

Analysis of the Success of Knowledge Management Implementation in the Customer Relationship Management Framework at PT. Telkom Indonesia

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ABSTRACT

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Implementation of knowledge management has emerged as an essential strategic move for organizations aiming to improve their performance and competitiveness during the digital age. Among the biggest telecommunication firms operating in Indonesia is PT Telkom Indonesia, which has implemented a range of knowledge management activities to support their business and customer relationship operations. This paper aims to explore the critical factors expected to impact the successful installation of knowledge management within the context of the CRM process in PT Telkom Indonesia. A descriptive approach involving the literature study was employed to evaluate the range of issues pertinent to the knowledge management process from the technology and human perspective. It has been found that the critical factors for the successful installation of knowledge management include the adaptation and commitment of the leadership and staff participation and involvement. Moreover, the integration of knowledge management operations and the process of CRM helps generate greater knowledge for the purpose of supporting customers-focused decisions. This study's findings provide valuable information to firms operating within the telecommunication sector to understand how to design an effective knowledge strategy by integrating the CRM strategy for gaining the intended competitive advantage.

1. INTRODUCTION

PT. Telkom Indonesia is one of the largest telecommunications companies in Indonesia, with the majority of its shares owned by the Government of the Republic of Indonesia (52.09%) and the remaining 47.91% owned by the public [1]. As a major player in the national telecommunications industry, Telkom plays a strategic role in providing infrastructure, services, and digital innovations that support economic transformation in various sectors. Telkom Group's business activities continue to evolve in line with the dynamics of technology, information, and digitalization, while remaining focused on the telecommunications and information industry as its core business. In an increasingly competitive business landscape disrupted by technological developments, knowledge management (KM) has become one of the key factors in a company's success. KM enables organizations to capture, store, share, and utilize knowledge effectively, both explicit (documented) and tacit (embedded in individual experience). In the telecommunications sector, the need for knowledge management is increasingly important due to rapid product innovation cycles, high customer service demands, and intensifying competition from both local and global players.

The implementation of KM integrated with the Customer Relationship Management (CRM) framework provides strategic added value. CRM, which focuses on managing interactions and relationships with customers, can benefit significantly from systematically managed knowledge. Knowledge generated from KM processes can enrich CRM strategies, making customer interactions more personalized, responsive, and data-driven. For Telkom, the integration of KM and CRM is relevant not only for retaining a large customer base but also for enhancing loyalty, maximizing customer lifetime value, and fostering sustainable service innovation. Previous studies have shown that the success of KM and CRM implementation in large companies like Telkom is influenced by various factors, including an organizational culture that supports collaboration, leadership commitment, the use of information technology, and structured performance measurement [2], [3], [4]. However, challenges still exist in the field, such as aligning strategies across divisions, gaps in employees' digital skills, and resistance to organizational change. These challenges indicate that the success of KM depends not only on technology but also on human factors, business processes, and change

management strategies. This article aims to analyze the factors influencing the success of KM implementation at PT. Telkom Indonesia, using the CRM framework as a reference for analysis. The approach used is descriptive analysis and literature review, identifying key factors that can serve as lessons for other companies in similar sectors. The results of this study are expected to provide practical insights for decision-makers, managers, and business practitioners in designing effective KM and CRM integration strategies, while also serving as an academic reference for further research in the fields of knowledge management and customer relations.

Nonetheless, in light of Telkom's broad efforts in developing both Knowledge Management (KM) and Customer Relationship Management (CRM), there still exist certain challenges within these practices. It has been observed through internal analysis and past research work in this field that there are still sporadic patterns within the divisional sharing of knowledge, thus generating information silos in decision-making. Moreover, there is still inadequate integration between KM practices and CRM processes. As a result, customer-related knowledge is still not fully leveraged within strategies regarding improved and customized services. These factors are accompanied by differing digital competency in employees and the lack of common standards within Telkom in terms of measuring KM practices' effectiveness. Needless to say, this is still indicative of a certain gap in this particular study since Telkom has already adopted so many practices in KM. Nonetheless, within the framework of Indonesian telecommunication enterprises, including Telkom, there is still little exploration in relation to the corporate success factors in KM practices, particularly in regard to their integration with CRM.

