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# ON THE EVOLUTION OF ONLINE TOURISM COMMUNITIES

## Network Battle or Long Tail Niches?

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## Abstract

*Even though the emergence or respectively the construction of online communities is of great interest for scientists and community engineers, only few empirical data has been presented on community growth. This article starts with a reflection on possible growth curves of virtual communities. It contrasts a network externality perspective that produces clear winners and losers in a market with a long tail perspective that also allows small niche products to be successful. These considerations are empirically tested with a sample of 74 travel communities whose numbers of registered members were recorded at two measure points. The results show that online travel communities develop into an archetypical long tail. A very small number of communities with exceedingly high numbers of members are accompanied by a vast amount of communities with only few members. An analysis of the long tail, however, reveals that the community tail is not dead but is populated by a large number of especially regional communities that show considerable growth rates.*

*Keywords: evolution, online communities, growth rates, network effects, long tail*

# 1 THE EVOLUTION OF ONLINE COMMUNITIES

Online communities have been the object of extensive research within the last 25 years (for an overview see Preece 2000; for a multi-disciplinary topology Porter 2004). Within these decades of research the phenomenon has been highlighted from different perspectives. One commonly cited source is Rheingold (1993) who describes online communities as technological enablers for communication among community members. The social interaction is the focus of the author's attention and the mutual support (e.g. in case of illnesses) is vividly described. Hagel & Armstrong (1997) in contrast, focus on the economic potential online communities offer to companies. The authors see them as platforms to redefine and strengthen a company's relationship to customers, suppliers, and competitors. From the customer's point of view, Hagel & Armstrong (1997) conceive communities as the option to be a more informed bargainer than in traditional markets. For the domain of tourism see Wang et al. (2002) who take the more social perspective by Preece as well as the economic perspective by Hagel & Armstrong to discuss implications for marketing and design of travel communities.

These two perspectives are reflected by approaches for the construction of communities as well. Preece (2000) proposes a community-centered approach which is related to a member or user-centered approach. In accordance with a participatory-design approach Preece claims user needs and social aspects to be crucial pillars for the development of a community (another practical guide on community development is provided by Kim (2000)). Hagel & Armstrong (1997), again, conceive community members more as potential customers. They claim that communities fulfil four basic needs: interest, relationship, fantasy and the need for transaction and bartering (like e.g. purchasing goods). In accordance with this potential-customer perspective their development strategies focus on binding the members to the community. Consequently, their strategy to reach a community's critical mass point comprises three stages: generating user traffic, concentrating traffic and locking in traffic.

Just like Hagel & Armstrong (1997) and Hummel & Lechner (2002), we also conceive Online Communities as phenomena that realize network effects. This implies that the benefit users receive from using a product or a virtual community is influenced by the number of persons who also use this service or product. For most communication products within networks like traditional telephone networks it is the case that the personal benefit increases with a rising number of other persons who also use the network (cf. Shapiro & Varian 1999). Crucial aspects of a networks' evolution is the fact that they can evoke positive as well as negative feedback loops and that they follow an S-shaped curve in three phases: a) flat during launch, b) a steep rise during takeoff as positive feedback kicks in and c) leveling off as saturation is reached (ibd.). Figure 1 depicts the assumed growth curve of virtual communities based on this network effect assumption.

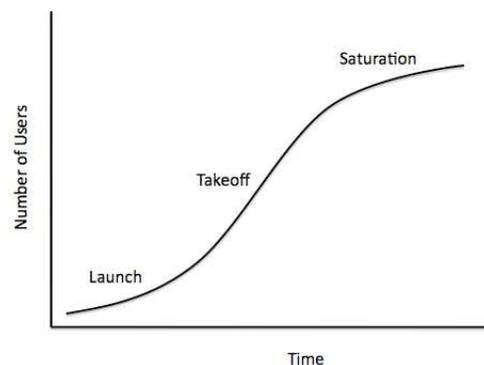


Figure 1: Assumed growth curve of online communities due to network effects (cf. Shapiro & Varian 1999)

From a practitioners point of view it is relevant to know at which number of users the accelerated growth curve starts for a specific community. If a common point or interval could be estimated for a specific community domain, it would be possible to predict the growth of different communities within the near future.

