

# Network Propagation – Chance or Design?

## Why Do People Share Online Content?

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## 1 Introduction

New media offer new opportunities. Does this also provide stronger influence over potential customers? With the possibility of ad block, the forward goal must be to develop consumer's desire to consume advertising. Having consumers' attention immensely increases likelihood them to remember content. (Cowan, 1995) This drives researchers to investigate the reasons artifacts become viral on the internet. What factors need to be in place to guarantee virality? Can there be a 'how-to' instruction guide? What needs to be considered when creating ads in order for this new advertising mechanism to be successful? In what way does the content of ads predict viral potential?

Placing an artifact online and achieving organic distribution through potential customers is the high point a company can hope for in advertising; it is cheap, easy and possibly fast, depending whether the artifact is being distributed quickly by the prospective users, is placed well on the internet, and reaches a lot of potential forwarders in the social graph. How can it be determined if the forwarding process works or fails? Is it possible to design a viral marketing campaign, or is success in these cases only by chance? Does the sending person make a difference?

This research investigates the design of viral marketing campaigns to evaluate the occurrence of virality. Section 2 proposes a virality research model. Using fifteen pre-selected YouTube video clips, we extend the model and review virality factors in Section 3, such as reach and activation, which enable artifacts to 'go viral.' Also under consideration are the needed attributes of artifacts in order to sponsor virality – the chance or design of virality. Section 4 finds and discusses that video clips 1 through 10 are successful in both spread and design, while the other five unsuccessful. The discussed results and future research of Section 5 reveal design implications for the marketing and social network analysis communities.

## 2 Related Literature: Milkman and Berger

Berger and Milkman (2012) looked into the '25 Most E-mailed List' of the New York Times to explore why certain articles became viral using a logistic regression model

to predict whether an article makes the ‘25 Most Emailed List.’ By testing the impact of the consumers’ emotions when reading an article, and the benefit and reasoning from forwarding it, their conclusion argues that in order for forwarding to happen people need to feel some kind of activation and motivation. Their study shows that activation is highly correlated to the consumers’ emotional state. In increasing order, the viral potential emotions they explored are disgust, sadness, anger, surprise, anxiety, amusement and awe. Also other categories like practical utility help virality. Milkman and Berger’s results can be used for predicting whether or not a viral marketing campaign will be successful, but in order to determine range of success, more criteria will be necessary. Looking into the compilation data it is obvious that activation is very important in order to make a viral marketing campaign successful, according to the fact, that the most successful marketing campaigns were interesting and awe-inspiring or surprising and that the unsuccessful viral marketing campaigns often did not inspire a specific emotion.

### 3 Viral Marketing on YouTube

Like in the paper of Milkman and Berger the artifacts used in this research cover a wide range of different target audiences. Since this paper not only looks at whether or not something is successfully viral, but also at the success rate, a standard logistic regression as used by Milkman and Berger is inappropriate. The authors thus extended the formula to prominently calculate the even more important existence of emotionality and positivity, which leads to the quantifier as shown in the formula ‘forecasted successes’.

$$\text{Forecasted Successes} = \frac{1}{a} + \frac{8}{36} * \text{emotionality} + \frac{7}{36} * \text{positivity} + \text{evoked emotion} + \text{interest} + \text{practical utility} \tag{1}$$

The variable a (average liked), measured via a convenience survey (n=27), a 5-point questionnaire where 4 is ‘like the video extremely’ and 0 is ‘do not like the video at all’, is the average of the answers of this survey for each video.

$$\text{Positivity} = \frac{\frac{\text{positive play time} * 100}{\text{Total play time}} + \frac{\text{Amount of positive words} * 100}{\text{Total amount of spoken words}}}{2} \tag{2}$$

$$\text{Emotionality} = \frac{\frac{\text{Emotional play time} * 100}{\text{Total play time}} + \frac{\text{Amount of emotional words} * 100}{\text{total amount of spoken words}}}{2} \tag{3}$$

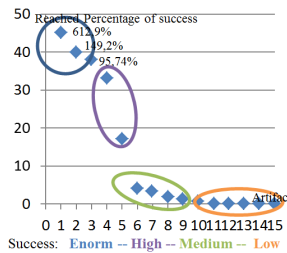
Positivity is the amount of time, where the video shows positive content and emotionality is the time the video shows emotional content (including positive emotions).

$$\begin{aligned} \text{Evoked emotion: Awe} &= \frac{6}{36}, \text{ Amusement} = \frac{5}{36}, \text{ Surprise} = \frac{4}{36}, \text{ Anger} = \frac{3}{36}, \text{ Anxiety} = \frac{2}{36}, \\ \text{Sadness} &= \frac{1}{36}, \text{ Disgust} = \frac{0}{36} \end{aligned} \tag{4}$$

The specific emotions, like awe, amusement, anger, sadness, disgust, surprise and anxiety, were determined through the convenience survey, by asking about the emotion(s) evoked.

$$\text{Interest: if yes} = 0,05, \text{ else } 0; \text{ Practical Utility: if yes} = 0,05, \text{ else } 0 \tag{5}$$

Additionally, the questionnaire asked whether or not an article is practically useful and interesting. The video is considered emotional when one of the emotions is shown or said in words. This calculation serves both to make the success rate results more comparable and to prove the correctness of the classification above, as shown in Figure 1. It is formed by the division of YouTube clicks and potential customers of the company or the people that are supposed to be reached.<sup>1</sup> Using this division the campaigns are more comparable to each other.



