



Evaluating the Effectiveness of Social Media Posts by SWH Sellers: An Empirical Analysis

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Abstract: The purpose of this research is to determine whether or not the social media postings that vendors of solar water heaters (SWH) generate are efficient in advertising their goods and connecting with prospective buyers. In light of the growing dependence on social media for marketing purposes, it is essential to have a solid grasp of the sorts of postings that are most likely to connect with audiences in order to optimise marketing tactics. The purpose of this research is to examine a variety of postings from a number of different vendors, with a particular emphasis on metrics such as engagement rates, reach, and conversion rates. The purpose of this research is to determine which aspects correlate to better levels of engagement and sales by analysing a variety of post forms, content kinds, and promotional techniques. The results will give insights into best practices for social media marketing within the solar water heater business. These insights will assist sellers in refining their tactics to improve their online presence and boost client acquisition.

Keywords: Social media, SWH sellers, effectiveness, marketing, conversation rate

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INTRODUCTION

In the present environment of sustainable energy, the fast acceptance of solar technology signals a key change towards lowering carbon footprints and boosting energy efficiency around the world. As more and more countries struggle to cope with the effects of climate change and the depletion of resources, there has been an unparalleled uptick in the search for energy sources that are both cleaner and renewable. In light of the fact that it is able to harness the power of the sun, solar energy stands out as one of the most promising and easily available ways to solve these environmental concerns. Solar water heaters, often known as SWHs, have developed as a particularly practical and cost-effective method of using solar energy, standing out among the many other solar technologies that are now available. The purpose of solar thermal heating (SWH) systems is to collect and transform sunlight into heat, which may subsequently be used to generate hot water for usage in residential, commercial, and industrial settings. Unlike conventional water heating techniques, which are dependent on fossil fuels or electricity, solar water heaters (SWHs) provide a sustainable option that minimises the amount of energy that is used and the amount of greenhouse gas emissions that are produced. Consequently, this makes them an appealing choice for people and organisations who are dedicated to lowering their influence on the environment and implementing more environmentally friendly activities (Pathak et al. 2019).

A greater worldwide drive towards the use of renewable energy sources is reflected in the exponential growth of solar thermal systems. At the same time as more people are becoming aware of environmental problems and the need of sustainability, more individuals are looking for methods to lessen their carbon

footprints and adopt environmentally friendly technology. This change is being brought about by a number of causes, some of which include the encouragement provided by the government, the development of solar technology, and the growing awareness among the general population about the advantages of renewable energy. Specifically, solar water heaters are becoming an essential component of this shift since they provide an efficient option for satisfying the need for hot water while also making a contribution to the overall efficiency of energy use. In addition to their positive effects on the environment, SWH systems also have other advantages. From a financial point of view, they provide significant cost reductions on monthly energy bills over the course of time. By harvesting solar energy, customers may drastically decrease their dependency on traditional energy sources, which ultimately results in reduced operating expenses and increased financial savings. In addition, the installation of SWH systems often makes them eligible for a variety of government subsidies and incentives, which further improves the cost-effectiveness of these systems and encourages broader adoption.

The rising number of solar water heaters (SWH) being installed in various areas is also a reflection of the increased support that governments and institutions are providing for programs that use renewable energy. Policies and regulations that have been put in place to encourage the utilisation of solar technologies, in conjunction with technological improvements that have made solar water heating systems more cost-effective and efficient, have contributed to the widespread acceptance of these systems. As an increasing number of families and companies become aware of the long-term advantages of solar water heaters (SWHs), their presence in the worldwide market continues to expand, therefore establishing their position as a crucial participant in the transition to sustainable energy solutions. As a sign of a more comprehensive commitment to sustainable development, the incorporation of solar water heaters into conventional life is becoming more commonplace. Through the use of such technologies, people and organisations not only make a contribution to the preservation of the environment, but they also establish a standard for the development of future advances in renewable energy. As the world progresses towards a more sustainable future, the continuous expansion and acceptance of solar water heating (SWH) systems will play a critical part in altering the energy landscape and supporting a greener and more efficient approach to fulfilling our hot water demands.

