Improving Hospital Patient Loyalty by Exploring the Concept of Customer Relationship Management

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Abstract:

Research on the influence of customer relationship management (CRM) on patient satisfaction and loyalty is essential because CRM plays a pivotal role in building long-term relationships between patients and healthcare providers. Besides, the moderating role of electronic word-of-mouth (e-WOM) is relevant, as patients' digitally shared opinions and experiences can either enhance or diminish the impact of CRM on patient satisfaction and loyalty. This study aims to identify the influence of CRM on patient satisfaction and loyalty, as well as the moderating effect of e-WOM in this context. The methodology employs a qualitative approach, utilizing a survey of 213 hospital patients, with responses measured on a 1 to 5 Likert scale. The study was also designed to examine the economic contribution of the CRM strategy to hospital profits through linear trend analysis.

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Quantitatively, the financial performance was measured using return on investment (ROI) and operating margin. Two different periods were compared: 2011–2017 (before CRM implementation) and 2018–2024 (after CRM implementation). The results of hypothesis testing indicate that CRM has a significant positive impact on patient satisfaction, which, in turn, positively influences patient loyalty through patient satisfaction. Nonetheless, patient satisfaction does not have a significant direct effect on patient loyalty. Other empirical findings confirm that patient satisfaction can indirectly foster patient loyalty through the positive impact of CRM. The other result found that e-WOM plays a significant moderating role by strengthening the causality between CRM and patient loyalty, enhancing the positive effect of CRM on loyalty. There is a concrete distinction between the CRM strategy implemented by hospital management and the operational margin. First, without CRM, it is known that ROI increases the hospital's operational margin by 89.93%. Second, the hospital's operational margin improves further when ROI utilizes CRM, with an increase of 94.45%.

These findings imply that hospitals should prioritize improving the quality of CRM in terms of medical services, communication, and information technology. Furthermore, adopting e-WOM as a tool for building reputation and patient loyalty is crucial. This research offers valuable insights for hospital managers to design more effective strategies for creating patient satisfaction and loyalty through enhanced relationship management and leveraging social media.

Introduction

The existence of hospitals is highly beneficial to the community, as health is fundamental to the survival of all living beings. Although no one desires to visit a hospital for treatment, hospitals play a crucial role in providing medical care. They employ medical personnel who offer services and support to patients (Ferreira et al., 2023). Also, hospitals are equipped with health facilities such as emergency units, radiology departments, laboratories, pharmacies, and other resources that improve the quality of care. High-quality facilities and services are important for hospital patients (Rande et al., 2023). Historically, hospitals functioned as social institutions; however, with the rise of private hospitals, they are now more accurately viewed as industrial health service providers, managed similarly to economically driven businesses (Kim & Han, 2012). The challenges hospitals face in improving their services correspond directly to societal demands and advances in technology. As a result, hospitals must continuously improve various aspects of their operations to foster patient satisfaction and loyalty, which in turn intensifies competition.

In East Kalimantan, the large number of hospitals creates intense competition, compelling healthcare providers to attract consumers through the services they offer. Hospital industry players strive to prevent consumers from being easily swayed by competitors' offers by delivering superior services that competitors do not provide. To achieve this, service providers must implement effective strategies to project a positive image to consumers. Hospitals not only offer healthcare services but also add value for consumers (Popa et al., 2008). Simultaneously, the fierce competition among hospitals necessitates the provision of systematic services to attract consumers, where schemes, branding, and public relations play a crucial role in helping institutions ensure that consumers feel comfortable with the facilities provided at the highest quality. Essentially, companies grow due to a large consumer base and the satisfaction of institutions that offer the services consumers need (Dam & Dam, 2021).

The average business spends five times more on attracting new customers than on serving existing ones (Sujansky & Ferri-Reed, 2009). To boost customer loyalty and reduce the tendency for customers to switch to competitors, various organizations have made CRM a key focus of organizational culture improvement (Chahal, 2008; Choi et al., 2013; Ngai, 2005). The healthcare industry, like many others, has recognized the importance and necessity of having loyal customers, in this case, patients, since focusing solely on quality of care and patient satisfaction may not be sufficient to achieve healthcare organizations' goals in today's competitive environment. Similar to other sectors, healthcare service providers must build mutually committed relationships with patients to foster patient loyalty.

For example, a strong patient-doctor relationship can significantly strengthen the bond between providers and patients. In this scope, CRM can help healthcare providers better understand patients, thereby enhancing the quality-of-service encounters and generating benefits for both providers and patients. From the provider's perspective, CRM can reduce competitive pressure, attract new patients through referrals from loyal patients, and decrease patient defections (Chahal, 2008). In addition to benefiting service providers, CRM can positively influence patients by fostering patient loyalty, which promotes continuity of care, a comprehensive understanding of patient needs, and ultimately, improved treatment outcomes (Mbuwel et al., 2022).

Despite the potential benefits of CRM in the healthcare sector, existing empirical studies have predominantly focused on industries such as hotels, retail, banking, tourism, transportation services, mobile industry, and public services (Anabila & Awunyo-Vitor, 2013; Dimitriadis, 2010; Lo et al., 2010; Özgener & İraz, 2006; Pan et al., 2006; Saadat & Nas, 2013; Truong et al., 2020). Only a limited number of manuscripts have applied the concept of CRM to the health sector (Baashar et al., 2016). There is a notable scarcity of research on CRM within the healthcare sector in Indonesia. In other fields, the role of emotions has garnered significant interest from academics and practitioners as a crucial factor in understanding consumption experiences and behavior (Han & Jeong, 2013; Mattila & Enz, 2002). Emotions serve as markers, mediators, and moderators of consumer responses (Bagozzi et al., 1999). They influence information processing, decision-making, satisfaction, perceptions of service failure, word-of-mouth (WOM), complaint behavior, and loyalty (Bagozzi & Yi, 1988; Han & Jeong, 2013; Joireman et al., 2013). When we travel for leisure, we primarily seek experiences and emotions. Similarly, when we receive healthcare services, we store those experiences and emotions in our memories.

Previous papers, as noted by Brunner-Sperdin et al. (2012) and Dong and Siu (2013), emphasize the limitations of cognitive models in explaining service encounter evaluations. Service experience evaluation is not solely cognitive but also emotional, particularly within the context of tourism (Edvardsson, 2005; Han & Jeong, 2013). Emotional experiences add a crucial dimension to understanding how consumers assess and respond to the services they receive, demonstrating a strong correlation between emotional factors and customer perceptions and attitudes toward service experiences, including those in the tourism industry.

This study attempts to provide insight into the extensive research on emotions within the healthcare industry by examining the role of positive emotional experiences in influencing behavioural intentions and patient satisfaction in specific hospital service areas. During healthcare treatment, emotional experiences often arise from various aspects of hospital services, including the condition of the rooms, the care provided by doctors, and interactions with nurses and the patient community. In response to increasing competition, some healthcare providers are exploring their capacity to deliver emotional experiences and customized services to patients, using these as distinct differentiators that can enhance customer loyalty and serve as sources of competitive advantage. These providers are increasingly focused on offering unique experiences rather than merely commoditized services. It is important to underscore that experiential elements are more difficult to replicate. The role of emotional outbursts in service usage has gained unprecedented recognition (Gnoth, 1997; Goossens, 2000). Previous scientific works have examined emotional experiences related to festivals, shopping, restaurants, amusement parks, holidays, and adventure tourism (Bigné et al., 2008; Faullant et al., 2011; Grappi & Montanari, 2011; Han & Jeong, 2013; Han et al., 2009; Ladhari, 2009; Lee et al., 2008; Rodríguez del Bosque & San Martín, 2008; Yüksel, 2007; Yüksel & Yüksel, 2007). However, specific research focusing on healthcare services and the hospital industry remains relatively scarce.

