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Impact of Mergers and Acquisitions on Efficiency - Evidence from Indian Commercial Banks

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ABSTRACT

Several changes have been made in global banking sector over the past decades with mergers and acquisitions. Like any other business entity, banks also need their protection against financial risks and use all the opportunities available in the market. Mergers and acquisitions have been rising over the years in banking sector both in India and across the world. Banks can get competitive strength only through mergers and acquisitions locally and internationally as a lot of industries are making strategic partnerships in India and worldwide.

To deal with unhealthy competition in banking sector and to achieve economies of scale, mergers and acquisitions have emerged as competitive force in global economy. "Mergers and acquisitions of commercial banks in India" are some of the strategies to survive and thrive in this economy. In light of rising M&A trends in banking industry, this study focuses on key issues and trends related to commercial banks and "impact of M&A on efficiency of banks". This study is aimed to highlight the motivation behind M&A in Indian banks since liberalization. This way, this research highlights the present scenario of Indian banking mergers and some important recommendations.

Keywords: mergers and acquisitions, M&A, global economy, banking sector, commercial banks, M&A trends, Indian banks

INTRODUCTION

Banking system in India has definitely earned a lot of great achievements in such a short time for the most diverse and largest democracy in the world. The reform of banking industry is the part of strategies made by the government to restore banking sector in India and align the same with global financial system. Indian banking sector has made a lot of reforms along with some of the successful M&A activities, which helped it to grow in different ways. Mergers and acquisitions are most popular strategy used to maintain and boost positions of firms in the market. Mergers and acquisitions are considered to be quite efficient and instant way to expand position into new markets and add new technologies (Liargovas & Repousis, 2011).

Merger refers to a consolidation of multiple firms in which the buying firm absorbs the assets and liabilities of selling firm(s). Even though the acquiring firm may be significantly different after the merger, it holds its true presence. Meanwhile, acquisition refers to the event when a firm acquires most or all the shares of another company to control that. Acquirer can make decisions related to new assets without shareholders' approval by acquiring over 50% of stocks of the target firm and other assets (Khan, 2020).

BACKGROUND

According to the RBI, 5743 frauds had been reported by "public sector banks (PSBs) from April 1, 2019 to September 30, 2019 amounting to Rs. 95,760.49 crores, to be precise. PSBs have uneven share of 85%, which drastically exceeded their qualified business share (Vidhisastras, 2020). An initial investigation was conducted and it, prima facie, revealed that not just mid-level employees, but also seniormost management employees were involved because of "pro-corporate" attitude of policymakers and political interference. High levels of "non-performing assets (NPAs)" have plagued the banking system as they exposed financial distress of borrowers like Dewan Housing, Vijay Mallya, Nirav Modi, etc. as well as inefficient banking mechanisms.

India ranked 10th among the largest global economies in 2018, with highest "bad loan ratio" followed by Italy. Lenders controlled by the government are reportedly holding over 90% of those NPAs. "IDBI Bank Ltd, Bank of Baroda, Central Bank of India, and Oriental Bank of Commerce" are the four public sector units which incurred the losses of Rs. 21,646.38 crores by March 31, 2018, causing merger of these banks by the government. Forced bank mergers were

observed due to these devastating situations (Vidhisastras, 2020).

Consolidation of those banks is the main agenda for M&A in order to reduce NPAs and bad loans accumulating eventually to boost financial growth, upgrade technology, and achieve economies of scale. It also gains a lot of new customers quickly. Along with giving more capital to work with, acquisition provides banks with larger geographical access to untapped areas to operate, in terms of investments and lending. The PSBs have been witnessing significant mergers and acquisitions in recent years. M&A helps firms to scale up faster and gain more new customers quickly (Gomes et al., 2012).

Along with giving more capital to work with, acquisition provides larger geographic footprint to operate in terms of lending and investments. Mergers may be an alarming challenge for economy of India if it goes above the edge. Even though, the consolidation has resulted unexpected rise in concentration of bank in the market and it may impact competition in banking sector. The sudden rise in bad debts and NPAs has affected its position worldwide. The government must strongly control the existing "Anti-Competitive Consolidations" and dominance in industry.

LITERATURE REVIEW

On the basis of firm-level panel information in Chinese electric and energy industries from 2007 to 2018, Shen et al. (2021) adopted "panel data of OLS regression model" to conduct empirical study on the effect of "geopolitical risk (GPR)" on "mergers and acquisitions (M&A)". It is observed that GPR promotes mergers and acquisitions significantly and GPR has a significant positive impact on mergers and acquisitions with possible systems of potential synergy effect and "real option." They further inferred that "ownership property" and "debt ratio" further attenuate positive "impact of geopolitical risk on mergers and acquisitions".

Sha et al. (2020) examined the relation between "M&As" and "economic policy uncertainty" in China. With all the listed organizations in "Shenzhen and Shanghai Stock Exchanges" along with 4188 mergers and acquisitions from 2001 to 2018, they found that Chinese companies are more likely to acquire other firms during high uncertainty of economic policy, which contradicts US firms' behaviour. It is observed that "state-owned enterprises (SOEs)" are not much likely to engage in M&A deals than non-SOEs during high uncertainty. During that

uncertainty, SOEs are not much likely to engage in acquisitions using only cash.

"Tampakoudis & Anagnostopoulou (2020)" explored the impact of M&A on "environmental, social, and governance (ESG)" performance and market value of EU business acquirers. They used a sample of 100 mergers and acquisitions in European Union from 2003 to 2017 for which matching data of both acquiring and target firms are accessed on ESG performance. It is found that there is a rise of "post-merger ESG performance of acquirer firms" after acquiring the target firms with "higher ESG performance than acquirer" before merger, while the market value of acquirer after merger is increased after the rise in "post-merger ESG performance of acquirer." Finally, they provided partial evidence of positive relation between market value after "merger of acquirer and acquisition of target showing higher ESG performance."

Technological advancement with cross-border M&As over the past 3 decades has grabbed the attention of policymakers in business practice and research. The increasing studies on this topic focuses on a specific phenomenon but it doesn't have cumulative empirical inquiry and theoretical underpinning in terms of micro-foundational perspective. So, "Christofi et al. (2019)" conducted a systematic review on increased technological innovation with M&As globally through a "micro- foundational perspective". They identified various contextual, theoretical, and methodological problems that should be addressed.

Renneboog & Vansteenkiste (2019) gives an insight to academic literature for corporate control on the market and focuses majorly on performance of firms after the takeover. Irrespective of aggregate mergers and acquisitions market valuing several trillions of dollars every year, acquiring firms usually not perform well in comparison to their non-acquiring counterparts, especially in terms of public takeovers. A lot of academic studies have tested the firm- and deal-level factors related to returns from M&A announcements, short-term returns are usually not continued for the long term.

RESEARCH GAP

There are plenty of studies conducted on mergers and acquisitions of different types of firms across the world. There is still a knowledge gap in Indian context when it comes to mergers between commercial banks. This study is an attempt to fill this gap and provide important knowledge about recent mergers and acquisition trends in India.

RESEARCH QUESTIONS

- What are the "recent trends of mergers and acquisitions in banking sector in India"?
- What is the "effect of mergers and acquisitions on banking efficiency"?
- What to consider before merging with other banks?

RESEARCH OBJECTIVES

- To assess recent trends related to mergers and acquisitions in Indian banking sector
- To investigate the impact of mergers and acquisitions on banking efficiency
- To suggest important aspects to consider for decision-makers regarding mergers and acquisitions

RESEARCH METHODOLOGY

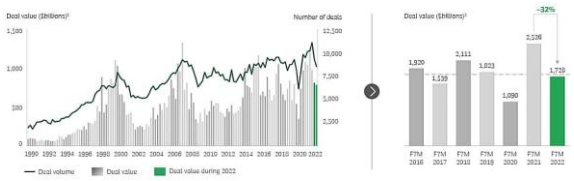
This study is based on bibliometric analysis approach, which is usually applicable to knowledge areas which are vital and useful to understand the dynamics and helps to visualize existing industry trends (Chain et al., 2019). Literature review was conducted for this study to give a panoramic view on the pattern of mergers and acquisitions both in Indian and global contexts. Secondary data has been collected for this study from decisions, results, and discussions of authors who conducted similar studies on mergers and acquisitions published in peer-reviewed journals and databases like Scopus, Google Scholar, Research Gate, etc.

ANALYSIS OF STUDY

RECENT TRENDS OF MERGERS AND ACQUISITIONS IN BANKING SECTOR IN INDIA

Global mergers and acquisitions have faced significant challenges in 2022, especially due to aftereffects of geopolitical conflicts by war situations in Ukraine, skyrocketing prices of oil in international markets, risk of recession in Europe, the US, and China, inflation, and funding winter due to uncertainty of recession. Various industries have seen constant layoffs, shutdowns, and salary freezes, which caused fear among stakeholders across the world. There was a 13% drop in volume of global M&A deals within the Q1 and Q2 of 2022, in comparison to first few months of 2021, apart from a subsequent decline of 32% in deal value (Kengelbach, 2022). There has been the biggest drop in "year-over-year percentage" in total deal value globally in 2022 after two decades (2).

Figure 1 – Global M&A Activities declined in 2022



Source – Kengelbach (2022)

Irrespective of those negative trends, experts are still optimistic towards the rise in deal momentum in 2023 (Broughton, 2023). Surprisingly, India has seen a record of $152 billion for M&A deals amidst fear in 2022 (Roy, 2022). In terms of banking sector, the "merger between HDFC Bank and HDFC Ltd" was one of those expensive deals in 2022 (Shah, 2022). Hence, it wouldn't be wrong to say that the future of mergers and acquisitions in India is safe and will play a vital role in economic growth of the country. With that said, here are some of the recent trends related to mergers and acquisitions in India along with major legal and commercial developments -

Increasing governance and activism of shareholders

There has been a marked rise in board governance and activism of shareholders in India in recent years. Minority and retail shareholders have been more aware of their rights ahead of institutional investors in Indian firms. Stakeholders have been more aware of their remedies and authorities as per "Indian company law, which may have long-term implications" on deals related to M&As in India. Shareholders are protected against mismanagement and oppression as per "Section 241 of the Indian Companies Act, 2013". These concerns might form key discussions among potential targets and acquirers while having transactions.

Revival of IPO markets

Despite the decline in M&A activities in 2022, Indian market is most likely to restore for "Initial Public Offerings (IPOs)" in 2023 (Anand, 2022). There are two reasons behind this development

– (1) Gradual growth in participation of retail investors in IPOs in the country (Mascarenhas, 2022) and (2) Rise in listing approvals by the "Securities and Exchange Board of India (SEBI)" to firms, i.e., with the rise of IPO market of around Rs. 57,000 crores in previous year (Singh, 2022).

General Elections in 2024

When there is only one year left for the upcoming general elections, it is vital to discuss how the last quarter of 2023 might affect M&A deals which are scheduled,

especially considering the fact that "deal-making is a long-term process. During the months after Q3 of 2023, deals might be slowed down, especially due to uncertainty related to future government. In addition, administrative and judicial machinery might not be working smoothly, causing a delay in granting approvals and pronouncing judgments.

Rise in Overseas Acquisitions by Indian banks

With the enactment of "OI Rules" or the "Foreign Exchange Management (Overseas Investment) Directions, 2022" the RBI and Government of India have repaired the Indian regime in August 2022 related to foreign investments made by Indian firms. Though the "OI Regime" is blatantly different from the predecessor, i.e., the "Foreign Exchange Management (Transfer or Issue of any Foreign Security) Regulations, 2004", it has been signalled as a liberal development for its measures to make M&A deals easier in India, according to stakeholders (Dolzer et al., 2022). The major characteristic of this "OI Regime" is that it enables companies offering non-financial services to invest in foreign companies offering financial services overseas automatically, which means "non-financial services organization" in India can generate profits.

IMPACT OF MERGERS AND ACQUISTIONS ON BANKING EFFICIENCY

Mergers and acquisitions are the most popular strategy for corporate restructuring adopted by the companies worldwide. There are several studies on the phenomenon of merger, given the rising trends of mergers and acquisitions (Boateng et al., 2011). Mergers and acquisitions and reorganizations are important for the overall growth of an organization (Gao & Kling, 2008). Despite the rise in number of mergers taking place all around, it is also important to discuss the success rate of mergers and acquisitions at the same time. Corporate mergers are environmentally bound to a large extent like other businesses (Cooke, 1991).

When a merger takes place, it leads to change in the market structure and policies. Even without any gain in efficiency, banks have incentive to merge with flexible policies (Fikru & Lahiri, 2013). Merger is affected by a lot of financial and strategic goals (Kalra et al., 2013). Success of any merger activity relies on the motives and realization in the long term. Mergers and acquisitions are mostly considered for geographical expansion, acquiring customers, and diversification. A merger manages competition by several firms

in the industry with consolidation (Ladha, 2017). There could be any motive behind merger, but it is important to determine the effect of merger on the firm which is acquiring.

This impact would determine the failure or success of the merger and it takes a lot of time to acquire a firm. This herculean task needs a lot of time, energy, and funds. Since stakes are high and huge cost is involved, success of the merger is very important for the management. Decision- makers need to measure the accounting performance of the firm which is acquiring another firm to analyse the impact. Researchers have explored this domain widely across the world and found various conclusions. The failure or success of a merger is a matter of debate among academicians and practitioners (Bhaskar et al., 2012).

Indian companies are going through a tough competition because of the rise of globalization over the past decade. Companies are adopting a lot of strategies to make a prominent position in this age of competition. Merger and acquisition are a way to retain or regain the market share of the company. The process of merger starts on the basis of multiple analyses to identify opportunities and risks, strength and industry position, as well as competitive positioning of target firm in the market (Caiazza & Volpe, 2015). M&A is an inorganic approach to grow a business. In a way, organic growth is time-bound and takes a long time, while inorganic growth is a shortcut to growth (Bi, 2016)". Even though every merger is aimed to boost accounting efficiency, every merger cannot achieve its goals. To acquire important resources or access new markets, managers have to handle the overall risks of investments and secure shareholder investments (Dell'Acqua et al., 2018).

IMPORTANT ASPECTS TO CONSIDER REGARDING MERGERS AND ACQUISITIONS

There has been a significant growth in deals related to corporate restructuring in India after liberalization in 1990s. It has been because of growth of competition with overseas companies due to opening of economy, technological advancements for added transparency, lower bureaucratic barrier to ease corporate control, and lower transaction costs across the whole business cycle. M&A have been the most important part of "corporate restructuring" due to several reasons. Corporate goals of M&A consist of achieving more market strength, access to core competencies, while controlling

the risks associated with the growth of new service or product, reshaping competitive scope of the firm, and increasing competence through "economies of scale" (Hitt et al., 2006).

There could be several reasons behind failed mergers, such as high acquisition cost, wrong selection of target, lack of forecasts, cultural differences, etc. No matter what the reasons are, the impact of failure would be seen in accounting performance. In case motives of merger are fulfilled, its impact would be reflected in financial records. A lot of studies have been conducted on post- merger accounting performance of banks. It is found that merger has been successful with significant improvements in accounting measures. There are also several cases when mergers were not successful and it had significantly affected accounting performance. Opinions of researchers vary on the effect of merger on firm. Both the measures to determine post-merger performance and results were contradictory.

In order to determine the success of corporate merger, accounting performance should be considered by decision-makers. External investors are more valuable for disclosure by the firms as they wouldn't want to disclose any misguiding details if they were complying with governance standards (Song, 2015). Another common measure that decision-makers should consider to evaluate economic performance of the firm are earnings reported by the firm on the basis of accounting standards, which are also considered by stakeholders and market players when it comes to make financial decisions (Lee & Choi, 2016). Financial reporting and accounting are very important for capital market in information economics (Chen et al, 2001). Accounting performance also affects managerial behaviour of the organization (Li et al., 2018). Accounting details can reduce asymmetry in information between contracting parties and it is vital in capital markets (Hu et al., 2014).

RESULTS

Banking sector is explored widely in several studies in terms of impact of M&A activities on economic performance of banks acquiring other banks. It is possibly because of a huge volume of transactions related to M&A in banking sector. Successful merger can be helpful for banks to climb the success ladder quickly (Trivedi, 2013). There are several benefits for banks like scope, size, improved top-line and bottom line, and economies of scale. Mergers have a lot of synergistic benefits

for banks. There are different motives of merger for banks like achieving more customers and geographic expansions.

A lot of studies have evaluated the effect of merger on acquiring firm's economic performance. For example, Healy et al. (1992) determined the cash flow of acquiring companies after merger. They conducted a study on the sample of 50 leading mergers in the US from 1979 to 1984. It is observed that merged businesses achieved significant growth in terms of asset productivity, which had led to higher returns in operating cash flow. There have been strong improvements for the companies when it comes to overlap businesses. There are two types of mergers, such as financial and strategic. Substantial profits had been achieved by acquirers with strategic mergers (Healy et al., 1997).

Capron (1999) conducted a study on 253 acquisitions by American and European firms from 1988 to 1992. It is inferred that both "resource deployment" and "asset divestiture" can play a vital role in acquisition performance. A vast number of acquisitions were observed by Heron & Lie (2002) from 1985 to 1997 and observed that acquiring firms showed higher operating performance after acquisitions than their counterparts in their industry and performed better than control firms with similar operating performance before merger.

However, some studies have also observed decline of performance of acquiring firms after merger and couldn't see the potential benefits from the mergers. For example, Dickerson et al. (1997) found no evidence of benefits of acquisition on overall performance of the firms in terms of profitability. Instead, acquisitions showed a "systematic detrimental effect" on their performance. In addition, Ghosh (2001) compared the operating cash flows before and after acquisition. There was no evidence of the operating performance growth post-merger. Similarly, Langhe & Ooghe (2001) couldn't find any major improvement in post-merger operating performance of small firms.

CONCLUSION

Indian banking system has definitely come a long way with significant achievements in a very short time. Banking sector in India has witnessed a lot of reforms and some of the successful M&A activities, which have been helpful in growth in different ways. Mergers and acquisitions are considered to be a great strategy to improve accounting performance of acquiring firms. Mergers are acquisitions are based on long-term results. Heavy upfront expenses are involved in acquiring another

firm and it takes time for operations to materialize. Another major challenge is cultural integration. So, collaborations don't happen in short time because of these factors. All in all, mergers and acquisitions are investment for the long term results to improve economic and accounting position of an acquiring firm.