The Use of Social Media as a Marketing Instrument

Concurrently with the proliferation of environmentally friendly technology, social media has emerged as an indispensable instrument for contemporary marketing, therefore bringing about a change in the manner in which companies engage with their target audiences and promote their goods. Traditional marketing paradigms have been revolutionised as a result of the vast reach and participatory nature of social media platforms, which have offered chances for engagement and brand creation that have never been seen before. Not only does social media provide vendors of solar water heaters (SWHs) with a strong conduit for increasing awareness about their goods, but it also provides them with the opportunity to cultivate direct connections with prospective clients.

The many social media sites, such as Facebook, Instagram, Twitter, and LinkedIn, each have their own set of distinctive features and benefits, which may be used to effectively increase marketing tactics. These platforms make it possible for vendors to communicate with a large and varied audience by allowing them

to personalise their material so that it is relevant to certain demographics and interests. The capacity to divide viewers into several groups according to characteristics such as age, geography, and interests enables marketing efforts to be much more targeted. For example, the powerful advertising tools and thorough analytics offered by Facebook give retailers with insights into the behaviour and engagement of consumers. This enables sellers to adjust their plans and increase the effect of their efforts. Due to the fact that Instagram places a strong focus on visual material, it is a great venue for displaying the aesthetic and practical advantages of SWH systems via the consumption of high-quality photographs and videos. While LinkedIn provides a professional environment for business-to-business (B2B) marketing and industry networking, Twitter's real-time nature makes it easier to provide information and communicate with others in a timely manner (Farsi 2021).

The ability of social media to provide direct conversation and engagement with customers is one of the most significant benefits of using these platforms. One of the key differences between social media and conventional advertising tactics is that social media platforms provide two-way contact, which enables vendors to participate in discussions with their audience, respond to questions, and collect feedback. Due to the fact that customers see businesses that actively connect with them as being more accessible and responsive, this degree of contact contributes to the development of trust and credibility. This is an opportunity for dealers of solar water heaters to educate prospective consumers about the advantages of solar water heating, put an end to common myths, and provide personalised advice based on the specific requirements of each individual client. Additionally, social media platforms provide a wide range of material types that may be used to attract and keep the attention of consumers. The posts might be anything from client testimonials and interactive polls to educational articles and movies that demonstrate how to do something. Different kinds of content are designed to accomplish different goals and are appealing to different subsets of the audience. Educational material has the potential to provide useful insights into the advantages and functioning of SWH systems, while case studies and testimonials from customers have the potential to generate social proof and trust. Users may be engaged and encouraged to participate via the use of interactive material like as polls and quizzes, which can result in an experience that is more dynamic and engaging. In addition, retailers are able to design customised advertising strategies that may precisely contact prospective buyers via the use of social media. By providing sellers with comprehensive targeting options, platforms such as Facebook and Instagram enable them to produce advertisements that are specifically suited to certain audience groups depending on the interests, behaviours, and demographics of those audience segments. This makes certain that marketing communications are sent to those who are most likely to be interested in SWH goods. As a result, the possibility of conversions is increased, and the return on investment for advertising expenditures is maximised.

The use of statistics related to social media platforms is yet another essential component of optimising marketing efforts. The platforms provide comprehensive analytics about the success of posts, the engagement of audiences, and the efficacy of campaigns. By analysing these indicators, sellers are able to obtain insights into the sorts of content that connect best with their audience, detect trends, and make choices based on facts in order to improve their social media efforts. Sellers are able to maintain their agility and responsiveness to shifting customer tastes and market situations by continuously analysing and adjusting their social media ads based on performance data (Miremadi et al. 2012).