The background presented highlights those studies on CRM, patient loyalty, patient satisfaction, and emotional experiences within healthcare services are key thematic areas that stimulate academic inquiry and attention. Nevertheless, several research gaps and unresolved issues remain that warrant further exploration. Theoretically, this study aims to contribute to the development of social exchange theory (SET), which serves as the primary framework for this research. SET is employed to explain the relationship between patients and hospitals through the lens of CRM.

This study also attempts to examine economic prospects, such as the ROI generated from CRM, using quantitative methods, in this case, linear trend analysis. This model is useful for measuring financial gains as an indicator of whether CRM can increase profit levels or not. It evaluates the impact of CRM as an example of efficient hospital management based on operating margin. Practically, the findings of this research are highly valuable, offering insights for hospitals to ensure sustainable service management, as retaining patients is more challenging than acquiring new ones. Also, private hospitals—the focus of this study—depend heavily on sales growth driven by patient retention, making the increase in patient numbers a critical factor in boosting hospital income and revenue. Hence, the research concept that applies CRM to patient retention is particularly beneficial for hospitals.

1. Literature Review and Hypothesis

1.1. Theoretical Basis

Several experts assert that in cooperative relationships, all parties involved expect the outcomes to provide significant value (Buchholz et al., 2020; Lankoski et al., 2010; Xiao et al., 2010). According to SET, the processes and interactions between individuals in a relationship can be understood as mutually beneficial transactions and exchanges (Ahmad et al., 2023). This theory is based on the premise that individuals engage in social relationships to achieve goals unattainable alone (Butera & Buchs, 2019).

The basic assumption of this theory is that individuals voluntarily enter into and remain in social relationships as long as those relationships are sufficiently satisfying in terms of rewards and costs. SET is based on four fundamental premises. First, rewards refer to what individuals gain from a social relationship. These rewards can include anything perceived as positive, such as money, happiness, emotional support, or social recognition. According to SET, individuals are more likely to maintain social relationships that provide greater rewards than the costs incurred. Second, costs refer to what individuals expend in a social relationship. Costs can include anything perceived as negative by the individual, such as time, energy, money, or personal sacrifice. Third, social norms emphasize the standards or rules that govern individual behaviour in social relationships. These norms can be explicitly agreed upon by all members of a social relationship or implicitly followed by its members. SET suggests that individuals are more likely to comply with social norms to maintain existing social relationships. Fourth, dependence highlights the degree to which individuals rely on a social relationship. Dependence can manifest as a need for emotional, material, or informational support from others. Basically, individuals are more likely to maintain social relationships that increase their dependence on others, as losing these relationships could negatively impact their well-being (Derrick et al., 2012).

Loyalty is a strong commitment to continue purchasing or supporting preferred products or services in the future, despite the possibility that changing circumstances or marketing efforts may lead customers to switch (Evanschitzky et al., 2022). It is generally understood as the willingness of customers to repeatedly buy the same product and recommend it to friends and family (Shiddiqi & Saifuddin, 2023). Consumer loyalty is influenced by both rational and emotional factors. Rational factors arise from product attributes such as quality, price, and reliability, while emotional factors are based on consumer feelings, such as satisfaction, trust, and affection for the brand (Elsäßer & Wirtz, 2017). Loyal customers, including hospital patients, do not develop loyalty instantly but gradually over time, requiring different services and attention tailored to each consumer (Liu et al., 2021). Khan et al. (2021) and Peralta (2025) categorize customer loyalty into five stages. First, new customers are those making a purchase for the first time. Second, regular customers make purchases on a consistent basis and are satisfied with the products or services provided. Third, loyal customers consistently buy from a particular brand and are unlikely to switch to a competitor. Fourth, promoter customers actively recommend a specific brand to others. Fifth, evangelist customers are deeply attached to a brand and enthusiastically promote it.

Patient satisfaction is an evaluation or assessment of healthcare services received, based on the patient's perception of the quality of care provided. It is closely related to the patient's needs and expectations regarding healthcare services (de Steenwinkel et al., 2022). Determining patient satisfaction with certainty is challenging because it involves subjective aspects such as the patient's perception of service quality and how it aligns with their expectations. Substantively, patient satisfaction should be grounded in empirical evidence rather than solely on conceptual definitions (Fitzpatrick & Hopkins, 1983). High-quality services can improve patient satisfaction, which in turn increases patient loyalty and reduces the likelihood of patients switching to competing hospitals (Apryani, 2025). Moreover, patient satisfaction influences the relationship between service providers and patients, fostering a harmonious and mutually beneficial partnership (Hameed et al., 2025).

Consumers gather information about companies or products using the internet; consequently, e-WOM has emerged as an important tool. e-WOM refers to any positive or negative statement made by potential, actual, or former customers about a product or company that is accessible to many people and institutions via the internet (Hennig-Thurau et al., 2004). e-WOM communication has become a significant platform for consumer opinions and due to its ease of accessibility and broad reach, it is more effective than offline WOM communication (Chatterjee, 2001; Godes & Mayzlin, 2004; Hennig-Thurau et al., 2004; Mayzlin, 2006). Product reviews posted by consumers online represent one of the most relevant forms of WOM or e-WOM communication (Sen & Lerman, 2007). Increasingly, consumers consult online product reviews during prepurchase information searches, which in turn shapes purchase intentions (Adjei et al., 2009; Zhang & Tran, 2009; Zhu & Zhang, 2010). In practice, e-WOM communication exerts a strong direct or indirect influence on purchase intentions, ultimately affecting involvement in the purchase decision (Jalilvand & Samiei, 2012).

CRM is a fundamental concept in modern marketing. Customer-oriented companies must continuously cultivate relationships with their customers. CRM encompasses all components involved in identifying customers, generating customer insights, building relationships, and sharing customers' perceptions of the organization and its products. Numerous studies highlight the benefits of CRM in the healthcare industry. Mohammed et al. (2024) report that CRM implementation can enhance customer data management, increase customer satisfaction, and build long-term relationships. Likewise, Baashar et al. (2020) reinforce that CRM can improve patient satisfaction, facilitate communication between patients and medical staff, and expedite the treatment process.

Conceptually, ROI is a fundamental profitability ratio that measures the strength of asset or capital utilization in generating operating profit. In financial ratio analysis, ROI reflects management's ability to convert total investment into profit by comparing net profit or operating profit to the amount of capital invested (Tantra et al., 2021). ROI is widely used in investment decision-making and project performance evaluation due to its simplicity and quantitative nature (Botchkarev & Andru, 2021). Even so, as noted by Thusini et al. (2022), ROI does not account for the time value of money, which limits its effectiveness. Thus, in financial management literature, ROI is often compared with or supplemented by other metrics such as net present value (NPV) and internal rate of return (IRR). To refine the ROI model to the specific context under study, the financial return on investment in a CRM system or activity is measured by the profit level reflected in the operating margin. Typically, ROI increases only if hospitals use CRM consistently; however, if CRM is not integrated with service processes, ROI may fluctuate or even decline (Alkhazali & Hassan, 2015; Baashar et al., 2020; Hung et al., 2010; Moffatt-Bruce et al., 2017).

1.2. Proposed Hypothesis

The main objective of implementing a CRM system is to enhance customer service and drive sales growth. A CRM system collects customer data from various communication channels, including websites, emails, telephone calls, chat, and social media. This data is then stored in a centralized database accessible to multiple teams within an organization or business. It is especially important for service providers, such as hospitals, to prioritize CRM, as the close relationship between service providers and customers can lead to increased customer satisfaction (Zimmerman & Anderson, 2019), which is a key determinant of loyalty. Besides, research has established that

customer satisfaction plays a crucial role in maintaining customer loyalty (Mittal et al., 2023; Sukardi et al., 2023; Yum & Yoo, 2023).