These are important insights because Telkom is facing a highly dynamic and competitive digital environment where the capacity to grasp, exchange, and leverage knowledge within an organization has a direct correlation to customer satisfaction, innovative services, and finally, competitive advantage. Thus, if the KM and CRM integration process is not properly optimized, Telkom may be facing inefficient knowledge processing and poor responsiveness towards customer needs and desires. Thus, it becomes a need for this study to resolve the basic problem of searching for the factors that influence KM success within PT Telkom Indonesia when it is considered in a CRM context, and by doing so, it shall endeavor to provide useful insights towards Telkom's continued improvement towards better customer-driven approaches in a highly competitive era in the telecom industry.

2. LITERATURE REVIEW

2.1 Knowledge Management Concept

Foundations of knowledge management are much more advanced since its official recognition as a separate academic discipline, with thinkers creating sophisticated frameworks for theory that distinguish between types of knowledge and how these can be utilized within organizations [5]. Knowledge management, being broadly conceptual as "a systematic process to acquire, organize, and communicate individual knowledge so that others may make use of it," is a multidisciplinary framework of deploying intellectual capital to obtain competitive advantage. It rests on epistemological dualism in terms of tacit and explicit knowledge, which was first theorized by Polanyi and then operationalized by Nonaka and Takeuchi in their early SECI model. Knowledge in itself is a "justified belief that enhances an entity's capacity for effective action" with several dimensions including state of mind, object, process, information access, and capability. The multi-dimensionality of knowledge are the assumptions from which one can understand how organizations can methodically use their intellectual capital in a way to drive innovation, improve decision-making, and overall performance [6], [7]. Theoretical model of knowledge management is best described in Nonaka's SECI model explaining four knowledge conversion processes: Socialization (tacit-to-tacit), Externalization (tacit-to-explicit), Combination (explicit-to-explicit), and Internalization (explicit-to-tacit). Empirical verification of this model has established that these processes of knowledge conversion exist as independent but interrelated dimensions that each play differently in organizational performance such as performance, innovation, and collective efficacy [8]. Socialization is the process of sharing knowledge and mentoring behaviour among members to facilitate experience-based knowledge transfer through direct communication and observation. Externalization is the creation of organizational memory and team reflexivity in which tacit knowledge is transformed into explicit form through discussion, metaphor, and systematic documentation. Combination focuses on organizational communication and tech support systems for the sharing of explicit knowledge assets, whereas Internalization focuses on human resource development and training transforming formal knowledge into the experience of individuals. This spiral model of knowledge creation is distinct from linear knowledge management routines in the sense that it emphasizes the transformatory character of knowledge conversion as opposed to knowledge transfer [9].

