Using web analytics tools to evaluate the diffusion of Outcome Mapping

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Introduction

As the Internet continues to become a part of everyday life for many people around the world, we are increasingly leaving traces of our behaviours online. When aggregated, trends in the real world can be found by looking at related trends in the virtual world where data is widely available and cheap to obtain and easily monitored. Our interests, conversations, habits, economic and social trends can be seen through our individual and collective footprints that we leave on the web. This study looks at trends associated with the diffusion of Outcome Mapping (OM) by examining virtual footprints of individuals engaging with OM and other OM users on the Internet. In doing so, I introduce the concepts of web analytics as a set of tools for conducting social science research and program evaluation.

Background

Outcome Mapping

OM is a tool for planning, monitoring and evaluating social change initiatives. It was developed by members of the Evaluation Unit at the International Development Research Centre (IDRC) in Canada in collaboration with research partners from around the world. Its development grew in response to an emerging demand for more reflective and adaptive approaches to international development and a need for better evaluation. This methodology is unique in that results are measured through changes in the behaviour of the individuals and organizations that the initiative intends to directly influence, offering an alternative perspective to that of more traditional methods (Earl et al. 2001).

After publication of the OM book (ibid), the authors from IDRC's evaluation unit took an active role in presenting, training and working with users of the methodology. As demand for these activities grew, so too did the need for a support strategy that was sustainable. Eventually, a decision was taken in 2005 to devolve the Evaluation Unit's role in directly disseminating OM. Instead, the Unit chose to focus on encouraging a growing community of self-supporting OM practitioners. This decision led to the creation of the Outcome Mapping Virtual Learning Community[1] (OMVLC) where information about the methodology is available and adopters from around the world can connect and share ideas and stories related to the continued development and spread of OM. This website is supported by IDRC, and is managed and maintained by the Overseas Development Institute (ODI) in the UK. Through this partnership and with the support of community members, it is hoped that the OMVLC will continue to promote and sustain the growing body of OM users.

Diffusion theory and evaluating the spread of Outcome Mapping

The subject of innovation diffusion is most notably characterized in the work of Everett Rogers' with his book 'Diffusion of Innovations' now in its fifth edition. According to Rogers (2003 p.11), "Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system". As a model of change, it can be used to characterize as well as predict, the spread of ideas, innovations, products and programs as they are adopted or rejected. This theory has been applied to thousands of academic works ranging across many fields of study, including evaluation (Ashley 2009). But what does it mean for OM to be adopted and how does this interpretation affect the evaluation of its diffusion?

[1] accessible at www.outcomemapping.ca

Diffusion theory helps researchers and evaluators establish a better understanding of change processes from a variety of perspectives (Ashley 2009). This helps evaluators to isolate the sources of change as well as the variations in change that arise across contexts (ibid). Rogers' (2003) theory can be used by evaluators for many different uses: to frame research questions or conceptual frameworks (Hubbard and Hayashi 2003); identify key evaluation measures (ibid; Brink et al 1995); as a subject of evaluation (Lewison et al. 2005); as well as guide in the creation of measurement instruments (Pankratz, Hallfors, Cho 2002; Hubbard, Huang, Mulvey 2003). In general, the diffusion model helps evaluators to think holistically about the wide range of factors that contribute to innovation adoption and change processes, in the environment, within individuals and over time.

An element of Rogers' theory suggests that as an individual is presented with a new innovation, such as OM, they enter into an "innovation decision process" whereby they either decide to adopt or reject this new innovation. Adoption of OM can range from implementing an OM project to adjusting the way one thinks about planning, monitoring and evaluating projects and programs. Either way, according to Rogers (2003), the adoption process occurs through the following five stages: (1) knowledge; (2) persuasion; (3) decision; (4) implementation; and (5) confirmation. Known as the innovation decision process, I explore these concepts in more detail below, as this framework has guided the data collection and analysis of OM on the Internet.

Critics of Rogers' framework suggest that additional factors often come into play for organizations looking to adopt an innovation (Van de Van 1993). Some of these factors include managerial readiness, chance and organizational structures (ibid). Avoiding such debate, this study is intended to explore the use of web analytics tools as they can be used to describe the activities of individuals online, whether part of an organization or not. I will draw on Rogers' diffusion frameworks to provide scope around the array of activities that individuals engage in online, as well as to contextualize each of the tools within the overall adoption process for individuals discovering OM.

Under this light, the spread of OM does not need to be described solely by the number of OM projects and programs that exist and the levels and directions of such spread. Instead, a much broader scope of the adoption of OM is considered here. As an output of research itself, OM is not only a practical planning and evaluation tool, but more broadly, is an idea that has the ability to influence the way people think. Just as in other forms of research outputs, OM has, in some way, influenced a much broader change process, whether in the field of international development or elsewhere. Therefore, looking at the adoption of OM through a broader scope, it is useful to assess diffusion patterns in terms of the "aggregate impact": otherwise known as reach (Sander 1998). Also, without a set of guidelines directing intended levels of diffusion, this study will take a goal-free evaluation approach that aims to look for "unanticipated effect" (Scriven 1991).

Web Analytics

Web Analytics (WA) is the study of online behaviour towards optimizing web experiences (Kaushik 2007; 2009). It is a field which began as a simple website hit counter, but over the past decade has evolved into an advanced software suite used to track and understand many different metrics that describe human behaviours on the Internet. The typical premise behind the practices of web analytics is that by studying the behavioural patterns of large populations on the Internet, one can form insights that can be used to guide the continued development and optimization of online services.

Recently, the concepts and tools used within web analytics have been applied elsewhere as tools for research and social science; the most notable of these come from the public health sector. Web analytics offer a perspective on the way in which information is organized and accessed by society, such that through our collective actions it is possible to reveal wider social trends. A great example of this is

the recently developed Google Flu. This software tracks the outbreak of the influenza virus, in real-time, as users of the Internet type their symptoms into Google's search engine[2]. To develop this tool, researchers with the Center for Disease Control (CDC) and Google built an algorithm based on national historical clinical data that correlates the frequency and proximity of influenza related keyword searches in order to determine where outbreaks of the flu are occurring in real-time (Ginsberg et al 2009). The researchers found this method to be reliable up to two weeks faster than the traditional method, which relies primarily on aggregating national clinical data (ibid). Similarly, a recent study (Wilson and Brownstein 2009) reported that spikes in Internet searches related to listeriosis emerged a month prior to an official Government of Canada announcement warning the general public of an outbreak in 2008. Although these studies are not without limitations, Internet-based warning systems could provide public health officials with more timely information so that they can mobilize resources quicker and more effectively.

The utility of web analytics data beyond marketing does not only include public health. For instance, two economists have described an unemployment forecasting model that provides faster information for assessing national unemployment levels in Germany. Using Google's search aggregation tool, Insights for Search, and by correlating search data with historical unemployment records, they suggest that unemployment levels and other economic indices can be derived through aggregating and grouping collective search engine queries (Askitas and Zimmermann 2009). Several other applications of web analytics research can also be found: there was a study to demonstrate the relation between fluctuating prices in oil markets and public interest in electric cars (Azar 2009); researchers at Stanford University are analyzing the general public's political opinions prior to elections based on search data and media coverage (Granka 2009); and Facebook is even monitoring "Gross National Happiness" in the US based on analysis of aggregated facebook status updates (Facebook 2009). Other studies focus on analyzing collective discourse and plotting relevant issues by mapping segments of the blogosphere (Etling et al. 2009); and by assessing varying cultural inputs of an online joke as it evolves and spreads around the world through email (Shifman and Thelwall 2009). Finally, the US Geological Survey Agency finds significant spikes in use of Twitter after earthquakes, which they report can be used to assess the severity of the situations on the ground (Amos 2009). Although these studies remain largely speculative at this point, it is clear that we are witnessing the emergence of a new field in social sciences.

