Major Antecedents of Electronic Customer Relationship Management (E-CRM) Studies in the Indian Banking Sector : A Systematic Review

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Abstract

Purpose : Through a comprehensive literature review using PRISMA criteria, the current study identified the primary antecedents of electronic customer relationship management (e-CRM) employed by prior studies across the Indian banking sector.

Methodology : The authors systematically reviewed peer-reviewed articles in the context of Indian banking. The study followed the PRISMA standards. Related keywords are improved and tested against various databases. Thirty-three research articles were considered for review after meeting the eligibility criteria.

Findings : The study highlighted customer perception and satisfaction as the significant antecedents of e-CRM research for the Indian banking sector. Additionally, the study showed more studies on the customer's perspective than the banker's perspective. Only a few studies used qualitative approaches in the context of e-CRM research.

Practical Implications : This study examined the evolution of e-CRM research in the Indian banking setting in terms of study categories, important antecedents, study kinds, data collection methods, sample sizes, and under and over-researched areas.

Originality : The study appeared to be the first of its kind for the Indian banking sector, adding new knowledge to the body of literature on e-CRM by taking into consideration the synthesis and summarization of the significant antecedents used across all the empirical studies of e-CRM in the Indian banking sector through systematic literature review.

Keywords : e-CRM, electronic customer relationship management, Indian banking sector, systematic review, antecedents

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Building long-term relationships with valuable customers is the key to profitability in an increasingly dynamic market. Using electronic customer relationship management (e-CRM), the company can integrate customers, employees, suppliers, and related business partners into a virtual team that primarily focuses on creating, developing, maintaining, and marketing goods or services (Herman et al., 2021). Adaptation of e-CRM in an organization like a bank aims at establishing and maintaining long-term relationships with customers (Malik & Kumar, 2013) and provides the best solutions to customers' needs, reduces the burden of customer retention, and substantially increases customer loyalty, resulting in a better customer engagement (Hendriyani & Raharja, 2018). Categories like e-CRM, knowledge management, data mining, data quality, and social CRM significantly determine the new challenges in the CRM domain (Soltani & Navimipour, 2016).

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An academic literature review on CRM was carried out to propose a method to classify the available CRM literature into multiple segments (Ngai, 2005). Understanding the different antecedents researchers have employed over the years is crucial to identifying which ones are commonly and infrequently used. Knowing the study methodology and data collection strategies allows researchers to develop new data-gathering methods.

The present study aims to add to the body of knowledge on e-CRM in the Indian banking context, in particular by considering the synthesis and summation of key antecedents used in all empirical studies of e-CRM in the Indian banking sector up to the year 2022. A comprehensive search strategy was developed by considering nearly two decades of publication and looking at various databases and platforms.

Systematic literature reviews (SLR) on the empirical studies in e-CRM for the Indian banking sector were performed. This literature review aims at answering the following key research questions :

RQ1. What are the major antecedents?

RQ2. What techniques were employed in earlier studies to collect the data?

RQ3. What are the research categories for e-CRM in the Indian banking context?

Literature Review

The process of building online customer relationships is called e-CRM. The distinction between e-CRM and traditional CRM is the platform used to deliver services to the customer. E-CRM focuses on technology that enables automated and electronic management of customer relationships through electronic channels, primarily the Internet (Sudhakar, 2009). Building and maintaining long-term relationships with customers rather than focusing only on a stream of discrete transactions is the basis of relationship marketing (Nagu, 2012). The days of waiting for customers to use the banking services are gone. If banks wait patiently for new business while their rivals capture it, they risk losing it to them (Mainrai, 2019). Customers in the public sector banks have worries about the weak regulatory environment for Internet banking and the lack of improvement in the laws and regulations governing online banking (Srivastav & Mittal, 2016). Information and Communication Technology (ICT) advancement has forced businesses to employ e-CRM to enhance customer interactions and increase profitability, loyalty, and satisfaction (Yang & Babapour, 2022). The concept of e-CRM has moved from an option to a need for the survival and growth of banks due to the intense competition in the industry (Joju et al., 2017). As digital banking grows, banks increasingly play a crucial role in the growth of an economy (Singh et al., 2022). Banks should invest more in modernizing their technology to provide customers with faster, more secure, and more accurate online banking services (Joshi & Dabas, 2022). The cost of adopting digital channels must be low for them to be widely adopted. Businesses must plan strategically before introducing their digital products in a specific place (Sharma et al., 2022). The most important takeaway for the Indian banking sector is that it must offer hassle-free services, establish trusting customer relationships, and offer quick and simple website portals (Nagdev & Rajesh, 2018). By recognizing the characteristics of an effective e-CRM, managers could significantly improve their appropriate customer-facing strategies.