Social media has evolved into a vital tool for sellers of small and medium-sized goods (SWH), as it provides a wide variety of features and capabilities that make it easier to contact customers and conduct successful marketing campaigns. As a result of its capacity to reach a large audience, engage in direct conversations, make use of a variety of content formats, and carry out targeted advertising campaigns, social media is a strong platform that can be used to increase sales, create connections, and drive awareness. As the market for solar water heaters continues to expand, it will be vital for sellers who want to accomplish their marketing objectives and build a strong presence in the competitive landscape of sustainable energy solutions to make full use of the possibilities that social media platforms provide.

Problem Statement

There is no empirical study on the efficacy of different kinds of social media postings in this setting, despite the fact that SWH vendors are increasingly using social media. Prior research has mostly concentrated on broad social media marketing tactics or certain sectors, creating a vacuum in our knowledge of the subtleties behind how social media content influences customer attitudes and behaviour in the specialised market for solar water heating systems. This study attempts to close this gap by methodically examining how various social media post formats affect customer engagement and sales results in the SWH sector.

Importance of the Research

There are several reasons why this study is important. First, it provides information about the efficacy of social media marketing tactics, particularly in the context of the solar water heater industry a field that has not received much attention. Secondly, the research looks at how consumers react to various kinds of social media material and offers practical suggestions that SWH sellers may use to boost their online visibility and increase their return on investment. Finally, the results add to the body of knowledge in the area of digital marketing research and provide sellers in other sustainable technology industries with insightful insights.

LITERATURE OF REVIEW

Farsi (2021) A growing number of sectors are feeling the effects of social media's (SM) pervasiveness and importance in people's daily lives. Social media is being used more and more by the healthcare business to establish brands, attract new employees, advertise services, and promote health. In both virtual and physical spaces, HCPs are obligated to uphold ethical standards. From March to April of 2020, researchers combed through medical publications published in English on the topic of SM usage in healthcare from 2007 to find the most relevant articles. After sorting through 158 papers, we found that SM may be used for a variety of purposes, including but not limited to: public health care concerns, scientific research, medical education, telemedicine, career development, recruiting, professional networking, health promotion, and scientific research. The evaluation found that integrating SM and other types of communication into multidimensional health care was effective. It is critical to find a middle ground between digital and conventional health care.

Sharifi et al. (2019) the promotion of renewable energy technologies (RETs) as a sustainable practice in the home building industry is dependent on the efforts that are made to publicise these technologies. Using

a modeling-based approach, the purpose of this research is to investigate the efficacy of advertising in relation to the adoption of renewable energy technologies (RETs) in the field of solar water heaters. A total of 398 Iranian people participated in the survey that served as the basis for this research. For the purpose of determining the efficiency of advertising in relation to the AIDA framework, a neural network analysis was used. According to the findings, the neural network is able to make accurate predictions about the links between advertising efficiency indices, including attention, interest, desire in the context of RETs, and action. The neural network study revealed that attention was the most important predictor of action, followed by interest and desire. Attention was determined to be the most significant predictor of action.

Pathak et al. (2019) there is widespread agreement that Geographic Information Systems are useful for managing and manipulating spatial data related to a watershed's hydrologic response. It is necessary to implement stormwater harvesting in order to preserve freshwater resources in light of the effects of climate change and drought. Before settling on an appropriate location for stormwater harvesting, it is necessary to conduct a number of analyses, including those of economic, social, cultural, and environmental nature, in addition to identifying hotspots and screening potential sites. In order to rank the selected sites, many economic factors are taken into account, such as water consumption, stormwater availability, and distance to end-use locations. The current research incorporates socio-environmental factors via the use of a web-GIS based methodology. The open-source database server (PostgreSQL/PostGIS) stores the geographical datasets and information linked to the research field, and GeoServer is used for further evaluation and analysis. via this method, geographical datasets are made available to the public via open-source websites, where they may be seen and analyzed at any time, from any location in the globe. By doing so, stakeholders may save time and money compared to doing individual field trips to collect comments from water planners and people, and then store those replies. To that end, we poll a wide range of institutions, water experts, stakeholders, and locals using a questionnaire that covers topics related to site selection. The Analytic Hierarchy Process is used to determine the relative importance of each criteria in relation to the gathered answers once they have been collected. Planners in the Indian city of Dehradun were able to use the weights thus collected to determine the best location for a stormwater collection system. Based on the replies that were collected, the locations 'B' and 'D' are considered to be the most appropriate ones in the research area. Also, the replies for the individual locations have given the most weight to the socio-environmental factors, such as "community acceptance," "recreational activities," and "need for water reuse." Water experts, citizens, planners, stakeholders, and the general public may all be active participants in water-related decision-making with the help of the suggested approach.