In accordance with this idea of a network market, virtual communities within one domain (e.g. English-speaking forums covering travel-related questions) cannot be considered to be independent from each other. Traditional off-line communities are to a strong degree bound to geographical aspects as well as aspects of affiliation. This means that originally one did not choose a community but one was born into one. Geographical boundaries as well as barriers between social classes were difficult to transgress. Even though this has changed to some degree since the industrial revolution, off-line communities are still rather a fate than a choice. This situation is considerably altered by the net situation: It provides the real choice to become a member of one community or the other.

This, however, implies that forum communities within one confined domain can be said to compete for users like products on a market compete for customers. From a neutral users' point of view it should always be more beneficial to join a community that has at least reached the take-off phase (for evidence that higher user activity indeed leads to better information quality within a community see Prestipino et al. 2006, Aschoff et al. 2007). If one community within a domain reaches this point, this would on principle be a good precondition for a monopolistic development. Wikipedia seems to be an interesting example of this situation. Only one main Wikipedia platform has developed up to now, even though some of the described topics on this platform are highly controversial. The positive network effects are so strong that users do not seem to be willing to launch competing knowledge sharing platforms. Figure 2 shows this division into winners and loser in a network market. Winners are said to enter a virtuous cycle while loser are said to enter a vicious cycle (Shapiro & Varian, 1999).

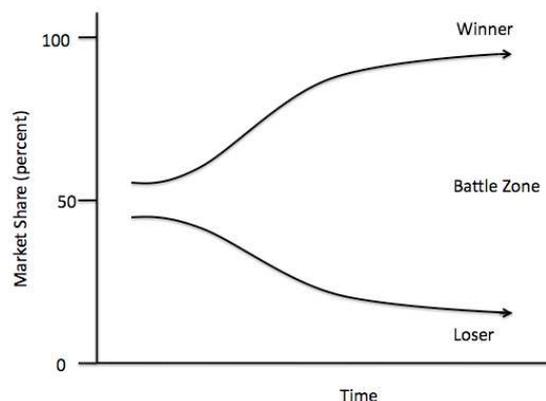


Figure 2: Separation of Winners and Losers in a network market (cf. Shapiro & Varian 1999)

Thus, a market with strong network effect tends to produce clear winners that are able to gain big revenues as well as clear losers that are not able to reach the positive feedback zone. This creates a situation in which a company either has to gain considerable amounts of the market share or will cease to exist.

In contrast to this situation, we see the conception of a long tail market as described by Anderson (2006). In these markets, products can be profitable in very small niches due to the decreased costs of warehousing and distribution in the digital economy (for a description of a long tail market for the business of online bookselling see Brynjolfsson et al. 2003). In these markets, the aggregated revenue from all the products that sell only in small numbers can equal or exceed the few hit products that sell in vast amounts. Thus, from an economic perspective it pays off to offer niche products for a small customer segment as long as the distribution costs are minuscule.

A market can show network effects as well as a long tail distribution. The characteristics of this market will, however, depend on how dominant either of these influences are. A market that is dominated by network effects will, as described above, favour one winner and one or more losers. This is especially given when systems or products are incompatible with each other, i.e. the user of one system cannot communicate with the user of another system. This can eventually lead to format wars (e.g. the recent competition between the HD DVD and the Blue-Ray format; for numerous additional examples see Katz & Shapiro 1994). In contrast to this, a long tail market allows products with far smaller consumer than the hit products to be “economically sustainable”. For a related controversy that contrasts a long-tail assumption that favours “underdogs” with a head-of-the tail assumption that favours “superstars” refer to Elberse & Oberholzer-Gee (2008). Applied to the market of online communities these perspectives lead to different predictions:

- a) *The network effect perspective would predict a winner-takes-it-all market, i.e. few large online communities with considerable growth rates are accompanied by a number of small communities with stagnating or declining growth.*
- b) *The long tail perspective would predict small communities in the tail to be successful as well, i.e. they would show user activity and growth rates.*

## **2. Empirical Method**

To empirically test these two assumptions, we assembled a comprehensive collection of online communities that dealt with travel-related questions. This search started in February 2008 and we only selected platforms that met the following characteristics:

- a) In this research, we focussed on classical online forum platforms. These forums are characterized by a communicational structure in which one community member starts a thread by sending an initial post (like a question) and possibly receives a number of replies. In contrast to wikis, product recommendation sites or newer social networking platforms (like e.g. [www.facebook.com](http://www.facebook.com)), these online forums have been developing on the Internet for more than 20 years. By now they cover a wide area of topics including cooking, health-related issues, computer problems or mobile phone technology. For an early account of the online forum community “The Well” founded in 1985 refer to Rheingold (1993). To obtain a more homogeneous sample, we confined our sample to browser-based forums.
- b) The main purpose of the forum had to be travel-related information exchange. Prominent examples are the Thorn Tree forum<sup>1</sup> run by the Lonely Planet Publisher Group or the Virtual Tourist platform<sup>2</sup>. The forum members had to discuss typical travel related topics (like e.g. How do I get to a certain place? How can I solve travel related problems? What are suggestions for attractive travel routes or locations? etc.).
- c) The language used by the community member to communicate had to be English.

The following search engines were used for this research: Google, Yahoo!, Altavista, Live Search by Microsoft as well as the meta search engine Mamma. In addition Boardreader was used which is a search engine specialized on finding online forums. The used key words comprised: “Travel Forum”, “Traveler Forum”, “Travel Board”, “Independent Traveler Forum”, “Independent Traveler” and “vbulletin travel”.

The number of registered members was registered at two measure points. The first measure point was between February and July 2008 and the second measure point was in November 2008. The number of

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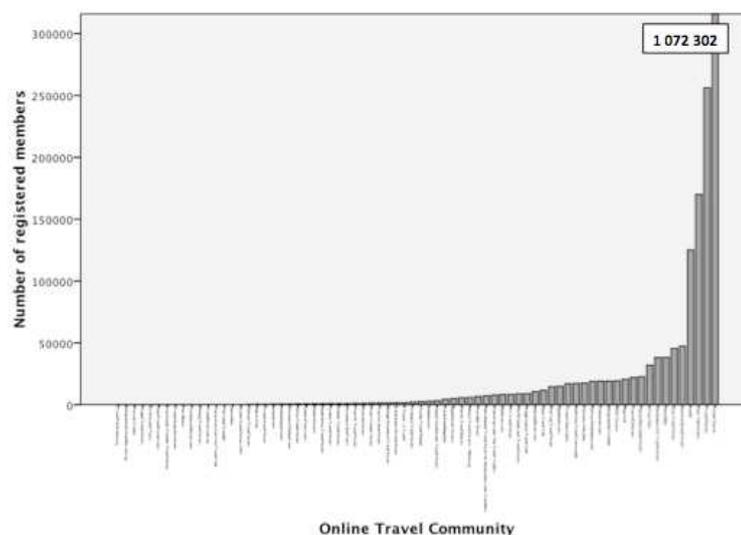
<sup>1</sup> <http://www.lonelyplanet.com/thorntree/index.jspa>

<sup>2</sup> <http://forum.virtualtourist.com/>

registered users was measured by reading out the respective number from the websites of the communities.

### 3. Results

The described search procedure resulted in 120 travel-related online discussion forums. The first measure point was between February and July 2008 and the second measure point was in November 2008. The number of the community members is not displayed by all communities and some communities seized to exist or were temporarily offline at one of the two measure points. In addition to this, two communities were so massively spammed at the time of the second measure point that travel related communication was hardly taking place anymore. We excluded these forums from the sample. Finally, we were able to measure 74 online communities at two points in time. Figure 3 shows the 74 communities with their respective numbers of member at the second measure point in November 2008.



*Figure 3: Number of registered members at the second measure point (Nov. 2008) for each forum*

The distribution of the absolute numbers of registered members shows an archetypical long tail for this community sample. Based on this distribution we can roughly distinguish three groups of communities that are separated from each other by about one order of magnitude. We have one community which claims to have more than 1000 000 registered members. The second group consists of three communities between 100 000 and 300 000 members. The third groups starts with communities with about 50 000 registered members and entails 70 communities whereas the smallest communities only have between 10 and 20 members. The data shows that those forums above 50 000 constitute only about 5% of the forums in the sample. One the other hand, note that the forum with the highest acclaimed number of members already has more members than all the remaining forum communities.