A growing body of research in the literature looks at the antecedents of e-CRM in the Indian banking scenario. This body of the work may be divided into five major non-mutually exclusive areas: e-CRM markets, e-CRM business models, e-CRM technology, e-CRM human factors, and e-CRM knowledge management (Romano & Fjermestad, 2001). To determine the regions of the field that are expanding, these five e-CRM study fields were integrated. A conceptual framework was then developed to examine how these five research areas are related (Romano & Fjermestad, 2003). We could find more articles about information technology and information systems in the literature for CRM research.

In contrast, only a few publications are found in the sales category. Major publications cover CRM extensively under broad concepts, planning, and strategy. Customer privacy was just briefly covered in a very small number of articles (Ngai, 2005). The marketing domain has received more attention than other domains with better utilization of IT resources. Publications are dominant toward the organizational and customer perspectives, with fewer articles focusing on sales and service aspects in multichannel CRM technology (Awasthi & Sangle, 2012). Considering the attractiveness of research in the field of CRM, a thorough investigation and classification of e-CRM academic research papers were very few. Classification of e-CRM academic research papers was essential to identify the popular subject areas and their importance for the researchers and to find their most preferred research areas (Kevork & Vrechopoulos, 2008).

Hence, it is essential to understand the various antecedents that researchers have used over time to determine which antecedents are frequently and infrequently used. Researchers can concentrate on creating innovative data collection techniques when familiar with the existing study methodology and data collection techniques.

Objectives of the Study

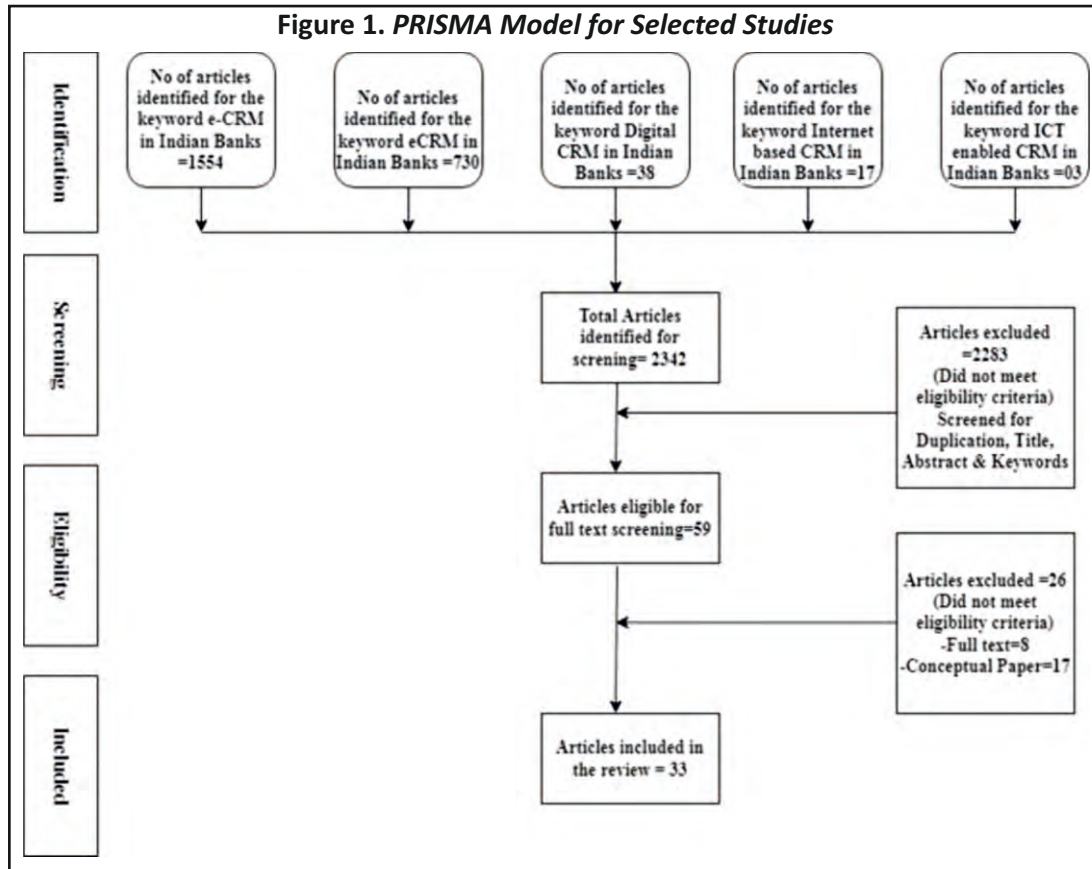To understand the role of e-CRM in the Indian banking sector, the study tries to investigate the following aspects :

(1) To evaluate the major antecedents used in e-CRM research for the Indian banking sector.

