

E-Barbershop Management System
SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY



Muranga University Of Technology

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DECLARATION

This project is my original work and has never been presented before

Name:

Signature: **Date:**

Approval:

SUPERVISOR:

I the undersigned do hereby certify that this is a true report for the project undertaken by the above named student under my supervision and that it has been submitted to Muranga University with my approval.

Supervisor's name:

Signature: **Date** **APRIL 2025**

DEDICATION

I dedicate this project to the hardworking barbers, loyal customers, and dedicated shop owners whose commitment to excellence inspires innovation and progress.

To the customers, whose trust and support drive us to continuously improve service delivery.

To the barbers, whose skills, passion, and dedication are the foundation of every successful barber shop.

To the shop owners, whose leadership, vision, and determination ensure the smooth operation and growth of their businesses.

This project is dedicated to all those who work tirelessly to deliver grooming services and create a welcoming environment. May the E-Barber Shop Management System serve as a testament to our commitment to modernizing barber shop operations and enhancing customer satisfaction.

ABSTRACT

The E-Barber Shop Management System is a robust software solution designed to transform administrative and customer service processes within barber shops. Its primary objective is to enhance operational efficiency, streamline appointment scheduling, and optimize resource allocation. This comprehensive system encompasses a suite of modules tailored to meet the unique needs of modern barber shops. From customer registration and online appointment booking to employee management, inventory control, billing, and reporting, each module is carefully crafted to integrate seamlessly into existing workflows. Key features include centralized customer management, automated booking processes, inventory and product management, and employee scheduling. Built on a secure and scalable platform using Django, the E-Barber Shop Management System prioritizes data security and accessibility. By leveraging technology, it empowers shop owners to deliver exceptional services, improve resource utilization, and enhance customer satisfaction. In summary, the E-Barber Shop Management System offers a holistic solution to the multifaceted challenges encountered by modern barber shops.

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PROBLEM STATEMENT

In today's fast-paced world, customers often find it inconvenient and time-consuming to wait in long queues at barber shops without prior appointments. The problem is, most traditional barber shops still rely on manual walk-in systems, where customers visit physically, wait for their turn, and sometimes discover that the barber is unavailable due to unforeseen circumstances or that the shop is overcrowded.

This results in wasted time, customer dissatisfaction, and inefficiencies in managing barber schedules and resources. Furthermore, customers may need to travel a considerable distance only to find out that their preferred barber is unavailable or the shop is fully booked, leading to frustration.

The E-Barber Shop Online Management System addresses all these challenges by enabling customers to book their appointments online from the comfort of their homes. They can view barber availability, select specific services, and schedule appointments based on their preferences. Barbers can confirm or decline appointments in real time, giving both parties clarity and saving time and effort.

Additionally, customers can make payments for their grooming services online, ensuring a seamless and efficient transaction process. For barber shops, the system offers a centralized platform to manage bookings, staff schedules, inventory, and customer data, leading to improved operational efficiency and enhanced customer satisfaction.

The implementation of this system is essential for modern barber shops to stay competitive, minimize operational bottlenecks, and offer superior customer experiences in the digital age.

Benefits of Implementing an E-Barber Shop Management System:

• Online Appointment Booking

- Enables customers to book appointments in advance, reducing long queues and waiting times.
- Equipped with features like automated email and SMS reminders to notify customers about their upcoming appointments.

• Role-Based Access Control

- Allows barbers, administrators, and shop owners to access only the information necessary to perform their duties.
- Enhances data security, ensures sensitive customer information is protected, and maintains system integrity.

• Overall Cost Reduction

- Eliminates the need for paper-based record keeping, reducing stationery and administrative costs.

- No need for setting up separate physical servers; the system operates on a centralized web platform.

- **Data Accuracy**

- Reduces manual errors by automating appointment bookings, inventory tracking, and billing processes.
- Provides alerts when product inventory (such as shaving cream, blades, etc.) is running low, ensuring smooth operations.

- **Data Security**

- Ensures that customer records, transaction details, and staff information remain private and secure.
- Access control mechanisms prevent unauthorized access and data breaches.

- **Revenue Management**

- Simplifies daily financial tracking, allowing shop owners to easily monitor earnings and expenses.
- Provides detailed reports and analytics on services provided, customer visits, and financial trends, aiding in business growth and planning.

PROCESS MODEL

The E-Barber Shop Management System follows the **INCREMENTAL MODEL** as its software development approach. Initially, the core software requirements, such as appointment booking, customer management, and payment integration, are well-defined. However, the overall scope of the project is flexible and allows for additional features to be introduced in later stages based on user feedback and evolving business needs.

The incremental model suits this project because it enables the development team to deliver a working version of the system early, incorporating essential modules like customer registration and booking management. Additional features—such as loyalty programs, customer reviews, advanced reporting, and promotional offers—can be integrated in subsequent increments.

Given that this is a short-term project scheduled for completion within **3 months and 3 weeks** and with a small team size of **3 developers**, the incremental model allows us to manage limited resources effectively while ensuring continuous delivery of functional components. This approach also allows us to gather user feedback at each stage and refine the system incrementally to meet the evolving expectations of both shop owners and customers.

CHAPTER ONE: INTRODUCTION

1.0 INTRODUCTION

The introduction highlights the background and context of the research, its purpose, and the implications it has. It also describes the statement of the research problem, the research objectives, and the scope of the study, and finally concludes on the significance and scope of the research.

In recent years, there has been a growing recognition of the need for efficient and streamlined management systems in small service-based businesses such as barber shops. With the increasing demand for quality customer service, rising operational costs, and advancements in technology, barber shops are under pressure to optimize their operations while maintaining high standards of service delivery.

The E-Barber Shop Online Management System project emerged in response to these pressing needs within the grooming industry. Recognizing the limitations of traditional manual processes and disparate systems for managing customer bookings, staff schedules, billing, inventory, and employee management, there was a clear imperative to develop a comprehensive and integrated solution.

The project team conducted extensive research and needs assessments to understand the specific requirements and pain points of barber shop owners, administrators, staff members, and customers. It became evident that there was a critical need for a robust, user-friendly, and scalable barber shop management system that could streamline workflows, improve efficiency, enhance communication, and ultimately, enhance the overall customer experience.

Drawing on best practices in software development, service management, and user experience design, the E-Barber Shop Online Management System project set out to create a state-of-the-art solution tailored to the unique needs of modern barber shops. By leveraging the latest technologies and incorporating feedback from stakeholders throughout the development process, the project aimed to deliver a comprehensive software platform that would revolutionize barber shop administration and service delivery.

Through collaboration with shop owners, staff, IT experts, and customers, the project team embarked on the journey to design, develop, and implement the E-Barber Shop Online Management System. With a focus on usability, scalability, security, and interoperability, the system was designed to address the diverse needs of barber shops of all sizes and specialties.

The development of the E-Barber Shop Online Management System represents a significant milestone in the ongoing evolution of service management and technology. By providing barber shops with a powerful tool to streamline operations, improve efficiency, and enhance customer satisfaction, the system has the potential to make a profound impact on the delivery of grooming services and the growth of businesses.

1.2 Problem Statement

Despite the significant advancements in digital technology, many barber shops grapple with inefficient operational processes due to continued reliance on traditional manual booking systems or disconnected software solutions. These outdated methods lead to fragmented customer information storage, resulting in duplication of efforts and difficulties in accessing crucial data promptly. Manual workflows for customer registration, appointment scheduling, billing, and inventory management exacerbate these challenges, leading to errors, delays, and diminished staff and customer satisfaction. Moreover, the lack of real-time data accessibility hampers decision-making, while security risks associated with outdated systems pose concerns for customer confidentiality. Existing solutions often lack scalability, further complicating efforts to adapt to the changing needs of growing barber businesses. In light of these issues, there is a pressing need for an integrated barber shop management system capable of addressing these challenges, streamlining operations, enhancing data accessibility, and ultimately improving customer service. The E-Barber Shop Online Management System project endeavors to develop such a solution, one that is comprehensive, user-friendly, scalable, and aligned with the evolving demands of modern barber shops.

1.3 Proposed System

The proposed solution, the E-Barber Shop Online Management System, offers a comprehensive and innovative software platform designed to transform barber shop operations and elevate customer service delivery. Through a cohesive integration of cutting-edge technology and intuitive design principles, this system presents a multifaceted approach to addressing the diverse needs of barber shops while prioritizing efficiency, accuracy, and scalability. Central to its functionality are a series of interconnected modules tailored to streamline critical aspects of barber shop management. These modules include customer management, appointment scheduling, service catalog management, billing and invoicing, inventory control, staff management, and promotional offers management. By digitizing customer records, optimizing appointment scheduling, and automating administrative tasks, the system enhances operational efficiency and promotes personalized customer service.

Furthermore, features such as real-time inventory monitoring, automated billing processes, and streamlined service management ensure resource optimization and smooth operations. Built upon a foundation of secure and scalable architecture, the E-Barber Shop Online Management System facilitates seamless integration with existing business systems and promotes interoperability with external payment platforms. In essence, this proposed solution represents a holistic approach to addressing the complex challenges faced by modern barber shops, with the ultimate goal of improving customer satisfaction, business efficiency, and fostering growth in the competitive grooming industry.