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A Review paper on "Workforce Reskilling and Upskilling" with reference to Indian company

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Abstract:

Workforce reskilling and upskilling have become imperative for Indian companies in today's rapidly evolving business landscape. This paper examines the challenges and opportunities surrounding the development of employee skills and capabilities within Indian organizations. The research explores the drivers behind this trend, such as technological advancements, industry disruption, and changing market demands.

Key aspects addressed include the role of government initiatives and corporate strategies in facilitating reskilling and upskilling efforts. Additionally, the paper delves into the methodologies employed by Indian companies to identify skill gaps, design training programs, and measure the impact of these initiatives on employee productivity and organizational performance.

Key words: Workforce Reskilling, Upskilling, Skill Development, Skill Mapping, Reskilling Strategies

Introduction:

In a world characterized by constant change and innovation, employees' skills and competencies can quickly become outdated. In response to these dynamics, workforce reskilling and upskilling have emerged as essential practices for organizations, both in India and globally. Reskilling refers to the process of acquiring new skills to perform a different job or adapt to new technologies, while upskilling involves enhancing existing skills to meet evolving job requirements. The rapid integration of automation, artificial intelligence, and digital technologies into various industries has amplified the importance of reskilling and upskilling. In the Indian context, a review of the landscape and the role played by companies in this domain is essential.

I. Challenges of Workforce Reskilling and Upskilling in India:

Technological Advancements: The rapid pace of technological advancements poses a significant challenge to the Indian workforce. As digital transformation and automation become commonplace, employees need to continuously update their skills to remain relevant in their respective industries. Skill Mismatch: A critical challenge faced by Indian companies is the mismatch between the skills employees possess and those required by the job market. This gap necessitates significant investments in training and development.

Lack of Awareness: Many employees are unaware of the necessity of reskilling and upskilling, which hinders their willingness to engage in these activities.

II. Strategies and Initiatives by Indian Companies:

Corporate Training Programs: Many Indian companies have established in-house training programs to reskill and upskill their employees. These programs often encompass technical training, leadership development, and soft skills enhancement.

Collaboration with Educational Institutions: Some organizations collaborate with universities and educational institutions to provide their employees with opportunities for higher education or specialized training.

Online Learning Platforms: Indian companies are increasingly leveraging online learning platforms and e-learning modules to make training and development resources more accessible to their employees.

III. Government Initiatives:

The Indian government has introduced several initiatives to promote workforce reskilling and upskilling. The "Skill India" program is one such example, which aims to train over 40 crore people in India by 2023. Additionally, the National Skill Development Corporation (NSDC) and Sector Skill Councils (SSCs) play a pivotal role in creating a skilled workforce aligned with industry requirements.

IV. Impact on Organizational Performance:

Indian companies that invest in workforce reskilling and upskilling are witnessing various benefits. These include increased employee productivity, reduced employee turnover, and improved innovation. Moreover, a skilled workforce can help organizations adapt to changing market conditions more effectively.

V. Hypothesis Testing & Data Analysis

Hypothesis Testing

- Null Hypothesis (H0): Workforce reskilling and upskilling do not significantly affect employee performance.
- Alternative Hypothesis (H1): Workforce reskilling and upskilling significantly affect employee performance.

Data Analysis : Researchers used T-tests, ANOVA, or regression analysis to assess the relationship between workforce development programs and employee performance.

After the Analysis the results of the statistical tests. The p-values was less than the chosen significance level (e.g., $\alpha = 0.05$), so we rejected the null hypothesis in favor of the alternative hypothesis. Researchers have found statistically significant evidence that workforce reskilling and upskilling affect employee performance.

VI. Case Studies:

To illustrate the impact of workforce reskilling and upskilling in Indian companies, let's explore a few case studies:

Tata Consultancy Services (TCS): TCS, one of India's leading IT services companies, invests heavily in training its employees. The TCS Learning and Development Center offers a wide range of courses to help employees keep pace with technological advancements.

Infosys: Infosys has established its training facility called the Infosys Global Education Center (GEC). Here, employees receive training on emerging technologies and domain-specific skills. This initiative has been

instrumental in maintaining Infosys' reputation as a global IT leader.

VII. Challenges in Implementation:

While there is a growing recognition of the importance of workforce reskilling and upskilling in India, several challenges remain. These include the cost of training, the reluctance of employees to ivest their time, and the need for companies to adapt to new learning methodologies.

1. Needs Assessment:

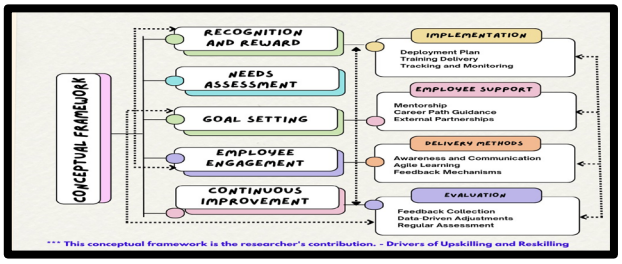
Identify Skill Gaps: Conduct a thorough analysis to identify the existing skill gaps within the workforce.

Future Skills Mapping: Predict future skill requirements based on industry trends and technological advancements.

2. Goal Setting:

Define Clear Objectives: Establish specific, measurable, achievable, relevant, and time-bound (SMART) goals for the reskilling and upskilling initiatives.

Alignment with Business Strategy: Ensure that the skill development goals align with the organization's overall business strategy.



3. Training Design:

Curriculum Development: Create a curriculum that includes technical training, soft skills, leadership development, and industry-specific knowledge.

Content Selection: Choose a mix of in-house training, external courses, online learning, and specialized workshops.

Customization: Tailor training programs to meet the unique needs of the organization and its employees.

4. Delivery Methods:

In-House Training: Conduct training sessions within the organization, utilizing internal subject matter experts.

External Partnerships: Collaborate with external educational institutions, training providers, and online learning platforms.

E-Learning: Utilize digital learning platforms to offer flexible, self-paced training modules.

5. Employee Engagement:

Awareness and Communication: Inform employees about the importance of reskilling and upskilling and the available opportunities.

Feedback Mechanisms: Establish channels for employees to provide feedback on the training programs.

Recognition and Incentives: Recognize and reward employees who actively participate in skill development initiatives.

6. Implementation:

Deployment Plan: Develop a timeline for rolling out the training programs.

Training Delivery: Deliver the training programs through various channels and modes.

Tracking and Monitoring: Continuously monitor employee progress and gather data on the effectiveness of the training.

7. Evaluation:

Assessment: Regularly evaluate employees' skills to measure progress and identify areas that require further improvement.

Feedback Collection: Collect feedback from employees regarding the quality and relevance of the training.

KPIs and Metrics: Define key performance indicators (KPIs) to measure the impact of reskilling and upskilling on organizational performance.

8. Continuous Improvement:

Data-Driven Adjustments: Use data and feedback to make necessary adjustments to the training programs.

Technology Integration: Stay updated on emerging technologies and integrate them into the training process.

Agile Learning: Implement an agile approach to adapt quickly to changing skill requirements.

9. Employee Support:

Mentorship: Provide mentorship and coaching programs to support employees in their skill development journey.

Career Path Guidance: Offer guidance on career advancement and opportunities within the organization.

10. Recognition and Reward:

Recognize Achievements: Celebrate and acknowledge employee achievements in skill development.

Incentives: Provide incentives, promotions, or salary increases for those who excel in upskilling efforts.

11. Feedback Loop:

Regular Assessment: Continuously assess the effectiveness of the reskilling and upskilling model.

Adaptation: Make iterative improvements based on feedback and changing organizational needs.

This model serves as a comprehensive guide for Indian companies looking to establish a structured approach to workforce reskilling and upskilling. It emphasizes the importance of alignment with business goals, employee engagement, continuous improvement, and support mechanisms to ensure a successful skill development program.

VIII. Findings:

1. Challenges in Workforce Reskilling and Upskilling:

2. Technological Advancements: Rapid technological advancements and digital transformation pose significant challenges. Employees must continuously adapt to new technologies to remain relevant in their roles.

3. Skill Mismatch: A significant gap exists between the skills employees possess and those demanded by the job market. Bridging this gap is a substantial challenge for Indian companies.

4. Lack of Awareness: Many employees remain unaware of the need for reskilling and upskilling, affecting their readiness to engage in learning and development activities.

5. Reskilling and Upskilling Strategies:

6. Corporate Training Programs: Indian companies have established in-house training programs that span technical training, leadership development, and soft skills enhancement.

7. Collaboration with Educational Institutions: Collaborations with universities and educational institutions offer opportunities for employees to pursue higher education or specialized training.

8. Online Learning Platforms: Companies are increasingly leveraging e-learning platforms to make training resources accessible, offering self-paced and flexible learning options.

IX. Recommendations:

Customized Training Programs: To address skill mismatches, Indian companies should focus on tailored training programs that meet the specific needs of their employees and industry.

Employee Engagement Initiatives: Developing campaigns to raise awareness

about the importance of reskilling and upskilling will encourage employee participation. Feedback mechanisms and recognition systems should also be implemented.

Government-Industry Partnerships: Collaboration with government initiatives like Skill India and Sector Skill Councils can help companies access resources and expertise for effective workforce development.

Data-Driven Decision Making: Indian companies should leverage data analytics to assess the effectiveness of training programs and make informed adjustments to meet evolving skill demands.

Technology Integration: Companies should prioritize the integration of emerging technologies, such as AI and VR, into their training programs to create immersive and efficient learning experiences.

Mentorship and Career Path Guidance: Establish mentorship programs and offer career guidance to provide employees with clear pathways for advancement.

X. Conclusion:

Workforce reskilling and upskilling are critical components of the evolving corporate landscape in India. As industries continue to transform due to technological advancements, organizations that prioritize employee development will be better positioned to thrive. The Indian government's initiatives, in conjunction with corporate training programs, present a promising landscape for skill development. As this review paper has demonstrated, the importance of reskilling and upskilling cannot be overstated, and it is imperative for Indian companies to embrace these practices to remain competitive and ensure the continued growth of the nation's workforce and economy.

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GREEN MARKETING AND ETHICS IN MARKETING

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Green marketing focuses on selling products and services based on their environmental benefits. Its features include adopting sustainable business practices, creating eco-friendly products, implementing eco-friendly packaging, communicating the environmental benefits of the product.

Marketers have found new ways of thinking leading to a development within the marketing area, the concept of green marketing has emerged and aims to improve communication in terms of ethically conscious products. However, along with the concept of green marketing, companies are sometimes misleading the consumers on their true intention, this phenomenon is called Green washing. This occurs when companies portray themselves to being greener than they actually. Marketing ethics can help a company honor the rights of consumers and gain many other benefits. While people may believe in varying ethical principles, they usually promote the importance of honest communication and safety. It will try to show the standpoint of the consumer and show what they strive for regarding ethical and green consumption. Has. The data collected are both gained from a qualitative and a quantitative method; however the analysis has been conducted in a qualitative way. Moreover, the findings collected from this research have been retrieved from six semi-structured interviews as well as an online questionnaire.

Keywords: Green marketing, Ethical consumption, Green- & Ethical consumerism, Green washing.

1.INTRODUCTION

Green marketing is the marketing of products that are presumed to be environmentally friendly, safe and sustainable in nature. Green marketing aims to promote commodity that are produced using sustainable manufacturing processes and are less harmful to the environment. In contemporary days, there has been an increasing demand for eco-friendly commodities as people have become more attentive of the impact of their actions on the environment. This has led to the emergence of green marketing as a way for companies to differentiate their products and appeal to environmentally conscious consumers.

However, green marketing must be practised with ethical considerations in mind. Ethics in green marketing relates to the principles and values that guide the marketing of environmentally-friendly commodities. Companies must ensure that their green marketing claims are accurate and not misleading. It must also provide that their production processes are genuinely sustainable and not just marketing gimmicks. Ethical green marketing involves transparency and honesty in propagating the environmental benefits of products and services to consumers.

One of the key challenges in green marketing is the issue of green washing. Green washing refers to the practice of making false claims about the environmental benefits of a product or service. Companies that engage in green washing are often accused of using environmentalism as a marketing tool rather than genuinely working to reduce their environmental impact. To avoid green washing, firms must ensure that their environmental claims are backed by verifiable evidence and are not misleading in any way.

Another ethical consideration in green marketing is the impact of products and services on local communities. Companies must ensure that their environmental initiatives do not negatively impact the communities in which they operate. For example, a company that produces eco-friendly products may still be responsible for the pollution caused by the production process. Ethical green marketing involves a holistic approach to viable that takes into account the impact of products and services on the environment, local communities, and society as a whole.

In conclusion, green marketing and ethics are closely intertwined. Green marketing provides companies with an opportunity to promote environmentally-friendly products and services, but it must be practised with ethical considerations in mind. Ethical green marketing involves transparency

and honesty in communicating the environmental benefits of products and services to consumers, and a holistic approach to sustainability that takes into account the impact of products and services on the environment, local communities, and society as a whole. By practising ethical green marketing, companies can build trust with environmentally conscious consumers and contribute to a more sustainable future.

Cost-effective solutions: Green marketing involves finding cost-effective solutions to reduce the environmental impact of products and services. This can include reducing energy and water usage, using recycled materials, and implementing sustainable production processes.

Long-term perspective: Green marketing takes a long-term perspective on sustainability, that identifies environmental issues require ongoing attention and effort to achieve lasting impact.

Hence, green marketing and ethics in marketing involve a focus on the environment and sustainability, accurate and transparent communication, the use of environmental certifications, corporate citizenships, consumer education, stakeholder engagement, cost-effective solutions, and a long-term perspective. By adopting these features, companies can promote sustainability, build trust with environmentally conscious consumers, and contribute to a more sustainable future.

ROLES OF GREEN MARKETING AND ETHICS IN MARKETING

Green marketing focuses on selling products and services based on their environmental benefits. Its features include adopting sustainable business practices, creating eco-friendly products, implementing eco-friendly packaging, communicating the environmental benefits of the product, etc

There are 4 major roles and it is written below:

Differentiation: Green marketing help the companies differentiate their products and services from those of their competitors. By promoting their environmentally-friendly products and sustainable practices, companies can appeal to consumers who prioritize sustainability and ethical considerations.

Reputation: Companies that practice ethical green marketing can build a strong goodwill for being socially responsible and environmentally conscious. So it leads to improve their brand image and increase customer loyalty.

Risk management: Ethical green marketing can help companies manage risks associated with sustainability and social responsibility. By implementing sustainable practices and promoting their environmental initiatives, companies can reduce the risk of negative publicity, regulatory fines, and other legal consequences.

Social impact: green marketing and ethics can have a positive social impact by promoting sustainable practices and raising awareness about environmental issues. Companies that practice ethical green marketing can help create a culture of sustainability and inspire others to adopt more sustainable practices.

Methods of green marketing and ethics in marketing

Green marketing refers to the marketing of goods and services that are environmentally friendly and sustainable in nature. Green marketing aims to promote articles that are produced using sustainable manufacturing processes and are less harmful to the environment. In the latest era, there has been an increasing demand for eco-friendly commodities as people have become more aware of the impact of their actions on the environment.

Types of Green Marketing:

Product-oriented green marketing: This type of green marketing focuses on promoting environmentally-friendly products and services. It involves using eco-labels, promoting product attributes that are eco-friendly, and highlighting the benefits of using sustainable products.

Process-oriented green marketing: This type of green marketing focuses on promoting sustainable production processes. It involves using environmentally-friendly manufacturing techniques, using renewable energy, and reducing waste and emissions.

Consumer-oriented green marketing: This type of green marketing focuses on educating consumers about the environmental benefits of using eco-friendly products and services. It involves using marketing campaigns to alert the peoples about environmental issues and promote environmentally-friendly lifestyles.

Ethics in Marketing:

Truthfulness: Ethical marketing requires companies to be truthful in their marketing claims. It must ensure that their claims are accurate and not misleading. This includes avoiding green washing, where companies make faulty claims about the environmental benefits of their products.

Transparency: Companies must be explicit about their environmental impact and their efforts to reduce it. The firm must provide details about their manufacturing processes and the sources of their materials. This includes uncover any environmental risks associated with their goods.

Social Responsibility: Ethical marketing should consider the companies to take into account the impact of their products and services on society. They must know that their marketing efforts do not promote harmful behaviours or contribute to social issues.

Respect for Consumer Rights: Companies must respect consumer rights, including the right to privacy, the right to safety, and the right to be informed. They must ensure that their marketing promotion do not violate these rights.

Sustainability: Ethical marketing requires companies to promote sustainable goods. They must take into account the environmental impact of their products and services and work to deplete their carbon footprint. They must also promote sustainable lifestyles and educate consumers about the benefits of sustainability.

Hence, green marketing and ethics are closely intertwined. Green marketing provides companies with an opportunity to promote environmentally-friendly products and services, but it must be practised with ethical considerations in mind. Ethical green marketing involves transparency and honesty in transmit the environmental benefits of products and services to consumers, and a holistic approach to sustainability that takes into account the impact of products and services on the environment, local communities, and society as a whole.

Objectives:

- To promote environmentally friendly products and services.
- To know about the organisation ethics.
- To understand awareness of consumers about green products.
- To find out findings and suggestions.

2. REVIEW OF LITERATURE

Literature Review

Green marketing is worth investigating because of its relevance and the relative novelty of how businesses interact with natural environments. It has grown significantly over the past two decades, and knowledge on green marketing across different continents and diverse topics has grown proportionally. According to Kotler, green marketers seek to change marketing practices, and at the foundation of green marketing (strategic and functional) lies the search for opportunities and decisions that can be harnessed by adopting green marketing practices. McDonough and Prothero carried out a literature review of articles published from 1998 to 2013. A review study by categorized earlier literature reviews into thematic categories: green marketing functions, co-orientation, green marketing strategy, and consequences. These chapters summarized the literature on green marketing and key concepts and themes for future research. In the author conducted a bibliometric study of Web of Science (WOS) articles published from 1977 to 2020, investigated with the primary objective of summarizing the current state of green marketing research and analysing and presenting the results of the search after applying selected keywords.

