INT 404 –ARTIFICIAL INTELLIGENCE

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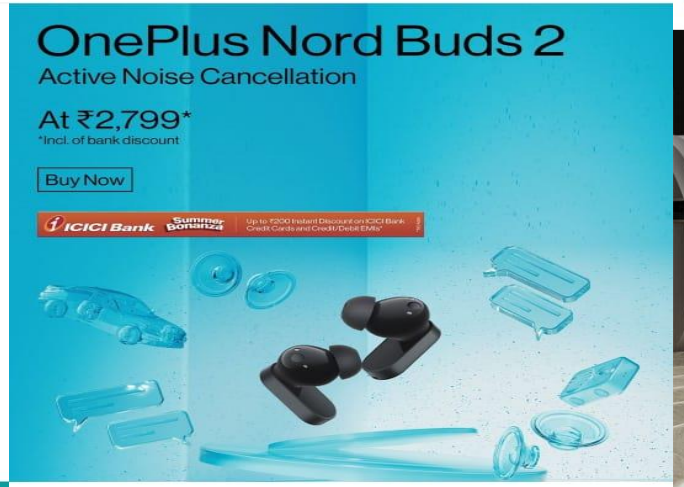

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ABSTRACT

ARTIFICIAL INTELLIGENCE IS A WAY OF MAKING A COMPUTER CONTROLLED ROBOT OR SOFTWARE THINK INTELLIGENTLY IN THE SIMILAR MANNER THE INTELLIGENT HUMANS THINK. HERE FOCUSES ON THE IMPACT OF ARTIFICIAL INTELLIGENCE IN E-COMMERCE. E-COMMERCE IS NOW ADOPTING VARIOUS TECHNOLOGY TO IDENTIFY PATTERNS BASED ON THE BUYING AND SELLING OF GOODS AND SERVICES USING THE INTERNET AND THE TRANSFER OF MONEY AND DATA TO EXECUTE THESE TRANSACTIONS. THE RESULT AND SUGGESTION THAT ARTIFICIAL INTELLIGENCE APPLICATIONS CAN GENERATE AND PREDICT THE ACCURATE FORECAST OF THE E-COMMERCE. THIS PAPER HIGHLIGHTS THE IMPACT OF ARTIFICIAL INTELLIGENCE IN E-COMMERCE AND ITS APPLICATIONS IN DIFFERENT AREAS OF E-COMMERCE. IT CONCLUDES ARTIFICIAL INTELLIGENCE HAS HELPED E-COMMERCE WEBSITES IN PROVIDING WITH BETTER USER EXPERIENCE.

