PSYCHO-NEURAL DATA DECIPHERING AND TELEMONITORING ECOSYSTEM

Mr. P. Logaiyan[1], Mr. K. Sudarson[2]
[1]Associate Professor, Department of Computer Applications, Sri Manakula Vinayagar Engineering College (Autonomous), Puducherry 605107, India,
logaiyan.mca@smvec.ac.in
[2]Post Graduate student, Department of Computer Applications, Sri Manakula Vinayagar Engineering College (Autonomous), Puducherry 605107, India sudarson835@gmail.com

ABSTRACT

Mental health in the digital age is significantly influenced by factors such as mobile phone radiation and social media usage. Traditional mental health evaluation methods often fail to consider the combined impact of these external digital exposures. This project introduces the ***Psycho-Neural Data Deciphering and Telemonitoring Ecosystem***, a comprehensive system designed to analyse and assess mental health across age groups by integrating psycho-neural data, social media activity, mobile radiation exposure, and mental health screenings. The system employs advanced statistical models to process this data, identifying correlations between digital behavior and psychological outcomes. It features a module-based design that calculates personalized mental health scores and classifies them by age group, helping to pinpoint vulnerable demographics and behavioral risk factors. Through real-time data collection, structured analysis, and intelligent reporting, this ecosystem supports proactive mental health management and promotes healthier digital habits.

Keywords:
Mental Health, Social Media, Mobile Radiation, Psycho-Neural Analysis, Telemonitoring, Digital Behavior, Statistical Correlation, Mental Health Scoring.

INTRODUCTION

The ***Mobile Mental Health application*** is developed with the primary goal of bridging the gap between mental health professionals and individuals in need of psychological support. In an age where mental health concerns are increasingly prevalent yet often neglected due to stigma, lack of access, or limited resources, this project provides a digital platform that connects users with necessary mental health services. By bringing professional assistance within reach via mobile technology, the system helps overcome barriers such as geographical limitations, time constraints, and social hesitation. This is particularly useful for individuals who may be reluctant to seek traditional in-person therapy, providing them with a confidential and convenient alternative.

The project is centered around key features like ***chat support, mood tracking, and self-help tools***, all integrated within the mobile platform. These features are designed to cater to a wide range of mental health needs from immediate emotional support via chat to long-term well-being monitoring through mood tracking. Self-help tools further empower users to engage in mental wellness activities independently, promoting personal growth and resilience. Through these functionalities, the application not only supports users in crisis but also contributes to mental health awareness and education, ultimately striving to reduce the stigma associated with seeking psychological help.

RELATED WORK

Existing mental health systems focus on individual aspects like psychological assessments, behavioral surveys, and physical health metrics but often overlook digital behaviors and environmental influences, such as social media usage and mobile radiation exposure, which are becoming more significant today. Many systems rely on offline surveys or manual data collection, which are time-consuming and lack real-time insights. They also target specific age groups, missing a comprehensive view of how technology and environmental factors affect mental health across all demographics.

These systems often function in isolation, focusing solely on personal assessments without considering broader influences like digital engagement or radiation exposure. The collected data is fragmented, lacking an integrated approach to analyze social media activity, mobile radiation, and mental health indicators together.

As a result, these systems fail to capture the full range of factors impacting mental health. Without a holistic framework that integrates both individual and external influences, it becomes challenging to understand the true impact of modern lifestyle habits on overall mental well-being.

RESEARCH METHODOLOGY

This project analyzes and monitors mental health across different age groups by integrating data from social media usage, mobile radiation levels, and mental health screenings. It collects data on individuals' social media activity across platforms, categorizing it by age to identify usage patterns and assess potential impacts on mental well-being, including anxiety and depression.

The system also evaluates mobile radiation exposure from various devices, tracking and analyzing levels to explore correlations with mental health indicators. Advanced statistical models and algorithms are used to identify links between social media use, radiation exposure, and mental health outcomes.

In addition, mental health screening data is incorporated, focusing on emotional well-being, stress, cognitive function, and overall mental status. Based on this analysis, personalized mental health scores are generated for individuals by age group. These scores indicate how digital behavior affects mental health and help identify high-risk individuals.

Finally, the system compiles a detailed report comparing mental health across age demographics, offering insights for targeted interventions. This methodology helps in understanding the influence of social media and mobile radiation on mental health, supporting healthcare professionals, policymakers, and individuals in adopting healthier digital habits and improving mental well-being.

ALGORITHM DETAILS

I. Encryption and Decryption (AES - Advanced Encryption Standard)

Encryption Phase

Steps:

1. Encrypt sensitive data using AES-256.
2. Generate a random AES key per session.
3. Securely store the key with session or access control; don't expose it.

Decryption Phase

Steps:

1. Employee requests access via secure system.
2. System verifies identity and role.
3. If authorized, system retrieves the AES key.
4. System decrypts data; key remains hidden from user.

II. Symmetric Encryption – Logical Key Access and Verification Process

Steps:

1. Generate a unique AES key during encryption.
2. Store the key securely with access permissions.
3. Authenticate and authorize user on access request.
4. If approved, system uses stored key to decrypt data.
5. User only sees decrypted output, not the key.
6. If verification fails, deny access and log the attempt.
7. Key remains protected at all times.

MODULE DETAILS

MODULE 1: ADMIN

1. Registers users, manages employee status, reviews applications, and sends login/rejection emails.
2. Approves decryption keys, final reports, and tracks historical data.
3. Ensures secure logout for confidentiality.

MODULE 2: RADIATION LEVELS

1. Employees register, get admin approval via email, and request decryption keys.
2. Upon approval, they upload mobile radiation data and generate reports.
3. Ends with secure logout.

MODULE 3: MENTAL ANALYZER

1. Employees register, receive admin approval, and request decryption keys.
2. Upload mental health data by age/category, perform calculations, and encrypt/decrypt results.
3. Review outcomes and log out securely.

MODULE 4: MENTAL LEVEL

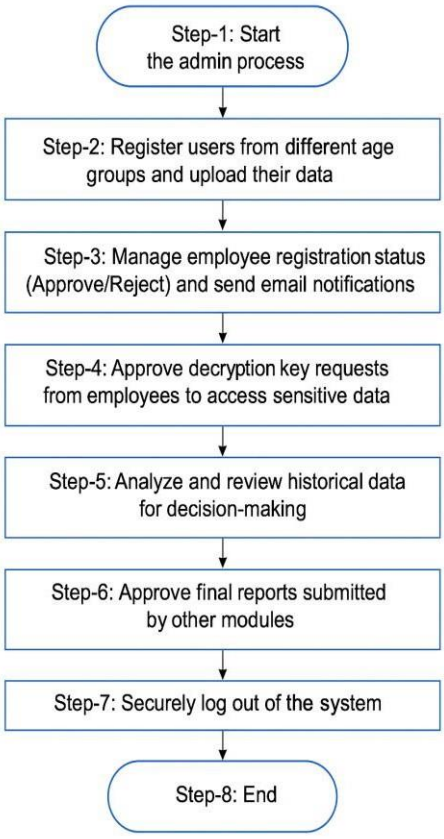
1. Registration and key request follow admin approval via email.
2. Employees upload mental status data by age/category, calculate insights, and encrypt/decrypt results.
3. Final report is reviewed before secure logout.

