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SOCIAL Q&A: AN ONLINE SOCIAL NETWORK BASED QUESTION AND ANSWER SYSTEM

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Abstract
The exponential growth of online information has increased the demand for effective Question and Answer (Q&A) systems. Traditional Q&A platforms suffer from slow response times, low answer quality, and a high percentage of unanswered questions due to reliance on random browsing or altruism. SocialQ&A is an intelligent online social network-based Q&A system that leverages social relationships to improve answer quality and reduce waiting time.

By utilizing common-interest and mutual-trust properties of social networks, the system actively forwards questions to friends or users who are most likely to provide relevant, high-quality answers. SocialQ&A integrates user interest profiling, question categorization, and a question-user mapping algorithm based on interest similarity and social closeness. The system was evaluated through simulations and analysis of real-user behavior, demonstrating significant improvements in answer quality, response time, and user satisfaction compared to conventional Q&A platforms. SocialQ&A offers a scalable, community-driven solution ideal for educational institutions, enterprise knowledge sharing, and general social platforms.

Keywords: Question and Answer System, Social Networks, SocialQ&A, Interest Profiling, Question Routing, Collaborative Knowledge Sharing, Social Closeness.

I.Introduction
Online Question and Answer (Q&A) systems have become essential platforms for knowledge sharing, problem-solving, and information seeking. Popular systems such as Yahoo! Answers, Quora, and Stack Overflow enable users to post questions and receive responses from the community. However, as the volume of questions grows rapidly, users often struggle to find suitable answerers, resulting in delayed responses, low-quality answers, or unanswered queries.

Traditional Q&A platforms depend on keyword search, tags, or random browsing, which fail to leverage personal relationships and expertise within social circles. SocialQ&A addresses these limitations by integrating social network properties into the Q&A process. It actively routes questions to users who share common interests with the asker and have strong social ties, thereby increasing the probability of receiving timely and high-quality answers.

The system exploits two key social phenomena: (1) friends tend to share similar interests, and (2) friends are more willing to help due to mutual trust and altruism. SocialQ&A provides 24/7 community-driven support and can be deployed in educational, enterprise, or general social networking environments.

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II. Literature Survey

Several studies have explored Q&A systems and the role of social networks in information retrieval:

- Shen et al. (2015) proposed SocialQ&A, an online social network-based Q&A system that forwards questions to capable and willing answerers using interest similarity and social closeness.
- Jin et al. investigated knowledge contribution behavior in online social Q&A communities using social capital and social exchange theories.
- Studies on Yahoo! Answers and Quora highlighted that only a small percentage of questions receive satisfactory answers, emphasizing the need for intelligent routing.
- Research on expert finding in social networks showed that combining user profiles, activity history, and relationship strength improves answer quality.
- Works on community question answering (CQA) explored tag-based categorization and collaborative filtering techniques.
- Comparative analyses of traditional Q&A vs. social-enhanced systems demonstrated reduced response time and higher user satisfaction in socially-aware models.

III. Existing System & Proposed System

A. Existing System

Most current Q&A platforms rely on keyword search, manual tagging, or public browsing. Users post questions and wait for voluntary responses from the community. While these systems offer broad reach, they suffer from:

1. Long waiting times and high percentage of unanswered questions.
2. Low answer quality due to mismatched expertise.
3. Over-reliance on altruism rather than targeted routing.
4. Poor personalization and lack of social context.
5. Difficulty in handling domain-specific or local questions.

B. Proposed System

SocialQ&A is a social network-integrated Q&A system that intelligently routes questions to potential answerers. It maintains user interest profiles (as vectors of categories) and calculates social closeness between users. When a question is posted, the system categorizes it and maps it to the most suitable friends or users based on interest similarity and relationship strength.

Key Advantages of the Proposed System:

1. Faster response time through targeted question forwarding.
2. Higher answer quality by matching expertise and interests.
3. Reduced unanswered questions using social trust.
4. Personalized and context-aware question routing.