The implementation of CRM in healthcare has led to significant positive changes (Peri, 2024). The application of CRM in patient registration has enhanced process efficiency, reduced bureaucracy, and shortened registration times. These improvements not only benefit healthcare facilities internally but also directly enhance patient satisfaction by providing a faster and more efficient registration experience. As well, CRM integration has successfully decreased patient waiting times, fostering a more responsive and effective service environment. For this reason, CRM implementation positively impacts operational efficiency and patient experience, driving comprehensive improvements in healthcare services. Rangu (2025) further underlines the urgency of adopting CRM in the healthcare sector. His findings highlight consistent improvements in patient experience, as CRM offers a framework for personalizing services based on individual needs. Moreover, CRM implementation is associated with reduced operational costs through increased efficiency in administrative processes and overall resource management. The first hypothesis is developed as follows:

H_1: CRM directly influences patient satisfaction

Every organization strives to maintain and utilize critical information about customer needs, expectations, and preferences to keep customers satisfied and loyal. CRM is widely regarded as an effective tool for achieving this goal (Purwati & Novari, 2023). This view is supported by Li et al. (2023), who demonstrate that CRM positively impacts customer loyalty through practices such as multi-channel engagement, customer service, customization, and cross-selling in e-commerce. Furthermore, evidence confirms that both customer satisfaction and loyalty are significantly influenced by CRM. Overall, the mainly objective of CRM is to create customer satisfaction, trust, loyalty, and retention. Based on this, the second hypothesis is designed as follows:

H_2: CRM has a direct impact on patient loyalty

Evidence from various cross-sectional studies shows that CRM is positively associated with customer satisfaction, trust, and knowledge (Fuad & Abdullah, 2025). Although satisfaction with a product or service is generally linked to loyalty, it does not sufficiently serve as a direct antecedent of loyalty. It has been widely recognized that CRM plays a key role in maintaining customer loyalty, especially among long-term patients (Ceissa et al., 2025). In the case of new patients, loyalty is considered an indirect outcome of satisfaction. Additionally, organizations that implement CRM effectively are likely to benefit from increased customer satisfaction (Prajapat, 2024). As well, customer satisfaction, loyalty, and trust are also regarded as outcomes resulting from customer involvement in CRM implementation. It is undeniable that improved CRM influences patient loyalty through patient satisfaction, even when accounting for other factors that equally affect patient satisfaction and loyalty. In conclusion, CRM has a direct and significant relationship with patient satisfaction; patient satisfaction, in turn, has a direct and significant relationship with patient loyalty; and CRM positively and significantly influences patient loyalty through patient satisfaction. The third hypothesis is formed as follows:

H_3: CRM indirectly influences patient loyalty through patient satisfaction

Xie et al. (2011) argue that e-WOM is prevalent in today's industrial markets and has the potential to shape consumer decision-making. On a related note, Litvin et al. (2008) demonstrated that interpersonal influence and word of mouth are the most important sources of information when consumers make purchasing decisions. Ye et al. (2009) emphasize that positive online reviews can significantly increase hotel bookings. Studies show that e-WOM can influence customer loyalty. Worthington et al. (2010) mention that loyal customers are more likely to express positive e-WOM and engage in brand advocacy. Yet, the reverse relationship has not been thoroughly explored: can e-WOM be considered a precursor to consumer brand loyalty? In other words, customers who invest time and effort in spreading positive opinions online may be at the early stages of developing stronger loyalty in the future. Moreover, positive comments are recognized to enhance brand reputation, which helps companies attract

new customers and increases the likelihood that these new customers will become loyal (Yacouel & Fleischer, 2012). The majority of publications concern on e-WOM in the hospitality and tourism industries, but few address the integration of CRM with e-WOM as a moderating variable and its impact on hospital patient loyalty. The healthcare industry also relies on reviews from previous patients, which can help enhance patient loyalty to hospitals and healthcare services. This study aims to develop a new model for the healthcare industry by adapting findings from previous studies conducted in different contexts and cultures. The fourth hypothesis is designed as follows:

H_4: e-WOM strengthens the influence of CRM on patient loyalty.

1.3. Conceptual Framework

The conceptual framework systematically outlines how this research is designed to understand, conceptualize, and explain the relationships between variables based on phenomena observed in the field. In this case, the conceptual framework is not standalone but is grounded in the identification of real phenomena or problems occurring within a specific setting, such as the decline in patient loyalty in hospitals in the digital age. This phenomenon serves as the starting point that motivates the research to develop structured reasoning aimed at explaining the root causes of the problem and guiding the direction of relevant solutions.

This study is a causal investigation examining the links between several exogenous and endogenous variables within a direct path model. For example, it explores the relationship between CRM and patient satisfaction and loyalty. In this context, CRM serves as an exogenous variable, while patient satisfaction and loyalty are endogenous variables. Technically, the study incorporates one intervening variable and one moderating variable within an indirect path model. Specifically, it examines the relationship between CRM and patient loyalty mediated by patient satisfaction, as well as the moderating effect of e-WOM on the relationship between CRM and patient loyalty. Patient loyalty is thus influenced by CRM both through patient satisfaction and through the moderating role of e-WOM. The study focuses on hospital patients in several cities and districts in East Kalimantan. Figure 1 illustrates the research model using partial least squares (PLS), detailing the interconnections among the variables.

In addition to the four hypotheses mentioned above, this study also applied ROI modelling to hospitals both before and after the implementation of CRM services. The profits of the hospitals analysed will illustrate the extent to which CRM can influence operational margins. Beyond financial metrics for predicting operational margins, the ROI value also reflects the generation of patient loyalty through CRM.

Figure 1. Conceptual framework of the investigated model
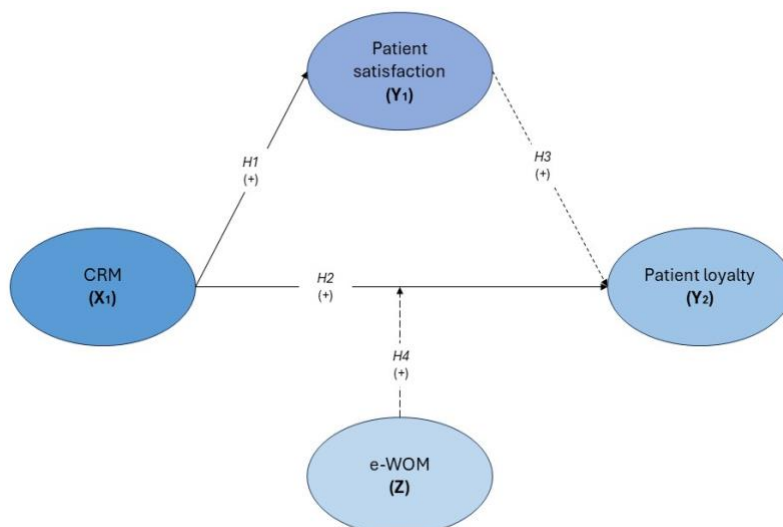
Source: Author's idea.

2. Research Methods

2.1. Operational Definitions of Variables and Measurements

The four variables in this qualitative model have distinct interpretations and parameters. First, patient loyalty refers to the behaviour of repeatedly using hospital services and maintaining a positive attitude toward the hospital service provider in the future (Abekah-Nkrumah et al., 2021). This variable is measured by the following three indicators: (1) giving a positive impression to colleagues, (2) willingness to recommend the hospital to others, and (3) desire to return. Second, patient satisfaction measures the extent to which patients feel satisfied with the healthcare services they receive, encompassing various aspects such as the quality of medical care, communication with healthcare staff, availability of facilities, patient safety, clarity of information, and other factors that influence the patient's experience during treatment (Manzoor et al., 2019). This variable is measured using the following four indicators: (1) patient expectation suitability, (2) quality of medical services, (3) healthcare facilities and environment, and (4) patients receiving value for money. Third, e-WOM refers to the process by which individuals share opinions, experiences, and information about products, services, brands, or organizations through electronic platforms such as social media, review websites, forums, and other online communication channels (Cheung et al., 2008; Chu & Kim, 2011; Serra-Cantallops et al., 2018). The e-WOM indicators are categorized into five dimensions: (1) e-WOM intensity, (2) e-WOM quality, (3) e-WOM relevance, (4) e-WOM sentiment, and (5) trust in e-WOM. Fourth, CRM is a business strategy that integrates processes, people, and technology. It helps attract sales prospects, convert them into loyal customers, and retain existing customers who are satisfied and committed (Astuti & Nagase, 2014; Hajikhani et al., 2016; Mohammadhossein et al., 2014). CRM is measured by the following four indicators: (1) customer service, (2) communication, (3) service quality, and (4) IT use.