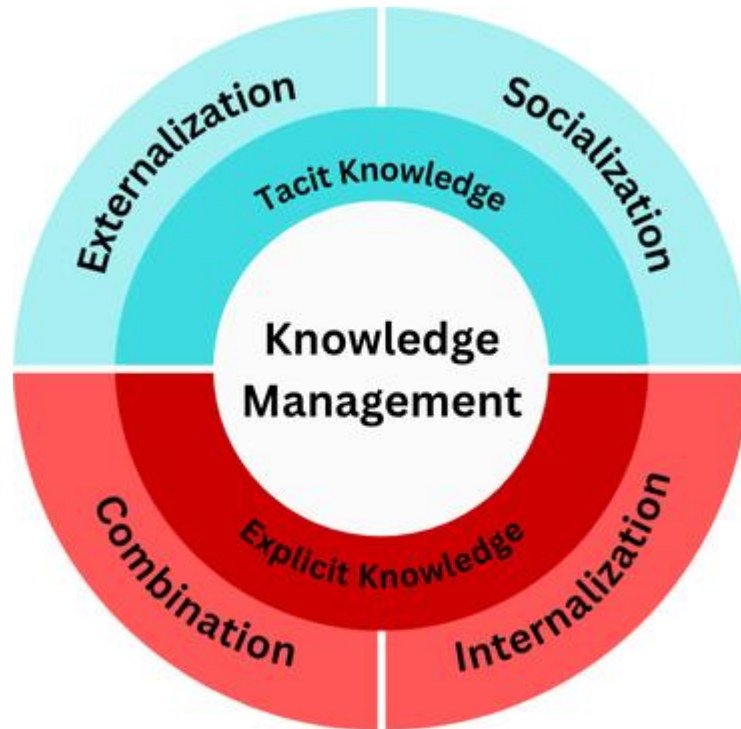


Figure 1. Knowledge Management Concept Framework

Knowledge management have aimed increasingly at the strategic use and measurement of such theoretical constructs in organizational environments, and results are geared towards business performance-firm relationships with knowledge management practices. Empirical studies offer evidence that knowledge management effectiveness is a multicomponent construct based on the acquisition of required knowledge, disseminating it to target users, and exploiting such knowledge in order to attain improved organizational and personal performance [10]. Knowledge management system success depends significantly on organizational drivers like culture, leadership, and technology infrastructure, while the success of implementation is heavily dependent on alignment in people, process, and technology dimensions. Knowledge management processes like creation, storage, sharing, and application highly influence the growth of productivity, innovation, and responsiveness at the organizational level [11]. Knowledge management and strategic management alignment has also emerged as a critical success factor where organizations must develop integrated structures that connect knowledge mechanisms to integrated business objectives and competitive strategies. These conclusions confirm the evolution of knowledge management into a technical, if not untechnical, area of research into a strategic organisational capability with corresponding effects on sustainable competitive advantage and organisational long-term performance [12].

2.2 Customer Relationship Management Concept

The theoretical foundation of Customer Relationship Management (CRM) began with Berry's now classic book on relationship marketing that shook paradigm thinking from transactional to relational thinking in how to retain as opposed to merely acquire customers. Existing CRM literature constitutes the concept as "a systematic approach to managing firm interactions with customers across all touchpoints throughout the customer lifecycle" with strategic, operational, and technical dimensions which work together towards maximum customer value and profitability for the firm [13], [14]. This three-dimensional conceptualization encapsulates CRM as business philosophy and technology-facilitated solution that brings customer acquisition, retention, development, and win-back strategies into a single organizational framework. Strategic significance of CRM is that it can change traditional marketing paradigms with an added emphasis on long-term customer relationships, value co-creation, and relational quality as bases for competitive excellence. Research continues to show that successful CRM adoption encompasses people, process, and technology alignment as columns of building a customer-centric organizational culture that aligns customer interactions with meaning in a quest to develop lifetime value and long-term profitability [15], [16].

