Dynamics of Engagement of Social Media in Health Care Industry: A Systemic Review

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Abstract

This study was set out to probe for benefits, hazards and dynamism of use of social media in health industry while proving supportive information to health care providers, stakeholders in health care industry and patients alike. We engaged a systematic study in which we mined for data on PubMed between 10th July and 8th August, 2018 using specific search words based on our set out inclusion criteria for studies we intended for selection into this study (provided in this our study). In all, 14 studies were eventually selected after we obtained records from our search words entered, studied the titles, abstracts and contents of full works to screen for studies that met our inclusion criteria and selected our studies for systemic review of the critical issues raised and findings and using PRIMSA guidelines. Our analysis engaged descriptive and non descriptive statistical features of which included mean, median and pooled population analysis of variance from Microsoft Excel Version 2007. Our findings suggested use of social media to be dynamic in nature in the areas of impacts, varieties of usage in health industry, interventional nature and specific fields of health it supports. It is both beneficial and hazardous and requires cautious use of information by the public to support health, restrained usage to avoid damaging effects of addiction and indulgence in harmful activities, and sustaining of present controls on posts on health on social media to protect users.

Keywords: Social media; Health; Dynamics; Usage; Hazards

Introduction

Social media generally refers to Internet based tools that enable individuals and communities to assemble, communicate, share: information, ideas, concepts, messages, and images among others; and make real-time collaboration with other users. Social media are also known as "Web 2.0" or "social networking" In 1997, the first recognized social media platform was developed and placed on Internet in a package called Six degrees but was withdrawn from Internet in 2001. It permitted users to create profiles and make friends. Social media usage became enhanced and popular in the late 1990s when the first blogging sites were birthed in 1999 and in the early 2000s (in the first social media boom period) when MySpace and LinkedIn were launched as social media platforms on the Internet, You Tube joined in the mid 2000s and in 2006 Twitter and Facebook became assessable worldwide at a period when over 200 million people were estimated to have access to the internet . Thereafter, various other social platforms have emerged on the internet serving various specific goals. The entry of Facebook marked a milestone in the social media service and presently with over 1 billion users on it, despite its first restricted usage for Harvard University students at its initial stage of formation. This was as a result of the potentials seen in its usage following the successful Harvard University experience. Today, social media has become widely used and is now helping people promote their businesses and market products such as health and medicine supplies, domestic needs, sports, educational and music [1-4].

Social media sites provide a myriad of features for different purposes for individual and organization based users. They include blogs, social networks, video and photo sharing sites, wikis information, all of which can be grouped by purpose. The major roles served by specialized social media in supporting the health industry through usage by health industry practitioners include Social networking to site for online Medical consultations and for Medical practitioners to meet and connect with clients (on Facebook, MySpace, Google Plus, Instagram, Twitter), Professional networking where health care practitioners share health information and connect with fellow health care practitioners, get information on latest discoveries and research trends on health issues and recruit health care professionals or search for health related jobs (on Globally followed LinkedIn, Mendeley, ResearchGate, Chinese based Tianji.com, Renhe.cn, Ushi.cn, Baidu, and Sina Weibo), media sharing in which some medical procedures are shared with doctors and nurse and physiotherapists and radiologists among others (on YouTube, Flicker), content production blogs with pictures to depict varieties of some health conditions (on Tumbler) and avenues created for disease surveillance with involvement of social media, micro blogging for designed to be easy and fast to share short pieces of information with clients in health care and even business industry among others [5,6]. In recent times, Social pharmacies have merged to provides free drugs to financially handicapped patients (Greece's model) while a pool of health related information are aggregated and

available with ease of access and cost, except for the cost of purchasing megabytes of browsing credits for internet service provide.

Social media has been included in health support frame work in some institutional health care in the United States such as for veterans to assist reach out to those in remote areas through ICU Telemedicine and ICU Telepharmacy. In addition it is aimed at increasing access to care, promote completion and be beneficial to American war/army veterans [7]. Yvonne Price of University of Arizona Telemedicine Program [ATP] opined that Telemedicine is taking advantage of the increasing number of users on social media with more than 75,000healthcare professionals on Twitter, 41% of consumers of health care products now on Facebook, Twitter, You Tube and online forums to select health care providers.

