

PET_x



TEAM ID: BSEF19-17

SESSION: BS SE FALL 2019 - 2023

PROJECT ADVISOR: NATALIA CHAUDHARY

SUBMITTED BY

Student Name	Roll Number
ATA UL MOHSIN	BSEF19M031
HASSAN AHMAD SARFRAZ	BSEF19M033
MUHAMMAD SAAD	BSEF19M037
MUHAMMAD SALEH BUTT	BSEF19M047

**PUNJAB UNIVERSITY COLLEGE OF
INFORMATION TECHNOLOGY,
UNIVERSITY OF THE PUNJAB, LAHORE.**

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Faculty of Computing & Information Technology



Title: **“PETx” FYP Documentation**

Group ID: **BSEF19-17**

Sr #.	Roll Number	Student Name
1	BSEF19M031	Ata UI Mohsin
2	BSEF19M033	Hassan Ahmad Sarfraz (Lead)
3	BSEF19M037	Muhammad Saad
4	BSEF19M047	Muhammad Saleh Butt

Project Supervisor: Ma'am **Natalia Chaudhary**

Date of Submission: **June 15, 2023**

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STATEMENT OF SUBMISSION

This is to certify that the students:

- ATA UL MOHSIN - BSEF19M031
- HASSAN AHMAD SARFRAZ - BSEF19M033 (Team Lead)
- MUHAMMAD SAAD - BSEF19M037
- MUHAMMAD SALEH BUTT - BSEF19M047

have successfully completed the final project named as **PETx**, at the Punjab University College of Information Technology, University of The Punjab, Lahore, to fulfill the partial requirement of the degree of **Bachelor of Science in Software Engineering**.

Project Office Supervisor
PUCIT, Lahore



Project Primary Advisor
Name: Natalia Chaudhary
Designation: Lecturer
PUCIT



Project Examiner
Name:
Designation:
PUCIT

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Proofreading Certificate

It is to certify that I have read the document meticulously and circumspectly. I am convinced that the resultant project does not contain any spelling, punctuation or grammatical mistakes as such. All in all I find this document well organized and I am in no doubt that its objectives have been successfully met.

Business Communication and Technical Writing,
Lecturer, PUCIT

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Acknowledgement

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- Mr. Ata Ul Mohsin
- Mr. Hassan Ahmad Sarfraz
- Mr. Muhammad Saad
- Mr. Muhamad Saleh Butt

Date: June 15, 2023

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Abstract

An abstract is necessary at this stage to give an understanding of the initial requirements of the system. This will show what high-level requirements the proposed system must address. This abstract will act as a foundation for the future analysis of the system.

Rescue System

Rescue system is the prime feature of our project. This module will require emergency situation information from the informer or the person who told the system about distress. This information should be in a form having location, contact number, and related information if any about the situation. Once an emergency event is initiated, it'll alert the volunteers and nearby rescue teams to move toward the location. Here only one team will be assigned the task of rescue and that team or volunteer will complete the job. If the task is not completed by a volunteer, a team will be assigned the job then.

Veterinary Doctor Appointment System

The logged-in customer or pet owner will visit the page of available doctors and will select a doctor according to his requirements. Then, he'll be asked to schedule an appointment from the available time slots of a doctor. If he selects the time, the doctor will be notified about the scheduled appointment and then the person will move to the payment page which will be the banking site for the transaction. From the doctor's side, he'll be able to see scheduled appointments from his side and will be able to change availability hours and fees.

Social Feed

This will serve as a community for pet owners. They'll be able to see posts of other users in their feed and like, and comment on them. These posts will be focused on pets only just like a Facebook group. Our first priority in this regard will be to integrate this module with Facebook APIs. Otherwise, we shall develop our own social media system.

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Project Overview Statement

As the name suggests, the project revolves around animal care and services related to them. Since everyone is so engaged in their lives, no one finds enough time to research their pet, which doctor is better, and where to find the best quality pet products. In case, some animal is ever struck in a do-or-die situation, no one knows how to help the poor soul. Thus keeping all this in mind, PETx will provide all these services with ease so that pet owners can serve their pets with peace of mind.

High Level System Components

- 1) Login / SignUp: Leads the user to Landing Page
- 2) Rescue Service: No login required, Immediate contact to rescue team
- 3) Appointment Section: Browse through doctors list, see reviews and choose from available appointment times.
- 4) Blog page: Users can share their insights, findings, research, experiences, or other information with each other.
- 5) Payment: Blockchain-based secure payment system

List of optional functional units

- Online store: Where users can buy all kinds of pet accessories, food, and medicines.
- Shelter Home: Where you can submit some stray / orphan animals, adopt a pet, or might abandon your pet as well.