In Stephen Baker's book The Numerati (2008), he describes a recent surge in demand for mathematicians (numerati) across many industries, who are charged with analyzing all this data we are creating. From grocery stores to anti-terrorist government agencies, spotting trends in copious amounts of data is the future, he argues, for many sectors. It seems that as society increasingly continues to use the Internet for more purposes, the more utility can be derived from the behavior patterns that emerge there and an increasing group of professions can benefit from such data. For evaluators, dealing with data of all sorts, from many types of organizations across many dimensions is just part of the job. This study will explore the utility of these approaches as they are applicable in theory and in practice for evaluators.

Aims of this study

Thinking strategically about how to best continue it's support for OM and OM users in the future, and in an effort to gain an understanding of the diffusion of OM to date, members of IDRC's Evaluation Unit have asked the following question, which has formed the basis of this investigation: "Using OM as a case study, how can we trace the spread and diffusion of ideas around the world?".

[2] This tools is available at www.google.com/flu

Un-packing this question brings me to the two goals of this research: (1) what can be said about the diffusion of OM through online activities? and (2) how can diffusion of ideas be evaluated through web-based methods? To explore these questions, I will introduce various web analytics tools employed by this study and present the relevant data that I have found through their use. Finally, I will wrap-up by discussing the broader implications, lessons and limitations of these tools as well as provide conclusions in response to the questions raised.

Web analytics tools and complementary research

For this research I have collected data using a series of web analytics related tools. This section will outline five categories of web analytics software and describe how tools from each were used in this study and in general how they might be useful for research and evaluation.

Website Analytics

Website analytics software is installed on most websites in order to track statistics about visitors to the website. Although there are many different types of website analytics software such as 'sniffers' and server logs, for this research I used a javascript-based analytics package called Google Analytics. This software is triggered each time a webpage is loaded, so that it collects information from the users browser including: date and time; user location; URL text; keyword search strings entered; the webpage requested[3]. Google Analytics stores this data, analyses it, and presents it in a customizable dashboard for further segmentation and analysis. This software was installed on outcomemapping.ca and IDRC's OM page in 2007 and has been collecting information since then.

Search Aggregation

Just as in the examples described above for Google Flu and Google Econometrics, search aggregation is the use of historical search engine data for identification of behavioral trends. As people across the world type their search queries into search engines such as Google, the text, along with date, time, geographic location and any other meta-data available, are stored in a large database. Google allows anyone on the Internet to access this information through a tool called "Insights for Search". Google presents normalized data through this tool, electing to display trends in search volume and not absolute values. This study presents the results of "outcome mapping" Google Insights figures, which demonstrate trends in search volume since 2004. In order to look at absolute searches, I also used Google's paid advertising service, Adwords. By purchasing a display ad for all global searches related to "outcome mapping" then counting the number of times the ad was displayed[4], I was able to estimate the actual number of global searches.

Social Media Analytics

With the very recent emergence of social media platforms such as Twitter, Facebook, social bookmarking and Youtube, researchers have yet another means from which to examine social behaviour. Although social media analytics is a very new field with few reputable tools, there are some useful software applications that obtain insights from these channels (Wetzker et al 2008). This study monitored several social media platforms including: mention of "outcome mapping" in a blog, forum or Twitter post; social bookmarking the OMVLC website through a tool such as Delicious or Digg; or tagging

[3] All of this data is subject to Google's privacy policy which does not permit collection or use of personally identifiable information. See privacy policy here: http://www.google.com/intl/en_uk/analytics/tos.
[4] Known in Google Adwords as "Impressions"

images with the text "outcome mapping" on photo-sharing services such as Picassa or Flickr. To obtain this data two different tools were used, which obtained similar results. The first tool, called "Herd The Noise"[5], which among many other functions, crawls the online social media platforms for any mention of a given term. Similarly, Google Alerts crawls the entire web for a term and provides weekly digests of their mention online.

Server Interaction Analysis

The study of online behaviour began through analysis of web server activities. These are the explicit activities that are often evident by looking at web pages or through website administration dashboards. For the OMVLC, these types of metrics include the frequency of member registrations over time, volume and type of resource downloads and participation in conversation threads. These metrics are different from other website analytics ones, because they describe explicit activities taken by users as they participate on a website and involve more than just visiting pages. The data for this research was obtained from website administrators of the OMVLC.

Webometrics

Web analytics, as presented in this study, lives under a banner otherwise known as webometrics (see chapter 8 Thelwall 2009). Webometrics is rooted in the field of information & library sciences (Bjorneborn et al. 2004), and is typically used for analyzing the organization and evolution of information as it co-exists on the web (Shifman & Thelwall 2009). One such tool is Google Scholar, which was shown to be a comprehensive source for bibliometric studies, with the limitation that data should be verified before being used in any study (Kousha & Thelwall 2006). It was used is this research to conduct a citation analysis of the OM book over time. The data used in this study was manually verified to ensure that all citations exist. Also from the webometrics toolbox (Thelwell 2009) I created and analyzed a URL map of websites that are connected via hyperlinks to the OMVLC. I did this using the LexiURL tool[6], which is particularly useful for determining the relevance and significance of a website within the broader ecosystem of information in which it is situated.

Summary of web tools

Combined, these tools form a broad picture of online activities related to OM. Looking at these tools in aggregate, they give this research a sense of the volume and timing of interest, geographic movement and level of dialogue of OM on the Internet. For instance, if interest in OM suddenly spiked around the world, these tools would provide a very early indication of this interest and when combined can begin to provide a context for this interest. In sum, these tools track the following online behaviours:

- Searches for "outcome mapping" through Google's search engine;
- Visiting and interacting with the OMVLC website as well as IDRC's OM page (the top two results from major search engines);
- Discussions that include "outcome mapping" on various social media platforms;
- Referencing OM either by linking to the OMVLC from another website or through an academic citation.

Although this list is composed of a wide spread of online activities, it is not necessarily comprehensive or without limitations. For instance, these tools do not capture all of the activities within each category, but merely a sample. Google Insights search aggregation tool presents global searches

[5] Available at http://www.herdthenoise.com/Default.asp?id=1&l=1

[6] LexiURL Searcher was developed and is hosted by the Statistical Cybermetrics Research Group at the University of Wolverhampton, UK: http://lexiurl.wlv.ac.uk/

entered into Google searches and not those of other search engines. Although this accounts for a large majority of total global searches (Stross 2009), use of search engines can vary across platform and across countries (Keane 2008). Google Insights also presents its data in normalized form, preventing analysis of actual search volume and limiting analysis to that of relative trends. Also, searchers and users of social media could be using the phrase "outcome mapping" in a context different from that of this research. Although this can be mediated by verifying the discourse, it presents subtle limitations in these tools. Finally, considering the scope of this list, one might notice that some Internet mediums are not included here. Social science research can rarely tap 100% of available data, so absent from this list are private communications such as email and Facebook.

Looking at the list of web analytics categories from another perspective, there are also limitations in terms of the depth of the tools I have used. For instance, there are no qualifiers to suggest that one visit to a website is more significant than another. Casual browsers and searchers count as a single website visit or keyword search and are tracked with the same weight as those visits coming from a program manager or donor. Similarly, using these tools I cannot be sure what is actually being done with the resources in question. Just because someone has downloaded a paper, does not mean they read it or were influenced by it. However, all of these limitations merely point to the notion that these numbers are not as useful in absolutes, but instead offer a way to look at broader trends in the reach of OM. Trends which can be examined with many different research methods.