1.4 Proposed Project Title

Optimizing Barber Shop Operations: The E-Barber Shop Online Management System

1.5 Specific objectives

1. Develop a user-friendly interface for the E-Barber Shop Online Management System that enables easy navigation and accessibility for customers, shop owners, barbers, and administrators.
2. Design and implement a customer management module that allows for efficient registration, tracking, and management of customer information, including personal details, service history, and appointment records.
3. Create an appointment scheduling module that automates the booking process, minimizes conflicts, and optimizes resource allocation to enhance shop workflow efficiency.
4. Implement a service catalog and customer history module to digitize and centralize service records, facilitating accurate documentation, information retrieval, and personalized customer service.
5. Develop a billing and invoicing module that streamlines revenue cycle management processes, including service billing, digital payments processing, and financial reporting.
6. Design and integrate an inventory management module that optimizes product workflows, stock control, product usage tracking, and restocking notifications to ensure smooth operations and customer satisfaction.

1.6 Justification

The development and implementation of the E-Barber Shop Online Management System are essential for several reasons:

1. **Enhanced Operational Efficiency:** By streamlining administrative processes, the system will improve overall operational efficiency, reducing manual errors, minimizing delays, and optimizing resource utilization. This efficiency will lead to cost savings and better allocation of staff time and shop resources.
2. **Improved Customer Service:** With centralized customer records, automated appointment scheduling, and efficient inventory management, barber shop staff will be better equipped to deliver high-quality services. Access to accurate customer information and streamlined workflows will enhance communication among staff, leading to better coordination and improved customer satisfaction.
3. **Compliance and Accountability:** The E-Barber Shop Management System will ensure compliance with data privacy regulations and industry standards. This will mitigate legal risks, enhance accountability in service delivery, and protect customer information.

4. **Data-Driven Decision Making:** The system will provide real-time access to key performance indicators, service metrics, and financial data, empowering shop owners and management to make informed decisions. This data-driven approach will support strategic planning, marketing strategies, and business growth initiatives.
5. **Scalability and Adaptability:** Designed with scalability in mind, the E-Barber Shop Management System will be able to grow and adapt to the evolving needs of barber shops. Whether a small local shop or a chain, the system can accommodate changes in customer volume, services offered, and market trends over time.
6. **Enhanced Customer Experience:** By reducing wait times, minimizing paperwork, and improving communication between customers and staff, the system will enhance the overall customer experience. Customers will benefit from more efficient appointments, personalized services, and improved access to barber services.
7. **Competitive Advantage:** Implementing the E-Barber Shop Management System will provide a competitive advantage for barber shops, positioning them as leaders in quality, efficiency, and innovation. This can attract new customers, improve staff retention, and enhance the shop's reputation within the community.

1.7 Scope

The scope of the E-Barber Shop Online Management System project encompasses the following key areas:

1. **Modules:** The development of a comprehensive set of modules including customer management, appointment scheduling, service catalog management, billing and invoicing, inventory control, staff management, and promotional offers management.
2. **Functionality:** Each module will be designed to perform specific functions related to its area of focus, such as customer registration, appointment booking, service record-keeping, billing, product inventory tracking, and employee scheduling.
3. **Integration:** The system will be designed to seamlessly integrate with existing business tools and external payment platforms (e.g., M-Pesa) to ensure interoperability, efficient payment processing, and customer engagement.
4. **User Interfaces:** User-friendly interfaces will be developed for customers, barbers, administrators, and shop owners to facilitate easy navigation, data input, and retrieval, ensuring a smooth user experience.
5. **Security:** Robust security measures will be implemented to protect customer data confidentiality and integrity, including access controls, data encryption, and audit trails, in compliance with data protection standards.
6. **Scalability:** The system will be designed to accommodate the needs of barber shops of varying sizes, with scalability features to support growth, changes in customer volume, and expansion of services over time.
7. **Testing and Validation:** Comprehensive testing and validation procedures will be conducted to ensure the functionality, reliability, and performance of the system, including unit testing, integration testing, user acceptance testing, and stress testing.

8. **Training and Support:** Training programs and support services will be provided to shop owners, barbers, and administrators to facilitate effective adoption and utilization of the system, ensuring its successful implementation and integration into daily operations.
9. **Documentation:** Thorough documentation will be produced, including user manuals, technical specifications, system architecture diagrams, and training materials, to support system implementation, maintenance, and ongoing support.
10. **Project Management:** Effective project management practices will be employed to ensure timely delivery, budget adherence, and stakeholder engagement throughout the project lifecycle, including project planning, execution, monitoring, and closure

1.8 Risks and mitigations

□ Technical Complexity:

Risk: The project may encounter technical challenges or complexities during system development, leading to delays or quality issues.

Mitigation: Conduct thorough technical feasibility studies and engage experienced developers and technical experts to address potential challenges. Implement agile development methodologies to adapt to changing requirements and mitigate risks incrementally.

□ Security Vulnerabilities:

Risk: The system may be susceptible to security breaches, data leaks, or unauthorized access, compromising customer confidentiality and data integrity.

Mitigation: Implement robust security measures, including encryption, access controls, regular security audits, and compliance with data protection standards. Provide training to staff on data security best practices to mitigate human error risks.

□ Integration Challenges:

Risk: Integrating the system with existing business tools and external payment platforms may pose compatibility issues or data interoperability challenges.

Mitigation: Conduct thorough compatibility assessments and develop standardized data exchange protocols to facilitate seamless integration. Collaborate closely with IT teams and external partners to address compatibility issues proactively.

□ User Adoption Resistance:

Risk: Barber shop staff and administrators may resist adopting the new system due to concerns about change management, workflow disruption, or lack of familiarity with technology.

Mitigation: Involve end-users in the system design and development process to ensure alignment with their needs and preferences. Provide comprehensive training and support programs to facilitate smooth adoption

and transition. Communicate the benefits of the new system and address concerns proactively through change management initiatives.

□ **Budget Overruns:**

Risk: The project may exceed its allocated budget due to unforeseen expenses, scope creep, or resource constraints.

Mitigation: Develop a detailed project budget with contingency provisions for unexpected expenses. Implement rigorous budget monitoring and control mechanisms to track expenses and identify variances early. Prioritize project requirements and manage scope changes through formal change control processes to mitigate scope creep risks.

□ **Staff Turnover or Availability:**

Risk: Key project team members may leave the project or become unavailable due to unforeseen circumstances, impacting project continuity and deliverables.

Mitigation: Implement knowledge transfer processes to document key project information and share expertise among team members. Cross-train team members on critical tasks to mitigate the risks associated with staff turnover. Maintain open communication channels and establish backup plans to address resource availability issues promptly.

□ **Regulatory Compliance Changes:**

Risk: Changes in business regulations or compliance requirements may necessitate modifications to the system, leading to delays or rework.

Mitigation: Stay informed about regulatory changes and proactively monitor compliance requirements relevant to the grooming industry. Design the system with flexibility and scalability to accommodate future regulatory changes. Engage legal experts or consultants to ensure ongoing compliance and mitigate legal risks.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

A literature review is a text written by someone to consider the critical points of current knowledge including substantive findings as well as theoretical and methodological contributions to a particular topic. Main goals are to situate the current study within the body of literature and to provide context for the particular reader. (Cooper, 1998)

2.1 Online Barber Shop Management System

The focus centers on the development and implementation of an online barber shop management system, a pivotal advancement in modern service industry management. At its core, this system serves as a comprehensive platform encompassing various modules crucial for efficient barber shop operations. These modules include customer management, appointment scheduling, service catalog management, billing, inventory control, staff management, and more. Our approach to system design emphasizes user-centricity, with intuitive interfaces tailored to the diverse needs of customers, barbers, administrators, and shop owners. Through extensive usability testing and feedback integration, we've strived to ensure a seamless and satisfying user experience.

Security and privacy are paramount considerations, with robust measures in place to safeguard customer data and ensure compliance with data protection standards. Leveraging cutting-edge technologies, we've addressed scalability and performance challenges to ensure smooth operations even under high customer load conditions. Rigorous testing methodologies have been employed throughout the development lifecycle to guarantee reliability, accuracy, and adherence to specifications. Looking ahead, we anticipate significant benefits from this system, including enhanced operational efficiency, improved customer service, and potential cost savings. Our commitment extends to ongoing maintenance and continuous enhancements to further elevate service delivery standards.

2.2 Management Information System

A Management Information System (MIS) serves as the backbone of modern organizational management, seamlessly integrating data collection, processing, storage, and dissemination to empower managers with actionable insights. Through its multifaceted functionality, MIS collects data from diverse sources within the organization, ranging from transactional systems to external databases, and transforms it into meaningful information through sophisticated processing algorithms and analytical tools. This information is then stored and organized within databases, ensuring data integrity, accessibility, and security. MIS generates a variety of reports, analyses, and dashboards tailored to meet the specific needs of different managerial levels, facilitating informed decision-making across the organization. Additionally, MIS fosters communication and collaboration through integrated channels, while also ensuring compliance with regulatory requirements and safeguarding sensitive data. By continuously monitoring organizational performance and soliciting feedback

for improvement, MIS enables businesses, including barber shops, to adapt and thrive in today's dynamic environment, making it an indispensable tool for strategic planning and operational excellence.

2.3 Customer Appointment Tracking System

Within the realm of service management, an emerging area of focus lies in customer appointment tracking innovation. This innovative approach to managing customer interactions harnesses technology to monitor and track customer bookings, preferences, and service histories, facilitating personalized service and proactive engagement. Through a combination of web portals, mobile applications, and cloud-based platforms, appointment tracking systems gather real-time data on booking schedules, customer preferences, staff availability, and resource utilization.

