
Practitioner Article

Achieving critical mass in social networks

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ABSTRACT This article addresses issues associated with the achievement of critical mass within a community and seeding the success of a new social network. It looks at the factors that influence people's adoption of a new network, how to influence them and what approach to take.

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INTRODUCTION

The creation of online social networks is now a process that is accompanied by technologies that are so advanced that what once took the best programmers weeks or months to achieve can now be bought off the shelf and personalised in as little as an afternoon. The difficulty with the creation of a social network still remains, however, the achievement of critical mass – that moment where there are enough users of the network to produce enough content on a daily basis to keep users logging in and contributing themselves.

This article looks at the component parts to achieving critical mass in a social network.

HOW MUCH IS CRITICAL MASS?

Critical mass depends on a number of different factors outlined below. Before

delving into them it is important to understand the limitations within which social networks must work.

Historically, studies have shown that the maximum number of people that can be sustained in a community where each and every relationship is actively maintained is around 150. Robert Dunbar performed a number of calculations based on the relative neocortical sizes of species and added credence to this number for humans (now known as Dunbar's number).¹ Examples can be found in neolithic village size upper limits, Roman army divisions, the splitting point for Hutterite settlements and, more recently, the proposed optimal company size for the modern military.

The same is true for online social networks. The maximum number of *relationships* that can be actively managed by an individual is about 150 and the average

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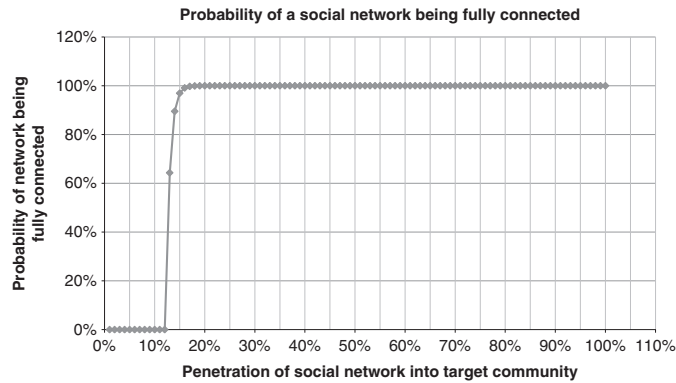


Figure 1: How community penetration determines interconnectedness of social networks.

is around 130. More interestingly, however, the number of *friendships* that are seen to be managed through social networks is between 10 and 15 per cent² of the number of *relationships* an individual has – the average Facebook user with 130 friends will leave only six comments per day on others’ photos, posts or statuses, indicating that not all of the 130 *relationships* are *friendships*.

NB: There is a nomenclature issue here as many people would describe their 130 connections as ‘friends’, but for the purpose of distinction between those that we communicate with most frequently, and those that we just ‘send a Christmas card’ to is necessary.

Comparisons across network theory, graph theory and real-life examples of technology adoption show that after around 15 per cent of a community has been penetrated, the rate of acceleration of adoption dramatically increases until it plateaus at a saturation point. See Figure 1.

Although the time taken to reach a plateau may vary from technology to technology, the same basic pattern is visible across a range of technologies, as shown in Figure 2.

Thus the immediate goal of any social network is to hit that approx. 15 per cent saturation of the community they are

targeting, but this raises the problem of how best to address critical mass when the target community is, for example, the population of the United Kingdom. To achieve 15 per cent of 60 000 000 (the approximate population of the United Kingdom), 9 000 000 people need to sign up (and use the service regularly) before critical mass is achieved – a prohibitively high threshold.

Herein lies the crux of the difficulties surrounding achieving critical mass for a social network:

- in order for people to visit a site more than once, there must be good content (*G*);
- in order to get good content on to a social site, people must be visiting that site frequently (*F*);
- once enough people (critical mass) are regular visitors to a site, they will produce enough content to ensure return custom and thus further good content and increased usage in a self-perpetuating cycle, if not counterbalanced by external forces, such as competition.

How does a fledgling social network ensure good content?

