Islamic University of Gaza
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Project Proposal

Electronic Court Management System in Gaza

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1. Executive Summary

The court system in the Gaza Strip suffers from a lack of technological integration, resulting in slow, paper-based, and labor-intensive administrative processes. Employees handle hundreds of files daily, while thousands of paper documents are stored annually, leading to delays, duplicated tasks, difficulties in retrieving records, and excessive use of physical resources such as paper. Consequently, both court staff and citizens face significant challenges in completing legal procedures efficiently.

This project aims to develop a fully automated electronic court management system that streamlines daily operations and improves the overall efficiency of information flow. The system will be developed using Python, along with PyQt and QSS to build modern, CSS-like styled graphical user interfaces. Furthermore, PostgreSQL will be used as the main database engine to ensure reliable, secure, and high-performance data storage.

The system will adopt a centralized architecture, where the court manager's computer functions as the main server, hosting the centralized database and managing all connected client devices used by employees. This approach ensures unified data storage, prevents duplication or inconsistency, and simplifies data administration across the court.

The expected outcome of this project is a modern digital platform that replaces the traditional paper-based workflow with an efficient electronic solution. The system will enhance electronic archiving, automate repetitive tasks, reduce human error, accelerate document retrieval, and simplify access to services for both staff and citizens. By reducing manual effort, saving resources, and improving workflow efficiency, the project aims to significantly improve operational effectiveness and the quality of judicial services within the court.

2. Problem Background

Many courts still rely on traditional paper-based procedures, which cause significant delays in case processing, loss or damage of documents, and difficulty in accessing information quickly. For example, court employees handle hundreds of files daily, while thousands of paper documents are stored annually, making it time-consuming to locate specific case files. Lost or misplaced documents can delay legal proceedings by days or even weeks,

affecting both staff and citizens. Manual record-keeping also increases the likelihood of errors in case data, duplication of work, and inefficiency in inter-departmental communication. Therefore, transitioning to an electronic system is essential to improve efficiency, reduce errors, enhance security, and increase transparency.

3. Research Problem

The court system in the Gaza Strip is still largely paper-based and manually operated. This traditional workflow leads to numerous challenges, including delays in case processing, duplication of tasks, and errors in data entry. Accessing and retrieving case records is often time-consuming and prone to mistakes, which affects the efficiency and accuracy of judicial operations.

Furthermore, the reliance on physical documents increases operational costs and consumes significant resources, such as paper and storage space. Court employees spend considerable time on administrative tasks rather than focusing on core judicial responsibilities. Citizens face long waiting times, difficulty in tracking case progress, and challenges in obtaining timely legal services.

The absence of an integrated electronic management system also limits the ability to generate accurate statistical reports, monitor case trends, and plan judicial resources effectively. These inefficiencies highlight the urgent need for a fully automated court management system that can streamline operations, reduce errors, and improve overall service delivery for both employees and citizens.

4. Main Objectives

- Functional Objectives

    1. Annual Case Archiving: To systematically archive cases on a yearly basis for organized record-keeping and easy retrieval.
    2. Registrant Data Management: To register and maintain accurate information of all court visitors and parties involved.
    3. Hearing Scheduling: To schedule court sessions efficiently and manage appointment dates for each case.

4. Judge Weekly Calendar: To provide judges with a weekly calendar displaying all scheduled hearings for better time management.
5. Ability for employees to securely send and receive case-related files within the court system.
6. Employee Data Management: To enable the system administrator to add, update, or remove employee records as required.
7. Role-Based Access Control: To assign specific permissions to users according to their roles within the court system.
8. Final Verdict Documentation: To generate official documents reflecting the final judgment for each case.
9. User Authentication: To allow secure login for users, ensuring that access to the system is authorized.

- Non-Functional Objectives

1. Ensure high system performance with fast response times.
2. Maintain data security and confidentiality for all court records
3. Design an intuitive and user-friendly interface for staff and citizens.
4. Ensure system reliability with minimal downtime.
5. Support scalability to accommodate future growth in the number of cases and users.

- Technical Objectives

1. Modernize the court's digital infrastructure using scalable and secure technologies.
2. Enhance data accessibility and ensure consistency across all court departments.
3. Improve system reliability through robust network and backup mechanisms.
4. Support seamless integration with internal and external digital services.