We calculated the absolute growth rates of registered members as well as the growth rates relative to the absolute number of registered members at the first measure point for each community per month. Overall, communities in our sample grew by an absolute average of 393 members per month which relates to a relative monthly growth of 17.7% . The absolute growth rate of the largest community with about 1000 000 members amounted to 8085 members per month (0.78%). The second group between 100 000 and 300 000 members had two forums with only marginal or even negative monthly growth (924.5 members (0.76%) and -1155.2 members (-0.66%). The third forum in this group, however, showed a considerable growth rate with 14267.56 additional members per month (11.16%).

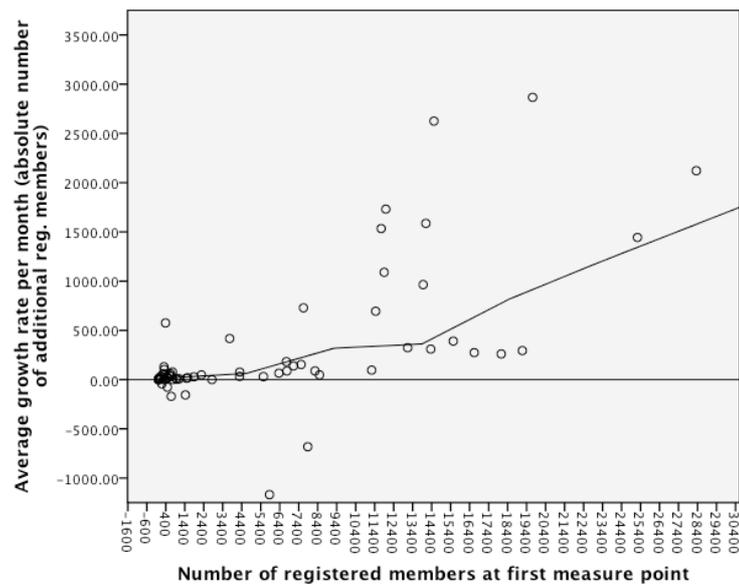


Figure 4: Absolute monthly growth rates for communities under 30 000 members

Figure 4 shows the absolute growth rates per month of communities below 30 000 registered members. The Loess fit line (Epanechnikov-Kernel with 50% of points to fit, entire sample included) indicates a steady increase in the absolute number of new members per month with considerable derivations. Overall, the absolute increase of members correlates significantly with the size of the community at the first measure point (Pearson = .336). This part of the sample consists of 70 communities out of which 62 communities show a positive growth level while 8 communities show zero growth or a negative growth level. The average growth level of these communities amounts to 17.66% (7.56% without one extremely fast growing community).

Thus, while this tendency is hard to prove due to the small number of communities at the head of the long tail, this data may indicate a certain saturation point. Overall we see a clear tendency that the biggest relative growth does not happen in the head of the curve but in the tail. Figure 5a shows these relative growth values for the range between 0 and 5 000 members. Figure 5b shows the range between 5 000 and 30 000 members.

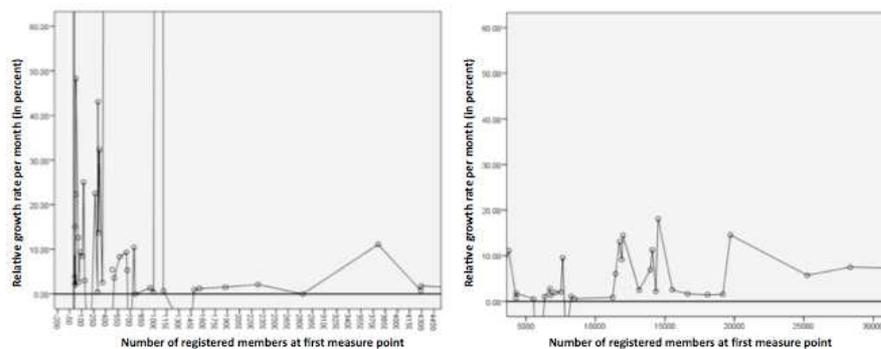


Figure 5a/b. Relative growth rates with respect to the absolute numbers of registered members (in percent)

Again, the data show a considerable variance among the different forums. Most of the forums grow between 1 and 20%. A notable high number of forums show increased growth rates in the interval between 0 and 500 members. To gain insights into the considerably high growth level at the end of the long tail we categorized our community sample into different subsamples.