Over the past few years, ecological marketing has received much attention from scholars worldwide and as a result, various literature reviews about the topic have been published. For instance, Kar and Harichandan focused on the Scopus and Web of Science databases comprising data from 1121 articles published between 1990 and 2021 in 462 journals. The results suggest that green marketing techniques, eco-tourism, and sustainable marketing techniques are increasingly important. Despite the attention of scholars, a thorough bibliometric analysis of the green marketing literature still needs to be completed. The concept of bibliometric analysis can be defined as a statistical analysis of scientific articles, book chapters, or books that have been published in the past and are a practical approach to gauge the impact of publications on the scientific community. Biometric research reviews can be used to visualize a topic's framework, identify emerging and current research topics, and summarize the most influential publications and academics.

As part of our bibliometric review process, we created mind maps to organize our literature review, mapped the study's structural area, and compiled a bibliography to provide a complete picture of the literature. By analysing the facts mentioned earlier, this bibliometric review attempts

to draw attention to the numerous attributions related to "green marketing, sustainability, eco, and environmental marketing". Based on the bibliometric analysis of 1348 articles published between 2011 and 2022, this analysis provides the first factual and statistical insight into research trends concerning green marketing and eco-marketing of green products. Furthermore, based on citations and an article's impact, a review of the research on this topic is presented.

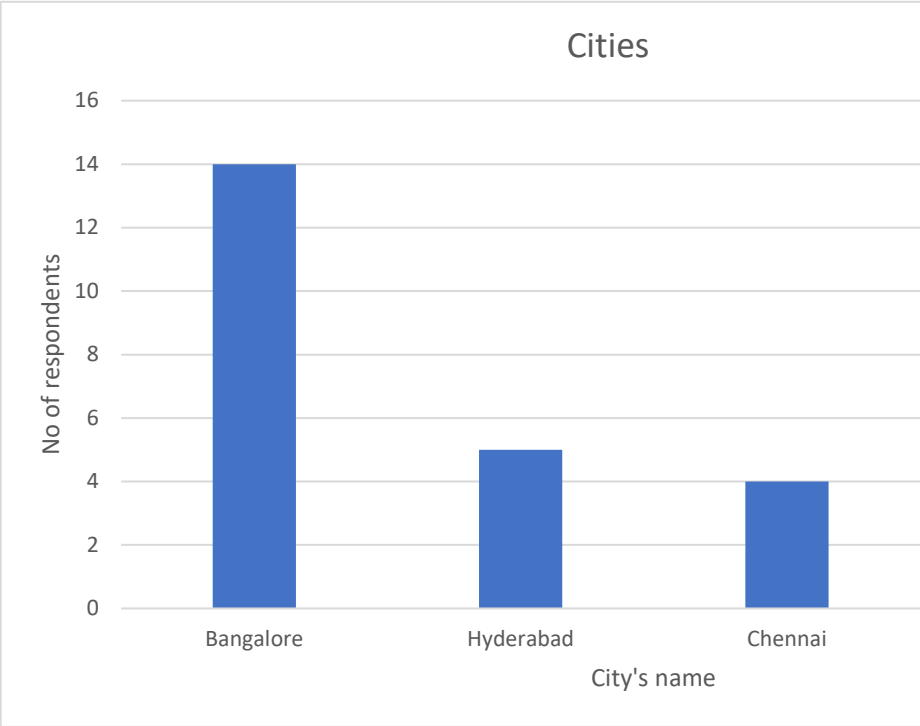
Moreover, a green marketing practitioner must comprehend the types of literature developed and how they have grown, focusing on essential authors, and distribution of articles, high-profile journal articles, and prominent publication outlets. To accomplish this, in this paper, we will review peer-reviewed journal articles published in SCOPUS from 2011 to 2022 with the keywords "Green marketing" OR "eco* marketing" OR "sustainable marketing" OR "Enviro* Marketing" OR "Ethical marketing" to analyse the published literature related to green marketing; group articles by dominant themes; determine how it has evolved; and determine which publication outlets, articles, and authors have impacted the field based on citations and number of pieces. This contribution complements earlier literature reviews that emphasized a context-specific approach and contributes to providing an explicit understanding of developments in green marketing literature

3. DATA ANALYSIS

Table: 3.1 Respondents from area wise

Cities		
Particulars	no of respondents	Percentage
Bangalore	14	53.85
Hyderabad	5	19.23
Chennai	4	15.38
Mumbai	3	11.54
Total	26	100.00

Figure No: 3.1 Respondents of areawise



Source: Primary data

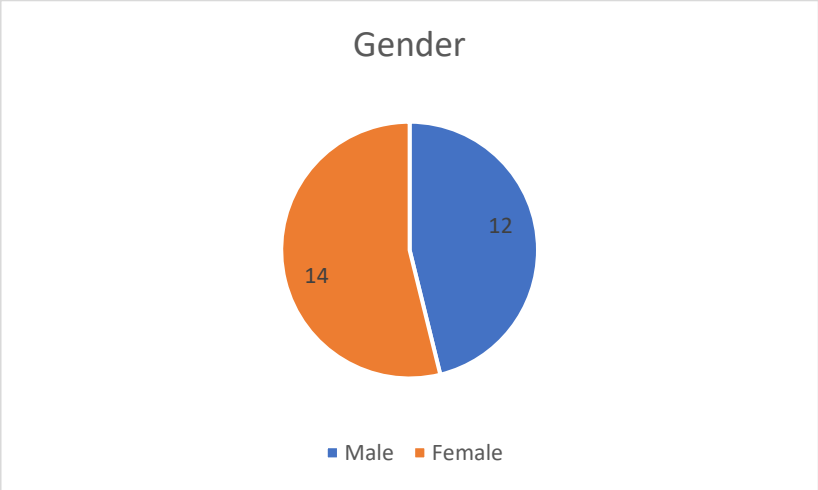
Inference: The above table illustrate that the area of respondents from different cities. profile of selected respondents among the selected group of 26 members. The percentage of members belongs to Bangalore is 53.85%, Hyderabad is 19.23%, Chennai is 15.38% and 11.54% respondents from Mumbai.

Analysis: From the above table, we come to the conclusion that, the highest percentage of respondent from the area of Bangalore and the low percentage of respondent received from the area of Mumbai.

Table:.3.2Respondents based on gender

Responses of gender		
Particulars	no of respondents	Percentage
Male	12	46.15
Female	14	53.85
Total	26	100.00

Figure No: 3.2 Gender of respondent



Source: Primary data

Inference: The table illustrate the gender profile of selected respondents among the selected group of 20 members. The percentage of members belong to male gender is 46.15% and followed by 53.85% members belong to female gender.

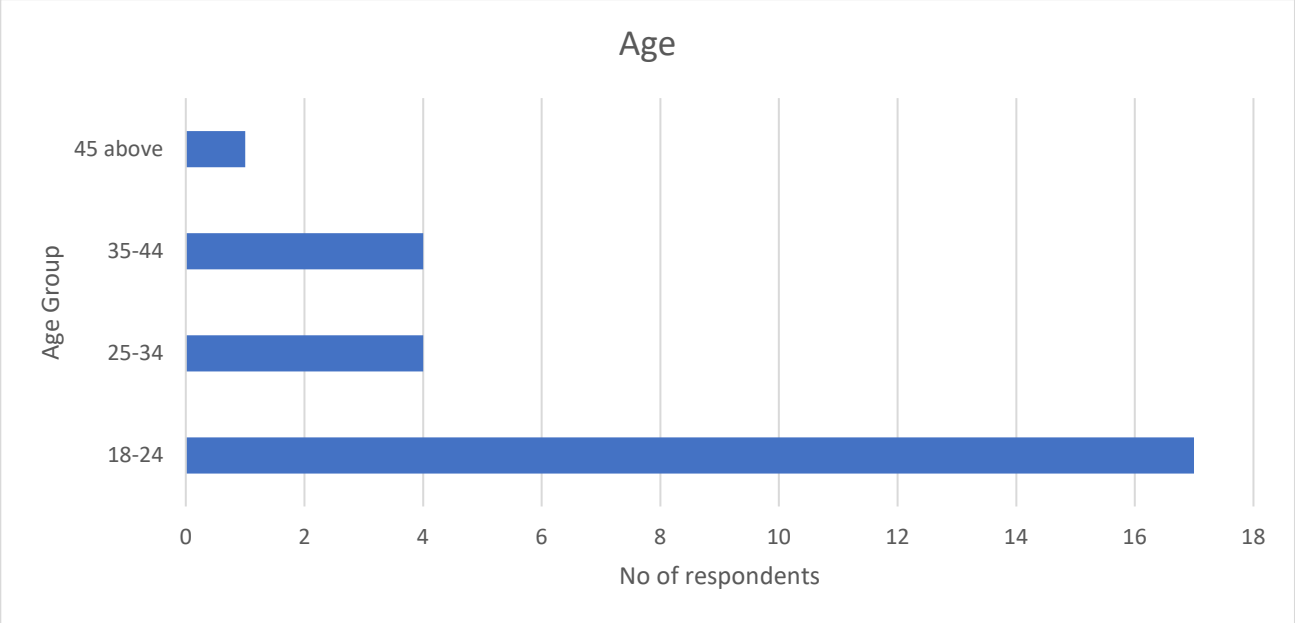
Analysis: The above table shows that the number of respondents of the male is 46.15% and female is 53.85% so; we can interpret that female respondents are more compare to male respondents.

Table: 3.3: Age of

lll: 3 Respondents

Age		
Particulars	no of respondents	Percentage
18-24	17	65.38
25-34	4	15.38
35-44	4	15.38
45 above	1	3.85
Total	26	100.00

Figure No: 3.3 Age of respondents



Source: Primary data

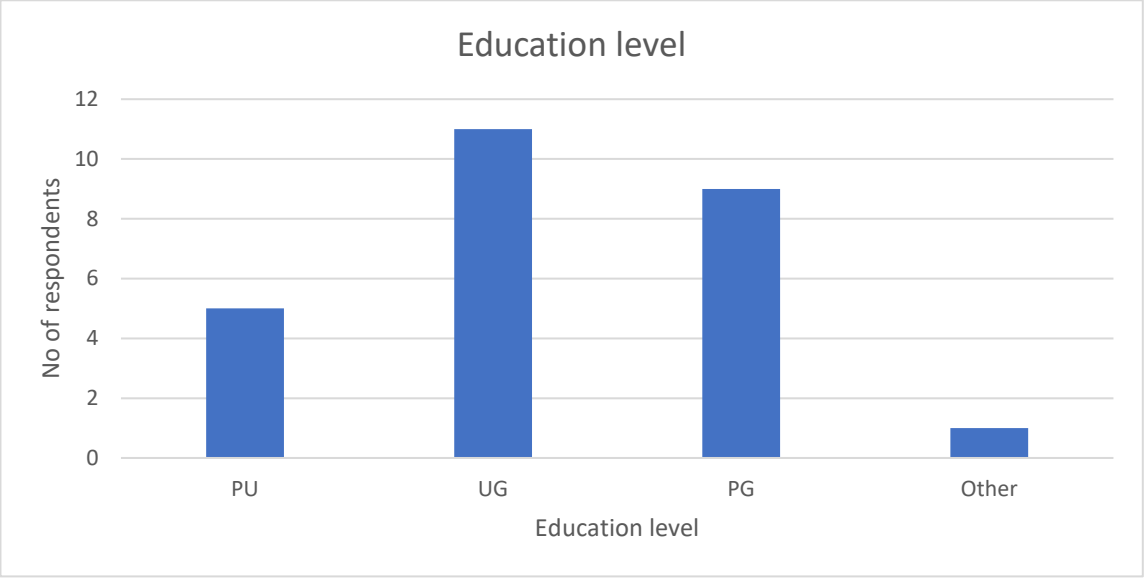
Inference: The above table shows that 17 respondents come under the age of 18-24 age range, 4 respondents come under 25-34 age range, 4 respondents from 35-44 age and 1 respondent come under 45 above age range.

Analysis: The above table illustrate that the age range between 18-24 are responded more compared to other age ranges. It shows that 65.38% respondents are aware of green products.

Table: 3.4: Respondents of Education level

Education level		
Particulars	no of respondents	Percentage
PU	5	19.23
UG	11	42.31
PG	9	34.62
Other	1	3.85
Total	26	100.00

Figure No: 3.4: Respondents of education level



Source: Primary data

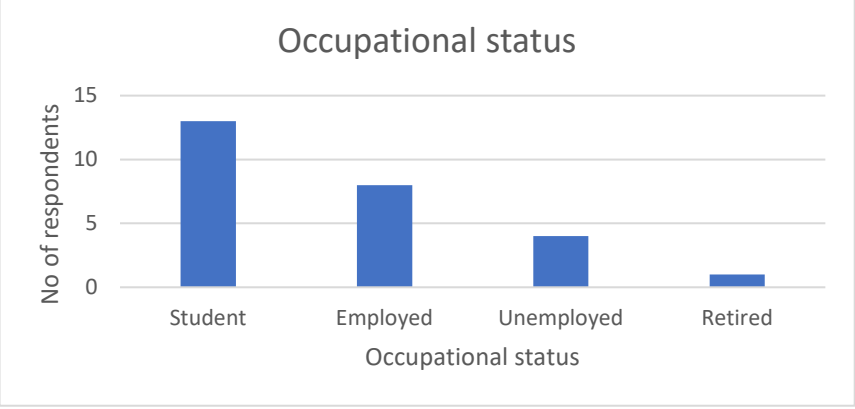
Inference: This table shows that education level of the people. The preferred respondent among selected group of 26 members. The percentage of people belongs to pu level is 19.23%, followed by UG 42.31%, 34.62 % of people belong to PG. And others 3.85%.

Analysis: The above table illustrate that the Education level of UG are given more responded compared to other education qualification. it shows that 42.31% of people are more aware of green products.

Table: 3.5: Respondents based on occupation level

Occupational status		
Particulars	no of respondents	Percentage
Student	13	50.00
Employed	8	30.77
Unemployed	4	15.38
Retired	1	3.85
Total	2 6	100.00

Figure No: 3.5: occupation of the respondent



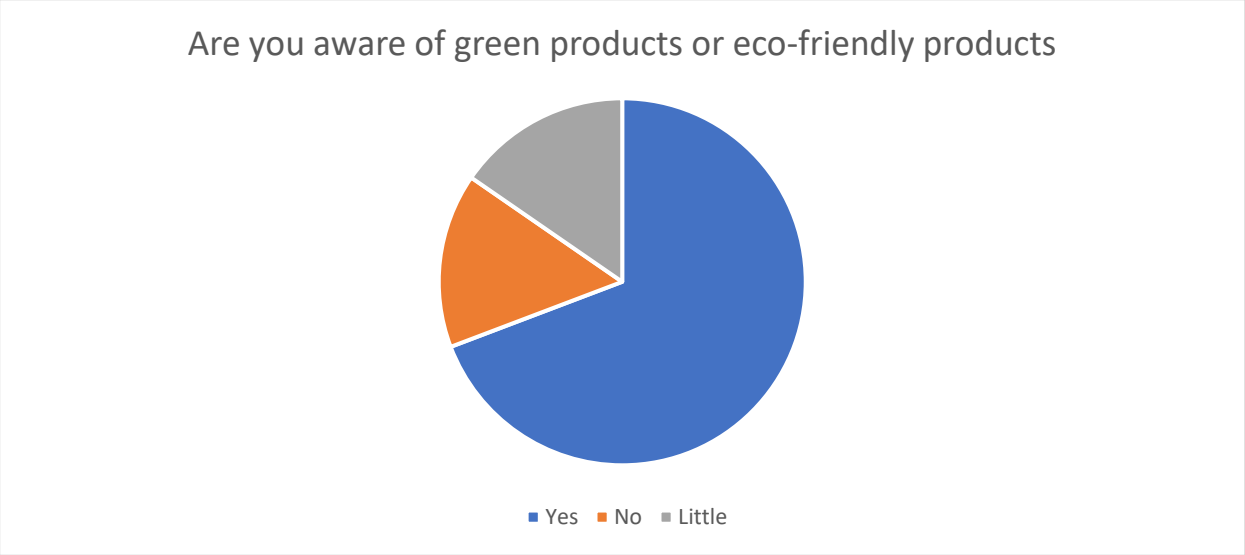
Source: Primary data

Inference: The above table shows that occupation level of the people. The selected respondent among selected group of 26 members. 13 respondents are students, 8 members are employed, the unemployed respondents are 4 and the retired respondents are 1.

Analysis: The above table illustrate that the all respondents use green product it replicates that every respondent knows about the green product but it shows the more attracted occupation level is 50% belongs to students.

Table: 3.6: Respondents of awareness of green products and eco-friendly products

Are you aware of green products or eco-friendly products		
Particulars	no of respondents	Percentage
Yes	18	69.23
No	4	15.38
Little	4	15.38
Total	26	100.00



Source: Primary data

Inference: The above table shows that the awareness about green product.the selected respondent belongs to 26 members and the members aware of green products are 18. The 4 members are not aware of green products. the respondent who are less aware of green products are 4 respondents.

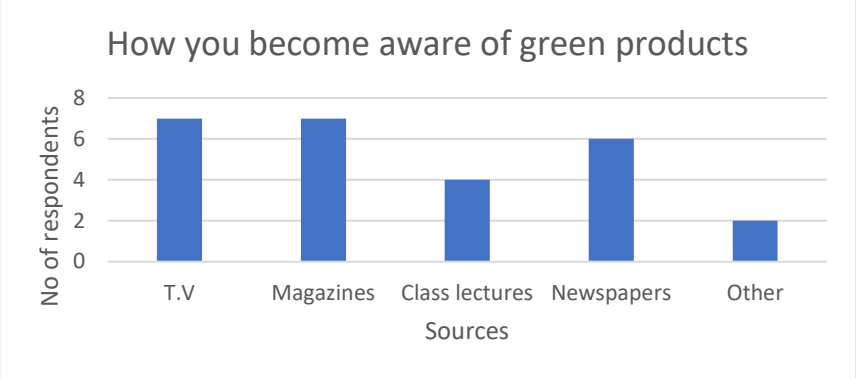
Analysis: The above table illustrate that the all respondents use green product and attracted to green products. But it shows that the 69.23% of people are more aware of green products. the less aware about green products are only a few members.