Complementary Research

In order to properly contextualize web analytics data, and deal with some of the limitations, it is important to triangulate findings through the use of additional data sets and methods. For this research I used interviews and surveys to complement the data found through web analytics approaches. These methods drew on individual experiences of OM users as they progressed through the adoption process of OM. The aim was to understand the nature of their online behaviour as it contributed to the adoption process.

Interviews

A series of semi-structured, informal interviews with attendees and trainers of an OM training were conducted. 14 attendees and 2 trainers came from various locations around the world to Zurich, Switzerland for a five day intensive training in OM. Their backgrounds ranged from academics and teachers to public sector development workers, NGO employees, consultants and donors. Each attendee and trainer participated and were asked to discuss their experiences after first discovering OM as well as the extent of their use of the Internet during this process.

Online Survey

The second component was an online survey consisting of 10 questions of various types. An email was sent to the 1800 members of the OMVLC, asking for their participation in this study. Of the 1800 presumed recipients of this email, 101 completed the survey. The entire survey is found in Annex 1. Recognizing the potential bias in surveying members of an online OM community for their online behaviour, the interviews were intended to compliment both the web analytics data as well as the survey data. Since the sample of interviewees has no direct connection to online activities, their participation online is presumed to be independent. However, since the dissemination of OM is intended to be online, any such limitations are presumed to be minimal.

Analysis of the spread of Outcome Mapping

This section is a presentation of findings that draw on a mixture of web analytics data and data obtained through interviews and an online survey. Below I present these metrics as they relate to each of the stages of Rogers' Innovation-Decision Process framework to describe the individual adoption process of OM. Each stage is un-packed and contextualized within the diffusion process of OM such that web metrics can be used to demonstrate trends in OM adoption.

Knowledge and Persuasion Stages of OM Adoption

The entire innovation decision process begins when an individual is initially exposed to a new idea. Having never heard of OM before, this would be the moment when someone is first made aware of its existence and subsequently seeks out information to learn more about it. The information-seeking and information-processing activities of these stages reflect the need to reduce uncertainty in an idea (Rogers 2003).

For attendees of a 5-day OM training workshop, this OM knowledge-seeking behaviour was described similarly by 12 out of 15 interviewees. When asked about what each person did when first learning about OM, the common stages that emerged through analysis were:

1. Conduct an Internet search for "outcome mapping" or related;
2. Read introductory resources from OMVLC and IDRC websites, join the OMVLC;
3. Attend the training to get more information about OM.

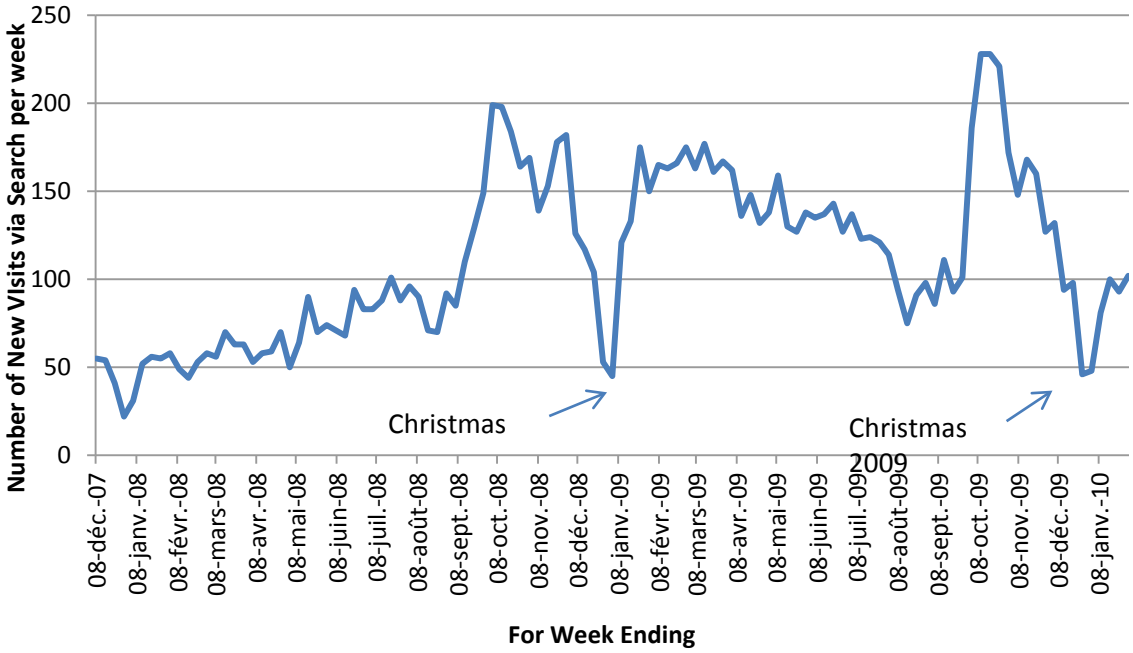
Similarly, when asked about their information-seeking strategies for OM, 55% of survey respondents reported they conducted an Internet search for resources in an attempt to learn more about it. An additional 14 respondents (that did not conduct an Internet search) reported that they joined the OMVLC as part of their information-seeking strategy. In total, 68% of respondents reported that they left some form of a digital footprint during these early stages of their OM adoption process. This finding suggests that amongst adopters of OM, a majority of the respondents perform information-seeking behaviour on the Internet.

Accepting that the Internet is a common form of information seeking behaviour for potential adopters of OM, web analytics data becomes a useful source to examine the spread of OM. As more people continually discover OM and go to their computers for information about it, they are leaving small pieces of a much broader puzzle. However, it is not as easy as simply stating how many visitors arrived to the OMVLC. Although, this metric may be useful in some scenarios, with tools such as Google Analytics it is possible to disaggregate data further and pull out groups of data that demonstrate social trends.

To look specifically at those demonstrating knowledge seeking behaviour on the OMVLC, total visits have been broken down into an appropriate subset of data that reflects adoption behaviours revealed by the survey. This was done by looking at only new visits[7] to the OMVLC who entered through a search engine. This data, presented in Figure 1 below, demonstrates that knowledge seeking behaviour of OM appears to be increasing over the two year period represented on this chart. The exceptions to this increase are the noticeable drops in visits to the OMVLC during Christmas holidays in 2008 and 2009 and to a smaller extent in 2007.

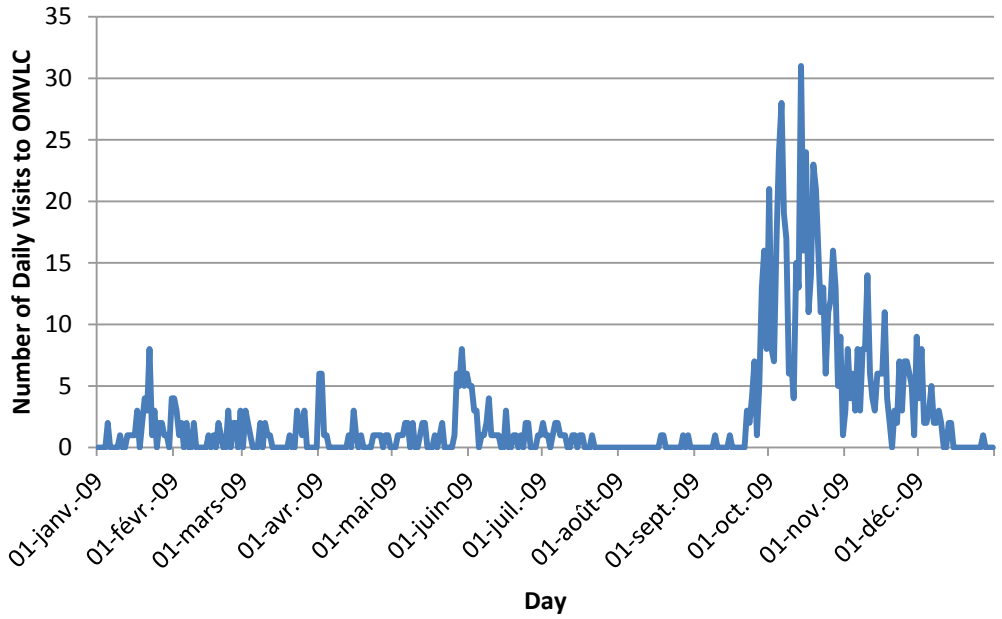
[7] New visitors to the website are calculated by first party cookies, embedded in each user's browser upon their first visit or after clearing the browser's cookies.

