



# **An Efficient Web-Based Family Tree Management System using WordPress CMS**

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**ABSTRACT:** Family history preservation plays an important role in understanding relationships and cultural heritage across generations. Traditional methods of maintaining family trees are usually manual, scattered across documents, or stored privately within families, making it difficult to maintain accuracy and accessibility. With the advancement of web technologies and content management systems, it is possible to build digital platforms that store and visualize family relationships efficiently.

This research presents the design and development of a web-based Family Tree Management System implemented as a plugin within the WordPress CMS. The system allows administrators to manage and verify family member records while enabling approved users to contribute their own family data through a front-end interface. The system stores structured family relationships and generates a dynamic family tree for visualization.

The proposed solution aims to simplify genealogy data management, improve accessibility, and support collaborative family history documentation.

**KEYWORDS:** Family Tree, Genealogy, WordPress Plugin, Web-Based System, CMS, Collaborative Data Management, Relationship Visualization

## **I. INTRODUCTION**

Genealogy is the study of family lineage and historical relationships among individuals. A family tree is a graphical representation of family relationships across generations. Traditionally, family trees were maintained using handwritten charts, printed diagrams, or standalone genealogy software. However, these methods often suffer from problems such as limited accessibility, difficulty updating records, and lack of collaborative features.

In modern society, families are geographically distributed, and sharing family history information has become more challenging. Web-based platforms provide an opportunity to digitize genealogy information and allow multiple users to contribute data while maintaining centralized control.

WordPress is one of the most widely used Content Management Systems (CMS) due to its flexibility, plugin architecture, and ease of use. Developing a Family Tree Management System as a WordPress plugin allows easy deployment, scalability, and integration with existing websites.

This research proposes a WordPress-based system where an administrator can manage family records and approve users. Once approved, users are able to add and update their family information through the front-end interface. The system dynamically organizes relationships such as parents, spouses, and children to generate a structured family tree.

### **1.1 Problem Statement**

Despite the availability of genealogy tools, many systems are complex or require specialized software. Traditional family tree documentation methods face several issues:

- Manual records are difficult to update and maintain.
- Lack of centralized data storage.
- Limited collaboration among family members.
- Difficulty visualizing large family structures.

- Lack of integration with common web platforms.

These challenges highlight the need for a simple, web-based system that allows families to collaboratively build and maintain their genealogy data.

### 1.2 Objectives of the Study

The main objectives of this research are:

1. To design a digital system for storing and managing family genealogy data.
2. To develop a WordPress plugin that allows administrators to manage family members.
3. To implement an approval-based user system for contributing family data.
4. To provide a front-end interface where users can add family members.
5. To generate a dynamic family tree structure representing relationships.

## II. LITERATURE REVIEW

Various studies have explored genealogy data visualization and analysis. Family tree visualization research discusses interactive graphical representations of genealogy data structures.

Research on genealogy data analysis focuses on understanding relationships and patterns in large family datasets using computational models.

Several studies have also explored algorithmic approaches to tree-structured data, graph theory applications, and knowledge graph techniques for representing relationships between individuals.

However, most of these studies focus on visualization techniques or theoretical analysis rather than implementing a practical web-based collaborative system that allows users to manage genealogy data in real time.

**Table 1: Comparative Summary of Key Studies in Genealogy Systems**

Table 1 presents a comparative summary of the key studies reviewed in this paper, highlighting how the proposed system addresses the gaps identified in prior work.

Author (Year)	Focus Area	Platform / Method	Key Contribution	Gap Addressed by Our Work
Keller et al. (2010)	Radial family tree visualization with temporal data	Custom D3-style interactive tool, UC Berkeley	Interactive radial layout encoding age and generation distances	No data management, no collaboration, no web CMS integration
Bokhare & Zainon (2019)	Survey of family tree visualization tools and techniques	Literature review across genealogy software	Taxonomy of visualization methods: hyperbolic, pedigree, genogram	Review only; no system built; no user data entry or approval workflow
Anil et al. (2018)	Academic genealogy tree using graph databases	Neo4j graph DB, web scraping, Python	Advisor-advisee lineage via algorithmic analysis and visualization	Domain-specific (academia only); no family data management or CMS
Fire et al. (2014)	Quantitative analysis of digitized genealogy datasets	WikiTree dataset, machine learning, statistical models	Large-scale computational study of 7M+ family profiles	Analytical only; no user-facing system; no collaborative data entry