The specific objectives of this article are to Probe for dynamics usage of social media in health industry with evidences from a systemic study of literature and other fact based resources. Probe for and highlight the health industry specific benefits and hazards in the use of social media. Proffer methods to avoid and overcome the hazards to individuals and organizations using social media for health issues. Provide supportive information to users of social media in health care industry.

Statement of Problem

Social media has beneficial uses a well as hazardous effects. We want to explore the range of its benefits in health industry, provide supportive information to available resources for health care industry users and create awareness in these practitioners on the hazards involved. As such, health care users must make effort to avoid the pitfalls and keep these hazards check. These hazards can be a problem to the professional practice and integrity of some health care practitioner users of social media users who do not take cognizance of its traps. The health care sector is a sensitive industry to human life, welfare and existence. For instance, risks come from conscious or unconscious distribution of poor quality information that could damage one's professional image, breach patient privacy, violation of personal professional boundaries, and licensing or legal issues [8,9] . A supportive evidence for the existence of this problem stems from the fact that health institutions and organizations have issued guidelines to prevent these risks.

Research Questions

Is the usage of social media usage dynamic?

What are the range of ways in which social media is dynamic?

How beneficial is social media usage to the health industry?

What steps could be taken by health industry practitioners making use of social media to avoid the vices and traps in its hazards?

Methods

We engaged a systemic review conducted on previous studies mined from PubMed database in the month of July, precisely between 10th July, 2018 and 8th August, 2018 for peer reviewed journal publications related to our study goals using three basic search phrases of: benefits of social media, digital health and eHealth. We focused on articles published within past 10years between 2008 and 2018. However, for the purpose of our introductory writeup, we extended our search to resources from years beyond 10years to help trace antecedents and history to help relate it to recent observations and developments on the subject of this study [10-13].

From pour database search on PubMed, a total of 59,377 peer reviewed articles were identified (made up of 397 Meta-analyses and 5314 Systemic reviews), 510 had related titles, out of which 496 were rejected. They were screened and thoroughly studied for usefulness to this work. Eventually, we selected14 peer reviewed articles for our systemic review based on our inclusion criteria for this study. We extracted relevant information that we analyzed to present our tables in the result section, discuss, cite authors and collate our selected references. Also, we screened for accuracy for each set of data and information obtained, by cross checking other indexed journals and resource for information on same issues and set of data. Those found to be similar and true were retained for analyses, citing, discussions and referencing in this review while those we could not authenticate were discarded. This helped us to validate our sets of data and resource materials.

In our writeup, we endeavored to use restrained, thoughtful and serious tone, with all these steps geared towards reducing elements of bias and attaining academic scholarly voice. The limitation of this review that we observed is that we did not find a wide pool of resources to further authenticable data and information retrieved.

Results

From our database search on PubMed, a total of 59,377 peer reviewed articles were identified (made up of 397 Meta-analyses and 5314 Systemic reviews), 510 had related titles, out of which 496 were rejected. They were screened and thoroughly studied for usefulness to this work. Eventually, we selected14 peer reviewed articles for our systemic review based on our inclusion criteria for this study (**Table 1**).

Search words	Records identified	Titles & related	Rejected	Additional	Total studies selected
Social media	12,102 (54M, 761S)	250	240	0	0
eHealth	29,166 (208M, 3622S)	190	187	0	3

Digital health	18, 109 (135M, 931S)	70	69	0	1

Table 1: Overview of records from database search on PubMed (Medline).

A high percentage of studies were interventional 71.43% . Approximately 57.14% of our selected studies (8 studies) indicted only clear cut positive effect from use of social media in health care industry, one study (7.14%) with only clear cut negative effect on use of social media in health care sector and same one study (7.14%) from all 14 selected studies indicated uncertainty due to paucity of data as 28.57% (4studies) ended up with observed positive and negative impacts from use of social media on health. Four studies, by Marimo focused on mental well being (health) issues. One of these four studies was interventional (25%) and 3 of the 4 studies (75%) observed positive influence of social media for mental health related issues with the exemption of while all 4 (100%) studies indicated negative impact from use of social media on mental health. In area of social media for specific communicable diseases, studies by Cao (26 studies) and Seltzer (one study with 9342 posts) interventionally utilized social media to beneficially support care, management and control of specific communicable diseases such as HIV/AIDS (1 study selected) and Zika virus (1study).