(2) To investigate the major data collection methodologies used in the e-CRM research across the Indian banking sector.

(3) To understand the research categories for e-CRM in the Indian banking context.

Methodology

A SLR (Moher et al., 2009) was conducted with PRISMA guidelines, which included inclusion and exclusion criteria similar to the study conducted by Shetty et al. (2022). Studies with empirical support, studies specifically about e-CRM in the Indian banking industry, and studies published in peer-reviewed journals were all considered eligible studies. Review papers, theses, conference proceedings, studies not published in English, and studies about other banking technologies in the Indian banking business were excluded. Google Scholar was the search engine for articles in databases like IEEE Explore, Science Direct, and Scopus until 2022. Emerald, Sage Publications, EBSCO Host, Elsevier, Springer, Wiley Online Library, ProQuest, Taylor & Francis, Research Gate, Inderscienceonline, CEEOL, and IGI Global provided the articles.

The keywords were optimized from literature and acquired studies. The optimized keywords matched research objectives, and synonyms were also established. Keywords like e-CRM, eCRM, Internet-based CRM, ICT-enabled CRM, digital CRM, and Indian banks were used to search for relevant articles in the Journals. Initially, 2,342 records through multiple keywords were identified. By applying the eligibility criteria, 2,283 records were excluded for duplication, title, abstract, and keywords.

Furthermore, 26 records were eliminated: eight due to a lack of full-text availability, one due to not satisfying the qualifying criteria, and 17 being conceptual works. Finally, 33 empirical articles were used for the study between the years 2010 to 2022. Figure 1 shows the PRISMA flow chart for the selected studies' screening and selection process.

Figure 1. *PRISMA Model for Selected Studies*

Identification

| No of articles identified for the keyword e-CRM in Indian Banks =1554 | No of articles identified for the keyword eCRM in Indian Banks =730 | No of articles identified for the keyword Digital CRM in Indian Banks =38 | No of articles identified for the keyword Internet based CRM in Indian Banks =17 | No of articles identified for the keyword ICT enabled CRM in Indian Banks =03 |

Screening

Total Articles identified for screening= 2342

Articles excluded =2283 (Did not meet eligibility criteria) Screened for Duplication, Title, Abstract & Keywords

Eligibility

Articles eligible for full text screening=59

Articles excluded =26 (Did not meet eligibility criteria) -Full text=8 -Conceptual Paper=17

Included

Articles included in the review = 33

Analysis and Results

The data from the eligible studies were extracted and placed in a Microsoft Excel spreadsheet for further validation by the authors. Extracted data consists of the year of publication, authors, objectives, antecedents, data collection methodology, sample size, statistical tools, and conclusions. The selected articles were appraised to avoid misinterpretation and bias. A criterion of quality assessment and assurance tools for undertaking a systematic review of disparate data (Hawker et al., 2002) was followed.

Study Trends

Figure 2 shows the distribution of articles as per the year of publication. Most e-CRM empirical articles in the Indian banking context were published between 2013 and 2017 ($N = 17$, 51.51%), with a maximum of five (15.15%) articles published in 2017.

Study Characteristics

Major studies considered sample sizes between 100 and 300 ($N = 17$, 51.51%). Five studies ($N = 5$, 15.15%) have used a sampling size of less than 100, and six studies ($N = 10$, 30.30%) have used a sampling size of more than 300. One study ($N = 1$, 3.03%) used the case study methodology. Figure 3 indicates the sample size variations of the selected studies.