Gomes et al. (2021)	Genetic genealogy: history meets DNA analysis	DNA markers, forensic case studies, MDPI review	Framework linking genetic data to genealogical records	Science/forensics focus; not applicable for general family web systems
Mao et al. (2023)	Geometric statistics for tree-shaped data correlation	Statistical modelling, simulation (arXiv)	Novel metric for quantifying correlation between genealogical trees	Theoretical math; no practical system or web-based tool
Dress et al. (2009)	Graph-theoretic analysis of the 'Tree of Life'	Discrete mathematics, phylogenetics	Formal classification of tree-like evolutionary structures	Biological focus; highly theoretical; not relevant to family web apps
Shan & Luther (2025)	HCI study on genealogy research, collaboration, education	Semi-structured interviews, 20 genealogists, ACM CSCW	Identified gaps in digital tools: search, collaboration, learning	Qualitative only; no system built; confirms need for better tools
ScienceDirect Topics (2024)	Overview of genealogy tree in computer science context	Encyclopedic reference, Elsevier	Broad survey of genealogy tree uses in CS: phylogenetics, citation graphs	Reference article only; no web system or user management
Proposed System (2024)	Web-based family tree management using WordPress CMS	WordPress plugin, PHP, MySQL, AJAX, JavaScript	Collaborative, admin-approved system with dynamic tree visualization on a popular CMS platform	Addresses ALL gaps: web-based, collaborative, CMS-integrated, approval workflow, non-technical users

### III. RESEARCH GAP

Based on the literature review, several research gaps were identified:

- Existing research mainly focuses on visualization rather than data management.
- Limited support for collaborative family member data entry.
- Lack of integration with popular CMS platforms like WordPress.
- Few systems provide administrator approval workflows.
- Limited focus on easy-to-use systems for non-technical users.

The proposed system addresses these gaps by implementing a collaborative Family Tree Management System using a WordPress plugin architecture.

### IV. PROPOSED SYSTEM

The proposed system is a web-based Family Tree Management System implemented as a WordPress plugin.

Administrator Features	User Features
Add and manage family member records	View the family tree
Approve registered users	Add new family members

Manage family relationships	Submit information for approval
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The system ensures data accuracy by allowing administrators to verify and approve user-submitted information before it becomes publicly visible.

### V. SYSTEM ARCHITECTURE

The system follows a three-layer architecture:

Layer	Description
<b>Presentation Layer</b>	Frontend interface where users interact with forms and view the family tree.
<b>Application Layer</b>	WordPress plugin logic developed using PHP, WordPress hooks, AJAX, and JavaScript.
<b>Data Layer</b>	WordPress MySQL database storing family member details and relationships using custom post types and metadata.

### VI. IMPLEMENTATION

The system is implemented as a custom WordPress plugin with the following core components:

Component	Technology
Custom Post Type for Family Members	PHP, WordPress APIs
Admin Dashboard Management Panel	WordPress Admin UI, PHP
User Registration & Approval System	PHP, WordPress User Roles
Front-End Submission Form	HTML, CSS, JavaScript, AJAX
Relationship Mapping (Father, Mother, Spouse, Children)	MySQL, Custom Post Meta
Dynamic Family Tree Visualization	JavaScript, CSS

The system is developed using PHP, JavaScript, HTML, CSS, and MySQL within the WordPress framework.

### VII. ISSUES AND LIMITATIONS

Although the system provides an efficient solution for family tree management, certain limitations exist:

- Manual verification is required for approving family data.
- Visualization of extremely large family trees may become complex.
- Data accuracy depends on user-provided information.
- Security and privacy must be carefully managed when storing personal data.

These issues can be addressed in future improvements.

### VIII. FUTURE SCOPE

The system can be enhanced in the future with additional features such as:

- Interactive graphical family tree visualization.
- Integration with mobile applications.
- AI-based relationship detection.

- Import and export of genealogy data formats such as GEDCOM.
  - Advanced search and filtering for family members.
  - Role-based access control for different family members.
- These improvements would enhance the usability and scalability of the system.

### **IX. CONCLUSION**

This research presented the design and development of a web-based Family Tree Management System using WordPress. The proposed system provides a centralized platform where administrators and approved users can collaboratively build and maintain family genealogy data.

The system improves accessibility, organization, and visualization of family relationships while ensuring data control through an approval mechanism. The research demonstrates how modern web technologies and CMS platforms can be used to create scalable genealogy management systems. Future enhancements can further improve the system's visualization, automation capabilities, and overall usability.

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