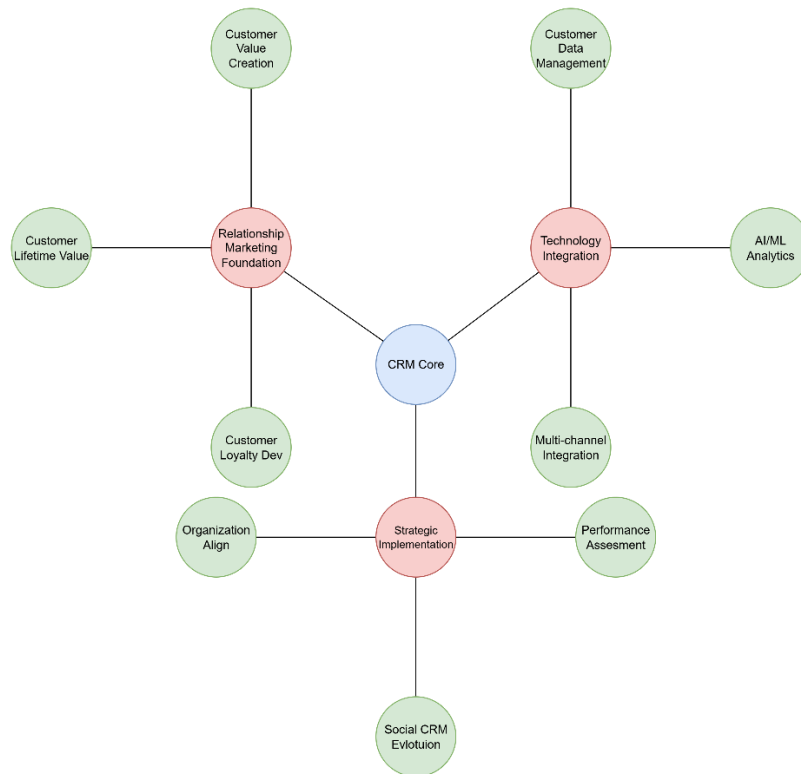


Figure 2. Customer Relationship Management Conceptual Framework

The process focus of CRM can be best conceptualized via Payne and Frow's strategic model outlining CRM implementation on four connected phases of strategy formulation, value creation, multi-channel integration, and performance measurement [17], [18]. The model assumes that successful CRM is based on organizational capabilities in end-to-end management of customer information to facilitate organizations to capture, analyze, and segment customer information to provide personalized experience and targeted marketing campaigns. New CRM technologies have increasingly been embedded with artificial intelligence, machine learning, and predictive analytics to enable real-time decision-making, predictive customer behavior modelling, and mass automation of customer personalization at scale [19], [20]. CRM has evolved beyond its historical boundaries to encompass Social CRM with social networking websites for greater customer interaction, community building, and viral marketing features. Customer Lifetime Value modeling has emerged as the core element of strategic CRM, converging predictive modeling, churn analysis, and profitability segmentation to guide marketing investment as much as possible and inform strategic customer relationship decision-making [21]. Combined analytical and technology capabilities altogether enable companies to transition from reactive to predictive customer relationship behaviors, to be able to provide proactive customer service and prescriptive value creation more effectively [22], [23]. The quantitative evidence that attests to CRM's organizational impact provides compellingly positive evidence of returns to customer satisfaction, customer retention level, revenue growth in sales, and business performance, particularly in developing economies because organizations there are faced with their own peculiarity of challenges by way of data fragmentation and lean customer insight. Research time and again attributes the achievement of CRM to quality aspects of the relationship with trust, commitment, and customer satisfaction that are ultimate antecedents of word-of-mouth and loyalty behavior [24], [25]. Implementation problems persist, with research setting at least a 50% failure rate in the success of CRM efforts on poor organizational alignment, insufficient change management, and poorly conceived integration of technology systems and business processes. The move towards Social CRM and digitalization has provided new avenues of customer interaction and community creation for the brand but with the weight of data privacy, integration of systems, and media consistency. Contemporary CRM research emphasizes organizational capability building to facilitate repeat innovation, responsive customer strategy, and performance measurement systems connecting CRM investment to long-term strategic objectives. These results collectively demonstrate CRM's evolution from a short-term customer management approach to an organizational competency that fundamentally alters how firms build, deliver, and capture value from relationships with customers [26], [27].

2.3 Relationship between Knowledge Management and Customer Relationship Management

Theoretical blending of CRM and KM is the top research theme in which conclusive empirical proof has shown remarkable synergic interdependencies between these two business competences. Present research posits Customer Knowledge

Management (CKM) as the plausible junction between CRM and KM by means of which firms acquire, organize, and realize customer-related knowledge in a coordinated manner to enhance relationship quality and business performance [28], [29]. This consolidation relies heavily on the premise that knowledge management systems extensively improve CRM performance by bringing systematized processes for knowledge capture and utilization to enable organizations to capture customer data as strategic decision-enabling intelligence [30], [31]. The digital transformation context has speeded up the convergence further, with studies confirming that knowledge management is positively associated with both customer relations capability and market orientation, and is an important mediator of organizational resources and customer-facing capabilities. Studies consistently show that big data analytics integration of human capital, technology, and information has a deep impact on CRM connecting abilities with knowledge management becoming a strong foundation for customer relationship strategies for the present times [32].