**Fig. 1.** Percentage of possible consumer reached per video clip (n=15)

The number of reached potential customers is only an approximation and not an exact number. The reasons for this fuzziness are numerous: It is currently not possible to know how often one person watched a video, nor how many people watched it at a time. Also while YouTube is a worldwide platform, not every video are accessible worldwide. Finally, this research does not consider how many consumers have internet access in the countries which companies distribute.

### 3.1 Context Specificity

Watching the videos one notices that the most viral videos do not seem to have a lot in common with the product they promote. The second question the authors explore measures the strength of connection between the artifact’s content and the actual product the online content is promoting by calculating the length of the video compared to the time the promoted product is seen in the video (Formula 6).

$$\text{Percentage of time product was shown} = \frac{\text{Time promoted product is in video} * 100}{\text{Total play time}} \tag{6}$$

Also the total amount of words that are spoken in the video are compared to the total of words that mention the promoted product, Formula 7.

$$\text{Percentage of words that broach the product} = \frac{\text{Amount of words broach the promoted product} * 100}{\text{Total amount of spoken words}} \tag{7}$$

<sup>1</sup> The number of potential customers is the sum of people living in the countries where the company is distributing (according to each company’s website). 1,705,670,000 is the predicted calculation of how many people have internet access in 2012.

Again the average of these two, as shown in Formula 8, is a useful measure, because, as mentioned earlier, watching a video two senses are addressed – sight and hearing. The total play time is taken from the YouTube video and total play time that broached the video is measured and the time is added up. The total amount of word is counted as well the amount of words that broach the product.

$$\text{Average} = \frac{\% \text{ of time product was shown} + \% \text{ of words that broach the promoted product}}{2} \tag{8}$$

Figure 2 shows the correlation between forecasted success and the success rate of all fifteen viral marketing campaigns. They have a moderately strong positive correlation, meaning that success can be forecasted using the given criteria. Considering the correlation strength and samples of this initial study of viral marketing examples, probability of success cannot yet be determined or interpreted. It does however show a trend that using the above criteria increases the chance of virality.

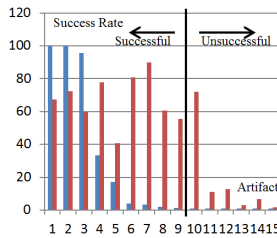


Fig. 2. Success rate decreasing (blue) and forecasted Success (red)

The connection between the total play time and time that is spent actually telling about the product to be promoted (Figure 3) is proved through a linear regression model:  $f(x) = -4,69 + 5,77x$ . When a company increases the percentage of time showing their product in the video, the chances for their campaign to go viral decreases. The unsuccessful viral marketing campaigns mainly reside to the right in Figure 3, where the percentage of the time spent showing the product to be promoted is high. Successful viral marketing campaigns mainly reside in the left side, where the percentage of time spent showing the product to be promoted is rather low.

The connection between the word total and amount that is spent actually on the product is proven through linear regression:  $f(x) = -16,48 + 6,99x$  (Figure 4).

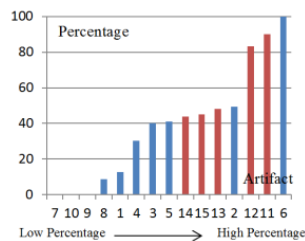
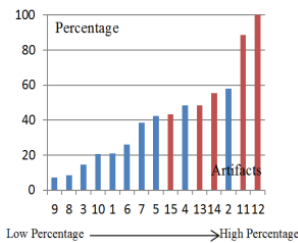
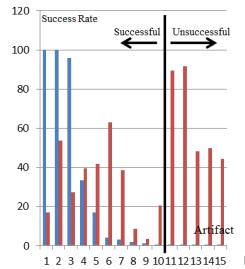


Fig. 3. Percentage of time referencing Product Fig. 4. Percentage of words promoting product

## 4 Evaluation and Future Work

Similar to the above findings, when a company increases the percentage of time mentioning their product in the video, they decrease the change for their campaign to go viral. In Figure 5 the correlation between the averages of the results of Figure 3 and Figure 4 and the success rate of all fifteen viral marketing campaigns displayed, with a correlation coefficient of  $-0,060$ .



**Fig. 5.** success rate of videos (n=15) compared to product promotion time

In summary, it is useful to keep the time sowing promoted product between 5% and 40%. In addition word total actually promoting the product and the time the product appears in the video should be at a max of 45%. This creates the recommendation that in order for higher return on investment when attempting to start a viral marketing campaign, keep the average between promotion time and words low. Looking at the results of this paper, it becomes obvious that it still is a long way to reach a functional instruction series on making content viral. But what is for sure it is not only chance. One further research need is an impact assessment of where an artifact is published. Another area is linking virality assessments to social network analysis, and node placement. Finally, content appearance needs to be carefully researched.

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