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Implementation of Customer Relationship Management in Web-Based Beauty Service Applications with Extreme Programming

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ABSTRACT

The development of information technology, including the internet, has had a great influence on various fields, especially trade and advertising. Strategies such as Customer Relationship Management (CRM) facilitate interaction between companies and customers, providing benefits for both parties. The use of CRM is very important for companies, especially in the service sector that has a strong relationship with customers. Beauty Care Clinic is a clinic that provides beauty care services. This clinic is located on Jl. Samarang, No. 76 (Dr. Patmawardani's practice), but still faces obstacles in the optimal use of information technology. Reservations and consultations are still done in person at the clinic, which is time-consuming and hinders operational efficiency. In addition, the payment process still uses conventional methods that slow down transactions. This study aims to implement CRM in a web-based Beauty Care Clinic application using the Extreme Programming (XP) method. This application offers advantages over conventional systems with more integrated and flexible features, such as online service reservations, consultations, electronic payment systems, promotions, and testimonial features that improve user interaction. The testing was carried out in two stages, namely Black Box Testing at the Alpha stage and Beta Testing using the System Usability Scale (SUS) questionnaire. The results of Alpha's testing show that all the features of the app run well without bugs. Beta testing, which involved the clinic's customers as respondents, resulted in an overall score of 646 with an average score of 80.75, which falls into the "Excellent" category based on the SUS indicator. These results show that the app significantly improves the efficiency of customer management by speeding up the reservation process, facilitating digital transactions, and strengthening customer engagement in clinical services. With these results, this application becomes a superior solution in managing customers in the beauty industry, supporting more effective operations, and increasing business competitiveness. The implementation of the XP method allows for the development of systems that are more responsive to changing customer needs and user feedback on an ongoing basis.

1. INTRODUCTION

Rapid developments in the field of information technology, including the internet, have proven to make a great impact on various fields, especially in the field of commerce and advertising [1]. In this environment

characterized by fierce competition, consumers can work with many opportunities to acquire products that align with their desires and requirements. As a result, to meet this demand, companies must have the capacity to deliver products that surpass their competitors in terms of superior quality, more economical prices, fast access to information, and better service than competitors. Strategies such as Customer Relationship Management (CRM) Facilitating interaction between companies and customers provides benefits for both parties [2]. Use of strategies Customer Relationship Management It is very important for many companies, especially in the service sector or services that have a strong relationship with customers [3], CRM as an integrated combination of sales, marketing, and service strategies [4].