Unlike qualitative models, the data parameters in the second model are quantitative. First, ROI reflects the effectiveness of hospital services in strategic investments. The ROI variable is measured as a percentage (%) to assess the efficiency of investments in facilities and infrastructure (e.g., computed tomography scan [CTS], magnetic resonance imaging [MRI], and operating rooms), service programs, or management projects. Second, similar to ROI, the hospital's operating margin variable describes the level of financial profit, also expressed as a percentage (%).

2.2. Sample Size

In determining the sample, two attributes must be considered: the unit of analysis and the population. The unit of analysis in this study is individuals, specifically hospital patients, while the population consists of patients at private hospitals. The sample selection focused on patients treated at five type C private hospitals located in Samarinda and Balikpapan, which serve as representatives of health services in the region. These hospitals are Dirgahayu Hospital, Hermina Balikpapan Hospital, Hermina Samarinda Hospital, Samarinda Medika Citra Hospital (SMC), and Restu Ibu Balikpapan Hospital. The choice of type C private hospitals was based on specific considerations relevant to the research focus. Type C private hospitals are believed to exhibit characteristics that reflect the real challenges of maintaining service quality, particularly due to their financial independence. Among the five private hospitals in East Kalimantan selected as study sites, the sampling approach employed is infinite sampling, which is used when the population is considered very large or effectively unlimited. Although the total number of patients across all private hospitals in East Kalimantan is not truly unlimited, the population is sufficiently large to be treated as infinite for statistical purposes. An infinite population in statistical studies refers to sampling from an extremely large population, where the addition or removal of a single element does not accurately affect the proportions or final results (Kamalasanan et al., 2023). In this context, we assume that the population of private hospital patients in East Kalimantan is sufficiently large to be considered infinite (Ghorbani et al., 2022). There are four reasons for selecting an infinite population model: (1) the relevance of a large population, (2) generalizability, (3) statistical efficiency, and (4) improved handling of variability.

Table 1. The process of incidental sampling

Selection criteria	Sample
Number of respondents successfully collected at the beginning at selected hospitals	372
Respondents who have never used the services of the selected hospitals	(53)
Respondents who had used the services of the selected hospitals	319
Does not meet the age requirement to be a respondent	(25)
Respondents who did not meet the inpatient time requirement	(77)
Eligible requirements to become a respondent	217
Incomplete questionnaire (removed)	(4)
Completed questionnaires	213
Usable questionnaire	213

The sample was selected based on its relevance to the identified variables. This approach allowed for the collection of information specific to the research objectives, despite not representing the entire population. Therefore, purposive sampling was employed to provide a framework for an in-depth understanding of the phenomenon under study. The inclusion criteria were as follows: inpatients who had been treated for more than 48 hours or had at least two visits; adult patients aged 17 years or older; those willing to complete a questionnaire and/or participate in an interview; and long-term patients who had been treated at the sample hospital's inpatient facility at least once. The exclusion criteria included patients who did not complete the questionnaire; patients with severe or chronic illnesses that prevented them from completing the questionnaire or participating in interviews; patients without family members to represent them; patients under 17 years of age; and patients who had just been admitted to the inpatient facility or outpatients who had made only one visit.

In social research employing structural equation modelling (SEM), one of the main challenges is determining an appropriate sample size to ensure the validity and reliability of the proposed model. The sample size was determined based on the recommendation of Hair et al. (2019), which suggests a minimum of 10 times the number of indicators for each variable. Here, indicators refer to observed variables used to measure latent constructs in the model. Since this study includes 15 indicators across all variables, the minimum sample size is 150 respondents. However, to account for potential low response rates, the sample size was doubled. This approach also broadens the distribution of the questionnaire, encouraging greater respondent participation and ultimately enhancing the study's validity by mitigating issues related to low response rates and ensuring the completeness of the required data. Of the 372 respondents who completed the online questionnaire, 53 were excluded because they had never used hospital services for outpatient care, resulting in a suitable sample of 319 hospital service users. Among these 319 respondents, 81 were excluded for not meeting the minimum length of stay for inpatient care, and an additional 25 were excluded for not meeting the age criteria. This resulted in a final sample size of 213 for analysis (Table 1).

Secondary data were compiled over fourteen periods, divided into two segments for evaluation. The first segment includes data from before the CRM application was implemented (2011–2017), and the second covers data after CRM implementation (2018–2024). The ROI data shows the effectiveness of CRM services, while the operating margin indicates the financial profit obtained from each unit of income. The overall secondary data sample, encompassing both variables across five case study sites (Dirgahayu Hospital, Hermina Balikpapan Hospital, Hermina Samarinda Hospital, SMC, and Restu Ibu Balikpapan Hospital) totals 140 units.

2.3. Data Instruments and Materials

The primary instrument used for data collection was a questionnaire. This questionnaire was administered directly via mail survey and sent to respondents based on a predetermined sample frame. The measurement technique for the questionnaire data was tailored to the statements of each indicator variable, utilizing a Likert scale. The three measurement procedures are described in detail. First, respondents were asked to answer general

questions to determine whether they met the inclusion criteria. Second, respondents indicated their level of agreement or disagreement with statements proposed by the researcher, based on their individual perceptions. The response options included five choices: strongly agree, agree, neutral, disagree, and strongly disagree. Third responses were scored on the Likert scale, with a value of 5, decreasing incrementally to a value of 1.

In addition to primary data obtained from interviews, this study also utilized secondary data to assess the financial performance of hospitals, concerning on ROI and operating margins. The secondary data were derived from annual reports published by the hospitals. Private hospitals typically disclose ROI and operating margins in their standard monetary and service reports.

2.4. Data Analysis

Data analysis in this study was conducted using the PLS approach with SmartPLS software. PLS is a component-based, or variance-based, SEM technique. According to Hair & Alamer (2022), PLS serves as an alternative to covariance-based SEM by focusing on variance-based SEM, which allows for simultaneous testing of the measurement model. The measurement model assesses validity and reliability, while the structural model evaluates causal relationships. There are two primary reasons for using the variance-based PLS analysis technique: first, the research model includes more than one endogenous variable; second, the constructs in the model are measured entirely indirectly through indicators or manifest variables.

Technically, latent variables, both endogenous and exogenous, can be measured using reflective and formative indicators. The reflective model assumes that the construct or latent variable influences the indicators, with causality directed from the construct to the indicators. Conversely, the formative model assumes that the indicators influence the construct or latent variable, with causality flowing from the indicators to the construct. The classification of constructs as reflective or formative depends on the direction of the causal relationship between indicators and latent variables. If the construct is considered a factor that causes the observed indicators, then the indicators are reflective. On the other hand, if the construct is viewed as a combination of indicators that collectively form the latent variable, then the indicators are formative.

To determine whether the parameter estimation results are significantly influential, hypothesis testing was conducted using *t*-statistics. Since the model estimation was performed using PLS, the criteria for accepting or rejecting statistical hypotheses were established as follows:

- Alternative hypothesis (H_a): $\beta_{ij}, \gamma_{ij} > 0$. If the *t*-statistic value for the tested variable is greater than 1.64, then the hypothesis is accepted.
- Null hypothesis (H_0): $\beta_{ij}, \gamma_{ij} < 0$. If the *t*-statistic value for the tested variable is less than 1.64, then the hypothesis is rejected.

