

A FUNDAMENTAL STUDY ON AWARENESS OF HEALTHY AGRARIAN PRODUCTS THROUGH TRADITIONAL KOLAM ART IN SOCIAL MEDIA

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Abstract

With the consistent and humongous growth of social media[1], there is a lot of information, as well as awareness, is mounting on the tip of the fingers, especially with the present-day young generation[2] more precisely through the platform Instagram [4][5]. In addition, while travelling with such continuous developments, there is a gradual vanish of Indian indigenous [8] elements such as the health benefits of the native produce, and various art forms. Considering the above scenario, an idea was initiated, of what-if to integrate the importance of agrarian products with a platform that youth handles often.

Keeping the above in mind and to spread awareness of the importance of Millets, a study has been done on the Kolams, drawn using the native grains, pulses, millets, and spices as materials during the Tamil month Markazhi (Tamil: மார்ச்சி; pron: mārkaḷi). While drawing kolams is an everyday practice in the state of Tamilnadu, India [3][6], the kolam works drawn during this period are photographed and posted on the Social Media platform Instagram with primary applications of HCI, to understand the reach. The kolams were drawn such as one agrarian produce a day as the material for each kolam throughout the month, and posted along with the importance of the respective product through the respective caption. The research is based on the data collected through user analytics of the posts.

Keywords: Social Media, HCI, Agriculture, Kolam, Grains, Millets, Pulses, Health, Art, Society, Social Awareness

I. Introduction

The present-day world is continuously witnessing humongous information, especially through the internet. With the various internet platforms opening gates for the continuous information flood, segregating such an abundance or identifying the right resource would take a considerable amount of time and energy. It takes categorical divisions of information and a considerable amount of time to fetch what is required.

Social media is one of the internet platforms that people gradually accepted as part of their daily lives [1] for information sharing. Although it delivers a lot, there are different individual networks to categorise and filter for the requirements. Instagram is one of the social networks where images are shared and its growth among youth is significant [4].

Human-Computer Interaction (HCI): As one of the fast-emerging fields in computer science, HCI is a discipline concerned with the design, evaluation, and implementation of interacting computing systems, which deals with understanding the psychological, organisational, and social factors of the entities involved [8].

Importance of agriculture: While we discuss technological growth that has been very tremendous in the last few decades, it is important not to forget the other side of the coin: the parameters such as respecting nature, or the traditional practices across different societies in various fields that build the backbone of the environment we exist. Farming is part of this process and consuming healthy products will be the feather on the cap [8] [11].

Kolam is an ephemeral art with a variation called Chikkukolam in Tamil, traditionally made using rice flour with the positive intention of feeding birds and insects [7]. Therefore, an effort has been taken to integrate these entities to study the effect of communicating the importance of agriculture through one of the popular social networks, Instagram through effective principles of HCI.

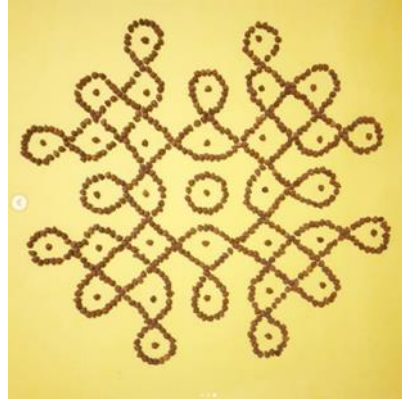


Figure 1: Sample Kolam posted using brown chickpea

The study was conducted using the Chikkukolam, as the tool, to create awareness of agriculture along with the health benefits of our indigenous grains, millets, pulses and spices during the Tamil month Markazhi (மார்கழி) pron. Maar-ga-zhi) leads to the harvest festival Pongal [6]. This occasion is taken for the reason that it is a traditional practice to draw Kolams during the Tamil month Markazhi [6]. The principles of HCI [8] such as consistency, usability, feedback, personalisation, emotional appeal and visual hierarchy are considered and the sequence of the pictures, captions, hashtags etc., which are part of the viewers' engagement were also considered. The impact of the reach and impressions of the posts are studied, through the effective relationship between the chosen platform Instagram, the pictures posted and the components of HCI [9].

Thus, for the objective, the above-said process could be focused on the younger generation, so that the message would spread relatively quicker. Among various platforms, the young crowd is very much with Instagram [4][5] because of the reason for reaching out through photographs and getting more attention. Therefore the pictures of the Kolams for the study were posted on Instagram [2] and responses were observed. The user analytics was broken down into various parameters and converted as a data set. This is for studying the variations in responses such as the reach of the posts with the Instagram user accounts, and the impressions the posts would create.

II Literature review

After an in-depth approach to the style, schema and detail for the photographs to be posted, the captions were planned and prepared by the author in the form of Tamil couplets so that the essence of the traditional art as a native form would have a stronger connect and create a better reach for the majority of the users.

With the acquired data formulated in the dataset categorised as the impressions and reach for each post, along with the post-interaction parameters, an overall statistical study and analysis have been carried out.

The entire dataset that carries information from 29 posts specific for the number of days of the Markazhi month[6] as well as the healthy grains including the millets and staple varieties[10], has been divided into columns with individual information such as the reach to the followers and non-followers thus the overall reach; impression created through profile, hashtags and any other parameters including location thus the total impressions; post-interaction detail with parameters such as likes, comments, saves, shares; and Profile activity parameters such as profile visits, follows and others [11].

Out of these above-said detail, the fields: impressions through location, follows through individual posts, 'others' and 'follows' of the profile activity and the post shares are eliminated as they did not get significant values or changes, hence have been removed through pre-processing. The remaining fields are included for further process of analytical representation through the following categories: reach, impressions, and profile activity and post interactions from the separate daily individual posts [11].

III Stages of Research

The research process has been treated as follows:

Sequencing the post information: The information regarding each kolam post has been taken according to the categories of grains, millets, pulses, and spices throughout the series.

Extracting data through categories: The Instagram data analytic parameter categories have been extracted, from each post,

Application of HCI for suitable material, composition and caption: Choosing the background and the respective grain/pulse/millet based on the principles of HCI to get an effective set of images for each post.

