

**STUDY ON ESTABLISHING CUSTOMER EXPERIENCE AS A
COMPETITIVE ADVANTAGE IN THE PHARMACEUTICAL
INDUSTRY WITH THE AID OF ARTIFICIAL
INTELLIGENCE(AI)**

Dissertation Submitted to



The IIHMR University, Jaipur

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degree of

Master of Business Administration (MBA)

in

Pharmaceutical Management

by

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Under the Supervision and Guidance of

Mr. Vivek Hattangadi

And

Dr. Sandeep Narula

2020-2021

DECLARATION

I hereby declare that this dissertation titled “Study on establishing customer experience as a competitive advantage in the pharmaceutical industry with the aid of artificial intelligence(ai)” is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

A handwritten signature in black ink, appearing to read 'R Varun Sastry', enclosed within a hand-drawn oval.

(Signature)

Name of Student: R Varun Sastry

Date: 27th June 2021

CERTIFICATE

This is to certify that R. Varun Sastry in partial fulfillment of the requirements for the award of the degree of MBA (Pharmaceutical Management) from the IIHMR University, Jaipur has completed her/his internship at The Enablers from March 22, 2021, to June 19, 2021.



Place: New Delhi

Mr. Vivek Hattangadi

Date: 27th June 2021

The Enablers

CERTIFICATE

This is to certify that dissertation titled “Study on establishing customer experience as a competitive advantage in the pharmaceutical industry with the aid of artificial intelligence(ai)” is a record of the research work undertaken by R. Varun Sastry in partial fulfillment of the requirements for the award of the degree of MBA (Pharmaceutical Management) from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

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ABBREVIATIONS

- AI – Artificial Intelligence
- CX – Customer Experience
- EHR – Electronic Health Record
- RIOC - Return on Invested Capital
- EAV - Economic Add Value
- RPA - Robot Process Automation
- NLP - Natural Language Processing
- CLV – Customer Lifetime Value
- CRM – Customer Relationship Management

Abstract

- **Background:** With the advent of modern technologies such as Artificial Intelligence and its various branches, the area of Customer Experience in the Pharmaceutical Industry could be upgraded to level of satisfaction of the customers with ease. This will help in increasing the trust within the patients while bringing more limelight on the pharmaceutical organizations.
- **Methodology:** Google Scholar, PubMed, researchgate.net, hindawi.net are among many of the websites which were used along with the grey literature involved in those research papers. The PRISMA guidelines were followed, and a modified version of PICO inclusion/exclusion criteria was followed for screening titles and abstracts, among others.
- **Conclusion:** This study reviews various pieces of literature that revolve around the usage of AI and its branches in enriching the CX division in the pharmaceutical industry. It explores the uses and definitions of the technological branches which would be suitably imported into the CX division.
- **Keywords:** Artificial Intelligence, Customer Experience, healthcare industry, machine learning, natural language processing, Pharma industry, and electronic health record systems.

Chapter 1: Introduction and Background

A. Customer Experience:

It can be defined as a process of interactions between an organization and a customer throughout their relationship. These interactions comprise various factors such as a customer's awareness, attraction to the product/service/brand, discovery, cultivation, and advocacy of purchased goods, among others. It can be assumed as a science about the know-how of your customers (supported by data preferably) as much as possible.

This knowledge could enable an organization to create and deliver premium personalized experiences that will persuade the customer to not just be loyal to the organization, but also assume the role of a kind of a pseudo-brand/product/service ambassador and advertise it to others. This can be in many forms such as word-of-mouth, posting on social media, displaying results of product/service used (if possible), and advocating for their choice against alternate options (if present) among others.

Deep knowledge of customers could be extracted from records that would be present for all points of interaction and channels comprising the entirety of an organization. It revolves around the concept of gathering, mining, and processing the customer's data ethically quickly, and efficiently while not compromising on precision nor accuracy.

The idea of Customer Experience is increasingly becoming an important differentiator in the present cutthroat worldwide commercial center. There is considerable business esteem in dealing with the customer experience adequately.

With great customer experience management, the executives can:

- 1) Fortify brand inclination through a great experience.

- 2) Increment income with gradual deals from existing clients and new deals from the positive image created by local word-of-mouth and product/service advocacy.
- 3) Advocate through valued and memorable customer interactions along with Improving customer loyalty.
- 4) Customer fluctuation can be reduced by lowering costs.

To accomplish the above points an organization ought to make and utilize a framework that will want to merge information into a solitary perspective on the customer. Having a particularly single view across multiple corporations, channels, items and time, would work with facilitated client interactions. Different elements can influence the customer experience, in this way it is critical to:

- 1) Make and keep up complete client profiles.
- 2) Customize all customer associations.
- 3) Get the right data to the perfect spot at the perfect time consistently.