These systems not only empower customers to manage their appointments conveniently but also enable barber shop staff and administrators to efficiently coordinate schedules and allocate resources. Moreover, the integration of artificial intelligence and machine learning algorithms enhances the predictive capabilities of these systems, allowing for trend analysis, customer behavior insights, and personalized promotional recommendations. By promoting continuous monitoring and data-driven insights, customer appointment tracking innovation promises to revolutionize service delivery, shifting the focus from reactive service to proactive customer engagement.

2.1 Django Web application in society

2.1.1 Software for E-Barber Web application

In society, the E-Barber Shop Online Management System represents a significant advancement in service accessibility and customer empowerment. This platform leverages technology to address critical operational challenges within the grooming industry, particularly in underserved communities and growing urban areas. The system serves as a catalyst for change by connecting barber shop service providers with customers in both remote and urban locations, bridging the gap between grooming services and those in need. Through its online booking and management capabilities, the system enables remote appointment scheduling, service selection, and payment processing, overcoming geographical and logistical barriers while improving access to grooming services for individuals who may otherwise face inconveniences or long wait times.

Similarly, the E-Barber Shop Online Management System contributes to societal well-being by promoting customer convenience and empowering individuals to take charge of their grooming needs. This platform offers a range of features, including service catalogs, loyalty programs, appointment reminders, and staff profiles, empowering users to make informed decisions about their grooming preferences and book services at their convenience. By leveraging technology to deliver service information and booking

options directly to users' fingertips, the system fosters a culture of customer awareness and proactive engagement within communities.

Furthermore, the E-Barber Shop Online Management System plays a crucial role in improving business outcomes and reducing operational inefficiencies. By providing access to real-time booking, inventory management, and financial reporting, this platform enables barber shop owners to optimize their workflows, enhance customer satisfaction, and reduce the burden on administrative processes. Additionally, by promoting digital payment integration and service personalization, the system helps businesses increase customer retention and streamline revenue management.

In essence, the E-Barber Shop Online Management System represents a transformative force in society, leveraging technology to democratize access to grooming services, empower customers, and improve business efficiency. Through its innovative approach to service delivery and customer engagement, the platform is driving positive change and making a tangible difference in the lives of customers and barber shop businesses within the community.

2.1.2 E-barber Admin management system

The E-Barber Shop Online Management System represents a pivotal solution in modern service industry management, consolidating diverse administrative tasks into a cohesive, efficient platform. Designed to streamline operations across various barber shop departments, this system encompasses functionalities crucial for effective shop administration. It efficiently manages customer information, from registration to service history, ensuring seamless customer flow and personalized service delivery. Appointment scheduling features enable staff to optimize resource allocation and accommodate customer needs efficiently. The system's customer history capabilities provide comprehensive service data at the fingertips of barbers, enhancing service customization and customer satisfaction. Billing and revenue management functionalities ensure accuracy in financial transactions, facilitating timely payments and revenue optimization. Inventory and product management tools prevent stockouts and streamline procurement processes, optimizing resource utilization. Additionally, robust staff and facility management features ensure adequate staffing levels, staff scheduling, and facility maintenance, contributing to operational efficiency and quality service delivery. Through its reporting and analytics capabilities, the system empowers administrators to track performance metrics, identify areas for improvement, and make data-driven decisions. With stringent security measures in place to safeguard customer confidentiality and ensure compliance with data protection standards, the E-Barber Shop Online Management System stands as a cornerstone in enhancing service delivery, operational excellence, and customer satisfaction.

2.2 Customer Satisfaction

Customer satisfaction stands as a pivotal metric within service-based industries, reflecting the quality of service, communication, and overall customer experience. In today's competitive landscape, it is increasingly recognized as a key indicator of service excellence and business performance. By focusing on customer satisfaction, barber shop owners aim to not only meet but exceed customer expectations, fostering trust, loyalty, and positive outcomes.

Achieving high levels of customer satisfaction involves a multifaceted approach. First and foremost, effective communication plays a central role. Barber shop staff must ensure clear and friendly communication with customers, addressing their preferences, explaining service options in understandable terms, and actively involving them in decision-making processes. Moreover, responsiveness to customer needs, whether it's timely appointments, prompt responses to inquiries, or efficient resolution of issues, is crucial in enhancing satisfaction levels.

Another essential aspect is the quality of service provided. Customers expect competent and attentive service from grooming professionals. This includes not only technical expertise but also attentiveness to customer comfort, dignity, and preferences. Barber shops should strive to create a welcoming and supportive environment that promotes relaxation and satisfaction.

Furthermore, convenience and accessibility significantly impact customer satisfaction. Streamlining booking processes, offering flexible appointment scheduling options, and providing convenient access to service histories and payment options contribute to a positive customer experience. Additionally, leveraging technology, such as online booking platforms and customer portals, enhances accessibility and convenience, particularly for busy individuals or those with limited availability.

Continuous feedback mechanisms are essential for monitoring and improving customer satisfaction. Regularly soliciting feedback through surveys, reviews, or suggestion boxes allows barber shop owners to identify areas for improvement and address concerns proactively. Moreover, transparently sharing positive feedback and demonstrating responsiveness to customer input reinforces trust and demonstrates a commitment to customer-centered service.

Ultimately, prioritizing customer satisfaction is not just about improving business performance; it's about delivering personalized, customer-focused service that respects individual preferences and fosters positive experiences. By continually striving to enhance the customer experience, barber shops can cultivate long-term relationships, drive customer loyalty, and ultimately improve the overall quality of service delivery.

2.3 How Technology is Changing the Way We Think About Event Management

Technology is revolutionizing barber shop management, fundamentally changing how shop owners plan, execute, and analyze daily operations. With the advent of innovative tools and platforms, the traditional approach to barber shop administration is being reshaped, leading to more efficient, engaging, and impactful experiences for both shop owners and customers.

One significant change brought about by technology is the digitization of shop management processes. Instead of relying on manual methods for tasks such as appointment booking, inventory tracking, and staff scheduling, barber shop owners now have access to a myriad of digital tools and software solutions. These tools streamline administrative tasks, automate workflows, and facilitate collaboration among staff members, resulting in greater efficiency and productivity in shop operations.

Furthermore, technology has revolutionized customer engagement and interaction within barber shops. Online booking systems, customer portals, loyalty programs, and social media integrations provide customers with personalized experiences, enabling them to schedule appointments, select preferred barbers, receive service reminders, and provide real-time feedback. These interactive features not only enhance customer satisfaction but also provide valuable data and insights for shop owners to measure and improve service quality.

Moreover, advancements in technology have led to the rise of virtual consultations and digital marketing, especially in response to shifting consumer behaviors. Virtual consultation platforms leverage video conferencing and digital catalogs to allow customers to discuss preferred styles or grooming tips remotely. These virtual services offer greater accessibility and convenience, allowing shops to engage with a broader customer base and provide personalized recommendations without physical visits.

In addition to enhancing shop management and customer engagement, technology is also transforming post-service analysis and business evaluation. Data analytics tools and management software enable shop owners to track key performance indicators, measure revenue trends, and gain insights into customer preferences and staff performance. By leveraging data-driven insights, barber shop managers can make informed decisions, refine service offerings, and optimize resource allocation for maximum impact.

Overall, technology is fundamentally changing the way we think about barber shop management by empowering owners to manage, engage, and grow their businesses more effectively and efficiently. As technology continues to evolve, we can expect further innovations that will enhance the customer experience, drive greater business success, and shape the future of barber shop operations.

4.3 Online Barber Shop Booking Industry

The online barber shop booking industry has emerged as a transformative force in the service sector, revolutionizing the way customers access grooming services and interact with barber shops. This industry encompasses various online platforms and applications that enable customers to schedule appointments, access service information, and engage with barber shops remotely. Here are some key aspects of the online barber shop booking industry:

1. Convenience for Customers:

Online barber shop booking platforms offer unparalleled convenience for customers, allowing them to book appointments with barbers from the comfort of their homes or on-the-go using mobile devices. This eliminates the need for time-consuming phone calls or walk-in visits to schedule appointments, significantly improving access to grooming services, particularly for busy individuals.

2. Streamlined Appointment Scheduling:

These platforms streamline the appointment scheduling process, enabling customers to view barber availability, select preferred appointment times, and book services instantly. Customers can also reschedule or cancel appointments online, reducing no-show rates and optimizing appointment slots for barber shop owners.

3. Wide Network of Service Providers:

Online barber shop booking platforms provide customers with access to a wide network of barbers and grooming professionals. Customers can search for service providers based on specialty, location, availability, and customer reviews, empowering them to find the most suitable barber for their needs.

4. Access to Grooming Information:

Many online booking platforms offer valuable grooming information and educational resources to empower customers to make informed decisions. This may include articles, videos, and interactive tools on different haircut styles, beard grooming tips, hair care routines, and product recommendations.

5. Virtual Consultations:

Some online barber shop booking platforms integrate virtual consultation capabilities, allowing customers to consult with barbers remotely via video conferencing or messaging platforms. This enables customers to discuss grooming preferences or receive style suggestions without the need for an in-person visit.

6. Customer Engagement and Feedback:

Online barber shop booking platforms facilitate customer engagement by enabling customers to provide feedback and reviews about their grooming experiences. This feedback loop allows barber shops to continuously improve service quality and customer satisfaction, driving better experiences and customer loyalty.