Figure 1. Frequency of new visits to the OMVLC through search



Disaggregating web analytics data further, pockets of information-seeking behaviour can be found that demonstrate additional subsets of diffusion trends. For instance, Figure 2 below depicts a spike in visits to the OMVLC from a Venezuela. During October and November of 2009, visits to the OMVLC from Venezuela accounted for approximately 15% of total traffic. This spike is indicative of an increase in knowledge-seeking behaviour in this region and may be representative of a rise in offline OM diffusion during this period. Further investigation is needed to fully understand why this spike might have occurred, however this data demonstrates the usefulness of web analytics for identifying regions where diffusion might be occurring most rapidly, both retrospectively and for real-time monitoring.

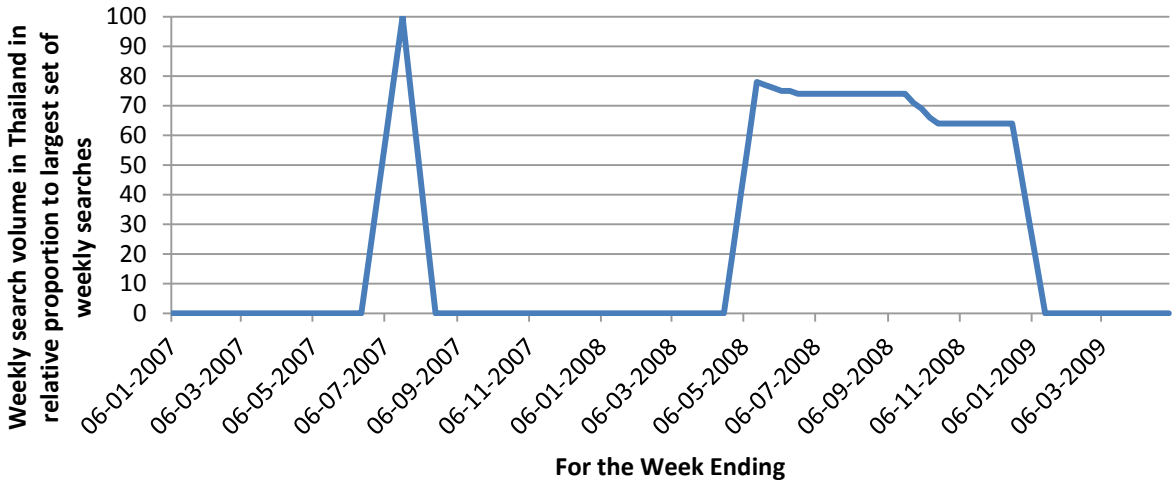
Figure 2. Actual Visits from Venezuela to OMVLC in 2009



Pockets of OM interest indicated through online searching can also be viewed through other tools. Using Google Insights in April 2009 to look at total Google searches for "outcome mapping"; what stood out was the proportionally high volume of traffic generated from Thailand. Between June and August of 2007 and from April to December of 2008, a relatively large portion of Google searches for OM came from Thailand. Since data presented in Google Insights is normalized and rationalized[8], there is no way to see how many searches actually occurred, only that the trend was significant proportionally to the volume of Internet traffic that normally happens in Thailand[9]. Given that the OM book has been translated into Thai, it would be interesting to follow-up with OM users in Thailand and investigate the cause of this sudden and timely interest. Figure 3 below depicts the normalized search volume of searches coming from Thailand between 2007 and 2009.

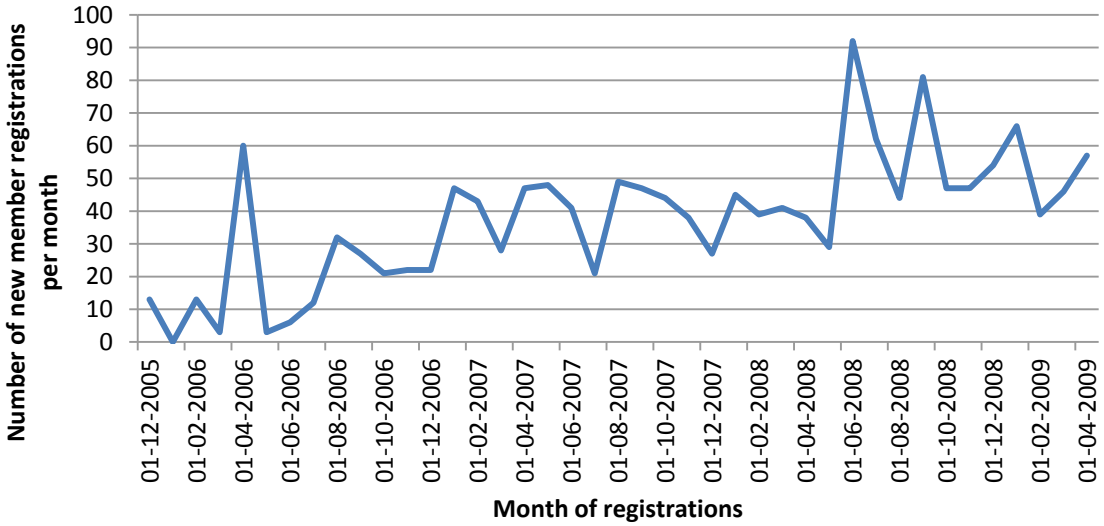
[8] Based on rationalized and normalized data sets according to Google's formula for presenting search data.
[9] Absolute search volume can be estimated through a Google Adwords campaign. By purchasing "outcome mapping" search phase as a sponsored link in Google I was able to determine that an average of 250 'impressions' or searches for OM occur per week.

Figure 3. Normalized searches for "outcome mapping" originating from Thailand



Further along in their innovation decision process, individuals actively seek information in order to form a favorable or unfavorable attitude towards the innovation (Rogers 2003). For potential adopters of OM, these information seeking patterns can take on many forms. In addition to hosting useful OM-related resources on the website, the OMVLC provides registered members with access to email updates, OM discussion forums and information for members only. For individuals new to OM, membership to the community is intended to provide necessary information which would lead to a reduction in uncertainty. The following, Figure 4, illustrates the number of new members to the OMVLC each month since 2005. With an increasing trend, this graph demonstrates an escalating growth rate of membership in the OMVLC.

Figure 4. Monthly new registrations to OMVLC



Decision and Implementation Stages

During these stages in the innovation decision process, individuals make a decision to adopt or reject an idea and subsequently take action towards implementation (Rogers 2003). As a project

planning, monitoring and evaluation tool, to adopt OM would require using it as the framework for a project or program. Aggregating the data from all of these projects from around the world into a single data set would be a useful way to examine the diffusion of OM. It happens that the OMVLC has a feature that allows its members to report on OM applications which are displayed on an interactive map of the world. Figure 6 on the right is a snapshot of this map, which displays the 23 reported OM applications. In contrast, Figure 5 on the left is a map displaying OMVLC member locations as they were provided by all users during the registration process of the website.