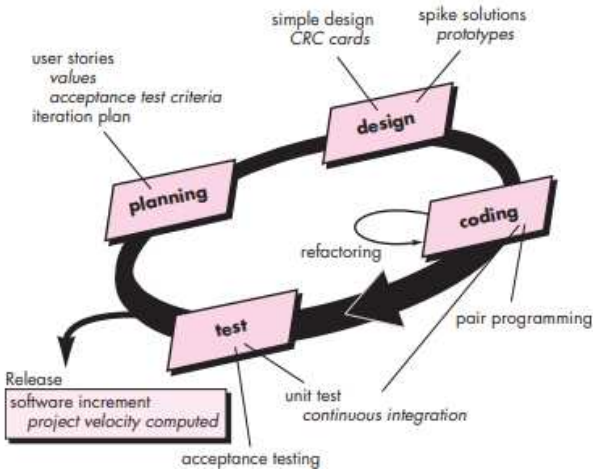
Clinic Beauty Care is a clinic that provides beauty treatment services. Clinic Beauty Care located on Jl. Samarang, No. 76 (Practice dr. Patmawardani). Services provided at the clinic Beauty Care Include Facial, Injection, Cauterizes, Peeling, Radio Frequency/Iron, Derma pen and Derma roller. Current Problems at the Clinic Beauty Care, has not fully utilized information technology advances optimally. Social media use Posted by E and Posted on Instagram For promotion and communication, however, reservations and consultations still have to be done in person at the clinic, in addition, the payment process that is still convertible often causes delays and inconvenience for customers. This research is based on previous research, including conducted by Erlansyah & Hersani (2023) to develop an application CRM Android-based for K-Skincare Clinic using the Extreme Programming (XP), which focuses on improving customer service. However, this system is still limited to mobile platforms [3], so that the novelty of this research develops CRM Based Web to provide greater access flexibility for customers as well as increase effectiveness in attracting and retaining customers. Maulidya Tahir (2023) researches the implementation of CRM on the Salon N'N-based reservation system Web, which aims to improve the effectiveness of reservations and promotions. This study uses the Rapid Application Development (RAD) for salon reservation systems, but less emphasis on continuous testing [5]. So this study uses the Extreme Programming (XP) which is more adaptive and emphasizes continuous testing to improve the quality of the system. Further research by Pratiwi et al. (2023), implements CRM at Laf Kisaran Clinic with the aim of increasing customer loyalty and strengthening the relationship between the clinic and its consumers. This study shows that CRM can improve customer satisfaction, but still focus on a quantitative approach without iterative system development. In addition, flexible software development methods have not been implemented [6]. The novelty of this research lies in the use of the Extreme Programming (XP) that is faster, flexible, and responsive to changing customer needs. Next, research by Wijaya et al. (2023), designing an application CRM Based Web Using the Action Research, but is still limited to the design stage without the implementation of a system that can be tested in clinical operations [7]. The novelty of this research is that the CRM Based Web that has been tested through the Blackbox Testing and System Usability Scale (SUS) to ensure reliability and optimal user experience. In addition, this study uses the Extreme Programming (XP), which allows feature changes to be made based on direct user feedback. And research by Babar & Saitakela (2019), developed a system CRM Based Web for Valerie Beauty Clinic using the Prototype, which aims to improve customer engagement, but is less flexible in continuous testing and less adaptive to changing business needs [8]. The novelty of this study is the use of the Extreme Programming (XP) which is more adaptive, so as to allow the system to be developed in a sustainable manner and ensure better system quality and more responsive to the business needs of beauty clinics.

Based on previous problems and research, this study aims to implement Customer Relationship Management in web-based beauty service applications using Extreme Programming, in order to develop a more efficient, flexible, and user-friendly system in managing customer relationships. The developed system will integrate a variety of important features, including service reservations, online consultations, digital payments, promotions, and customer testimonials, providing a more comprehensive solution than previous studies. The results of this research are expected to improve the operational efficiency of the beauty business, strengthen marketing strategies, and significantly increase customer satisfaction and loyalty.

2. RESEARCH METHODOLOGY

Extreme Programming is a tool in development Agile focusing on five key areas namely, communication, collaboration, decision-making, and time management. XP ensure effective communication between all

stakeholders through effective collaboration, effective metaphors, and clear documentation. To achieve the principle of simplicity, XP encourages developers to design based solely on current needs, without thinking too far ahead. This approach is shown to produce a design that is simple and easy to implement in code [9]. Extreme Programming (XP) It was chosen as the development method because of its flexibility in handling changing user needs as well as its focus on continuous testing to ensure high software quality. Compared to other methods, XP It is more adaptive to user feedback, allows for rapid iteration in the development cycle, and is better suited for projects that require continuous development with dynamic feature changes. XP It has key principles such as intensive communication, user stories-based development, pair programming, and repetitive testing. Each feature is developed in short cycles with live trials, ensuring the system is always in stable condition and ready to use[10], Implementation is carried out in several stages, namely Planning, Designing, Coding and Testing [11].



