Tree-like Viral Posts in Social Media and Fractals

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Abstract: **The following article compares the construction of a tree in space with the spreading of viral posts in social media with time. The viral post-tree diagram is drawn starting from level-zero spreader to level-n spreader to explain the construction of the entire tree (though the diagram is drawn in 2d but clearly actual tree will be in 3d). In each stage the viral tree can be compared with a real tree structure. The analysis clearly shows that there will be a definite upper limit of spreading of branches of real tree (as is visible in nature) as well as for viral tree (also clearly visible because any viral post ultimately dies out with time after a certain number of views in social media platform). There after we have defined fractals. That both these (viral post-tree in temporal scale and real tree in spatiotemporal scale) structures behave like natural fractals are also mentioned in the analysis as well.**

Index terms: **Viral posts, Trees, Fractals;**

I. INTRODUCTION

Often we heard the term "viral post" [1, 2, 3] in social media, i.e. the posts those spread in the social media platforms from one user to another in parallel, thick and fast. In fact this is a current trend. Either some conscious event become viral in social media, if they are "rare" as well as if there are some deliberate uncommon performances shoot and posted in social media to make them viral to earn "fame" by individual(s). Not always those events have enough merit to become "viral" [1, 2, 3] or "famous" but it is completely unknown and uncontrollable phenomena to presume which event or act will hit the feelings of majority people and they will start sharing the relevant post to make it viral for absolutely nothing (no profit or income). Viral posts [1, 2, 3] not only earn fames, sometimes the post creator will earn money from their viral activity depending upon the criteria of the social media concerned. On the contrary sometimes people are so crazy to become "viral" [1, 2, 3] they act illegally that lead to possible legal hazard for them.

II. VIRAL POST SPREADING IN SOCIAL MEDIA-LIKE TREES AND FRACTALS

Now first we have to understand how does a particular post become viral in social media, then we can correlate it to a tree and hence with a fractal. To explain this we need the help of a viral-tree diagram. In the diagram (and obviously in reality also) there must be a level-zero spreader (the stem of the viral tree). The level zero spreader may be the creator of the viral event himself or herself (if he or she or any assistant is shooting his or her own activity) or may be another person who either informing (e.g. a news reporter) or in many cases not informing (stranger passing by) the event creator, shoots the "rare" activity of the viral event creator and spread it to social media through his/ her social media connections and become the level-zero spreader. Generally when the viral event creator is himself (or herself) the level-zero spreader then it is his (or her) conscious effort to become famous or viral. Sometimes it may so happen that he or she never thought of becoming viral beforehand, rather simply sharing his or her activity in social media, but other people love it and make it viral or as per recent trend people are willing to become viral hence shooting their own activities.
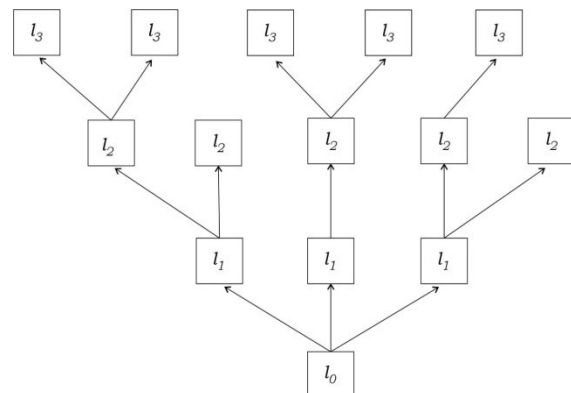
Fig.1: Viral-tree diagram (l_i indicates ith level spreader).

Now after the level-zero spreader most often there will be many level-one spreaders depending upon on how many social media platforms and groups the level-zero spreader has spread the upcoming (would be) "viral" post. This situation is explained with the viral-tree and clearly one can find resemblance of this to many branches of big trees those start once the stem splits along the upward direction. Immediately after the level-one spreading there will be level-two spreading. Clearly depending upon the activeness and densities of level one spreaders in different social media groups and platforms, the level-two spreading starts at random times from each level-one spreading (which is again quite clear from the viral-tree diagram in Fig.1). One can identify this situation with a very big tree, where no exact and definite rule of mathematics is applicable in successive branching orders of trees. The more the post is spread in different levels (level-two, level-three, …..) the more it becomes viral and popular in short time and will become a sensational news (not always extraordinary though). It may reach from few hundred people to few thousands (sometimes few million people also) depending upon how people are becoming enthusiastic about the post and keep on forwarding it with fast reaction.