Sequencing the suitable images: With the focus on the importance of the millets and kolam art, the sequencing of pictures for each post has been prepared to start with the millet close-up, then the detail of the kolam followed by the whole of the kolam the subject of the photographs.

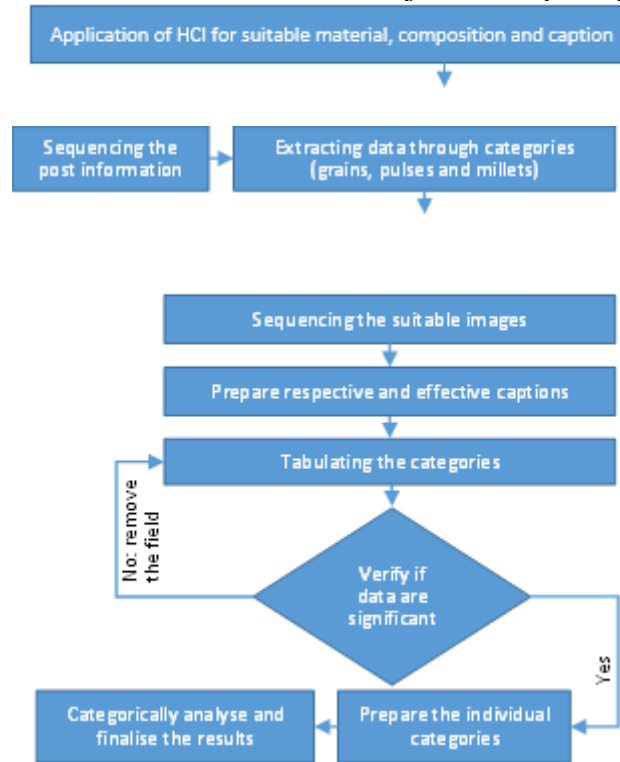


Figure 2: Flow of Research

Prepare respective and effective captions: To engage the audience through the awareness of the benefits of the millet chosen, it was planned to spread through Tamil couplets to deliver and explain. Accordingly, the contents were created.

Tabulating the categories: Organising the individual field of data in a format for process convenience.

Verifying the data: To check if each field extracted onto a table has a worthy amount of information to process. If not, continue removing until getting a significant amount of data.

Prepare individual categories: As per the overall table order, create individual categories of tables, from the dataset for further analysis.

Analyse as per the categories: Based on the parameters impressions, reach, profile-activity and post-interactions study and analyse the impact the posts received.

IV Method of the research

The Kolams made of different agrarian sources have been sequenced as per the day order in the Tamil month of Markazhi: with the staple grains and pulses [12] which are regularly consumed to start with, followed by the millets and spices.

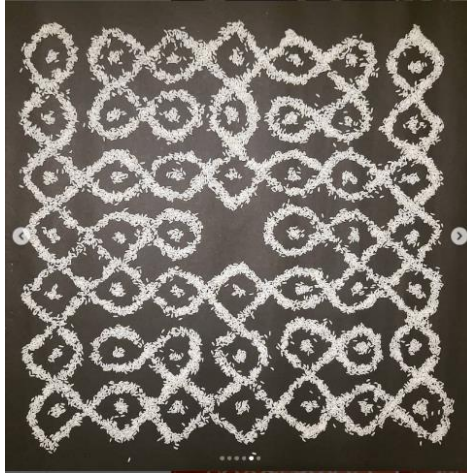


Figure 3: An Instagram Kolam post using rice



Figure 4: An Instagram Kolam post using pigeon pea (Toor Dal)

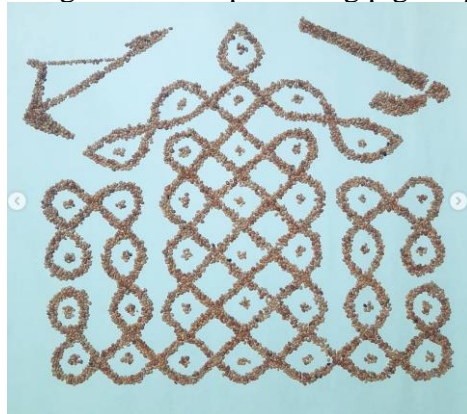


Figure 5: An Instagram Kolam post using Horse gram

The above figures 3, 4 and 5 have samples of Kolam drawings posted on Instagram for the study. The entire list of farm products used in the Kolams is as follows: Rice, Pigeon pea, Black gram, Indian Yellow split pea, Indian green gram, Wheat, Split Bengal gram, Black chickpea, Pearl Millet, Maize, Horse gram, Kodo Millet, Foxtail Millet, Finger Millet, Barnyard Millet, Little Millet, Black Rice, White chickpea, Dry pea, Brown Cowpea, White Cowpea, Dry hyacinth bean, Sorghum, Black sesame, White sesame, Mustard, Cumin (Brown & Black), Fenugreek, and Groundnut, with the idea to start with above the soil produce, cover the most used [12] and conclude with below the soil produce. The overall plan was to incorporate the essence of the principles of Human-Computer Interaction by themselves as well as the perspectives on how Instagram makes use of the users' approach for more viewership [4].

The preparedness of the study included the consideration of the fundamental interface parameters that Instagram uses from the interaction perspective, i.e. Interface design, User feedback, User engagement, and Personalisation [8] along with the intense connecting factors namely visibility, categorization, and recommendations were also analysed.

Based on this the photographs of each kolam post were taken in such a way that the focus starts with the millet, then the blend of the art and the millet followed by the complete kolam, in the sequence as a set of pictures to swipe through per post.

To enhance the post with the awareness detail where the author has prepared Tamil couplets to add more of a personal connection [6] as well as to balance the interaction principle [8].