Picture 1. Extreme Programming

The following is an explanation of the stages of Extreme Programming:

1. Planning
   Planning starts with understanding user needs through user stories that are prioritized based on business and risk. The stories are grouped for subsequent releases and can be changed during development [9].
2. Designing
   Designing deep XP following the principle "Keep It Simple" (KIS) use case simple diagrams. Class Responsibilities Collaboration (CRC) Card used to consider the software objectively [12]. For complicated issues, XP Recommend "Spike Solution" as Prototype to reduce risk [9].
3. Coding
   Pairing programming is key, where two people work together to code, allowing for problem-solving Real-time and quality assurance. Code is integrated with other jobs to prevent problems Compatibility. Refactoring Applied to improve efficiency, unit tests are conducted to get instant feedback [9].
4. Testing
   Do Testing Unit and Acceptance Testing to ensure the software meets the needs and standards of the user with an approach to black box testing and Beta Testing [12].

In this project, the Laravel framework is used as a backend to manage Databases and business processes, and third-party APIs such as Midtrans are used as payment gateways to support faster and more secure digital transactions. MySQL databases were chosen for their reliability in handling transaction data and customer information efficiently.

3. RESULTS AND DISCUSSION

Results and discussion of the implementation of Customer Relationship Management (CRM) in a web-based beauty service application using the Extreme Programming (XP) method.

3.1 Early Identification

At the initial identification stage, the study begins the process with several key steps. These steps include conducting literature studies, observations, and interviews. The purpose of these steps is to understand more deeply the problems at hand. Literature studies include reading and analyzing relevant journals as well as previous research. Observations and interviews were conducted by asking questions to stakeholders to collect the necessary data.

3.2 Planning

This stage focuses on collecting data related to the needs of the application to be created. These activities involve a variety of activities to ensure that the application requirements are met. The following activities are carried out at the planning stage:

1. Identify Business Processes
   Observations and interviews are conducted to identify application needs at the business process stage. Based on the results of observations and interviews, it was found that the existing system has not fully utilized information technology optimally. Reservations and consultations are still done in person, while conventional payment processes cause long queues. The absence of a customer data management system hinders service personalization, while the lack of transparency of service information makes it difficult for customers to choose the appropriate service. With these findings, CRM systems are designed to address issues with online reservations, WhatsApp consultations, and digital payments to improve customer experience and operational efficiency. The system will also include service history recording and promotions based on customer preferences to increase customer loyalty and satisfaction.
2. Application specifications based on CRM strategy
   The results of business process identification are used as a reference to determine system specifications. CRM implementation is carried out with a SWOT analysis to find out the CRM features in the application. The following is a SWOT analysis that can be seen in Figure 2.

Internal / Eksternal	Strengths (Kekuatan) 1. Pelayanan yang disediakan beragam	Weakness (Kelemahan) 1. Proses reservasi hanya dapat dilakukan secara offline 2. Promisi hanya sebatas informasi melalui platform whatsapp dan instagram 3. Alur reservasi dan pembayaran mayoritas secara konvensional dan memakan waktu yang cukup lama.
Opportunity (Peluang) 1. Konsumen dalam jasa kecantikan yang tinggi 2. Target pasar yang luas 3, Peningkatan jumlah pelanggan dalam berbagai program yang tersedia	S-O 1. S1-O1 = Dengan layanan yang beragam, bisnis bisa menawarkan paket-paket khusus untuk menarik konsumen jasa kecantikan yang semakin meningkat . 2. . S1-O2 = Layanan yang variatif dapat disesuaikan dengan berbagai segmen pasar, dari remaja hingga dewasa, untuk memaksimalkan potensi pasar yang luas. 3. S1-O3 = meningkatkan jumlah pelanggan dengan menawarkan program loyalitas atau promosi layanan yang tersedia,	W-O 1. W1-O1 = Memanfaatkan tingginya permintaan konsumen jasa kecantikan dengan mengembangkan sistem reservasi online, sehingga lebih memudahkan pelanggan untuk memesan layanan dan menyesuaikan dengan preferensi mereka. 2. W2-O2 = memperluas cakupan promosi dengan menggunakan platform web 3. W3-O3 = memperbaiki alur reservasi dan pembayaran, misalnya dengan menyediakan opsi pembayaran digital dan sistem reservasi otomatis.
Threat (Ancaman) 1. Persaingan yang ketat dalam bidang yang sama 2. Pelanggan yang memiliki kebutuhan yang berbeda	S-T 1. S1-T1 = Dengan beragamnya layanan, bisnis bisa menciptakan nilai unik yang membedakannya dari kompetitor. Misalnya, menawarkan layanan eksklusif atau premium yang tidak disediakan oleh kompetitor untuk menarik segmen pelanggan khusus. 2. S1-T2 = Bisnis dapat beradaptasi dengan kebutuhan pelanggan yang beragam dengan menciptakan layanan yang dipersonalisasi. Dengan memanfaatkan kekuatan dalam menyediakan layanan yang beragam, bisnis bisa memenuhi preferensi khusus setiap pelanggan.	W-T 1. W1,W3-T1=Untuk bersaing dengan kompetitor, bisnis harus segera meningkatkan proses reservasi dan pembayaran menjadi lebih modern dan efisien, misalnya dengan menyediakan aplikasi mobile atau website yang mudah diakses oleh pelanggan. 2. W2-T2 = Bisnis perlu memperluas strategi promosi dan lebih memahami preferensi pelanggan. Dengan menggunakan platform yang lebih luas dan mengembangkan promosi berbasis data bisnis bisa menawarkan promosi yang lebih relevan sesuai kebutuhan pelanggan.

