NETWORK EFFECTS // BLOG

What are Network Effects?

By **Nicholas L. Johnson**

When talking about platform businesses, the conversation often includes a reference to network effects and how platforms can more quickly create value for different types of user groups. The concept of network effects can seem difficult to grasp at a glance but is really quite simple. By understanding network effects first, platform designers can begin to implement platform growth techniques that capitalize on their understanding of network effects.

What are network effects?

Network effects exist in any network, whether it's the pony express, old-school landline phones, the internet, or platforms. Network effects are the incremental benefit gained by an existing user for each new user that joins the network.

Put differently, the phone is only useful if other people (users) also own a phone. If only one person owns a phone, the value of the phone network is zero, because they cannot do anything with the network. If a second person owns a phone, then the first person can call the second person, and if that's beneficial to them both, then the network has some value. If everyone owns a phone (e.g. personal friends, government institutions, service providers, and so on), then the phone network is very valuable to all users. Imagine the first time the police department joined the phone network and provided the emergency call service 9-1-1. That new user (police departments) provided a huge value to all other phone users simply by joining the network.
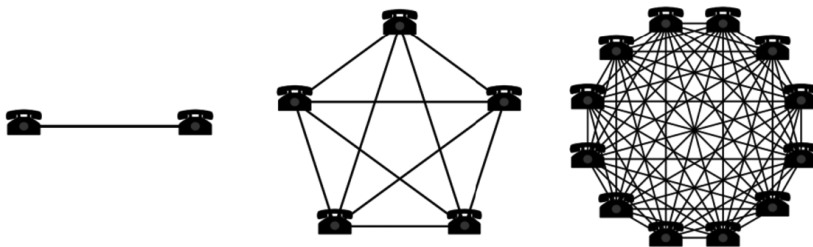
incremental benefit gained by an existing user for each new user that joins the network.

"

The phone network is a clear and easy to understand example, but it only accounts for one type of network effect. There are two types of network effects: direct and indirect network effects. Phones benefit from direct network effects, but platforms benefit from indirect network effects. The difference is key to the exponential growth we have witnessed in platform business models.

Two Types of Network Effects: Direct vs. Indirect

Direct network effects are also known as same-side effects. The value of a service simply goes up as the number of users goes up. Returning to the example of the telephone, it is only useful if the people that you need to reach also have telephones. The more people there are who have phones, the more useful it is to have one yourself.

"

With direct network effects, the value of a service simply goes up as the number of users goes up.

"

Direct network effects aren't as applicable to platform businesses because platforms have *two or more user groups* exchanging value with one another. In most platforms, there are two users groups: producers and consumers. The more consumers on the network, the more valuable that network is to producers, and vice versa.

This type of network effect is called an indirect network effect, also known as cross-side effects. With indirect network effects, the value of the service increases for one user group when a new user of a different user

Taking Uber as an example, as more riders (i.e. consumers) join the platform, the more useful and valuable it is to drivers (i.e. producers), because they have more business opportunities. The reverse is also true. As more drivers join the network, riders have shorter wait times and more locations available for their rides, thus the network is more valuable.

Note that a key difference between indirect and direct network effects is that the *type* of user who joins *matters*. Sticking with the Uber example, when a new driver joins Uber, there is little to no additional value to other drivers. However, when a rider joins Uber, that increase the value of Uber for all drivers.

> *With indirect network effects, the value of the service increases for one user group when a new user of a different user group joins the network.*

Cost-benefit analysis of joining a network

Joining a network has a cost. In some cases, to join a network a user must buy hardware, such as the telephone. Even today, digital platforms require smart devices and benefit greatly from the ubiquity of smartphones, such that from the consumer perspective apps are "free." Uber is free – for those who already have a smartphone.

In other cases, the cost is more direct. An Uber driver pays a fee to Uber for services rendered through the app.