Let us discuss the essential interaction applications through a sample post:

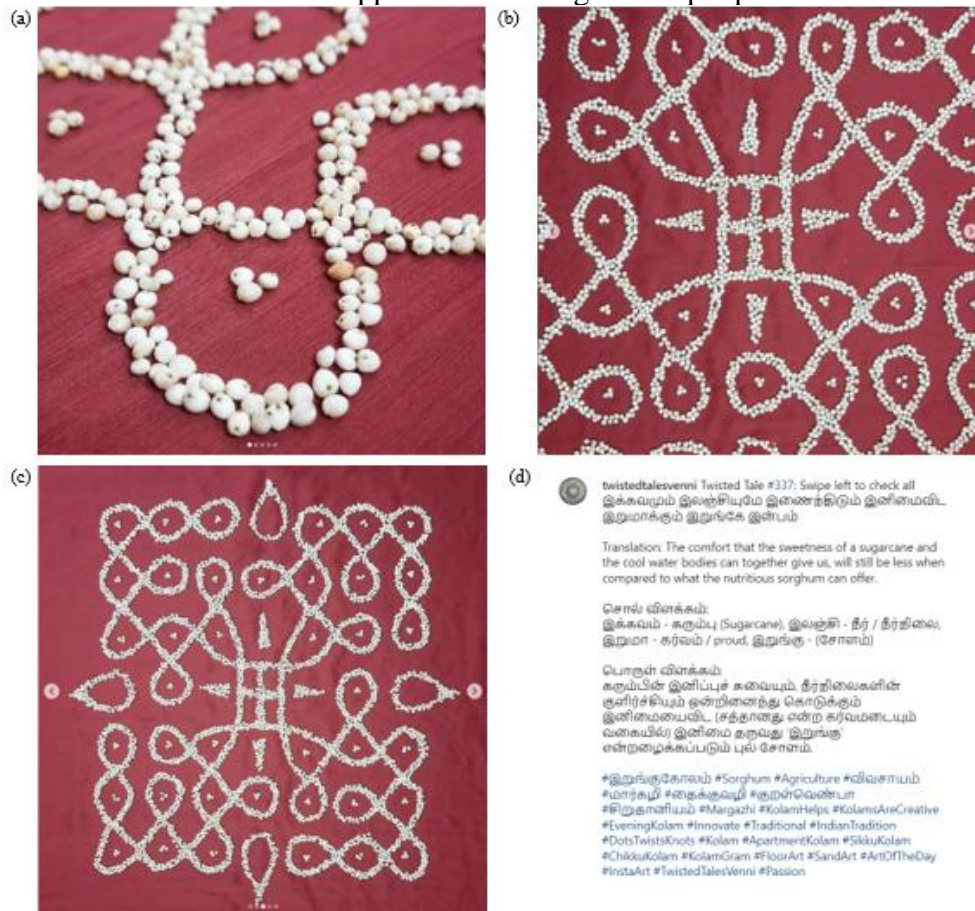


Figure 6: A sample sequence of images from one of the posts to represent the importance of various parameters. (a) Focus on the millet (sorghum is used in this example); (b) Focus on the detail of the art; (c) Emphasis on the completed Kolam; (d) Prepared caption with suitable hashtags spreading awareness through Tamil couplet with the required information and suitable English translation and explanation

The sample post and the entries in the sequence are taken from the real-time live Instagram handle maintained by the author [19] and represented in a series as Figure 6.

In this figure series, Figure 6-a focuses only on the millet and is given primary importance. The second in the sequence from the sample post is a 50% closely taken photograph in Figure 6-b, which shows the part of the detail from the complete kolam depicting how the millet is used for creating the kolam. The last, Figure 6-c, from the sequence, shows the whole of the Kolam and the use of the chosen millet as a material to prepare the design. To continue with the purpose and enrich the post for more viewers, the Tamil couplet composed by the author is added as the caption with information. Further to reach more audience and make viewers understand quickly, both the Tamil explanation and the English translation of the couplet, were added as part of the caption which is represented in Figure 6-d. It was also taken into consideration that the elements including the colour, balance and emphasis of the

composition for the photograph were chosen in such a way that the subject is in contrast with the background for clear visibility [21].

The series of images shown in Figure 7 has sample photographs used to signify the effect of the selected design elements and principles (colour, balance and emphasis) so that the appeal can be generated on the material and art: the Millets and Kolam.

While the above discussion substantiates the effective use of the fundamental principles of HCI, the responses and feedback by the viewers complete the importance of principles involving user engagement. We can check the interaction that occurred through the same post on sorghum as discussed earlier



Figure 7: Three sample posts to represent the use of contrasting colours so that a quick reach would be created. (a) A pale yellow Fox Tail Millet on a deep green; (b) Dull white Kodo Millet on purple; (c) Off-white Little Millet on the deep blue



Figure 8: Sample real-time feedback and views through the comments section for the post with the millet – Sorghum (Private accounts are masked)

From Figure 8, we can understand the purpose of spreading the information as an awareness act has had a significant impact through user engagement. Therefore the parameters: of user feedback and personalisation for a post on Instagram, if created in a dedicated space, will make the users have consistency in viewing, and visiting the same Instagram handle as well as similar posts.

In addition to the above parameters, collaboration is also a notable one. A user can extend the reach through fellow Instagram users. Figure 9 is a sample direct message from another user [24] [25].

Overall, the relationship between the major components: Social Media platform Instagram, the photographs used for the posts and HCI has been studied in detail to understand the effect of the notable entities [8] Visual Centric Design, Hashtag System, Mobile friendly approach considered for the posts. This helped in further understanding how well the reach amongst the viewers was

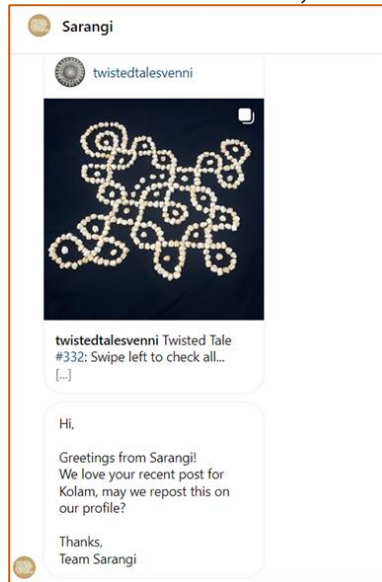


Figure 9: Sample real-time feedback and views through the comments section for the post with the millet - Sorghum

V. Details of Datasets

Through the method explained in the previous section, millet-wise analysis has been done for every post made.