Picture 2. SWOT Analysis

After the SWOT analysis, the next CRM-SWOT strategy mapping is to determine the strategy for implementing CRM features, so that it can produce application features by implementing CRM. The following mapping of the CRM-SWOT strategy can be seen in table 1:

Table 1. CRM-SWOT Strategy Mapping

Yes	Acquire	Retain	Enhance
1	S1-O1: Offering a service package that suits the specific needs of the market to attract new consumers	S1-T2: Providing personalized services based on diverse customer needs to retain customers by meeting their preferences.	S1-O3: Increase customer loyalty through loyalty programs and better promotional offers.
2	S1-O2: Tailoring services to different market segments to attract a larger customer base.	W1,W3-T1: Improve the reservation process to stay competitive and retain existing customers.	W2-O2: Encourage the use of digital payment systems and increase promotions through web platforms to improve the overall customer experience of the reservation process
3	W1-O1: Improved the reservation system by changing the process from offline to online, making the experience easier for new users.	W2-T2: Develop better loyalty programs with personalized promotions to retain customers.	S1-T1: With a wide range of services, businesses can create unique value that sets them apart from competitors. For example, offering exclusive or premium services that competitors do not provide to attract a niche customer segment.
4.	W3-O3: Improving payment options by introducing digital payments and making transactions easier across multiple platforms		

Based on Table 1, which explains the mapping of CRM strategies using SWOT analysis along with solutions to build websites described in Table 2 of applications that implement CRM.

Table 2. CRM Features

Yes	CRM-SWOT Strategy	Feature	Analysis
1.	S1-O1: Offering a service package that suits the specific needs of the market to attract new consumers	Promotional Features	This strategy leverages the diverse power of services to create compelling offers, using service packages as promotional tools to attract new customers.
2.	S1-O2: Tailor services to different market segments to attract a larger customer base.	Consulting Features	Tailoring services to different market segments can involve consulting to understand the specific needs of each segment and offer relevant services.
3.	W1-O1: Improve the reservation system by changing the process from offline to online, making the experience easier for new users.	Service Reservation Features	Modernizing the reservation system with online booking to make it easier for new customers to access and use.