Figure 2. *Distribution of Articles by Years*

Figure 3. *Sample Size in Articles Considered for Review*
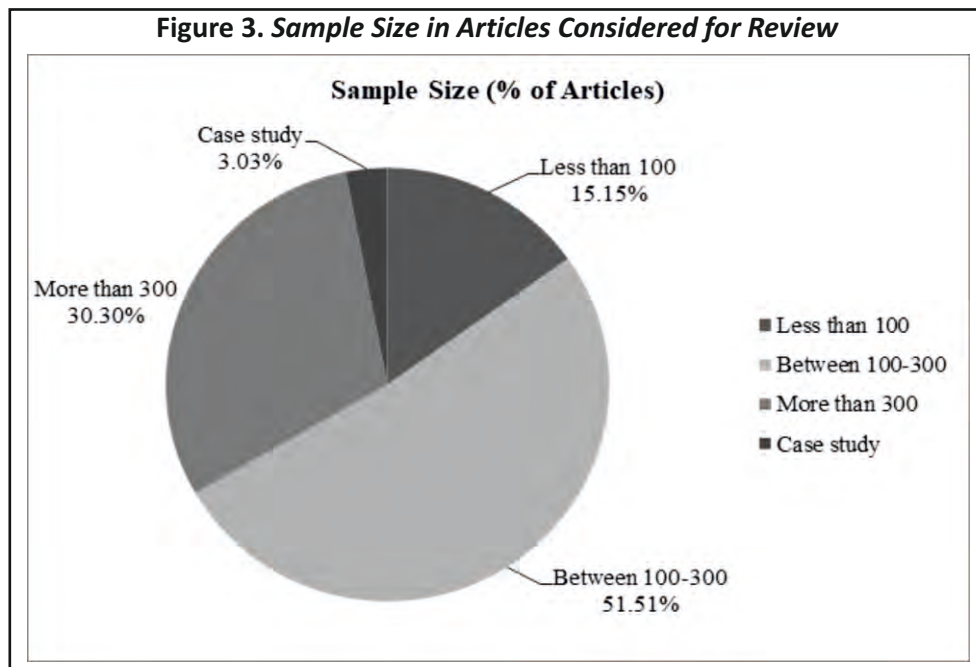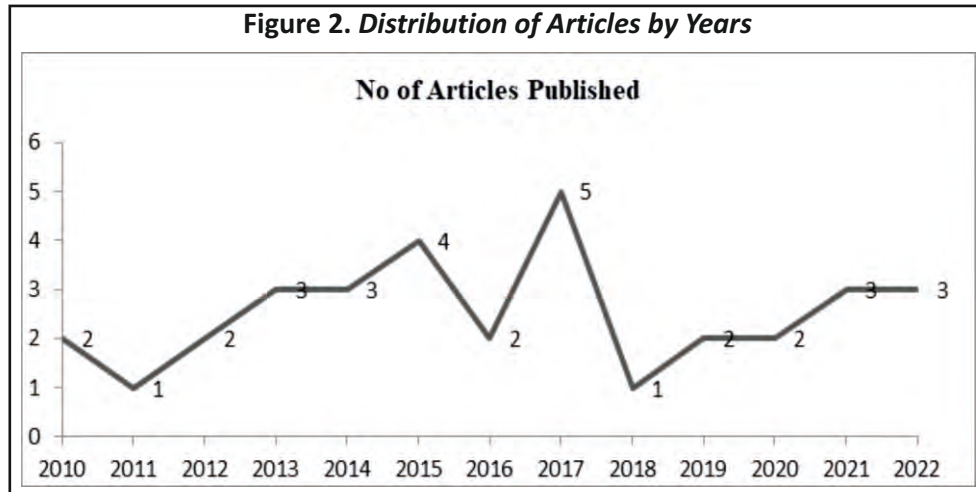
Among the selected studies, 96.96% (32) are of quantitative designs. The remaining 3.45% (1) studies used a case study approach. Most of the studies adopted a survey with a questionnaire ($N = 21, 63.63\%$) method followed by a questionnaire and interview ($N = 8, 24.24\%$). Few studies had also conducted interview schedules ($N = 3, 09.09\%$) to gather the information. As demonstrated in Figure 4, just one study ($N = 1, 3.03\%$) employed the case study approach to obtain information.

Major Antecedents of e-CRM Research in Indian Banking

The study also highlights the major antecedents used in e-CRM research for the Indian banking sector. Customer satisfaction with e-CRM ($N = 8, 24.24\%$) and customer perception of e-CRM ($N = 6, 18.18\%$) are the two major antecedents considered across the selected studies of e-CRM research for the Indian banking sector. Demographic variables and e-CRM ($N = 4, 12.12\%$), demographic variables and service quality ($N = 2, 6.06\%$), demographic