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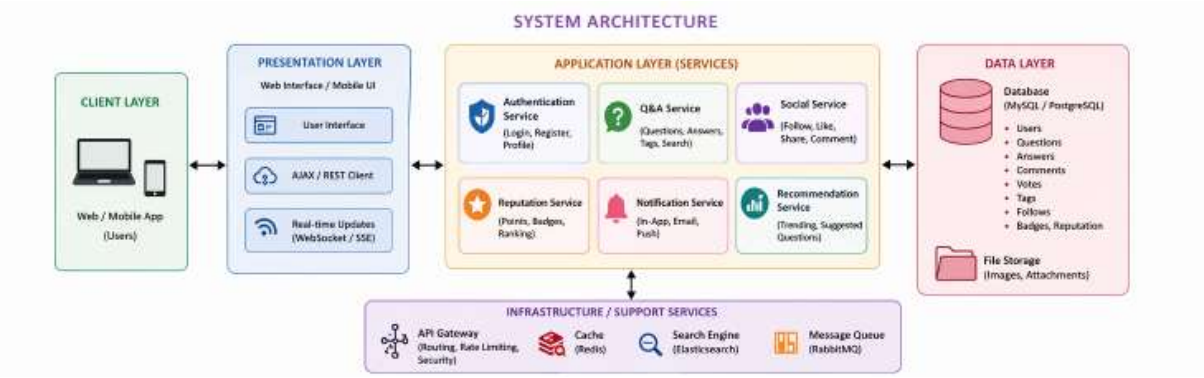
5. Scalable architecture suitable for web and mobile platforms.
6. Improved user engagement and community participation.
7. Support for both public and friend-circle Q&A modes.

IV. System Design & Architecture

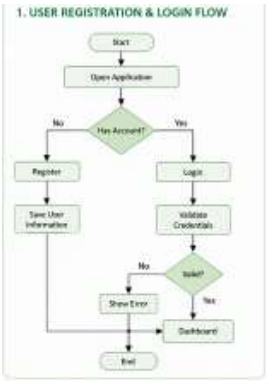
A. System Architecture

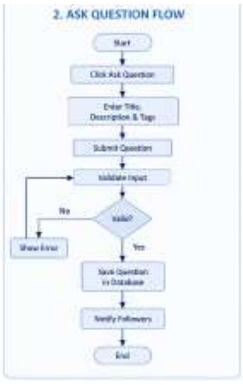
The architecture consists of a user-friendly web/mobile interface, User Interest Analyzer, Question Categorizer, Question-User Mapper, social graph module, and notification system. Data flows from question posting → categorization → interest & closeness matching → question forwarding → answer collection and ranking.

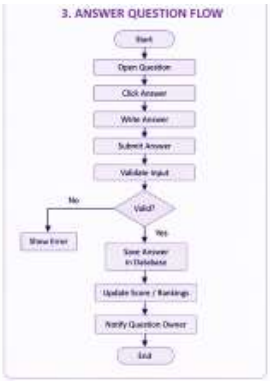


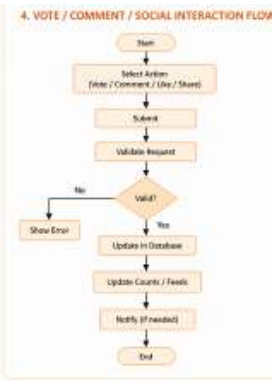
B. System Flowchart

The process starts with user login/registration → question posting → automatic categorization → computation of interest similarity and social closeness → intelligent forwarding to top-k potential answerers → notification → answer submission and ranking → feedback to the asker.









C. Modules Overview

1. User Authentication Module: Secure signup, login, and profile management.
2. User Interest Profiling Module: Builds and updates interest vectors from user activity, posts, and self-declared categories.

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3. Question Categorization Module: Classifies posted questions into interest categories using NLP techniques.
4. Question Routing Module: Computes similarity scores and forwards questions to suitable users.
5. Social Graph & Closeness Module: Maintains friendship relationships and calculates social closeness.
6. Notification & Answer Management Module: Handles alerts and answer ranking.