Another important factor in Customer Experience is the part of successfully creating a positive image in the customer's perspective by providing service to their utmost satisfaction. Customer Satisfaction is present in many pieces of literature such as P. Kotler who defines it as the "state felt by the body and connected with a comparison of perceived characteristics of the product and the expectations of individuals regarding these characteristics" and as K. Mazurek-Łopacińska defines it as the "emotional response to the comparative processes started by the client, consisting of the combination of their experiences and feelings after consumption of a product or service with expectations, individual standards or specific evaluation pattern".

The following are the steps leading to the achievement of satisfaction:

- 1) fulfillment – comprising in the contribution by the organization what the purchaser needs.
- 2) value – which means the satisfaction of the assumptions for the purchaser concerning cost.
- 3) convenience – comprising of the simple accessibility of the item.
- 4) confidence – the certainty of the purchaser concerning the way that the item is dependable.
- 5) accomplishing customer loyalty.

Thus, the level of Customer Satisfaction fundamentally depends on the actual characteristics of the product or service, the communication policy followed by the organization, the individually unique characteristics of the buyer and their requirements for their choice of products or services along with previous experience of the consumer (if any).

To calculate these factors, Oracle Research came up with an equation, namely, the *Customer Experience Value Equation (CX)*. It is somewhat a complex practice area that requires great and accurate execution, the right set of tools, and a clear vision to succeed thoroughly. They recommend three major areas to focus upon, which are; *Acquisition (A)*, *Efficiency (E)*, and *Retention (R)*. When combined, they together form the CX Value Equation as shown below:

$$CX = A + E + R$$

Acquisition: In this, organizations mainly focus on increasing the customer base by acquiring new or additional customers in an organization.

Retention: In this, the focus is on how the organizations increase their lifetime value to retain their customer by reducing the customer outflow.

Efficiency: In this, the organization focuses on doing the right operational activity at the right time to deliver results while keeping the costs low.

Acquisition	Efficiency	Retention
Generate more opportunities	Increase in ROIC/EVA	Increase in share of wallet
Increase brand equity	Increase in productivity	Drive loyalty
Increase market share	Decrease in cost of Operations	Drive advocacy

Source: based on Oracle Corporation, '*Customer Experience (CX) Metrics and Key Performance Indicators*', online leaflet, 2012 (10.12.2016).

B. *Artificial Intelligence:*

In the course of recent years, client experience in medical services has changed from non-existent to one of the needs in the business. Until recently, medical care establishments had basically been centered around individuals administrations, disregarding the patient experience. By the by, the emphasis on esteem based consideration has been boosting the business to regard patients as shoppers and convey "top of the line" or "premium level" encounters: reliable, charming, and smoothed out encounters, similar to the ones conveyed by Starbucks, Netflix, Uber, or some other well-known popular service provider.

Exploration by Salesforce showed that no under 47% of shoppers say that medical services and life sciences are more centered around industry needs than patient requirements. An investigation from PwC shows that just 49% of buyers say that the medical care client experience is good. It is protected to say that wellbeing-related associations, going from guarantors to drug organizations, are not seen as the most client-driven. This is a genuine misfortune when we contemplate upon how much this industry is expected to assist us with tackling the gigantic issues of a developing and maturing populace and the COVID-like pandemic emergencies that await us in future on.

The current disruption happening in this sector by some clever tech giants (for example, Apple, Amazon, Google, and Uber, among others) can be observed, as they have over the years acquired this knowledge by trying and testing the many ways in how to put the customer at the center of their offering. They have essentially set the standards in customer expectations, and many healthcare companies can learn a lot from them.

They have done this by using an essential piece of modern technology, that is, Artificial Intelligence. *Artificial intelligence* can be defined as the intelligence demonstrated by machines, unlike the natural intelligence displayed by humans and animals, which involves consciousness and the emotionality of living. The distinction between the former and the latter categories is often revealed by the acronym chosen, which is AI.

Specific AI applications include various expert systems, natural language processing (NLP), speech recognition, and machine vision. Essentially, AI is not one technology but more like a collection of them. Most of these technologies can have immediate relevance to the healthcare field, but the specific processes and tasks they support may vary widely.

Some AI technologies of high importance to the pharmaceutical sector are defined and described below:

1) *Machine Learning:*

This is a statistical technique for fitting models for data and learning by training these models with data such as sales figures and production forecasting. This is also one of the most common forms of artificial intelligence. In 2018, Deloitte conducted a survey consisting of around 1100 US managers whose organizations were already pursuing artificial intelligence. According to this report, 53% of the organizations reviewed were utilizing AI in their businesses.