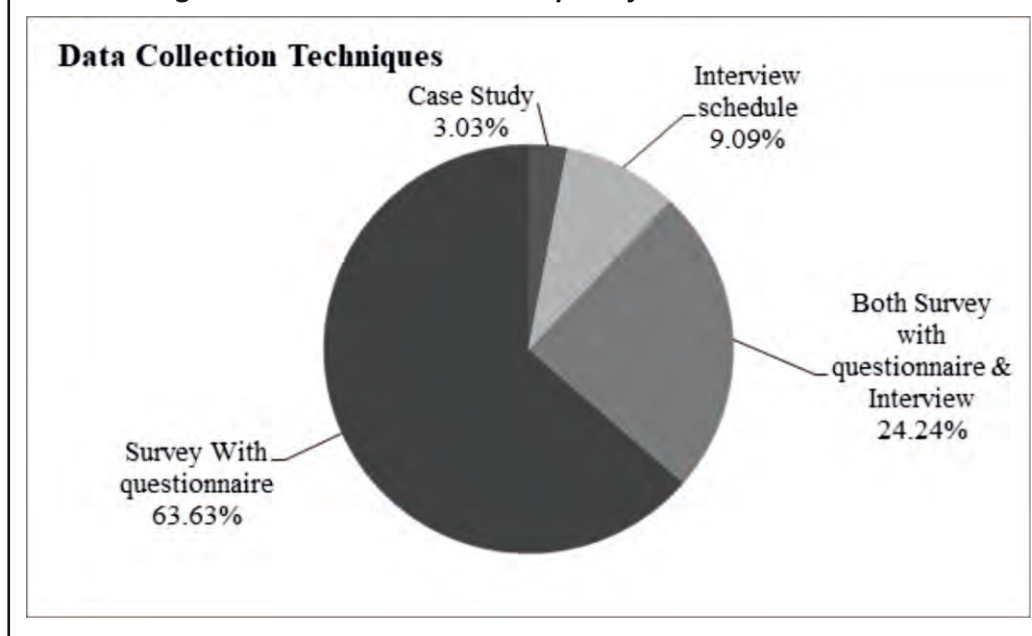**Figure 4.** *Data Collection Techniques of the Selected Articles*

Data Collection Techniques

- Case Study 3.03%
- Interview schedule 9.09%
- Both Survey with questionnaire & Interview 24.24%
- Survey With questionnaire 63.63%

Table 1. *Selected Article Details*

Year of Publication	Authors	Data Collection Methodology	Sampling Size	Antecedents
2010	Sharma et al. (2010)	SQ & Interview	80	Data quality and performances of data mining tools
2010	Khare (2010)	SQ	80	Online banking and customer satisfaction
2011	Kavitha & Lakshmi (2011)	SQ & Interview	75	Demographic variables and perception of e-CRM services, demographic variables and level of customer satisfaction
2012	Pawar & Chary (2012)	SQ & Interaction	600	Customer's perception of the effectiveness of banking services
2012	Gulati & Kolhatkar (2012)	SQ	200	Customer's perceptions of e-CRM parameters
2013	Sahoo & Sahoo (2013)	SQ	120	Choice of banks and role of different persons
2013	Dhingra & Dhingra (2013)	Case Study	4 Cases	e-CRM and customer satisfaction
2013	Kavitha (2013)	SQ	250	Demographic variables and employees' perception and willingness to use
2014	Manoj et al. (2014)	SQ & Interview	100	Customer opinions on different e-CRM services offered, computer literacy of bank staff
2014	Farooqi & Kumari (2014)	SQ & Interview	250	Effective services and interaction of bank with customers, Internet banking & age/gender
2014	Sahoo & Sahoo (2014)	SQ	450	Demographic variables and use of technology
2015	Manoj (2015)	SQ & Interview	150	Gender and use of e-CRM services, educational level, and use of e-CRM services
2015	Joju et al. (2015)	SQ	100	Customers' experience and e-CRM practices

Year	Study	Method	N	Antecedents
2015	Selvakumar (2015)	Interview Schedule	125	Demographic variables and customer satisfaction
2015	Sopna & Saravanan (2015)	Interview Schedule	150	e-CRM factors on technology and its benefits
2016	Kaur & Kaur (2016)	SQ	275	e-CRM competitive advantage on e-CRM performance
2016	Marimuthu et al. (2016)	SQ & Interview	83	Opinion of the bank employees about the e-CRM services
2017	Borgaon & Prashantha (2017)	SQ	39	Customer awareness and experiences with e-CRM services, Level of satisfaction with e-CRM services
2017	Mathapati & Kodag (2017)	SQ	600	e-CRM cruciality for a competitive market, e-CRM as a strategy for competitive advantage
2017	Kukkala & Devi (2017)	SQ & Discussion	100	e-CRM services and customer opinion
2017	Kasliwal & Singh (2017)	SQ	200	e-CRM and consumer satisfaction
2017	Joju et al. (2017)	SQ	100	e-CRM and service quality
2018	Priya & Moorthy (2018)	Interview Schedule	196	Customer opinion on e-CRM services
2019	Singh & Kasliwal (2019a)	SQ	600	Demographic variable (age) and service quality
2019	Singh & Kasliwal (2019b)	SQ	463	Demographic variables and service quality
2020	Mokha & Kumar (2020)	SQ	200	e-CRM services and customer satisfaction
2020	Sharma et al. (2020)	SQ	363	Elements influencing e-CRM in the banking sector
2021	Vidya & Shanthi (2021)	SQ	150	On e-CRM characteristics, age and number of visits, age and number of online transactions, and educational qualification
2020	Kumar & Mokha (2020)	SQ	300	e-CRM dimensions and customer loyalty
2022	Hota (2022)	SQ	592	Customer perception and e-CRM technology
2022	Kumar et al. (2022)	SQ	836	e-CRM, customer experience, and customer satisfaction
2022	Mokha & Kumar (2022)	SQ	836	e-CRM, customer experience, customer satisfaction, and customer loyalty
2022	Kumar & Mokha (2022)	SQ	836	e-CRM, customer satisfaction, and customer loyalty