Further to this, the study was carried out from real-time data through all the Kolam Instagram posts to understand the impact those informative art posts would have created.

Thus the entire list of Kolam design post information has been tabulated as Datasets with the following fields.

Table 1: List of fields used for the data sets

Name of the Grain/Pulse/ Millet/Spice	Reach through Followers	Reach through Non- followers	Total Reach
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Impression from Profile	Impression from Hashtags	Impression from Others	Impression from Location	Total Impressions
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Profile Activity through			
Profile visits	Follows	Others	Total

Post Interaction				
Likes	Comments	Saves	Shares	Total

From the above sixteen initially, classified fields, verification has been done to understand the significance of the values. Accordingly, the fields: Impression from location, Profile-activity through Follows, Profile activity through others and Post Interaction-Shares were removed as they did not generate notable non-NULL values. Therefore, the rest of the data are tabulated into four categories for four different analysis processes- reach, impression, \profile-activity and post-interactions.

Through the prepared dataset and further analysis, the parameters Impression and Reach would respectively yield the number of times the post would be seen and the unique number of users who saw or notice the post being shared [14].

In addition to this, the other impactful field classification: Profile-activity through which we can study the breakdown of users’ reactions after visiting each post whereas through Post-interactions we can study the number of users who responded to the posts in the form of likes, comments, and shares. Since

the Instagram platform provides an option to let the posts public, we can study how well the users respond to individual posts through the above classifications: no matter whether they follow or not, the author’s Instagram account where the study has been carried out [18][19].

VI. Results and Discussion

According to the above-said groundwork, the dataset has been broken down into four different sets of tables with the respective data from each of the agrarian produce.

Table 2: Data compiled for the parameter reach

Name of the Grain/ Pulse Millet/ Spice	Reach through followers	Reach through Non-followers
Rice	70	202
Pigeon pea	73	180
Black gram	71	171
Indian Yellow split pea	67	180
Indian green gram	67	178
Wheat	79	197
Split Bengal gram	87	199
Black chickpea	82	226
Pearl Millet	92	328
Maize	95	233
Horse gram	95	197
Kodo Millet	105	248
Foxtail Millet	98	225
Finger Millet	94	221
Barnyard Millet	87	229
Little Millet	92	280
Black Rice	107	352
White chickpea	120	366
Dry pea	110	316
Brown Cowpea	114	306
White Cowpea	116	328
Dry hyacinth bean	136	397
Sorghum	127	354
Black sesame	127	357
White sesame	141	386
Mustard	128	337
Cumin (Brown & Black)	125	375
Fenugreek	158	480
Groundnut	200	556

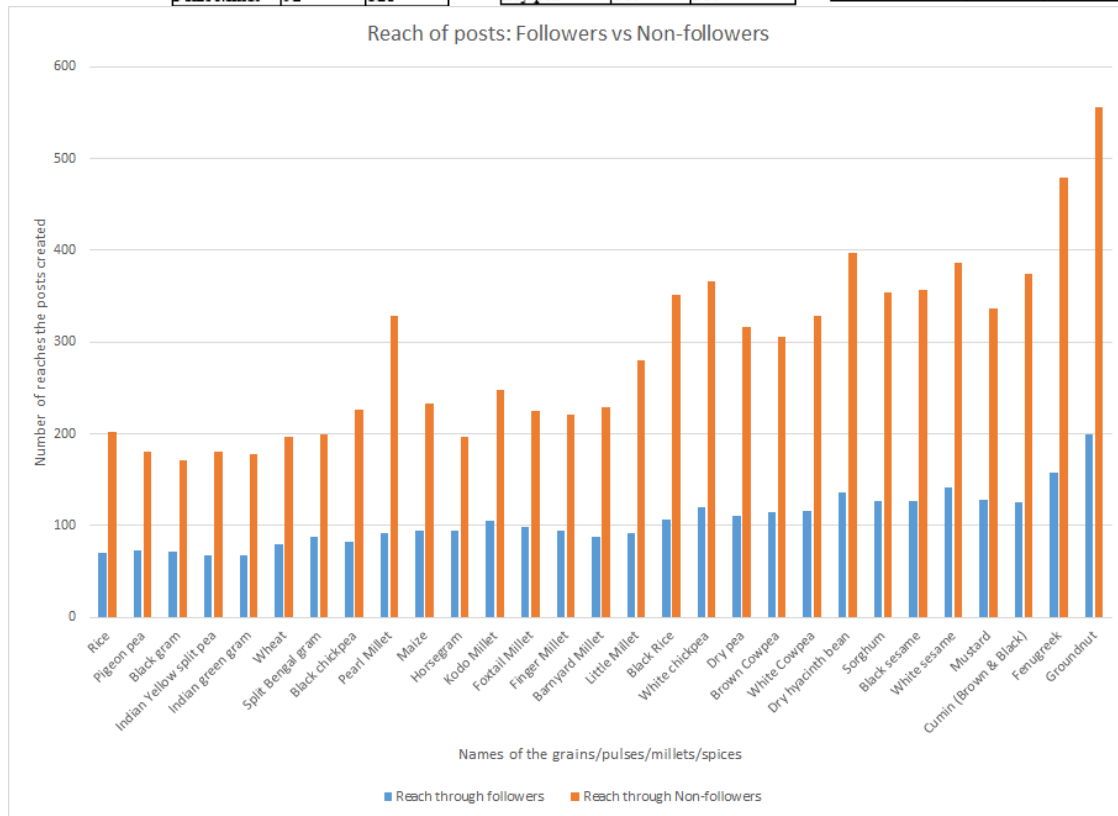


Figure 10: The variations in the parameter Reach (ref Table 2)

Let us break down the process through the chosen parameters along with the respective charts. Through Figure 10, it could be observed that the Kolam posts have had a relatively bigger impact on the non-followers than the followers in terms of the parameter Reach.

