EUROPEAN UNIVERSITY OF LEFKE

FACULTY OF ENGINEERING

Graduation Project I

Hotel Management Automation

Zübeyir Kaan Zünbülcan

191228

Hotel Management Automation is a comprehensive project that facilitates the management of hotels. The priority of this project is to provide a web-based booking system to customers and a desktop application to hotel staff in order to simplify processes, increase efficiency and improve the overall guest experience. The aim of this project is to streamline the management operations of the hotel, increase operational efficiency and provide a simple and fast booking service to its guests.

Supervisor

Cem Kalyoncu

08.06.2023

Table Of Contents

1.Introduction

1.1 Problem definition

The current manual hotel management systems have various difficulties and limitations that hinder efficient operations and customer satisfaction. The lack of automation in the hospitality industry results in slow and error-prone processes, poor resource management, ineffective communication and poor guest experience. Therefore, there is an urgent need for a comprehensive software solution that automates various hotel management tasks and improves overall operations. –

The main problem solved by the proposed hotel management automation system is the lack of an integrated and facilitated reservation process for customers and an efficient management system for hotel staff. Double reservation, guest data errors and late check-in/check-out are common situations in our current manual reservation system. Similarly, the lack of a centralized management system makes it difficult to manage space allocation and employee coordination. The proposed solution aims to reduce these problems by developing two modules - a web-based booking system for customers and a desktop application for hotel staff. A web-based booking system provides customers with an intuitive and easy-to-use interface for finding availability, making reservations and managing reservations. This module automates the reservation process, providing accurate availability information, instant reservation confirmation and efficient pay management.

Desktop applications for hotel staff make it easy to manage various hotel operations. This includes features such as room allocation, check-in/check-out management, inventory tracking, invoicing and billing, workforce planning and reporting. By centralizing these tasks in a single easy-to-use desktop application, the system increases operational efficiency, reduces errors and improves collaboration between hotel staff.

In general, these projects are aimed at addressing the challenges faced by the hotel industry in terms of manual processes, inefficient resource management and poor customer experience. The project will develop a web-based booking system for customers and a desktop application for hotel staff to automate basic hotel management tasks, simplify operations, and improve overall efficiency and quality of service in the hospitality industry.

1.2 Goals

1. Develop a web-based reservation system.

- Purpose: To create an easy-to-use web-based reservation system that simplifies the reservation process for customers.
- Details: The system should provide real-time availability information, allow customers to easily search for availability, ensure a smooth reservation and paying process, and provide instant reservation confirmations.
- Benefits: Better customer satisfaction, fewer manual errors, better reservation efficiency, more revenue from online reservations.

2. Design a desktop application for hotel staff management.

- Purpose: To develop a desktop application that provides effective management of hotel operations for employees.
- Details: The application should include features such as room allocation, check-in/check-out management, inventory tracking, invoicing and billing, personnel planning and reporting.
- Benefits: Simplify hotel operations with comprehensive reporting and analysis, improve staff productivity, improve the accuracy of guest data and invoice management, and improve decision-making process.

3. Optimize resource allocation and management.

- Purpose: To centralize and automate the resource management process within the hotel.
- Details: The system should be able to effectively manage space occupancy, inventory and staffing schedules to maximize resource utilization and prevent overbooking and underutilization.
- Benefits: efficient use of hotel facilities and personnel; improved revenue management; minimized errors and conflicts in resource allocation; increased overall operational efficiency.

4. Improve the guest experience and satisfaction:

- Purpose: To provide a superior guest experience by automating processes and customizing services.
- Details: The system should streamline check-in/check-out procedures, allow customization of guest preferences, properly manage billing and invoicing, and respond instantly to guest questions and requests.

- Benefits: Increased guest satisfaction, increased service quality, increased customer loyalty, positive word-of-mouth communication.

5. Produce comprehensive reports and analyses.

- Purpose: To provide valuable information for hotel management to make informed decisions.
- Details: The system should generate comprehensive reports and analyses on occupancy, revenue analysis, guest preferences and staff performance, among other relevant metrics.
- Benefits: data-based decision-making, increased operational efficiency, identification of areas for improvement, strategic planning for future growth.

2. Literature Survey

Existing systems also used manual processes for tasks such as property management and customer support. This can lead to problems such as paper records for tracking accommodation or irregular accumulated invoices. This project, on the other hand, makes these operations very easy with its efficient, fast, safe and easy operation in the shortest possible time.