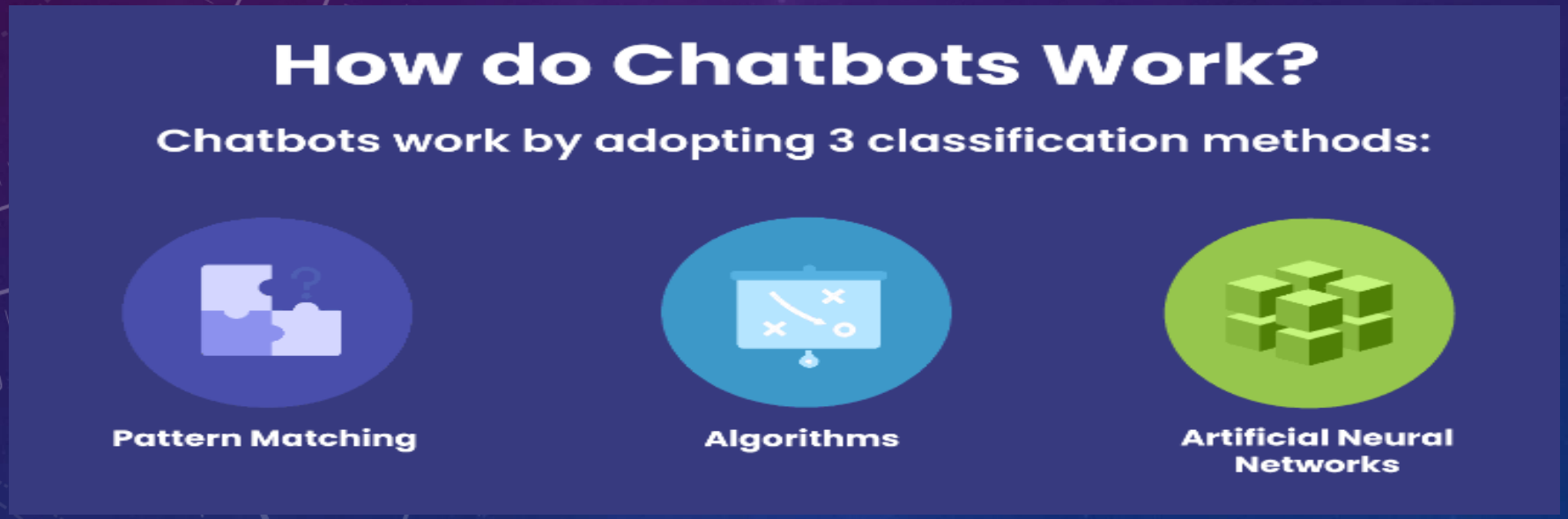
INTRODUCTION

ARTIFICIAL INTELLIGENCE ALSO IS KNOWN AS AI IS ONE OF THE WIDEST AND POPULAR BRANCHES OF COMPUTER SCIENCE IN TODAY'S DATE WHICH INVOLVED CREATING AND BUILDING SMART MACHINES. WE CAN SAY THAT ARTIFICIAL INTELLIGENCE IS ALL AROUND US STARTING FROM THE DEPARTMENT STORE YOU VISIT FOR GROCERY HAVING SELF CHECKOUT CASH COUNTERS TO HUGE SHOPPING MALLS AND AIRPORTS HAVING BEST AND ADVANCE SECURITY SYSTEMS. ARTIFICIAL INTELLIGENCE HAS BECOME AN INDISPENSABLE PART OF PEOPLE'S LIFE. IT IS AI WHICH ALLOWS A BUSINESS TO INVESTIGATE IN REAL-TIME AND BRING MORE EFFICIENCY IN THEIR WORK AND ALSO HELPS IN COUNTRIES SAFETY, SECURITY. IT CAN BE SAID THAT IN TODAY'S DATE ECOMMERCE IS ONE SUCH INDUSTRY WHICH IS USING ARTIFICIAL INTELLIGENCE AT ITS BEST BY GENERATING HUGE CUSTOMER BASE, UNDERSTANDING CUSTOMER NEEDS, DOING REAL-TIME RESEARCH, COMING WITH END SOLUTIONS TO PROBLEMS AND A LOT MORE. ONE CAN SEE AI IN THE ECOMMERCE INDUSTRY AS CHAT BOTS ,(CRM) CUSTOMER RELATIONSHIP MANAGEMENT , PRODUCT CONTENT MANAGEMENT (PCM) , CUSTOMER SERVICE AND SO MUCH MORE.

ROLE OF AI IN ECOMMERCE INDUSTRY

A. CHAT BOTS

CHAT BOTS THE BEST PART ABOUT SHOPPING ONLINE IS THAT THE ECOMMERCE WEBSITES ASSIST ITS CUSTOMERS WITH 24*7 CUSTOMER SUPPORT AND HELP. THIS HAS BEEN ALL POSSIBLE BECAUSE OF CHAT BOTS . CHAT BOTS CAN BE DEFINED AS A TYPE OF SOFTWARE APPLICATION WHICH MAKES USE OF AI TO HAVE ONLINE CHAT CONVERSATIONS VIA TEXT OR SPEECH MEDIUM WITH PEOPLE VISITING ON THE WEBSITE.



WHAT IS PATTERN MATCHER?

- BOTS USE PATTERN MATCHING TO CLASSIFY THE TEXT AND PRODUCE A SUITABLE RESPONSE FOR THE CUSTOMERS. A STANDARD STRUCTURE OF THESE PATTERNS IS “ARTIFICIAL INTELLIGENCE MARKUP LANGUAGE” (AIML).

- THE ARTIFICIAL INTELLIGENCE MARKUP LANGUAGE (AIML) IS AN XML-BASED LANGUAGE USED TO CREATE CHAT BOTS AND VIRTUAL ASSISTANTS. AIML IS PRIMARILY USED IN CREATING CONVERSATIONAL AGENTS THAT ARE ABLE TO MIMIC HUMAN-LIKE CONVERSATIONS.