Table: 3.7: Respondents of awareness of green products from various sources

How you become aware of green products		
Particulars	no of respondents	Percentage
T.V	7	26.92
Magazines	7	26.92

Class lectures	4	15.38
Newspapers	6	23.08
Other	2	7.69
Total	26	100.00

Figure No: 3.7: sources of awarness of green produts from various sources



Source: Primary data

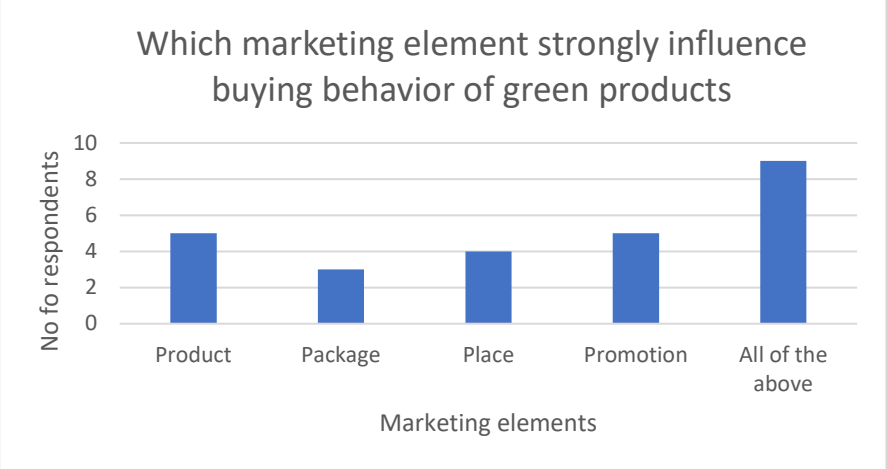
Inference: The above table shows that the sources of awareness about green product. the selected respondent belongs to 26 members .in that the respondent who are aware from tv is 7 members, the other 7 members are aware from magazines, the class lecturer awareness will be of4 members, from the newspaper 6 members are aware of green products and the others consist of 2 members.

Analysis: The above table illustrate that the number of respondents from the source of television will be more compared to the othersources. As the television spread the information faster than the other sources of media.

Table: 3.8: Marketing elements strongly influence buying behaviour of green products

Which marketing element strongly influence buying behaviour of green products		
Particulars	no of respondents	Percentage
Product	5	19.23
Package	3	11.54
Place	4	15.38
Promotion	5	19.23
All of the above	9	34.62
Total	26	100.00

Figure No: 3.8: Marketing elements strongly influence buying behaviour of green products



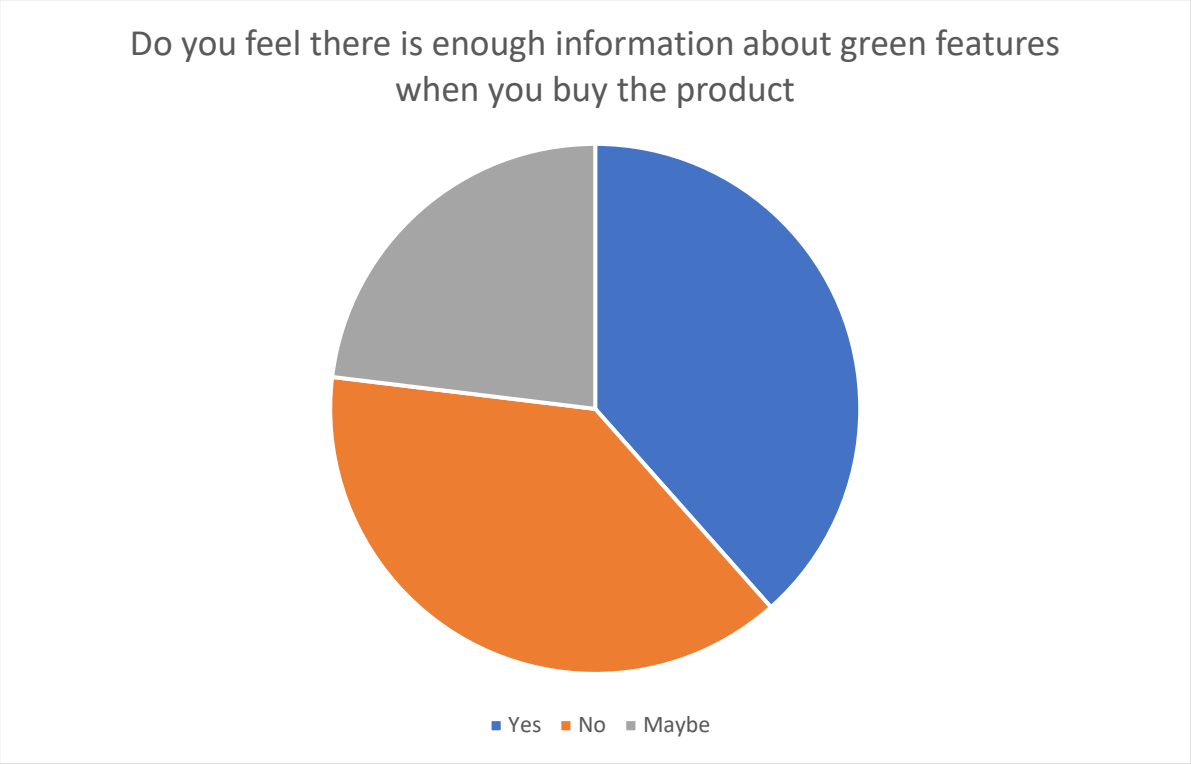
Source: Primary data

Inference: The above table shows that the marketing elements strongly influence buying behaviour of green products. The selected respondents belong to 26 members. among that 5 members are influenced by the product,3 members are influenced from the package of the product,4 members are influenced by the place and other 5 are from promotion of the product, remaining 9 members influenced by all above strategies.

Analysis: From the above table we can come to the conclusion that instead of influencing individual marketing elements likes product, package, place, promotion. The more respondents influenced by all the above types of marketing elements for buying of green products.

Table:3.9: Information about the green features at the time of buying the product

		Do you feel there is enough information about green features when you buy the product	
Particulars		no of respondents	Percentage
Yes		10	38.46
No		10	38.46
Maybe		6	23.08
Total		26	100.00



Source: Primary data

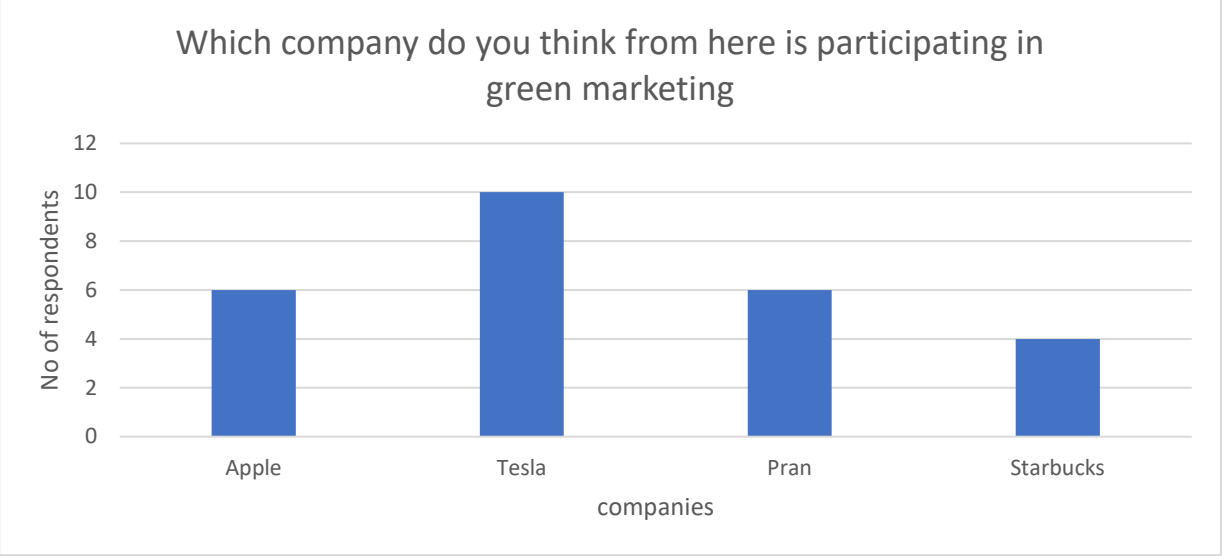
Inference: The above table shows that the respondents have got enough information about the green products at the time of buying the product. The respondent selected is 26 members.in that 10 respondents have replied yes and other 10 also responded yes, the remaining 6 members they re in dilemma in which they replied may be.

Analysis: From the above diagram, we can conclude that 20 respondents replied they use to get enough information about the green products, but 6 members still they are in confusion of getting information about green products.

Table: 3.10: companies participating in green marketing

Which company do you think from here is participating in green marketing		
Particulars	no of respondents	Percentage
Apple	6	23.08
Tesla	10	38.46
Pran	6	23.08
Starbucks	4	15.38
Total	26	100.00

Figure no 3.10: companies participating in green marketing



Source: Primary data

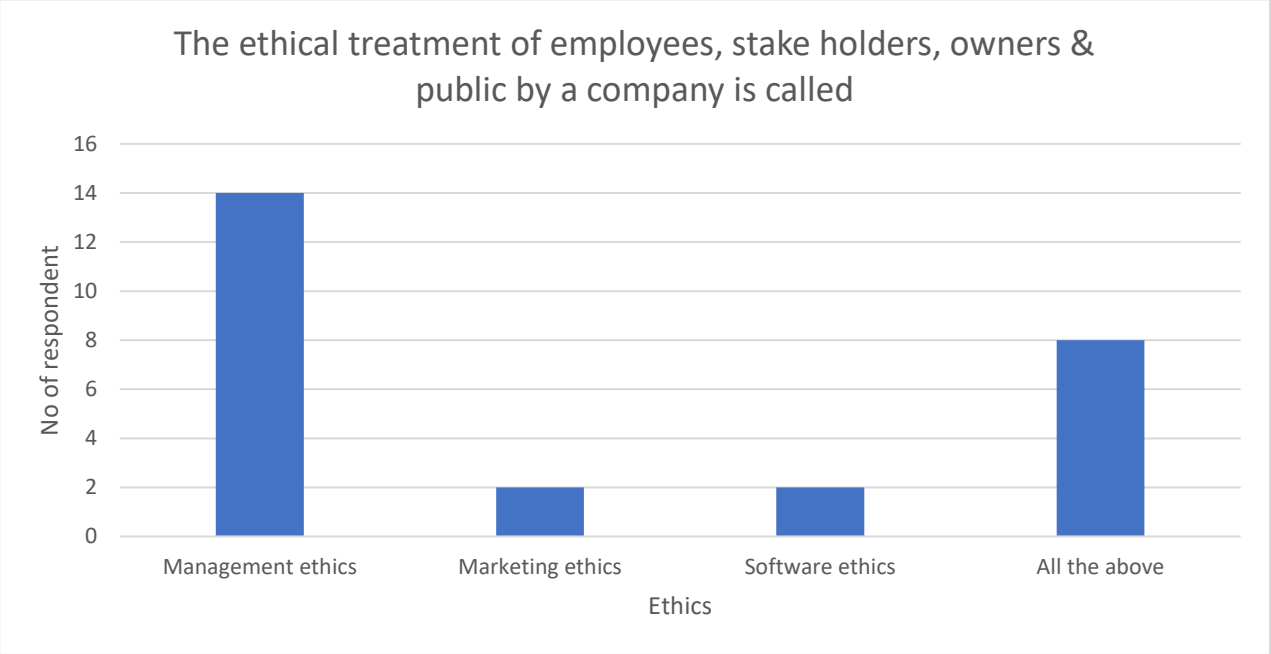
Inference: The above table gives information about the company participating in green marketing. The respondents selected are 26 members. Among them 6 respondents are replied that Apple company has taken initiative in green marketing,10 respondents replied Tesla company participating in green marketing,6 members replied that pran using green marketing, and other 4 respondents said that Starbucks are participating in green marketing.

Analysis: From the above table, we can illustrate that all the companies are participating in green marketing but the awareness of their participation in green marketing known to consumers is depends upon how they promote their products by using green marketing. In above table 10 respondents replied more for tesla company for participating in green marketing when compared to other companies.

Table: 3.11: Ethical treatment of employees, stakeholders, owners, & public of a company

The ethical treatment of employees, stake holders, owners & public by a company is called		
Particulars	no of respondents	Percentage
Management ethics	14	53.85
Marketing ethics	2	7.69
Software ethics	2	7.69
All the above	8	30.77
Total	26	100.00

Figure: 3.11;Ethical treatment of employees, stakeholders, owners, & public of a company



Source: Primary data

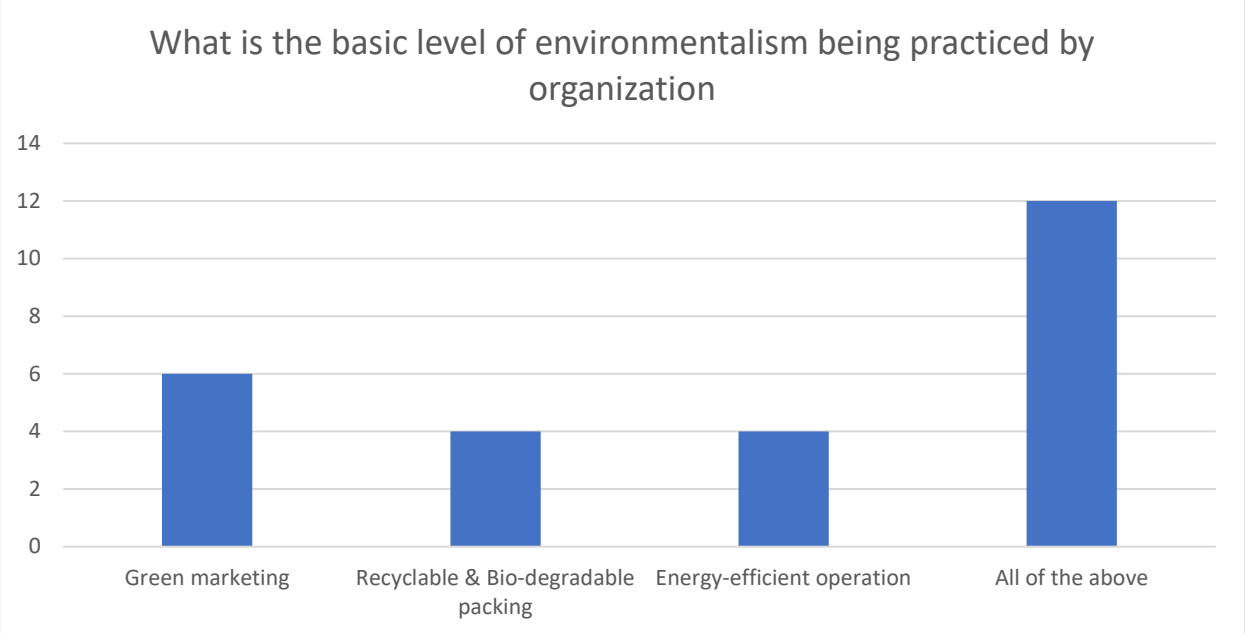
Inference: The above table gives information about the ethical treatment of employees, stakeholders, owners public by a company. The selected respondents are 26 members. In those 14 members responded for Management ethics,2 members responded for marketing ethics, for software ethics only 2 members have responded, other 8 members responded from all the above.

Analysis: From the above table, we can illustrate that the more people have responded for management ethics, compared to all other type of ethics like marketing, software and others etc. The management ethics is considered as more important.

Table: 3.12: Environmentalism practised by an organisation.

What is the basic level of environmentalism being practiced by organization		
Particulars	no of respondents	Percentage
Green marketing	6	23.08
Recyclable & Bio-degradable packing	4	15.38
Energy-efficient operation	4	15.38
All of the above	12	46.15
Total	26	100.00

Figure: 3.12; Environmentalism practised by organisations



Source: Primary data

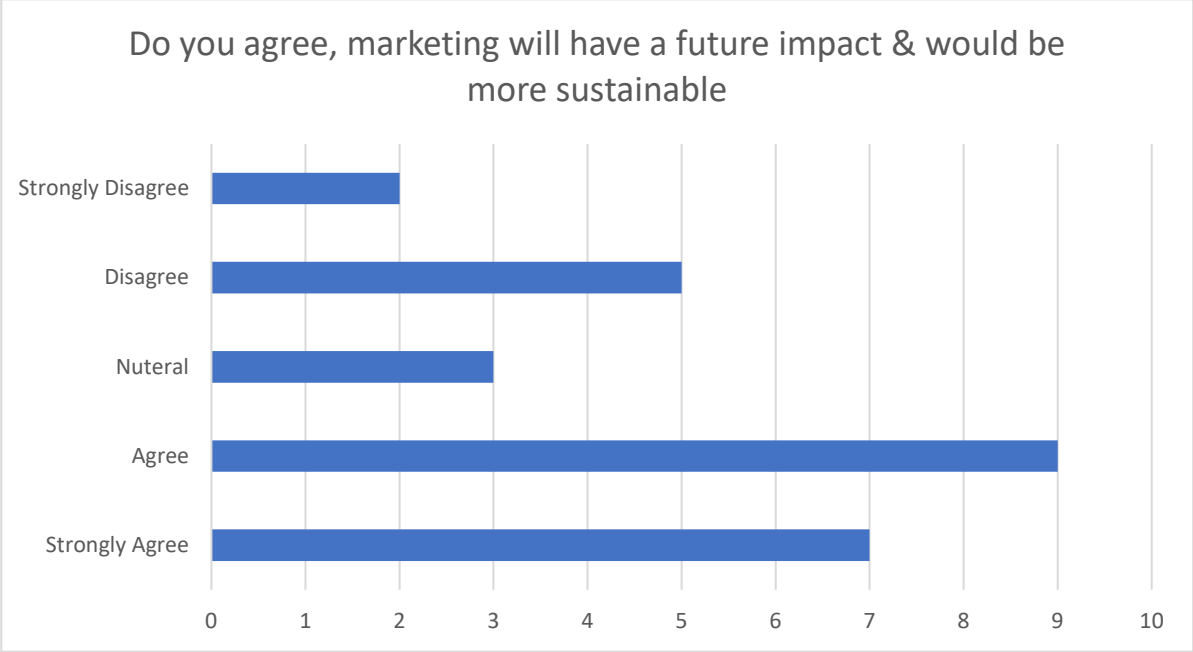
Inference: The above table provide the information of basic level of environmentalism practiced by an organisation. The number of respondents selected is 26 members. Among those 6 members voted for green marketing,4 members replied for recyclable bio degradable packing, the other 4 replied for energy-efficient operation and last 12 members opted for all the above.

