**USING UNSUPERVISED MACHINE LEARNING TECHNIQUES TO UNDERSTAND THE USER ENGAGEMENT AND PERFORMANCE OF PUBLIC HEALTH CARE POSTS ON SOCIAL MEDIA.**

***Abstract:*** *In recent years, social media has offered new opportunities for interaction and distribution of public health information within and across organizations. In this model, I have analyzed data from Facebook walls of various public health organizations using unsupervised machine learning techniques to understand the characteristics of user engagement and post performance. My analysis indicates an increasing trend of user engagement on public health posts during recent years. Based on the clustering results, my analysis shows that Photo and Link type posts are most favorable for high and medium user engagement respectively.*

***Keywords:*** *Data Analysis, Unsupervised Machine Learning, K-means Clustering, Statistics, Social Media Analysis, Business Intelligence*

1. **Introduction**

Recent research has shown a growth in the number of studies and articles about social media and health care. Growing number of healthcare organisations and individuals are realising the beneﬁts of using social media to communicate health information. Their main purposes include to train medical personnel, provide information to patients and allow rapid communication in times of crisis, through social media sites [1]. Social media provides new opportunities for interaction and distribution of information within and across organisations, which results in new kinds of socially mediated organisations [2]. As a result, knowledge on how organisations spread and how users interact with health information through social media and mobile computing will become increasingly important in the near future. This emphasis on understanding the socio-technical interactional contexts of users and health care organisations is already evident in the new public health paradigm in general and the ﬁeld of health informatics in particular. Public health has traditionally been understood through its unit of analysis i.e. the public. Straton, Hansen and Vatrapu [1] have investigated the distribution and user engagement with health information on the Facebook walls of Public Healthcare Services. Social and health scientists have shown considerable interest in investigating the importance of the connection between our social lives and health situations. Christakis and Fowler [6] have studied how social networks can inﬂuence our health situation as a consequence of how everything we think, feel, do, or say can spread far beyond the people we know. Facebook is amongst the leading social media network channels globally and has approximately 1.5 billion active users on monthly basis. Even though users tend to be active on more than one social media network channels, most people consider Facebook their social media home. The widespread societal and individual adoption of Facebook has led to a new kind of relationship between people and information [7]. In this research work, my research explores the following question and proposition: What are the key characteristics of post performance of the Socially Shared Information on the Facebook walls of Public Health organisations?

1. **Survey Of Mathematical Models**
2. **PROPOSED Mathematical Model**

Let S be the given problem statement and its solution perspective:

S = { s , e , X , Y , Fn , Ffr , Su , Fa , DD , NDD , ϕ}

Where,

s = Start State

= Set of pages of Public Health Organisations

e = End State

= Analysis of social media data performed

X = Input set

= { P1 , P2 , P3 ,…….., Pnp }

Where,

P = Facebook page

= { Lk , Cm , Sh }

Where,

Lk = No. of total post likes

= { Lki | Lki ∈ [0-9] }

Cm = No. of total post comments

= { Cmi | Cmi ∈ [0-9] }

Sh = No. of total post likes

= { Shi | Shi ∈ [0-9] }

np = No. of pages

= { np | np ∈ [0-9] }

Y = Output set

= { C1 , C2 , C3 ,……., Cnc }

Where,

C = Cluster of pages

= { Ci | Ci ∈ Y }

nc = No. of clusters

= { nc | nc ∈ [0-9] }

Fn = Set of Functions

= { F1 , F2 }

Where,

F1: X  Y

= Function to perform clustering on input set

F2: Y  Y

**=** Function to perform analysis on results

Ffr = Set of Friend Functions

= { Fip , Fop }

Where,

Fip: Function to accept Input

Fop: Function to display Output

Su = Success Case

= { Clusters formed successfully, proper results derived from analysis }

Fa = Failure Case

= { Output clusters are undefined, analysis gives ambiguous results }

DD = Deterministic Data

= { Number of clusters }

NDD = Non Deterministic Data

= { Number of }

ϕ = Constraints

= { nc <= np }

1. **DESIGN AND ANALYSIS OF SYSTEM**
2. **DISCUSSION ON IMPLEMENTATION RESULTS**
3. **Conclusion And Future Enhancement**
4. **References**

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