Figure 5. OMVLC member locations as reported during registration

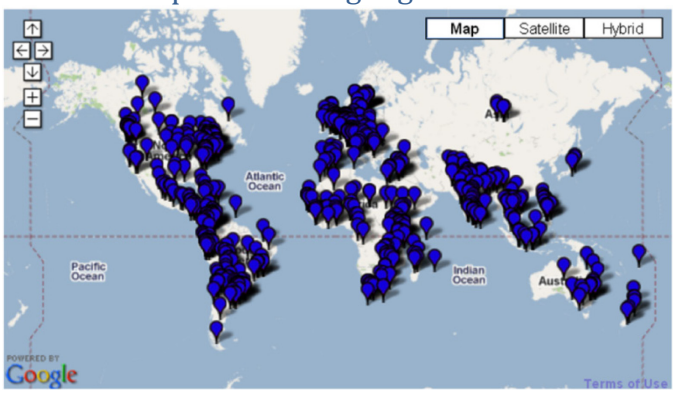


Figure 6. OMVLC member reports of OM Applications' location

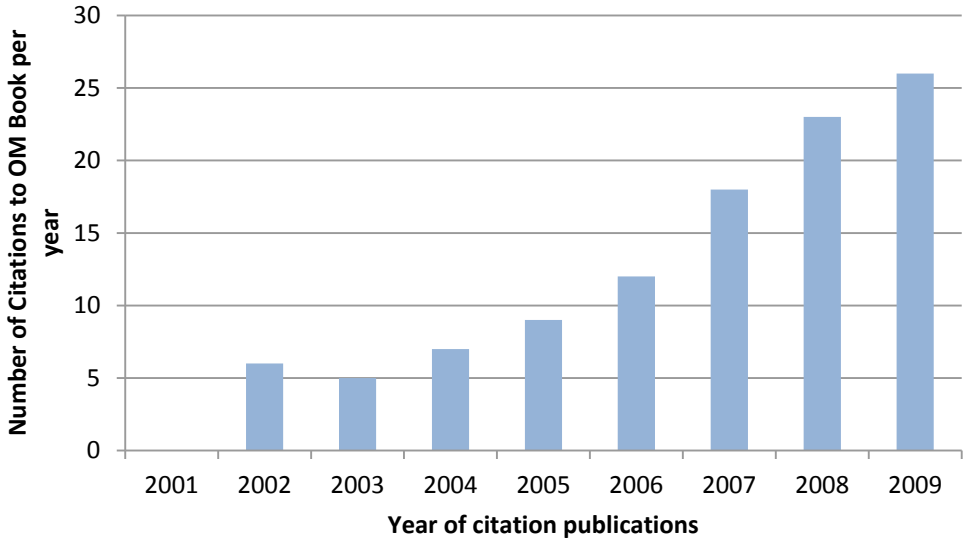
The map in Figure 6 would be useful for a study of diffusion if it contained all of the OM applications around the world, however it does not. However, with roughly 2000 members in the OMVLC, of whom 71% report to have participated in an OM project or program, perhaps this map should contain more than 23 applications. This lack of reporting is not surprising considering that to report OM applications on the OMVLC requires members to voluntarily provide this information with little incentive. Providing the data to populate Figure 5 is a requirement of membership and so has generated a large and representative data set. To get an understanding of the spread of OM, it is necessary to expand the notion of implementation and look towards different types of activities that have built in benefits and data requirements. Therefore, researching the decision and implementation stages of OM adoption requires a much broader perspective on what it means to adopt OM. This section presents web data that suggests OM has been learned; cited; adapted; and has otherwise influenced thinking about development planning.

It happens that a participant of an OM workshop in South Africa in 2004 wrote a daily blog about his experiences[10]. The blog describes his challenges during the training and detailed how his perspective changed towards the development project he was involved with over the course of the training. By adapting his project to include influences from OM, the writer suggests that through his training (persuasion stage) he ultimately decided to adopt. In other words, his project was not originally an OM project, but throughout the workshop he decided that OM was a useful perspective and modified his project accordingly. This decision reveals the subtle influence that OM has had. It also demonstrates the rich source of data (albeit unverifiable) on the Internet that is often at the fingertips of researchers and evaluators.

[10] See blog transcript available at http://www.idrc.ca/en/ev-88678-201-1-DO_TOPIC.html

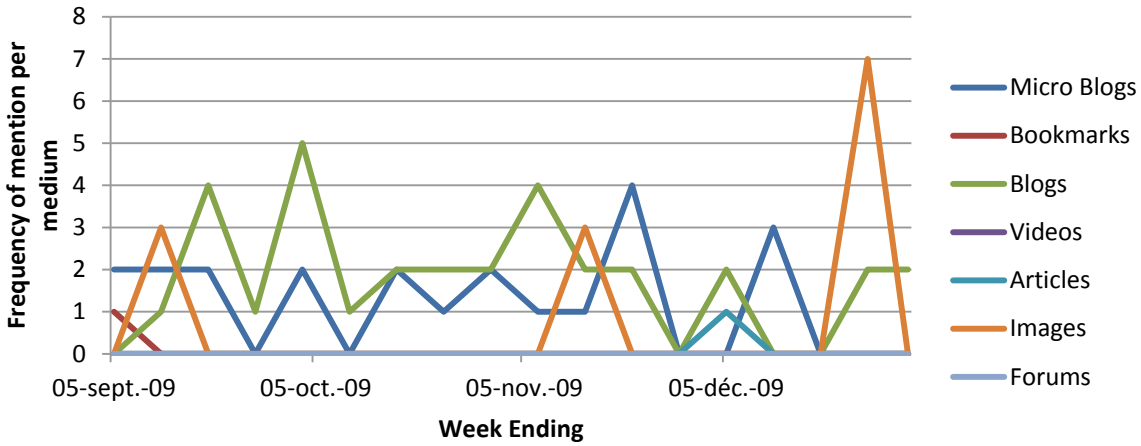
Taking this notion further, implementation of OM can occur at a literary level. Assuming an author has taken time to read and understand OM, implementation can involve referencing the OM book or related articles in a journal, book or report. In this space, OM can have an influence on many other methodologies and fields of practice. Again, some web metrics can be used to demonstrate this stage of adoption. As of January 2010, Google Scholar reports that the OM book has been cited 142 times. Figure 7 below plots these citations over the past several years to give an indication of the increasing frequency of OM citations within the literature.