Analysis: From the above table, we can illustrate that the basic level of environmentalism practised by an organisation. More respondent givestheir opinion for all the above factors like green marketing, Recyclable & Bio-degradable packing, Energy-efficient operation etc.so we can conclude that company is practising environmentalism in an organisation.

Table: 3.13: whether marketing have a future impact & would be more sustainable?

Do you agree, marketing will have a future impact & would be more sustainable		
Particulars	no of respondents	Percentage
Strongly Agree	7	26.92
Agree	9	34.62
Neutral	3	11.54
Disagree	5	19.23
Strongly Disagree	2	7.69
Total	26	100.00

Figure: 3.13;whether marketing have a future impact & would be more sustainable?



Source: Primary data

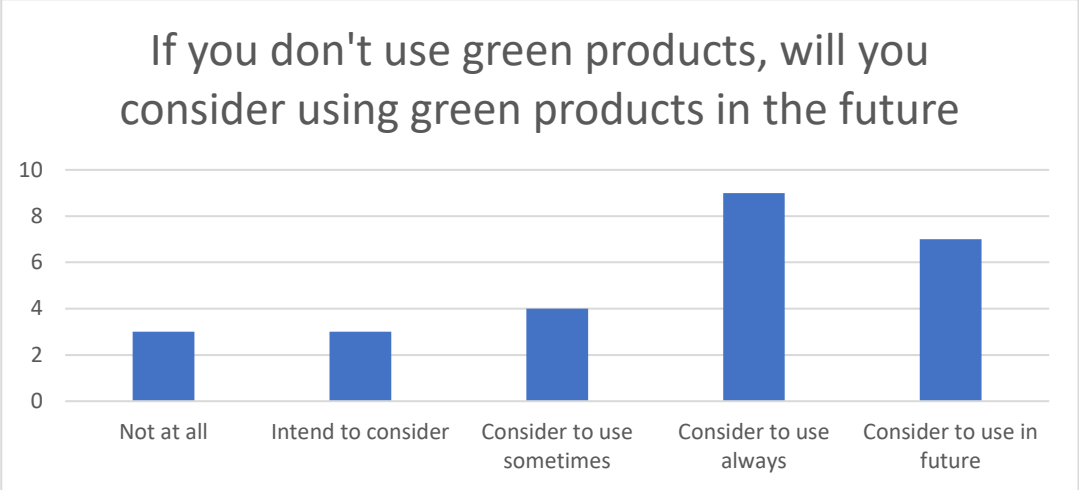
Inference: The above table gives the information that whether marketing will have a future impact & would be more sustainable. The respondent selected is 26 members. In that 7 members they said that strongly agree, 9members replied only agree, the other 3 members goes for neutral,5 members are disagreed and last 2 members replied strongly disagree.

Analysis: From the above table, we can illustrate that 9 members agreed for future impact of marketing, and only 2 members responded for strongly disagree.so we can conclude that the marketing will have future impact & would be more sustainable.

Table: 3.14: consider of using the green products in future?

	If you don't use green products, will you consider using green products in the future	
Particulars	no of respondents	Percentage
Not at all	3	11.54
Intend to consider	3	11.54
Consider to use sometimes	4	15.38
Consider to use always	9	34.62
Consider to use in future	7	26.92
Total	26	100.00

Figure: 3.14;consider of using the green products in future?



Source: Primary data

Inference: The above table is questioning to the respondents to consider using of green products in the future. The selected respondents are 26, in that 3 members replied not at all of using the green

product, other3 replied they may intend to consider of using green produts,4 members replied consider to use sometimes,9 members said consider to use always and last 7 members replied to use in the future.

Analysis: From the above table, we can come to conclusion that among 26 respondent,9 members replied that they consider to use green products in the future.so in the future more no of peoples go for using the green products which is good for individual and the country.

Findings of the study

- It is found that among 26 respondents only 18 members are aware of the green marketing.
- When compared to other media only television influenced the customer more about awareness of green products.
- Only 38% of the respondents have information about the green products at the time of buying the products.
- It is found that only less companies are participating in the green marketing.
- Only 53.85% of Management ethics followed in the company. Neglecting other types of ethics.
- 34.62% of people replied of future impact of marketing and sustainability.
- Only 26% of people replied to use green product in future.

Suggestions of the study

1. It Improve consciouness about green products and its effectiveness.
2. All types of Medias have to play a very important role in spreading awareness of the green products to the world.
3. The participation of companies in green marketing is very important.
4. Companies must adapt the ethics in an organisation.
5. The intense efforts should be made by government for implementing green marketing for wellbeing of next generation.

Conclusions

It is clearly evident that the majority of the consumers still lack green knowledge. The firms should work constantly to find out the green material, methods of making green finished products which are commercially viable. Most of the people are ready to accept, but the entrepreneurs and government has to take initiative for promoting and implementing the green marketing and green products. Every organisation must also follow the ethics.

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The Usage of Artificial Intelligence within Classrooms is a Boon to the Future of Education in the Digital Age

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Abstract

The present study explains that using artificial intelligence (AI) within classrooms is a boom to the future of education in the digital age. Teacher-student communication has also come a long way since the dawn of formal education. Teachers are becoming more careful in their classroom practices to help students achieve better and more lasting achievement. The widespread nature of technology influence is largely to blame for this change. Education has benefited greatly from the incorporation of AI into computing. AI has benefited classrooms and classroom learning in numerous ways. Among these are the development of a robotic teaching system and a method for automatically grading student response sheets. In order to present a thorough review and show the significance of AI in teaching and student analysis, we studied the many analysis enhancements implemented worldwide, such as computer science approaches used in the education sector. AI can improve education in low-resource situations by increasing teachers' use of available resources, as discussed in the first half of this paper. After showing the comprehensive character of AI, this paper looks into how governments and educational institutions are reassessing and retooling educational programs to better prepare students for this future. The study also examines the challenges and regulatory concerns when preparing students for a future when AI is widespread. Finally, it anticipates the future of AI in classrooms and encourages new discussions on how to best utilize such innovative tools in the future of education in the digital age. Our study shows that information science is the backbone upon which all intelligent teaching solutions built on artificial intelligence rest. Systems of this kind help persons improve their self-awareness, question-answering abilities, conflict-statement partitioning, creative question generation, and decision-making skills. AI is a rapidly growing field that could completely alter the way people interact with one another. Various educational institutions are presently piloting recently developed AI-generated educational solutions. This working paper aims to provide policymakers in the education sector with information they can use to get ready for the possible effects of AI on modern teaching-learning methods in the digital age.

Keywords: Usage, Artificial Intelligence, Classrooms, Boon, Future, Education, and Digital Age

Introduction

The educational system is essential to the success of a community. The networks it has established have a profound impact on every other sector. This is why, despite our differences, everyone needs access to high-quality education. The fast-expanding science of AI has the potential to transform human interaction drastically. AI has been studied in depth since it is the effect it has on individuals and society. It covers a wide range of relevant topics, including AI's future and current state in education, the tools and applications already used by various AI in education applications, academic developments, and the risks and constraints currently faced by AI in education. The progress of AI is changing every aspect of human existence. AI can model a system, estimate its complexity, and make solution recommendations based on information that is causing a paradigm shift in education by shedding light on topics such as how students learn, how to personalize students' educational experiences, how to obtain more data to aid decision-making, and how to model the complex interaction between student learning, the knowledge domain, and the tools that allow students to interact with the domain. Today's educational system needs to be simplified and taught using conventional techniques. All of these and more are explored in the study, from grading and evaluations to retention and attrition prediction models, sentiment analysis to intelligent tutoring, classroom monitoring, and the generation of suggestions. Recent AI-generated instructional solutions are being piloted at several educational institutions. What about the need for complicated facilities and a strong ecosystem of inventors in developing countries to accommodate AI? Is the affordable use of AI a realistic possibility, and if so, when? Should we put off addressing AI until we close the gap between the digital and social spheres? Whether the education sector has had an exceptionally rapid adoption of AI. AI has many potential applications in the classroom, including facilitating better two-way communication between teachers and students. The ability to tailor lessons to each student's prior knowledge, learning style, and course objectives has transformed how we educate.

Instead of relying on one-time assessments of strengths and weaknesses, we continually track each student's learning history to identify areas for growth and offer suitable courses (Ahmad et al., S. I, 2021). Now is the time to put AI to good use. The explosion in online education is generating a tidal wave of data that AI may one day examine to help decipher the knotty problems currently plaguing academia and

usher in more efficient technology solutions. Academics, teachers, lawmakers, and the private sector have all been keeping a careful eye on the use of AI in schools during the past decade. Experts estimate that the US AI market in education will expand by more than 47% between 2018 and 2022 (Ahmad et al., 2020). In recent years, AI has emerged as a paradigm shift in several fields, including academia. The positive effects that AI is having on the classroom, for both students and teachers, bode well for the future of education in the digital age.

What Does Artificial Intelligence Mean

AI is the ability to absorb external information successfully, learn from this information, and apply such lessons toward fulfilling stated goals and activities through flexible adaptation (Kaplan & Haenlein, 2019). Poole and Mackworth (2010) created the term AI to describe the study of developing and accessing intelligent computer programs. Agents ultimately bring about changes to the status quo. AI is the capacity of computers to mimic intelligent behaviour in humans and other animals. This technology makes uses like speech recognition, education, planning, and problem-solving possible. AI is essential in robotics because the field concentrates on linking perception and behaviour. There are fundamental questions at the heart of AI, such as: What kinds of knowledge are necessary for different kinds of thinking? How should that knowledge be represented?

Moreover, how should that knowledge be used? In robotics, AI is put to the test since it must learn to control and manage things that are real. The ability to tailor lessons to each student is one of AI's most potential contributions to education. AI-powered learning platforms may evaluate student data to determine each student's unique learning preferences, skills, and weaknesses. AI may look at each student's test results, attendance records, and other data to see where they excel and where they could use some extra help. From its early days of exploration, AI has developed into a field with far-reaching implications. There has been some shift in the definition of AI. Many professionals in AI joke that the definition of AI is everything computers still cannot do.

Despite the humorous nature of the expression, the fear that something entirely new could be created as an outcome of advances in AI and robots is not. Defining AI, a thought process that has developed and evolved, is challenging. One of the most ground-breaking innovations of the last decade, and likely the next, is AI, and will

likely be one of the most significant technological advances of the next ten years. This research aims to facilitate in-depth assessment and constructive discussion of AI by providing easily accessible information on current and predicted AI approaches and their implications. It also outlines various legal, technological, and societal activities that could be mobilized in response. It is based on the European Commission's latest (2018) and most thorough definition of AI. AI enables machines to learn and make decisions without human input. Since AI could mean many different things, we need a clearer one. In conversations regarding the ethics of data-driven approaches that make their judgments about individuals, it is crucial to distinguish between arguments about basic expert systems in advising positions and those about more complicated ones. The potential impacts of AI need to be addressed openly. The expert panel decided to look into how AI could alter the classroom dynamic. Since the significance of the story and framework for evaluating AI emerged from the fieldwork, the experts focused on management, education, and training. Items like computers and machines have intellect on par with people thanks to the combination of discoveries and improvements in domains like cognition, learning, adaptation, and decision-making with the study of artificial intelligence. The outcome was supported by prior studies showing widespread AI use in educational settings, particularly at the university level. Following embedded computer systems and other technologies, the most recent AI deployments are web-based chatbots and AI humanoids that execute the roles and behaviours of teachers, either independently or in combination with teachers. The technologies let teachers assess and grade student work faster and more accurately. Teachers may rest easy knowing that their students will pay attention and retain the material offered to them because these systems rely on AI and adaptability in the digital age.

The Importance of Artificial Intelligence in Education

One of the most ground-breaking innovations of the last decade, and likely the next as well, is AI is rapidly invading every aspect of our lives, from the way we shop and learn to the way we connect with others, and is one of the most revolutionary innovations of the past decade and, most likely, the next as well. Due to the rapid development of technology, students must obtain AI education as part of their legally binding education. This underlines the need to remember

underprivileged schools, whose students are typically the last to gain access to new technology. One of the most ground-breaking innovations of the last decade, and likely the next, is In the past decade. The next revolutionary development was one of the most innovative innovations of the previous decade. The next, as well, is One of the most ground-breaking developments of the last decade. One of the most revolutionary inventions of the last decade and, most likely, the future is the supercomputer, which comes to mind when most people think of AI. These robots can act and think like humans because of their advanced artificial intelligence, ability to learn and adapt, and other features. The temperature in smart buildings may change depending on the mood of the people within, as depicted in one of the numerous films designed to demonstrate the promise of AI. One of the most ground-breaking innovations of the last decade, and likely the next as well, is AI is one of the most game-changing technologies of the previous decade and will continue to be so in the next. It is still in its infancy. However, it has already begun transforming educational materials and long-standing structures, making it one of the most revolutionary advances of the past decade and, very likely, the future. The educational sector recommends that students always have easy access to qualified instructors. Teachers now play a different and arguably more important function due to the advent of AI. To calculate an individual's velocity about the group's average velocity, the AI significantly utilizes complicated analytics, deep learning, and machine learning. New and improved AI solutions are shining a light on where schools may be made better, inspiring pedagogical changes in the classroom. Perhaps teachers will have more time to focus on helping kids learn and adapt to new conditions, two areas where computers now struggle if AI can improve efficiency and personalization and eliminate administrative processes in the classroom. The highest results for children have been seen when state-of-the-art resources are used with competent teachers (Kengam, J., 2020).

As the capabilities of AI go beyond those of a supercomputer, embedded computer systems and other forms of AI are becoming increasingly popular in schools. With the help of computers, AI, and other supporting technology, educational robots have been developed to assist students from kindergarten through college. M. J. Timms (2016) claims that robots already offer personalized instruction in basic skills like spelling and pronunciation. Chassignol, M.

Vaismoradi, H. Turunen, and T. Bondas (2013) argue that AI should be incorporated into all facets of education to improve these processes. Since these questions are central to the AI education paradigm proposed by Chassignol et al., (2018) they will be the primary focus of the analysis. AI is becoming increasingly pervasive in our daily lives, making it one of the most revolutionary innovations of the last decade and one of the most innovative technologies of the upcoming decade. This is why schools keep working, constantly churning out new students to power AI's exponential rise. There has been progress in STEM (science, technology, engineering, and mathematics) education, but students still need more help preparing for classrooms in the digital age.

Artificial Intelligence Support for Teaching-Learning

Future developments in education have an inherent connection to the rising processing power needed to create smart machines. Regarding recent developments in AI, teachers in higher education may be presented with both an opportunity and a challenge: the possibility of significant change in the structure and administration of today's educational institutions. The fundamental motivation for this research was to provide policymakers and educators with a better understanding of these revolutionary technical developments. We need a clearer understanding of what AI is and what it is capable of before we can evaluate its impact. The current assault of AI makes this harder to accomplish. Many schools and regulatory bodies are still in the learning phase of AI. It is tempting to get swept up in the happiness around recent advancements in AI, such as self-driving cars and robots that can pass for humans by mimicking human speech. Of course, there is a better situation. Due to technological, societal, scientific, and conceptual limitations, AI is still in its infancy. Surprisingly, cutting-edge approaches and ideas from the study of human learning can provide insight into the future of AI. Since modern AI systems rely on simplified representations of learning and biological intelligence, learning theories help understand their abilities (Ilkka, 2018). AI can greatly enhance the condition of education by facilitating more efficient classrooms, boosting teachers, and expanding students' access to personalized learning experiences. Teachers should have access to the resources they need to integrate new technologies into their lessons effectively. In many areas, including progress, adaptation, diversity, language, games, and immersion, AI is already having a tremendous

effect on the educational industry. In personalized education, AI-enabled systems analyze each student's learning profile and adapt the curriculum appropriately. If a student is using a tailored learning platform, they may find it simpler to study and remember the material. With AI taking over every day administrative duties, teachers will have more time to focus on student learning and individualization. Access to AI-powered virtual tutors on-demand is incredibly helpful for students with special needs. Several aspects of AI's potential to improve education are investigated here. AI has the potential to advance the field of education significantly. This could lead to more effective school administration and evaluation of teachers, as well as the development of innovative classrooms and educational resources. The AI age has brought new standards to education, and it is advised that schools adopt these practices to support the use of AI to advance the transformation of teaching and learning in the digital age.

Artificial Intelligence in the Classroom

AI depends on computers' innate abilities to identify visual and auditory cues, engage in two-way communication via built-in Language modules, reason using computer programs, and store and recall enormous amounts of information. Education is not immune to the far-reaching changes brought about by AI. The ability of AI to adapt lessons to each learner has significant implications for the field of education. The concept of AI has always intrigued people from all walks of life. Many groups have proposed various descriptions of AI in today's classrooms. It is worth living in the insight it provides on the potential applications of AI in the classroom. This review is also motivated by the question of whether and how AI could be used to make better use of educational inputs.

- In the 1970s, experts began probing AI's potential in machine learning and natural language processing. It paves the door for intelligent systems for tutoring that may comprehend student feedback and adapt their instruction accordingly.
- The AI of the 1980s is used to enhance teaching and tutoring. There has been an increase in exchange for integrating expert systems into educational settings.
- Since the 1990s, AI has created smart learning environments and adaptable educational systems. AI-based lesson preparation ponders students' expertise and learning styles.

- In the 2000s, data mining and learning insights saw major developments, making information-driven pedagogy an achievable aim for teachers. AI drives virtual classrooms and tutors.
- 2020s, as an outcome of the COVID-19 pandemic, schools are increasingly relying on AI, particularly for things like distance learning and testing. Chatbots using AI allow students to get help whenever and wherever they need it. Virtual and augmented reality are now being studied to determine whether they may be utilized to improve the educational process (Adair, A., 2022).

Benefits of Artificial Intelligence in Education

As the number of uses for AI grows, experts will have to assess its worth. To advocate for AI, justify investment in AI, and assess the outcomes of deploying AI, one must be familiar with the benefits of AI. Several aspects of education have benefited from AI. Quality and efficiency rise, expenses fall, knowledge and wisdom grow, opportunities emerge, and the satisfaction of both students and teachers rises. Before the full potential of AI in the classroom can be realized, much more study is needed. The quality of information, problem complexity, neural network and model choice, human knowledge and involvement, biases and ethics, computational resources and infrastructure, and so on, should all be considered before committing to an AI solution (Umer Sultan, C,2023). Young adults and teenagers who did not grow up with cell phones quickly become a minority. Using AI, even only a few minutes of study time can be more productive. In the future, AI might utilize gesture recognition to measure students' degrees of anxiety. Human emotions and body language are being taught to artificial intelligence so that it can assist sleepy students. With AI, computers could provide individualized lessons to each learner. Recent advances in AI have made it possible for students who are deaf or hard of hearing to participate fully in classroom debates. A sick child who cannot attend class will be eternally grateful for this. In most schools, grading students' work is a major time commitment.