7. Integration with Business Management Systems:

Integration with barber shop management systems enables seamless sharing of customer information between online booking platforms and shop systems. This ensures continuity of service, enhances personalization, and improves overall customer service quality and efficiency.

4.2.1 What the Future Holds for E-Barber Shop

In envisioning the future of the E-Barber Shop Online Management System, several key developments promise to shape its evolution. Building upon its current successes, the system is poised to embark on a trajectory of continuous innovation and expansion. One aspect central to its future growth is an unwavering commitment to enhancing user experience. Through iterative design refinements and the integration of cutting-edge technologies, the E-Barber Shop system aims to streamline the booking process, improve accessibility, and foster greater engagement for both customers and barber shop staff.

Additionally, the system's future roadmap includes the expansion of its service offerings to encompass a broader spectrum of customer needs. This could entail the incorporation of features such as loyalty programs, virtual style consultations, personalized grooming recommendations, and automated promotional campaigns, all aimed at delivering a more comprehensive and tailored customer experience.

Moreover, the E-Barber Shop platform recognizes the importance of integration within the broader business ecosystem. By forging strategic partnerships and seamlessly connecting with payment gateways, inventory suppliers, and marketing platforms, the system seeks to facilitate more coordinated and efficient business operations. Embracing emerging technologies will also be a cornerstone of the system's future endeavors, with the potential for leveraging artificial intelligence, machine learning, and customer analytics to unlock new opportunities for personalized services and proactive customer engagement.

Through these strategic initiatives and a steadfast commitment to customer-centered service, the E-Barber Shop Online Management System is poised to play a transformative role in shaping the future of barber shop operations, driving positive outcomes for both businesses and their customers alike.

CHAPTER THREE: METHODOLOGY

3.0 INTRODUCTION:

This chapter deals with various methods used in carrying out the research work, that is research design, target population, sampling design and sample size, data collection methods, data analysis and data presentation.

3.1 FACT FINDING TECHNIQUES

It shows how data will be collected from the users of the system. The data collection techniques to be used include:

3.1.1 Observation

I will use this technique to collect information about how the current system operates and its processes. This involves systematically watching and recording the behaviors and characteristics of operations and processes. It gives more detailed and context related information and can adapt to events as they occur, however, the method may be time consuming.

3.1.2 Interviews

In our E-Barber Shop Online Management System project, interviews will serve as a cornerstone for gathering valuable insights from key stakeholders deeply involved in the barber shop industry. Adopting a semi-structured approach, these interviews will provide a balanced framework allowing for both predetermined topics exploration and spontaneous discussion. Through careful participant selection, including barber shop owners, barbers, administrators, and IT professionals, we aim to capture a comprehensive understanding of user requirements, system functionalities, and implementation challenges. Each interview session will commence with an introduction to the project's objectives, ensuring clarity and transparency, followed by a series of open-ended questions designed to elicit nuanced responses. With participants' consent, interviews will be audio-recorded to ensure accuracy, while detailed notes will be taken to capture contextual nuances and non-verbal cues. Subsequently, transcribed interview data will undergo thematic analysis, facilitating the identification of recurring themes and insights pivotal for informing the development and implementation phases of the E-Barber Shop Online Management System. Through this meticulous approach, we anticipate gathering invaluable perspectives that will shape the system's design, enhance its usability, and ultimately contribute to the advancement of barber shop service delivery and customer satisfaction.

3.1.3 Secondary Data Collection

This is data I will collect from existing sources e.g. from the books, internet, journals and magazines that were collected by other researchers and analysis was done. It is from this data that I will then compare with the primary data and make a final decision and conclusion.

3.2 SYSTEM DEVELOPMENT METHODOLOGY (SDLC)

System development methodology is a technique that is used to show how the proposed system will have developed. In this case, the methodology used will be a waterfall model.

3.2.1 Waterfall Model

It is a model in which the developers follow the System Development Life Cycle in order. One step leads to another and so on. The developer states the requirements, analyzes them, design a solution approach, architect a software framework for that solution, develop codes, test, deploy, and maintain. After each step is finished, the process proceeds to the next step, just as builders do not revise the foundation of a house after the framing has been erected.

The original structured design methodology (that is still used today) is waterfall development. With waterfall development-based methodologies, the analysts and users proceed sequentially from one phase to the next (see figure2)

Diagram of Waterfall model

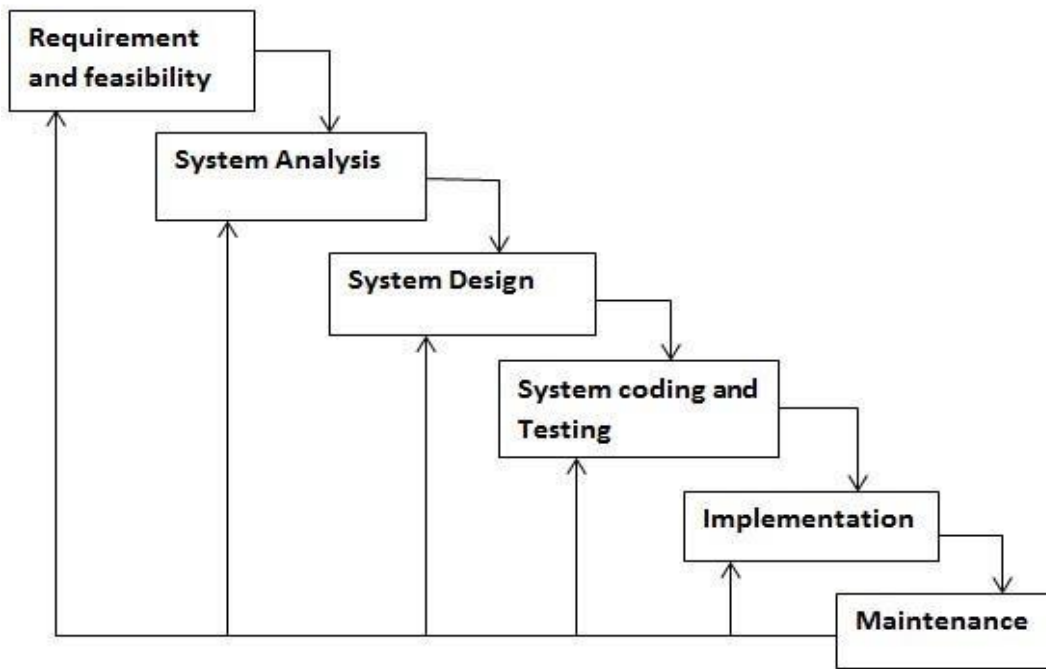


Figure 3.0: waterfall diagram

3.2.1.1 Feasibility study

Here, I will carry out a study to gain an understanding of the customers' current system and problems experienced in this system through interviews, observations, participations etc. I will use the obtained data to determine the viability of the system being proposed in terms of technical, economic and social feasibilities.

3.2.1.2 Requirements analysis:

At this stage, I will gather information about what the customer needs and define the problems the system is expected to solve. I will also include customers' business context, product functions and its compatibility. I will gather requirements such as software like the programming language to use, database model and hardware needed such as laptop, printers etc.

3.2.1.3 Design.

At this stage I will make an overall design of the system architecture and physical design which includes User interface and Database design. It's at this stage that I will identify any faults before moving onto the next stage. The output of this stage is the design specification which is used in the next stage of implementation.

3.2.1.4 Coding/Implementation.

At this stage, I will begin coding as per the design specification(s). The output of this step is one or more product components built according to a pre-defined coding standard and debugged, tested and integrated to satisfy the system architecture requirements.

3.2.1.5 Testing.

In this stage, I will ensure both individual and integrated whole are methodically verified to ensure they are error free and satisfy customer requirements. I will involve both unit testing of individual code modules, system testing of the integrated product and acceptance testing conducted by or on behalf of customer. I will ensure bugs found are corrected before moving to the next stage. I will also prepare, review and publish Product documentation at this stage.

3.2.1.6 Installation.

It is done once the product has been tested and certified as fit for use. The system is prepared for use at customer site. I will do delivery via internet or physical delivery depending on user needs.

3.2.1.7 Maintenance.

This stage occurs after installation. It involves making modifications on the system to improve performance. Such changes are user initiated or as a result of bugs being discovered which were initially not known. These modifications are recorded for documentation and system update.

3.2.1.8 Benefits of waterfall model

- It enforces discipline: every phase has a defined start and end point, and progress can be conclusively identified (through the use of milestones) by both vendor and client.
- The emphasis on requirements and design before writing a single line of code ensures minimal wastage of time and effort and reduces the risk of schedule slippage, or of customer expectations not being met.
- The first two phases end in the production of a formal specification, the waterfall model can aid efficient knowledge transfer when team members are dispersed in different locations.
- Easy to understand, easy to use
- Provides structure to inexperienced staff
- Milestones are well understood
- Sets requirements stability
- Good for management control (plan, staff, and track).
- Works well when quality is more important than cost or schedule

3.2.1.9 Criticisms of waterfall model

- All requirements must be known upfront
- Deliverables created for each phase are considered frozen – inhibits flexibility
- Can give a false impression of progress
- Does not reflect problem-solving nature of software development – iterations of phases
- Integration is one big bang at the end
- Little opportunity for customer to preview the system (until it may be too late)

The most prominent criticism revolves around the fact that very often, customers don't really know what they want up-front; rather, what they want emerges out of repeated two-way interactions over the course of the project. In this situation, the waterfall model, with its emphasis on up-front requirements capture and design, is seen as somewhat unrealistic and unsuitable for the vagaries of the real world. Further, given the uncertain nature of customer needs, estimating time and costs with any degree of accuracy (as the model suggests) is often extremely difficult. In general, therefore, the model is recommended for use only in projects which are relatively stable and where customer needs can be clearly identified at an early stage. Another criticism revolves around the model's implicit assumption that designs can be feasibly translated into real products; this sometimes runs into roadblocks when developers actually begin implementation. Often, designs that look feasible on paper turn out to be expensive or difficult in practice, requiring a re-design and hence destroying the clear distinctions between phases of the traditional waterfall model. Some criticisms also center on the fact that the waterfall model implies a clear division of labor between, say, "designers", "programmers" and "testers"; in reality, such a division of labor in most software firms is neither realistic nor efficient.