When a platform attains a critical mass of users, the cost of joining the platform is outweighed by the value of joining, with most of that value being derived from the power of the network (e.g. the Uber driver will have access to *many* more passengers, making the transaction fee worth the cost).

> *When a platform attains a critical mass of users, the cost of joining the platform is outweighed by the value of joining, with most of*
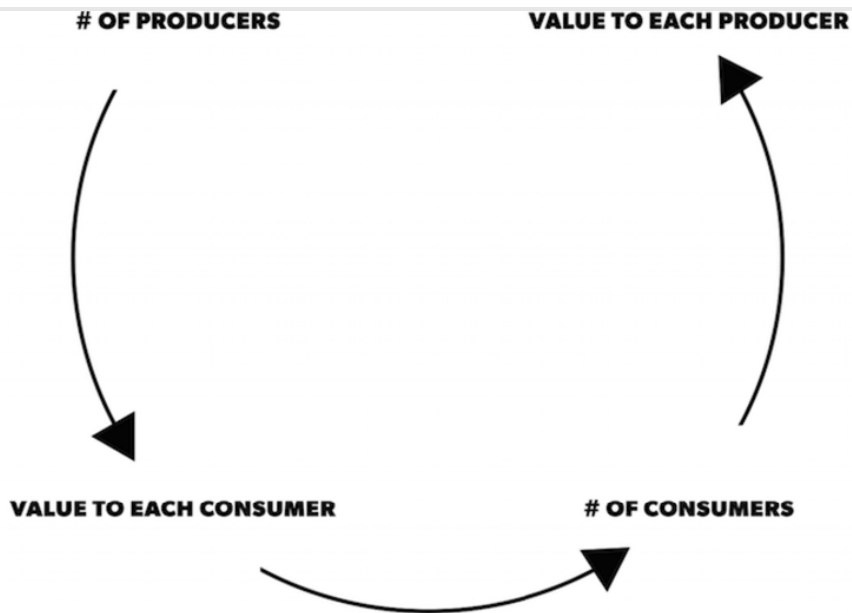
Prior to critical mass, the cost of joining is greater than the value derived from joining, so the platform will need to employ strategies to incentivize early usage, such as subsidizing initial user acquisition. Like providing a referral fee, for example. In a platform's early days, there's a chicken and egg problem – consumers only want to be on a platform with an existing network of producers, and vice versa. We wrote an article to help platform designers solve this problem with 7 strategies to grow your platform.

High quality growth is lasting growth

In most productive work, there is a tradeoff between quantity and quality. That's not necessarily true for platforms. In fact, if all else holds equal, an uptick in platform membership can lead to higher quality services or products transacted on the platform.

For example, if there are many developers producing great apps on a given platform – say Apple's iOS – more consumers will be drawn to that platform and will go out and buy iPhones. As the number of iPhone users grows, more and more people will learn how to develop apps on iOS because the market is growing, thereby opening the doors to a wider array of higher quality apps. Expert software developers who existed before Apple iOS will also see the growing platform as an opportunity too big to ignore.

This interdependent cycle between producers and consumers known is known as a "positive feedback loop" and is the bread and butter of successful platforms.

However, while this is the key to sustained platform growth, not all growth on a platform leads to higher quality. While a grow platforming *will* attract more high quality users, it will also attract lower quality users too, as well as spammers and scammers. Therefore platform managers must emphasize the "higher quality" nature of growth and maintain a high standard for access and use.

Facebook provides an early case study in growth management. The initial user base began as a highly curated group (students at a single university). As it expanded, Facebook remained strived to maintain user integrity by flushing out spam accounts, ensuring users are who they say they are, and creating community rules to highlight the aspects of Facebook that users most enjoy, while banning objectionable content. Former competitors like MySpace and other social networks rapidly deteriorated precisely because they did not implement these safeguards against low-quality growth.

These safeguards did not stymie Facebook's early growth either, because Facebook chose appropriate curation and access rules. Today Facebook boasts 2.23 billion users.