- AIML IS MADE UP OF TWO KEY ELEMENTS: PATTERNS AND TEMPLATES. A PATTERN IS A SPECIFIC SEQUENCE OF WORDS THAT A USER MIGHT TYPE OR SAY TO A CHAT BOT, WHILE A TEMPLATE IS THE RESPONSE THAT THE CHAT BOT WILL GENERATE BASED ON THAT PATTERN.

- AIML IS DESIGNED TO BE MODULAR AND EXTENSIBLE, ALLOWING DEVELOPERS TO ADD NEW PATTERNS AND TEMPLATES AS NEEDED. IT IS ALSO DESIGNED TO BE EASY TO LEARN AND USE, MAKING IT A POPULAR CHOICE FOR CREATING CHAT BOTS AND VIRTUAL ASSISTANTS.

- AIML HAS BEEN USED IN A WIDE RANGE OF APPLICATIONS, FROM SIMPLE CHAT BOTS THAT ANSWER BASIC QUESTIONS TO MORE COMPLEX VIRTUAL ASSISTANTS THAT CAN HANDLE A VARIETY OF TASKS. WHILE AIML HAS ITS LIMITATIONS, IT HAS PROVEN TO BE A USEFUL TOOL FOR CREATING CONVERSATIONAL AGENTS THAT CAN PROVIDE A MORE HUMAN-LIKE EXPERIENCE FOR USERS.

ALGORITHM USED IN CHAT BOT

- A UNIQUE PATTERN MUST BE AVAILABLE IN THE DATABASE TO PROVIDE A SUITABLE RESPONSE FOR EACH KIND OF QUESTION. A HIERARCHY IS CREATED WITH LOTS OF COMBINATIONS OF PATTERNS. ALGORITHMS ARE USED TO REDUCE THE NUMBER OF CLASSIFIERS AND CREATE A MORE MANAGEABLE STRUCTURE.
- MULTINOMIAL NAIVE BAYES IS THE BEST EXAMPLE OF THE ALGORITHM FOR NLP(NATURAL LANGUAGE) PROCESSING AND TEXT CLASSIFICATION

MULTINOMIAL NAIVE BAYES

- MULTINOMIAL NAIVE BAYES ALGORITHM IS A PROBABILISTIC LEARNING METHOD THAT IS MOSTLY USED IN NATURAL LANGUAGE PROCESSING (NLP). THE ALGORITHM IS BASED ON THE BAYES THEOREM AND PREDICTS THE TAG OF A TEXT SUCH AS A PIECE OF EMAIL OR NEWSPAPER ARTICLE. IT CALCULATES THE PROBABILITY OF EACH TAG FOR A GIVEN SAMPLE AND THEN GIVES THE TAG WITH THE HIGHEST PROBABILITY AS OUTPUT.
- BEFORE KNOWING MULTINOMIAL NAÏVE BAYES WE SHOULD KNOW ABOUT INDEPENDENT EVENTS , DEPENDENT EVENTS , CONDITIONAL PROBABILITY AND BAYES THEOREM.

INDEPENDENT EVENTS : THE PROBABILITY OF ONE EVENT DOES NOT EFFECT THE PROBABILITY OF A 2ND EVENT

DEPENDENT EVENTS : THE PROBABILITY OF ONE EVENT DOES EFFECT THE PROBABILITY OF A 2ND EVENT

CONDITIONAL PROBABILITY : CHANCE OF OCCURRENCE OF A → B HAS ALREADY OCCURRED

$$P(A|B) = P(A \text{ AND } B)/P(B)$$

BAYES THEOREM :

BAYES' THEOREM STATES THAT THE CONDITIONAL PROBABILITY OF AN EVENT, BASED ON THE OCCURRENCE OF ANOTHER EVENT, IS EQUAL TO THE LIKELIHOOD OF THE SECOND EVENT GIVEN THE FIRST EVENT MULTIPLIED BY THE PROBABILITY OF THE FIRST EVENT.

$$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{P(A) \cdot P(B|A)}{P(B)}$$