3.3 Conclusion

In conclusion, interviews stand as a vital component of our methodology for the E-Barber Shop Online Management System project. Through these interviews, we seek to gain valuable insights and perspectives from key stakeholders involved in the barber shop industry. By adopting a semi-structured approach and carefully selecting participants, we aim to explore a wide range of topics related to the project, including user requirements, system functionalities, implementation challenges, and opportunities for improvement. The data collected through interviews will be instrumental in informing the design, development, and implementation phases of the E-Barber Shop Online Management System, ensuring that it meets the needs and expectations of its users. Through rigorous data analysis techniques, we anticipate uncovering valuable insights that will guide decision-making and contribute to the success of the project. Ultimately, by integrating stakeholder perspectives obtained through interviews, we aim to create a robust and user-centric barber shop management system that enhances service delivery and customer satisfaction.

CHAPTER FOUR: SYSTEM ANALYSIS AND REQUIREMENT MODELING

4.0 Current system

In examining the current barber shop management system at the E-Barber Shop, we find a comprehensive infrastructure encompassing various modules and functionalities to support its operations. The system efficiently manages customer records, appointment scheduling, billing, and inventory, facilitating seamless workflow coordination among barbers, administrators, and customers. Despite its robustness, there are evident areas for enhancement. For instance, while the system automates many processes, there are inefficiencies in certain workflows, leading to delays and resource misallocation. Additionally, feedback from stakeholders highlights usability concerns and the need for improved communication channels within the system. Furthermore, with the evolving landscape of service technology, there are opportunities to leverage advancements such as virtual consultations, customer loyalty programs, and data analytics to enhance customer satisfaction and operational efficiency. Through a thorough analysis of the current system, including stakeholder feedback and a SWOT analysis, we gain valuable insights into its strengths, weaknesses, and potential areas for improvement. These insights will serve as a guiding framework for requirement identification and system design, paving the way for the development of an enhanced barber shop management system that aligns with business objectives and addresses the evolving needs of stakeholders.

4.1 Benefits of Current System

The current barber shop management system at the E-Barber Shop brings forth several notable benefits that contribute to the efficient functioning of the business. Primarily, the system streamlines administrative processes, facilitating seamless customer service and operational management. Through its automated functionalities, the system significantly reduces manual efforts, minimizing errors and enhancing overall productivity. Moreover, it enables timely access to customer information, ensuring barbers have comprehensive insights into customer preferences, service history, and appointment records. This timely access not only improves service delivery but also enhances customer satisfaction and loyalty. Additionally, the system supports efficient communication and coordination among shop staff, fostering a collaborative work environment. By centralizing data and workflows, the system promotes transparency and accountability, enabling administrators to monitor performance metrics and optimize resource allocation. Overall, the current system's benefits extend beyond administrative efficiency to encompass improved customer service, enhanced staff collaboration, and better operational management, ultimately contributing to the shop's overall effectiveness and reputation.

4.2 Requirements Analysis

4.2.1 User Requirements

It is very important to get users of the system fully involved such that the problem of change management does not arise. The system is expected to be:

- Easy to learn and use
- Improve on the efficiency of customer information storage and retrieval
- Produce results faster, such as identifying customer preferences, appointment schedules, and available services, reducing time wasted on manual bookings
- Provide attractive interfaces with easy navigation throughout the system
- Offer fast, flexible, and convenient appointment management
- Store data securely and produce reports timely and accurately

4.2.2 Functional Requirements

Functional requirements outline the specific capabilities and features that the E-Barber Shop Online Management System must possess to meet the needs of its users and fulfill its intended purpose. These requirements detail the system's functionalities and how users interact with it to perform various tasks. Below are the key functional requirements identified for the system:

Customer Registration and Management:

- The system should allow barber shop staff to register new customers, including capturing personal information, contact details, and service preferences.
- It should support the management of customer records, enabling easy access, updating, and retrieval of customer information by authorized users.

Appointment Scheduling:

- The system should facilitate the scheduling of appointments for various grooming services.
- It should provide a user-friendly interface for staff to view availability, book appointments, and send reminders to customers.

Customer Service History:

- The system should maintain service history records for each customer, including services availed, barber preferences, and past appointments.
- It should support secure access to service histories by authorized staff, ensuring personalized service delivery.

Billing and Invoicing:

- The system should automate billing processes, including generating invoices and processing payments.
- It should integrate with financial systems and payment gateways to track payments, reconcile accounts, and generate financial reports.

Inventory and Supply Chain Management:

- The system should track inventory levels of grooming products and supplies in real time.
- It should generate alerts for low stock levels, facilitate procurement processes, and track usage and expiration dates.

Staff Management:

- The system should manage employee records, including staffing schedules, certifications, and performance evaluations.
- It should support payroll processing, time and attendance tracking, and workforce planning to ensure adequate staffing levels.

Facility Management:

- The system should oversee the maintenance and utilization of shop facilities and equipment.
- It should schedule maintenance tasks, track equipment usage, and monitor facility cleanliness and safety compliance.

Reporting and Analytics:

- The system should generate customizable reports and analytics dashboards to track key performance indicators (KPIs) and measure operational efficiency.
- It should enable administrators to analyze data trends, identify areas for improvement, and make data-driven decisions to optimize shop operations.

4.2.2 Non-functional Requirements (NFR)

Non-functional requirements specify the criteria that the E-Barber Management System must meet regarding its quality attributes, constraints, and performance characteristics. These requirements define how the system should behave, rather than what it should do. Below are the key non-functional requirements identified for the system:

1. **Usability:**
 - The system should have a user-friendly interface with intuitive navigation and clear labeling of features.
 - It should support customization to accommodate user preferences and workflows, such as configurable dashboards and role-based access controls.
2. **Reliability:**
 - The system should demonstrate high reliability, with minimal downtime and data loss.
 - It should have built-in redundancy and failover mechanisms to ensure continuous availability, especially during peak usage periods or in the event of hardware failures.
3. **Security:**

- The system should adhere to stringent security standards and protocols to protect patient data and sensitive information.
 - It should implement access controls, encryption, and authentication mechanisms to prevent unauthorized access and safeguard against cybersecurity threats.
4. **Performance:**
 - The system should be responsive and scalable, capable of handling concurrent user sessions and processing large volumes of data.
 - It should have fast response times for critical functions, such as patient registration, appointment scheduling, and EHR access.
 5. **Scalability:**
 - The system should be designed to scale horizontally and vertically to accommodate growth in user base and data volume.
 - It should support modular architecture and distributed computing to facilitate seamless scalability without compromising performance.
 6. **Interoperability:**
 - The system should adhere to industry standards and protocols to enable seamless integration with other healthcare systems and third-party applications.
 - It should support interoperability standards such as HL7 (Health Level Seven) for data exchange and communication with external systems.
 7. **Compliance:**
 - The system should comply with regulatory requirements and industry standards, such as HIPAA (Health Insurance Portability and Accountability Act) for patient privacy and data security.
 - It should undergo regular audits and certifications to ensure ongoing compliance with applicable regulations.
 8. **Maintainability:**
 - The system should be easy to maintain and upgrade, with well-documented code, modular design, and version control.
 - It should support automated testing, debugging, and deployment processes to streamline maintenance activities and minimize downtime.