MODULE 5: TESTING

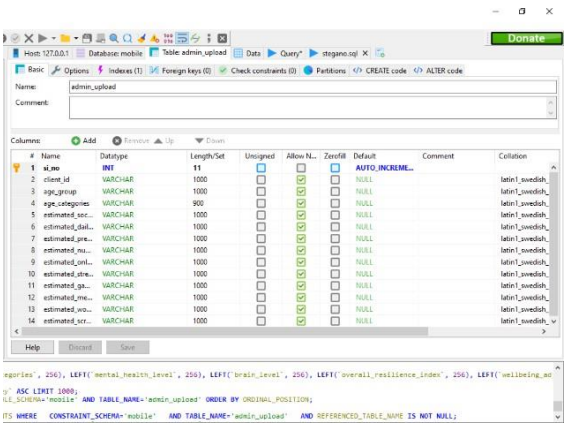
1. Employees register, get approved, and receive decryption keys.
2. Upload mental health test data, perform calculations, and verify results via encryption/decryption.
3. Final report is reviewed; session ends with logout.

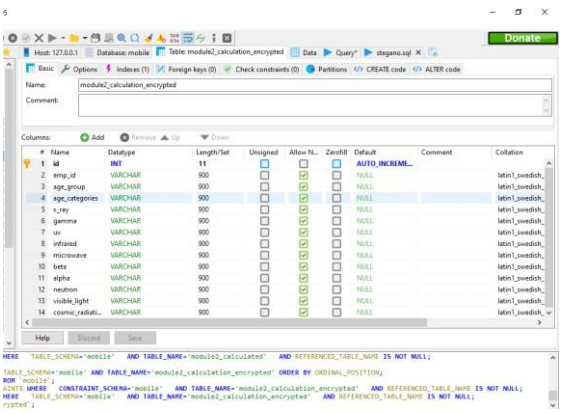
FLOWCHART

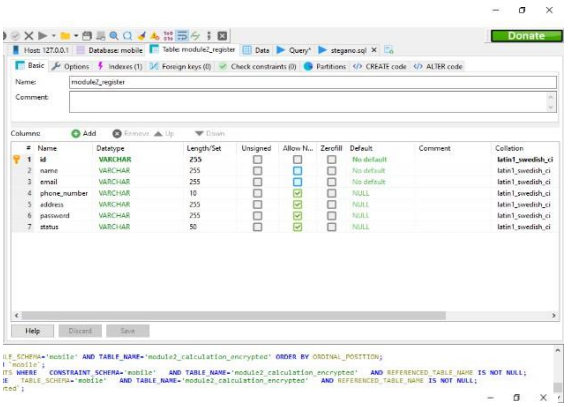
The steps listed below can be used to explain the working process:

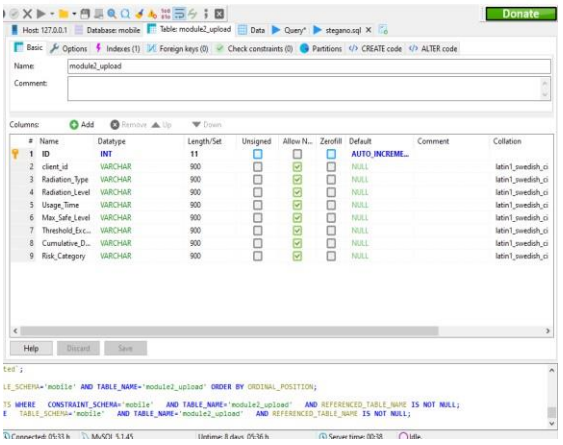


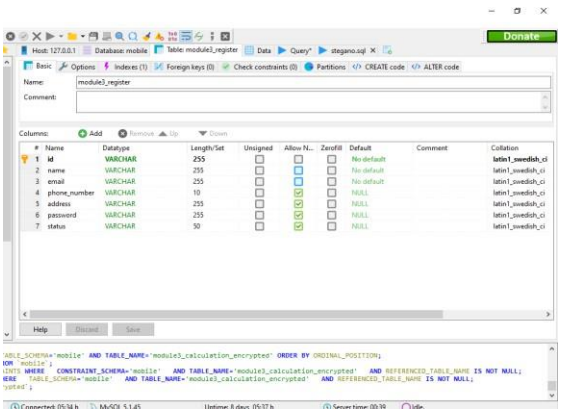
DATABASE SCREEN SHOTS

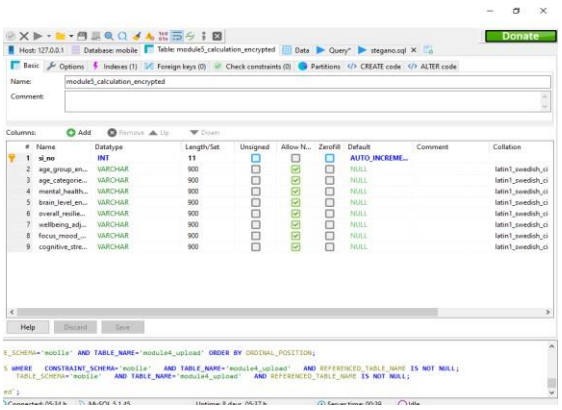


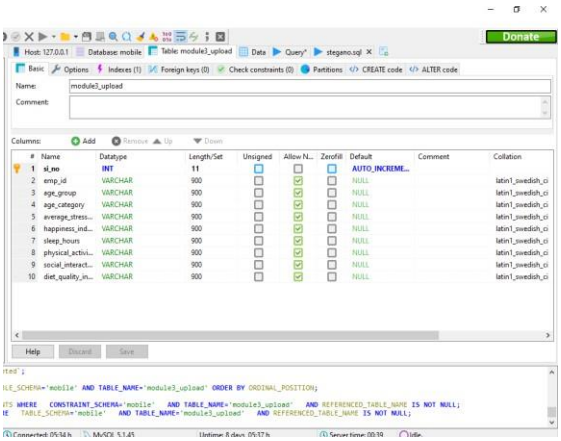


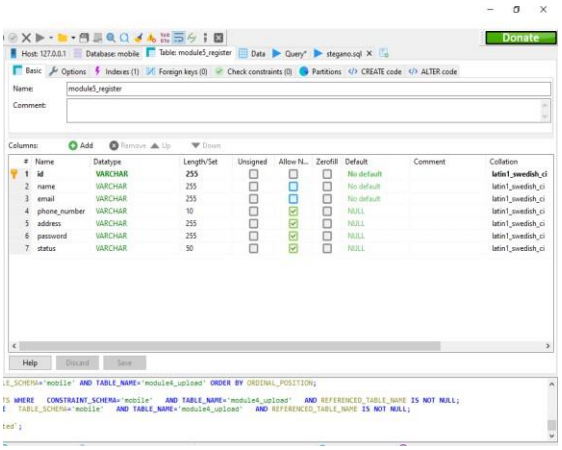


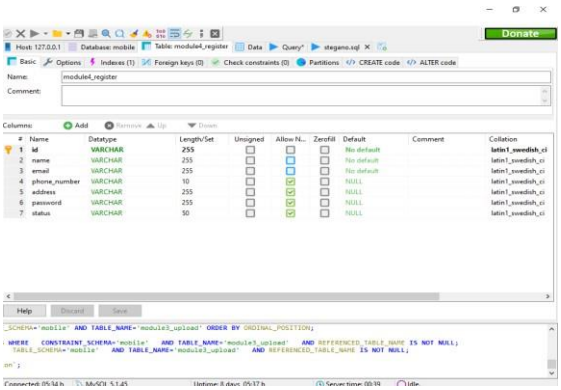


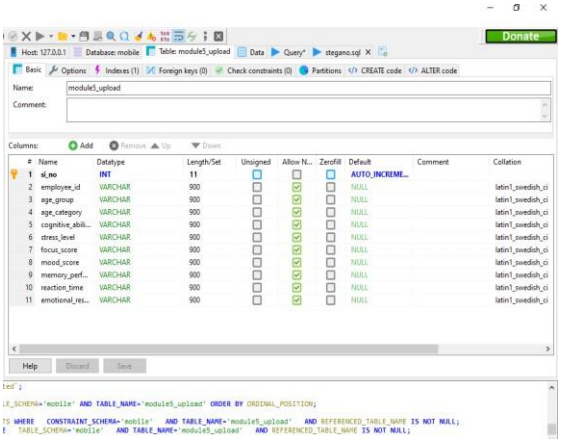


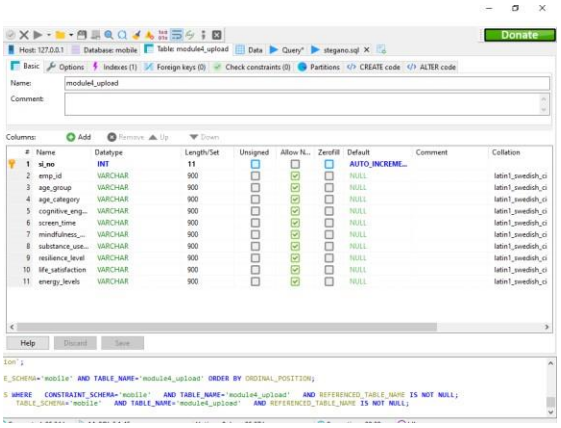


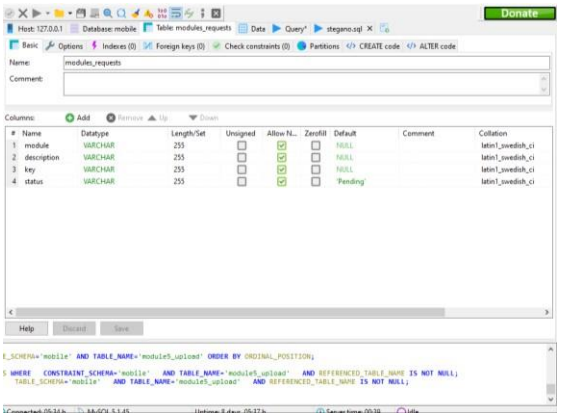












Basic Data Exploration

Social media usage, mobile radiation exposure, and mental health screening data are the core elements explored in this project. The system collects data from individuals based on their digital behavior especially time spent on social media platforms and categorizes it by age groups to identify patterns that may relate to mental health conditions like anxiety, depression, or cognitive issues. Furthermore, mobile device radiation levels are recorded to examine their potential psychological impact. This preliminary exploration lays the foundation for understanding how digital environments influence mental well-being across age demographics.

Feature Engineering

The system utilizes statistical algorithms to process and derive meaningful attributes from the collected data. Information on social media usage patterns, mobile radiation exposure, and mental health indicators such as emotional well-being and cognitive performance is extracted and categorized. These features are refined to highlight age-specific sensitivities and to strengthen correlations between digital behavior and mental health outcomes. The features are further structured to support personalized analysis and predictive assessment.

Explanatory Data Analysis (EDA)

The data is analyzed through comparative studies to discover trends within and across age groups. Mental health scores are calculated for each individual and further segmented by demographic categories. These scores help identify how different age groups are affected by technology usage. The compiled report presents key trends and highlights at-risk populations, enabling a deeper understanding of how factors like mobile radiation and excessive screen time influence mental health.

Data Preprocessing

Collected data includes raw figures from social media interaction logs, mobile radiation readings, and mental health screening results. This data is filtered, categorized, and normalized to ensure consistency and accuracy. Emotional well-being, cognitive states, and stress levels are extracted and structured to improve the reliability of subsequent analyses. This step ensures that the model inputs are clean, structured, and representative of real-world conditions.

Modelling

Advanced statistical models and algorithms are employed to identify and evaluate correlations among the data points. The modeling stage involves using these methods to derive mental health scores for individuals, which are then grouped by age to identify vulnerability levels. The final analysis produces a comprehensive report that consolidates findings across various demographics and highlights key psychological risk indicators associated with digital engagement.

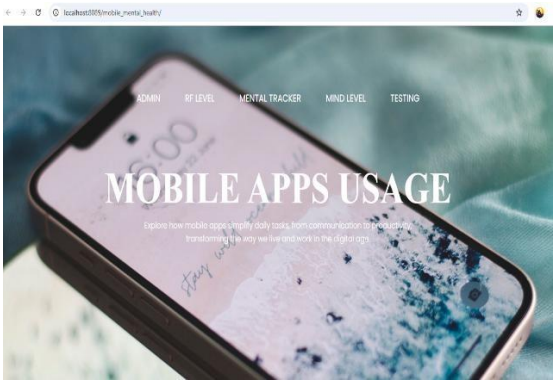
Website

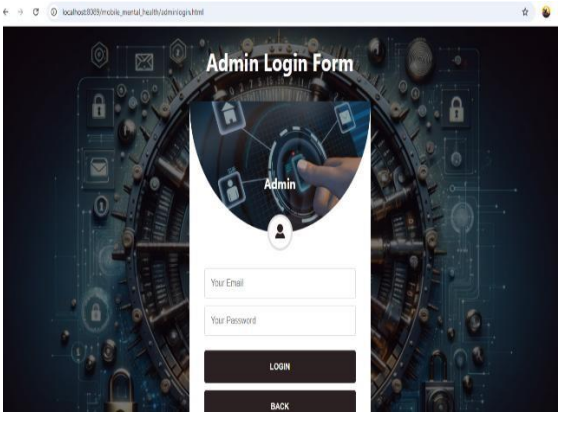
The online system is developed using Java-based web technologies such as HTML, CSS, JavaScript, JSP, and servlets. It provides interfaces for both data upload and result visualization. Front-end elements ensure user-friendly navigation, while the back-end handles data integration and logic processing. Through secure login modules, users can access personalized mental health assessments and system administrators can manage data flows, approvals, and system configurations.