In the pharmaceutical sector, a typical application of traditional machine learning could be the prediction of production strategies for specific medications that are more likely to be sold based on various patient attributes and environmental changes such as medication for seasonal flu, sunscreen in the summers, lip-balm, and cough lozenges in the winters, among others.

The great majority of machine learning and precise application in healthcare, especially the pharma sector, requires a training dataset for which the outcome variable (for example, onset of disease) is known. This is called *Supervised Learning*.

One of the more mind-boggling types of AI is the Neural Network. It is an innovation that was concocted in 1958 by clinician Frank Rosenblatt. He called it Perceptron and proposed to demonstrate how the human mind prepared visual information and figured out how to perceive objects. Neural Network has been grounded in clinical consideration research for many years. It has been used for order applications like

choosing if a patient will get a particular disease. It notices issues as far as data sources, yields, and loads of factors or 'highlights' that partner contributions with yields. It has been compared to the way that neurons interact signals; however, the similarity to the cerebrum's capacity is generally frail.

The most unpredictable types of AI include *Deep Learning* or neural network models with numerous degrees of highlights or factors that foresee results. There might be a considerable number of covered-up highlights in such models, which are uncovered by the quicker preparation of the present designs handling units and cloud structures. A typical application of deep learning in the pharmaceutical sector can be the ability to view the mechanism-of-action (MoA) of their drugs when in contact with the diseased part of the human body, and as such, organizations nowadays are increasingly trying to apply or are applying deep learning methodology to radionics, that is, the detection of the clinically relevant features in imaging data, which would be beyond what the human eye can perceive. Currently, both radionics and deep learning can be found in the Oncology field of the healthcare sector for image analysis. Their blend seems to guarantee more prominent precision in conclusion than the past age of robotized devices for picture examination, known as computer-aided location or CAD.

2) *Natural Language Processing (NLP):*

Sorting out human language has been an objective of AI analysts since the 1950s. This field, NLP, incorporates applications like speech recognition, text analysis, interpretation, and different objectives identified with language. There are two fundamental ways to deal with it: factual and semantic NLP. Factual NLP depends on AI (deep learning neural organizations specifically) and has added to a new expansion in the accuracy of recognition. It is anything but an enormous 'corpus' or group of languages from which to learn.

In the pharmaceutical sector, the dominant applications of NLP involve the creation, understanding, and classification of clinical documentation and published research. NLP systems can analyze unstructured clinical notes on patients, analyze prescriptions (for example, on radiology

examinations), transcribe patient interactions, and conduct conversational AI.

3) *Rule-based Expert Systems:*

Expert Systems require human specialists and information designers to build a progression of rules in a specific information space. They function admirably to a limited extent and are straightforward. Be that as it may, when the quantity of rules is enormous (generally more than a few thousand), and the principles start to struggle with one another, they will, in general separate. In addition, if the information space changes, changing the standards can be troublesome and tedious. They are gradually being supplanted in medical services by more methodologies dependent on information and AI calculations.

They are generally based on the 'if-then rules, which were the dominant technology for AI in the 1980s and were widely used commercially in that and later periods. In the pharmaceutical sector, these can be widely employed to support patient care by keeping an electronic health record of the patient's medical history, which would aid the pharmacies and the organizations to monitor which medication affects which patient in which manner. It would also make it easier to conduct clinical trials for the new and upcoming drugs or observing a blend of presently used drugs for a new disease.

4) *Physical Robots:*

Actual robots are eminent by this point, given that more than 200,000 current robots are presented each year all through the planet. They perform pre-described endeavors like lifting, repositioning, welding, or gathering objects in places like assembling plants and appropriation focus and passing on provisions in facilities. Even more, lately, robots have gotten more help with individuals and are generally the more successfully ready by moving them through an optimal endeavor. They are also getting smarter, as other AI limits are being introduced in their 'minds' (actually their functioning systems). Over time, it appears to be probable that the very enhancements in insight that we have seen in different spaces of AI would be consolidated into actual robots.

Surgical robots initially approved in the USA in 2000, provide 'superpowers' to surgeons, improving their ability to see, create precise and minimally invasive incisions, stitch wounds, and so forth. Important decisions are still made by human surgeons, however. Standard surgical procedures using robotic surgery include gynecologic surgery, prostate surgery, and head and neck surgery.

