Chapter 5

Identifying Temporal Changes and Topics that Promote Growth Within Online Communities: A Prospective Study of Six Online Cancer Forums

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ABSTRACT

In this paper the authors have extended the methodology for temporal analysis of online forums and applied the methodology to six online cancer forums (melanoma, prostate cancer, testicular cancer, ovarian cancer and breast cancer). The goal was to develop, apply and improve methods that quantify the responsiveness of the interactions in online forums in order to identify the users and topics that promote use and usefulness of these online medical communities. The evolutionary stages that gauge when a forum is expanding, contracting, or in a state of equilibrium were considered. The response function was thought to be an approximation of a discussion group’s utility to its members. By applying the evolutionary phase algorithm, it was determined that two out of six of the forums are in contracting phases, while four are in their largest growth phase. By analyzing the topics of the influential threads, the authors conclude that cancer treatment discussions as well as stage IV cancer discussions promote growth in the forums. It is observed that the discussion of treatment rather than diagnosis is important to help a cancer forum thrive.

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1. INTRODUCTION

People join online medical discussion groups to discover medical information, coping strategies as well as support while dealing with their particular disease. Members of a medical discussion group create relationships through the sharing of information. One member poses a discussion topic and other members post relevant text to the topic. This online communication process is known as thread creation. Once created, a thread is a permanent informational resource for all members of an online community.

The utility of a discussion group is its ability to provide the wanted response to a member in a short period of time. Members actively choose to spend valuable time on the medical forum during a very difficult time in their lives (dealing with cancer); this decision will be reversed if the forum does not provide a benefit to its members. Forums that are losing information-seeking members may fail to thrive, since these communities need people to start discussions. Forums not responding to inquiries may also fail to thrive, since people want a response to the questions they pose. People dealing with cancer should be provided online resources that quickly service their informational needs.

Modeling the communicative interactions of an online discussion group must involve a temporal aspect since the active participants as well as the number of interactions between the members varies substantially across time. The majority of the members spend a short period of time contributing to the forum. If other members who behave differently replace members, the experience (experience such as the responsiveness, topics discussed, quality of the information, etc) at the medical forum will vary across time. In order to keep the growth rate as well as the benefit of the online forum at its current state, new members willing to become voluntary online caregivers to other members of the online community must replace non-active members.

This research extends a methodology for assessing the responsiveness, the temporal changes, and the topics that elicit a strong response from an online forum (Durant et al., 2010b). We investigated the composition of different roles that members play within the forum and measure these values at six online cancer forums that vary in size, response rate and topology. We believe this research is relevant to the medical community given the number of health-information seekers that are turning to online resources for their medical informational needs (Fox, 2009).

By providing a methodology as well as metrics for quantifying support at online medical communities, this research provides an initial step for assessing and comparing the quality of support provided by online medical communities. We believe these metrics help develop communication metrics analogous to the communication metrics found in the Consumer Assessment of Healthcare Providers and Systems (CAHPS) program used for assessing the quality of professional medical communication (U. S. Department of Health and Human Services, 2010).

2. RELATED WORK

We have previously defined a methodology (Durant et. al, 2010b) using a phase detection algorithm and response function and applied it to a melanoma forum. We extended the analysis of thread topics in order to compare the topics that are influential in each calendar year as well as for the duration of each cancer forum.

Temporal data models have been analyzed by Leskovec (2007, 2008a, 2008b, 2008c). However, their analysis is not completely applicable to communicative network models. The communicative networks we present in this paper do not follow Leskovec’s proposed growth power law. Our communicative networks are similar to Leskovec’s models since they do display heavy left tails (but not right tails) for in and out degree distributions.