Although we are looking at the applications used today, and there are advanced applications in general, we are aiming to collect the shortcomings in all of them and reveal an integrity with this application. Today's applications can also take time for the user to understand the application, and this causes them not to use these applications.

In this project, the usability is also at a high level and an easy and simple use is aimed at the user. The user will gladly use an application prepared in this way, which will create trust in terms of the application. The fact that the application keeps up with the developing technologies also creates an attraction for the user.

It also includes the wishes of the user that are developing with the developing technologies and special innovations can be brought to each user. In this way, a program prepared according to the user's request will also be in great demand in the accommodation sector. As someone who has been in the accommodation sector for more than 5 years, I have observed these shortcomings well, and taking these shortcomings into account, we are developing a useful application for this sector.

3. Background Information

I will use HTML5, CSS, JavaScript for the web part and I will use C# for the desktop application part.

3.1 Required software

- **ASP.NET Mvc5:**
- **Entity Framework**
- **DevExpress**
- **Visual Studio Code**
- **MYSQL**

3.2 Other software

- **Adobe Illustrator :**

  For design icons and logos.

- **Adobe XD :**

  For designing presentation poster

4. Modules

4.1 Reservation and registiration

This module will be the web part of my project, it can be used by our guests. It will contain information and promotion of the hotel.

4.1.1 Registiration

You will registier with your name-surname, email, phone number and password

4.1.2 Login

You will be login with your email and password**.**

4.1.3 Guest Panel

You have profile, reservation and chat pages.

4.2 Management

After this part, the project switches to desktop form application.

4.2.1 Staff

Record of staff and their jobs

4.2.2 Reservations

The part where we can view and arrange reservations

4.2.3 Reception

Face-to-face transactions with the customer at the reception

4.2.4 Graphics

The part where there are graphs related to hotel occupancy rates.

5. Risk Analysis

1. Technology Compatibility:

- Risk: HTML5, CSS, JavaScript, C#, ASP.NET Problems may occur due to compatibility between various technologies used in projects such as Mvc5, Entity Framework, DevExpress Dec.
- Mitigation: Comprehensively test the integration of these technologies to ensure compatibility and address potential conflicts and problems early in the development process. Look at the relevant documents, forums, or support resources for help.

2. Learning curve:

- Risk: The project involves multiple technologies, some of which may require team members to learn or become familiar with.
- Damage Control: Provide appropriate training or give your team members enough time to master the necessary technology. It encourages collaboration and information sharing among team members to benefit from collective expertise.

3. Time limit:

- Risk: Failure to allocate sufficient time for development, testing and error correction may lead to delays and poor quality.
- Damage Control: Create a realistic project schedule that takes into account system complexity and the learning curve associated with new technology. Divide your project into manageable tasks and allocate enough time for each stage. Monitor progress regularly and make the necessary adjustments to reach project milestones.

4. Vulnerability:

- Risk: Insufficiently secure web-based reservation systems and desktop applications may lead to data breaches, unauthorized access and other vulnerabilities.

- Throttling: Implement security best practices such as login authentication, secure communication protocols, appropriate authentication and authorization mechanisms, and encryption of sensitive data. Perform regular security assessments and tests to proactively identify and troubleshoot vulnerabilities.

5. Third-party library dependencies:

- Risks: Relying on third-party libraries such as DevExpress brings risks such as compatibility issues, license restrictions, and lack of support.
- Damage limitation: Please carefully check the compatibility of third-party libraries and license terms before integration. Choose a reputable and well-supported library with regular updates and community support. Have a contingency plan in case of unforeseen problems or restrictions.

6.Scalability and performance:

- Risk: Poor system design or implementation can lead to scalability and performance problems, especially as user bases and data volumes grow.
- Mitigation: Design your system with scalability in mind, taking into account factors such as database optimization, efficient query design, caching mechanisms, and load balancing. Run performance tests in different scenarios to identify bottlenecks and optimize system performance accordingly.

7. User Approval:

- Risk: The final product may not meet the expectations and needs of the end user, which may lead to inadequacy or dissatisfaction in the adoption of users.
- Mitigation: Involve end users throughout the development process, collect feedback and requirements, and incorporate their input into the system design. Conduct user testing and usability studies to verify the usability of the system and address issues and concerns raised by users.

6. Ethics

1. Privacy and data protection:

- * To ensure the protection of customer and staff data by implementing robust security measures. We protect personal information against unauthorized access, use and disclosure. We obtain explicit consent from individuals for the collection and processing of their data and process their data in accordance with applicable data protection regulations.

