Network Dynamics of Knowledge Creation in the Wikishere

Myshkin Ingawale

Abstract

The rapid success of initiatives such a Sourforge, Slashdot, Wikipedia, Digg, Facebook, Del.icio.us and others over the last decade have aroused tremendous academic interest in the field of social computing. This thesis addresses the research gaps in extant literature in the understanding of growth dynamics, emergence and persistence of high quality content in a social computing forum called Wikipedia. Wikipedia is a free online encyclopedia that

significant churn in the contributor base. Using our results of scale-free nature and assortativity in degree distribution and drawing from prior work in diverse areas of memetics, epidemiological approach to culture, contagion theory and network science, we also put forward a network-theoretic explanation for the sustainability of governance mechanism. In particular, we claim that provided an interaction network displays the structural characteristics of scale-free degree distribution and assortative mixing of nodes, it is a candidate for persistence of social norms in its inner-core. This process is path-dependent. In a system where the initial social norms benefit quality, the governance mechanism they provide is likely to persist indefinitely. The contributions of this work are as follows:

Exploratory
- Carries out the longitudinal network analysis of 6 different language Wikipedias, and documents the evolution of structural measures over the full life-cycle, beginning from inception. Uncovers interaction networks to be scale-free and non-hierarchical.
- Develops an understanding of growth dynamics of Wikipedia and documents the self-similar nature of growth over time.
- To the best of our knowledge, this is the first work to investigate, uncover and analyze interaction network dynamics in Wikipedia or any similar social system.

Explanatory
- Uncovers the mechanism by which high quality articles emerge in an interaction network, and highlights the role played by hubs therein.