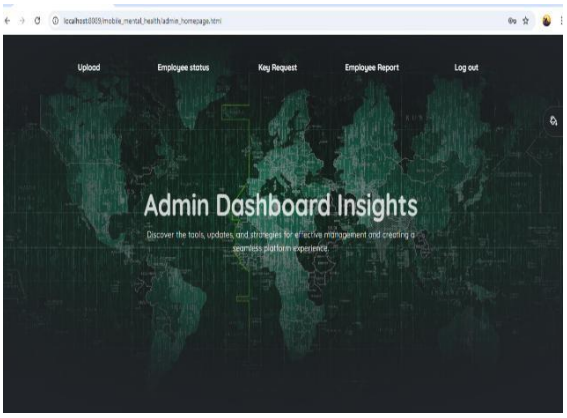
Deployment

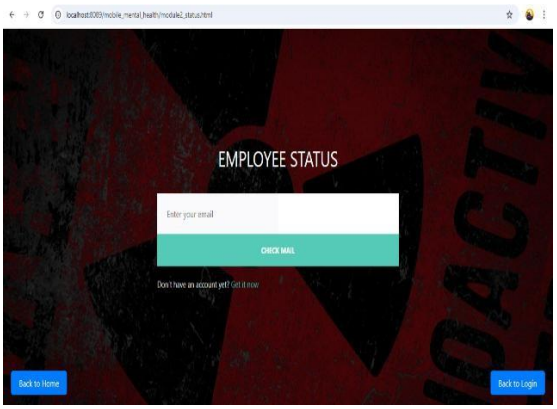
After testing, the system is formally deployed into the intended environment. It may first be introduced in limited phases to ensure functionality under real-world conditions, following which it becomes available for broader use. Post-deployment, the system undergoes routine maintenance and updates to accommodate new data and to refine its analytical capabilities. This ensures the platform remains accurate, secure, and scalable for long-term mental health monitoring.

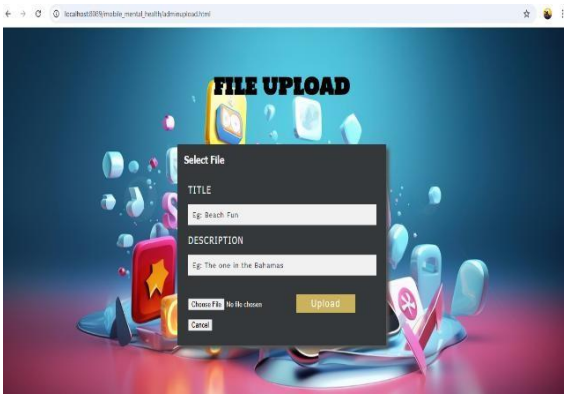
The results are displayed in the figures below.

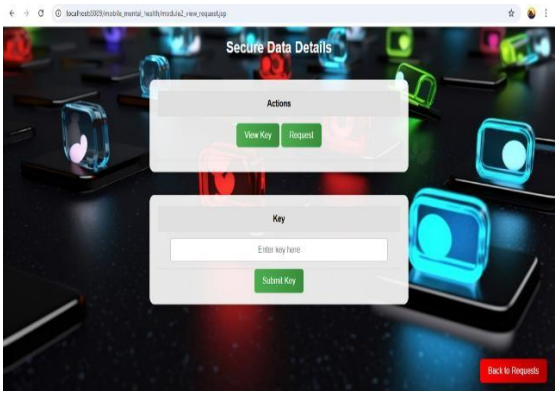


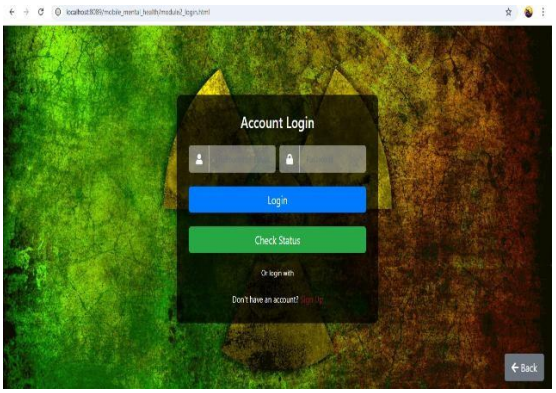


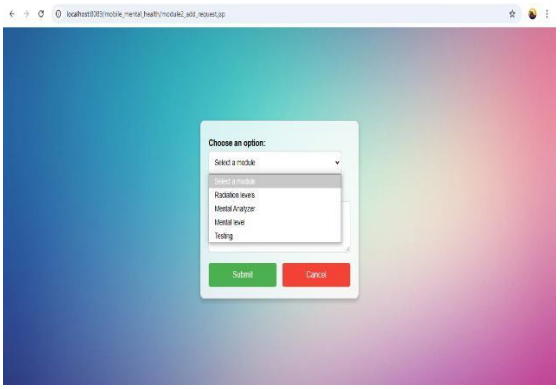

Upload
Employee status
Key Request
Employee Report
Log out
Admin Dashboard Insights