Figure 3. Knowledge Management and Customer Relationship Management Integration Framework

Empirical research between 2021-2025 provides significant evidence of beneficial impacts of KM-CRM integration in various sectors of industries and organizational contexts. Empirical research from a 263 Jordanian Fast-Moving Consumer Goods (FMCG) companies study is reported to reveal that Knowledge Management Systems contribute positively to the performance of CRM and proves strategic worthiness to maintain competitiveness by integrating KMS dimensions within CRM practice in unsecure markets. Similarly, in a study of 667 middle and senior-level managers employed in e-retailer companies, it was found that knowledge management capability plays important mediators in order to positively impact market orientation capability and customer relationship capability and improve financial and market performance. The technology component of the integration is also supported by evidence from 315 Jordanian companies, where big data analytics capability based on knowledge management systems revealed strong positive effects on CRM linking capabilities and multi-dimensional firm performance. Brazilian organizational studies across 261 companies supported the fact that knowledge creation and knowledge sharing have an impact on IT infrastructure and decision support systems for strategy, whereas business process performance confirms complete mediation of the relationship between knowledge-enabled systems and firm performance. The foregoing empirical findings collectively confirm that knowledge management activities like acquisition, storage, sharing, and application directly affect CRM performance by enhancing customer insight, individualized relationships, and strategic decision-making capabilities [33], [34], [35]. Strategic implications of KM-CRM integration lie beyond functional ability to transformatory organizational capabilities enabling proactive customer relationship management and sustainable competitive advantage. The literature emphasizes evolution towards Social CRM where social networking sites provide instant, pervasive, and accessible infrastructure for organizational knowledge sharing that enables more intense customer engagement and more viable brand community creation [36], [37]. The convergence of artificial intelligence and machine learning technology with knowledge management systems has provided unprecedented promise for predictive customer analytics, and current implementations have been able to reach accuracy of 0.89 and ROC-AUC of 0.91 in

predictive models of customer retention. Beyond that, mediation functions of knowledge management capabilities in the organizational resources-customer performance results relationship suggest that successful alignment between KM and CRM requires end-to-end coordination among individuals, processes, and technology variables. Research directions for the future imply that future research needs to be conducted on the ethics involved in using big data in customer knowledge management, creating more sophisticated predictive models to analyze customer behavior, and formulating sectoral-specific KM-CRM integration models taking into account sectoral-specific problems and possibilities [38], [39]. These shifts collectively put the interaction between KM and CRM at the crossroads of organizational transformation, enabling organizations to transition away from the conventional reactive customer service approach towards proactive, knowledge-driven customer contact strategies that create enduring value for firms and stakeholders [40][41].

3. RESEARCH METHODS

In this research, a descriptive qualitative approach with a literature review technique is employed to explore the factors of success associated with the implementation of Knowledge Management (KM) within the Customer Relationship Management (CRM) system of PT Telkom Indonesia. In using the descriptive approach, the description and explanation of various theories, models, and findings surrounding the implementation of KM and CRM are emphasized.

The process involved in carrying out this study included various structured stages. First, problem identification involved analyses on organizational problems associated with KM and CRM implementation in PT Telkom Indonesia reported in previous literature. Then, literature pertinent to this study was gathered from credible sources in academia. Sources included various peer-reviewed journals, conference literature, as well as books ranging from 2015-2025, covering topics in relation to knowledge management and customer relationship management as well as their integration. Then, thematic analysis is done on selected literature in this study based on factors that particularly impact KM success, including organizational culture, leadership, HR process integration, technology, as well as process integration with CRM. Finally, literature analysis is finished with formulation of conclusions based on interpretation. To provide clarity on methodology in this study, note that this overall study process encompassed various stages as indicated in Figure 4 below.