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Gantt chart

ID	Name	Start Date	End Date	Duration
1	Iteration 1	Oct 31, 2022	Dec 31, 2022	62 days
2	Planning	Nov 01, 2022	Nov 14, 2022	14 days
3	Documentation	Nov 08, 2022	Nov 18, 2022	11 days
4	Research	Nov 16, 2022	Nov 26, 2022	11 days
5	Implementation	Nov 21, 2022	Dec 08, 2022	18 days
6	Testing	Dec 07, 2022	Dec 19, 2022	13 days
7	Bug Fixing	Dec 15, 2022	Dec 26, 2022	12 days
8	Deployment	Dec 26, 2022	Dec 30, 2022	5 days
9	Iteration 2	Jan 01, 2023	Feb 28, 2023	59 days
10	Planning	Jan 01, 2023	Jan 07, 2023	7 days
11	Documentation	Jan 08, 2023	Jan 14, 2023	7 days
12	Research	Jan 15, 2023	Jan 17, 2023	3 days
13	Implementation	Jan 16, 2023	Feb 10, 2023	26 days
14	Testing	Feb 12, 2023	Feb 15, 2023	4 days
15	Bug Fixing	Feb 16, 2023	Feb 20, 2023	5 days
16	Deployment	Feb 19, 2023	Feb 22, 2023	4 days
17	Iteration 3	Mar 01, 2023	Apr 30, 2023	61 days
18	Planning	Mar 01, 2023	Mar 08, 2023	8 days
19	Documentation	Mar 08, 2023	Mar 15, 2023	8 days
20	Research	Mar 15, 2023	Mar 18, 2023	4 days
21	Implementation	Mar 19, 2023	Apr 15, 2023	28 days
22	Testing	Apr 16, 2023	Apr 20, 2023	5 days
23	Bug Fixing	Apr 20, 2023	Apr 22, 2023	3 days
24	Deployment	Apr 21, 2023	Apr 27, 2023	7 days
25	Iteration 4	May 01, 2023	Jun 30, 2023	61 days
26	Planning	May 01, 2023	May 06, 2023	6 days
27	Documentation	May 05, 2023	May 08, 2023	4 days
28	Research	May 08, 2023	May 13, 2023	6 days
29	Implementation	May 18, 2023	Jun 17, 2023	31 days
30	Testing	Jun 16, 2023	Jun 19, 2023	4 days
31	Bug Fixing	Jun 18, 2023	Jun 21, 2023	4 days
32	Deployment	Jun 22, 2023	Jun 24, 2023	3 days

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Iteration One

	ID ↑ ⋮	Name	Nov, 22					Dec, 22					Jan, 23	
			30	06	13	20	27	04	11	18	25	01	08	
⋮	1	Iteration 1												
⋮	2	Planning												
⋮	3	Documentation												
⋮	4	Research												
⋮	5	Implementation												
⋮	6	Testing												
⋮	7	Bug Fixing												
⋮	8	Deployment												

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Iteration Two

ID ↑ :	Name	Jan, 23				Feb, 23				Mar, 23		
		01	08	15	22	29	05	12	19	26	05	12
9	Iteration 2											
10	Planning											
11	Documentation											
12	Research											
13	Implementation											
14	Testing											
15	Bug Fixing											
16	Deployment											

Iteration Three

ID ↑ ⋮	Name	Mar, 23				Apr, 23				May, 23				
		26	05	12	19	26	02	09	16	23	30	07	14	
⋮ 17	Iteration 3	<div></div>												
⋮ 18	Planning	<div></div>												
⋮ 19	Documentation			<div></div>										
⋮ 20	Research				<div></div>									
⋮ 21	Implementation					<div></div>								
⋮ 22	Testing									<div></div>				
⋮ 23	Bug Fixing										<div></div>			
⋮ 24	Deployment											<div></div>		

Iteration Four

			May, 23				Jun, 23				Jul, 23				
	ID ↑ ⋮	Name	30	07	14	21	28	04	11	18	25	02	09	16	
⋮	25	Iteration 4	<div></div>												
⋮	26	Planning	<div></div>												
⋮	27	Documentation		<div></div>											
⋮	28	Research			<div></div>										
⋮	29	Implementation				<div></div>									
⋮	30	Testing								<div></div>					
⋮	31	Bug Fixing								<div></div>					
⋮	32	Deployment									<div></div>				

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Application Architecture

We will be using Three-Tier architecture for this project. These 3 layers will be as

- 1) Frontend Tier
- 2) Application Tier
- 3) Database Tier

Frontend will be handled using HTML5, CSS3, ES6, and ReactJS. The application tier will be implemented using NodeJS and ExpressJS. While the last layer of the database will be implemented using MongoDB.