This type of runaway growth led to its own problems after Facebook reached one billion users in 2012. Facebook's outsized influence and reach made it especially attractive to would-be scammers and unethical parties who wanted to wield Facebook's power for their own means and were determined to circumvent Facebook's rules. The sheer scale of Facebook made it difficult for the social media giant to police its users. The tactics that were appropriate and effective when the platform had only a few million users did not work at a larger scale. As scammer, bots,
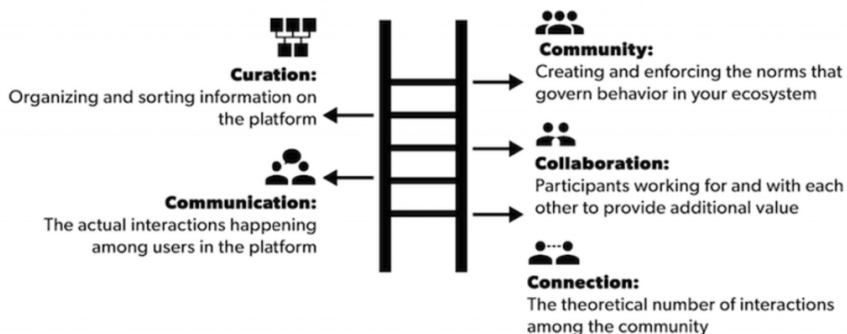
"

Platform managers must emphasize the "higher quality" nature of growth and maintain a high standard for access and use.

"

Optimizing for network effects in platform design

Beyond user acquisition, platforms can be designed with features that boost network effects. These five features can be broken down into five design steps called The 5 C's of Network Effects: Connection, Communication, Collaboration, Curation, and Community.

Step 1: Connection

Connection refers to user onboarding and their ability to find others on the platform. How easy is it for users to find the right counter parties to buy from, sell to, share and collaborate with, etc.?

Step 2: Communication

Communication between users should be as seamless as possible, allowing for the greatest ease-of-use. Seamless mobile syncing is a must-have as well.

Step 3: Curation

Curation maintains the usability and integrity of your platform by keeping the quality of your users and content high and easily searchable. To ensure quality, platforms must focus on two aspects of the platform: user

to find any product, service, content or counterparty.

> " To ensure quality, platforms must focus on two aspects of the platform: user access (who is on the platform) and content/catalog curation (what is on the platform). "

Step 4: Collaboration

Collaboration enables users to self-organize into new networks that advance the specific agendas that are important to them individually. For example, Etsy users self-sort by interest into groups within the marketplace. Reddit's subreddits perform the same function within the content platform.

Step 5: Community

The final step, community, grants users a sense of ownership of the platform, such as when a user edits a fact on Wikipedia, rates an app in Google Play, or flags inappropriate content on Facebook. In a sense, it's user-enforced curation. It not only gives users a sense of ownership over the platform's quality, but it also provides platform managers with invaluable user feedback. For example, what type of content are users of Facebook finding objectionable, and why?

Once a platform has optimized The Five C's, the growth generated through network effects can be a powerful force that leads to scale that's unachievable with linear business models. Curation and Community feedback and participation provide steady guardrails for runaway growth, while Connection, Communication, and Collaboration attracts users and keep them coming to the platform over and over again.

In practice, network effects are not global

When talking about network effects, the discourse implicitly refers to network effects as having a global benefit wherein each new user benefits the entire network (global here refers to the entire network, not geography). However, in practice, network effects are local and clustered

For example, YouTube has many local networks on its platforms from makeup enthusiasts to video game streamers to book reviewers. When a new video game streamer joins YouTube they benefit users who are interested in video game streams. When a new makeup guru launches a channel, their channel doesn't add value for the gamers, but it does add value for the makeup audience. This strengthens Youtube's resilience to competition. While Youtube still has a strong gaming culture, many gamers have moved on to game-streaming platform Twitch. Despite Twitch's growing popularity, YouTube continues to grow overall because its other micro-networks are robust and growing. If Youtube were dependent on gamers, then Twitch's growth would be existential.