The use of 1.64 as the significance level is based on the recommendation of Hair et al. (2006), who state that the path coefficient or inner model score indicated by the *t*-statistic must exceed 1.960 for a two-tailed hypothesis test and/or exceed 1.64 for a one-tailed hypothesis test at an alpha level of 5% ($\alpha = 0.05$).

Another econometric technique for scrutinizing secondary data is linear trend analysis. In this study, a quantification model was modified into a linear trend model to examine patterns of change over time and predict future values based on the linear relationship between variables (ROI and operating margin). Both data sets were processed using Microsoft Excel. In various fields of health management and hospital finance, linear trend analysis is valuable for detecting whether the direction of change is decreasing, stagnant, or increasing. The linear trend model used to assess the relationship between time and the ROI and operating margin variables across five hospitals is formulated as follows:

$$Y = \alpha + \beta X \tag{1}$$

The method for calculating the values of α and β employs the following statistical equation:

$$\beta = \frac{n \sum XY - (\sum X)(\sum Y)}{n \sum X^2 - (\sum X)^2} \qquad (2)$$

$$\alpha = \frac{\sum Y - \beta \sum X}{n} \qquad (3)$$

where: Y = operating margin, X = ROI, α = intercept (the value of Y when X = 0), β = slope (trend slope; the change in Y for every one-unit increase in X), and n = observation period.

From the statistical equation above, three conclusions can be drawn based on the sign of the coefficient (β) in the trend line, as follows:

- $\beta > 0 \rightarrow$ increasing trend: the value of operating margin increases as ROI increases;
- $\beta < 0 \rightarrow$ decreasing trend: the value of operating margin decreases as ROI increases;
- $\beta = 0 \rightarrow$ no trend/flat: the value of operating margin is relatively constant, even as ROI increases.

3. Research Results

3.1. Respondent Profile

Information about respondent profiles includes characteristics such as gender, age, and occupation. According to Figure 2, among the 213 respondents surveyed, the majority were female, totalling 112 patients (53%), while the remaining 101 were male patients (47%). This difference in proportion may reflect women's preferences or needs for certain health services, or other factors such as their tendency to utilize health services more frequently than men.

Figure 3 shows that more than half of the respondents,112 patients (53%), were aged 20 to 30 years. This age group dominated the sample, likely reflecting the tendency of individuals in their productive years to be more active in accessing health services. Meanwhile, 65 patients (30%) were aged 31 to 40 years, 25 patients (12%) were aged 41 to 50 years, and 11 patients (5%) were over 50 years old. The data indicate a concentration within the productive age group, offering valuable insights for hospitals to develop service strategies tailored to the primary needs of this demographic.

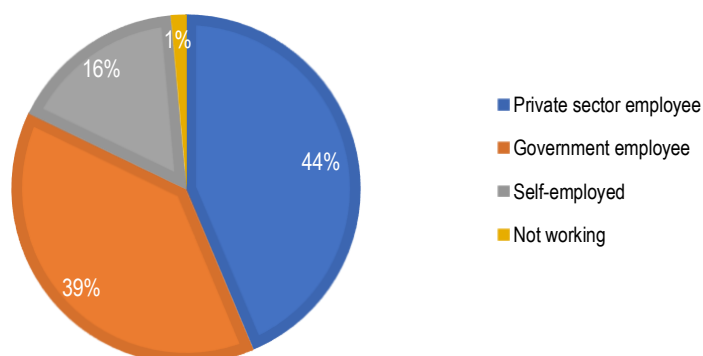Figure 2. Respondent demographics by gender
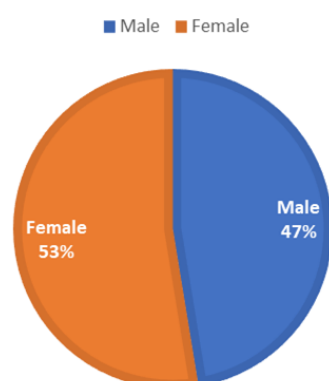
Source: field survey recapitulation.

Figure 3. Respondent demographics by age range
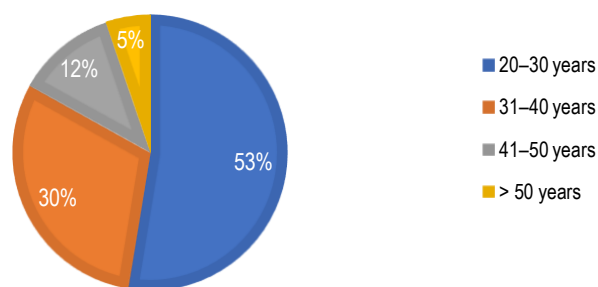
Source: field survey recapitulation.

Figure 4. Respondent demographics by occupation

Source: field survey recapitulation.

Based on the occupational structure of respondents, it was found that 93 patients (44%) were employed in the private sector. This suggests that hospital services are predominantly utilized by individuals working in the private sector. Also, 82 patients (38%) were government employees, including civil servants, military personnel, and police officers. Thirty-five patients (16%) were self-employed, including entrepreneurs, while 3 patients (1%) were either unemployed, students, or housewives. Figure 4 offers valuable insights for hospitals to better understand service needs according to the occupational backgrounds of their patients.

3.2. Tabulation of Respondents' Assessment of the Questionnaire

In the CRM construct, the majority of respondents provided positive ratings for the services received at the hospital. As shown in Table 2, 34.5% of respondents selected 'agree' (scale 4), while 23.6% selected 'strongly agree' (scale 5). Approximately 22.3% of respondents gave a 'neutral' rating (scale 3), 11.2% selected 'disagree' (scale 2), and 8.4% chose 'strongly disagree' (scale 1). These results indicate that more than half of the respondents believe the implemented CRM is functioning well, especially regarding responsiveness, communication, and service quality.

Table 2. Distribution of assessments on CRM constructs

Item (scale)	Percentage of answers (%)
Strongly disagree (1)	8.4
Disagree (2)	11.2
Neutral (3)	22.3
Agree (4)	34.5
Strongly agree (5)	23.6
Total	100

Source: field survey recapitulation.

The patient satisfaction construct reveals that the majority of respondents provided positive ratings regarding hospital services. Specifically, 42% of respondents selected 'agree' (scale 4), while 24.8% chose 'strongly agree' (scale 5). This indicates that more than two-thirds of respondents were satisfied with the services they received, including the professionalism of medical staff, communication, facilities, and the balance between cost and quality of service. Conversely, approximately 22.3% of respondents gave a 'neutral' response (scale 3), suggesting that some patients found the hospital services adequate but not fully meeting their expectations. This area presents an opportunity for further improvement, particularly in aspects considered less than optimal, such as facilities or the value of services relative to costs (see Table 3). Meanwhile, only 6.7% of respondents selected 'disagree' (scale 2), and 4.2% selected 'strongly disagree' (scale 1).

Table 3. Distribution of assessments on patient satisfaction constructs

Item (scale)	Percentage of answers (%)
Strongly disagree (1)	4.2
Disagree (2)	6.7
Neutral (3)	22.3
Agree (4)	42
Strongly agree (5)	24.8
Total	100

Source: field survey recapitulation.

Table 4. Distribution of assessments on patient loyalty construct

Item (scale)	Percentage of answers (%)
Strongly disagree (1)	3.62
Disagree (2)	4.8
Neutral (3)	24.9
Agree (4)	44.8
Strongly agree (5)	21.8
Total	100

Source: field survey recapitulation.

The patient loyalty construct indicates that the majority of respondents provided positive ratings regarding their loyalty to the hospital. Specifically, 44.88% of respondents selected 'agree' (scale 4), while 21.8% chose 'strongly agree' (scale 5). Additionally, 24.9% of respondents were 'neutral' (scale 3). Only a small proportion of respondents rated 'disagree' (4.8%) or 'strongly disagree' (3.62%). Overall, Table 4 demonstrates that most patients feel comfortable with the hospital's services, are willing to recommend the hospital to others, and intend to return if they require treatment in the future.