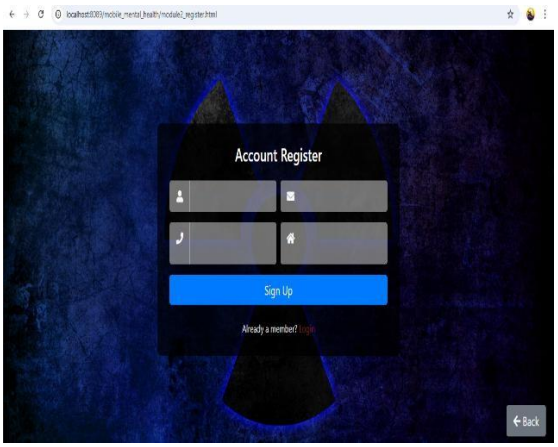

EMPLOYEE STATUS
Enter your email
CHECK MAIL
Back to Home
Back to Login

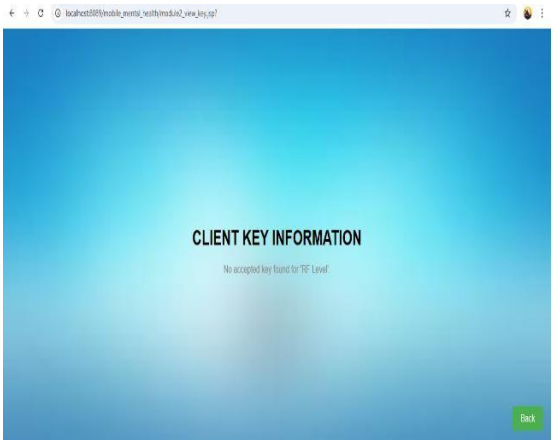

FILE UPLOAD
Select File
TITLE
DESCRIPTION
Upload
Cancel

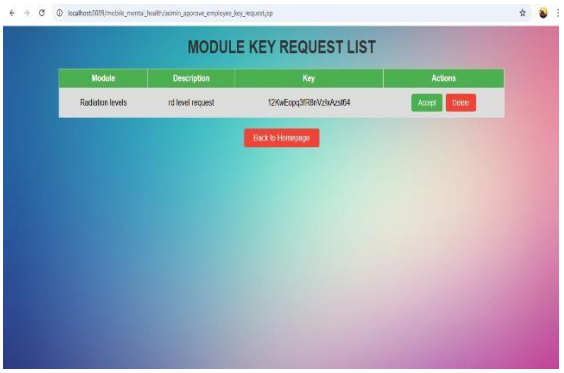

Secure Data Details
Actions
View Key
Request
Key
Submit Key
Back to Requests


Account Login
Login
Check Status
Back


Choose an option:
Submit
Cancel

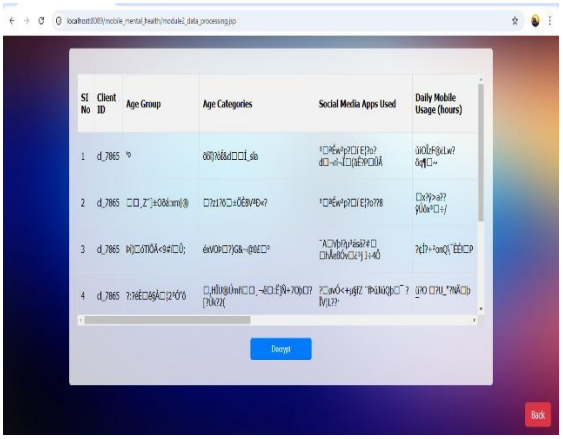

Account Register
Sign Up
Back

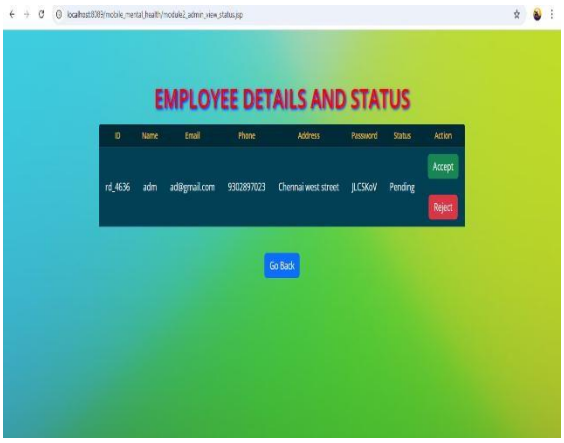

CLIENT KEY INFORMATION
Back

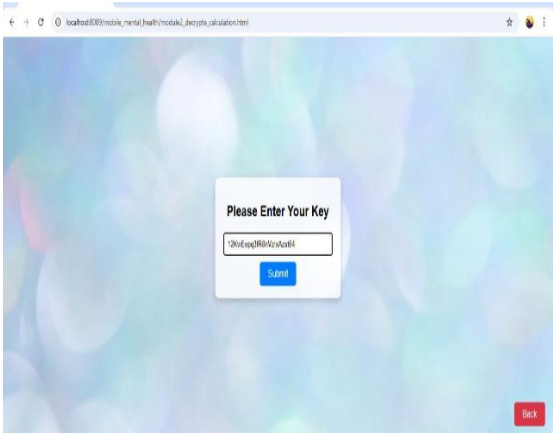

MODULE KEY REQUEST LIST
Module
Description
Key
Actions
Radiation levels
rd level request
12KwExpq3fR8nVzfwAzsl64
Accept
Delete
Back to Homepage

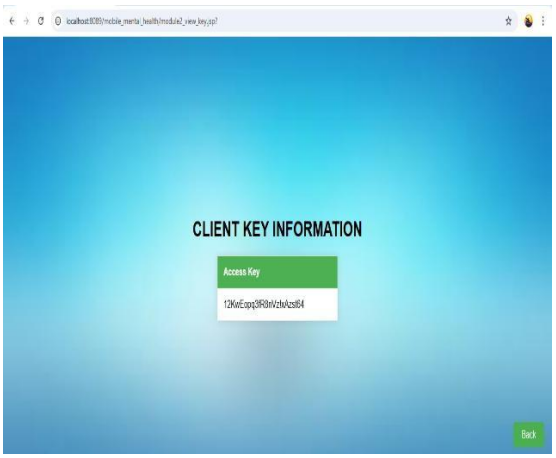
ADMIN UPLOAD ENCRYPTED DATA
Back to Home

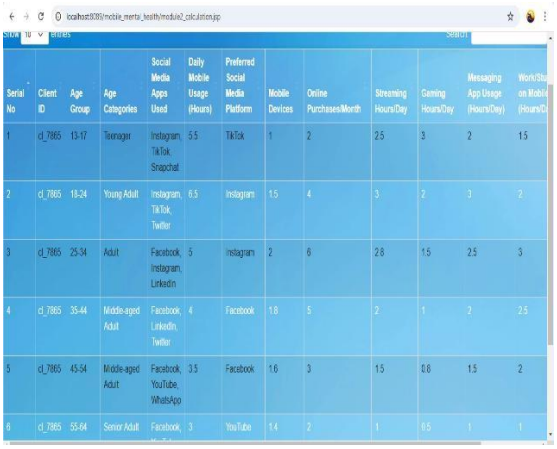
Modules request
Modules request
Option 1
Option 2
Option 3
Option 4
Back

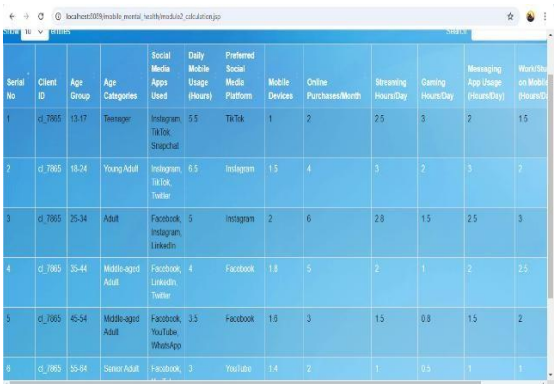

SI No
Client ID
Age Group
Age Categories
Social Media Apps Used
Daily Mobile Usage (hours)
Decrypt
Back

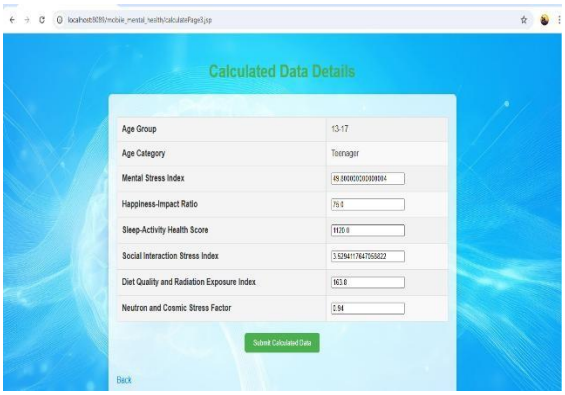

EMPLOYEE DETAILS AND STATUS
ID
Name
Email
Phone
Address
Password
Status
Action
rd_4636
adm
adl@gmail.com
9302897023
Chennai west street
JLC5KeV
Pending
Accept
Reject
Go Back