Four studies, Mita (16 studies with 10,711 participants), Ashfarian (12 studies with 941 participants), Williams (22 studies with 2510 participants) and Karner (57 studies with 34,390 participants) all focused on non-communicable diseases (NCD). Mita study was general for NCDs while the other 3 were specific for selected NCDs on obesity.

On use of ICU Telemedicine/ICU Telepharmacy in curative health management, the only study we selected which was conducted by Strnad (11 studies) for Telepharmacy was an interventional, had only clearly stated benefits, made of distinct recommendations, examined 11 studies in its selected studies.

Discussion

The percentage of studies that was interventional well above average mark, of which included studies on Schizophrenia, Self harm injury, Suicidal behavior and Psychological distress. About half (57.14%) of our selected studies indicted only clear cut positive effect from use of social media in health care industry, one study (7.14%) with only clear cut negative effect on use of social media in health care sector and again one study (7.14%) from all 14 selected studies indicated uncertainty due to paucity of data as 28.57% (4studies) ended up with observed positive and negative impacts from use of social media on health. The reason for the higher 57.14% compared to 28.57% and 7.14% figures from number of our selected studies is simply because our search words did not directly include use of the word "hazard" and if we had access to other data bases like CINAHL and PsycInfo, we would have had a bigger pool to make a categorical statement on this. By implication, the use of social media is not just only beneficial in clear cut terms, but having both health benefits and hazards and of various dimensions in different areas of our health care industry. This is the limitation on our study which we recognize for other studies future studies. As such, a dynamic nature in impacts from use of social media is observed form our systemic review, which could be positive (beneficial) or negative (non-beneficial). We had interventional and non-interventional status of usages in which we identified four key areas of health involved in studies (mental health, communicable diseases, non communicable diseases and general well being areas), and from our literature searches not included in systemic review, it is apparently clear that social media has found usages in marketing and sales, consultancy, treatments and interventionally to prevent and control diseases of various types [14].

Social media has a wide range of beneficial usage in the health industry, cutting across various health practitioners' fields in the health industry; from usages by Clinicians, Nurses, Pharmacists, Vaccinologists, Public health practitioners, Medical educators, Health nutritionists and Social pharmacists among others. This collaborates with one of the courses instructed by Walden Lecturers on "Multidisciplinary approach to health" of which Ozurumba L.N. and Schumaker C. Jnr (two of co-authors of this review) are witnesses. However, there are risks of traps involved that users, particularly in the healthcare industry on which this article focuses on, should endeavor to avoid in order to maintain the ethics of their professional practice, personal integrity and uphold their licenses and rights to practice.

Given as observed from this our study upon which wider studies could be conducted by other researchers and as highlighted in previous statements, we propose that the use of social media is "dynamic in nature". With 92.86% proffering suggestions and recommendations based on their findings, this is a welcome development for providing a pool of suggestions, sievable and could be incorporated to models for our health care systems while considering the peculiar circumstances and challenges for each country. However, we encourage researchers to do interventional studies on mental health psychotherapy to support studies unraveling impacts as either positive, negative or both.

Mental health and psychotherapy

All four studies on mental health related issues provided recommendations. Marimo observed a negative correlation between Facebook use and wellbeing with a positive correlation between problematic Facebook use and psychological distress. The wellbeing yardsticks used by Marimo were positive on mental health, psychological distress (in areas such as depression, anxiety among others) and life satisfaction. We opine that use of the social media platforms has clear cut negative impacts on mental health wellbeing of users, requiring intervention from our policy formulators to carefully study and reform our policies to protect the most vulnerable groups (children and youthful users of social media) from harm and affliction with psychological problems that help increase level of potential psychiatric patients, considering the already substantial numbers rooming streets in the third world from various causes, both non-social media aggravated and social media aggravated ones. Images on display can also be controlled

and checked for mental health harm content levels and potentials, with a view to blanking out such contents. The practice of users informing Facebook Corporation on such contents they don't want to see is a welcome negative behavioral attitude control and could be strengthened by creating awareness in users to endeavor to report self harm, suicidal and injury provoking contents which they detest and do not want to see again on their timelines and social media page contents.