5) *Robotic Process Automation:*

This innovation performs organized computerized errands for authoritative purposes, that is, those including data frameworks, as though they were a human client observing content or rules. Compared with different types of AI, they are economical, simple to program, and straightforward in their activities. Robotic Process Automation (RPA) does not actually include robots – just computer programs on servers. It is anything but a mix of the work process, business rules, and 'presentation layer' incorporation with data frameworks to behave like a semi-insightful client of the frameworks. They are utilized for redundant undertakings like prior authorization, vital patient records, or charging in medical services. When joined with different innovations like image recognition, they can extract information from, for instance, faxed or emailed pictures to enter them into conditional frameworks.

Chapter 2: Literature Review

S.No.	Author	Title	Source	Focus	Findings
01)	Ruth N. Bolton, Janet R. McColl-Kennedy, Lilliemay Cheung, Andrew Gallan, Chiara Orsingher, Lars Witell, Mohamed Zaki	Customer experience challenges : bringing together digital, physical and social realms	Journal of Service Managem ent. 2018	The reason for this paper is to investigate developments in client experience at the crossing point of the computerized, physical, and social domains. It unequivocally considers encounters including innovation empowered administrations, like computerized twins and mechanized social presence (that is, remote helpers and administration robots).	The applied structure distinguishes eight "dualities" or explicit difficulties associated with incorporating computerized, physical, and social domains that challenge associations to make better client encounters in both business- than-business and business-to- shopper markets. The eight dualities are contradicting vital choices that associations should accommodate when the co-making client encounters under various

					conditions.
02)	Davenport T, Kalakota R	The potential for artificial intelligence in healthcare	Future healthcare journal 2019	The intricacy and ascent of information in medical care imply that man-made consciousness (AI) will progressively be applied inside the field. A few sorts of AI are as of now being utilized by payers and suppliers of care, and life sciences organizations. Although there are numerous occurrences wherein AI can perform medical care undertakings also or better than people, execution components will forestall huge scope robotization of medical care proficient positions for an impressive period. Moral issues in the utilization of AI in	They accept that AI has a significant task to carry out in the contributions of the medical service of things to come. Like AI, it is the essential ability behind the improvement of accuracy medication, broadly consented to be a painfully required development in care. Albeit early endeavors at giving analysis and treatment suggestions have demonstrated testing, they expect that AI will at last dominate that space also.

				medical care are likewise talked about.	
03)	Panesar A.	Machine learning and AI for healthcare. Coventry,	Published on Apress. 2019		This book investigates the hypothesis and down-to-earth utilization of AI and AI in medical services. This book offers a directed visit through AI calculations, engineering plans, and utilizations of learning in medical care and large information challenges.
04)	De Keyser A, Köcher S, Alkire L, Verbeeck C, Kandampully J	Frontline service technology infusion: conceptual archetypes and future research directions. Journal of Service Management. 2019 Jan 14.	Journal of Service Management. Published on 2019 Jan 14.	Savvy innovations and associated objects are quickly changing the hierarchical cutting edge. However, our comprehension of how these advances mix administration experiences stay restricted. Hence, this paper embarks to refresh existing arrangements of	The authors characterize FST and propose a bunch of FST imbuement models at the hierarchical cutting edge. Furthermore, they foster future exploration headings zeroed in on conversational

				Frontline Service Technology (FST) imbue ment. Besides, the creators talk about three promising shrewd and associated advances – conversational specialists, broadened reality (XR), and blockchain innovation - and their separate ramifications for clients, Frontline Employees (FLEs), and administration associations.	specialists, XR, and blockchain innovation suggestions for administration.
05)	Su-In Lee, Safiye Celik, Benjamin A. Logsdon, Scott M. Lundberg, Timothy J. Martins, Vivian G. Oehler, Elihu H. Estey, Chris P.	A machine learning approach to integrate big data for precision medicine in acute myeloid leukemia	Nature Communications Published on 03 rd January 2018	They exhibit a promising way to deal with recognize strong atomic markers for designated therapy of intense myeloid leukemia (AML) by presenting information from 30 AML patients including genome-wide quality	They show that our technique outflanks a few best-in-class approaches in recognizing atomic markers imitated refutation information and anticipating drug affectability precisely. At long