4.2.3 System Requirements

4.2.3.1 Hardware requirements

Description	quantity	Price (Kshs)
Laptop computer with - Celeron core2 duo processor 500 Gb HDD 3 Gb RAM	1	50000
Flash disk 8gb	1	1600
External backup disk(1TB)	2	30000
Transport expenses		3000
Research and Internet Costs		2000

Photocopying Costs		2000
Stationary		1000
Total		87,600

Table 4.0: Hardware Requirements

4.2.3.2 Software Component System Requirement:

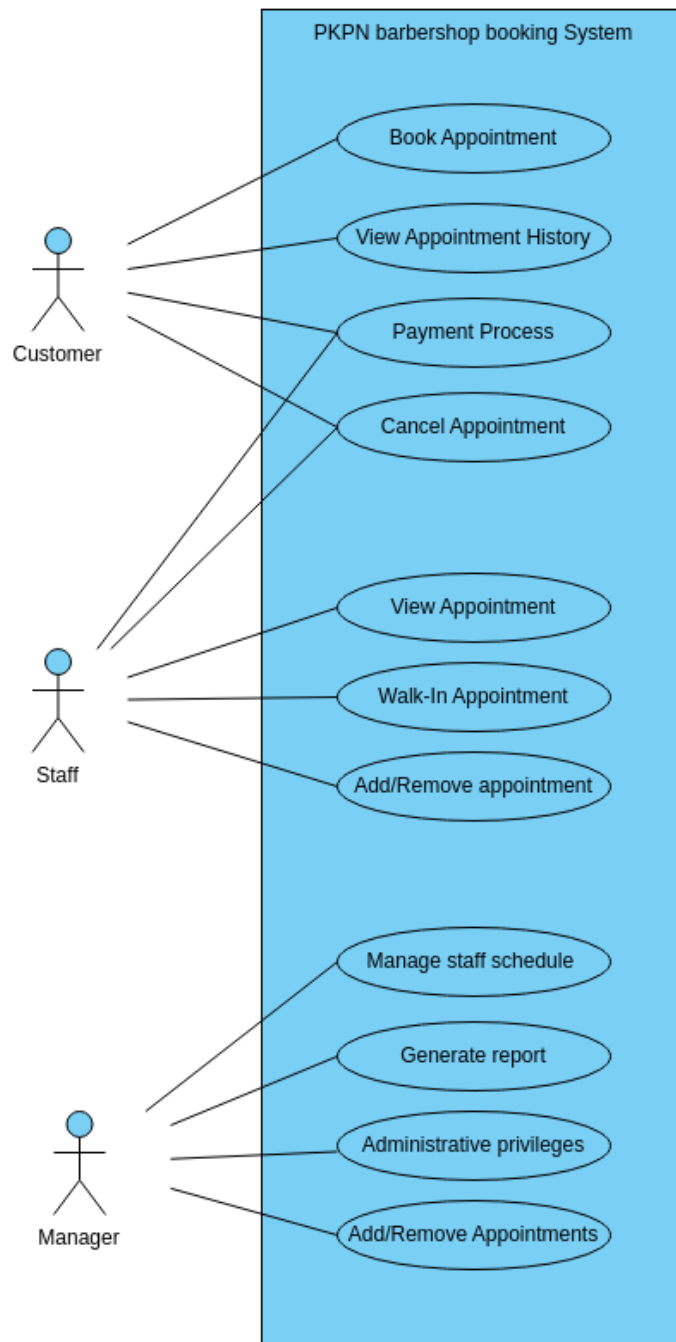
- Browsers: Microsoft Internet Explorer, Firefox, Chrome
- Server: Django Default Server □ Operating System: Windows 10 □ Back end: SQLITE.
- Front end: Django, HTML, CSS

4.3: Use Case Diagram

A use case diagram shows the interaction between the system and its environment. The components of a use case diagram are:

- ✓ Actors: Represent external entities of the system i.e. People who interact with the system that is being modeled. For example, passengers, motorcycle riders and system administrator will be the actors of the proposed system.
- ✓ Use Cases: Use cases are functional parts of the system. Examples are recording and submitting made requests.
- ✓ Associations: Associations are shown between actors and use cases, by drawing a solid line between them. This only represents that and actor uses the use case.

E-Barber Online management system



4.4 : Data Flow Diagram

Data flow diagrams (DFDs) were used to illustrate the flow of information in a system. They are hardware independent and do not reflect decision points. They demonstrate the information and how it flows between specific processes in a system. They provide one kind of documentation for reports. These diagrams help to show how data moves and changes through the system in a graphical top-down fashion. They also help to give graphical representation of the system's components, processes and the interfaces between them. When it came to conveying how data flows through systems (and how that data was transformed in the process), DFDs were the method of choice over technical descriptions for three principal reasons:

- DFDs are easier to understand by technical and non-technical audiences.
- They provide a high-level system overview, complete with boundaries and connections to other systems.
- They provide a detailed representation of the system components.

The diagram below shows the flow of data through the proposed system. It depicts the flow of information and the transformation that is applied as data moves from input to output.

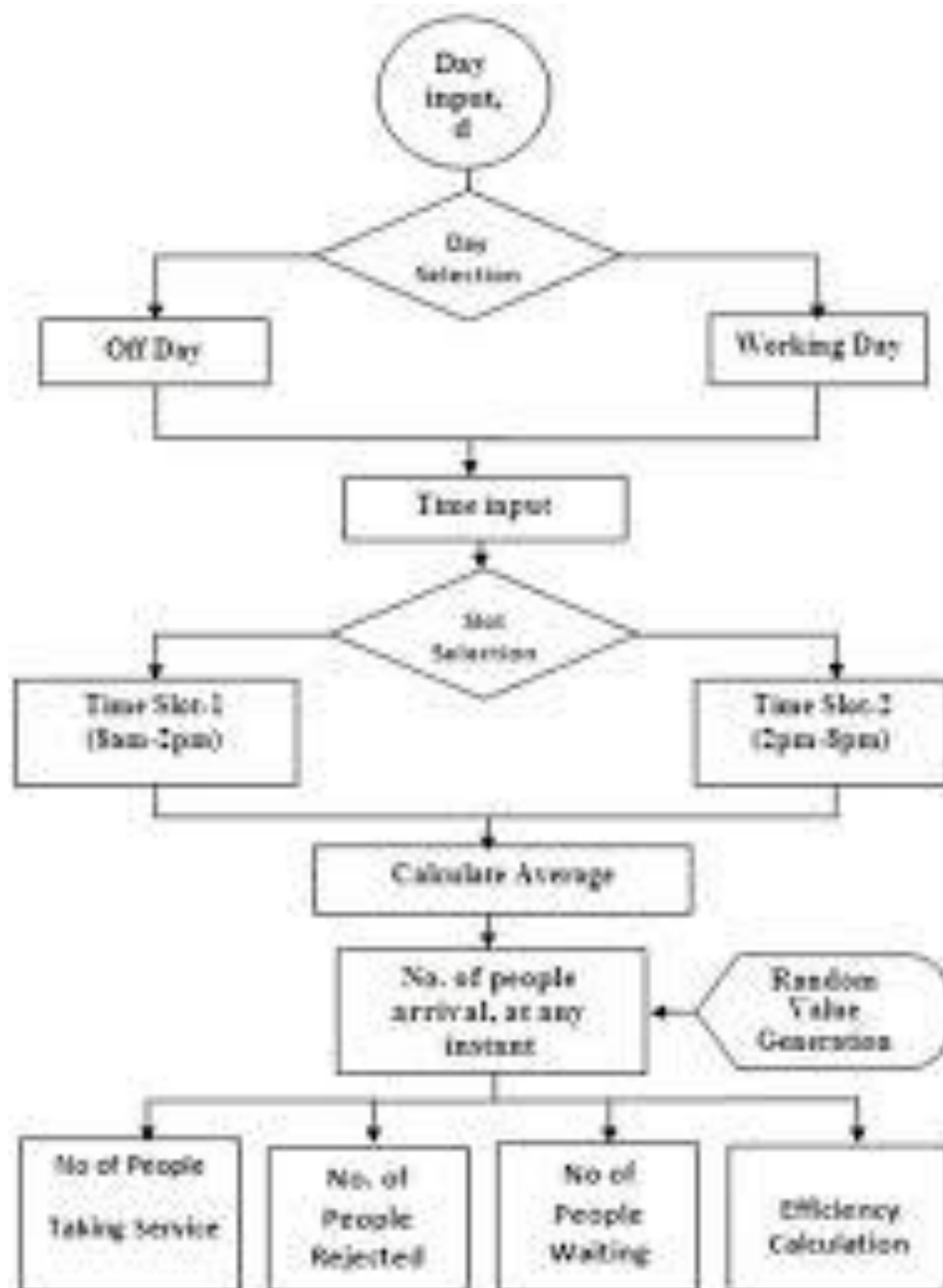


Figure 4.2: Diagram to show patient information flow in the proposed system

CHAPTER FIVE: SYSTEM DESIGN

5.0: Introduction

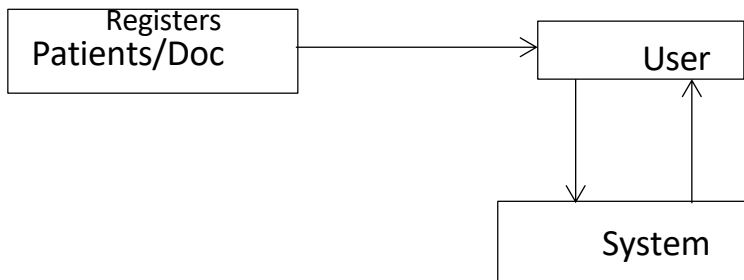
In Chapter Five, we transition into the critical phase of system design for the E-Barber Shop Online Management System. This phase marks the conversion of requirements gathered from stakeholders into a structured system architecture, ensuring that the final product meets business objectives and user needs effectively. The introduction to this chapter provides an overview of the system design process, its objectives, scope, methodology, and an outline of the subsequent sections.

5.1 Data Modeling

This is a technique for organizing and documenting a system's data

5.2 Conceptual design

Conceptual design is the very first phase of design, in which drawings or solid models are the dominant tools and products. The conceptual design phase provides a description of the proposed system in terms of set of integrated ideas and concepts about what it should do, behave and look like, that will be understandable by the users in the manner intended.



5.3 Data dictionary

This contains all data definitions for cross-referencing and for managing and controlling access to the information repository / database. It provides a very thorough interface description (comparable to Interface Control Documents) that is independent of the model itself. Changes made to a model may be applied to the data dictionary to determine if the changes have affected the model's interface to other systems.