Note. SQ : Survey with questionnaire.

variables and customer satisfaction ($N = 2$, 6.06%), e-CRM and customer experience ($N = 2$, 6.06%), e-CRM and customer loyalty ($N = 2$, 6.06%) are the subsequent antecedents used in the selected study as shown in Table 1.

Critical Appraisal of the Selected Studies

With a critical appraisal, we found major weaknesses in certain areas of the selected study, as shown in Table 2. Major weaknesses are found across (a) Abstract, (b) Ethics and bias, (c) Transferability or generalizability, (d) Implications and usefulness, and (e) Sampling. For most of the studies, abstracts are rated poorly. Around 48.48% ($N = 16$) of studies had poor and inadequate abstracts with minimal description of the research. Ethics and bias were not mentioned in 42.42 % ($N = 14$) studies and were briefly mentioned in 36.36% ($N = 12$) studies. In transferability or generalizability, only 48.48% ($N = 16$) of the studies could explain the research contexts and settings. Around 33.33% ($N = 11$) of the studies provided a minimal description of research contexts and were rated poor. In terms of implications and utility, 57.57% ($N = 19$) of the studies were graded fairly, indicating that key studies neglected certain aspects, such as contributions to the literature, recommendations for future study, or

Table 2. *Critical Appraisal of the Selected Studies*

| Item	Assessment Criteria	Score			
		Good	*Fair*	*Poor*	*Very Poor*
QA1	Abstract and Title	13(39.39%)	4(12.12%)	16(48.48%)	0(0.00%)
QA2	Introduction and Aims	17(63.63.62%)	12(36.36%)	0(0.00%)	0(0.00%)
QA3	Method and Data	22(66.66%)	7(21.21%)	4(12.12%)	0(0.00%)
QA4	Sampling	13(39.39%)	14(42.42 %)	5(15.15%)	1(3.03%)
QA5	Data Analysis	19(57.57%)	9(27.27%)	4(12.12%)	1(3.03%)
QA6	Ethics and Bias	7(21.21%)	1(3.03%)	11(33.33%)	14(42.42%)
QA7	Findings	19(57.57%)	8(24.24%)	5(15.15%)	1(3.03%)
QA8	Transferability/Generalizability	9(27.27%)	13(39.39%)	11(33.33%)	0(0.00%)
QA9	Implications and Usefulness	9(27.27%)	15(45.45%)	9(31.03%)	1(3.03%)

Note. Numbers in brackets denote *N* (%).

implications for policy and/or practice. In terms of sampling, 54.54% (*N* = 18) of the studies were graded fairly, suggesting that the sample size was justified with most of the details provided and only a few missing details.

Findings Related to RQ1, RQ2, and RQ3

This SLR explores significant knowledge regarding e-CRM in the Indian banking sector. Major antecedents considered in the selected study are customer perception of e-CRM and customer satisfaction with e-CRM. Multiple factors like privacy, security, user-friendliness, convenience, easy accessibility, customized products/services, alternative payment methods, online feedback, frequently asked questions, customer interaction and satisfaction, speed of processing, service quality, trust, website, personalized services, business communications, well-trained employees, adequate cash provided by ATMs, prompt and reliable post-purchase email/SMS services were considered while relating e-CRM to customer perception and customer satisfaction.