	Miller, Sylvia Chien, Jin Dai, Akanksh Saxena, C. Anthony Blau and Pamela S. Becker			articulation profiles and in vitro affectability to 160 chemotherapy tranquilizes, a computational strategy to distinguish dependable quality articulation markers for drug affectability by fusing multi-omic earlier data pertinent to every quality's capability to drive malignant growth.	last, we distinguish SMARCA4 as a marker and driver of affectability to topoisomerase II inhibitors, mitoxantrone, and etoposide, in AML by showing that phone lines transduced to have high SMARCA4 articulation uncover drastically expanded affectability to these specialists.
06)	Wereda W, Grzybowska M.	Customer Experience – Does it Matter?	Modern Management Review March 2016	The reason for this article is to portray a part of a Customer Experience as an instrument to expand the offer of items or/and administrations given by an association, in the case of Oracle Corporation. The client experience is	In its investigation on the connection between client experience and client dedication, the organization Forrester Research, discovered that clients who had a positive encounter were bound to return for another

				a blend of the actual picture of the venture and the sentiments and sensations evoked by it, intentionally and unwittingly at each phase of the client contact with the undertaking and the brand at all marks of the contact (alleged touchpoints).	buy, bound to prescribe the business to a companion, and less inclined to change to a contender. The article is a piece of a progression of articles on building the model of expert client care and the connected deals in the endeavor.
07)	Libai B, Bart Y, Gensler S, Hofacker CF, Kaplan A, Kötterheinrich K, Kroll EB.	Brave new world? On AI and the management of customer relationships.	Journal of Interactive Marketing. 2020 Aug	Considering the arising talk on AI frameworks' impact on society, whose discernment swings broadly among idealistic and tragic, they lead in this a basic investigation of how man-made reasoning (AI) influences the fundamental idea of client relationship the board (CRM).	They feature how AI-CRM's further developing capacity to anticipate client lifetime worth will produce an inflexible ascent in carrying out adjusted treatment of clients, prompting more prominent client prioritization and administration segregation in business sectors. We further think about the

					ramifications for firms and the difficulties to controllers.
08)	Schwartz EM, Bradlow ET, Fader PS. Marketing Science. 2017 Jul	Customer acquisition via display advertising using multi-armed bandit experiments	Marketing Science. 2017 Jul	Firms utilizing internet promoting consistently run tries different things with numerous adaptations of their advertisements since they are dubious about which ones are best. During a mission, firms attempt to adjust to the middle-of-the-road consequences of their tests, enhancing what they procure while finding out about their advertisements. However, how might they choose which level of impressions to apportion to every promotion? This paper responds to that inquiry,	They executed this arrangement in a live field analysis conveying more than 750 million advertisement impressions in an online showcase crusade with an enormous retail bank. Throughout two months, our arrangement accomplished an 8% improvement in the client obtaining rate, comparative with a control strategy, with no extra expenses for the bank. Past the genuine analysis, we performed counterfactual recreations to assess the scope of elective model details and

				settling the notable "learn-and-procure" compromise utilizing multi-armed bandits (MAB) techniques.	designation leads in MAB arrangements. At long last, we show that client securing would diminish by about 10% if the firm were to streamline navigate rates rather than change straightforwardly, a finding that has suggestions for understanding the showcasing pipe.
09)	Gijs Overgoor, Mannuel Chica< William Rand, And Anthony Weishampel	Letting the Computers Take Over: Using AI to Solve Marketing Problems	California Management Review July 2019	Artificial Intelligence (AI) has been demonstrated to be valuable in numerous applications from mechanizing vehicles to giving client assistance reactions. In any case, however, numerous organizations need to exploit AI to further develop	This article talks about the utilization of AI to offer help for advertising choices. Because of the setup Cross-Industry Standard Process for Data Mining (CRISP-DM) structure, it makes an interaction for directors to utilize when executing a Marketing AI

				advertising, they do not have an interaction by which to execute a Marketing AI project.	project and examines issues that may emerge. It investigates how this structure was utilized to foster three state-of-the-art Marketing AI applications.
10)	Ascarza E.	Retention futility: Targeting high-risk customers might be ineffective . Marketing Research. 2018.	Journal of Marketing Research February 2018	Organizations in an assortment of areas are progressively overseeing client beat proactively, for the most part by identifying clients at the most noteworthy danger of stirring and focusing on maintenance endeavors towards them. While there is an immense literature on developing churn prediction models that recognize clients at the most noteworthy danger of stirring, no researcher has researched whether	Consolidating two fields tries different things with AI strategies, the creator shows that clients recognized as having the most elevated danger of agitating are not the best focuses for proactive beat programs. This finding isn't simply in opposition to normal intelligence yet additionally recommends that maintenance programs are once in a while

				it is without a doubt ideal to focus on those people.	worthless not because organizations offer some unacceptable impetus but since they don't have any significant bearing the right focusing on rules. This methodology is observationally shown to be altogether more viable than the standard act of focusing on clients with the most elevated danger of stirring. All the more comprehensively, the author supports firms and analysts utilizing randomized preliminaries (or A/B tests) to look past the normal impact of mediations and influence the
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					noticed heterogeneity in clients' reactions to choose client targets.
11)	Loucks J, Davenport T, Schatsky D.	State of AI in the Enterprise.	Deloitte Insights Report. 2018.		Early adopters are inclining up their AI ventures, dispatching more drives, and getting positive returns. Organizations ought to further develop hazards and change the board. Early adopters need the right blend of ability—not simply specialized abilities—to speed up their advancement. These discoveries delineate that those intellectual advances hold captivating guarantees, some

					of which are being satisfied today. Notwithstanding, AI advancements may convey their best returns when organizations balance energy over their potential with the capacity to execute.
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Chapter 3: Research Methodology