5. Ensure the system operates efficiently on the existing hardware and software environment.

5. Project Scope

- In-Scope

  The project will directly implement the following:

  1. Automation of daily court operations: Case registration, file tracking, and document archiving.
  2. Graphical User Interface (GUI): Developed using Python with PyQt and QSS for an intuitive user experience.
  3. Issuing court judgments for each case directly through the system.
  4. Centralized Database: Implementation of a PostgreSQL database to store all court records and user information.
  5. Role-Based Access Control: Providing user permissions according to roles (Employee, Administrator).

- Out-of-Scope

  The project will not cover the following areas, which may be addressed in future versions:

  1. Integration with external systems or other courts.
  2. Advanced system features or intelligent data analysis (e.g., AI-driven analytics).
  3. Paper-based backup – the system will be fully digita

- Permissions / Access Control

  1. Court Administrator: Full permissions to manage all data and user accounts.
  2. Employees: Limited permissions based on their department.

- Minimum Viable Product (MVP)

  1. Basic case registration and management.
  2. Document archiving and storage in the centralized database.

3. Simple user interface for employees and administrators.
4. Basic reporting, such as the number of open and closed cases.
5. simple automated data backup

6. Target Users

- Court Administrators / System Administrators

  - Role: Full management of the system, ensuring smooth operation.
  - Permissions:
    - Full access to manage all data and user accounts.
    - Perform data backup and restoration.
  - Purpose: To ensure system continuity and maintain accurate and secure data.

- Court Employees / Staff

  - Role: Enter and update case data and related documents.
  - Permissions:
    - Create and modify case files within their assigned department only.
    - Access only the files they are responsible for; cannot modify others' files.
  - Purpose: To speed up daily court operations, reduce manual errors, and improve case management.

  → Court Scheduler:

  - Role: Responsible for organizing court session schedules and entering cases into judges' calendars.
  - Permissions:
    - Add cases to the judges' weekly calendars.
    - Modify session dates when necessary.
    - Ensure no scheduling conflicts between judges or departments.
  - Purpose: To ensure efficient scheduling of court sessions, facilitate case management for judges, and prevent any timetable conflicts

- Petition Clerks
  - Role: Register petitions and requests submitted by visitors.
  - Permissions:
    - Enter petition data and link it to relevant cases or parties.
    - Edit basic petition details before forwarding for judicial procedures.
    - Access petitions within their assigned scope only.
  - Purpose: To facilitate petition registration and tracking, reduce manual errors, and streamline information flow between visitors, staff, and judges.

- Judges
  - Role: Review cases and make judicial decisions.
  - Permissions:
    - Access case files assigned to them.
    - View and manage weekly hearing schedules.
  - Purpose: To efficiently manage court sessions and make accurate decisions.

7. Functional Requirements

ID	Functional Requirement	Description
FR-01	Employee Authentication	The system shall allow employees to log in using a username and password based on their role and access level.
FR-02	Client Data Registration	The system shall enable authorized employees to enter, register, and store client/visitor information in the database.
FR-03	Secure File Transfer	The system shall support secure file exchange between employees within the platform.
FR-04	Case Registration	The system shall allow authorized personnel to register new cases.
FR-05	Case Scheduling	The system shall provide functionality for scheduling case hearings and assigning dates to judges.
FR-06	Real-Time Notifications	The system shall send instant notifications when new files, data, or updates arrive.
FR-07	Case Archiving	The system shall archive all cases in a central master record within the database.
FR-08	Role-Based Access	The system shall provide controlled access to the database based on user roles and permissions.
FR-09	Verdict Issuance	The system shall allow judges to issue and record the final verdict for each case.
FR-10	Document Printing	The system shall support printing of different types of documents and files as needed.
FR-11	Case Management	The system shall allow authorized users to create, update, and delete case records.
FR-12	Database Backup	The system shall provide a simple automated backup mechanism for the database.
FR-13	Search Functionality	The system shall provide a searchable interface to quickly locate cases, users, or documents.

8. Technical Requirements

1. Centralized Database Architecture:
The system must use a unified, centralized database accessible by all court departments to ensure real-time data consistency and integrity.

2. Modern Development Stack:
The system should be developed using modern and widely supported programming languages and frameworks (such as Python, Java, or equivalent technologies).