P(A|B) ---- IS THE CONDITIONAL PROBABILITY OF EVENT A OCCURRING , GIVEN THAT B IS TRUE

P(B|A)---- IS THE CONDITIONAL PROBABILITY OF EVENT B OCCURRING , GIVEN THAT A IS TRUE

P(A) AND P(B) ARE THE PROBABILITIES OF A AND B OCCURRING INDEPENDENTLY OF ONE ANOTHER

NAÏVE BAYES MODEL – TEXT CLASSIFICATION EXAMPLE

- DATASET FOR THE TEXT CLASSIFICATION WITH TRAINING AND TEST DATA IS GIVEN BELOW
- THE GOAL IS TO CLASSIFY THE TEST DATA INTO THE RIGHT CLASS AS H OR –H (READ AS NOT H)

	Document ID	Keywords in the document	Class h
Training Set	1	Love Happy Joy Joy Happy	Yes
	2	Happy Love Kick Joy Happy	Yes
	3	Love Move Joy Good	Yes
	4	Love Happy Joy Love Pain	Yes
	5	Joy Love Pain Kick Pain	No
	6	Pain Pain Love kick	No
Testing Set	7	Love Pain Joy Love Kick	?

THE PROBABILITY OF THE DOCUMENT ‘D’ BEING IN CLASS ‘C’ IS COMPUTED AS FOLLOWS,

$$p(c|d) \propto p(c) \prod_{1 \le k \le n_d} p(t_k|c)$$

Where, $p(t_k|c)$ is the conditional probability of term t_k occurring in a document of class c.

- THE PRIOR PROBABILITIES OF A DOCUMENT BEING CLASSIFIED USING THE SIX DOCUMENTS ARE ,

  P(H) = 4/6 = 2/3

  P(-H) = 2/6 =1/3

The conditional probability for each term is the relative frequency of the term occurring in each class of the documents 'h class' and 'not h class'.

Testing Example:

Love Pain Joy Love Kick = ?

Class h	Class -h
$P(Love \mid h) = 5/19$	$P(Love \mid -h) = 2/9$
$P(Pain \mid h) = 1/19$	$P(Pain \mid -h) = 4/9$
$P(Joy \mid h) = 5/19$	$P(Joy \mid -h) = 1/9$
$P(Kick \mid h) = 1/19$	$P(Kick \mid -h) = 2/9$

$$P(h|d_7) = P(h) * (P(Love|h) * (P(Love|h) * P(Pain|h) * P(Joy|h) * P(Kick|h)$$
$$= (2/3) * (5/19) * (5/19) * (1/19) * (5/19) * (1/19) = \mathbf{0.0000067}$$

$$p(-h|d7) = p(-h) * P(Love|-h) * P(Love|-h) * P(Pain|-h) * P(Joy|-h) * P(Kick|-h)$$
$$= (1/3) * (2/9) * (2/9) * (4/9) * (1/9) * (2/9) = \mathbf{0.00018}$$

HERE 0.00018 IS GREATER THAN 0.0000067

SO,CLASS LABEL FOR TESTING EXAMPLE IS : NO

B . CRM - CUSTOMER RELATIONSHIP MANAGEMENT

- CRM IS A VERY IMPORTANT PART IN THE ECOMMERCE INDUSTRY BECAUSE IT IS TROUGH THE CRM PLATFORM ONLY THAT ONE CAN STUDY THE CUSTOMER'S BUYING TRENDS, ETC IN DETAIL TO FORM BEST AND PROFITING PREDICTIONS FOR BETTER ACCURACY AND BETTER RESULTS

C . PRODUCT CONTENT MANAGEMENT (PCM)

PRODUCT CONTENT MANAGEMENT (PCM) IS THE PROCESS OF MAINTAINING TYPES OF CONTENT AND SOURCES OF CONTENT (SUCH AS SPREADSHEETS, DOCUMENTS, AND OTHER FILES) TO ENSURE CONSUMERS HAVE ACCESS TO ACCURATE PRODUCT CONTENT THAT'S CONSISTENT ACROSS ALL SALES CHANNELS.