The use of AI could greatly increase output. Filling in any knowledge gaps is also covered. Those who have trouble connecting with others due to language or other hurdles can

now choose from a variety of options based on artificial intelligence. The presentation translator is a software program powered by AI that can provide real-time presentation captions. When students do not comprehend the target language, Google Translate is the only tool to help them catch up with the rest of the class. Virtual assistants provide free learning resources for students outside of the classroom. These voice assistants can save the school money by answering common queries about the campus and a specific student's schedule and classes without the need to print and distribute handbooks, which are only used briefly at the beginning of each student's acceptance. Over the next few years, we anticipate a steady but slow rise in the application of this AI technology.

Challenges for Artificial Intelligence in Education

AI is advancing rapidly, which could have profound implications for human interactions and collaboration. Numerous educational institutions are now investigating the use of AI-generated pedagogical solutions. This study examines the development of AI education worldwide, focusing on programs that help children from families with poor incomes. Since AI could significantly change education, there are many unanswered questions. As AI is developed further and implemented into the current educational system, experts and programmers must work together to address potential challenges (Umer Sultan, C,2023). Finally, the challenges and policy implications of integrating AI into classrooms and preparing students for a society ruled by AI are discussed, as they should be a part of global and local discussions on both the advantages and the risks of doing so. Most existing apps are created with firms in mind, which is an enormous challenge to the wider use of AI in classrooms. However, only some people involved in the development of AI have the expertise in education and the learning sciences necessary for the technology to be applied effectively in the classroom (Luckin & Cukurova, 2019). It draws attention to issues like AI's inaccuracy, limited capabilities, and limited applicability when implementing AI in the classroom. These results highlight the need for further investment in the study and creation of AI systems with the technical and pedagogical expertise to contribute substantially to education in various settings. To achieve this goal, it will be vital for the developers of AI tools to collaborate with teachers and students. However, the needs and desires of educators should be more noticed in favour of AI progress (Cukurova & Luckin, 2018; Luckin

& Cukurova, 2019). It is important to consider the opinions and goals of educators before implementing AI in the classroom (Holmes et al., 2019). As per the work done by Seufert et al. (2020), teachers will play a pivotal role in developing AI in schools. More research into the pros and cons of implementing AI in the classroom is necessary. However, educators' perspectives should be considered when addressing the implementation of AI in the classroom. Teachers have yet to contribute to artificial intelligence research, and the academic community has paid scant attention to their suggestions for improving the educational use of AI in the digital age.

Artificial Intelligence in the Digital Age

It will take significant effort and time from many people across academia, government, and society to create an AI platform that can be accessed on demand. It examined the evolution of the concept of AI and defined it as closely as possible. Integrating the provided concepts and applications, a proposed proprietary classification of AI services was created. Common AI system development models now include support for model-based control. The design for an immediate AI platform that could support the presented model was also proposed. Numerous place a premium on AI exploration, creation, and application today. The success of any nation depends on its people and their access to and use of knowledge. Its main focus is AI and how it could be deployed in business by creating appropriate frameworks and models. This effort aims to lay a foundation for further study and development of AI in the digital age (Stamova et al.; M., 2020). There has been a dramatic shift in advertising strategies since the advent of AI. AI-enabled marketing strategies are replacing more traditional methods. This piece analyzes the pros and cons of using AI in online advertising efforts. We also discuss the importance of balancing socially responsible advertising and modern AI developments in the digital age (Mazur, N,2023). The usage of AI technology to generate ongoing internet money has grown in contemporary schools. With integrated hardware, recurrent processing, and advanced techniques, AI develops software that adheres to pre-existing patterns. It allows management the discretion to exercise wise judgment, which improves the institution's financial performance and can be applied in various ways in the digital age. It enables businesses to reach out to existing clients more successfully and draw in new ones. Many schools will employ chatbots to assist students in a few years. The decline in the need for human beings across various fields, including content

creation and management in a digital age, has impacted higher education.

Conclusion

AI represents a big improvement in education. The use of AI in education at the next level is still being developed. As an outcome, individuals creating AI applications should appropriately notify policymakers and teachers. Given that AI is the future of technology, schools should begin introducing it to their students despite its flaws. Starting at the primary stages of education, the effects of AI will gradually move up to higher education. It will take some time before it is obvious how AI will affect schooling in the long run. The potential, profit, tools, applications, research trends over the next five years, limits, and hazards of implementing AI in the classroom are discussed. Strategies for grading students' work, methods for keeping students engaged, online classrooms, data mining for student feedback, artificial intelligence-driven tutoring, and classroom observation were all covered. Career options for AI researchers and software engineers were addressed as well. The most well-known methods for teaching AI are also explored. AI seeks to simplify the work of teachers rather than replace them. Personal computers and later advances that improved processing and computing capability and the ability to embed or integrate computer technologies in machinery, equipment, and platforms stimulated AI development and deployment in many fields. Teaching in studied institutions employs AI. AI's impact on education administration, instruction, and learning was investigated. Computers and systems preceded online AI education. Together or alone, robots and chatbots may teach and solve problems. Tools help teachers work faster and teach better. Personalized content from AI improves student learning. Digital school management and learning have altered with AI in the digital age.

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DATA BASE AND DATA WARE HOUSES – An Overview

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ABSTRACT

Data base is a collection of data about anything. College data base has the data about the departments, staff, and students. Student's database may contain the data about the student's register number, where about, phone number, e-mail address and marks etc.

There are many database software available to manage and manipulate the data. Data are stored in table format which is structured. There are different types of data bases, object oriented data base, Network data base, Hierarchical data base and Relational data base, NoSql Data base, Distributed Data base, Centralized Data base.

Data base is used to keep track of the data. For example, Business Organizations can keep track of their customers. College data base can be used to follow their students.

Before the advent of the first generation of computers, people used various methods to store data.

Now-a-days data availability gives hundred percent strength to the business and to the things in this world. Availability means that whatever people want, those should be on hand or has easy access to them (Something available and ready to use).

Data should be available with no time bounds, and continuously which delivers quality performance and may easily handle various loads of data. The role of Data Ware house exists here. It is a central repository. Data ware house stores huge amount of data and integrate data obtained from various heterogeneous sources. Historical data can be analyzed and make decisions based on it. Data ware houses increase the quality and enhance the Business Intelligence.

This article discusses and analyses the database, types of data bases and data ware houses with clear pictures.

KEY WORDS:

Data base, Distributed data base, centralized data base, NoSql, Object Oriented, Data Availability, Data Ware house, Heterogeneous.

1. INTRODUCTION

People are storing items for long-term needs. Similarly, digital data can be saved/stored in storage devices. People or users may store the data to retain it permanently or temporarily. Some of the storage methods are listed here.

Written Materials: Paper was used and the information written like text or accounts, manually. They maintain account books, Ledgers. Those written documents are organized in shelves or boxes.

Physical Devices: Some devices are used for storage and to process data. Basic mathematical calculations were performed using beads. Punched cards were used for storage. Attendance was made using punched cards made up of cardboard. The card had holes.

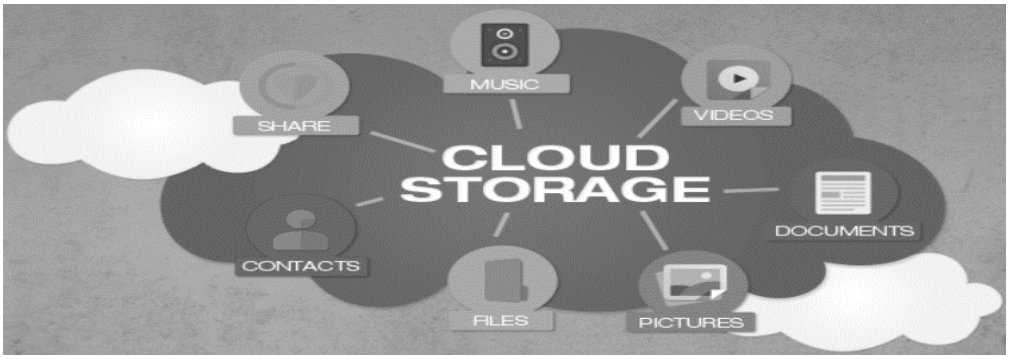
Similarly, people experienced Magnetic Tape, Drum and Mechanical hard drives etc. Gradually, generation moved and Microfilm and Microfiche were used. They were in film format.

From 1980, the data storage has drastically changed, so the speed and capacity of storage devices have been decreased. The size of devices is reduced.

The following list shows the list of various storage devices in chronological order.

1. Hard Disk Drives (HDD)
2. Floppy Disks
3. Compact Discs (CDs)
4. Flash Memory: DVDs
5. Blu-ray Discs
6. Magneto-Optical (MO) Drives
7. Solid-State Drives (SSDs)

And finally, Cloud Storage supports to store data at remote place and could be accessed over the internet. Cloud storage is scalable and very easy to store and access.



Current technologies support to store audio, video, images in the various formats. These multimedia files are inevitable for each and every domain. These are known as Multimedia Data base. Maps, satellite data and climate information can be handled by Geographical Information system.

Forest Animals Video Data base

IMAGENET DATABASE

2. Characteristics of Data Base System:

Data base system is defined as software which stores data in an organized manner and supports easy access and manipulation.

Management refers to management of data. Data can be retrieved and stored in an organized way. That data can be manipulated by doing operations like insert, delete, add, update and edit. Data Base Management System software provides all the functionalities.

Prior to modern data database systems, files with data were inserted into the apps. If the structure of the file changes, then the changes have to be made in all the related programs. In DBMS, structure is stored separately. This program-data independence property support accessing data and other programs easily.

There are four types of data bases: Object Oriented, Network, Hierarchical and Relational Data base.

3. Functions/Tasks of DBMS

1. **STORAGE:** The primary task is storage. DBMS creates structure and allows users to access data faster just by clicking buttons. DBMS also manages the Meta data by following protocols like validation.
2. **SECURITY:**Security is the main concern for everything around us. DBMS gives a higher degree of security measures for all types of access. Using access control, one can control what or who can view or use resources on a computer. Business or organizations rely on this concept to minimize risks.
3. **RECOVERY AND BACK UP**: Sometimes, users may delete TB capacity of data with no knowledge. Data may be corrupted. The data has to be recovered and to be kept safe, which can be done by DBMS. Recovery of data can be done with the automatic backup of data with the time interval.
4. **DATA DICTIONAY**: Dictionaries also store the data with its information and relationships among the data. Data structure is also kept in a dictionary. DBMS is responsible for the dictionary. DBMS clears the dependency of the data from the system.
5. **ACCESS CONTROL:** Many users can access the data base with some restrictions. Some users can have "read only" permission. Some users have "write and read" permission. DBMS can support these access controls. Another characteristic of DBMS is that multiple users can access the same data base concurrently. ACID property makes the DBMS carry out this task. ACID means Autonomous, Concurrency, Isolation and Durable. DBMS has to maintain integrity so that data redundancy can be avoided and consistency can be increased.

4. DATA BASE

We have an Object-Oriented Data Base, Network Data Base, Hierarchical Data Base and Relational Data Base.

4.1 Object-Oriented Data Base

The object-oriented data base works around objects, their characteristics, and actions. Object means anything around us. Example: Book

Object: Book

Properties: Paper Type, Thickness, cover type

Actions: flip, hold (in any orientation)

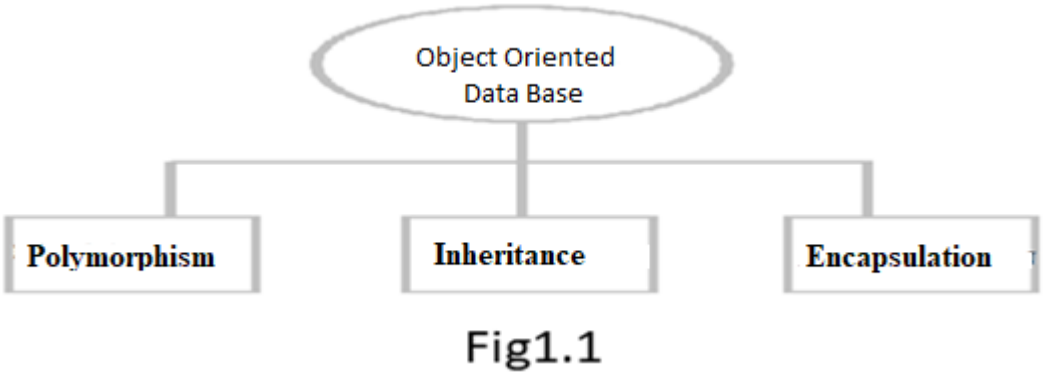


Fig1.1

Figure 1.1 shows the properties of OODB.

Polymorphism gives more forms for a single operation. For example, addition operations can add numerical values as well as strings.

The operator + symbol is used in numerical values 456 and 700

456+700 = 1156

The same symbol is used in the strings "I Love" and "INDIA".

"I Love" + " " + "INDIA" = I Love INDIA

We may pass different data types by using the same operation.

Inheritance inherits the property of a parent with its own property. There are different types of inheritance available.

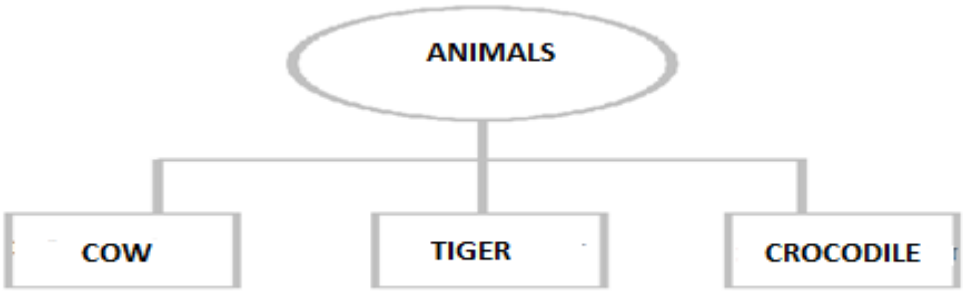


Fig : 1.2

Fig 1.2 explains the property of inheritance where a cow, tiger and crocodile are animals and have their own property.

Encapsulation encapsulates the important details by denying access from outside. It supports data hiding and reusability. Data and methods are encapsulated so that outside access cannot be done.

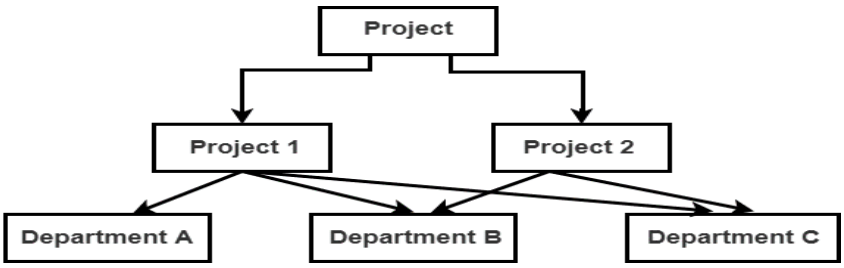
Example: Car

The car encapsulates machines, mechanisms, even drivers and people who travel in a car.

Abstraction means shows anything in simple view with necessary details. Encapsulation hiding the unnecessary details.

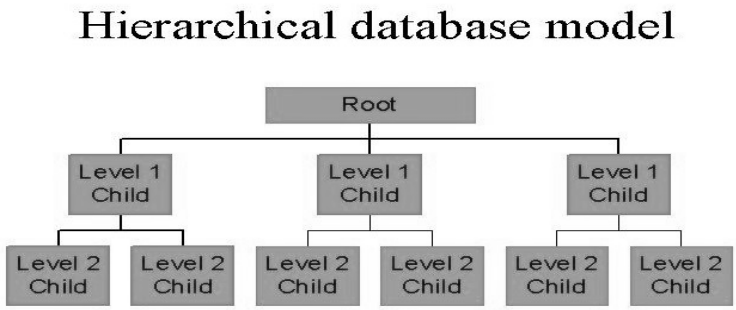
4.2. NETWORK DATA BASE

It is a network model in which one child can have multiple parents, i.e., multiple primary records.



Hierarchical Data Base: Hierarchy means different levels from lowest to highest. It is like a family tree.

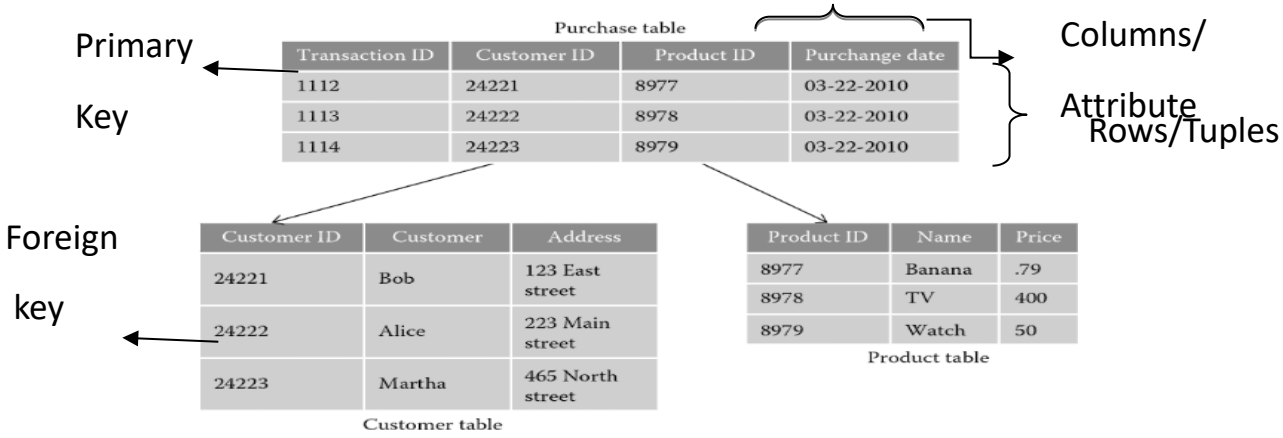
Data warehousing organizes and formats the data. Data mining retrieve or extract relevant data and predict the pattern by comparing data. There is no need to have data warehouse for mining purpose. Mining can be done with data bases. Data warehouse supports to mine the data well. Data warehouse has query optimization techniques for prediction.