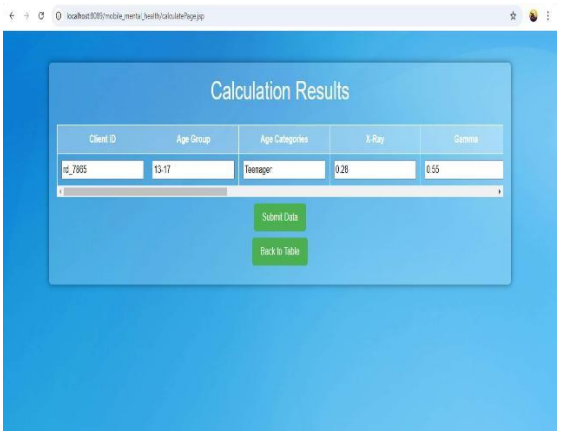

Please Enter Your Key
Submit
Back


CLIENT KEY INFORMATION
Access Key
12KwExpq3fR8nVzfwAzsl64
Back

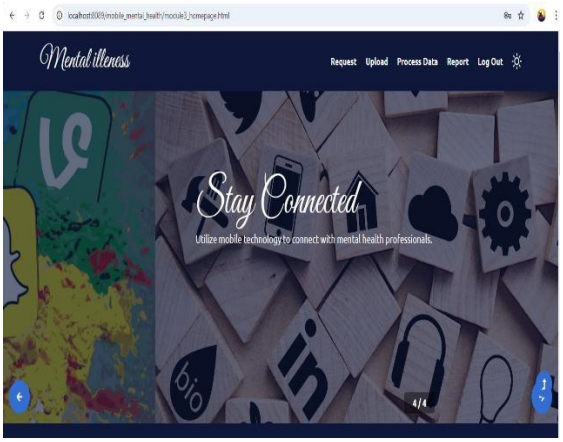

Serial No
Client ID
Age Group
Age Categories
Social Media Apps Used
Daily Mobile Usage (Hours)
Preferred Social Media Platform
Mobile Devices
Online Purchases/Month
Streaming Hours/Day
Gaming Hours/Day
Messaging App Usage (Hours/Day)
1 cl_7865 13-17 Teenager Instagram, TikTok, Snapchat 5.5 TikTok 1 2 2.5 3 2 1.5
2 cl_7865 18-24 Young Adult Instagram, TikTok, Twitter 6.5 Instagram 1.5 4 3 2 3 2
3 cl_7865 25-34 Adult Facebook, Instagram, LinkedIn 5 Instagram 2 6 2.8 1.5 2.5 3
4 cl_7865 35-44 Middle-aged Adult Facebook, LinkedIn, Twitter 4 Facebook 1.8 5 2 1 2 2.5
5 cl_7865 45-54 Middle-aged Adult Facebook, YouTube, WhatsApp 3.5 Facebook 1.6 3 1.5 0.8 1.5 2
6 cl_7865 55-64 Senior Adult Facebook, 3 YouTube 1.4 2 1 0.5 1 1



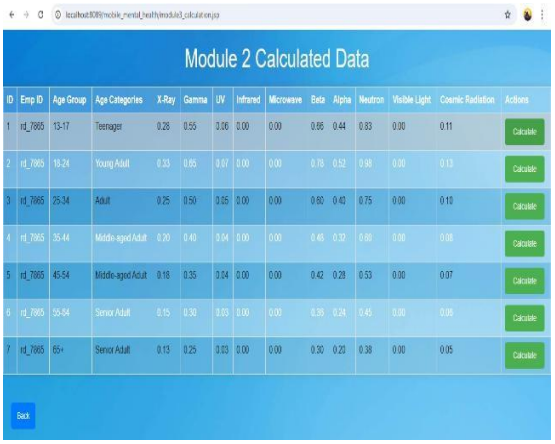

Calculated Data Details
Age Group
13-17
Age Category
Teenager
Mental Stress Index
Happiness-Impact Ratio
Sleep-Activity Health Score
Social Interaction Stress Index
Diet Quality and Radiation Exposure Index
Neutron and Cosmic Stress Factor
Submit Calculated Data
Back

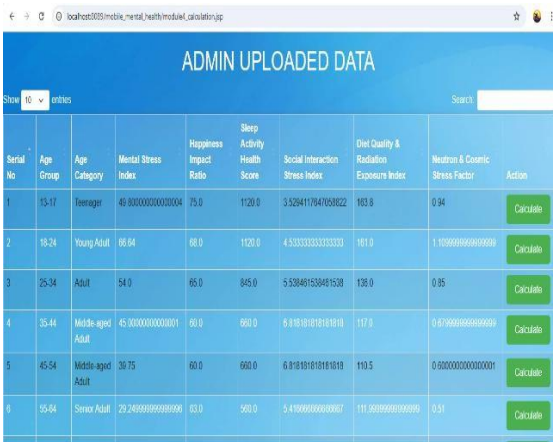

Calculation Results
Client ID
Age Group
Age Categories
X-Ray
Gamma
rd_7865
13-17
Teenager
0.28
0.55
Submit Data
Back to Table

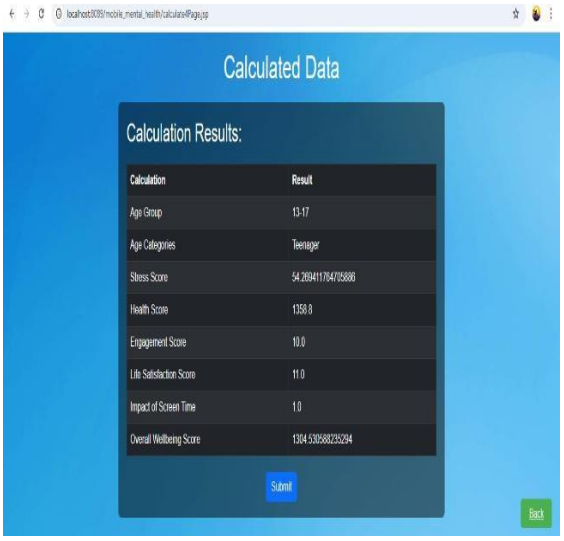
REPORT
S.NO
AGE GROUP
AGE CATEGORY
MENTAL STRESS INDEX
HAPPINESS IMPACT RATIO
SLEEP ACTIVITY HEALTH SCORE
SOCIAL INTERACTION STRESS INDEX
DIET QUALITY AND RADIATION EXPOSURE INDEX
NEUTRON AND COSMIC STRESS FACTOR