Table 5. Distribution of assessments on e-WOM construct

Item (scale)	Percentage of answers (%)
Strongly disagree (1)	3.47
Disagree (2)	5.4
Neutral (3)	25.4
Agree (4)	42.3
Strongly agree (5)	23.43
Total	100

Source: field survey recapitulation.

Finally, regarding the e-WOM construct, the majority of respondents expressed a positive perception of their involvement in providing reviews or comments about their hospital experiences. Specifically, 42.3% of respondents agreed (scale 4) with the statement, while 23.43% strongly agreed (scale 5). Additionally, 25.4% of respondents were neutral (scale 3), 5.4% disagreed (scale 2), and 3.47% strongly disagreed (scale 1). The data presented in Table 5 indicate that many patients feel comfortable sharing their positive experiences on social media or other online platforms related to hospital services.

3.3. PLS Results

In this session, outer model testing in PLS emphasizes convergent validity (CV), average variance extracted (AVE), composite reliability (CR), and Cronbach's alpha (CA). First, CV aims to assess the validity of the relationships between indicators and their corresponding constructs or latent variables. There are two types of validity in PLS: convergent validity and discriminant validity. Convergent validity indicates that a set of indicators represents a single latent variable and reflects that latent variable. The CV of a measurement model with reflective indicators is evaluated based on the correlation between the component scores and the construct scores. A reflective measure is considered strong if it correlates above 0.7 with the construct it intends to measure. However, for initial research involving the development of a measurement scale, a loading value between 0.5 and 0.6 is deemed acceptable.

Table 6. Outer loading value algorithm test

Indicators	CRM	Patient satisfaction	Patient loyalty	e-WOM
X1.1	0.911			
X1.2	0.949			
X1.3	0.965			
X1.4	0.952			
Y1.1		0.957		
Y1.2		0.873		
Y1.3		0.868		
Y1.4		0.995		
Y2.1			0.936	
Y2.2			0.976	
Y2.3			0.973	
Z1.1				0.904
Z1.2				0.855
Z1.3				0.924
Z1.4				0.926
Z1.5				0.889

Source: field survey recapitulation.

According to the results of the PLS model calculations based on the factor loading values for each variable indicator, as shown in Table 6, all factor loadings were found to be greater than 0.6. The loading values for the indicators collectively demonstrate a high level of validity. In other words, it can be concluded that the relationships between the indicators and their corresponding constructs satisfy the CV assumption.

Table 7. Values for AVE, CR, and CA

Variables (code)	AVE	CR	CA
CRM (X1)	0.892	0.971	0.959
Patient satisfaction (Y1)	0.866	0.975	0.993
Patient loyalty (Y2)	0.925	0.974	0.959
e-WOM (Z)	0.810	0.955	0.941

Source: field survey recapitulation.

Second, to evaluate discriminant validity, the AVE can be calculated for each construct or latent variable. The AVE value represents the proportion of variance in the observed variables that is explained by the latent construct. The minimum acceptable AVE value for CV is 0.5, indicating that the latent variable explains more than half of the variance of its indicators. Table 7 shows that the AVE values for all variables exceed 0.5, demonstrating that all indicators exhibit CV in measuring their respective constructs. In addition to assessing convergent and discriminant validity, the outer model can also be evaluated by estimating the reliability of each construct using CR based on the indicator block measuring the construct. CR is generally considered superior to CA for measuring internal consistency in PLS analysis because it does not assume equal indicator loadings. The CR test results indicate that the composite reliability values for all constructs are above 0.7. Therefore, all constructs demonstrate good reliability, meeting the minimum required threshold. Furthermore, the outer model can also be detected through construct reliability, which refers to the CA value of the indicator block measuring the construct. A construct is considered reliable if its CA value exceeds 0.6. As summarized in Table 7, the overall construct demonstrates good reliability according to this threshold.

Table 8. Values in R square, SRMR, and NFI

Parameters	Estimated model
R Square	0.811
SRMR	0.079
NFI	0.829

Source: field survey recapitulation.

Inner model testing involves studying the strength and feasibility of the model, as well as conducting hypothesis testing. First, the strength of the model is indicated by the coefficient of determination (R^2). Similar to its interpretation in linear regression, the R^2 value in PLS reflects the proportion of variability in the endogenous variables explained by the exogenous variables. Basically, changes in the R^2 value are used to assess whether the influence of exogenous latent variables on endogenous latent variables is substantive, or vice versa. Referring to Table 8, the R^2 value obtained for the patient loyalty formation model is 0.811. This suggests that patient loyalty can be explained by CRM, patient satisfaction, and e-WOM to the extent of 81.1%. Conversely, the residual value of 0.189, or 18.9%, represents the unexplained variance (1 - 0.811). Second, goodness of fit (GoF) is applied to evaluate the overall feasibility of the model. In detail, GoF employs the F-test using the standardized root mean square residual (SRMR) and the normed fit index (NFI). For SRMR, the acceptable threshold is below 0.1, with 0.08 as the minimum standard, while NFI values range between 0 and 1. The closer these values are to 1, the better the model fit (see Table 8). Third, the hypothesis test results, which highlight the causal relationships, are presented in Table 9.

Table 9. Recapitulation of bootstrapping tests

| Causality (path)	*t*-statistics	*p*-values	Original sample	Sample mean	Standard deviation
CRM → patient satisfaction	101.251	0.000	0.955	0.949	0.009
CRM → patient loyalty	5.621	0.004	0.260	0.218	0.140
CRM → patient satisfaction → patient loyalty	0.966	0.335	–0.109	–0.069	0.113
CRM*e-WOM → patient loyalty	2.711	0.007	0.360	0.262	0.022

Noted: *moderating effect. Source: field survey recapitulation.

Statistical analysis indicates that CRM has a positive effect on patient satisfaction with a significant relationship ($t = 101.251 > 1.64$; $p = 0.000 < 0.05$), supporting the acceptance of the first hypothesis. The second hypothesis is also accepted, as CRM positively impacts patient loyalty with a significant effect ($t = 5.621 > 1.64$; $p = 0.004 < 0.05$). Although CRM is positively associated with loyalty through patient satisfaction, this indirect effect is not significant ($t = 0.966 < 1.64$; $p = 0.335 > 0.05$). The final test aligns with previous findings, showing that e-WOM significantly moderates the relationship between CRM and patient loyalty ($t = 2.711 > 1.64$; $p = 0.007 < 0.05$), leading to the acceptance of the fourth hypothesis. Based on these inferential statistical results, an in-depth discussion of the hypothesis testing is essential to fully understand the empirical implications.

3.4. Results of Linear Trend Analysis

The financial model with trend line analysis of the overall dataset, which includes time-series data, revealed several important insights. First, when investments have not been directed toward CRM, the average operating margin is estimated to increase by 69.13% for every 1% increase in ROI. With an intercept value of 0.535, as displayed in Figure 5, the trend in the 2011–2017 baseline data shows positive growth. The strength of the trend line is very high, with an R^2 value of 89.93% (nearly 90%), indicating that variations in the operating margin can be largely explained by changes in ROI.