PERCEIVED USER VALUE

Consumers make repeat visits to a website because it delivers value to the user in one of four areas. However, the reason that

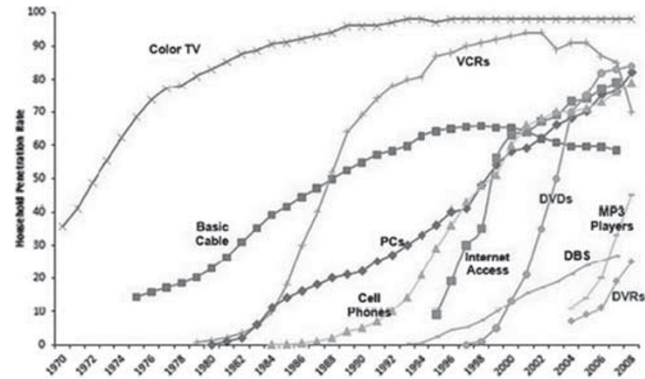


Figure 2: Adoption rates of technologies in the United States.

Table 1: ‘The four pillars’ – online value delivery channels

<i>Pillar</i>	<i>Benefit</i>	<i>Moment of truth/realisation</i>
Information capital	Provides user with information that they find useful	‘Plastic windows are more insulating’
Emotional capital	Provides content that triggers an emotion in the user	‘Knock knock...’ Or ‘Bankers are fat cats’
Temporal capital	Provides a function that saves the user time or effort	‘I can find a plumber when I’m on the train’
Financial capital	Provides a financial incentive to use the site	‘20% off plumbing service this week’

people visit social networks on a repeat basis is slightly more complex. The true value (V) of the site is only one element of the considerations that are made when evaluating a social network. The four pillars are set out in Table 1.

Perceived user value (P) for a particular user is a factor of the content itself, the frequency at which the content refreshes and the distance (strength) of relationship that the contributor has with the user as well as the actual value of the site. It can be defined as the interaction of seven key factors:

$$P = \frac{I(F \times R \times U \times V)}{D \times N}$$

where P is the perceived user value, I is the influence, F is the frequency, R is the relevance, U is the uniqueness, V is the value, D is the distance of relationship and N is the community population size.

It should be noted that perceived user value (P) is, in itself, made up of four components:

1. Perceived competitive positioning – ‘I think this is the best’.
2. Perceived associations – ‘Others have perceptions of this, and I do/do not want to be associated with these things’.
3. Customer need – ‘This does what I need it to do’.
4. Perceived proposition delivery – ‘The exchange works for me’.

In addition, ‘recommendation’ – or ‘antirecommendation’ is captured within the four pillars as the recommendation will either save time/effort or result in an increase in financial capital or knowledge capital for the recipient. Within the equation for perceived user value (P), the power of a recommendation IS the perceived user value.

FIXING THE RESULT

In order to ensure that a site achieves the critical 15 per cent opt in from a community, the content must be good. Initially, though, frequency will be low, as there are few contributors, and distance of relationship is likely to be high (as the probability that any other user chosen at random throughout a population is closely affiliated to another randomly chosen individual is small).

There are, however, techniques that can be used to increase the likelihood of a positive outcome. First, critical mass is achieved by increasing the numerator, in the above equation, and decreasing the denominator, which can be done in the following ways.

LEVERAGE EXISTING NETWORKS AND RELATIONSHIPS

The closer the relationships that individuals have with others, the more frequent the communication becomes because there is more in common, more shared time together, more shared experiences and so on. Thus starting a social network among an already-strong network, where conversations are already happening regularly and relationships are strong is an important factor in achieving good content that precedes critical mass.

Furthermore, the closer the relationships, the greater the probability that an individual has a high level of influence over the audience. The influence of the user is not directly related to the content itself, however (hence its separation from the rest of the numerator), but it is important as to the success of the network, as those with influence have a stronger 'pull' on peers.

Influence is based on trust that is built up by consistently producing high ' $(F \times R \times U \times V)$ ' and, as such, builds on previous interactions. In essence, Influence is based on the reputation of the individual making the comment.

RESTRICT THE TOPICS OF CONVERSATION

By decreasing the scope of conversation that can be held through a social network, network administrators ensure that a higher proportion of the comments are relevant to the individuals that are using it.

Plumbers may not, for example, be interested in hairdressing tips, but would be interested in plumbing tips. MySpace have recently recognised that the generic social network is not an environment that they can compete with Facebook in anymore. Therefore, they have redefined themselves as an 'entertainment centric social network' with particular focus in their historical niche of music.