TYPES OF ARTIFICIAL INTELLIGENCE

1 . WEAK AI

- IN THE CASE OF WEAK ARTIFICIAL INTELLIGENCE, ROBOTS MIMIC INTELLIGENT HUMAN BEHAVIOUR. WEAKLY INTELLIGENT MACHINES ARE CAPABLE OF THINKING, MOVING, AND COMMUNICATING, BUT THEY ARE PROGRAMMED TO DO SO. THE CHESS PLAYING COMPUTER LACKS THE CAPACITY TO THINK LIKE A PERSON DOES, YET IT CAN PLAY THE GAME. IN ORDER TO COMPETE WITH HUMAN PLAYERS, THE MACHINE IS DESIGNED TO PLAY CHESS AND EXECUTE DEFT MOVES

2 . STRONG AI

- STRONG ARTIFICIAL INTELLIGENCE IN STRONG AI, MACHINES ACTUAL ABILITY IS LIKE HUMANS. IT IS BASED ON THE CONCEPT THAT MACHINES CAN BE PROGRAMMED LIKE THE HUMAN MIND. THEY CAN THINK, MAKE DECISIONS, AND HAVE PERCEPTIONS AND BELIEFS.

CONCLUSION

THE PURPOSE OF THE ESSAY WAS TO DISCUSS THE FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE AND E-COMMERCE AS WELL AS THEIR ADVANTAGES. THE REPORT ALSO DISCUSSES THE APPRAISAL OF ARTIFICIAL INTELLIGENCE'S SIGNIFICANCE AND POTENTIAL APPLICATIONS IN THE WORLD OF E-COMMERCE USING THE RESEARCH THAT ARE NOW ACCESSIBLE. E-COMMERCE IS IMPORTANT IN TODAY'S WORLD OF BUSINESS AND TECHNOLOGY. PEOPLE USE THE INTERNET OFTEN TODAY; THEY ARE OPEN TO EXPERIMENTING WITH NEW BRANDS AND GOODS BUT ARE ALSO CRITICAL AND DEMANDING. E-COMMERCE LOOKS TO BE A GOOD FIT IN THIS SITUATION TO SATISFY THEIR NEEDS. SEVERAL BUSINESS SCIENTISTS AND SPECIALISTS ARE NOW INTERESTED IN THE USE OF ARTIFICIAL INTELLIGENCE IN ONLINE COMMERCE. PAST STUDIES HAVE EMPHASISED THE REQUIREMENT FOR MORE STUDIES THAT WOULD ADVANCE UNDERSTANDING AND TACTICS IN THE USE OF ARTIFICIAL INTELLIGENCE IN E-COMMERCE IT IS REASONABLE TO ANTICIPATE THAT ARTIFICIAL INTELLIGENCE WILL BE EMPLOYED MORE AND MORE FREQUENTLY IN THE CONTEXT OF INTERNET COMMERCE AND WILL EVENTUALLY FORM A CRUCIAL COMPONENT OF ALL BUSINESSES OF THIS NATURE.