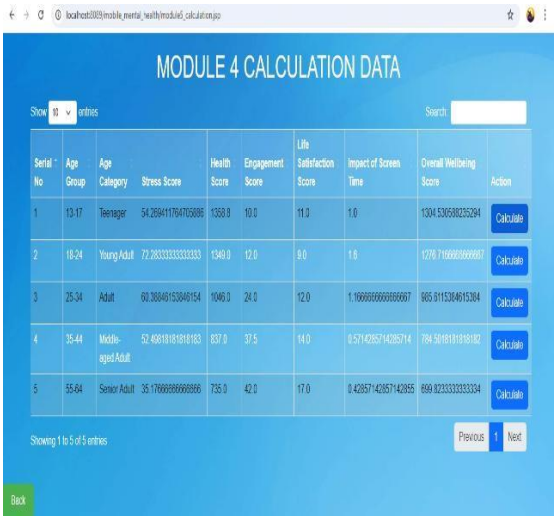

Mental illness
Request
Upload
Process Data
Report
Log Out
Stay Connected
Utilize mobile technology to connect with mental health professionals.

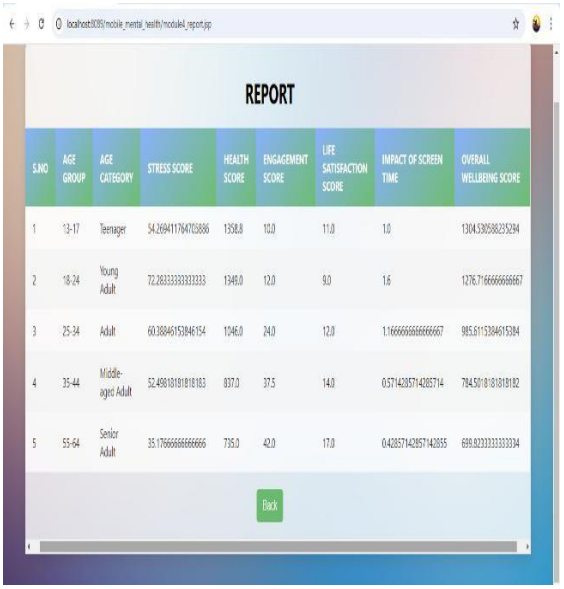
ENCRYPTED DATA
ID
CLIENT ID
AGE GROUP
AGE CATEGORY
MENTAL STRESS INDEX
HAPPINESS IMPACT RATIO
SLEEP ACTIVITY HEALTH SCORE
SOCIAL INTERACTION STRESS INDEX
DIET QUALITY AND RADIATION EXPOSURE INDEX
NEUTRON AND COSMIC STRESS FACTOR
Back to Home


Module 2 Calculated Data
ID
Emp ID
Age Group
Age Categories
X-Ray
Gamma
UV
Infrared
Microwave
Beta
Alpha
Neutron
Visible Light
Cosmic Radiation
Actions
Back

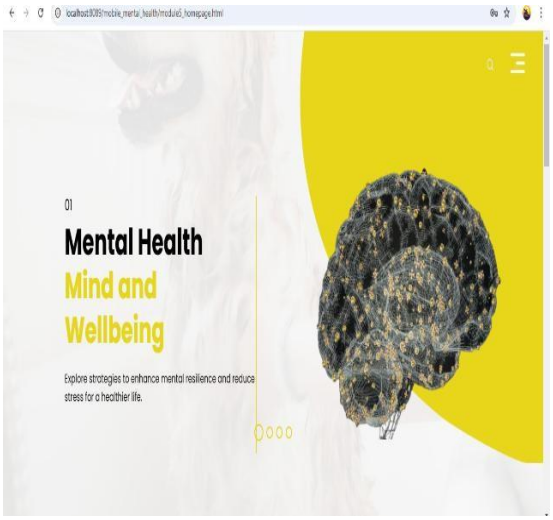

ADMIN UPLOADED DATA
Serial No
Age Group
Age Category
Mental Stress Index
Happiness Impact Ratio
Sleep Activity Health Score
Social Interaction Stress Index
Diet Quality & Radiation Exposure Index
Neutron & Cosmic Stress Factor
Action

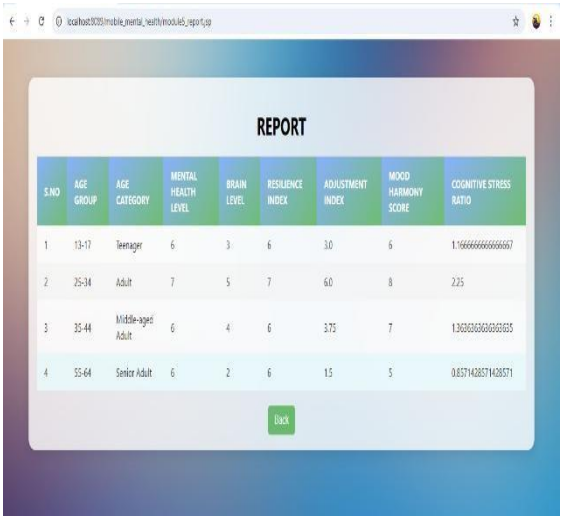

Calculated Data
Calculation Results:
Calculation
Result
Age Group
13-17
Age Categories
Teenager
Stress Score
54.269411764705886
Health Score
1358.8
Engagement Score
10.0
Life Satisfaction Score
11.0
Impact of Screen Time
1.0
Overall Wellbeing Score
1304.530588235294
Submit
Back


MODULE 4 CALCULATION DATA
Back


REPORT
Back

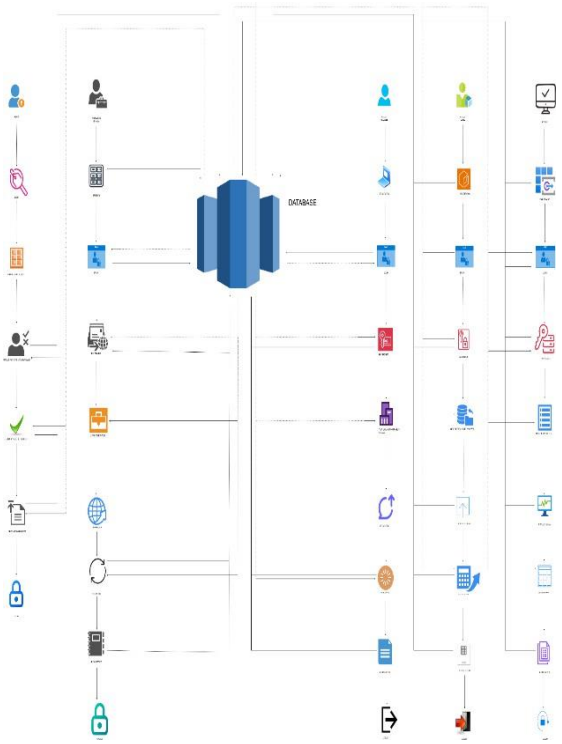
Age Category Comparison Results
Metric
Value
Age Group
18-24
Age Categories
Young Adult
Mental Health Level
6
Brain Level
4
Overall Resilience Index
6
Wellbeing Adjustment Index
4.5
Focus-Mood Harmony Score
7
Cognitive Stress Ratio
1.6


01
Mental Health
Mind and
Wellbeing
Explore strategies to enhance mental resilience and reduce stress for a healthier life.


