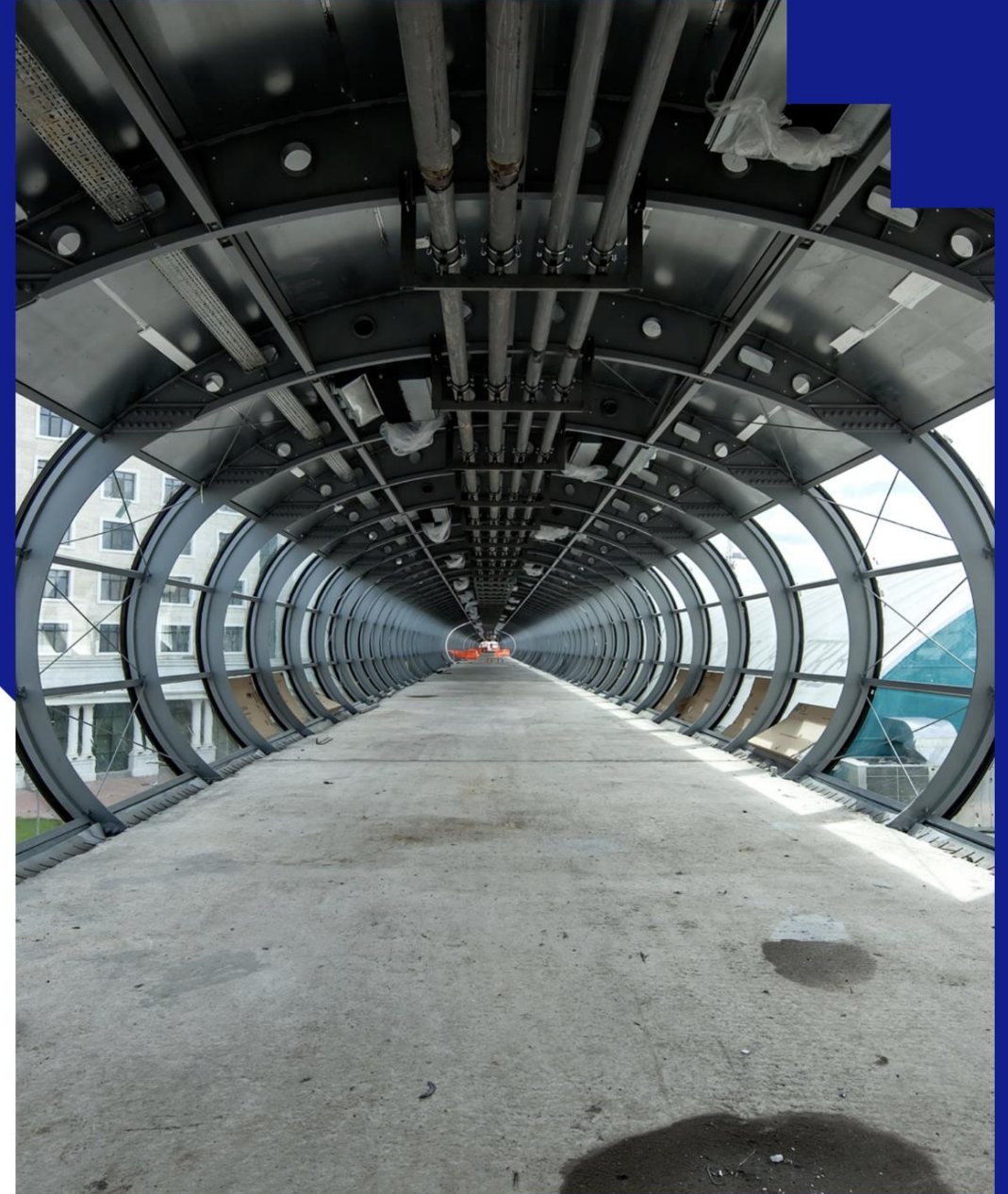




# Nazarbayev University Housing

A comprehensive overview of the Nazarbayev University Housing Management System.

CSCI409 | Senior Project II | Team 55



# Nazarbayev University Housing

01

## **Purpose: Identify inefficiencies**

Address inefficiencies in NU's dormitory operations, reliant on manual processes.