REFERENCE

- HTTP://WWW.IJCRT.ORG/
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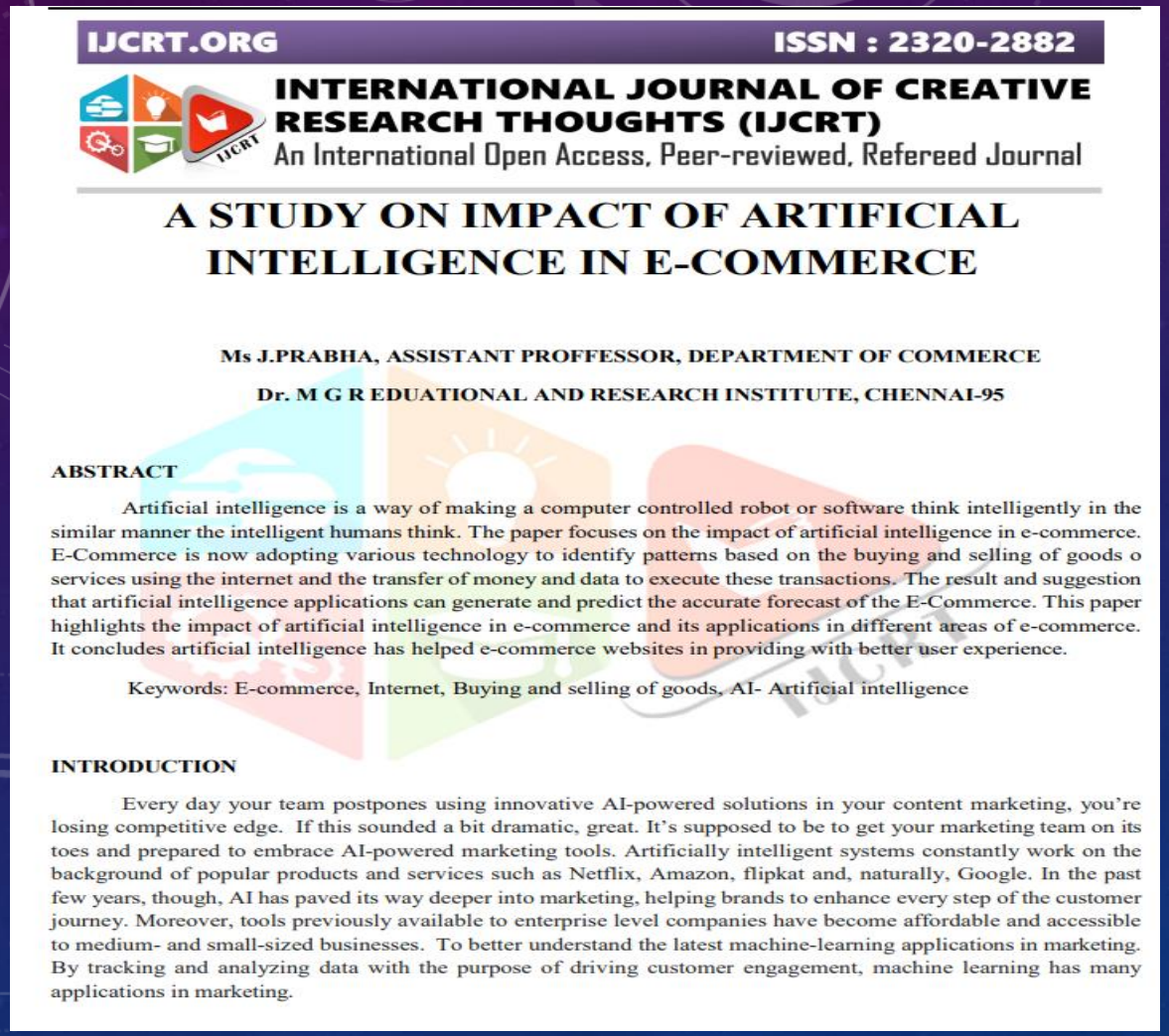

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A STUDY ON IMPACT OF ARTIFICIAL INTELLIGENCE IN E-COMMERCE

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ABSTRACT

Artificial intelligence is a way of making a computer controlled robot or software think intelligently in the similar manner the intelligent humans think. The paper focuses on the impact of artificial intelligence in e-commerce. E-Commerce is now adopting various technology to identify patterns based on the buying and selling of goods o services using the internet and the transfer of money and data to execute these transactions. The result and suggestion that artificial intelligence applications can generate and predict the accurate forecast of the E-Commerce. This paper highlights the impact of artificial intelligence in e-commerce and its applications in different areas of e-commerce. It concludes artificial intelligence has helped e-commerce websites in providing with better user experience.

Keywords: E-commerce, Internet, Buying and selling of goods, AI- Artificial intelligence

INTRODUCTION

Every day your team postpones using innovative AI-powered solutions in your content marketing, you're losing competitive edge. If this sounded a bit dramatic, great. It's supposed to be to get your marketing team on its toes and prepared to embrace AI-powered marketing tools. Artificially intelligent systems constantly work on the background of popular products and services such as Netflix, Amazon, flipkat and, naturally, Google. In the past few years, though, AI has paved its way deeper into marketing, helping brands to enhance every step of the customer journey. Moreover, tools previously available to enterprise level companies have become affordable and accessible to medium- and small-sized businesses. To better understand the latest machine-learning applications in marketing. By tracking and analyzing data with the purpose of driving customer engagement, machine learning has many applications in marketing.

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Thank You