3. Network Connectivity:
The system must support operation over a secure Local Area Network (LAN) and optionally allow remote access through the Internet using secure communication protocols.

4. System Integration Capabilities:
The solution must support integration with external services such as email servers for automated notifications and case-related alerts.

5. Hardware & Software Compatibility:
The platform must be compatible with existing court hardware (desktop PCs, printers, scanners) and standard operating systems commonly used within the institution.

6. Data Backup & Recovery:
The system must include automated, regular data backup mechanisms and provide reliable disaster recovery procedures to ensure business continuity.

9. Use Case

UC01 – Employee Login	
Actors	Employee
Description	Employee enters username & password to access the system.
Main Flow	1. User enters credentials 2. System verifies role & permissions 3. System grants access

UC02 – Register Client Information	
Actors	Employee
Main Flow	1. Employee enters client data 2. System validates input 3. System stores data in database

UC03 – Transfer Files	
Actors	Employee
Main Flow	1. Employee uploads file 2. Selects recipient employee 3. System notifies recipient

UC04 – Create Case	
Actors	Employee
Main Flow	1. Employee enters case details 2. System generates case ID 3. Case stored in database

UC05 – Schedule Case for Judge	
Actors	Employee
Main Flow	1. Select case 2. Choose judge and date 3. System assigns session

UC06 – Notifications	
Actors	Employee
Main Flow	1. New file/data enters system 2. System sends instant notification

UC07 – Case Archiving	
Actors	System
Main Flow	1. Case completed 2. System stores it in master archive

UC08 – Role-Based Access	
Actors	All users
Main Flow	1. System checks user permissions 2. Grants allowed actions only

UC09 – Final Verdict	
Actors	Judge
Main Flow	1. Judge opens case 2. Writes final verdict 3. System stores verdict

UC10 – Print Files	
Actors	Employee
Main Flow	1. Select document 2. System formats print view 3. Print executed

UC11 – Update/Delete Case	
Actors	Authorized employee
Main Flow	1. Select case 2. Update or delete 3. System saves changes

UC12 – Database Backup	
Actors	System
Main Flow	1. System performs scheduled backup 2. Stores backup in secure location

UC13 – Search	
Actors	All users
Main Flow	1. User types query 2. System retrieves results

10. User Stories

1. Judge

1. As a judge, I want to view all cases assigned to me, so that I can easily access and manage them.
2. As a judge, I want to review case documents electronically, so that I can avoid handling physical papers.
3. As a judge, I want to record judgments and link them to cases, so that the court can maintain accurate judicial records.
4. As a judge, I want to search for cases quickly using filters, so that I can retrieve information efficiently.
5. As a judge, I want to view my scheduled sessions, so that I can follow my daily workflow without needing to handle administrative tasks.

2. Clerk

1. As a clerk, I want to register new cases, so that they can be added to the court workflow.
2. As a clerk, I want to upload documents to each case, so that all files are stored electronically.
3. As a clerk, I want to track requests (dismissals, evidence requests, appeals), so that I can follow up on them efficiently.

4. As a clerk, I want to send files to other court employees, so that case information can be shared internally.
5. As a clerk, I want to schedule and reschedule sessions, so that I can manage my daily judicial calendar.
6. As a clerk, I want to receive alerts about pending tasks or deadlines, so that no case action is missed.

3. System Admin

1. As an admin, I want to manage user accounts (add, edit, delete), so that each employee has appropriate system access.
2. As an admin, I want to assign roles and permissions, so that each user can only access authorized features.
3. As an admin, I want to manage the centralized database on the server, so that all devices stay synchronized.
4. As an admin, I want to perform periodic backups, so that data remains safe in case of system failures.
5. As an admin, I want to monitor system usage and logs, so that security and performance issues can be identified.

11. Proposed Timeline

- Phase 1 — Analysis & Design: 2 weeks
    - Gather detailed requirements, design database schema, UI mockups.
- Phase 2 — Development & Implementation: 7 weeks
    - Build interfaces, database, and core functionalities.
- Phase 3 — Testing & Improvement: 2 weeks
    - Functional testing, bug fixing, UI refinement.
- Phase 4 — Documentation & Delivery: 1 week
    - User guide, code documentation, project submission.

Total Estimated Duration: 12 weeks

12. Project Team & Supervisor

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