### What grows in the long tail?

As mentioned we see an archetypical long tail with very few communities with exceedingly high numbers alongside a vast amount of communities with only few members. Figure 6 shows the number of communities at the very end of the long tail only depicting communities with less than 10 000 members.

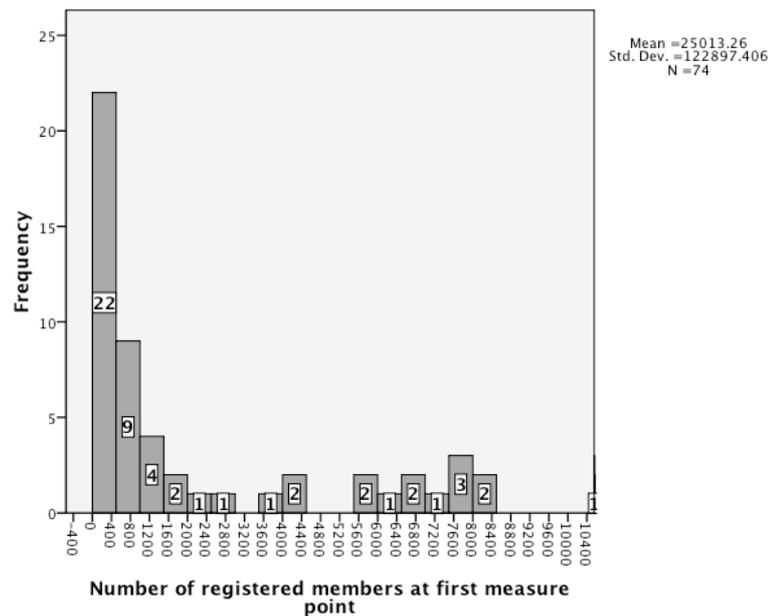


Figure 6. Frequency histogram for communities with less than 10 000 members

Note that 53 communities fall into the range between 0 and 10 000 community members. This is already 72% of the entire community sample whereas the largest communities have more than 100 000 members. In addition, the interval with the most communities within this range lies between 0 and 500. The network effect approach as well as the long tail approach would expect a diversification of the communities at the end of the tail. From a user perspective a community in the tail should provide some special good that cannot be offered by the big communities. Only based on the probability to obtain good answers to posted questions or the chance to meet many new people, the larger communities should always be in advantage of gaining new users. To test this assumption we divided our sample into three groups. The first group of communities are communities that on principal cover all regions of the globe. The second group are communities that are specialized on certain regions like specific continents or countries. The third group, finally, focusses on special interest groups like mounting biking, diving, or travelling by motorcycle.

Figure 7 shows the end of the long tail with communities below 10 000 members divided by these three groups. As could have been expected the ratio between worldwide and regional forums changes if the sample is divided by this threshold. Above 10 000 the sample contains 10 worldwide forums and 7 regional forums, and below this threshold the sample contains 10 worldwide forums and 37 regional forums.