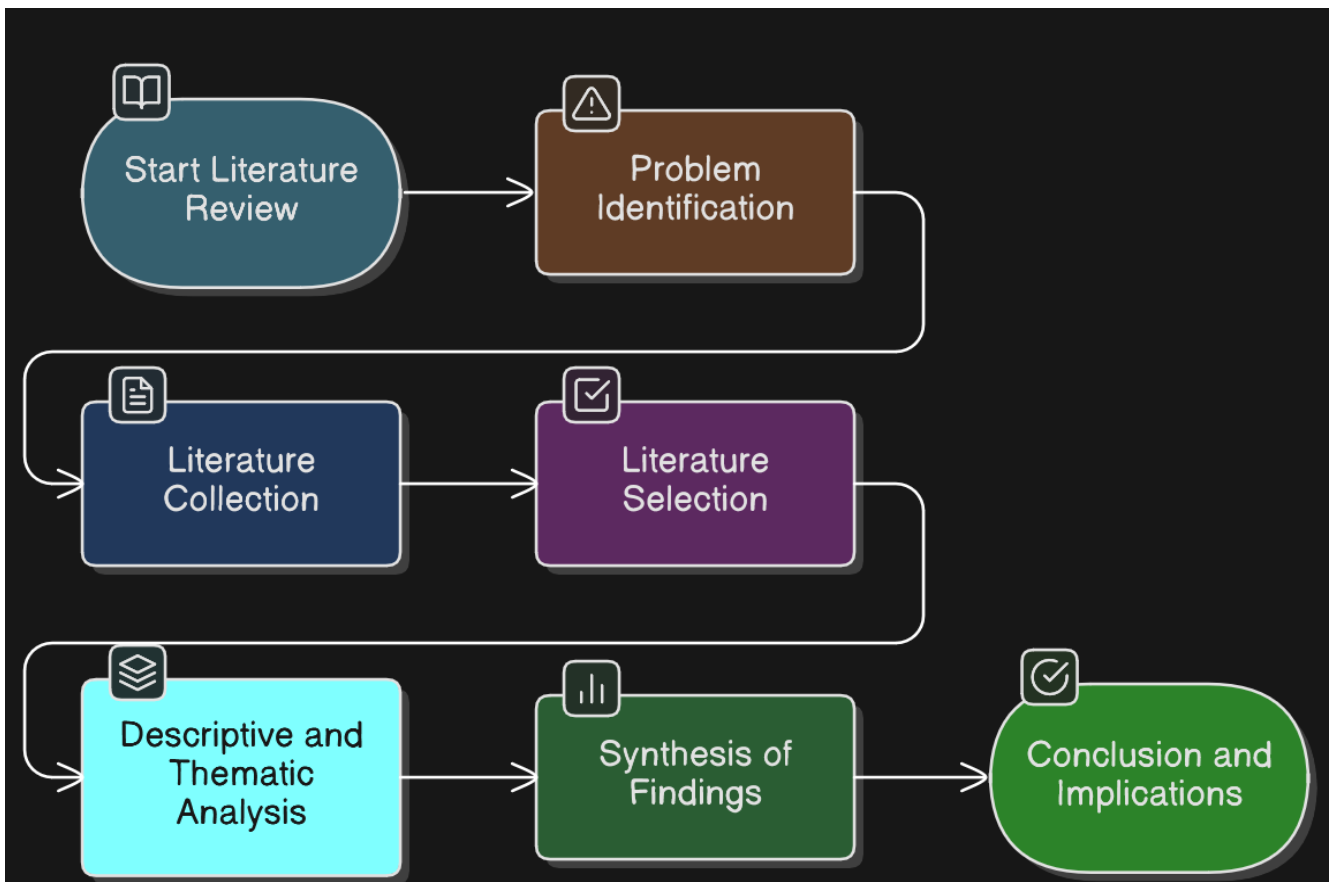


Figure 5. North & Probst Framework

4. DISCUSSION AND RESULT

Based on the descriptive analysis of the reviewed literature and the contextual case of PT Telkom Indonesia, this study identifies several key factors that influence the success of Knowledge Management (KM) implementation within the Customer Relationship Management (CRM) framework. The findings indicate that organizational alignment, human resource capability, technological integration, and process standardization are the dominant factors determining the effectiveness of KM practices in supporting customer-centric strategies. These results are discussed in the following subsections.

4.1 Knowledge Management

PT Telekomunikasi Indonesia (Telkom) is one of the largest telecommunications companies in Indonesia. In this digital age, knowledge has become an important asset for companies to improve their performance and competitiveness. Therefore, Telkom implements knowledge management (KM) to manage and utilize knowledge effectively. One of the frameworks used by Telkom in implementing KM is the North & Probst Framework. This framework was developed by Michael E. North and Karl-Heinz Probst and consists of seven dimensions, namely [42]:

1. Strategy and Culture, aligning KM with the company's strategy and culture.
2. Organization, building structures and processes that support KM.
3. People, developing employees' competencies and motivation to share knowledge.
4. Technology, leveraging information technology to support KM.
5. Process, developing processes to create, capture, share, and apply knowledge.
6. Measurement, measuring the effectiveness of KM.
7. Content, creating and managing high-quality knowledge content.