The analysis indicates that out of the selected studies, major studies had embedded surveys using

Figure 5. *Category of Studies in the Context of e-CRM for the Indian Banking Sector*
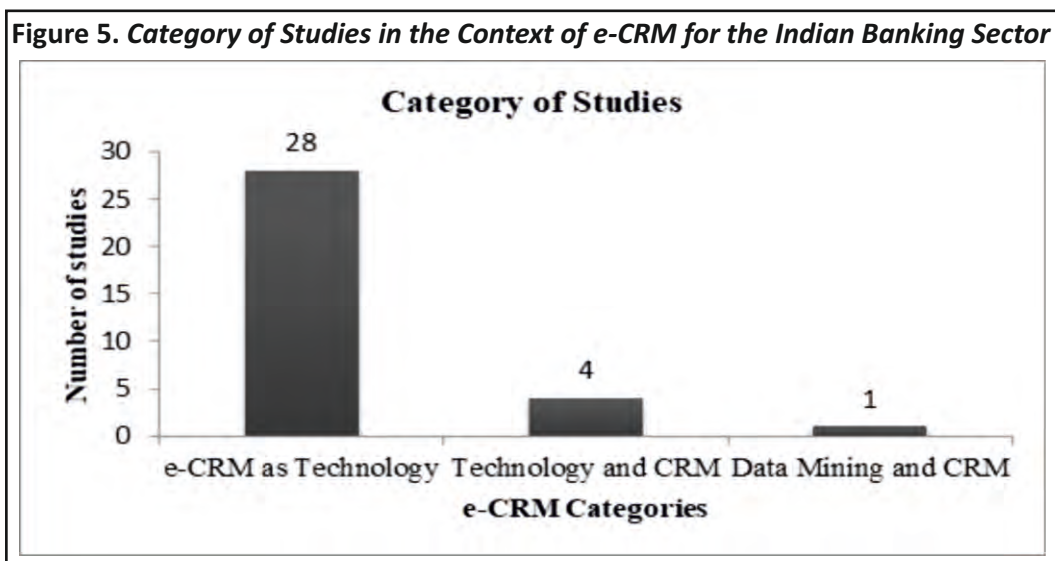
questionnaires with both offline and online surveys as per their convenience. Interview schedules were very rarely used. Limited studies considered e-CRM research from a banker's perspective for the Indian banking sector. Only one study has used the case study approach, which indicates that qualitative studies were scarce in e-CRM research for the Indian banking sector. No qualitative studies were found from a banker's perspective in e-CRM research for Indian banking sectors. The empirical articles defining the relationship between data mining and CRM are scarce in the Indian banking sector.

Out of the 33 articles considered, 28 were studies related to the factors of e-CRM. Four articles were related to banking technology from a CRM perspective. With sufficient conceptual articles related to data mining in the Indian banking sector, only one empirical article related to data mining from a CRM perspective could be found in the literature. Study analysis has categorized three types of e-CRM research across the Indian banking industry. They are : (a) research on e-CRM technology, (b) research on technology and CRM, and (c) research on data mining and CRM. Figure 5 shows the representation of e-CRM research categories in the Indian banking context.

Discussion

With technology advancements, service sectors like banks have realized that creating superior customer service would be key to their survival among competitors (Kavitha & Lakshmi, 2011). Compared to earlier scenarios, customer perceptions are more optimistic about the e-CRM parameters of the banks that have effectively implemented e-CRM in their operations (Gulati & Kolhatkar, 2012). Reference groups play a significant role in choosing the banks, and user-friendly e-CRM services help attract new and retain existing customers (Sahoo & Sahoo, 2013). E-CRM factors like customer interaction and satisfaction, convenience, the speed of transactions, rate of accuracy, reliable employees, availability of the latest information technology, and trust are the major benefits provided by the banks to customers with the implementation of e-CRM in their banks (Borgaon & Prashantha, 2017; Dhingra & Dhingra, 2013; Kukkala & Devi, 2017; Priya & Moorthy, 2018).

On the other hand, demographic variables like education, nature of job, income, and years of experience with the bank have a positive relationship with willingness to use e-CRM (Kavitha, 2013; Selvakumar, 2015). Irrespective of gender, both males and females have accepted the e-CRM, and gender and education levels are not significant factors in accepting e-CRM (Manoj, 2015).

