may influence the decision of individual agents in choosing a technology. In doing so, I hope to learn which factors have a more significant effect in shaping the market share, and what corporations with mobile products should focus on, whether it is a marketing campaign, or new features.

Implementation

The agents in this model will be the individual customers. They will choose, for simplicity, between two technologies: iPhone and Android. The main motivating factor for which technology is chosen is the technology that their close friends have. This will be indicated by links between agents. This factor can be made stronger when iPhones and Android offer technologies that only work with themselves. This will be controlled by a switch.

There will be two initial states for the two technologies, and they will not be represented in the model. The agents will represent the model they chose by their color. The two initial states for the technologies will grow over time, according to a series of sliders describing the decisions each corporation will make. These decisions will describe the amount of money they wish to put into these sectors: marketing, development, maintenance, negotiations with carriers. Each agent using a technology adds to the technology's funds. The sliders control the percentage of the funds used, not the total amount.

Not all people are the same, and neither should all agents. Each agent, when made, will have their own set of preferences. One may like to be on top of the technology curve more, and others may be more influenced by marketing or friends. Each agent will be made to hopefully represent the distribution of preferences in the real world.

Because of the nature of North American carrier plans, each agent will have the option of choosing a new technology every n ticks. They are less likely to choose a different technology. They are also less likely to choose a different carrier. When choosing a phone, or re-picking one, the decisions will be influenced by the money that is spent on each sector: marketing, development, negotiations with carriers, etc. There will also be new users entering the field.

All decisions made by agents will be based off of a probability. An agent may be very unlikely to switch to different technology and carrier that has poor marketing and product maintenance, but it is not impossible for an agent to do so. This will hopefully model real life more accurately, as there are many unaccountable factors which come up that can influence a person's decision.

To analyze the market share, there will be a graph which represents the market share of both the two technologies. If the market shares generally tend towards an equilibrium, BehaviorSpace will be used to record the effect factors have on market share. Hopefully, we will also be able to see the profound impact the initial cumulative advantage has on the resulting equilibrium.

Rational

Netlogo is a natural fit for the mobile market share model. Agents represent customers, and links represent friendships between customers. Netlogo makes for a relatively simple way to model individual customers and the decisions which they make based on a number of factors.