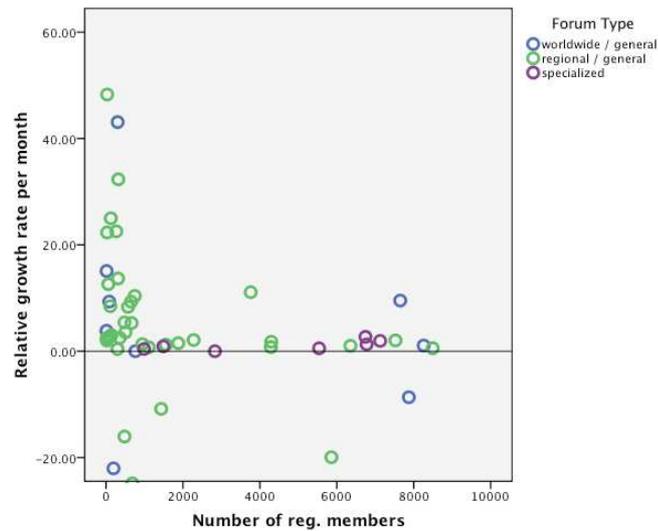


Figure 7: Relative growth rates for different forum types

Thus, we can conclude that there is a vast number of small communities that grow at a considerable rate. We assumed that regional forums in the end of the long tail would grow faster than worldwide. To diminish the effect of the extreme outliers within the sample we transformed the relative growth variable into a ranking scale and performed a non-parametric Kruskal Wallis Test. The mean ranks for the global forums as well as for the regional forums proved to be almost identical (36,47 and 37,42) whereas the specialized forums had lower mean ranks of 24,39. The test failed to reach significance with  $p=.212$ . Thus, the data indicate that small global communities grow at a similar rate as small regional communities.

### Limitations

The research is yet limited due to the fact that the number of registered members in a forum is only a very indirect measurement of the activity within a forum. Future research has to substantiate our findings by additional measures like e.g. the number of written posts per month recorded over a longer period of time.

### 4. Discussion of the results

With respect to the absolute numbers of registered members our sample shows an archetypical long tail. Very few travel communities with an exceedingly high number of members (ca. 100 000 members and more) are accompanied by a large amount of small communities (between ca. 10 members and ca. 30 000 members). With respect to growth rates, however, the data show that this long tail is not dead but shows considerable average growth rates. Hence, the long tail does not seem to be populated by losers but rather by communities that are developing in a promising way. This leads to the question why end user would join a smaller travel community if they also have the chance to join a “market leader”. This can have a number of reasons:

- a) Differentiation. Some small communities might offer a special service or cover a special aspect that is not provided by the communities at the head of the tail. This might be related to special travel-related interests (e.g. diving, hiking) or special region-related coverage (e.g. communities specializing only on Thailand). However, our current data does not support this claim. There are more specialized communities at the long end of the tail compared to communities with a worldwide coverage. However, these worldwide communities show growth rates that are similar to the growth rates of the more specialized communities. Further analysis considering additional characteristics (like e.g. degree of commercialization etc.) has to show whether variables can be found that separate the long tail communities from the

communities in the head of the tail. Another possibility is that the size of the community is a differentiating characteristic by itself. A number of Internet users might prefer smaller communities for different reasons: the risk of information overload is decreased, it is easier to gain a higher social status and the feeling of social belonging might be stronger in a smaller community.

- b) Intransparency of the online community landscape. The idea of the network effect driven community market assumes that Internet end users have a choice to become a member of any arbitrary community. Obviously, this implies that Internet user have an overview over a more or less transparent market situation. Since central repositories for online (travel) communities are not very widely spread, most users probably do not even know what kind of choices they have. This might lead to a situation in which a user engages into the first online community she finds more or less suitable without being aware of other options. Further research especially in the field of information behaviour can yield fruitful insight as to how Internet users actually search for virtual communities and how they decide which one to join.

These results also underline the fact that online communities assumably do not only have positive feedback loops but also negative feedback loops as they increase in size. This negative feedback loop is caused by information overflow that can be caused if too many persons ask questions (this means for example that each question gets less attention) or too many replies are given. In addition, the transaction costs are increasing for a single user if she has to manage relationships to many points within the social network of the community. This aspect sets online forums apart from cooperatively constructed online encyclopedia like Wikipedia. At least for the vast amount of passive consumers of Wikipedia, an increased user community only has the positive effect of increased quality without the negative effects of information overload or increased transaction costs. This might have led to the monopolistic position wikipedia is holding today.

This argumentation points to a relationship between community size and perceived value of an online forum that is rather characterized by a U-shaped function opening downward than by a steady increase as depicted in Figure 1. Further research should focus on the lower as well as on the upper boundaries of this value curve. This is also related to the question whether online forums need a minimum number of members for a sustained development. Our current data shows considerable relative growth rates for communities between 10 and 500 members. Additional future measure points of our sample will reveal whether these developments are persistent over time. Practical implications of this research arise especially for the field of online community development. Approaches in this domain up-to-now have often been of a prescriptive or design-oriented nature. These rules of community development, however, have to be complemented by quantitative models of online community evolution that are empirically well founded.

### **Acknowledgements**

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