Miremadi et al. (2012) Banking and insurance services are more important than ever before due to the high amount of local and international commerce and business, as well as the dangers associated with them. Nevertheless, managers in the financial services sector are under constant pressure to improve their marketing strategies and plans due to the intense competition in the business. Marketing managers must discover and implement more efficient ways to deal with financial constraints since, while promotion and communication tools are essential to any marketing strategy, they may be rather expensive. There is a lot of rivalry in the financial services industry nowadays, so effective marketing, including promotion and communication tactics, is crucial. The second issue is the lack of research in the field of effective marketing methods based on target market and product or service life cycle stage, which pushes marketers to hunt for

solutions due to financial constraints. The research team behind this project hopes to learn which marketing and PR tactics are working best for certain demographics in the financial services sector. In order to learn about the promotional tactics used by financial services, we began with an exploratory study of their marketing. Quantitative methods replaced exploratory ones during the course of the investigation. The study is practical, and the data is collected via surveys. To rank the strategies in order of importance, we employ descriptive statistics and the Friedman Test. The most effective promotion and communication strategies for informing, persuading, and reminding customers of financial services were introduced after we prioritized these tools and strategies. We then investigated more detailed results by demographic and business type categories, and we provided the rank orders.

METHODOLOGY

Research Design: The research design for this study is primarily problem-solving in nature, focusing on promotional strategies used by SWH sellers. The research is aimed at understanding which promotional efforts are most effective in attracting and retaining customers, thereby assisting sellers in optimizing their marketing strategies. The study utilizes a blend of primary and secondary data to gather relevant insights and address the research objectives. A pilot study was conducted with 35 SWH sellers and 50 customers to test the research instruments. Based on feedback, the questionnaires were revised to ensure clarity and relevance. Reliability was tested using Cronbach's Alpha, and all values exceeded 0.7, confirming the reliability of the scales.

Data Collection Methods

- **Primary Data Collection:** Primary data was collected through structured questionnaires and in-depth interviews. The primary data collection involved two distinct sets of respondents:

SWH Sellers/Marketing In-Charge: A structured questionnaire was developed to gather information on the promotional strategies used by SWH sellers. This questionnaire included questions related to the types of promotional activities undertaken, their perceived effectiveness, and their impact on customer acquisition and retention. Additionally, in-depth interviews were conducted with marketing in-charges to gain deeper insights into their promotional practices and challenges.

Customers of SWH Sellers: For customers, a separate structured questionnaire was administered to understand their perceptions of promotional strategies and their decision-making process in selecting SWH sellers. The questionnaire aimed to gather data on the effectiveness of various promotional tools and the factors influencing customers' choice of sellers.

- **Secondary Data Collection:** Secondary data was collected from a range of sources to supplement the primary data and provide contextual understanding. This included:

Internal Sources: Data from SWH sellers' records, solar energy magazines, brochures, and annual reports.

External Sources: Published data, government reports, books, periodicals, online databases (e.g., EBSCO & EMERALD), and academic journals. Secondary data was used to gain conceptual clarity, validate findings, and identify gaps in primary data.

Data Analysis

Statistical Methods

Data analysis involved both parametric and non-parametric tests. Key statistical methods included:

- **Parametric Tests:** Independent T-Tests, MANOVA, and One-way MANOVA were used to analyze differences between groups.
- **Non-Parametric Tests:** When it came time to analyse categorical data or variables that didn't follow a normal distribution, they turned to the Friedman Test, Cochran's Test, Chi-Square Test, and Factorial Analysis.