Yes	CRM-SWOT Strategy	Feature	Analysis
4.	W3-O3: Improve payment options by introducing digital payments and making transactions easier across multiple platforms	Payment Features	Adding digital payment options that make it easier for customers to make transactions, and speed up and simplify the payment process.
5.	S1-T2: Providing personalized services based on diverse customer needs to retain customers by meeting their preferences.	Consulting Features	Providing personalized services often involves consulting to understand and meet the specific needs of customers, thereby increasing retention
6.	W1,W3-T1: Improve the reservation process to stay competitive and retain existing customers	Service Reservation Feature, Payment Feature	Integrate efficient reservation features and modern payment options to compete with competitors and maintain existing customer satisfaction.
7.	W2-T2: Develop better loyalty programs with personalized promotions to retain customers.	Promotional Features, Testimonial Features	Use personalized loyalty programs to provide added value to loyal customers, including special offers and leverage testimonials to attract more customers.
8.	S1-O3: Increase customer loyalty through loyalty programs and better promotional offers.	Promotional Features, Testimonial Features	Loyalty programs and promotional offers can encourage customers to keep coming back and recommending services to others, with the support of customer testimonials.
9.	W2-O2: Encourage the use of digital payment systems and increase promotions through web platforms to improve the overall customer experience of the reservation process	Payment Features, Promotion Features	Increase promotion through web platforms and facilitate digital payments to improve customer experience and attract more new users.
10.	S1-T1: With a wide range of services, businesses can create unique value that sets them apart from competitors. For example, offering exclusive or premium services that competitors do not provide to attract a niche customer segment.	Consultation Feature, Testimonial Feature	Utilize diverse services to provide added value and use testimonials to highlight the unique and exclusive advantages of services.

The following are the application specifications based on CRM strategies that include functional and non-functional needs:

Table 3. Application Specifications

Functional	Non-Functional
The system can log in	Web-based system
The system can manage categories	Uses PHP programming language version 8.3 and uses Laravel Framework version 11
The system can manage the products	
The system can make product reservations	The system uses midtran as a payment gateway library
The system can make payments	
The system can display payment history	MySQL is used as a database management system
The system can manage testimonials	The hardware specifications used from the developer's side include:
The system can display testimonials	
The system can manage product promotions	Processor : Intel Core i3
The system can choose promotions	RAM : 4 GB
The system can redirect consultations via WhatsApp	Hard disk : 500 GB

3. Identify the Actor

The activities that can be carried out by each actor will be described in table 4 as follows:

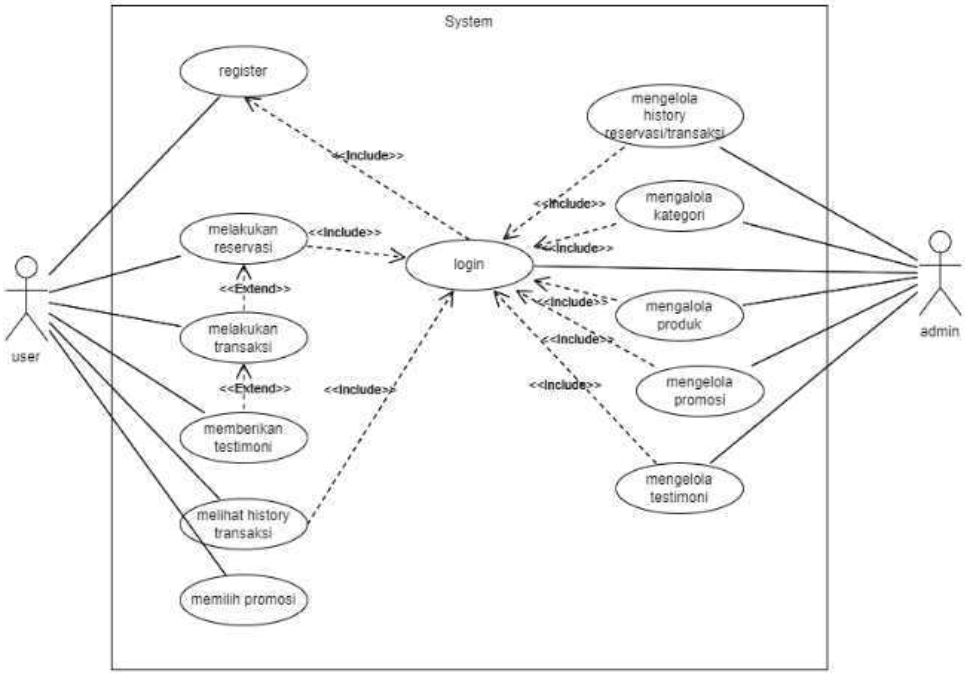
Table 4. Identify the Actor

Actor	Activity
Admin	. Login
	. Manage categories
	. Manage products
	. Manage reservation history
	. Manage promotions
	. Manage testimonials
E-Mail	. Registration
	. Login
	. Choose a promotion
	. Make a reservation
	. Make a payment
	. Provide testimonials on product reservations
	. View reservation history
	. Redirect consultation via WhatsApp

3.3 Designing

At the Designing stage, activities carried out at this stage include designing Use Case diagrams, CRC Cards and designing user interfaces.

1. Use Case Diagram



Picture 3. Use case diagram

The Use Case describes the user's interaction with the system. Where admins are in charge of managing categories, managing products, managing transaction history, managing promotions, and managing testimonials. Meanwhile, users can log in, can choose promotions, can make service reservations, make payments, provide testimonials, and view transaction history.

2. CRC Card

The CRC Card Design defines the responsibilities of each class in the system, which is shown in Figure 4.

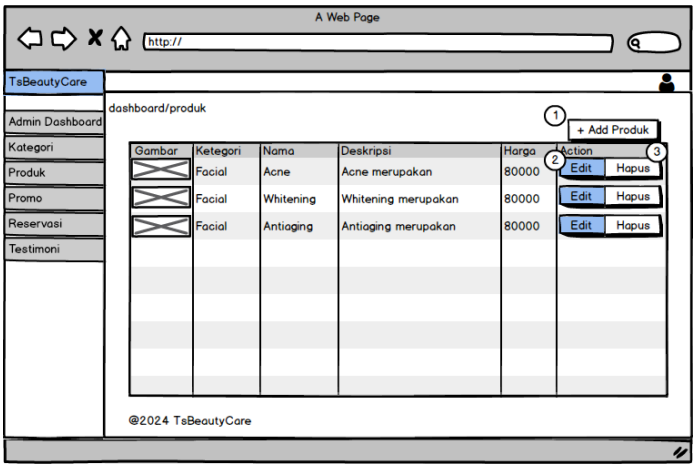
Class	
Sistem Mengelola Kategori	
Responsibility	***Collaborator***
Menampilkan halaman kategori	Admin
Menambah, mengubah, menghapus kategori	

Picture 4. CRC Card Categories

The CRC category has six main responsibilities. Among them, adding categories, changing categories, and deleting categories. With admin, category, and product collaboration.

3. Mock up Interface

The design of the user interface is made to provide a visual representation of the application to be developed. Here is what the user interface of the product management page looks like.

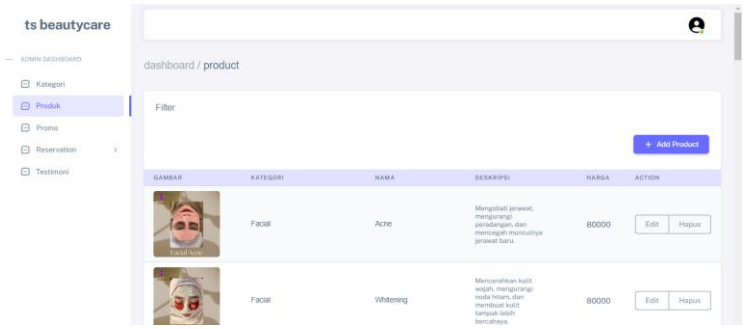


Picture 5. Interface for managing products

The product management interface design presented in Figure 4 includes several menus, including "Add Product" which is used to add products, "Edit" which is used to edit products, and "Delete" which is used to delete products.