DEMONSTRATE THE VALUE THAT USERS ACHIEVE

By showing off the value that is provided by the social network as publicly as possible, it is possible to ensure that the message is able to be passed on to others, thus increasing the saturation of a community and progressing towards critical mass. Showing photos, leads, connections, friends, 'likes' or any other statistic is a reasonably public way not only to encourage others to join to reap the same rewards, but also to trigger a degree of competitiveness among users, further increasing the rate of adoption.

IN ORDER TO BE A BIG FISH, SHRINK THE SIZE OF THE POOL

Critical mass is essential to the success of a social network, but critical mass is not dependant on the size of the target community. Facebook reached saturation within a single university before it spread to a second, a third and, eventually, opened up to the rest of the university world. Only after Facebook had reached saturation within the student communities, did it open its doors to the world.

The principle behind this is that at each enlargement of the community, the saturation never dropped below the critical mass.

A good analogy is that of a bucket that has been filled with water. This equates to the Harvard University Facebook saturation. The bucket is full and so cannot hold any more water – every student that will use Facebook now does. If, however, the bucket is doubled in size, by adding another university, for example, the bigger bucket is only half full and thus there is now room to pour in more water once again. If the increase in the size of the bucket (community population) does not result in the new bucket being < 15 per cent full, this bucket can also fill up until it, too, is full. This process can, and did, continue, bucket by bucket, until Facebook became the phenomenon it is today.

If, however, then population saturation (amount of water in the bucket) had fallen below 15 per cent, the Facebook ran the very real risk of collapsing before it got off the ground.

Despite this, over expansion does not *necessarily* result in collapse of a social network: humans have a strong tendency towards self-segmentation into smaller groups within the larger community, thus maintaining saturation within their subcommunity. However, in cases where this does not occur, the probability of collapse is significantly increased.

FILLING THE FIRST, SMALL BUCKET

The equation for good content is a little more complex than suggested above because N (community population size) is made up of users and employees – those that are independent of the host company and those that are subject to direction – such that

$$N=U+E$$

where N represents community population size, U represents users (non-employees) and E represents employees (and U and E are mutually exclusive).

One way to ensure that a seed network reaches critical mass is to increase E as far as possible by mandating participation from employees. By controlling the majority of the population on the network, it is possible to fix the frequency, the value and the relevance, not to mention the decreased distance of relationship between co-workers compared with strangers.

There are difficulties with this approach. Specifically, there is a need for careful planning, strategy, training and policies to ensure that communications are transparent, legally compliant, relevant and of value. However, so long as this caveat is observed, this approach can help in achieving critical mass.

CONCLUSION

Although difficult to achieve, it is perfectly possible to grow a social network from nothing to critical mass organically. Groupon, a discounts and offers website, has accomplished this organic growth since November 2008, launching city-by-city across the world and now is a multi-billion dollar business. Their success is at least partially due to their approach of achieving critical mass in each city, not nationally.

The conversation and buzz within cities (not to mention the relevance of the local offers) heavily sways the equation in their favour.

Success is, however, absolutely reliant on getting it right first time. Users are fickle and are significantly less likely to log in a second time if, for whatever reason, their first time experience fails to meet their expectations.

Beyond this, the approach set out in this article is about building social networks (and critical mass) on a block by block basis: so long as each community reaches a high enough saturation that the inclusion of new communities does not dilute the

Table 2: Key strategies for achieving and maintaining critical mass

<i>Key factor</i>	<i>Direction of effect</i>	<i>Strategy</i>
Perceived user value	Increase	Increase perceived competitive positioning, perceived associations, customer need or perceived proposition delivery
Influence	Increase	Leverage close, existing networks with established influencers Mine existing conversations and identify existing super-influencers for targeting
Frequency	Increase	Leverage existing strong relationships in existing networks, as they have more frequent conversations
Relevance	Increase	Decrease the scope of conversation on the network, so as to ensure that more conversations are on topic
Uniqueness	Increase	Allow users to reward or thank users that produce great content, thus encouraging new, unique content
Value	Increase	Clearly demonstrate the value that the network offers while also displaying the value that other users get from it
Distance of relationship	Decrease	Leverage close, existing relationships initially
Community population size	Decrease	Reduce the target community size so as to ensure that the saturation increases faster

content to below the critical mass, then a project is likely to continue to expand.

The key strategies for achieving continued expansion are set out in Table 2.

REFERENCE AND NOTE

- 1 http://en.wikipedia.org/wiki/Dunbar's_number.
- 2 Marlow, C. (2009) Primates on Facebook, *The Economist*, 26 February 2009.