Communicable diseases (CDs)

Studies by Seltzer (one study with 9342 posts) interventionally utilized social media to beneficially support care, management and control of specific communicable diseases such as HIV/AIDS (1 study selected) and Zika virus (1study). However, Seltzer cautious suggestions pointed to the need for health programs and policies to help modify and regulate very misleading contents on social media. We are of opinion that this step could support disease management and truncation of lines of transmission of these diseases. In studies by Dumit incorporating cost-benefits of immunization information systems (IIS) and Black focusing on impact of eHealth solutions, one clearly provided data (6 studies) while one highlighted uncertainty in data availability (53 studies) . However, both called for increased provision of empirical data evidences to analyze cost-benefits of eHealth options in our healthcare systems.

Non-communicable diseases (NCDs)

Four studies, Mita (16 studies with 10,711 participants), Ashfarian (12 studies with 941 participants), Williams (22 studies with 2510 participants) and Karner (57 studies with 34,390 participants) all focused on non-communicable diseases (NCD). The study by Mita was general for NCDs while the other 3 were specific for selected NCDs. All these 4 studies indicated no clearly stated hazards from findings for use of social media on health. All four studies were directly or indirectly linked interventional use of social media for prevention of NCDs and all 4 also indicated positive effects for use social media in health industry. Nevertheless, following Ashfarian observing its modest positive impacts (0.64%) reduction in obesity via body mass index (BMI) measurements (n = 941), they called for policy reforms that promote anti-obesity networking sites and for other NCDs. Also, Karner observed moderate quality evidence that digital interventions may lower alcohol consumption with an average reduction of up to 3 United Kingdom standard drinks per week compared to control participants, with comparison being between digital and face to face interaction based interventions. Mita observed an insignificant positive impact that could not be generalized for now between social media and reduction of levels of NCDs. In addition, Williams observed only significant decrease in 5 of 22 studies but no significant impact for social media in reducing diet and exercise behavior in their overall 22 pooled studies that were systematical reviewed [15].

Based on our preview of these the studies, we opine that interventional use of social media for NCDs has not achieved much, still infantry in its deployment and yet to help us achieve the appropriate results from efforts put in so far. As such, our policy needs reforms that rightly now address this insignificant and modest positive outcomes, ought to be better structured and strengthened to promote use of more efficient international use of social media networking services to help confront and start making significant impacts of outcomes on the prevention and control of prevalence of NCDs associated with these behavioral patterns. Of course, if achieved, it ought to be sustained and further strengthened in the light of current attitudes of people and developments. In the light of the foregoing in our systemic study, social media specific usage for non-communicable diseases like obesity, diet and exercise behaviors spreads concepts of interventional usage across both CD and NCD.

General

On use of ICU Telemedicine/ICU Telepharmacy in curative health management, the only study we selected which was conducted by Strnad (11 studies) for Telepharmacy was an interventional, had only clearly stated benefits, made of distinct recommendations, examined 11 studies units selected studies. These authors observed that Tele ICU was associated with positive outcome in patient's outcome and disease management. In a study by Udeh not used for systemic review) it was associated with positive impact for survival benefits and quality improvement. However, Udeh cautioned that Tele ICU cover only a small proportion of ICU patients due to cost hindrances, though increasing in deployment. They recommended that Tele ICU could fit into a hybrid model of care to complement efforts by high intensity ICU staff, though more interventions come from onsite physicians. Use of ICU Telemedicine has been connected with social media usage for beneficial means in healthcare industry. The Telemedicine provider HealthTap has now made its network of physicians available through Facebook messenger and offering patients access to them through video. HealthTap is a cutting edge application technology and offers patients access to physicians. The University of Arizona is another example on linkage of Telemedicine and Telepharmacy with social media stating that Telemedicine providers have now found social media as a great networking tool. The University of Arizona became active on social media in September 2013, and now with extend their outreach to Twitter, Google+ and LinkedIn. Telemedicine providers hint that their potential patients are on social media and it's their moral obligation to met them [16].

Telehealth now receives good support from Federal Trade Commission of America and helping to increase access to health care to veterans in remote areas with difficult access to health care.

Cost-benefits

Worthy of mentioning is the undecided authors Black who worked on cost-benefits and indicated lack of adequate empirical evidence to substantiate outright claims on eHealth solutions as overwhelmingly beneficial against the hazards. As such, researchers and stakeholders in health sector should approach this issue cautiously and investigate this thoroughly in

using it to model our Health policies. Therefore, researchers ought to be cautious before making outright categorical statements on cost-benefits or just benefits for eHealth solutions on quality and safety of our health systems [17].