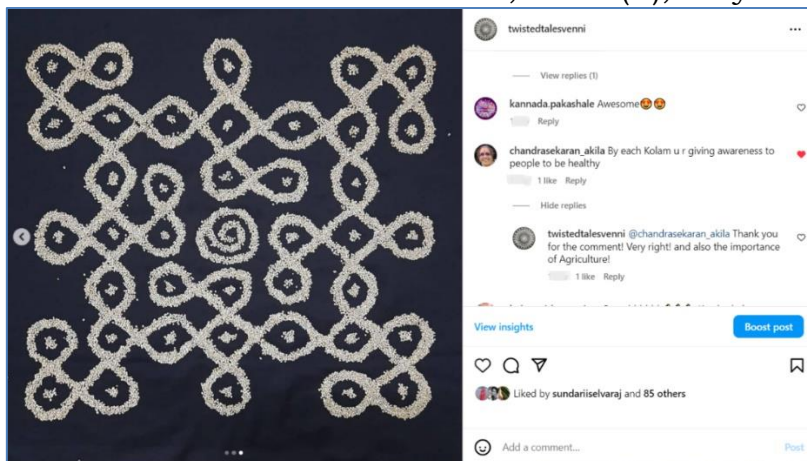


Figure 11: A sample screenshot of positive feedback on awareness for the post 'Pearl Millet', reach value: 328 (Private accounts are masked)

This leads to a point of view, that being an effective tool on an open platform, the Kolam art has reached a considerable amount of non-followers for the account as well and collectively resulting in a gradual and notable increase in reach towards the end of the series of Kolam awareness posts.

Table 3: Data compiled for the parameter Impression

Name of the Grain/Pulse/Millet/Spice	Impression from profile	Impression from Hashtags	Impression from Others
Rice	249	28	12
Pigeon pea	241	24	6
Black gram	88	28	2
Indian Yellow split pea	254	4	3
Indian green gram	251	4	2
Wheat	281	4	3
Split Bengal gram	285	9	6
Black chickpea	305	9	7
Pearl Millet	416	3	5
Maize	321	6	17
Horse gram	301	3	4
Kodo Millet	327	22	33
Foxtail Millet	324	4	4
Finger Millet	333	0	4
Barnyard Millet	336	3	3

Name of the Grain/Pulse/Millet/Spice	Impression from profile	Impression from Hashtags	Impression from Others
Little Millet	388	12	3
Black Rice	462	22	8
White chickpea	480	31	5
Dry pea	447	3	2
Brown Cowpea	430	15	1
White Cowpea	461	4	2
Dry hyacinth bean	533	29	16
Sorghum	522	1	2
Black sesame	504	1	5
White sesame	544	2	13
Mustard	496	1	6
Cumin (Brown & Black)	533	2	7
Fenugreek	664	11	12
Groundnut	773	2	27

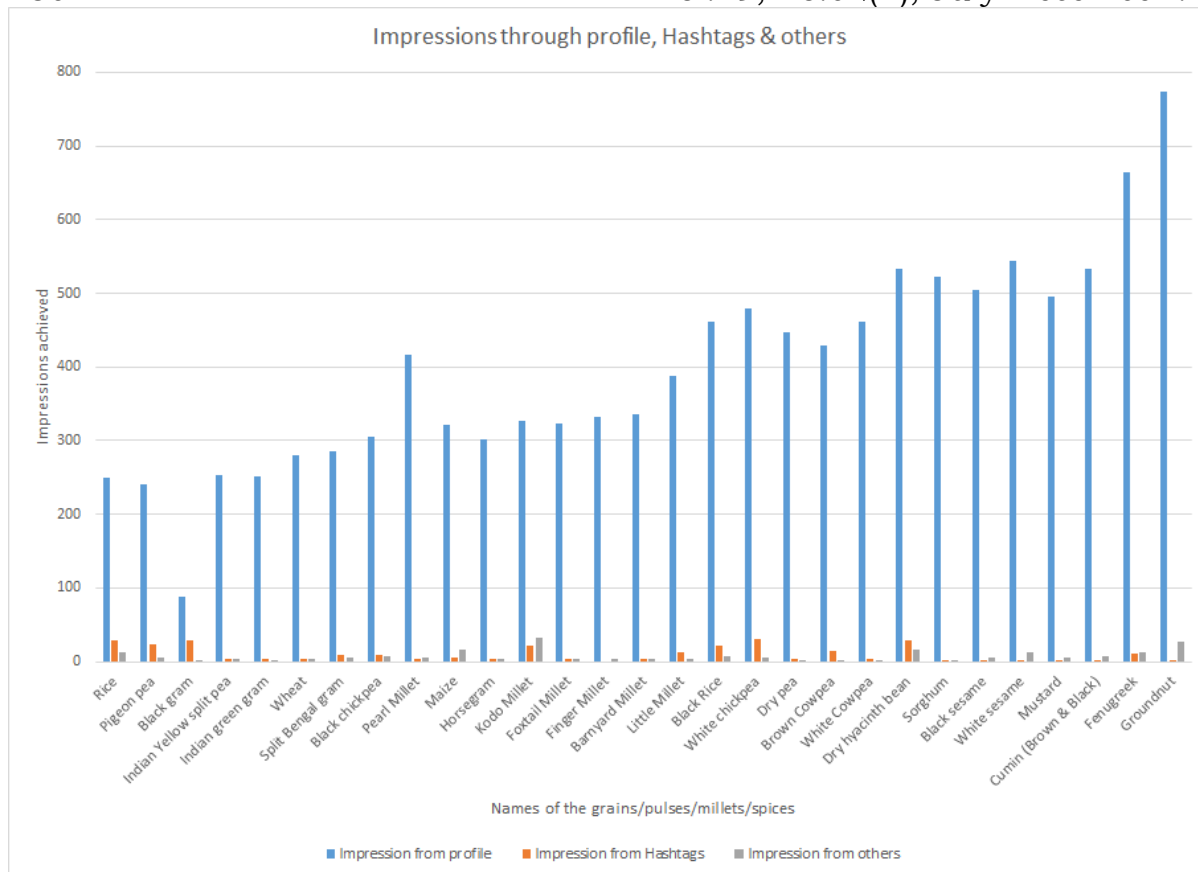


Figure 12: The variations in the parameter Impression (ref Table 3)

While analysing Figure 12 for Impressions, we can observe clearly that there has been a positive increase in impressions towards the end of the series with the Kolam post on ‘Groundnut’ and the impact of impressions is more through the profile. Also to note that once again a millet post (the Kolam pearl millet) has received a steep hike (value 416) and then continued with the gradual positive increase.

