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Trust Necessitated through Metrics: Estimating the Trustworthiness of Websites

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Abstract

The issue of **trust** is of exhilarating concern in case of information disseminated through websites. Digitization technologies such as Internet has lowered the cost and increased the access to information of all kinds. This increased exposure to information from humongous number of websites poses a need for some mechanism or tool that can address this issue and provide rankings to the websites on basis of their credibility or the trust value they possess. Previous research has shown a lot of efforts in this area. Both exogenous and endogenous signals have been evaluated to derive the credibility of websites. Trust being more of a sociological virtue of psychometric nature; cannot be quantified easily. Aiming this fact we have tried to measure the trust by evaluating the actual behavioral metrics of the users (of the websites) which gets collected by analytical tools automatically with every hit on a website. This gives a pertinent and bias-free quantification of trust value of a website as tools collect the data being anonymous from the user. In this paper, we have introduced our novel web-based tool which estimates trust (of websites) imposed by web metrics collected through *similarweb.com*. The tool will re-rank the web-links (URLs) extracted from Google search engine for any keyword according to the trust maintained by the actual users of the websites. We will also evaluate the performance of our tool in terms of validated rankings and benchmarking it with other recently acceptable tools.

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Keywords: Web Trust; Credibility; Content Trust; Quantization of Trust; User Behavior; User Satisfaction.

1. Introduction

When a search query is entered in a search engine, the user is returned with a large number of web-links (URLs) to websites claiming to contain the related information. With such huge pool of web-links available, user does not

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know which of them to select on the basis of trusted or credible information, as the origination, motivation and latent purpose of their information dissemination is unknown [1].

It is advocated that since the information is present on the Internet in an analogous arrangement of Websites, an even layout of information is laid as far as accessibility is concerned, thus giving almost equal credibility to all the authors in the Internet users' observances [2-7]. Information on the web is generally not filtered using any professional mechanisms and it is largely deficit of "traditional authority indicators" viz. identity and reputation [2]. There are no universal or globally accepted standards for publishing online and the information may be effortlessly copied, altered or produced namelessly under false facades. Thus a user-based judgment is essential before consuming any kind of information from websites which can be both objective (information quality, accuracy, etc.) and subjective (expertise of author, attractiveness of website, etc.) in nature [8]. It is claimed that three factors influence the online information extensively viz. credibility of website, simplicity in usage and interest of the users being respected [9]. Trust in websites is vital if the user needs the information for supplementing decision-making as in symptom analysis using information from health related websites.

Our endeavor is to model the actual judgment of website users to find the trust possessed by the websites. As the behavior of each and every user of a website is recorded by the Analytics tools; their cumulative analysis will give most appropriate trust evaluation for the website. This forms the underlying basis of our model which is nomenclature as TNM (Trust Necessitated through Metrics). The model is validated and a web-based tool is built for trust evaluation as accurate as possible.

The rest of the paper is divided into different subsections. The first subsection gives a review of recent and relevant research in the area and background of the work. Then design and implementation of TNM tool is discussed followed by its empirical evaluation which will establish the effectiveness of the tool. Future perspectives for the research are also listed.

2. Background and Related Work

2.1. User Perception

The trust of users in a website depends upon three basic notions as suggested by 3S model in [10]. 3S model specifies semantic features (neutrality, accuracy, etc.), surface features (website quality, design, font size, etc.) and source of information (previous experience with the website) as the three antecedents of credibility assessment of a website. It has been found many a time in studies that these semantic and surface features affects the trustworthiness or credibility of a source only for acquainted or frequent users [10-12]. It may be invalid for all the websites as suggested in [13] but the work was restricted only to Wikipedia articles. An extensive literary assessment from multiple research articles [14-19] led to the determination of precursors of trust in websites enlisted in Table 1.

Table 1: Literary assessment of precursors of trust [14-19]

S. No.	Criteria	Characteristics/Implication
1.	Purpose of the Website	e-commerce, support, lead generation, informational website, etc.
2.	Last updated date	Website is presumed more credible if it is recently updated.
3.	Primary or Secondary source of information	Secondary source is supposed for manipulation of facts of information from primary resource.
4.	Contact information accessibility	Address or e-mail id of author entrusts the user to believe in the information.
5.	Link integrity of the website	No broken links should be there. If the number of external links is larger, then the credibility of the referred information needs to be assessed.
6.	Affiliation	Trust is judged on the basis of logo of concerned organization or sponsors by analyzing the header and footer.
7.	Completeness, accuracy and unambiguity	This strengthens the belief of users about credible or trustworthy information.
8.	Expertise of author	If the provided content is expertise area of the author, then it is considered trustworthy without any further verification.
9.	Website Design	Aesthetics of a website has direct link with the acceptable trustworthiness of