2. Justice and Equal Treatment:

- * To design reservation systems and management applications to ensure that all customers and employees are treated fairly and equally. Avoid biased algorithms and decision-making processes that can lead to discrimination based on factors such as race, gender, religion, or other protected characteristics.

3. Transparency and Informed Consent:

- Provide users with clear and transparent information about data collection, use and storage. Obtain informed consent from users for data processing activities. Communicate system limitations, risks or changes to users in a timely and transparent manner.

4. Intellectual Property Rights:

- Comply with intellectual property rights and license agreements when using third-party libraries, frameworks, or software components. Comply with the software licenses and properly link the open source contributions used in the project.

5. Professional behavior:

- Maintain a professional attitude and integrity throughout the project. We create a respectful and inclusive working environment by treating team members, stakeholders and end users fairly, respectfully and with dignity. Promote open communication and cooperation between all stakeholders.

6. User Experience and Ease of Use:

- Give priority to user experience and ease of use when designing web-based booking systems and desktop applications. Create an intuitive user interface to minimize user confusion and provide clear instructions. Try to meet the needs and preferences of a wide range of users, including people with disabilities.

7. System Reliability and Responsibility:

- Ensure system reliability and accountability by conducting rigorous testing, quickly correcting detected problems, and maintaining a robust troubleshooting process. We take responsibility for system failures, report them transparently and take appropriate corrective action.

8. Sustainable Development:

- Consider the environmental impact of the project by optimizing resource utilization, minimizing energy consumption, and adopting sustainable practices wherever possible. We

choose environmentally friendly equipment, promote efficient code and database design, and support responsible waste management.

7. Conclusion

Once completed, the Hotel Management Automation project will bring several benefits to both the users and myself, while also addressing the specific reasons that led to its selection. Additionally, there are potential future tasks and improvements that can be undertaken.

7.1 Benefits

A. User Benefits:

1. Increased Efficiency: Users experience streamlined and automated processes such as easy online reservations, efficient check-in/check-out procedures, accurate billing, and personalized service. This saves time and improves the overall guest experience.
2. Increased accuracy: By automating various hotel management tasks, errors in room allocation, inventory tracking and billing are reduced and customer satisfaction is increased by minimizing inconsistencies.
3. Real-time information: The web-based reservation system provides up-to-date information about room availability so that users can make informed decisions and secure reservations instantly.

B. Advantages for me:

1. Skill Development: HTML5, CSS, JavaScript, C#, ASP.NET Mvc5, Entity Framework, DevExpress are working on this project. Gain hands-on experience in developing web-based and desktop applications and improve your problem-solving and software development skills.
2. Specialization: Entering the hospitality management industry can provide valuable information about the industry's processes, challenges and best practices that can be useful for future career opportunities.
3. Project Management Experience: Leading this project will give you valuable project management skills that you can successfully apply to other professional tasks such as planning, organization, communication and teamwork.

Why did I choose this project?

The main idea that attracted me to undertake the Hotel Management Automation project is the opportunity to combine my passion for software engineering with the practical application in the hospitality industry. This project aligns perfectly with my academic background in software engineering and my interest in developing innovative solutions. The chance to automate and optimize hotel management processes, improving the overall guest experience and operational efficiency, is a compelling motivation for me. (staj mevzusunu ekle)

7.2 Future Works

After graduation, I will do my internship in this field as well, but I don't know if I will develop this project further. But if I continue to develop this project I probably will implement further improvements. Some potential future tasks include:

1. Mobile Application Development.
2. Integration with Online Travel Agencies.
3. Exploring the integration of smart technologies, such as IoT devices and voice assistants, to enhance guest experiences and automate specific tasks, is a growing trend in various industries.
4. Continuous System Upgrades: Regular updating and maintenance of the system to include new technologies, security improvements and user feedback for a constantly evolving user experience.

8. References

Hotel Automation Checklist: Trends, Tools, and Tips for Success. (2022). *eZee Absolute*. https://www.ezeeabsolute.com/blog/hotel-automation/ adresinden alındı

Hotel automation: benefits & tools to improve operations. (2023). *Oaky*. https://oaky.com/en/blog/hotel-automation adresinden alındı

Hotel Automation: Tools & Tips for Better Operations Performance. (2023). *Operto*. https://operto.com/hotel-automation/ adresinden alındı

Hotel Automation: Trends, Tools, and Tips to Know. (2022). *cvent*. https://www.cvent.com/en/blog/hospitality/hotel-automation adresinden alındı