Table 4: Data compiled for the parameter Profile-activity

Name of the Grain/Pulse/Millet/Spice	Profile activity through Profile visits
Rice	5
Pigeon pea	1
Black gram	3
Indian Yellow split pea	0
Indian green gram	0
Wheat	0
Split Bengal gram	0
Black chickpea	1
Pearl Millet	4

Name of the Grain/Pulse/Millet/Spice	Profile activity through Profile visits
Maize	0
Horse gram	0
Kodo Millet	3
Foxtail Millet	1
Finger Millet	0
Barnyard Millet	0
Little Millet	0
Black Rice	1
White chickpea	1
Dry pea	1

Name of the Grain/Pulse/Millet/Spice	Profile activity through Profile visits
Brown Cowpea	0
White Cowpea	0
Dry hyacinth bean	1
Sorghum	2
Black sesame	1
White sesame	1
Mustard	1
Cumin (Brown & Black)	0
Fenugreek	4
Groundnut	1

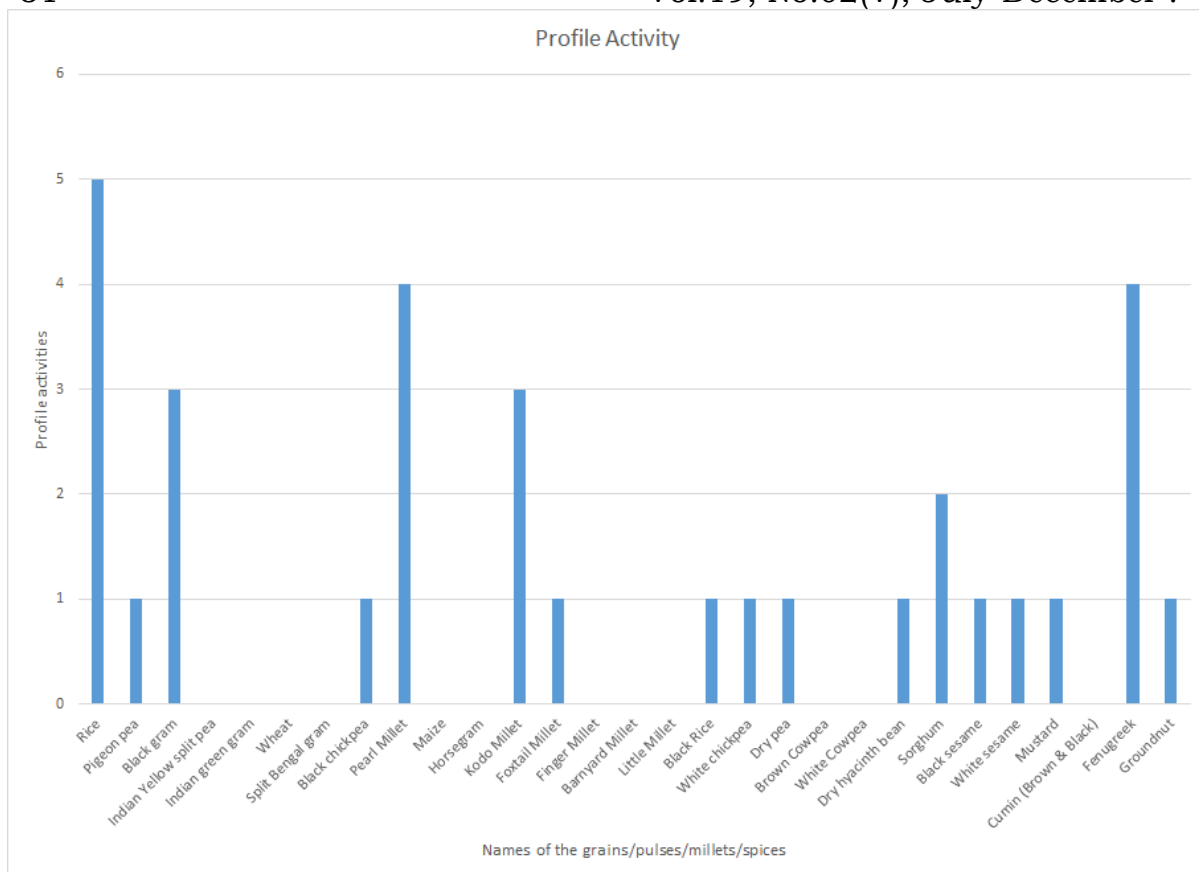


Figure 13: The variations in the parameter Profile activity (ref Table 4)

Although a relatively less value, the visits to the profile by both the followers and non-followers still have had a role to play throughout which is neither increased nor decreased rather is consistent. Reference Figure 13, where yet again a millet Kolam post helped to sustain the Profile activity.