02

## **Solution: Centralized platform**

Implement a centralized digital platform to automate key processes.

03

## **Key Features: User-friendly UI**

Responsive UI for desktop/mobile, ensuring ease of use.

04

## **Technologies: Modern stack**

Utilizes Java Spring Boot, React.js, PostgreSQL, and Docker.

05

## **Outcome: Management approval**

System approved by Housing Management for operational use after testing.

# Challenges in Housing Operations



## Manual Processes Delay Maintenance

Current maintenance responses are significantly delayed due to reliance on manual processes, affecting service delivery.



## Errors in Room Assignments

Utilizing spreadsheet-based tracking leads to frequent errors in room assignments, compromising student satisfaction.



## Administrative Burden from Paperwork

Paper-based workflows create an administrative burden, making operations less efficient and increasing workload for staff.



## Impact on Student Satisfaction

These challenges collectively result in reduced student satisfaction and operational inefficiencies within housing management.

# Enhancing Housing Management

- **Primary Goal: Develop a platform**

The main goal is to create a web-based platform that improves housing management efficiency and enhances the user experience for both administrators and residents.

- **Automate room allocation**

Implement automation for room allocation processes, reducing manual effort and minimizing errors in managing housing assignments.

- **Real-time maintenance tracking**

Enable users to track maintenance requests and provide feedback instantly, ensuring timely responses and improved service quality.

- **Unified interface for users**

Create a single, cohesive interface for both administrators and residents, facilitating seamless interactions and information access.

- **Scalability of the platform**

Design the system to be scalable, accommodating future growth in user base and functionality without performance degradation.

- **Mobile accessibility**

Ensure the platform is accessible via mobile devices, allowing users to manage housing tasks on-the-go, increasing convenience and engagement.

# Nazarbayev University Housing Overview

## Client-Server Web Application

A robust client-server web application designed for efficient dormitory management.

## User Management Module

Facilitates management of various users: students, staff, and faculty.

## Property Management Features

Manages different housing types: dormitories, apartments, and cottages.

## Lease Management Capabilities

Streamlines the process of lease agreements and renewals.

## Maintenance Requests Handling

Allows users to submit and track maintenance requests effectively.

## Application Forms Integration

Incorporates application forms for seamless user engagement.

## User Roles Defined

Identifies three main user roles: Residents, Housing Staff, and Maintenance Personnel.

# Nazarbayev University Housing Sys

## Deployment Strategy

Utilizing **Docker** and **Docker Compose** enhances the scalability and manageability of the application during deployment.

## Backend Frameworks

The backend is built on **Java Spring Boot** and **Spring Data JPA**, ensuring robust data handling and integration with **PostgreSQL** for storage.

## Client-Server Architecture

The system utilizes a **client-server** architecture, enabling efficient communication between the frontend and backend components.



## RESTful APIs

Employing **RESTful APIs** with **Swagger** documentation facilitates seamless interaction between the frontend and backend systems.

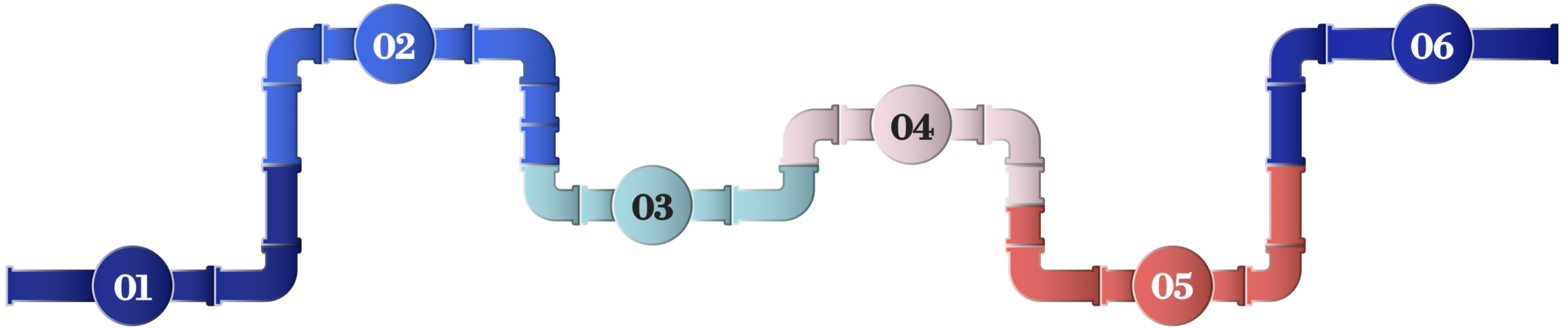
## Frontend Technologies

Leveraging **React.js (v18)**, **TypeScript**, and **TailwindCSS** ensures a modern, responsive UI with real-time capabilities using **ApexCharts**.