This Systematic Literature Review is in line with PRISMA Guidelines and has followed the Vancouver Citation format for all the references.

a) Search Strategy and Eligibility Criteria

- i. Google Scholar, PubMed, researchgate.net, hindawi.net are among many of the websites which were used along with the grey literature involved in those research papers.
- ii. Studies that proposed the integration of new technology, namely artificial intelligence to improve the customer experience in the pharmaceutical sector and healthcare sector were shortlisted.
- iii. The searches were conducted utilizing a search string and important keywords which employed the following combinations: Artificial Intelligence, Customer Experience, healthcare industry, machine learning, natural language processing, Pharma industry, and electronic health record systems.
- iv. The given modified set of PICO Inclusion and Exclusion Criteria were utilized to screen titles and/or abstracts and subsequently full texts.

b) Table for Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Population	Adequately sized organizations.	Animals Plants
Intervention	Not Applicable	Not Applicable
Comparator	Not Applicable	Not Applicable
Outcomes	Shows presence of impact on the quality of customer experience when AI is used to aid the process of customer interaction.	AI and its subsidiaries are not used in any capacity to improve or change the customer experience.

	Organizations have completely immersed modern technologies in their day-to-day functions. Economic burden, including the cost of integrating AI, loss of productivity, incoherent communications.	Customer Interaction points are handled individually and by humans.
Study Design	Case-control studies Cohort studies Cross-sectional studies Modeling studies Economic Evaluations	Editorials Letters Case series reports Conference reports Reviews
Other	English Language	

c) Data Quality Assessment

- i. The risk of bias in individual studies will be assessed.
- ii. The risk of bias across studies will be assessed in two groups, studies looking at the impact of presence and absence of AI in customer experience will simply be assessed based on the nature and significance of the outcome.

d) Data Analysis

- i. No meta-analysis was performed due to the heterogeneity nature of the study.

- ii. The following information was extracted: study identifiers, study characteristics, data sets. Study methodology, the outcome of interest, results, stated limitations, and information used for risk bias assessment.

e) Study Details

- i. *Study Type:* Systematic Literature Review
- ii. *Study duration:* 3 Months
- iii. *Analysis Tools Used:* PubMed Pub ReMiner, Go PubMed, Oxford English Dictionary, and Google Scholar were used.

f) Study Objective

- i. To determine whether the usage of new and modern technology would help healthcare providers in boosting their customer experience satisfaction.
- ii. To establish the usage of artificial intelligence as a competitive advantage in improving customer experience.
- iii. To show that improving customer experience may lead to supporting and improving patient acquisition, patient retention, and patient engagement.

Chapter 4: Discussion

We have as of late saw an expansion in what programming can do, pervaded all things considered with adequate abilities to legitimize the term insight, as clarified previously. As such we are currently entering the time of computer-aided vision, discourse acknowledgment, robot, and automobile versatility, and numerous different regions that while being defective are progressed sufficiently that it is a highly ideal opportunity to pursue in applying their capabilities to different regions like Customer Relations Management.

AI has been utilized to improve relationship-procurement publicizing efforts to make better suggestions than foster existing connections and to distinguish stir sooner to upgrade relationship maintenance. Likewise, utilizing human-like chatbots for correspondence turned into a grounded technique for managing administration disappointment and subsequently stir aversion. These forerunner models feature the potential for AI-CRM to use immense measures of information in foreseeing what advertisements clients will tap on, what items clients will like, or which clients will beat.

Some of the various precursor examples are as follows:

1) Leveraging Big Customer Data:

The Internet of Things (IoT), and related evaluation and digitalization patterns, lead to the undeniable assumption that we will see much larger CRM datasets utilized by firms in the future than are utilized as of now. Information, in this way, is progressively an establishment for esteem creation and extraction. We outline this rule with two verifiable tales. In 2009, Google purchased the telecom organization Grand Central and rebranded it Google Voice. Among other upper hands, this gave Google admittance to an always developing corpus of voice messages. Google programming experts utilized the corpus to figure out how to deliver phone message records and subsequently acquire insight with spoken discourse. This ability would ultimately be utilized in the AI behind Google's voice-actuated collaborator. Similarly, Amazon picked books as

its first item classification. Notwithstanding the wide arrangement of books in the commercial center, we accept that the decision likewise permitted Amazon to draw in the right (i.e., more well-off, and hence more important) clients and influence their perusing and exchange information to refine their future development into other item classes. In the two cases, we saw a one-of-a-kind noteworthy chance to make a defectively imitable asset.