Web links of some health based organizations and agencies on social media platforms

Medical Directors Forum is a social networking site for medical directors that provide a verified, secure, closed-loop environment for peer-to-peer interaction. The Doctors' Channel hosts videos for medical news, medical education, and health care gingles. Media-sharing sites, like YouTube, of social media tools - optimized for viewing, sharing, and including digital media on the Web in health related information. Physicians networking sites like QuantiaMD Doctors' Hangout.

In area of medical education there is CliniSpace and for surgical simulation we have OpenSim. These social platforms allow users to interact via a virtual representation of them. They maintained by Mayo Clinic are are increasingly engaged for patient education, simulation of epidemiology and prophylaxis, surgery and research Interestingly, patients are also using social media to connect with others affected by similar ailments. Sites such as PatientsLikeMe and typical examples. Social networking sites for pharmacists incorporates ASHP Connect sponsored by the American Society of Health-System Pharmacists, Social pharmacies which provide free drugs to financially handicapped patients in the city of Athens Greece where at least 67 Social pharmacy outlets have been established and all networked to a central Social pharmacy app called Yoda developed and created by a Greek. Drugs are donated by philanthropists and other citizens to these social pharmacy outlets which patients handicapped financially to purchase their drugs can access freely provided they are with certified prescriptions from medical doctors of recognized health care centers where they underwent diagnosis. Even expensive drugs of cost in the range of 12 Euros are given out on such certified prescriptions. This has helped a lot in Greece where the economy has immensely nosedived with many grappling with the woes of an unfortunately ailing economy. The social pharmacy in Greece operates in an existing structure of Doctors of the World, which works in collaboration with the program Open Polyclinic since 1997, aiming to provide free pharmaceutical care to patients attending the Polyclinic as well as outpatients based on the earlier stated conditions of obtaining such drugs free. It was carefully integrated into supported Greece's Traditional Health care system and a commendable effort that received approval entry the country's health policy system. The program is funded by the European Social Fund and has helped to address the peculiar austere economic crisis that Greeks have been going through for well over a decade now. Professional networking forums for nurses

Some physicians use blogs to communicate with other Health care professionals (HCP) or the public. The Clinical cases blog features case studies in a large pool of medical specialties. truncating Web log; it is the oldest and most established form of social media that has been used in medicine since the 2004. Examples of widely used free long form blogging platforms include Tumbler, Word Press Wiki projects such as RxWiki and Blogger .There are Micro blogs that provide the most dynamic and concise form of information exchange via most prominent among them. On Twitter, users publish messages called tweets that consist of a maximum of 140 characters. Tweets can be in form of supplemented videos or other vital websites. Domain for Third party apps empowering Clinicians and patients: CLU Clinical Language Understanding that helps to improve patient care by creating and analyzing free text dictations, tagging clinical data like diagnoses, problems, allergies and medications and easily extracting actionable knowledge from the narrative notes, found on We ehealth, digital health, telemedicine and telediagnosis and teleconsultations now have connections to social media platforms, such as through the Telehealth app named Telemedicine provider HealthTap. For instance, have presence on Facebook, Twitter and Linked which clients, patients and health information seekers can connect to, from where they get redirected to their e-consultation rooms and clinics and health care centres, were they meet the health care practitioners who could be clinicians (medical doctors), specialist consultant clinicians, certified naturalist doctors like acupuncture practice experts and homeopathic doctors, e-nurses, public health advocacy consultants, epidemiologist and health based institutions/organizations in reporting of suspected outbreaks of infections to seek urgent interventions .