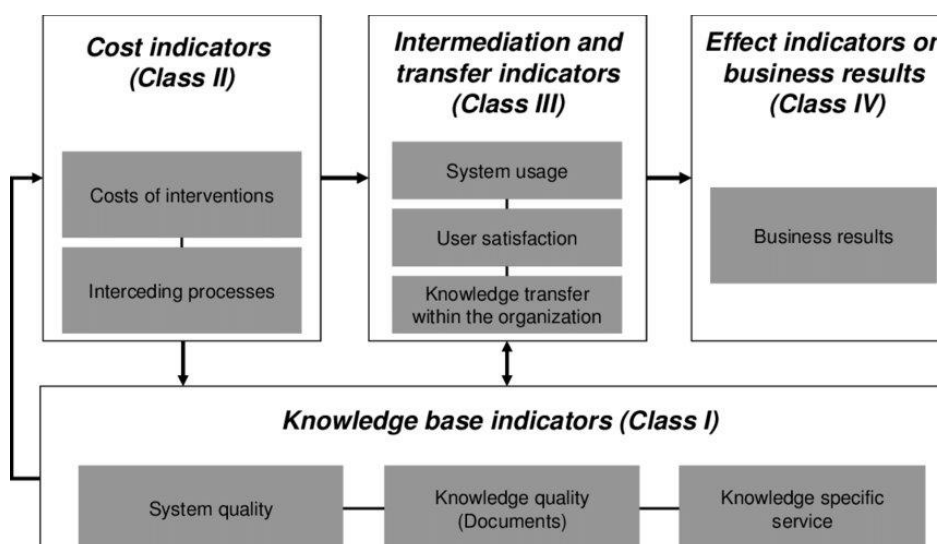


Figure 5. North & Probst Framework

Telkom has implemented the North & Probst Framework in various KM initiatives, such as:

1. KM portal creation: Telkom has a KM portal that provides access to various knowledge sources, such as documents, videos, and discussion forums.
2. KM training: Telkom provides KM training for employees to enhance their KM awareness and skills.
3. KM community: Telkom has established a KM community to facilitate knowledge exchange among employees.
4. Knowledge management system: Telkom uses a knowledge management system to manage and track its knowledge assets.

A case study conducted in Telkom's Planning & Deployment Division shows that the implementation of the North & Probst Framework has improved KM effectiveness in that division. The study found that employees in this division are more aware of the importance of KM and share knowledge with their colleagues more frequently. This has contributed to improved efficiency and effectiveness in their work. The implementation of the North & Probst Framework at Telkom has shown positive results. Telkom has successfully increased its employees' KM awareness and skills and has created a strong culture of knowledge sharing. This has contributed to an increase in the company's performance and competitiveness [42].

The findings of this study indicate that the successful implementation of Knowledge Management at PT Telkom Indonesia is strongly influenced by organizational and cultural factors. The application of the North and Probst framework demonstrates that

strategy alignment and organizational culture play a central role in fostering knowledge-sharing behavior among employees. While technology and KM systems serve as important enablers, the effectiveness of KM initiatives largely depends on employee awareness, leadership commitment, and continuous learning practices. This suggests that KM success at Telkom is not solely driven by technological infrastructure but by the integration of people, processes, and organizational values.