Even though the technologies have been implemented, the customers are still in the learning curve, and a human touch is very important to retain the existing customers along with the technology (Manoj et al., 2014). Hence, convenience is vital to implementing e-CRMs in banks (Farooqi & Kumari, 2014). Customers will always try using the banks' technologies until they feel safe and user-friendly (Sahoo & Sahoo, 2014). For any bank, e-CRM competitive advantage contributes to financial growth, thereby increasing organizational performance. E-CRM competitive advantage improves non-financial aspects such as customer satisfaction and quality of the internal business and upgrades e-services and facilities within the bank (Kaur & Kaur, 2016). To taste the success of banks, bank officials must provide distinguished services, too (Marimuthu et al., 2016). To satisfy customers, banks need to approach their customers physically and psychologically. Practicing e-CRM strategies in the bank can be a survival tool in the competitive market. The impact determinants of e-CRM have a significant positive impact on customer satisfaction, customer experience, and customer loyalty (Kumar & Mokha, 2020; Kumar & Mokha, 2022; Kumar et al., 2022; Mathapati & Kodag, 2017; Mokha & Kumar, 2020; Mokha & Kumar, 2022). Private banks are competitive over public sector banks by considering services like fast customer support and well-trained employees to handle customer complaints. But concerning security and trust, public sector banks take a competitive advantage. Private bank customers seem happier than public sector banks (Kasliwal & Singh, 2017). Urban area customers are better facilitated and more satisfied with e-CRM services than rural area bank customers (Joju et al., 2015).

Managerial Implications

To sustain in the competitive market, banks must provide quality services and adopt new technologies as the customers are gaining much knowledge and awareness through different sources (Pawar & Chary, 2012). Even though the services are available online, customers are still giving importance to the presence of physical branches of their bank (Joju et al., 2017). The perception of customers in different banks may vary due to the behavior of the individual employees or executives (Purohit & Parthardikar, 2007). Furthermore, the banks can also use data mining techniques to get customer insights (Sharma et al., 2010). Major challenges for the banks are ensuring customer satisfaction and building customer loyalty despite decreased personal interaction with their customers. CRM technology helps banks build and manage close customer relationships and also helps in examining banks' marketing performance (Sopna & Saravanan, 2015). Hence, this review article examines the trends in e-CRM research and gives an insight into the popular antecedents and tools used in studies.

Theoretical Implications

The study appears to add additional knowledge to the literature review on e-CRM in the Indian banking sector, particularly by considering the synthesis and summarization of major antecedents used across all the empirical studies of e-CRM in the Indian banking sector till 2022. As banking technology and antecedents have changed over the years, this study illustrates how e-CRM research has changed over time in the Indian banking context in terms of study categories, important antecedents used, study types, data collection techniques, sample sizes, and under and over-researched areas. A broad search strategy considered the timeline from the beginning till 2022, covering almost two decades of publication, examining several databases and platforms. However, the articles related to e-CRM in the Indian banking context mainly were found after 2010. Hence, the latest articles from 2010 to 2022 are considered for the review, and each study was critically appraised. The study has also provided insights into major categories of e-CRM research, frequency of publication, sample size, and data collection methodology.

Conclusion

The study aims to categorize, summarize, synthesize, and appraise e-CRM research studies in the Indian banking sector. This SLR followed the PRISMA criteria. All 33 selected articles are carefully analyzed and evaluated. The findings are categorized into three research categories: e-CRM as technology, technology-based CRM, and data mining and CRM. The study highlights that customer satisfaction and perception are the major antecedents considered across e-CRM research for the Indian banking sector. A survey with a questionnaire is the major data collection technique used. The results also imply that research across e-CRM in Indian banking sectors should adopt different methodologies to collect the data and consider multiple antecedents related to CRM and the banking domain. Further research across data mining and related technologies from a CRM perspective for banking operations would help add more knowledge to the literature. This SLR provides insights and recommendations for future academic researchers and banking institutions.

Limitations of the Study and Future Recommendations

The study also has certain limitations. Google Scholar is the only search engine used to identify the articles. Conference proceedings are not considered, and only a few offline sources are considered. Specific articles were excluded for the non-availability of the full text. Critical appraisal shows that the quality of major selected articles ranges from fair to poor. Finally, the study has focused only on the Indian banking sector.

Future studies can highlight synthesizing and summarizing the major e-CRM parameters considered across all the research articles on e-CRM in the Indian banking sector. Further studies can also be done across associated channels of CRM like m-CRM, social-CRM, and multi-channel CRM. A more detailed study on establishing the relationship between data mining and banking from a customer perspective could be undertaken to add more knowledge to the literature database. Future researchers should consider multiple antecedents related to CRM and the banking sector, which may deduce a new relationship or test an existing one. Researchers are encouraged to use new methodologies to explore other potential factors like the implication of culture and geography to e-CRM in the Indian banking sector, including studies related to other financial institutions like small and cooperative banks, which can also broaden the study. A meta-analysis of the e-CRM research across the Indian banking sector can give more insights into the thrust area.

Authors' Contribution

Dr. Poornima Y. conceived the idea. Prashanth Shetty identified the need and then developed the architecture for the review paper. He also extracted research papers of high repute from multiple databases, filtered them based on keywords, and generated concepts and codes relevant to the study design. Dr. Poornima Y. verified the process and supervised the study.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

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