3.4 Coding

At this stage, the implementation of the design into a CRM strategy-based programming language is carried out, this application is built using the Laravel framework. The results of the implementation of the design into the programming language can be seen in Figure 6.



Picture 6. Product management page

3.5 Testing

At this stage, the testing stage is carried out to ensure that the application that has been built is functioning properly. Alpha testing is done with the Blackbox testing method to check functionality to ensure that the application runs smoothly without errors or bugs. And, Beta testing is carried out by users to obtain feedback through questionnaires using the System Usability Scale (SUS).

1. Blackbox Testing
   Black Box Testing is to evaluate the quality of the software, focusing on its functionality. To do Black Box Testing We can use the Alpha Testing [13]. Alpha Testing is a process carried out by the development team to verify that the application can operate properly, free from errors or Bug, Testing is done before the software is released to users, Testing Alpha It is done as a first step before the software is released. Proceed to the testing stage Beta [14]. Overall, the test results Alpha The researchers showed that all the features of the application ran well without the presence of Bug.
2. Beta Testing
   Tester Beta is a form of software testing conducted by an end user to validate the readiness of an

application for actual use or to solicit feedback or judgment from them. The use of questionnaires is one of the strategies used to collect Feedback, where in the test Beta questionnaire System Usability Scale (SUS) It is widely used to evaluate user satisfaction, due to its advantages in fast and inexpensive administration. Testing Beta Done using a questionnaire System Usability Scale (SUS), which consists of ten questions that the user must complete, as depicted in Figure 6, and five response options, as illustrated in Figure 7 [11] .

No	Pertanyaan
1.	Saya berpikir akan menggunakan sistem ini lagi?
2.	Saya merasa sistem ini rumit untuk digunakan?
3.	Saya merasa sistem ini mudah digunakan?
4.	Saya membutuhkan bantuan dari orang lain atau teknisi dalam menggunakan sistem ini?
5.	Saya merasa fitur-fitur sistem ini berjalan dengan semestinya?
6.	Saya merasa ada banyak hal yang tidak konsisten (tidak serasi pada sistem ini)?
7.	Saya merasa orang lain akan memahami cara menggunakan sistem ini dengan cepat?
8.	Saya merasa sistem ini membingungkan?
9.	Saya merasa tidak ada hambatan dalam menggunakan sistem ini?
10.	Saya perlu membiasakan diri terlebih dahulu sebelum menggunakan sistem ini?

Picture 7. SUS question template

Skala	Keterangan
5	Sangat setuju (ST)
4	Setuju (S)
3	Cukup (C)
2	Tidak setuju (TS)
1	Sangat tidak setuju (STS)

Picture 8. SUS Answer List

This questionnaire is filled out by clinic customers who have used the application. The following is the data from the collection and calculation of the SUS questionnaire.

HASIL PERHITUNGAN SUS												Nilai
Respondent	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	JUMLAH	(Jumlah x 2.5)
R1	2	3	2	2	2	2	2	3	2	2	22	55
R2	3	3	3	4	2	3	3	3	3	3	30	75
R3	3	2	3	2	2	3	4	3	3	2	27	67.5
R4	4	3	4	2	4	4	3	3	3	2	32	80
R5	4	4	4	3	4	4	4	4	4	3	38	95
R6	3	3	3	3	3	3	3	3	3	3	30	75
R7	4	4	4	4	4	4	4	4	4	4	40	100
R8	4	4	4	4	4	4	4	4	4	4	40	100
R9	3	3	2	3	3	3	3	3	3	3	29	72.5
R10	4	4	4	4	4	4	4	4	4	4	40	100
R11	4	4	4	3	3	4	4	4	4	3	37	92.5
R12	2	2	3	2	3	3	3	3	3	3	27	67.5
R13	4	4	4	4	4	0	4	4	4	4	36	90
R14	3	2	3	3	3	3	2	2	2	2	25	62.5
R15	3	0	3	3	4	4	4	3	3	3	30	75
R16	4	4	3	3	4	3	3	4	4	4	36	90
R17	4	1	3	1	4	4	2	2	3	2	26	65
R18	4	4	4	4	4	4	4	4	4	4	40	100
R19	4	4	4	4	4	4	4	4	4	4	40	100
R20	2	3	3	2	3	2	1	2	1	2	21	52.5
SKOR RATA-RATA SUS											646	80.75