REPORT
Back

Dataset Selection

In today's digital world, mental health is increasingly shaped by technological influences such as social media usage and mobile radiation exposure. This project aims to provide an in-depth analysis of how these factors impact mental well-being across different age groups. By integrating data from social media engagement, mobile radiation levels, and mental health screenings, the study seeks to establish meaningful correlations between technology use and psychological health outcomes.



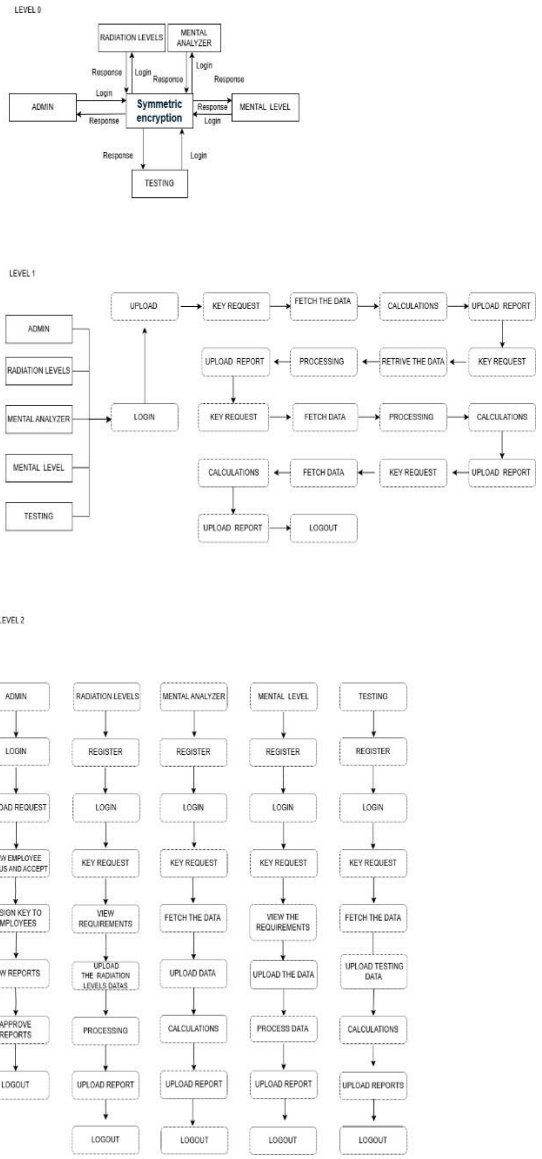
SYSTEM ARCHITECTURE

Data Pre-processing

Once logged in, the employee encounters encrypted data and must submit a key request to the admin for decryption. The admin evaluates the request, approves it, and sends the decryption key to the respective employee. Using the key, the employee decrypts the data and uploads relevant information. The module includes functionality for conducting calculations based on the uploaded data to generate reports.

Feature Selection

The data within the module is encrypted for security, requiring the employee to submit a key request to the admin to enable decryption. The admin reviews and approves the key request, providing the decryption key to the respective employee. Once decrypted, the employee uploads data related to the mental level status of various age groups and categories.



DATA FLOW DIAGRAM

Prediction Model

After uploading the data, the employee performs calculations on the data to generate insights. The calculated results are encrypted, requiring the employee to use the provided decryption key again to access and verify the final report.

Comparison Model

The module enables the employee to perform calculations on the data to generate meaningful insights. The calculated results are also encrypted for security purposes, requiring the employee to decrypt the data again for verification.

Medical News / Updates

Public Awareness and Education: The insights provided by the system can be used to raise public awareness about the potential mental health risks of excessive screen time and mobile radiation, promoting healthier lifestyle choices and digital habits among the population.

Result Analysis and Discussion

The final phase of the project compiles the results into a comprehensive report, highlighting key trends and risk factors. This report serves as a valuable resource for identifying vulnerable populations and understanding how lifestyle factors shape mental health.

REFERENCES

1. Fong, A., Jain, M., Sacks, W., Ho, A., & Chen, Y. (2020). Crowdfunding campaigns and thyroid surgery: Who what where and how much? *Journal of Surgical Research, 253*, 63–68.
2. Ba, Z., Zhao, Y., Song, S., & Zhu, Q. (2021). Understanding the determinants of online medical crowdfunding project success in China. *Information Processing & Management, 58*.
3. Mejia, J., Urrea, G., & Pedraza-Martinez, A. J. (2019). Operational transparency on crowdfunding platforms: Effect on donations for emergency response. *Production and Operations Management, 28*, 1773–1791.
4. Zhao, K., Zhou, L., & Zhao, X. (2022). Multi-modal emotion expression and online charity crowdfunding success. *Decision Support Systems, 163*.
5. Hou, J.-R., Zhang, J., & Zhang, K. (2023). Pictures that are worth a thousand donations: How emotions in project images drive the success of online charity fundraising campaigns? *MIS Quarterly, 47*, 535–584.
6. Iweriebor, L. E. (2023). Approaches to Medicare provider fraud detection and prevention. Doctoral dissertation, Capitol Technology University.
7. Bauder, R. A., & Khoshgoftaar, T. M. (2017, December). Machine learning models for detecting Medicare fraud. Presented at IEEE conference.
8. Johnson, J. M., & Khoshgoftaar, T. M. (2019). Applying neural networks for Medicare fraud detection. *Journal of Big Data*.
9. Bauder, R., & Khoshgoftaar, T. (2018, July). Medicare data processing and integration techniques for fraud detection. IEEE IRI Conference.
10. Herland, M., Khoshgoftaar, T. M., & Bauder, R. A. (2018). Multiple Medicare data sources for large-scale fraud detection. *Journal of Big Data*.
11. McGee, J., Sandridge, L., Treadway, C., Vance, K., & Coustasse, A. (2018). Strategic approaches to fighting Medicare fraud. *The Health Care Manager*.
12. Mohammed, M. A., Boujelben, M., & Abid, M. (2023). A novel machine learning framework for fraud detection in blockchain-based healthcare networks. *Future Internet*.
13. Castaneda, G., Morris, P., & Khoshgoftaar, T. M. (2019, April). Using Maxout neural networks for detecting medical fraud in large datasets. IEEE BigDataService.
14. Nabrawi, E., & Alanazi, A. (2023). Applying machine learning to healthcare insurance fraud detection. *Risks*.
15. Kumaraswamy, N., Markey, M. K., Ekin, T., Barner, J. C., & Rascati, K. (2022). Retrospective and prospective view on healthcare fraud data mining methods. *Perspectives in Health Information Management*.