Table I: Technology Stack

Component	Technology / Tool
Programming Language	Java / Python
Web Framework	JSP / Servlets or Django / Flask
Database	MySQL / PostgreSQL
Frontend	HTML, CSS, JavaScript, Bootstrap
NLP / Categorization	TF-IDF, KNN, or BERT-based models
Social Graph	Neo4j or custom adjacency lists
Deployment	Tomcat / Docker
OS	Windows / Linux

V. Results & Discussion

6.1 Fig: home Page

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6.2 Fig: User registration

6.3 Fig: User Login

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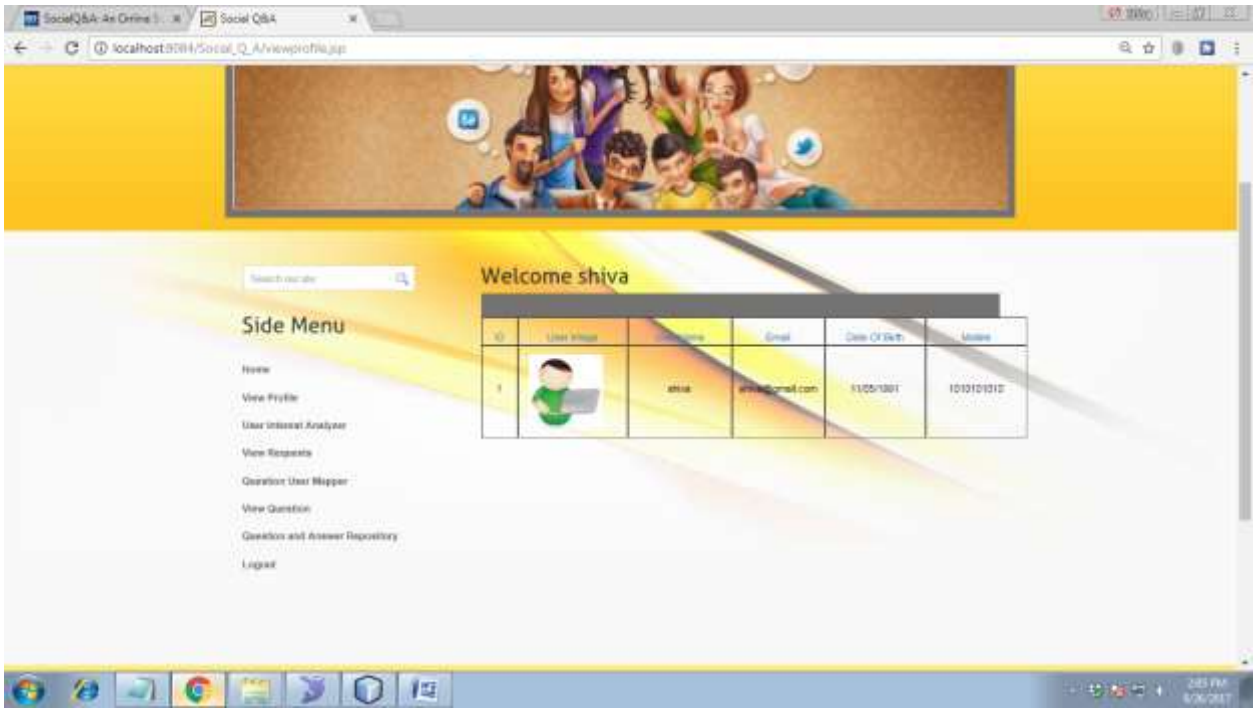
6.4 Fig: User Home



6.5 Fig: View Profile

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Table II: Performance / Evaluation Summary

Metric / Component	SocialQ&A	Traditional Q&A	Remarks
Average Response Time	Low (hours)	High (days)	Targeted social routing
Answer Quality	High	Moderate	Interest + closeness matching
Unanswered Questions	Low	High	Proactive forwarding
User Satisfaction	Excellent	Moderate	Social trust & relevance
Scalability	High	Limited	Handles growing social graphs

VI.Conclusion

This project presented SocialQ&A, an intelligent online social network-based Question and Answer system that leverages friendship relationships, common interests, and social closeness to route questions effectively. By moving beyond random or tag-based approaches, the system achieves faster responses, higher answer quality, and better user engagement.

The modular architecture and quantitative routing algorithms make SocialQ&A highly adaptable for educational institutions, enterprise knowledge bases, and general social platforms. The project highlights the transformative potential of combining social networks with Q&A systems and provides a foundation for future enhancements such as AI-powered interest modeling and mobile-first implementations.

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