# Essential Features Overview

- 01 Room Assignment**  
Automated and manual allocation based on availability/preferences.
- 02 Maintenance Requests**  
Residents submit tickets, track status in real-time.
- 03 Contract Management**  
Automated lease creation, renewal, and termination.
- 04 Dashboard**  
Real-time metrics (leases, applications, maintenance).
- 05 Application Forms**  
Streamlined housing application process.

# Agile Development Process Overview



## Agile Methodology

Utilizing **Agile** with 2-week sprints for efficient project management through **Jira**.

## Research Phase

Conducting **3 visits** to the **Housing Management Office** to accurately identify user needs.

## Design Phase

Creating **UI/UX prototypes** using **Figma** to visualize user interactions and design concepts.

## Implementation Phase

Engaging in **full-stack development** utilizing **React.js** for the frontend and **Spring Boot** for the backend.

## Testing Phase

Performing **user testing** and gathering **iterative feedback** to refine the system before launch.

# Technological Framework Overview

## Frontend Technologies

Utilizing **React.js** and **TypeScript** for robust UI development.

01

## IDE Utilization

Development is facilitated by **IntelliJ IDEA** for enhanced productivity.

05

## Design Tools

Using **Figma** for efficient UI/UX wireframing and prototyping.

04

## Backend Frameworks

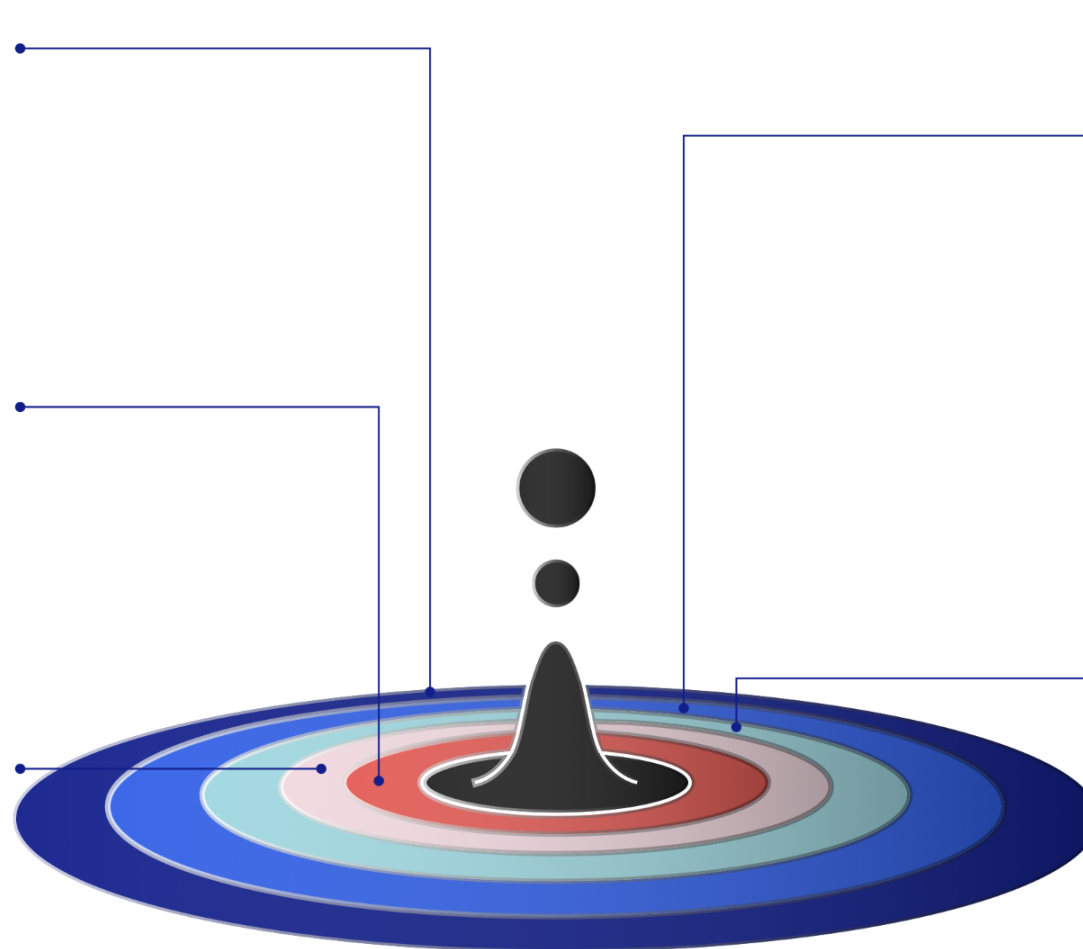
Employing **Java Spring Boot** with **PostgreSQL** for data management.