Picture 9. SUS Calculation Results

Based on the results of the SUS calculation, this system got an overall score of 646 with an average score of 80.75. Based on the SUS indicator in Figure 9, this score is in category A, indicating that the system has an outstanding usability quality, described as "Excellent". This shows that the majority of users are very satisfied with their experience and the system is very acceptable. This score also shows that users are more likely to recommend the system to others, making it a "Promoter" category. Overall, these results confirm that the tested systems have excellent usability quality, meeting or even exceeding user expectations.

Test results Alpha show all the features of the app running properly without Bug. Testing Beta use System Usability Scale (SUS) resulting in a score of 80.75 which is in the category "Excellent", signifying an excellent user experience and a high level of satisfaction. Comparison with Previous Research. Compared to the research of Erlansyah & Hersani (2023) developed an application CRM Android-based for K-Skincare Clinic using XP, which focuses on improving customer service, but is still limited to mobile platforms [3]. In contrast to this study, the system developed is based on Web, providing wider access for customers and flexibility in usage. Meanwhile, Maulidya Tahir (2023) researched the implementation of CRM on the Salon N'N-based reservation system Web Using the Rapid Application Development (RAD). Even though RAD Accelerating the development process, the study underemphasized continuous testing [5]. For comparison, this study uses Extreme Programming (XP) which is more adaptive, allowing for repeated testing thus improving the stability and quality of the system. Research by Pratiwi et al. (2023) shows that CRM can increase customer loyalty, but the study puts more emphasis on a quantitative approach without iteratively developing the system [6]. In this study, XP It is used to develop a flexible and user feedback-oriented system, thus enabling rapid iteration in adapting features to customer needs. Furthermore, Wijaya et al. (2023) designed an application CRM Based Web Using the Action Research, but the research is still limited to the design stage without the implementation of a system that can be tested operationally [7]. In this study, the testing Black Box Testing and SUS used to ensure reliability and optimal user experience. Research by Babar & Saitakela (2019) developed a system CRM Based Web Using the Prototype, which aims to increase customer engagement. However, the system is less flexible in continuous testing and less adaptive to changing business needs [8]. This study shows that the XP more adaptive, thus enabling continuous system development and ensuring better software quality. From the results of the comparison, it can be concluded that the use of the Extreme Programming (XP) In this study it provides advantages in terms of adaptability, rapid iteration, and continuous testing, which sets it apart from previous studies. Implementation CRM Based Web tested in this study has a positive impact on improving customer experience, operational efficiency, and beauty clinic marketing strategy. Feature Impact CRM to Customer Satisfaction. Online reservation feature, consultation Posted by E, digital payments, and testimonials have been proven to improve operational efficiency and customer interaction as well as Midtrans as Payment Gateway Speed up transactions, reduce customer wait time.

4. CONCLUSION

Based on the results of research on the Implementation of Customer Relationship Management (CRM) in web-based beauty service applications using the Extreme Programming (XP) method, it can be concluded that this application has succeeded in improving operational efficiency, strengthening interactions with customers and increasing customer satisfaction and loyalty through reservations, promotions, testimonials, consultations, and payments through the application The website allows the clinic to be more responsive to customer needs and reduce wait times, which significantly improves the customer experience. The use of the Extreme Programming method in the development of this application ensures that the system can be developed quickly and adaptive to user feedback, allowing the clinic to continue to innovate and adapt to changing customer needs. For further development, the addition of an artificial intelligence-based chatbot feature to handle customer queries and consultations can be considered automatically. This feature can improve efficiency in providing customer service and speed up responses to frequently asked questions, resulting in a more optimal user experience.

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