DATA ANALYSIS AND RESULT

· Distributed Frequency: Using Social Media for Advertising

We polled SWH vendors to find out how important it is to use social media to market their company. On a scale from 1 (not at all important) to 5 (very essential), social media tools were ranked according to their perceived importance.

Table 1: The significance of advertising on social media

Response	Frequency	Percent
Not at all important	56	53.8
Slightly important	45	43.3
Moderately important	3	2.9
Extremely important	0	0
Total	104	100.0

The data in the table show that out of all the SWH sellers, 56% think social media promotion is completely unimportant, 45% think it's somewhat important, 3% think it's highly significant, and none thinks it's very important. As a result, the vast majority of SWH vendors felt that advertising their company on social media was irrelevant.

· Distributed Frequency: Using Social Media as a Marketing Tool

Introduction: SWH vendors were requested to provide the various social media channels via which their SWH businesses were advertised. These channels included Facebook, Twitter, YouTube, Google+, Foursquare, Flickr, LinkedIn, Yelp, Upstream, and Instant Messenger Apps such as WhatsApp and Hike. On a scale from 1 (never) to 5 (often), we tracked how often people used various social media networks.

Table 2: Engagement with Social Media Sites How People Use Social Media

Variables	Never		Rarely		Sometimes		Often		Always		Mean Rank
	%	F	%	F	%	F	%	F	%	F	
WhatsApp/Hike App	2.9	3	1	1	59.6	62	31.7	33	4.8	5	8.42
Facebook	2.9	3	7.7	8	50	52	31.7	33	7.7	8	8.37
Twitter	6.7	7	7.7	8	40.4	42	39.5	40	6.7	7	8.34
YouTube	40.4	42	16.3	17	21.2	22	17.3	18	4.8	5	5.07
Google+	9.6	10	1.9	2	40.4	42	32.7	34	15.4	16	8.44
Foursquare	36.5	38	14.4	15	35.6	37	11.5	12	1.9	2	5.54
Flicker	32.7	34	22.1	23	37.5	39	5.8	6	1.9	2	5.27
LinkedIn	12.5	13	37.5	39	42.3	44	3.8	4	3.8	4	5.58
Yelp	43.3	45	37.5	39	17.3	18	1.9	2	0	0	3.94
Upstreams	49	51	34.6	36	12.5	13	3.8	4	0	0	3.78

The table shows that 2.9% of SWH sellers never used WhatsApp/Hike Apps to promote their SWH selling, while 1.9% rarely used them. The majority of sellers used WhatsApp/Hike apps, but not frequently. 7.7% of sellers never used Facebook, while 7.7% used Twitter, and 8.7% used YouTube. 9.6% of sellers never used Google+, and 3.6% never used Foursquare. Flicker was rarely used, and LinkedIn was sometimes used. Yelp was not used, and Upstream was not used.

The mean rank of WhatsApp/Hike App usage is 8.42, followed by Facebook (8.37), Twitter (8.34), YouTube (5.07), Google+ (8.44), Foursquare (5.54), Flicker (22.1%), LinkedIn (5.8%), Yelp (1.9%), and Upstream (3.8%). Overall, SWH sellers emphasized using WhatsApp, Facebook, Twitter, and Google+ as social media platforms for promotion. The data suggests that overall, SWH sellers are focusing more on these platforms than other social media platforms.

· Social Media Activities for Spreading SWH: Frequency Distribution

We invited SWH sellers to contribute their social media activity, such as videos about SWH selling and services, posts, photos, follow-groups, Twitter handle tweets, newsletters, and links to the aforementioned on your website. A 5-point scale was used to quantify the social media activities that were done to promote SWH sales. 1 was never, 2 was seldom, 3 was sometimes, 4 was often, and 5 was always.