In summary, getting and keeping up with more assorted informational collections will be a huge wellspring of AI-CRM's upper hand. Strangely, a firm should be seen as reliable to accomplish Big Data assortment through setting up different organizations with outside elements, accordingly, delivering trust significantly more basic; each time a firm looks to catch another sort of information, there is a chance for the outer element giving that information to re-evaluate the worth trade.

2) Communicate, Understand and Create the way Humans do:

Long before our current AI era, Alan Turing suggested that one could evaluate AI by checking on the off chance that it could trick people into accepting that they were speaking with different people. With the development of administration chatbots, Twitter bots, and voice-enacted advanced partners, it is progressively apparent that the product is improving at conveying like a human.

For example, Precire is a German organization whose product pays attention to accounts of enlistment interviews. This permits firms to do an underlying screening of applicants, disposing of those whose discourse rate, discourse volume, number of filler sounds, sentence intricacy, and word decision can foresee disappointment at the employment. Correspondence capacities of bots and mechanized colleagues currently take into consideration close human client contact at just an unobtrusive peripheral expense for every contact.

3) Customer Acquisition:

Leading associations are attempting to use the large packets of information, that is, big data about their clients by anticipating another client's Customer Lifetime Value (CLV) and their client obtaining costs. A new report proposed an AI calculation to choose focuses for a client obtaining utilizing information from an outside merchant with individual, family, and neighborhood data. While this information is as of now important, a tighter mix of outside information sources with singular purchasing conduct and interests, and more extensive accessibility at a huge scope with expanded assortment and degree can be anticipated. Such information will take care of calculations to additionally work on the choice of possibilities, prompting more information, and accordingly making a positive criticism circle. On the whole, AI-CRM will improve an association's capacity to anticipate possibilities' CLV and to utilize this data in dealing with the client obtaining measure through securing, whereby just more productive ("better") clients will be gained.

Additionally, more precise, and exceptionally powerful focusing on will build the client transformation rate, accordingly, lessening client obtaining costs. At present, most investigations give little consideration to the extent of outer information however improvement in data management capacities will empower firms not exclusively to all the more likely recognize high-CLV possibilities yet additionally to foster contributions that address these possibilities' issues.

One example is the start-up Brytes, which delivers buyers' computerized non-verbal communication apparent and utilizes this data to distinguish the psychographic characteristics of each client of a given site progressively and convey the data and help that a purchaser needs. Such advancements will diminish client procurement costs as a rule and will likewise influence new clients' CLV emphatically.

4) Customer Development and Retention:

Two parts of customer relationship management are key to the creation of customer profitability:

Customer development alludes to endeavors to increment per-period benefit from current clients like expanding edge, recurrence, strategically pitching, or upselling.

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5) *Personalization:*

Pursuing the present directions and concentrating from the writing of AI-CRM frameworks can be thought to display adequately adaptable transformation. Prominent utilization of such frameworks is to empower firms to make a more customized discourse with clients that thinks about the previous' buying history and collaborations and adjust the subsequent advertising blend components to the individual client. While AI frameworks generally perform mechanical and insightful undertakings today, they will steadily move to perform correspondence assignments that request the impersonation of human instinct and sympathy. This will, thusly, empower an intelligent capacity to foresee singular client needs and conceivably fulfill them. A clear ramification thereof is that we can anticipate better progress in creating clients and holding them. In this way, clients' lifetime esteems should increment, and similarly the inspiration to put resources into client procurement.

A subsequent ramification is that organizations can choose who NOT to put resources into. While at present, numerous endeavors to create and hold clients are intended for the client populace, by and large, directors are as yet urged to zero in just on those clients who will make an upper hand, and AI-CRM-driven personalization will empower firms to progressively move toward this path. Subsequently, we hope to see expanding utilization of turn of events and maintenance that emphasis just on a subset—some of the time a little one—of clients.