Thus, local network effects can be a powerful force in keeping user engagement high and consistent, because it emphasizes and accounts for each user's individual interest and forms a community around that interest.

Also noteworthy is that fact that many of the most successful platforms today began with a niche focus on a particular demographic. YouTube began primarily as a music video platform that enabled aspiring musicians to post video and embed it in MySpace. Facebook began at a single university then extended to neighboring universities, and spread from school to school before expanding beyond collegiate users. If Facebook had started with the mission to attract *everyone* to their platform, their message and positioning would have been muddled, and they would have most likely failed.
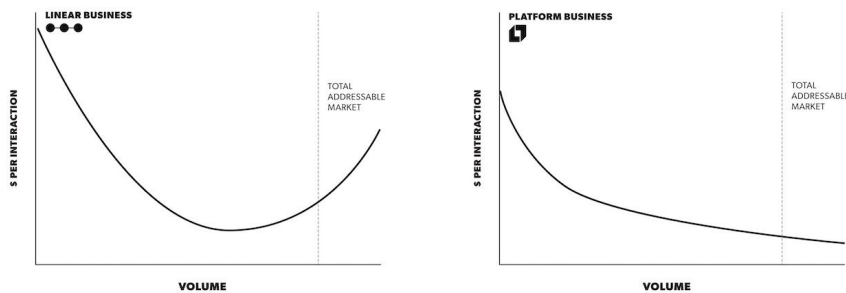
Seen through this lens, a new platform should never try to target *everyone*, but instead focus on a niche subculture or demographic. That niche may be the entire network in the platform's early stages, but, in the future, it will represent just one strong local network in a larger platform. A good growth strategy for platform managers looking to expand their network is to consciously target new local networks and optimize the platform to serve the new segment.

Financial returns of network effects

As a platform scales, its costs per unit sold decreases logarithmically (see figure below). In comparison, linear businesses are constrained by a U-shaped cost-per-unit curve as they increase sales. To understand why, consider a linear business manufacturing lumber. Initially, as the company grows, it benefits from economies of scale as its operations become more efficient and can process large quantities of wood at lower costs.

explores in depth the financial differences between linear and platform business models.)

In contrast, a platform grows not by buying more assets, but by acquiring more users, which has a near-zero cost. For example, when Uber wants to add more cars to its platform, it just needs to attract new drivers to its network, not buy more cars. This costs the platform next to nothing.

> # " A platform grows not by buying more assets, but by acquiring more users, which has a near-zero cost. "

On the flipside, in terms of distribution, the cost of serving one additional customer is also next to nothing. Returning to the example of Uber, all Uber needs to do to distribute ride-sharing services to riders is provide each user with a copy of the app.

The word 'copy' is key to understanding a platform's near-zero marginal cost of distribution. An app might cost $500,000 to develop. However, every copy of that app thereafter costs next to nothing to produce and distribute. Uber made some investment in developing Uber, and today continues to improve the app through developers to enhance user experience, but development costs do not have a one-to-one relationship with each new user acquired. Thanks to the Internet and sharing technology, information goods today have a near-zero marginal cost of distribution.

*Data from *Modern Monopolies* research looking at S&P 500, 2016

And investors have taken notice. Platforms boast higher profit margins and higher price-to-revenue multiples. Perhaps this explains some of the high valuations we see in platform businesses today.

To learn more about how to build, manage, or grow a platform, join our newsletter in the form below or on the right-side menu.

Related Articles

We're constantly updating our feeds with the latest platform news and Applico announcements. Stay in touch!

Popular Platform Newsletter

Sign up to join over 20,000 other subscribers and receive the latest in platform news and insights. Sent weekly on Sunday. Become a platform expert – sign up for our newsletter now!

Full name   Email   GET INSIGHTS