Figure 5. Calibration curve between ROI and operating margin (without CRM)
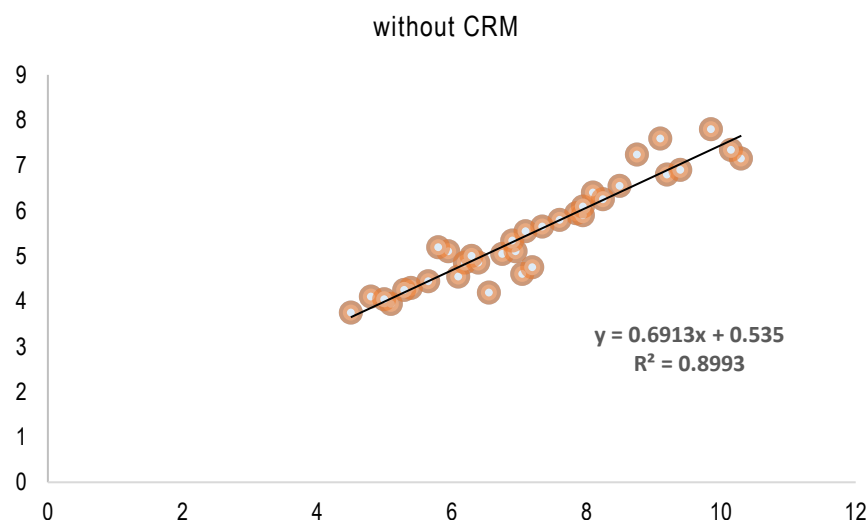
Source: secondary data processed.

Secondly, when the ROI level increased by 1% following CRM implementation, the operating margin improved by 68.57%. In the five hospitals observed, using baseline data from 2018 to 2024, the operating margin consistently rose with each increase in ROI, accompanied by a cash value of 2.149. As shown in Figure 6, the R^2 value is 94.45%, or nearly 1, indicating that the trend line fits the data very well, demonstrating a strong correlation.

Figure 6. Calibration curve between ROI and operating margin (with CRM)

with CRM

$$y = 0.6857x + 2.1499$$
$$R^2 = 0.9445$$
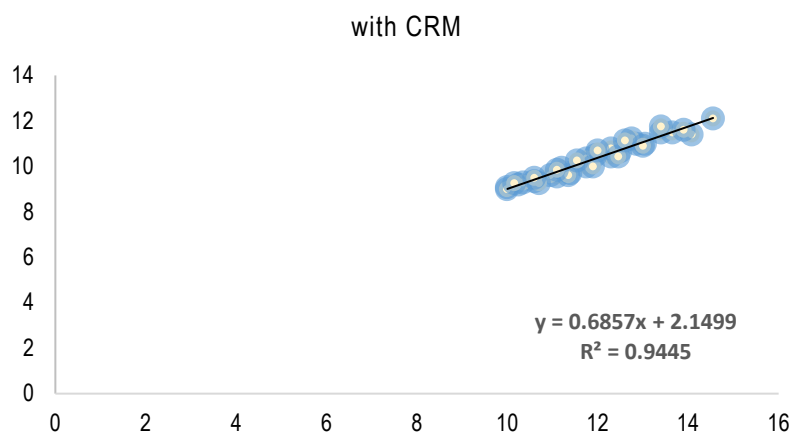
Source: secondary data processed.

Projecting operating margins using ROI data can enhance decision-making by leveraging historical trends, especially when supported by a robust CRM system. It is important to note that even without a CRM, the five hospitals performed well, for example, in integrating patient data services, which facilitated clinical and managerial decision-making and ultimately reduced operating costs. Interestingly, regarding the promotion of financial effectiveness, this study affirms that ROI can maximize operating margins when a CRM system is implemented.

4. Discussion

4.1. Justification of Relevance between Variable Relationships

The authors' findings indicate that service quality is the primary focus of overall hospital service. A patient's experience when receiving professional medical care adds optimal value; if service professionalism declines, the patient's evaluation of the hospital will also deteriorate. These results support the first hypothesis, which underlines that effective CRM implementation can enhance patient satisfaction levels. This positive correlation suggests that the better a hospital implements CRM, the higher the patient satisfaction with the services provided. CRM aims to build long-term relationships between organizations and customers through mutually beneficial interactions. In the hospital context, CRM encompasses efforts such as proactive communication, prompt response to patient needs, and personalized services. When CRM is effectively implemented, patients feel valued and prioritized, thereby improving their perception of service quality.

Past studies have verified that effective CRM implementation can enhance customer trust and satisfaction, which are important for maintaining long-term relationships. Bin-Nashwan and Hassan (2020) revealed that CRM significantly stimulates customer trust by providing accurate information, prompt service, and personalized experiences. In the healthcare industry, which heavily relies on patient trust, CRM serves as a vital tool for improving the quality of hospital-patient relationships. Notably, Baashar et al. (2020) highlight the role of technology in optimizing CRM within the service sector, including healthcare. They found that technology-based CRM systems enable organizations to improve communication efficiency, personalize customer experiences, and foster relationships focused on long-term needs. For private type C hospitals, which face financial challenges without government subsidies, effective CRM implementation is crucial for ensuring a positive patient experience, thereby driving patient loyalty and supporting the hospital's financial sustainability. The paper by Payne and Frow (2005) also supports the findings of this study, demonstrating that CRM helps organizations gain a deeper understanding of customer needs, enabling them to offer relevant and personalized solutions. In the healthcare sector, the strong correlation between patients and hospitals often plays a crucial role in patients' decisions to continue using specific services. Furthermore, Baashar et al. (2020) note that CRM not only enhances patient satisfaction but also generates a domino effect on patient loyalty, which is vital for business sustainability.

The findings support the second hypothesis, which asserts that CRM not only directly influences patient loyalty but also involves patient satisfaction as an intermediary mechanism. This relationship underscores that effective CRM creates a satisfying experience for patients, which in turn strengthens their loyalty to the hospital. Patient loyalty is not only the result of a direct relationship with the organization but also reflects the level of satisfaction experienced through interactions with healthcare services. Patients who feel satisfied are more likely to return to use the same services and recommend the hospital to others. In their scientific work, Abekah-Nkrumah et al. (2021) emphasize that patient satisfaction serves as a crucial mediator in the relationship between CRM and loyalty in the healthcare sector. Moreover, Al-Azzam and Al-Mizeed (2021) highlight that technology-based CRM can enhance customer loyalty by improving the overall customer experience. In type C private hospitals, technology-based CRM strategies enhance efficiency in patient care by providing automatic appointment reminders, quick access to medical records, and improved communication channels between patients and medical staff. Consequently, these improvements lead to a more positive patient experience and higher satisfaction, which are essential foundations for building integrated loyalty.

A recent study by Jalal et al. (2021) found that CRM designed to address the emotional and functional needs of patients can strengthen the relationship between patients and healthcare providers. Notably, factors such as empathy in interactions, service reliability, and active patient involvement in medical decision-making are key elements that enhance patient loyalty. This is particularly relevant in the context of type C private hospitals, where financial sustainability heavily depends on the hospital's ability to retain a loyal customer base. Another study by Ceissa et al. (2025) revealed that the quality of service mediated by CRM not only acts as a catalyst for patient satisfaction but also creates a deeper emotional connection between patients and hospitals. Patients who perceive that they receive personalized attention from hospitals tend to form strong emotional bonds, which ultimately encourage ongoing loyalty. Consistent with existing case studies, specifically those involving type C hospitals operating in resource-constrained environments, CRM integrated with human interaction and personalized attention becomes a competitive advantage.

The findings confirm that although CRM is important in the context of healthcare experiences, it may not directly influence the relationship between patient satisfaction and patient loyalty at the observed location. The insignificance of this relationship can be attributed to several points. First, according to SET, Thibaut and Kelley (1959) argue that the reciprocal relationship between organizations and individuals is not always linear. In some cases, even when patients are satisfied with the services they receive, their loyalty may still be affected by external dimensions, such as service costs, facility availability, or the proximity of the hospital. Gustafsson et al. (2005) explain that customer satisfaction does not always lead to loyalty unless it is supported by trust and commitment. Second, patient loyalty in healthcare is often complex and not solely based on a satisfying experience. Factors such as the hospital's reputation, emotional connections with medical staff, and personal preferences can have a greater impact on patient loyalty than satisfaction alone. Liu et al. (2021) emphasize that patient loyalty is more likely to develop through a long-term relationship that includes emotional elements such as trust and a sense of security, which may not be fully captured by the satisfaction dimension.