Hazards and challenges of social media usage in health care industry

The hazards of social media usage by health care professionals and stakeholders include possibility of giving out poor quality of health information which can damage one's professional image, posting of medically unprofessional contents that can attract negative feedbacks which can , conveyance of sensitive information about person's health or breaching of patients' privacy alongside potentials for negative repercussions resulting from breach of patients' privacy and possible loss of professional medical practice licensing by defaulters of guiding regulations. This falls under the purview of Ethical Issues of Public health. Also, we have risk of cyberbullying and crimes against children; all of which can attract offensive feedback that may hurt emotions.These are medical psychological issues with community health implications. Part of the causes for the temptation of disseminating poor quality information are due to

poor training of some medical practitioners due to inadequate teaching, research and training manpower in some institutions , hurriedly assembled information that have not gone through filters of editorial work and peer scrutiny to establish and ascertain facts, infiltration by non-members of medically focused professional communities to disseminate hate based comments against the health professional owners of such blogs or websites thereby afflicting the integrity and market potentials of such medical personnel. we have risk of fraud or identity fraud, time wasting, cyberbullying and crimes against children; all of which can attract offensive feedback that may hurt emotions.

For instance, a partly deranged or unstable person can easily access the open timeline or page of a healthcare providing consultant or clinic or eHealth facility on social media like Facebook, Twitter of Instagram to post false and misleading health disaster alerts, information or even maliciously blackmail targeted healthcare providers. A typical example was during this mid-decade Ebola outbreak in West Africa and the misleading and appropriate information presented in the study by Fung.

Since management of patients and handling health disaster crisis situations are sensitive and demands patience on part of patient, communities involved and the healthcare practitioner or health disaster management team leader, social media can provide easy platforms for inpatients to post abusive and inciting comments that could affect the psychology of the ca and trigger uproar by citizens or relations of patients being treated in situations that require calmness and patient. Instances were highlighted by Merchant and Marino both of self harm and suicide inciting posts and Seltzer on appropriate and misleading content posts on Zika Virus studied on social media.

How we ought to use social media in health care sector

Health care practitioners, health sector workers and stakeholders ought to endeavor to use the tools of social media to:

- Share vital health information.
- Open up constructive debate on health care policy and practice issues.
- Promote health behaviors.
- Educate and interact with health care givers, students in area of health sciences and our career field colleagues.
- Potentially support measures to improve health outcomes.
- Develop a professional network.
- Increase awareness of discoveries in health sciences.
- Motivate victims of natural disasters.
- Provide health information to the communities.

Generally, practitioners in the health care sector engaging social media should endeavor to conform to social media guidelines issued and set by health care institutions and professional organizations. Additional information regarding social media guidelines can be found in the online database at http:// socialmediagovernance.com/policies.

Conclusion

Social media usage in the health industry has been both beneficial and with accompanying hazards in its impacts, that should be ideally avoided by professional health workers, stakeholders in health care sector, clients and patients in need of health care services. Usage of social media in health care industry is dynamic based on nature of impacts, type of use, interventional and other usage nature, and specific areas of health it supports. It has supported meeting patients by health care providers, practitioners and ICU Telehealth professionals and vice versa; marketing and sales of health care products like drugs; advertising and seeking for health related jobs; creating forum for brainstorming on health issues, alerting health care providers and organizations on emergency situations; and providing useful information on diseases preventive and recommended curative steps; and education of students of health related courses among others.

Hazards have come from areas like misinforming the public on critical health issues, luring audience into harmful activities of which includes suicidal acts, creating mental health problems for careless audiences who fall prey to misuse of social media in area of its addiction thereby creating psychiatric cases requiring psychotherapeutic care and vulnerable children being misled into slavery and destructive groups to extent of creating social problems in area of such children requiring psychological treatments and family fragmentations among others. Invariably, the watch words in using social media to support health care industry ought to be that of cautious time input into its use with personal and parental controls for vulnerable under age ones, carefully sieving posts to avoid indulging in activities that can be damaging to personal health, provision of useful and accurate health information.

We suggest further strengthening of forms of controls on self harm and suicidal materials and information posted on social media, avenues to create awareness on were the public can find authentic information on health issues and how to avoid being affected health wise during disasters requiring emergency responses, and training of Psychiatry experts and Psychologists on vital psychotherapy steps to support individuals who fall prey and victim to indulgence or participation in activities detrimental to their health. Our researchers could get more involved unraveling more information on cost and benefits issues on use of specific intervention measures done through or with involvement of social media, such as the involvement of ICU Telemedicine/Telehealth for meeting patients and treatment procedures based on some recorded successes. This will enhance steps on nature of governmental and health organizational (international, national and community based ones) support and extent of increasing reach out of Telehealth practices via social media to patients with remote access to healthcare.

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