02

## DevOps Tools

Leveraging **Docker** and **GitHub** for streamlined version control.

03



# Team Roles and Collaboration Overview

01

## Miras Zakaryanov

Handles system design and backend development using Spring Boot, along with Dockerization for containerization.

02

## Nurbergen Agadil

Focuses on database setup using PostgreSQL and backend optimization strategies for improved performance.

03

## Ralina Tashenova

Leads project management, sprint planning, and creates video presentations to communicate progress and updates.

04

## Aktilek Ishanov

Responsible for UI/UX design using Figma and frontend development utilizing React to enhance user experience.

05

## Temirlan Sansyzbay

Contributes to frontend development and conducts security testing to ensure application integrity and safety.

06

## Collaboration

Engages in weekly meetings, utilizes Jira for task tracking, and GitHub for effective code management among team members.



FEEDBACK PROCESS

# Evaluation and Feedback for Housing Management



Three comprehensive review sessions conducted with the Housing Management Office to enhance UI and backend logic, leading to final operational approval.

# Housing Management Project Outcomes

## **Achievements: Fully functional prototype**

Developed a prototype that effectively meets the primary housing needs of the users, showcasing robust functionality.

## **Limitations: Payment system integration pending**

Integration of payment systems is still pending, limiting the financial functionalities of the housing management system.

## **Achievements: Streamlined workflows**

Implemented efficient administrative processes that enhance interactions between residents and management, promoting better communication.

## **Impact: Improved efficiency**

The project has resulted in enhanced operational efficiency, reducing time spent on administrative tasks and improving service delivery.

## **Achievements: Scalable architecture**

Designed the system with scalability in mind, allowing for future upgrades and enhancements as new requirements emerge.

## **Impact: Enhanced student experience**

By addressing core needs, the project significantly improves the overall experience for students living in university housing.

## **Limitations: Electronic signatures not implemented**

The system currently lacks support for electronic signatures on contracts, which may hinder some administrative processes.

# Future Enhancements Overview



## Planned Features

The upcoming features aim to improve user experience and system efficiency.



## Multilingual interface support

This feature ensures accessibility for users from diverse linguistic backgrounds.



## Real-time maintenance notifications

Users will receive immediate alerts regarding maintenance issues, enhancing responsiveness.



## Integration with NU's student portal

Seamless integration with my.nu.edu.kz will enhance user experience for students.



## Analytics dashboards for resource planning

Dashboards will provide insights for efficient resource management and decision-making.



## Modular design for scalability


The system's modular architecture allows for easy addition of new features or users.



## CONCLUSION

# Modern Dormitory Management System

This presentation highlights the implementation of a scalable, automated dormitory management solution that enhances operational efficiency and supports a smarter campus infrastructure.



# Engaging Q&A Session



## **Audience Engagement**

Encourage participants to share their thoughts and questions, promoting a collaborative atmosphere.



## **Clarification of Concepts**

This is an opportunity to clarify any complex topics discussed in the presentation regarding the Housing Management System.



## **Feedback Collection**

Gather valuable feedback from the audience to improve future presentations and the Housing Management System itself.



## **Addressing Concerns**

Address any concerns or issues raised by the audience, ensuring transparency and building trust.