Table 3: Activity Use in Social Media

Variables	Never		Rarely		Sometimes		Often		Always		Mean Rank
	%	F	%	F	%	F	%	F	%	F	
Blogs & micro blogs	2.9	3	1	1	32.7	34	58.7	61	4.8	5	5.25
Videos on Solar Water Heater selling business	2.9	3	2.9	3	30.8	32	57.7	60	5.8	6	5.21
Posts	1.9	2	6.7	7	53.8	56	32.7	34	4.8	5	4.20
Photos	1.9	2	5.8	6	54.8	57	31.7	33	5.8	6	4.21
Follow groups	2.9	3	11.5	12	51.9	54	28.8	30	4.8	5	3.90
Twitter handle tweets	3.8	4	3.8	4	61.5	64	24	25	6.7	7	4.03
Newsletters	1.9	2	1.9	2	49	51	38.5	40	8.7	9	4.75
Links of above are available on your website	2.9	3	1.9	2	57.7	60	25	26	12.5	13	4.46

According to the data in the table, only 2.9% of SWH vendors utilise any kind of online content to advertise their wares. This includes videos, articles, images, Twitter handle tweets, newsletters, and links on their websites. The mean ranking of these activities is 5.25, with videos and posts ranking highest at

5.21. Follow groups rank third at 3.90, and Twitter handle tweets rank fourth at 4.03. Newsletters rank fifth at 4.75. Overall, SWH sellers prioritize using social media for product promotion.

· **Distribution of Frequencies: How Effective Are Various Social Media Platforms?**

To begin, we asked SWH vendors to tell us how well they promoted their SWH products and services using various social media platforms, including video, photos, testimonials, blogs, news/newsletters, articles, awards/rewards, and events. Using a 5-point scale, we evaluated the effectiveness of social media tools: 1= Not Effective, 2= Less Effective, 3= Somewhat Effective, 4= Effective and 5= Very Effective.

Table 4: The efficacy of various social media platforms used by SWH vendors

Variables	Missing value		Not at all Effective		Less Effective		Somewhat Effective		Effective		Very Effective		Mean Rank
	%	F	%	F	%	F	%	F	%	F	%	F	
Video	0	0	0	0	4.8	5	45.2	47	44.2	46	5.8	6	4.16
Photo	1	1	1	1	16.3	17	37.5	39	32.7	34	11.5	12	3.91
Testimonials	0	0	0	0	31.7	33	28.8	30	17.3	18	22.1	23	3.64
Blogs	0	0	1	1	1.9	2	17.3	18	52.9	55	26.9	28	5.94
News/Newsletters	0	0	0	0	1	1	10.6	11	59.6	62	28.8	30	6.30
Articles	0	0	0	0	1.9	2	8.7	9	54.8	57	34.6	36	6.35
Awards/Rewards	0	0	1	1	2.9	3	16.3	17	49	51	30.8	32	6.02
Events	0	0	1	1	2.9	3	17.3	18	46.2	48	32.7	34	6.13

According to the research, SWH vendors may increase their sales via the use of video, images, testimonials, blogs, newsletters, articles, awards/rewards, and events. Videos had the highest mean rank of 4.16, followed by photos at 3.91, testimonials at 3.64, blogs at 5.94, newsletters at 6.30, articles at 6.35, awards/rewards at 6.02, and events at 6.13. These social media tools were found to be highly effective in promoting SWH selling.

CONCLUSION

According to the findings of the study, the vast majority of sellers on SWH do not consider social media marketing to be a high priority. The majority of sellers consider it to be either not at all significant or mildly important from their point of view. Despite this, the majority of merchants promote their products on social media platforms such as Facebook and WhatsApp/Hike Apps, which reflects their affinity for platforms like these. Other platforms and activities get less attention, despite the fact that social media activities such as publishing blogs, producing movies, and sharing images are carried out on a regular basis. The effectiveness of various tools such as videos, blogs, newsletters, and events in promoting SWH selling is acknowledged, which suggests that increasing engagement and awareness of these tools might enhance promotional strategies for SWH sellers. It is important to note that the perceived importance of social media is low, but the effectiveness of these tools is acknowledged.

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