PETx Architecture

Introduction

The PETx application is a comprehensive platform built using the MERN stack (MongoDB, Express.js, React.js, Node.js). It consists of four main modules: Rescue Service, Ecommerce Shop, Doctor Appointment, and Social Media Blogging. This document aims to provide a concise overview of the architecture employed in PETx, highlighting the key components, their interactions, and the design choices made.

High-Level Architecture Overview

The PETx application follows a client-server architecture, where the client-side is built with React.js and the server-side is implemented using Node.js and Express.js. MongoDB is used as the database to store and retrieve application data. The architecture can be summarized as follows:

Component Breakdown

3.1 Rescue Service

The Rescue Service module allows users to report and seek assistance for lost or injured pets. It includes features such as reporting a lost pet, contacting nearby animal shelters, and providing real-time updates on rescue operations.

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3.2 Ecommerce Shop

The Ecommerce Shop module enables users to purchase accessories, food, and other pet-related products. It provides functionalities like product listing, filtering, shopping cart management, and secure payment integration.

3.3 Doctor Appointment

The Doctor Appointment module facilitates scheduling appointments with veterinarians. Users can view available time slots, book appointments, receive reminders, and maintain a history of their pet's medical visits.

3.4 Social Media Blogging

The Social Media Blogging module serves as a platform for pet owners to share experiences, write blogs, and connect with other pet enthusiasts. It includes features like creating blog posts, commenting, liking, and following other users.

Front-end Architecture

The front-end of PETx is developed using React.js, following a component-based architecture. Key components include:

4.1 App.js:

The root component that handles routing and navigation.

4.2 RescueService.js:

Implements the UI and logic for the Rescue Service module.

4.3 EcommerceShop.js:

Implements the UI and logic for the Ecommerce Shop module.

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4.4 DoctorAppointment.js:

Implements the UI and logic for the Doctor Appointment module.

4.5 SocialMediaBlogging.js:

Implements the UI and logic for the Social Media Blogging module.

State management is handled using Redux, allowing efficient sharing of data between components and maintaining a centralized application state.

Back-end Architecture

The back-end of PETx is built using Node.js and Express.js, providing a RESTful API to handle client requests. Key components and features include:

5.1 Server.js:

The main entry point that sets up the Express server and establishes database connections.

5.2 Routes:

Separate route files for each module (Rescue Service, Ecommerce Shop, Doctor Appointment, Social Media Blogging) that handle specific API endpoints and request handling.

5.3 Controllers:

Corresponding controllers for each module that contain the logic for processing requests, interacting with the database, and returning appropriate responses.

5.4 MongoDB Integration:

Utilizes the MongoDB Node.js driver to connect to the database, perform CRUD operations, and manage data persistence.

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Data Storage and Database Design

PETx utilizes MongoDB as the database to store and retrieve application data. The database design includes the following collections:

6.1 Users:

Stores user information including authentication details and user roles.

6.2 Pets:

Contains pet-related data such as pet details, owner information, and medical history.

6.3 Products:

Stores details about products available in the Ecommerce Shop module.

6.4 Appointments:

Records information about scheduled appointments with veterinarians.

6.5 BlogPosts:

Stores blog post content, author details, and associated metadata.

Authentication and Authorization

PETx implements user authentication and authorization using JSON Web Tokens (JWT). When users register or log in, a token is generated and included in subsequent API requests to verify the user's identity and permissions.

Deployment and Scalability

The PETx application is deployed using a cloud-based hosting platform such as Heroku. The deployment process involves setting up the server environment, configuring the database connection, and deploying the client-side application. To ensure scalability, load balancing and caching techniques can be employed, and the application can be containerized using Docker for easy deployment.

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Testing and Quality Assurance

PETx follows a comprehensive testing approach, including unit tests, integration tests, and end-to-end tests. Testing frameworks such as Jest and React Testing Library are used for front-end testing, while tools like Postman or Supertest are employed for API testing. Continuous integration (CI) and code quality tools such as Travis CI and ESLint are utilized to ensure code reliability and maintainability.

Performance Optimization

To improve performance, PETx implements various strategies, including client-side caching of static assets, server-side optimizations (e.g., GZIP compression, HTTP/2), and the use of a Content Delivery Network (CDN) to serve static content globally.

Security Considerations

PETx prioritizes security and implements measures such as input validation, encryption of sensitive data, and protection against common web vulnerabilities (e.g., XSS, SQL injection). Communication between the client and server is secured using HTTPS.

Error Handling and Logging

PETx implements robust error handling mechanisms to provide meaningful error messages to users and log errors for debugging and monitoring purposes. Logging is performed using libraries like Winston or Morgan, which log events and errors to a centralized logging service.

This document provides a concise overview of the PETx application's architecture, covering its high-level structure, key components, data storage, authentication, deployment, testing, security measures, and more. It serves as a comprehensive reference for understanding the architecture and implementation of PETx in the MERN stack.