4.3 RELATIONAL DATA BASE

Relational data base is organized as a table with rows and columns. Columns meant for attributes where rows for records. Table is also referred to as Relation.

Example:



4.4 ENTITY-RELATIONSHIP MODEL

It is an oldest semantic data model. It contains entities and relationships among them.

There are three types of relationships: one-to-one, many-to-one, and many-to-many.

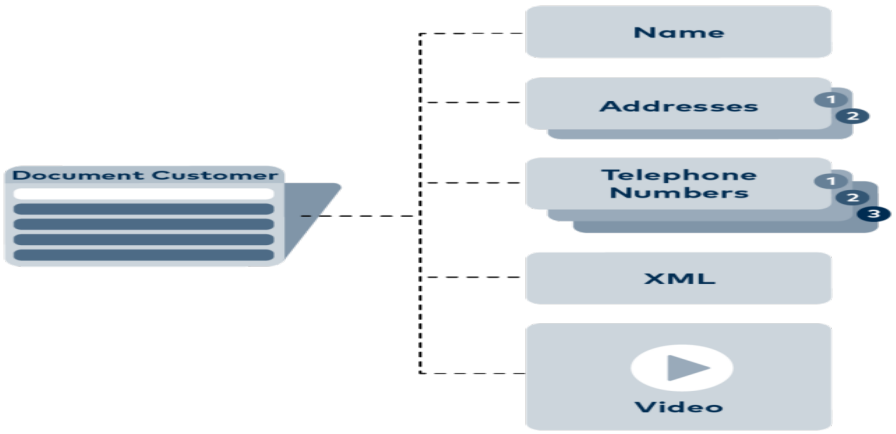
Examples:

- A Student studies a course – one –one
- 50 students study a course – many – one
- Many students study many courses – many – many

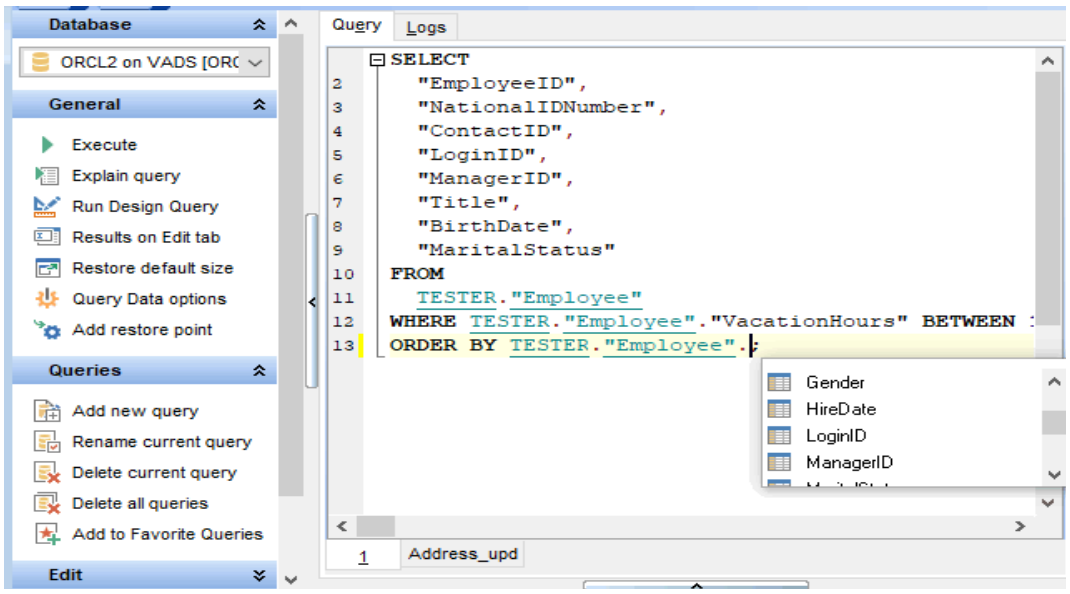
5. DATA BASES TODAY

RDBMS is basis for the entire data base currently used by the users in the whole world. Data base –today is collecting and storing huge amount of data from various and heterogeneous sources. Moreover, data bases now-a-days, managing current data. Data analysis is the primary goal of all the industries. By analyzing the data business make a good decision for the higher productivity and revenue gain. Historical data are available in data ware house. These data could be accessed by using queries. Example SQL, Structured Query Language Data mining techniques supports to understand the customer behavior, their priorities and preference, their timely need by segmenting the people into group. Management people may look into the customer database and may predict their wishes/like. Based on these, they may design new products or they implement new strategy or modify the strategies for delivering products as well as attract them.

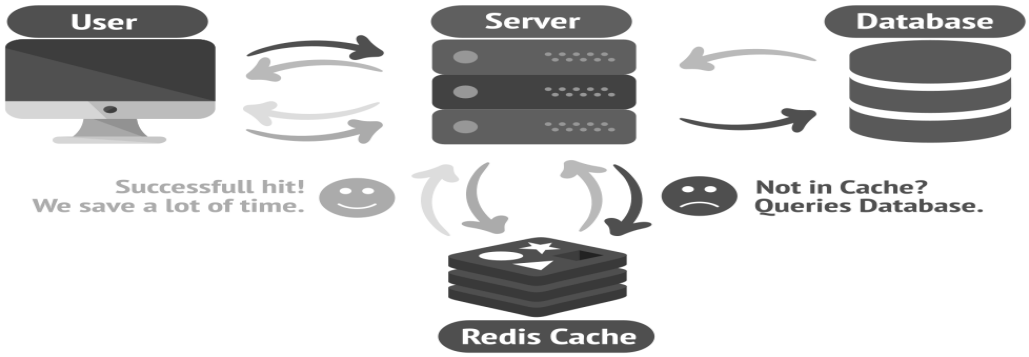
Business people need historical data for the comparison to take better decisions. Artificial Intelligence and machine learning also support business people to take better decision in current era. The data bases used the most by users are MySql, PostgreSQL, MS SQL Server, Oracle, Redis, Cassandra, MongoDB, DB2.



MongoDB –Stores data as document form and documents are turned in to collections.



Oracle Database – here the collection of data is known as unit. All in one solution for data mart, data lake, and batch



Redis

5.1 Data base for social science

There is a multidisciplinary bibliographic database that covers health, social services, psychology, sociology, economics, politics, race relations and education.

These data base may contain journals published in different countries. Some data bases are particularly useful for research at the intersections between social science and health information.

5.2 MACHINE LEARNING:

A machine that mimics cognitive human behavior is called an Artificial Intelligence machine. AI typically encompasses several disciplines based on the complexity of human behavior, such as planning, problem-solving, robots, NLP and machine learning, etc.

Machine Learning makes the computers to perform the tasks by learning with experience. Machine learning includes the techniques like neural networks, genetic algorithms and decision trees algorithms.

Machine Learning Database:

A large number of organizations around the world are currently using MLDB, a commonly known open-source database about machine learning. Using this system, you will be able to perform

all machine learning tasks. In this way, machines learn how to extract meaning and pattern from the data they collect by storing and analyzing it using this system.

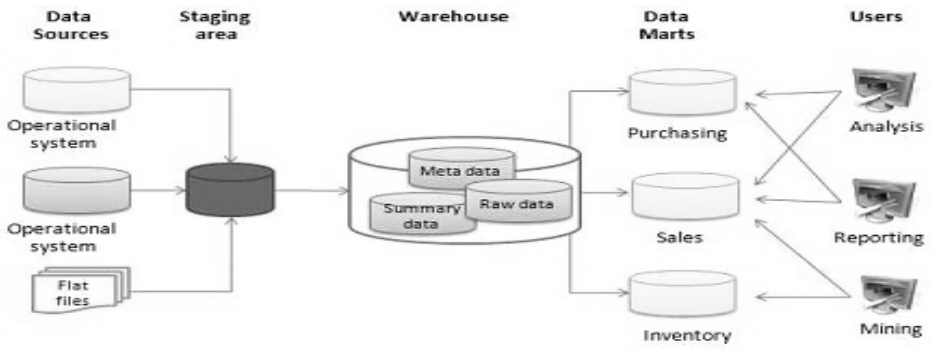
Example

Human language is analyzed using sentiment analysis models using machine learning. Some metrics have been used to identify the sentence or word type, i.e., whether the sentence is Positive, negative, and neutral sentiment.

Python provides support for a variety of databases due to its high-level nature. By implementing Python, we are able to connect to a specific database and run queries directly without having to write raw SQL in the terminal or shell. This database needs to be installed in our system.

Example Libraries: Tensorflow, SKLearn, pytorch

6. DATA WARE HOUSE



Data warehouse is simply a collection of data from various heterogeneous networks, platforms and databases and integrating data. For an example, Data warehouse can contain 2010-2011 passed out PG Student's data from Colleges, Universities, Social Media, e-mails and Employment office.

Historical data meant the data that happened in the past. It contains the data generated by the enterprises in the particular subject. It is subject oriented. These data can be analyzed by data scientists and analysts in the enterprises.

Data warehouses contain decision support technologies that can facilitate the use of the data. Executives benefit from these technologies since they can use the warehouse more quickly

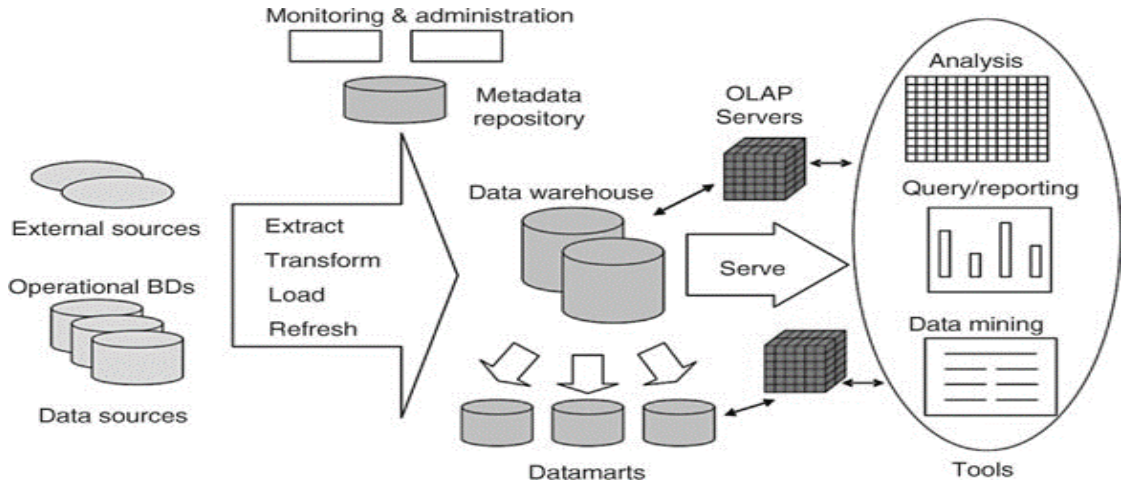
and efficiently. The warehouse stores data that can be gathered, analyzed, and used to make decisions.

We may retrieve answers for some of the following questions.

- ✓ What is the result of each department during corona period in college?
- ✓ Types of grievances received from the stack holders and parents.
- ✓ How often upgrade the software and hardware of the computers

6.1 TECHNOLOGIES OF DATA WAREHOUSE:

- Data Model
- Security
- Integration of data
- Distributed
- Indexing and methods of Access
- Admin
- High performance
- Data about data
- Query



6.2 OPERATIONS

Data warehouse is for specific subject and contains historical, past data. So it is time oriented. As data warehouse contains past data which cannot be changed. Once write or upload the data, data would be in read only mode. Data is integrated from various sources. These characteristics of Data warehouse can be described by the single terms like, Subject oriented, Time variant, non-volatile and integrated.

Data can be uploaded from currently operating data base or operational data. Data using at real time is operational data. Bank transactions doing at current are known as operational data. Example data base is given in the following:

Forecast Database:

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service
Current Location: Elev: 1518 ft. Lat: 33.4191° N Lon: -111.6444° W
Station: **EAST MESA, AZ US USC00022782**

Record of Climatological Observations
These data are quality controlled and may not be identical to the original observations.
Generated on 05/03/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 1700 Observation Time Precipitation: 1700

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time			4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2016	01	01	65	30	60	0.00												
2016	01	02	71	47	62	0.00												
2016	01	03	73	51	64	0.00												
2016	01	04	64	50	57	0.13												
2016	01	05	59	48	54	0.26												
2016	01	06	58	47	55	0.71												
2016	01	07	55	45	48	0.67												
2016	01	08	52	40	50	0.19												
2016	01	09	57	34	53	0.00												
2016	01	10	55	35	52	0.00												
2016	01	11	60	35	54	0.00												
2016	01	12	65	31	60	0.00												
2016	01	13	67	33	60	0.00												
2016	01	14	63	33	59	0.00												
2016	01	15	60	37	55	0.00												
2016	01	16	61	33	56	0.00												
2016	01	17	66	35	60	0.00												
2016	01	18	70	37	62	0.00												
2016	01	19	67	35	64	0.00												
2016	01	20	68	39	65	0.00												

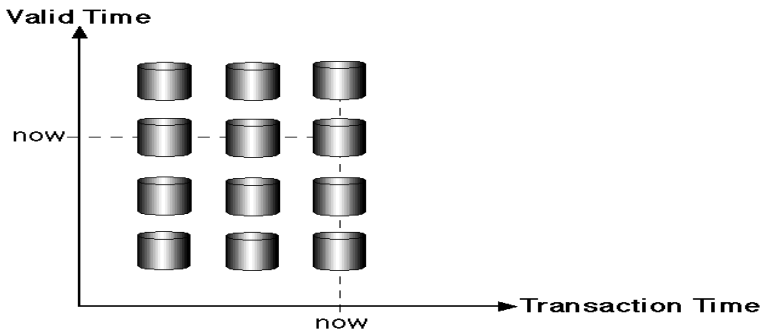
The above is Manual Data base for weather fore cast DATABASE - 1

	A	B	C	D	E	F	G	H	J	NH	NI	NJ	NK	NL
1	Zip Code	City	State	Historical Avg Monthly Temperature (in °F)	Jan 1988	Feb 1988	Mar 1988	Apr 1988	• • •	Aug 2018	Sep 2018	Oct 2018	Nov 2018	Dec 2018
2	01366	Petersham	MA	49.61	21.58	30.88	33.93	42.75		75.22	66.61	50.29	36.73	30.76
3	02196	Boston	MA	52.25	28.31	38.70	37.02	45.57		76.68	67.06	52.25	41.20	35.31
4	53132	Franklin	WI	45.73	19.58	22.53	32.58	35.96		71.17	63.95	47.39	30.16	28.27
5	04465	Cary	ME	40.51	12.74	19.24	28.67	36.48		67.33	57.04	40.26	27.52	15.30
6	12083	Greenville	NY	46.63	19.02	29.80	31.12	39.02		70.95	63.01	48.00	34.47	28.92
7	24945	Greenville	WV	53.76	27.32	41.23	37.99	48.61		73.11	71.62	56.08	40.62	36.05
8	76631	Bynum	TX	66.67	41.95	50.25	62.06	60.64		85.46	79.07	68.02	52.81	49.12
9	76653	Kosse	TX	65.41	42.22	50.65	61.54	60.30		83.75	77.70	66.60	51.60	48.43
10	25103	Hansford	WV	56.33	29.39	43.05	41.31	50.83		75.65	74.16	59.13	42.93	39.85
11	94067	San Bruno	CA	59.66	52.52	52.56	53.91	57.83		67.66	64.60	62.80	56.05	50.54
12	21289	Baltimore	MD	56.27	31.05	40.87	39.87	51.06		77.79	72.93	59.22	43.56	39.45
13	22185	Vienna	VA	54.32	29.70	39.36	38.16	49.93		75.33	70.45	57.22	41.40	37.53

DATA BASE - 2

This is Digital Forecast Database. These data bases are used at the time of emergency or for the prediction. Public can also be used. National Weather Service is generating forecast data.

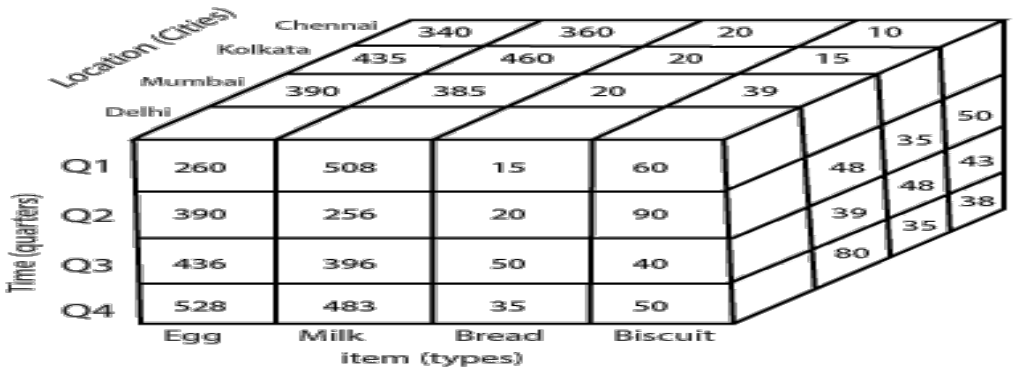
National Centers for Environmental Prediction provides real time data other than historical data. Data warehouse for weather supports to identify weather conditions of each season so that it could be useful for taking major decision particularly for agriculture and other major plans.



TEMPORAL DATABASE

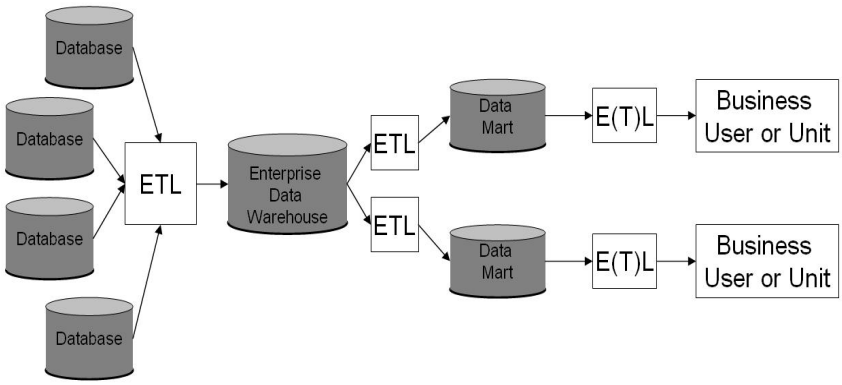
Rows or records are related with time

Data warehouse supports to view the database in a different view by different applications. Data can be viewed in a Multidimensional method.