Table 5: Data extracted for the parameter Post-interactions

Name of the Grain/Pulse/Millet/Spice	Post Interaction -Likes	Post Interaction -Comments	Post Interaction -Saves
Rice	142	45	8
Pigeon pea	128	41	11
Black gram	88	28	2
Indian Yellow split pea	85	26	5
Indian green gram	73	21	4
Wheat	85	40	5
Split Bengal gram	84	44	6
Black chickpea	100	50	11
Pearl Millet	86	36	5
Maize	89	53	6
Horse gram	76	34	7
Kodo Millet	115	58	14
Foxtail Millet	79	28	5
Finger Millet	71	37	7
Barnyard Millet	70	35	7
Little Millet	76	38	7
Black Rice	68	33	6
White chickpea	90	40	15
Dry pea	88	38	5
Brown Cowpea	65	28	7
White Cowpea	81	35	9
Dry hyacinth bean	103	54	28
Sorghum	79	27	4
Black sesame	71	41	7
White sesame	84	41	9
Mustard	75	56	8
Cumin (Brown & Black)	80	43	16
Fenugreek	85	40	11
Groundnut	101	43	18

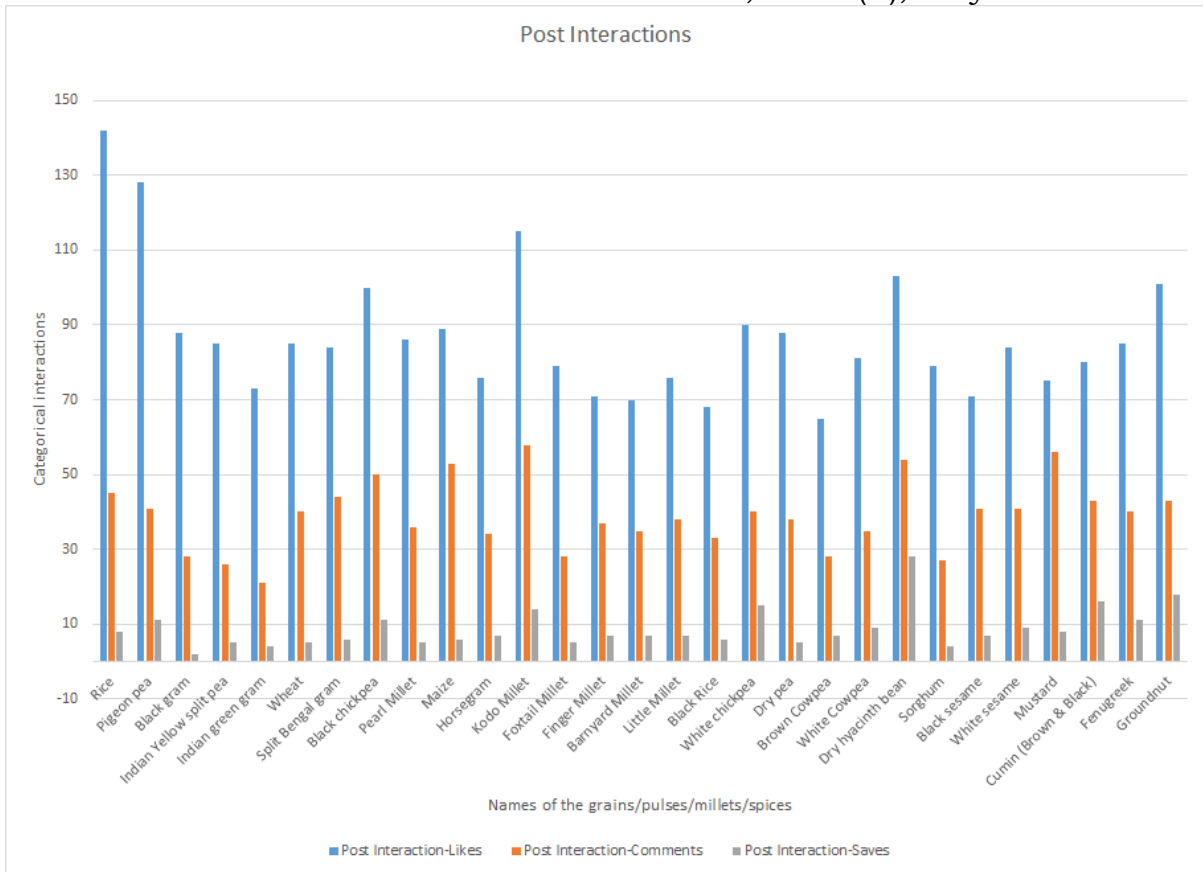


Figure 14: The variations in the parameter Post-interactions (ref Table 5)

From Figure 14, an interesting finding is that being the first post in the series and a material different from the conventional and usual material for traditional Kolam art, the staple rice has received notable and a good number of Post-interactions (Likes 142, Comments 45, and Saves 8). Similarly, for Kodo millet (Likes 115, Comments 58, and Saves 14) and Dry Hyacinth Bean (Likes 103, Comments 54, and Saves 28) the results were on the positive end.

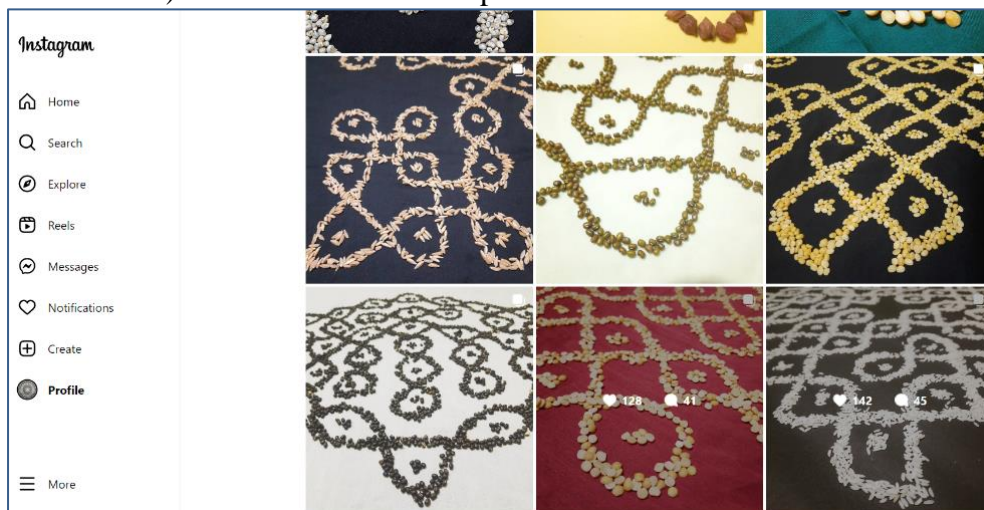


Figure 15: A sample screenshot to show the impact a grain kolam created through Post-interactions

This consistent yet small variation among different materials chosen for the post-interaction proves to have reached many users irrespective of being followers or not. To add to the likes are the saves, which, being an Instagram post and an artwork, would add convenience for the users for future reference.