Figure 7. Number of Google Scholar citations of the OM book per year



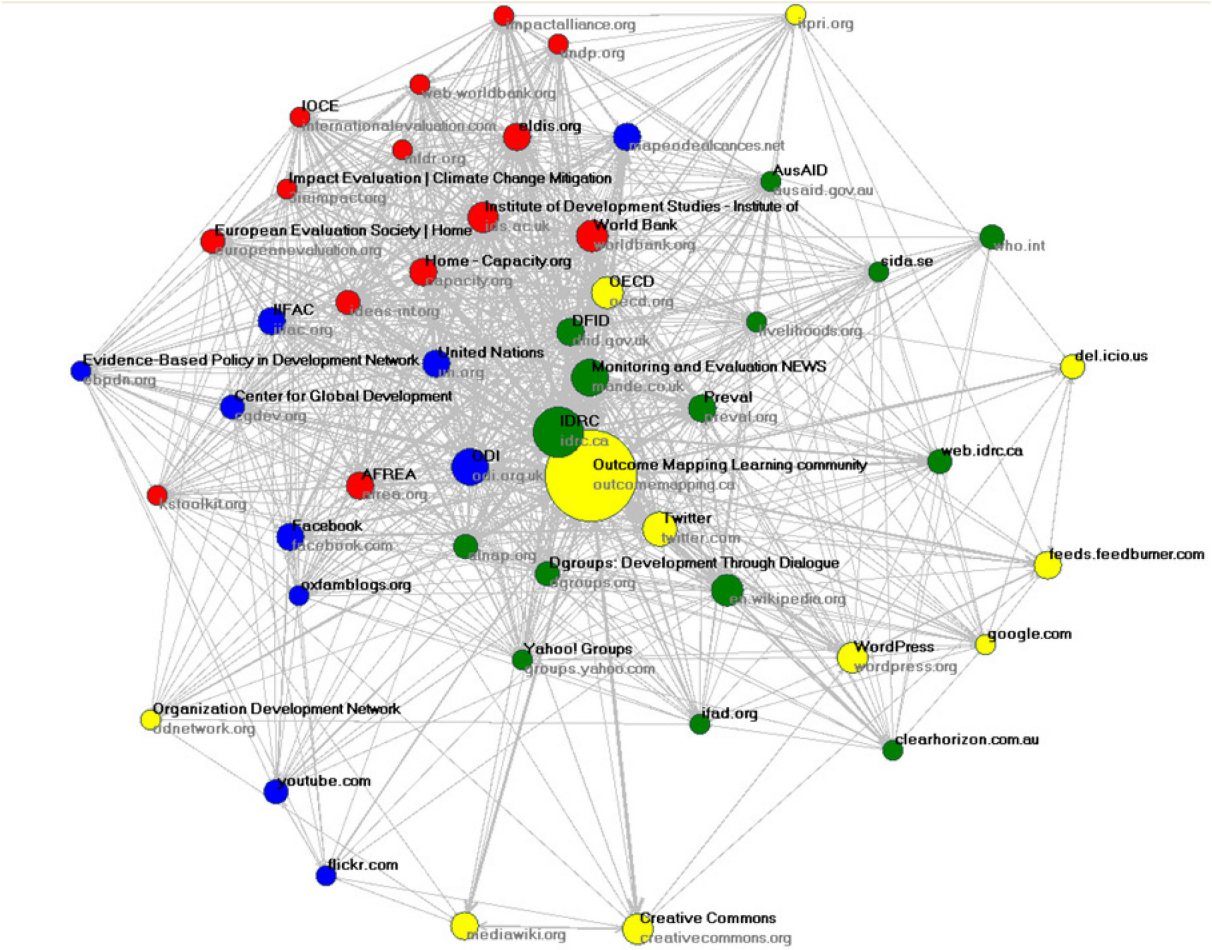
Similarly, members of various online social media platforms can engage in OM dialogue for all to see. The figure below presents the results from social media monitoring exercise undertaken through this study. Figure 8 is a summary of references to the term "outcome mapping" as it was mentioned throughout social media from September 2009 to December 2009. Although this figure is not conclusive, it demonstrates a constant chatter of OM throughout various social media platforms, indicating that discussions are occurring outside the OMVLC.

Figure 8. Frequency of social media mentions per week of "outcome mapping"



Finally, considering that someone might find the concepts of OM relevant to their online discourse, one website can host a hyperlink to OM materials found elsewhere online. As one website refers to another website and vice versa, these links and the network they form, represent a valuable perspective of information online. Search engines use this information to determine the relevance and importance of a given site, based on the social network of hyperlinks that surround it. Meaning that for websites to be disseminated as widely as possible through search, relevant linkages are important to monitor and maintain. Utilizing webometrics software described by Thelwell (2009), the diagram in Figure 10 below represents the network of websites connected to the OMVLC.

Figure 10. LexiURL map of websites connected to OMVLC



Each node in Figure 10 above[11] represents an Internet domain with a link to the OMVLC and each line in the diagram represents a hyperlink to the other websites. The size of each node denotes the relative number of links it has within this network and the colour indicates groupings within a sub network of interlinked websites. Examining the entire network, and analyzing the respective content that each node contains, one can see that outcome mapping is situated within several sub-networks relating to:

[11] This diagram has been created with the lexiURL tool, which was configured to map out hyperlinks that point to outcomemapping.ca.

- evaluation (mande.co.uk; afrea.org; europeanevaluation.org; internationalevaluation.com; 3ieimpact.org);
- international development (UNDP.org; unitednations.org; sida.se; dfid.gov.uk; cgdev.org; ausaid.gov.au; worldbank.org; capacity.org; oecd.org)
- social media (Yahoo! Groups; flickr.com; dgroups.org; wordpress.org; oxfamblogs.org; youtube.com).

The Confirmation Stage

Once implemented or rejected, the innovation decision process does not necessarily end. Rogers suggests that in the confirmation stage, adopters continually seek information to reinforce their decision and reduce dissonance (Rogers 2003). In other words, once an innovation such as OM has been adopted, individuals are likely to keep up with new information about it. For OM survey respondents, when provided with a range of purposes for visiting the OMVLC, almost half indicated that they visit in order to "learn about latest developments and the newest resources related to OM"; an indication that many members of the OMVLC are continually reaffirming and strengthening their decision to adopt OM. The following table presents data obtained through the survey, which compares different segments of visitors: those who have participated in a discussion on the OMVLC and those who have not.

Figure 11. Survey Results of questions 4 & 5

	Total respondents n=101	Mean response to How often they visit OMVLC
Respondents who have never posted a comment to the OMVLC	52	2.4
Respondents who have posted a comment to the OMVLC	49	3.1

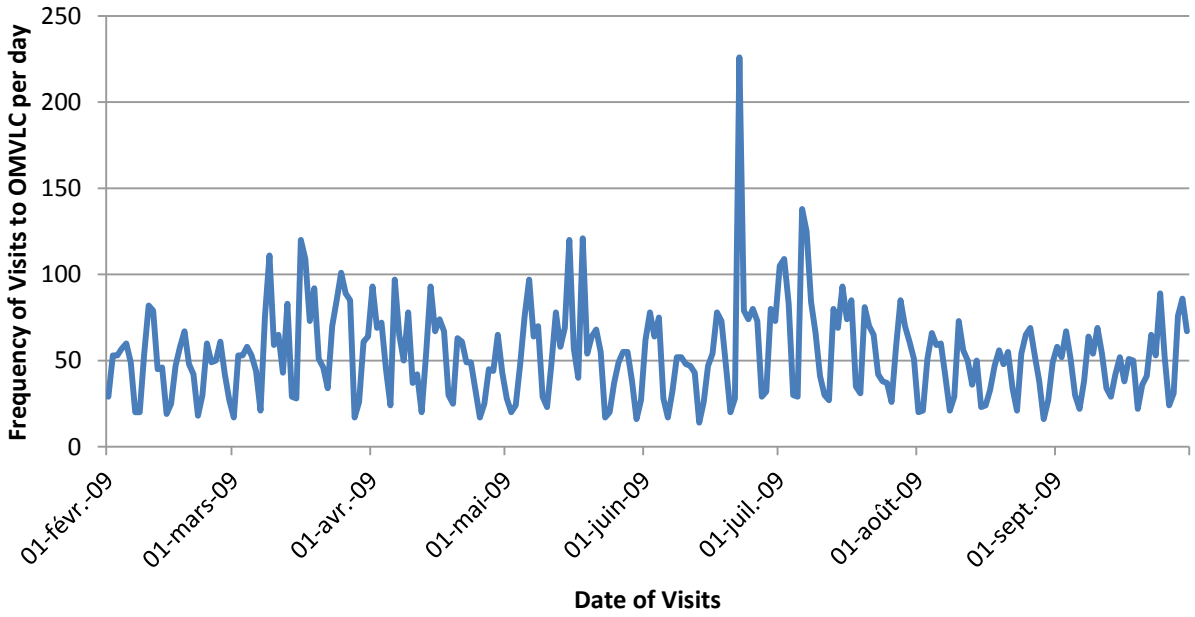
Perhaps the most interesting thing about Figure 11 is the proportion of respondents who have not participated in a discussion in the OMVLC. Over half of survey respondents fall into this category. Although they report to visit the OMVLC less than those who have responded, they do still visit. Considering the source of this sample, obtained through a message to the entire community, it is especially interesting to see that over half of those that responded are passive participants, or "lurkers", in the OMVLC discussions. By using web analytics data it is possible to examine topics of interest of the community, not only from active participants and their discussion, but also the passive ones and their interests.