6) *Role of Social Network:*

Despite the growing significance of interpersonal organizations' part in client dynamic and benefit, most advertisers are as yet not exploiting

client availability data given the troubles in the recognizable proof and examination of client networks for explicit items. Because of the intricacy of the examination, a large part of the examination to date had been limited to utilizing information on generally little interpersonal organizations. Artificial intelligence applications will permit such examinations to grow and extend, empowering a greatly improved utilizing of client network information. Advanced AI-based machines consider the distinguishing proof of informal organizations and networks inside the organizations utilizing an assortment of online information. Driven by cell phone omnipresence, area-based information can additionally upgrade the capacity to distinguish client interpersonal organizations utilizing advanced AI strategies to analyze these huge scopes of information. This organization data would then be able to be utilized to more readily customize the collaboration with clients.

7) Role of Consumer Technology Skills:

Many pieces of literature have assumed and to some degree set up a reality that burdened buyers may pay more than higher-pay clients because of the previous' restricted extent of buys and the capacity to make the most of market openings. One may envision that AI frameworks can help such buyers in such a manner. They may utilize AI-based brilliant aides that catch and investigate their inclinations to help them face progressively complex commercial centers. In that sense, some lower part-of-the-pyramid clients who are customarily less ready to make the most of worth-based market openings can utilize such colleagues to improve an incentive at a lower cost.

The topic of abilities and AI's impact might be task-subordinate. For less difficult assignments like discovering an item to buy in a specific class, an AI-based gadget, for example, Alexa can assist less-talented people to explore the commercial center with the assistance of innovation. Notwithstanding, for more confounded errands (like tracking down the ideal item, beating advertisers' endeavors to attract the client a specific heading) the proficient utilization of AI may rely upon abilities that may

begin even with the information on which programming and innovation to utilize. Exploiting progressively refined partners will request abilities that are not accessible to huge sections of the populace. Given that, even consumer-side AI may increase dissimilarity among clients.

Chapter 5: Conclusion.

The author accepts the fact that AI and AI-based technology will have a significant role to play in advancing the technological side of industry, particularly the customer experience segment. It is noted to have the potential to greatly improve the accuracy of medication and patient care which the general population has simultaneously consented to be in a state of woefully requiring an upgrade, that is, in development in care. Even though these early endeavours are in the stages of testing the waters, per se, the potential capabilities which are demonstrated in these tests depict an absolute need for thorough and significant testing upon which the future versions will be built.

The current times can observe a growth in the advances of AI-based technology with ease as their examples are present in almost every field such as AI for imaging investigation as it appears to be conceivable in the manner that most radiology and pathology pictures may sooner or later be inspected by a machine. Other features such as Text recognition and Speech recognition are in the beginning stages of being used in the healthcare and the pharmaceutical sector like recording patient correspondence and improving the database of clinical notes.

With new and upcoming spaces for AI-based systems to grow in the healthcare and the pharmaceutical sectors, the grounds for testing AI in versatile environments are also opening rapidly. This will ensure that the advances will strive to be adequately able to be valuable in nature and guaranteeing that their selection for every point-of-contact to enhance the customer experience in the pharmaceutical sector will be provable in nature. For the selections to occur, stringent measures could be put in place such as AI frameworks which should support the existing controllers, they should be incorporated with HER frameworks and should be normalized and regulated to an adequate degree that comparative items work and respond adequately while being supervised by appropriately qualified individuals. These may require to be paid for by open or private payer associations and will need to sufficiently be refreshed in the long run.

These various difficulties will eventually be survived, even though they will most probably take long to do so than the actual innovations are to develop. Therefore, the author hopes to see limited utilization of AI-based CX in the pharmaceutical industry within 5 years and more broad use within 10 years.

Moreover, it appears to be progressively certain that AI frameworks will not replace the human Customer Care Experts for an enormous scope, but instead will expand their endeavours to new boundaries and focus on patient care not just by the patient or a medical professional but also by the care takers, that is, the kin of the patient. Post the successful establishment of these systems, human clinicians may push toward errands and occupation plans that will particularly require or draw on human abilities like compassion, influence, and higher perspective combination.

It could be said that, in the current stage a majority of the methodology by which firms deal with AI-based commitment to form customer relations is viewable as a basic upgrade in innovation on comparison to previous technological levels. Although, it is certain that a data escalated world in which customers are overseen exclusively, and their interest is very much anticipatorily awaited and has been imagined for quite a long time, yet the magnitude of errors that will be brought alongside such frameworks and innovations also need to be taken into consideration as such mistakes may be fatal to the patient. This further pushes the point that even though as it may seem to be so, AI systems will not replace the Human Touch, that is, the human point-of-contact on a huge scale such as globally. But rather aid, enable and augment their efforts towards creating a better relationship with the patients and their caregivers which would be based on trust and commitment.

Chapter 6: References

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Chapter 7: Annexure

1) Plagiarism Report