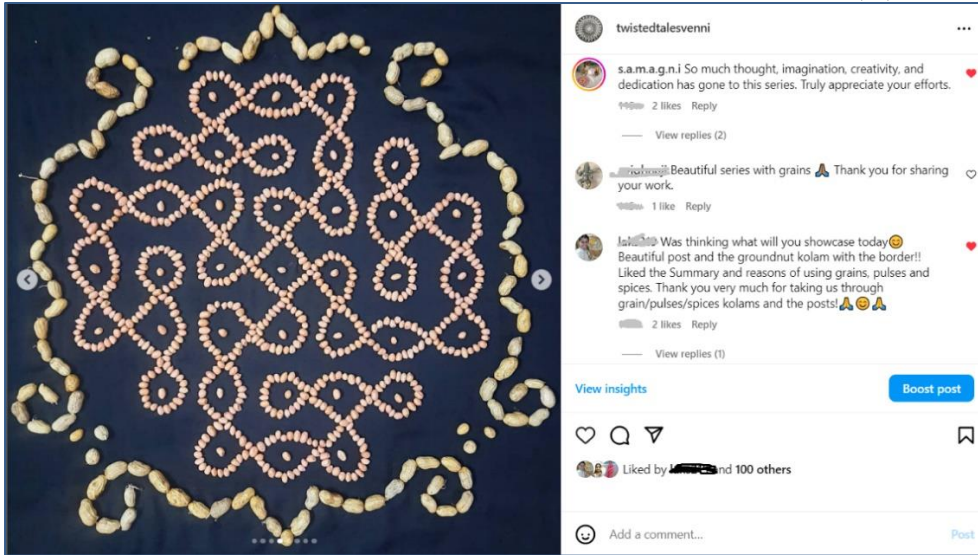


Figure 16: A sample screenshot of cumulative positive feedback on the awareness series. (Private accounts are masked)

Through the series of posts with various grains, pulses and millets, there was a gradual increase in the reach and impression. Being the final post, the Kolam which was made using the groundnut, shown in Figure 16, has evolved to be the finale and thus has attracted more positive feedback from the peer users.

VI. Conclusion

The concept was initiated to connect the agrarian community with the traditional art form. Therefore the author has chosen the idea of using a new material which included agrarian produces, instead of conventional and traditional Kolam material (traditional rice powder or limestone powder)[16][17]. The idea then was carefully approached from the HCI perspective using the parameters such as consistency, usability, feedback, personalisation, emotional appeal and visual hierarchy, and executed along with the preparation of photographs, caption and the final presentation into posts, which has indeed resulted in a positive transformation. With the respective data that we can observe through individual studies on the parameters, we can find out that post-interactions also became consistent. On the other hand, a gradual increase in reach and impression can be studied as the result of the chosen unique combination of the materials and art form to awareness of the benefits of native agricultural products, presented as planned.

In the recent past, people have started becoming more health conscious [12], and there has been a consistent need for the right information. It would be a great move if the information is shared with them using a platform that they find convenient and interesting to use. Therefore, the platform Instagram, where the young generation spends time, has been chosen for the study. From the positive feedback [22] [23] shown both in Figures 11 and 16, we can understand the notable impact created through the efforts. Bringing in the traditional Kolam art along with, and binding the prime purpose, which is for the awareness of the importance of agriculture and the health benefits of the indigenous grains, pulses, millets, and spices has indeed given positive results as above. To emphasise the results to the readers, the research has been effectively embellished and presented here to insist on the importance of adopting a healthy lifestyle by the youth and society.

VII. Future method and scope

The exploratory observation study that has been represented thus far has analysed the statistical information through how far each post has reached. However, the opinions of individuals who contributed through follows, shares, or comments could also be assessed separately. To comprehend the true thoughts and comments, this method could further be utilised using suitable algorithms. It

might also be employed to determine whether the analysis of the viewpoints stated by followers and non-followers through comments is headed in the right direction. This could also engage stages such as analysing the comments for engagement pod(s) [15] followed by distinguishing the comments through sentiment analysis [20] so that it will help classify the messages for a more diversified and focused perspective. In addition to the above the study can be extended to other similar social media platforms to understand more varied age groups as well as more pockets of viewers whose social media preferences and requirements would be more than only still images.

VIII. Replication of results

The research process was carried out using a total of 29 different grains, millets and pulses to understand the positive impact of the blend of three different streams: Human-Computer Interaction, the benefits of various agricultural products and the traditional art form called Kolam.

The research did not use computer-generated code or any similar background procedures. It used the images, comments, feedback and insight data from the Instagram posts and the profile. Given the purpose of this research, replicating the results will benefit all subsequent research in this discipline, which may be categorised as below:

The approach to HCI: While keeping in mind the principles and components of the Human-Computer Interface [9], the colour schemes used in different posts with Kolam artworks, the consistency in terms of the respective captions and hashtags can be used further to expand the perspectives towards the integration of HCI with other disciplines.

The designs made in Kolam: All the designs used for the Kolam artworks have the 7 dots as the basis for the construction, signifying the 7 popular millets. Since the artworks posted on Instagram [19] were made to spread awareness of the health benefits of the agrarian products that were used as the materials, and the same were studied for the research, the replication will benefit more widely.

The health facts: The information about the healthy facts used as part of the Instagram posts [19] is also a study parameter to understand the changes in the profile visits, followers and other parameters that lead to the results presented. Therefore, this may also be referred to and used for other studies.

Images, Tables and Graphs: Since the Kolam art images are from the corresponding author's public profile, they can be used for other research. In addition, the datasets used as tables, and the respective graphs genuinely show the transformation in increased numbers, which can also be quoted.

The methodology and results: The research used the method of studying the changes in the viewers' response through the insight parameters of the Instagram profile such as reach, impression, profile activity and post-interaction. All these parameters have shown, although not mammoth-sized, a significant growth through these 29 posts. As mentioned earlier since the research is expected to raise awareness among youth, the method and the results of this research, when reproduced, will benefit a larger audience.

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