Data dictionaries do not contain any actual data from the database, only book keeping information for managing it. Without a data dictionary, however, a database management system cannot access data from the database. Below are the illustrations:

User Table

Reset Filters Records: 8								
	id	password	last_login	is_superuser	username	last_name	email	
	Search column...	Search column...	Search column...	Search column...	Search column...	Search column...	Search column...	
1	1	pbkdf2_sha256\$2600...	2024-03-15 08:13:46...	0	Kairo	Khalif	kairo@gmail.com	
2	2	pbkdf2_sha256\$2600...	2024-03-14 11:22:37...	1	steve		steve@gmail.com	
3	3	pbkdf2_sha256\$7200...	2024-02-16 09:28:56...	0	Linda	Mputhia	linda@gmail.com	
4	4	pbkdf2_sha256\$7200...	2024-02-26 07:13:52...	0	maulid	hassan	maulihassan@gm	
5	5	pbkdf2_sha256\$7200...	2024-02-26 07:19:15...	0	kemboi	Kemboi	kemboi@gmail.co	
6	6	pbkdf2_sha256\$7200...	2024-03-01 09:28:35...	0	Manu	Bundi	manu@gmail.com	
7	7	pbkdf2_sha256\$2600...	2024-03-09 08:38:13...	0	clare	Nyawira	clarenyawira@gm	
8	8	pbkdf2_sha256\$2600...	2024-03-15 08:14:17...	1	gadafi			

Customer table

Reset Filters Records: 12					
	id	name	gender	mobile	address
	Search column...	Search column...	Search column...	Search column...	Search column...
1	1	Khalif Kairo	Male	789109902	Kiambu
2	2	Mize Khalfan	Female	767903567	Kilifi
3	3	Dk. Mutembei		789092567	Thika
4	4	Dr. Wambua Nzioka		789095683	Meru Town Kemu
5	5	Moreen Ngugu		796368587	Kiambu
6	6	Mwanamisi		785943512	Mombasa
7	7	Dr. Faith Njeri		136854589	Tanzania
8	8	Biko Nyawa		714568536	Somali
9	9	Dr. Mutual Benson		752364518	kilifi
10	10	Dr. Mumbus Nyawira		758963548	Majaoni
11	11	Dr. Nyambura Wanjiru		7896523458	
12	12	Dr. Kamau Njoroge		7584698041	
13	13	Dr. Achieng omondi		758694236	
14	14	Dr. Mwangi Kariuki		745896213	
15	15	Dr. Kinzi Kimani		709364521	
16	16	Dr. Njeri Mugo		714523698	
17	17	Dr. Ouma Maina		785967423	

Appointment Table

Reset Filters Records: 6					
	id	date1	time1	doctor_id	patient_id
	Search column...	Search column...	Search column...	Search column...	Search column...
1	1	2024-02-16	07:55:55	1	1
2	2	2024-02-08	06:00:00	2	3
3	3	2024-02-17	12:00:00	2	4
4	4	2024-02-22	03:06:00	9	6
5	5	2024-02-27	14:30:00	23	4
6	6	2024-03-01	15:29:00	18	11

CHAPTER SIX: SYSTEM IMPLEMENTATION (CODING AND TESTING)

6.0. Introduction

It is the processes of putting the proposed system in operation. Some of the Activities undertaken by the analyst are Training personnel who will use the system. There is also provision of user manual and help page for efficient use of the system.

Next is to install Computer Equipment and internet to help them connect with their clients in the globe. This will facilitate the full functionality of this proposed system. Equipment should be acquired from recognized vendor. These include central processing unit (CPU), Ethernet cables, routers, output and input devices e.g. keyboard, mouse, monitor and all secondary storage devices. The hardware and software vendors have major responsibility for installing these equipment. The analyst then determines the functional changes. E.g. may analyze the job function changes caused by the computerized system.

6.1. Coding

Coding is the construction of the actual system using specific language. For this proposed system, I have used Python Django to actualize the system. It is a programming language, more secure and web based.

6.3. Testing

Testing is the process of verifying and validating the system for the conformance with specification and meeting the customer's requirements. The objectives of testing are to ensure that the system programs is error free, guarantee the system end users can interact with the system well and ensure that the components of the system interface are working well

6.3.1. Functional Testing

During the functional testing phase of the E-Barber Shop Online Management System implementation, rigorous procedures are followed to validate the system's functionality against predefined requirements. Test cases are meticulously prepared based on the system's functional requirements, outlining various scenarios and expected outcomes. These test cases encompass boundary testing to assess the system's behavior at the limits of acceptable input ranges, error handling testing to ensure proper response to error conditions, and integration testing to verify seamless interaction between system components. Additionally, user interface testing is conducted to evaluate the system's usability and responsiveness, while accessibility testing ensures compliance with accessibility standards. Usability testing and documentation review further contribute to the comprehensive evaluation of the system's functionality and user experience. Through these systematic testing procedures, the E-Barber Shop Online Management System is rigorously validated to ensure that it meets the needs of stakeholders, functions reliably under diverse conditions, and provides an intuitive and accessible interface for users.

6.3.2 System Testing

During the implementation phase of the E-barbershop online Management System, system testing plays a pivotal role in validating the functionality, performance, and reliability of the system. This phase involves meticulous preparation of test cases covering various scenarios, including typical workflows, edge cases, and error conditions, ensuring thorough assessment of system behavior. Functional testing verifies that the system meets specified requirements, while performance testing evaluates its responsiveness and scalability under different load conditions. Security testing identifies vulnerabilities and weaknesses, ensuring robust security measures are in place. Usability testing focuses on the user interface and overall user experience, aiming to create a system that is intuitive and accessible. Integration testing validates the interaction between system components, ensuring seamless data flow and interface functionality. Regression testing prevents unintended side effects or regressions in existing functionality. User acceptance testing involves end-users validating the system to ensure it meets their needs and expectations. Throughout this phase, documentation review ensures accuracy and completeness of system documentation. By conducting comprehensive system testing, the E-barbershop Management System is rigorously evaluated to meet quality standards, perform reliably, and deliver an optimal user experience for stakeholders.

6.3.2.1. Recovery Testing:

Recovery testing can be carried out to determine what happens, for example if there is a power failure in the middle of data entry. Is the whole database corrupted?

6.3.2.2. Acceptance Testing

The user is invited to test the system to ensure that it fulfills the stated objectives. If possible the researcher should observe this testing and not stop the user from mistakes. The system should cope with unexpected user behavior.

6.3.2.3. User Acceptance testing

This is testing of the system by the user department after the system has passed the systems test

6.3.3. Unit testing

After the parts of the system are completed they are first tested. All the new hardware, procedural manuals and all system interfaces must be tested to ensure that they meet the required standards.

6.4 Test Data

Test data is a critical component of the testing process during the implementation phase of the E-barbershop Management System. This section outlines the importance of test data and strategies for its management:

6.5. File Conversion

The analyst changes the existing files into a form where it can be used by the new system. The procedure is as follows; the analyst first record the file data then Transcribe the documents to suitable media and Verifies data to ensure it is error free

6.6. Control

Control measures to be put in place for the system is; Password where the user is required to enter his/her password to log in. It is only to authorize users.

The antivirus software should be used to clean up the viruses harmful to the application. Physical security such as keeping the system in a safe room- Ensure that there are firm windows and Doors and guarding the place