In mid-June 2009, an email was sent from the administrator of the OMVLC to its members[12]. In it was a description of a new research paper hosted on the OMVLC titled "A conceptual fusion of the logical framework approach and outcome mapping" (Roduner & Ambrose 2009). Following this email was a large spike in web traffic to the OMVLC: over ten times larger than the average number of daily visits to the site. The majority of these visits involved viewing the page that hosted the newly posted research paper and perhaps suggests that the issue of combining OM and the logical framework

[12] this note is available at outcomemapping.ca

approach is of great interest to the community. Evidence of this spike in interest can be found below in Figure 12.

Figure 12. Number of visits to OMVLC during 2009



This analysis does not suggest a physical spread of OM but rather suggests a conceptual one. Being different from traditional planning methods such as the Logframe approach, is a strength of OM. However, such differences are not necessarily conducive to wide spread adoption in the field of international development. A fusion of the two approaches, as suggested in this paper, may provide the middle ground that reluctant or uncertain adopters require to fully adopt and implement in practice. Interest in this topic and others, revealed through passive web analytics data, may serve to guide the continued development of OM and could help administrators of the OMVLC encourage discussions that are responsive to the community.

Synthesis of web analytics data

Diffusion is much more complex than simply having many people rush out and adopt it. The social system is spread internationally, inter-personal communication channels such as trainings and conferences are relatively few and the innovation itself is unique and not necessarily conducive to traditional donor-recipient frameworks. Given the complex and global nature of OM, diffusion is quite like a giant and complicated puzzle. This puzzle, is made up of many little pieces, some of which are missing or offline, some have been identified in this study. However, if this research can fit together even just a few of these pieces, a broader picture may start to emerge that describes more generally the diffusion of OM. This picture was brought into focus by use of Rogers' framework such that pockets of behaviours could be identified in context and appropriate tools could be used to identify them.

Web analytics data along with survey and interview data, provided a very useful combination for this research. By linking knowledge seeking behaviour of OM with web activities, the data obtained through web analytics can be used to describe general interest in OM and the geographic reach. However, what I

hope becomes valuable to readers of this paper is the use of web analytics tools for conducting research and evaluation. This section will discuss the implications of using these tools as well as offer suggestions for their use elsewhere.

A Tipping Point?

This research suggests that many, but certainly not all, new-comers to the OM approach will access the Internet during their innovation decision process. If OM began to approach what Gladwell has described as a 'tipping point', where popularity of the idea began to spread immensely around the world, web analytics data might be the most appropriate source of data to initially identify this phenomenon. Even retrospectively, this data is useful for pinpointing the time and place where the diffusion of an idea began to take-off, as demonstrated through segmentation methods within the tools. Identification of tipping points, or at least large spikes in activity could be useful for evaluators reviewing impacts of other project or program activities, such as publications, conferences and communications campaigns.

Passive voice

Although it is useful to look at metrics such as number of discussion threads, reported applications of OM and number of new registered members, analysis does not necessarily end here. Much can be seen from more passive participation of visitors who might not have a need to participate. A website can track all of the activities of its visitors, even the ones where visitors do not explicitly participate. Each time a visitor views a page, data is tracked and stored about this activity. Since over half of OMVLC visitors can be said to be "lurkers", this study reiterates findings from a related research project that claimed online communities can have a passive voice through these non-explicit or passive activities (Dwyer et al 2004, Granka 2009). However, by exploring these passive online activities deeper by segmenting data based on variables of diffusion (such as by region or pages viewed by content), this study has shown the emergence of diffusion puzzle pieces.

Use of diffusion theory

According to Rogers, diffusion is intended to occur through the innovation decision process in a linear manner: complete the knowledge stage and then proceed to the persuasion stage. Critics argue that this is not always true and that it is possible to go through these stages in a different order (Van de Van 1993). This research takes neither side on the issue of the linearity of this framework, since web analytics data does not contain linkages between these stages. In other words, with the tools used in this study there is no way to explicitly link a new visitor to the OMVLC with their consumption of information, leading to a decision and ultimately a citation in a book. These activities are independent and have been measured separately. Perhaps the basic assumption behind this web analytics approach is that if some of the pieces of the diffusion process are showing signs of an increase in uptake, the overall picture starts to take this shape as well.

Putting the available pieces of the puzzle together, the findings presented in this paper amount to a suggestion that OM is slowly but continuously gaining influence and increasing in uptake around the world. This should not overshadow the fact that the scope of such diffusion is still relatively small, but the growth levels appear to remain on the rise. However, the entire picture of the diffusion of OM is still incomplete. There are many unknowns and this data is based on several assumptions. But considering the utility of this study and these tools, which is to inform strategies that support the community of OM practitioners, the fuzziness of the overall picture is not necessarily the most important component.

Conclusions

Talk to people involved with OM and they will likely tell you that OM is increasing in popularity around the world. Training sessions are in demand and projects are popping up all over the globe. For these people, the web analytics data presented in this paper may only be telling them what they already think they know. However, one cannot base conclusions on their personal experiences, especially since they are likely to be quite connected to the OM community. This is where web analytics data is potentially most useful as it is not based upon expectations and takes the broadest possible view of the world. Taking this perspective, some additional pieces that may have otherwise remained unknown have come into light.

Although nothing monumental occurred during the period that data was collected, smaller pockets of activities began to take shape. I have presented increasing levels of book citations, mapped the information ecosystem surrounding OMVLC, monitored online discussions and identified topics of particular interest to the community of OM members. All of which demonstrate a constant and relevant discourse of OM as it occurs in many formats over multiple Internet related mediums. In sum, these figures are useful gauges of the global pulse of OM, and accordingly, it is very much alive.

This study has also tapped into the spreading interest of OM. Looking at Internet-based knowledge seeking behaviour evident in the early adoption phases of OM, more of the diffusion puzzle starts to take shape. With a growing level of new visits to the OMVLC, an increasing growth rate of new registered members and growing trends in search, evidence suggests that more and more people are learning about OM and seeing information about it. Although this growth rate remains modest, any changes in the future would be easily identified through the web analytics metrics presented in this paper.

References

Amos, J. (2009). OMG. Did you just feel a quake? *BBC News*. Retrieved December 15, 2009, from http://news.bbc.co.uk/2/hi/science/nature/8413128.stm

Ashley, S. R. (2009). Innovation diffusion: Implications for evaluation. *New Directions for Evaluation*, *2009*(124), 35-45.