4.2 Customer Relationship Management

Customer Relationship Management (CRM) framework for Telkom as an internet service provider, possibly using a CRM framework that focuses on employee-to-customer relationships (ECR) and customer satisfaction to increase customer loyalty, as suggested by the research mentioned in Widodo & Gumilang (2019) research [43]. This study found that although ECR does not have a direct impact on customer loyalty, ECR has an indirect impact through the mediating role of customer satisfaction. Therefore, Telkom can prioritize ECR and customer satisfaction in their CRM strategy to increase customer loyalty. Additionally, Telkom may also consider implementing analytical CRM software, as discussed in Devda et al. research [44], to gain more benefits over time by leveraging valuable data. This may involve the use of data mining frameworks, as mentioned in Gupta research [45], to analyze customer behavior and preferences. In summary, although the specific CRM framework used by Telkom is not explicitly mentioned, it is likely that they use a framework that emphasizes ECR and customer satisfaction to improve customer loyalty, and may combine analytical CRM software and data mining techniques to enhance their CRM strategy. PT. Telkom implements Customer Relationship Management (CRM) in their customer care units using various strategies and methods. Here are some examples of CRM implementation at PT. Telkom:

1. IDIC CRM Strategy, PT. Telkom Witel Ridar uses the IDIC (Identify, Differentiate, Interact, and Customize) concept to manage customer relationships. This method involves identifying customers through NCX (New Customer Experience), My CX (Customer Experience), and starclick, then differentiating customers based on existing customer data, interacting through various intermediary channels or directly, and modifying various services and promotions to align with customer needs [46].
2. Use of Digital Marketing, PT. Telkom uses digital marketing strategies to increase internet sales and improve customer loyalty. This strategy involves the use of various digital channels such as social media and email marketing to increase interaction with customers [47].

In several studies, CRM is used to improve customer satisfaction, increase customer loyalty, and improve operational effectiveness. Various CRM methods and systems are used by PT. Telkom to achieve these objectives. PT. Telkom faces several challenges when implementing Customer Relationship Management (CRM) in their customer care unit. Here are some examples of the challenges faced:

1. Technology Integration, PT. Telkom faces challenges in integrating CRM technology with existing systems, such as information systems and management systems. This requires effective cultural and organizational structure changes [48].
2. Human Resource Quality: PT. Telkom faces challenges in improving human resource quality, such as poor help desk quality and insufficient personnel in the information systems unit.
3. Information System Development: PT. Telkom faces challenges in developing effective and efficient information systems, such as analyzing the gap between existing information system conditions and the required information system conditions [48].
4. Business Model Transformation: PT. Telkom faces challenges in transforming its business model through managed services, such as changing the outsourcing paradigm in the global telecommunications industry [48].
5. CRM Strategy Development, PT. Telkom faces challenges in developing effective CRM strategies, such as using the IDIC (Identify, Differentiate, Interact, and Customize) concept to manage customer relationships [46].
6. Strategic Plan Development: PT. Telkom faces challenges in developing an effective information system strategic plan, such as using the stages of information system strategic plan development, which include setting plans, evaluating existing information system conditions, projecting information system needs, and conducting gap analysis.

In several studies, PT. Telkom faces challenges in implementing CRM in their customer care units. Various strategies and methods are used to overcome these challenges and improve operational effectiveness and customer satisfaction.

From a CRM perspective, the analysis shows that knowledge utilization significantly enhances customer relationship effectiveness when supported by structured CRM strategies. The emphasis on Employee-to-Customer Relationship (ECR) and customer satisfaction indicates that internal knowledge sharing among employees contributes indirectly to customer loyalty. The findings suggest that CRM initiatives at PT Telkom Indonesia benefit from analytical CRM and digital marketing tools; however, their impact is maximized only when customer knowledge is systematically captured, shared, and applied through KM processes. This highlights the interdependence between KM and CRM in delivering consistent and personalized customer experiences

4.3 Integration of Knowledge Management and CRM at PT Telkom Indonesia

The integration of Knowledge Management and Customer Relationship Management emerges as a critical success factor in enhancing organizational performance at PT Telkom Indonesia. The findings reveal that KM acts as a foundational capability that supports CRM by transforming customer data into actionable knowledge for decision-making and service improvement. Effective KM-CRM integration enables Telkom to respond more proactively to customer needs, improve service quality, and

strengthen long-term customer relationships. However, the analysis also indicates challenges related to system integration, change management, and measurement of KM outcomes. Addressing these challenges requires a holistic approach that aligns technology, human resources, and business processes to ensure sustainable value creation.

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