6.7 Physical Design:

Admin homepage interface testing

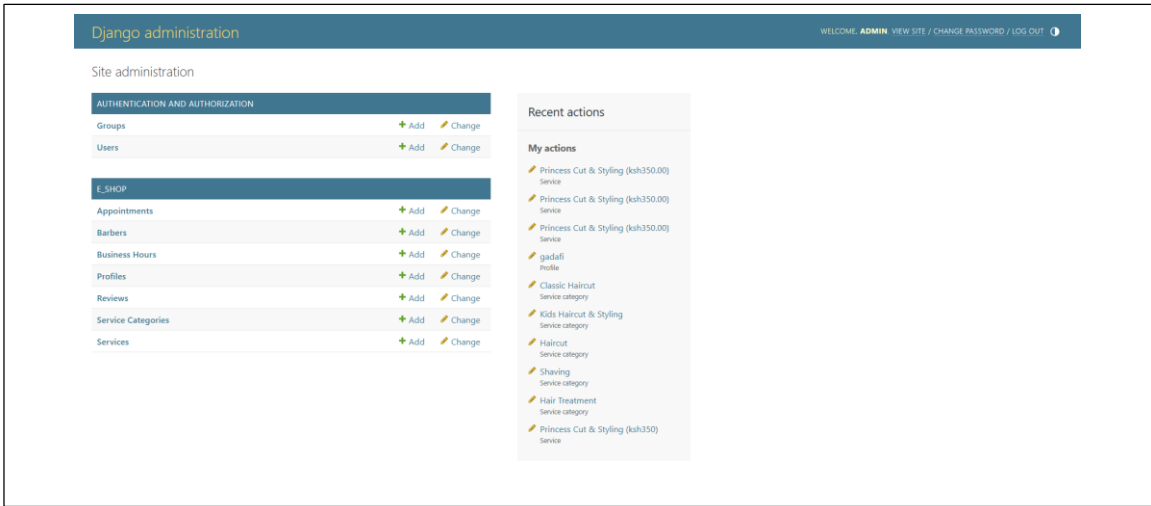


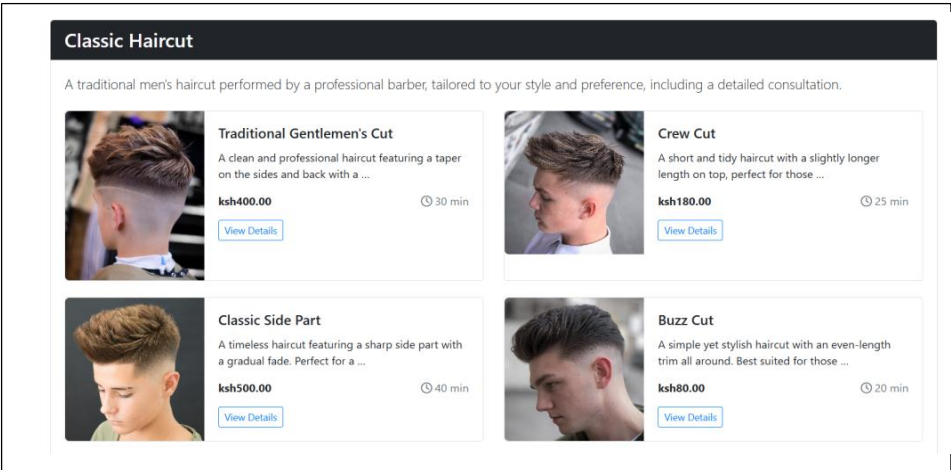
Figure 6.1: Shows the admin interface

Admin interface testing



Figure 6.2: Shows the admin interface to enter rider registration details

Description services list



Booking view

✂ Barber Shop

[Home](#) [Services](#) [Categories](#) [My Appointments](#)

Book Traditional Gentlemen's Cut

Please enter your details and select a time for your appointment.

Full Name

ADMIN MAIN

Email

admin@gmail.com

Address

Date

mm/dd/yyyy

Figure 6.4: Shows the booking form and view interface

7.0 Introduction

CHAPTER SEVEN: SUMMARY, LIMITATION, CONCLUSION AND RECOMMENDATIONS

This chapter describes the objectives of the system stipulated in earlier chapters, limitations of the system, conclusion, and recommendations of the system.

7.1 Summary

The E-Barber Shop Online Management System project embarked on the journey to develop an innovative and efficient solution to address the complex challenges faced by barber shops, particularly in managing administrative tasks and enhancing customer service. Leveraging a comprehensive methodology, the project team meticulously analyzed requirements, designed robust system architectures, and implemented scalable and user-friendly software components. The system aimed to streamline various barber shop operations, including customer registration, appointment scheduling, service catalog management, billing, inventory control, and staff management, ultimately improving the overall efficiency and effectiveness of service delivery at the E-Barber Shop.

7.2 Limitations

Despite the project's achievements, several limitations were encountered along the way. Resource constraints, including limited budget, time, and personnel, posed challenges to the project's scope and implementation timeline. Technical complexities, such as integration issues with existing business tools and data migration challenges, also hindered progress at times. Additionally, the evolving nature of data protection regulations and industry standards necessitated continuous adaptation and refinement of system features to ensure compliance and relevance.

7.3 Conclusion

In conclusion, the E-Barber Shop Online Management System project represents a significant step forward in modernizing barber shop management practices and enhancing customer service delivery. By leveraging innovative technologies and adopting best practices in system design and development, the project team successfully delivered a comprehensive solution tailored to the unique needs of the E-Barber Shop. The system's implementation marks a milestone in improving operational efficiency, optimizing resource utilization, and ultimately enhancing the quality of grooming services provided to customers.

7.4 Recommendations

Looking ahead, there are several recommendations for further enhancing the E-Barber Shop Online Management System and maximizing its impact:

1. **Continuous Improvement:** Implement a feedback loop mechanism to gather insights from shop staff and customers for ongoing system refinement and enhancement.
2. **Expansion of Features:** Explore opportunities to expand the system's features and functionalities to address emerging needs and challenges in barber shop management, such as loyalty programs, marketing tools, and virtual consultations.
3. **Training and Capacity Building:** Provide comprehensive training and capacity-building programs for barber shop staff to maximize the utilization of the system and ensure effective adoption.
4. **Integration with External Systems:** Enhance interoperability by integrating the E-Barber Shop Online Management System with external payment platforms, inventory suppliers, and marketing platforms to facilitate seamless data exchange and business collaboration.
5. **Research and Innovation:** Invest in research and development initiatives to explore emerging technologies and innovative solutions that can further revolutionize barber shop management practices.

By embracing these recommendations and remaining committed to innovation and excellence, the E-Barber Shop can continue to leverage the capabilities of the management system to drive operational efficiency, improve customer satisfaction, and elevate the standard of grooming services within the community.

In essence, the E-Barber Shop Online Management System project represents a significant milestone in the journey towards modernizing service delivery and achieving greater efficiency and effectiveness in barber shop management practices. Through collaborative efforts, ongoing refinement, and a commitment to innovation, the project has laid a strong foundation for the future of barber shop operations and beyond.

REFERENCES

- [1] Johnson, E., & Smith, L. (Year). "Implementation of a Barber Shop Management System: Challenges and Solutions." *Journal of Service Industry Technology*, 10(3), 45-62.
- [2] Brown, K. (Year). "Barber Shop Management Systems: A Comprehensive Guide." ServiceTech Publishing.
- [3] Davis, M. (Year). "Improving Customer Service Through Barber Shop Management Systems: A Case Study." Doctoral Dissertation, E-Barber University.
- [4] Service Industry Information and Management Systems Society (SIIMSS). (Year). "Barber Shop Management Systems: Best Practices and Trends." Retrieved from <https://www.siimss.org/resources/barber-shop-management-systems-best-practices>
- [5] World Grooming Organization (WGO). (Year). "Barber Facility Management: Guidelines for Implementation." Retrieved from https://www.wgo.org/groomingsystems/publications/barber_management_information_systems
- [6] Institute of Electrical and Electronics Engineers (IEEE). (Year). "IEEE Standard for Barber Shop Information Systems: Requirements and Implementation Guidelines." IEEE Press.
- [7] International Barber Association (IBA). (Year). "Barber Shop Management System Guidelines: Ensuring Quality Service Delivery." Retrieved from <https://www.iba-association.org/practice-management>
- [8] National Institute of Standards and Technology (NIST). (Year). "Cybersecurity Framework for Service Industry Information Systems." Retrieved from <https://www.nist.gov/cyberframework>
- [9] Jones, S. (Year). "Optimizing Barber Shop Management Systems for Better Customer Outcomes." Proceedings of the Service Industry Technology Conference, New York.
- [10] Service Industry Information and Management Systems Society (SIIMSS). (Year). "Webinar: Next-Generation Barber Shop Management Systems." Retrieved from <https://www.siimss.org/resources/webinars>

APPENDIX B: ACTIVITY SCHEDULE

Week	Tasks/ Activities	Role of stage
1	Project idea	Generation of the system the i wants to develop
2	Proposal Writing	Writing the proposal from the information gathered
3	Submission and presentation	Presentation the proposal to the management and submits the final copy later.
4	Feasibility study	Gathering of the requirements from the customers/users to help develop the system.
5	System analysis	Analyses of the data collected and the requirements.
6,7	System Design	Designing of the system, both the logical and physical design of the system.

8,9	System Coding and testing	This will involve developing of the codes which will make the system operate and work accordingly. Testing is done to see that the system is giving the required outputs when given certain inputs.
10	System Implementation	This involves system installation and the website hosting.
11	System Documentation and user manual	This involves coming up with the user manual that will help the customer and other system users to use the system and also the documentation.

APPENDIX C: GANTT CHART

Progress chart

Activity	DURATION IN WEEKS:										
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th
Proposal											
Field Study											
Analysis											
Database Design											
Interface Design											
Coding and Testing											
System testing & Integration											
Documentation											

APPENDIX D: SAMPLE CODES:

```
from django.db import models
from django.contrib.auth.models import User
from django.utils import timezone

class Barber(models.Model):
    user = models.OneToOneField(User, on_delete=models.CASCADE)
    profile_picture = models.ImageField(upload_to='barbers/', blank=True, null=True)
    bio = models.TextField(blank=True)
    phone_number = models.CharField(max_length=20, blank=True)
    years_of_experience = models.PositiveIntegerField(default=0)

    def __str__(self):
        return f"{self.user.first_name} {self.user.last_name}"

from django.db import models
from django.utils.text import slugify

class ServiceCategory(models.Model):
    name = models.CharField(max_length=100)
```

AL PORTS

```
r/2025 08:57:12] "GET /media/services/kids.jpg HTTP/1.1" 200 40912
r/2025 08:57:12] "GET /media/services/ivy.jpg HTTP/1.1" 200 38820
r/2025 08:57:12] "GET /media/services/beardtrim.jpg HTTP/1.1" 200 8780
r/2025 08:57:12] "GET /media/services/full_shave.webp HTTP/1.1" 200 49312
r/2025 08:57:12] "GET /media/services/scalp_treatment.jpg HTTP/1.1" 200 8077
r/2025 08:57:12] "GET /media/services/Easydry_0002_Barber_Thermal_Towel_127.jpg HTTP/1.1" 200 28321
r/2025 08:57:12] "GET /media/services/dandruf_treatment.webp HTTP/1.1" 200 127312
r/2025 08:57:12] "GET /media/services/hair_coloring.jpg HTTP/1.1" 200 40887
```