Askitas, N., & Zimmermann, K. F. (2009). Google Econometrics and Unemployment Forecasting. *Applied Economics Quarterly*, *55*(2), 107-120.

Azar, J. (2009). *Electric Cars and Oil Prices*. Social Science Research Network. Princeton University - Department of Economics. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1474023

Baily, D. (2004). Outcome Mapping and Research Methodologies Workshop: International Development Research Centre. Retrieved February 5, 2010, from http://www.idrc.ca/en/ev-88678-201-1-DO_TOPIC.html

Baker, S. (2008). *The Numerati*. Houghton Mifflin Harcourt.

Bjorneborn, L., & Ingwersen, P. (2004). Toward a basic framework for webometrics. *Journal of the American Society for Information Science and Technology*, *55*(14), 1216-1227.

Brink, S. G., Basen-Engquist, K. M., O'Hara-Tompkins, N. M., Parcel, G. S., Gottlieb, N. H., & Lovato, C. Y. (1995). Diffusion of an effective tobacco prevention program. Part I: evaluation of the dissemination phase. *Health Educ. Res.*, *10*(3), 283-295.

Dwyer, C., Zhang, Y., & Hiltz, S. R. (2004). Using Web Analytics to Measure the Activity in a Research-Oriented Online Community. *AMCIS 2004 Proceedings*, 319.

Earl, S., Carden, F., & Smutylo, T. (2001). *Outcome mapping: Building learning and reflection into development programs*. Idrc.

Etling, B., Kelly, J., Faris, R., & Palfrey, J. (2009). Mapping the Arabic Blogosphere: Politics, Culture, and Dissent. *Berkman Center Publication Series*. Retrieved from http://cyber.law.harvard.edu/sites/cyber.law.harvard.edu/files/Mapping_the_Arabic_Blogosphere.pdf

Ginsberg, J., Mohebbi, M. H., Patel, R. S., Brammer, L., Smolinski, M. S., & Brilliant, L. (2008). Detecting influenza epidemics using search engine query data. *Nature*, *457*(7232), 1012-1014.

Gladwell, M. (2000). *The tipping point: How little things can make a big difference*. Little, Brown and Company.

Granka, L. (2009). *Inferring the Public Agenda from Implicit Query Data*. Stanford University: Google. Retrieved from http://uiir-2009.dfki.de/papers/uiir2009_submission_10.pdf

Hubbard, S. M., Huang, J. Y., & Mulvey, K. P. (2003). Application of diffusion of innovations theory to the TIPs evaluation project results and beyond. *Evaluation and Program Planning*, *26*(1), 99-107.

Hubbard, S. M., & Hayashi, S. W. (2003). Use of diffusion of innovations theory to drive a federal agency's program evaluation. *Evaluation and Program Planning*, *26*(1), 49-56.

Kaushik, A. (2007). *Web analytics: An hour a day*. Sybex.

Kaushik, A. (2009). *Web Analytics 2.0: The Art of Online Accountability and Science of Customer Centricity*. Sybex.

Keane, M. T., O'Brien, M., & Smyth, B. (2008). Are people biased in their use of search engines? *Communications of the ACM*, *51*(2), 49-52.

Kousha, K., & Thelwall, M. (2007). Google Scholar citations and Google Web/URL citations: A multi-discipline exploratory analysis. *Journal of the American Society for Information Science and Technology*, *58*(7), 1055-1065.

Lewison, G., Rippon, I., & Wooding, S. (2005). Tracking knowledge diffusion through citations. *Research Evaluation*, *14*(1), 5-14. doi:Article

Pankratz, M., Hallfors, D., & Cho, H. (2002). Measuring perceptions of innovation adoption: the diffusion of a federal drug prevention policy. *Health education research*, *17*(3), 315.

Rogers, E. M. (2003). *Diffusion of innovations*. Free Press.

Scriven, M. (1991). Prose and cons about goal-free evaluation. *American Journal of Evaluation*, *12*(1), 55.

Stross, R. (2009). *Planet Google: one company's audacious plan to organize everything we know*. Free Press.

Thelwall, M. (2009). Introduction to Webometrics: Quantitative Web Research for the Social Sciences. *Synthesis Lectures on Information Concepts, Retrieval, and Services*, *1*(1), 1-116.

Van de Ven, A. H. (1993). Managing the process of organizational innovation. *Organizational change and redesign: Ideas and insights for improving performance*, 269–294.

Wetzker, R., Zimmermann, C., & Bauckhage, C. (2008). Analyzing Social Bookmarking Systems: A del.icio.us Cookbook. In *Proceedings of the ECAI 2008 Mining Social Data Workshop* (pp. 30, 26). IOS Press. Retrieved from http://robertwetzker.com/wp-content/uploads/2008/06/wetzker_delicious_ecai2008_final.pdf

Wilson, K., & Brownstein, J. S. (2009). Early detection of disease outbreaks using the Internet. *Canadian Medical Association Journal*, *180*(8), 829.

Annex 1

Outcome Mapping Survey

Thanks for taking my survey.

Through this survey I am hoping to gain an understanding of Outcome Mapping users and how they learn and interact over the Internet. I am hoping to contribute to a better understanding of the diffusion of Outcome Mapping around the world and to assist in making improvements to the online experience of OMers.

Your response is very much appreciated.

Please feel free to contact me at mwalton@idrc.ca if you have any comments or questions regarding this study.

_____

1. What is the main purpose for your visits to outcomemapping.ca
    a. You want to learn more about the Outcome Mapping methodology
    b. You are familiar with the Outcome Mapping methodology, but would like to learn about the latest developments and newest resources
    c. You would like to contribute to outcomemapping.ca so that others may benefit
    d. You want to discuss your experience with other Outcome Mapping practicioners
    e. Other:

2. Have you ever typed "outcome mapping" into a search engine? (ex: google, yahoo, ask jeeves, etc) *

- Yes
- No

3. Are you a member of the Outcome Mapping Virtual Learning Community? *

- Yes
- No

4. Have you ever been involved with a project or program that used Outcome Mapping? *

- Yes
- No

5. Have you ever posted a comment to the OMVLC discussion forum? Which method do you use most often: via the web or by responding to email? *

- Yes: via the website

- Yes: by email
- No

6. How often would you say that you visit outcomemapping.ca website? *

1 2 3 4 5

Not at all Very Often

7. How do you load the outcomemapping.ca website on your computer most often?

a. You have saved a Bookmark/Favorite in your browser
b. By searching (Google, Yahoo, etc) and selecting outcomemapping.ca from the results.
c. By typing the URL directly into the address bar of your browser (www.outcomemapping.ca)
d. By clicking a link from a different web page or email
e. Other:

8. How would you rate your overall understanding of the Outcome Mappping methodology? (select one)

a. Very little knowledge of outcome mapping
b. Familiar with basic principles of outcome mapping
c. Comfortable with most of the outcome mapping methodology
d. Comfortable with all of the outcome mapping methodology
e. Complete understanding of the outcome mapping methodology
f. Other:

9. How did you discover Outcome Mapping? * (select all that apply)

a. A friend
b. Conference
c. School/training
d. At work
e. Written publication/article/book
f. Website
g. Other:

10. After discovering Outcome Mapping, what steps did you take to learn more about it? * (select all that apply)

a. Internet search for resources
b. Library search for books/articles
c. Training
d. Purchase Outcome Mapping book
e. Join OMVLC
f. Other:

11. (optional) Please provide any additional information or story relating to how you learned about outcome mapping or about your experience with Outcome Mapping on the Internet. If necessary, you can also use this space to respond or elaborate on any of the questions above

12. (optional) Your email address: I can keep you informed of the survey/research results