Clearly as a demand of time, enthusiasm of people will die out. The rate of forwarding becomes slow (clearly seen in our viral-tree diagram). One can compare it with the phenomena that branches of trees are becoming thin as they spread more in all directions. Ultimately the viral post has to die out (one can compare it with the situation when the sub-sub-….braches of trees become thinner and thinner with time) and will reach the digital device as well as social media platforms of those people who are either not that enthusiastic or the so called "viral"-tagged post lose its importance with time and people are finding interest on another such post. So finally those posts stay and imprisoned for ever inside the social-media platforms of n/m-th level spreaders and will be lost in the sea of posts in social media (we can identify it as the upper limit of branching of a tree. Whatever the thickness of the stem may be, ultimately there will be a sub-branch that will not split and the tree ends there, which is applicable in all directions of the tree-growth).

One can easily check the spreading time-statistics of viral posts and can find a bell-shaped curve like covid 19 waves (having some central tendency) as shown in Fig.2.
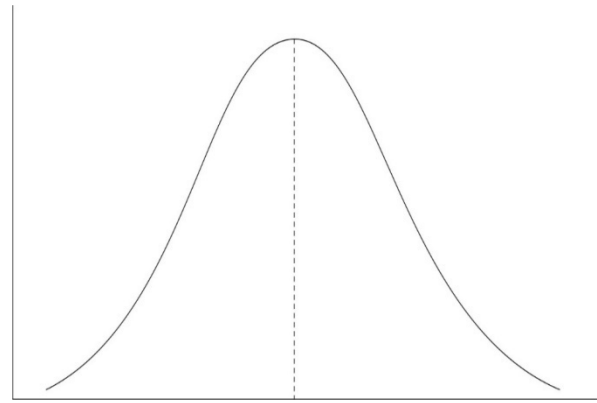

Fig 2: Bell-shaped curve showing the time variation of viral post spreading.

This is all about the viral tree. The natural tree is also compared in the discussion. Now the fractal: natural fractal [4] is very famous structure in nonlinear dynamics and chaos theory and is defined as the repetition of a typical shape in successively smaller scales. Fractal repeats itself but it lowers its size. Hence after a few stage of repetitions it has to be "vanished" in the macroscopic scale. A few figures are posted (Fig.3 and Fig.4) those are photographs shoot by one of the author (PM) of leafless trees at Kakrajhor, West Midnapore, West Bengal, India in the month of April 2022 in the evening. These figures explain the fractals. One can check that the identical
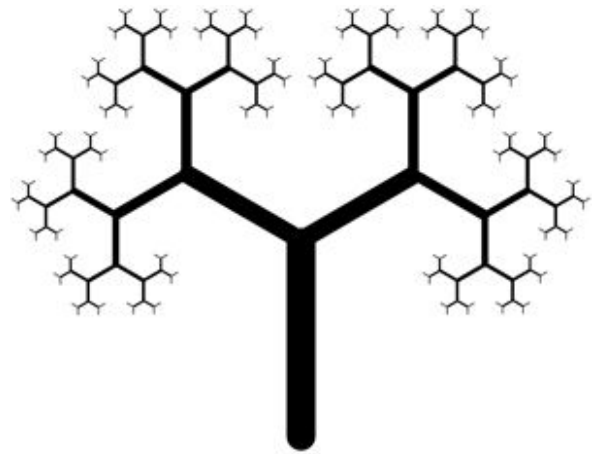
Fig.5: Natural fractal diagram.

III. CONCLUSION

The viral post spreading process can be exactly compared with trees that we have already discussed. Now the process of spreading (branching) from level-zero to level-one or from level-one to level-two or say from level-n to level-$(n+1)$ looks identical. There is practically no difference in between the spreading of viral massage from one level to the very next level. Only additional thing is that, as it is happening simultaneously so in each level more number of spreading is occurring in parallel.

Consequently the number of level-two spreaders is much greater than the number of level-one spreader; number of level-three spreaders is much greater than the number of level-two spreaders and so on. Clearly the number of 2nd level branches of a tree is much greater than the number of 1st level branches; the number of 3rd level branches of a tree is much greater than the number of 2nd level branches and so on. Hence ultimately the resemblance between viral posts, trees and fractals are clear to us.

References:

1) Berger J., & Milkman K.L. (2012), What makes online content viral?. Journal of Marketing Research, 49(2), 192-205.

2) Berger J., & Milkman K.L. (2013), Emotion and Virality: What Makes Online Content Go Viral?. Insights, 5(1), 18-23.

3) West T. (2011), Going Viral: Factors That Lead Videos to Become Internet Phenomena. The Elon Journal of Undergraduate Research in Communications, 2(1), 76-84.

4) K. E. Robles *et.al.* (2021), Aesthetics and Psychological Effects of Fractal based Design. Frontiers in Psychology, 12, 1-21.

Fig.3 and Fig.4: Fractal shaped trees photographed at Kakrajhor, West Midnapore, West Bengal, India in the month of April 2022 in the evening.

Shapes repeat themselves to construct the entire trees, which are nothing but fractals [4] by definition. A fractal is shown Fig.5 as illustration.