For type C private hospitals, patients typically have a wide range of choices when selecting healthcare facilities. Although they may be satisfied with the services, their loyalty can be fragmented due to the availability of other options perceived as more attractive or beneficial. Most patients at these five hospitals participate in the national health insurance program (JKN), which is regulated by the Health Insurance Administration Agency (BPJS). While these patients may be satisfied with the services at a particular hospital, factors such as zoning restrictions or the full-service quotas imposed by BPJS providers often compel them to seek alternatives by transferring to another hospital or rescheduling their consultation. This situation highlights the need for a more comprehensive strategic approach to building patient loyalty, one that extends beyond satisfaction to include service innovation, membership programs, and patient-centered incentives.

The findings reveal that e-WOM plays a crucial role in strengthening the positive impact of CRM on patient loyalty, highlighting the significance of technology and digital media in building closer relationships between organizations and customers. In theoretical models, moderating variables typically influence the relationship between exogenous and endogenous variables. Even so, in SmartPLS software, the arrow representing the moderating variable is automatically directed toward the endogenous variable. This occurs because PLS creates an interaction effect (interaction term) between exogenous variables and moderators, then tests its influence on the endogenous variable. Although this visual representation differs from the traditional model framework, it aligns with the logic of interaction construct formation in PLS. Therefore, the model remains scientifically and methodologically valid.

As Thariq (2023) explains, e-WOM not only enhances customers' positive perceptions of a company but also strengthens emotional bonds, which are crucial for fostering loyalty. One of the primary reasons e-WOM amplifies the influence of CRM on customer loyalty is trust. Customers tend to trust reviews or recommendations from fellow users more than direct promotions from companies (Litvin et al., 2008). When effective CRM leads to customer satisfaction, individuals are more likely to share their positive experiences on digital platforms. This creates a domino effect, where positive reviews from one customer can influence the perceptions of potential customers and expand the impact of loyalty.

In terms of benefits, e-WOM not only encourages loyalty among existing customers but also attracts new customers influenced by positive reviews (Erkan & Evans, 2016). This is particularly relevant in the healthcare industry, where patients' decisions are often shaped by recommendations from others, either directly or through online platforms. By strategically managing CRM, hospitals can ensure that customer interactions generate positive e-WOM, thereby enhancing the organization's reputation. Another advantage of e-WOM is its role as an amplifier in the customer decision-making process. Satisfied customers frequently become advocates for the company on digital platforms (Satya et al., 2023). Consistent with this perspective, effective CRM creates an environment where customers feel valued and are motivated to share their experiences, ultimately expanding the organization's reach and providing social validation to prospective customers. Severi et al. (2014) concluded that well-managed e-WOM through social media platforms accelerates the process of strengthening customer relationships with companies. The integration of CRM and e-WOM strategies enables organizations to be more responsive to customer needs and to create a more personalized and meaningful customer experience. In healthcare services, this implies that patient satisfaction is a key factor in enhancing a hospital's reputation through positive reviews.

4.2. Impact of ROI on Operating Margins

Whether with or without the use of CRM, it has been proven that ROI can generate positive operating margins. In contrast, it would be more advantageous if the five hospitals analysed implemented CRM, as the ROI rate would increase. Initially, before CRM implementation (2011–2017), the average ROI and operating margin were 7.18% and 5.5%, respectively. After CRM implementation (2018–2024), the average ROI and operating margin rose to 11.93% and 10.33%, respectively. In percentage terms, there was a crucial change between the two periods, with ROI increasing by 4.75% and operating margin by 4.83%.

To date, the increased ROI following CRM implementation can drive higher operating margins, as CRM enhances patient satisfaction and loyalty, as well as operational efficiency, which in turn reduces costs and increases revenue. In the healthcare sector, CRM is adopted to boost profitability by improving patient relationships and service efficiency (Baashar et al., 2020). Service efficiency through CRM accelerates patient registration, scheduling, and communication processes. Broadly speaking, CRM is a long-term investment that can drive an organization's financial performance, including ROI, by reducing costs and increasing customer value. Both marketing and service segmentation become more precise, making service promotion more cost-effective.

Regarding hospital adoption, Hung et al. (2010) found that hospitals implementing CRM are more effective at reducing operational burdens and management costs, such as those related to medical disputes. Enhancing the quality of the patient experience is an effective strategy to boost a hospital's reputation through increased recommendations and visit rates.

Conclusion

This study was designed to examine the causal relationship between CRM and patient satisfaction and loyalty, both directly and through e-WOM as a moderator. The research utilized a sample from five Type C private hospitals in East Kalimantan and employed PLS analysis. In summary, three key conclusions were drawn: (1) CRM has a significant effect on patient satisfaction and loyalty; (2) CRM does not have a significant effect on loyalty through patient satisfaction; and (3) CRM has a significant effect on patient loyalty through the support of e-WOM.

Next, the research results based on two comparative data scenarios with linear trend analysis reveal that hospital operating margins are slightly better when ROI is focused on CRM compared to ROI without CRM. Economically, the level of profitability, reflected in operating margins, improves significantly when ROI incorporates CRM. This fact signals that increased patient retention, supported by higher satisfaction, tends to generate returns, thereby boosting hospital revenue.

Several suggestions for future research are proposed to enrich the current findings. First, a more comprehensive CRM model could be developed by incorporating additional variables that influence patient satisfaction and loyalty. The impact of various digital communication channels and direct interactions on patient perceptions should also be examined through comparative studies across different types of hospitals. Second, the survey sample should be expanded beyond specific segments to include patients from diverse groups, such as JKN participants, non-JKN insurance holders, and independent patients without any insurance coverage. Third, a longitudinal study would be valuable to observe how the effect of CRM on patient loyalty evolves over time, providing deeper insight into whether the relationship between CRM and patient loyalty is sustained long-term or only temporary following treatment. Besides, new factors, such as changes in hospital regulations, should be considered as potential influences on this relationship. Fourth, multinational studies are essential to understand how local cultures and customs influence the function of e-WOM in shaping hospital reputation. References addressing cultural differences in communication and information sharing may offer valuable insights into the effectiveness of e-WOM across various countries and communities. Such studies can inform how CRM strategies can be adapted to optimize patient experience in diverse markets. Fifth, when planning hospital service profit strategies, linear trend models based on ROI data (with or without policy interventions such as CRM) are insufficient for assessing their impact on short-term operating margins; it is also essential to consider medium- and long-term effects.

The successful implementation of CRM not only enhances patient satisfaction but also provides valuable insights into the overall sustainability of the hospital. It is recommended that hospital management continue to innovate and adapt their CRM strategies to meet the evolving needs and preferences of patients. By applying the principles of SET, hospitals can prioritize operational efficiency while ensuring that patients feel valued and receive high-quality care. Furthermore, these findings suggest that hospital management should prioritize investments in CRM systems that improve the quality of patient interactions. Recognizing that patient satisfaction serves as a critical link between CRM and patient loyalty, hospitals can develop more effective strategies to foster long-term relationships with patients, thereby contributing to the operational sustainability and competitiveness of hospitals in an increasingly competitive healthcare market. The results of the study underscore the importance of understanding loyalty as a multidimensional phenomenon. While patient satisfaction provides a solid foundation, building loyalty requires a more comprehensive approach that encompasses long-term relationship management and the creation of tangible added value for patients.

Hospitals aiming to increase patient loyalty must integrate CRM strategies, cultivate deep emotional connections, and deliver sustainable value that extends beyond the immediate healthcare experience. Finally, internal decision-makers should actively monitor, respond to, and promote positive e-WOM as a key component of their digital marketing strategy. By harnessing the power of e-WOM, hospital management can strengthen customer relationships, deepen loyalty, and ultimately increase their competitive advantage in the market.

Credit Authorship Contribution Statement

Acknowledgments

Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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