6.3 ETL

The name implies Extract, Transform and Load. Data are to be extracted from the various heterogeneous sources. Data are to be transformed in the needed format and could be loaded to data warehouse. These three stages are iterative.



Extract

Transform

Load

Data warehouse has the repository of data, which supports Business Intelligence. Data ware house is Online Analytical Processing system i.e., query answering system.

Example: Weather forecasting, sales forecasting and Trend Analysis

While Online Transaction Processing System deals day to day transactions.

Example: Banking

On-line Transactional Processing contains operational data and On Line Analytical Processing contains informational data.

Data warehouse is of three types.

Enterprise Data warehouse

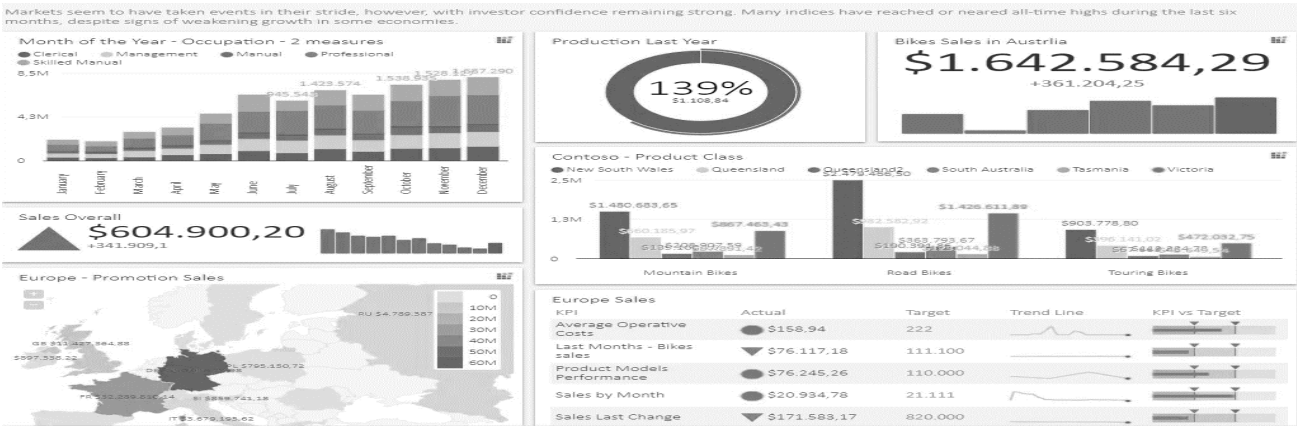
Operational Data Store

Data Mart.

The subset of data warehouse is data marts which maintain data for a specific unit, region or department. These data would be stored in the Operational Database and these will be received by Enterprise data warehouse.

6.4 OLAP TOOLS

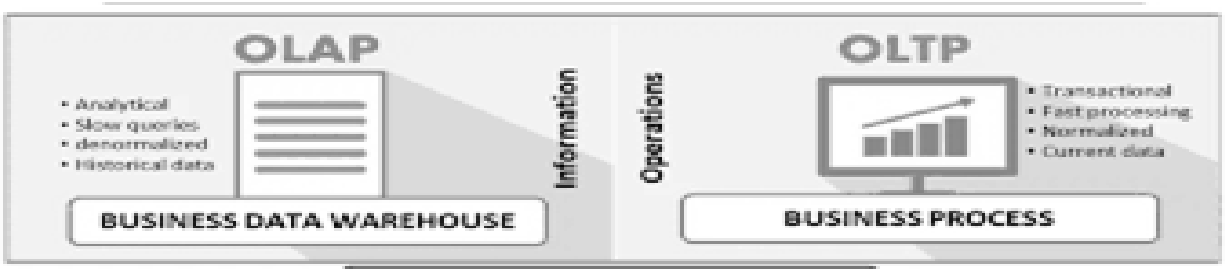
OLAP 3 types of tools ROLP, MOLAP and HOLAP.



The above figure describes reporting and analysis of sales with the help of OLAP tool.

OLAP tools is doing analysis in multi dimension at rapid speed on the huge volume of data available in data warehouse or data mart or any other data store.

OLTP does append, delete, insert and update actions. Generally, Finance, sales and Customer Relationship Management domains use the OLTP.



6.5 Data warehouse in real-world today:

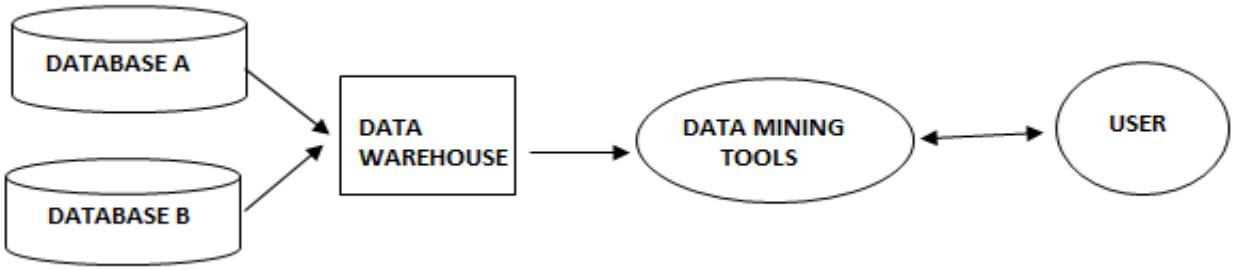
Amazon Redshift –data warehouse services -a cloud based

IBM Db2 warehouse – a large scale warehousing

Google BigQuery – Bigdata Analytics – a cloud based.

6.6 Data Warehousing with Data Mining

Data warehousing organizes and formats the data. Data mining retrieve or extract relevant data and predict the pattern by comparing data. There is no need to have data warehouse for mining purpose. Mining can be done with data bases. Data warehouse supports to mine the data well. Data warehouse has query optimization techniques for prediction.



6.7 Business Intelligence:

By bridging the gap between data and decision-making, Power BI stands out from all the data visualization tools on the market. As a result of Microsoft Power BI, businesses have established a data-driven culture and transformed raw data into interactive dashboards and rich visualizations

that make it easier to make actionable decisions. This has ushered in a paradigm shift in Business Intelligence (BI) and Data Analytics.

Tasks of BI

- ✓ Mining
- ✓ Benchmarking,
- ✓ Process Analysis
- ✓ Descriptive Analytics.

Business Intelligence (BI) helps businesses achieve better results and increase their income through insights into strategic decisions.

Business Intelligence tools (BI Tools) assist companies in collecting, monitoring, analyzing, and predicting future business conditions by analyzing all of their big data centrally.

In **Business Intelligence reports, tabular data arrays can be transformed into digestible information, allowing you to analyze, draw conclusions, and make important business decisions using it.** Users should be able to interact with reports, sort them, conditionally format them, and drill down from each one.

7 Conclusion

This article gave an overview of conventional databases to current databases with data warehousing, data mining technologies. It also outlined Machine learning concepts. The sections 1 to 4 discussed the reason for storing data with various devices available in the computer field. This article described about the various data base systems with MLDB. The sections 5 to 6 gave an overview on Data warehousing, technologies, about data mining and Business Intelligence with example pictures. Now-a-days organizations work with real time data. Real time data contains time dimension (historical data). The wearable devices track and collect the human medical data like blood pressure, sugar and etc. The challenge is that for each and every data versions are needed to be stored separately. Faster Queries processing is required. These challenges are to be addressed and these are going on research area.

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A STUDY ON SUSTAINABLE MARKETING THROUGH SOCIAL AND ENVIRONMENTALLY RESPONSIBLE MARKETING ACTIVITIES IN THE RESTAURANTS IN UAE.

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Assistant Professor, Department of Marketing,
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Abstract

This paper investigates into the measures taken by the fast food restaurants in the UAE to promote sustainable marketing through socially and environmentally responsible marketing activities and analyse the extent to which these fast food restaurants have adopted sustainable marketing principles. The world population is facing problems like environmental pollution, increased carbon footprint, and unethical business practices. One of the causes of this pathetic state of affairs are the mushrooming fast-food restaurants which have contributed largely to the environmental footprint due to its wasteful packaging, inefficient waste disposal, and inefficient use of energy in its outlets. It was observed that the majority of the international fast food restaurants were implementing the sustainable marketing principles to a great extent. Though, a few small local fast food restaurants were aware of the sustainable marketing principles, however, they were finding it difficult to implement them in practice as these local restaurants were small business firms with low financial returns.

Key words: Sustainability, Carbon Footprint, Restaurant, Environmental Pollution.

1. INTRODUCTION

Responsible marketers take pains to understand the genuine and changing needs of the consumers and respond with goods and services that create value for the customers and capture value in return. A few companies use unethical marketing practices to grind their own axe rather than serving the consumers' interests. Therefore, responsible marketers must take into account if their market offerings or market actions are sustainable in future. Sustainability marketing calls for socially and environmentally responsible actions that meet the current needs of the consumers and businesses

while also preserving or enhancing the ability of future generations to meet their needs [1]. Sustainability is defined on the basis of a 'Triple Bottom Line' perspective i.e., people, planet, and profit [2]. The term sustainability was coined by The Brundtland Report in 1987. The term sustainability does not cover the environmental and social issues alone, but is also bound by ethical and moral issues under the broad umbrella of the principles of sustainability marketing. Therefore the purpose of this paper is to investigate the extent to which the fast food restaurants in Ajman abide by the principles of sustainability marketing. Every company should strive to implement the principles of sustainable marketing viz. consumer-oriented marketing, customer value marketing, innovative marketing, sense-of-mission marketing, and societal marketing.

2. SCOPE AND IMPORTANCE OF THE STUDY

This study assumes paramount importance and a wide scope in fetching benefits to companies like fast food restaurants, cafeterias, and other food and beverage firms by highlighting the importance of implementing sustainable marketing principles in a proactive fashion which in turn will bring value to both the customers and also to the society at large. It will help save the planet from environmental pollution, increased carbon footprint, and unethical business practices.

3. RESEARCH PROBLEM

The research problem of the study is to investigate into the measures taken by the fast food restaurants in the UAE to promote sustainable marketing through socially and environmentally responsible marketing activities and analyze the extent to which the international and local fast food restaurants have adopted sustainable marketing principles.

4. RESEARCH QUESTIONS

1. To what extent have the fast food restaurants in the UAE implemented the principles of sustainable marketing?
2. To find out if there is any significant difference in the implementation of sustainable marketing principles between the international and local fast food restaurants in the UAE.

5. REVIEW OF LITERATURE

Sustainable marketing has been studied across different perspectives. Many scientists have studied and deliberated on environmental and social issues. But there has not been enough study about the principles of sustainable marketing viz. principles of consumer-oriented marketing, customer-value marketing, innovative marketing, sense-of-mission marketing, and societal marketing. The previous studies have only evaluated and analysed the green or environmental marketing strategies. Therefore, there is an urgent need to throw light on the principles of sustainable marketing which will address issues related to environmental, social and ethical goals and objectives in an integrated fashion. Therefore, this paper focuses on the principles of sustainable marketing.

1. Andrea Bedek (2012) conducted a study on the topic 'Sustainable Marketing Strategies: Examples of Best Practices in Croatia'. The objective of this paper was to examine best practices among Croatian companies that distinct themselves from others by implementing sustainability in their everyday business practices and provide managerial suggestions that can help in sustainability implementation. The author concludes saying that quite often companies are guided with short term goals and by the desire to achieve immediate profit and companies usually neglect activities that have positive impact on environment and society.

2. Kumar, Vinod, Zillur Rahman, A.A. Kazmi & Praveen Goyal (2012) collectively conducted a study on the topic 'Evolution of Sustainability as Marketing Strategy: Beginning of New Era'. The objective of this paper was to review and understand concepts of marketing strategy and sustainability. They concluded saying that reassessment of the social issues resulted in evolution of green or environmental issues in marketing strategy and now the sustainability in marketing strategy has become the focus of attention of the researchers

3. Marek Seretny (2016) of American University in the Emirates published an article titled 'Marketing as an Agent of Sustainable Change'. The purpose of the paper was to highlight the vital role that marketing plays in achieving behavioural change among customers as well as emphasize the changes in marketing practice that are required to help business adopt more sustainable practices. He concluded that sustainable marketing promotes credibility and responsibility, leading

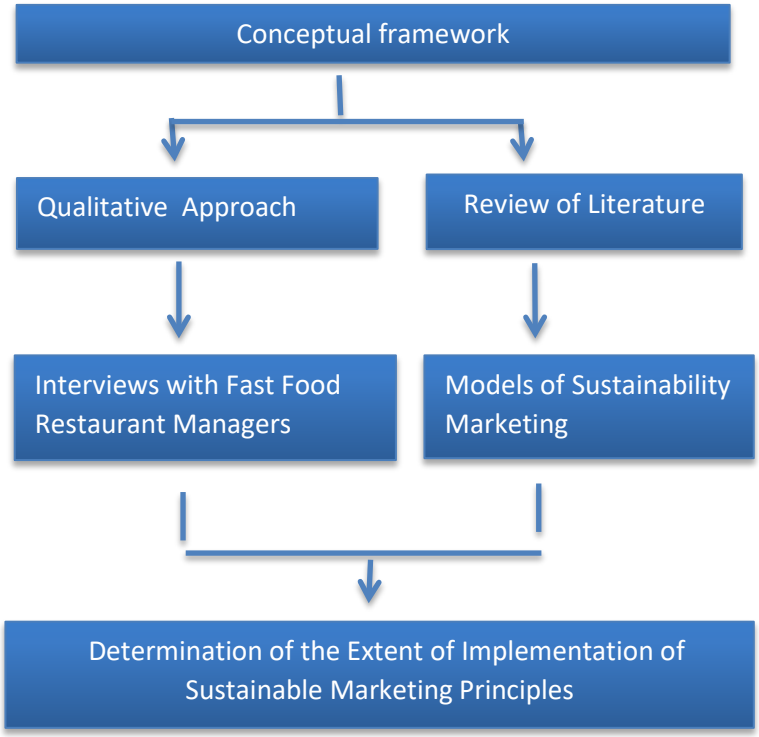
to better consumption, better relationships, and more responsible business, thus influencing the creation of a better world.

4. Mark Peterson et al. (2020) conducted a study on the topic 'Sustainable Marketing and Consumer Support for Sustainable Business'. The objective of this paper was to examine how consumer values and consumer perceptions of the marketplace practices of firms influence consumer support for those firms pursuing sustainable business practices. The authors conclude that 1) consumers' nature-based values have the most positive influence on consumers' support for sustainable businesses, 2) followed by attitude toward firm benevolence, and 3) concern about the ethicality of firms. Valuing social justice and recognizing business' contribution to one's own quality of life did not register as being influential on consumers' support for sustainable businesses.

5. Pierre Mc Donagh et al. (2021) conducted a collective study on 'Sustainability Marketing Research: Past, Present and Future'. This paper provides a synthesis and critical assessment of the sustainability marketing literature, from the period 1998–2013, building on a previous assessment from 1971 to 1998. It details research within major marketing journals and critically assesses this research in relation to the on-going conversation which focuses on marketing's relationship with the natural environment. Differences in the content and depth of sustainability coverage in marketing journals are considered. Potential avenues for future sustainability marketing research are proposed, with a particular call for theoretical and managerial reflections which tackle broader systemic and institutional issues within the discipline.

6. CONCEPTUAL FRAMEWORK

The conceptual framework has been developed with the help of major factors that have been derived from the review of literature and qualitative data. The framework consists of dependent and independent variables. The research aims to identify those principles of sustainability practices that are implemented in the fast food restaurants in the UAE. The below conceptual framework summarizes the aim of this research in which it intends to study the principles of sustainability practices that are implemented among the fast food restaurants in the UAE.



The following research hypothesis will be tested.

7. HYPOTHESES OF THE STUDY

H0: There is no significant relationship between the practices of sustainable marketing principles of the international and local fast food restaurants in the UAE.

H1: There is a significant relationship between the practices of sustainable marketing principles of the international and local fast food restaurants in the UAE.

8. METHODOLOGY

The researcher has adopted a descriptive research design to investigate into the research questions by conducting both quantitative and qualitative research among the fast food restaurants in the UAE. The researcher has developed a conceptual framework with the help of major sustainable marketing factors that will be derived from the review of literature and qualitative data. The conceptual

framework consists of dependent and independent variables. A research hypothesis has been evolved and clearly stated and is subject to testing.

8.1 Sample frame

The sample frame of the study comprises the international fast food chains and the local/regional fast food restaurants in the UAE.

8.2 Sampling Technique

A simple random sampling technique has been used to choose the sample units of fast food restaurants from the sample frame mentioned above.

8.3 Sample size

The sample size of the study undertaken was '60' **sampling units** from the above sample frame. The sampling units referred to here are the 60 fast food restaurants in the UAE both International and local

8.4 Tools and Techniques used for Data Collection

The study was conducted using both primary and secondary data. The primary data were collected using interview schedules. The interview schedule was pre-tested on a small trial group comprising 10 respondents to ensure the validity and reliability of the research instrument. In response to the pilot study, necessary modifications were made in the interview schedule and the modified instrument was used for the collection of primary data. To fulfil the objectives of the study, the researcher has used both criterion (dependent) and predictor (independent) variables in the study. The primary data collected were consolidated to a Microsoft Excel spreadsheet for conducting the data analysis. The consolidated data were finally analysed by classifying, tabulating and applying statistical tools such as percentage analysis, coefficient of correlation, and Chi-square test.

8.5 Limitations of the study:

This study is not free from limitations. Following are the limitations that the researcher could find in the study:

1. Due to time, money, and energy constraints the researcher had to limit the sample size of the study to a small number.
2. A factor analysis could have also been adopted by the researcher so that the study highlights the important factors that will contribute in the achievement of sustainability marketing.

9. DATA ANALYSIS AND INTERPRETATION

After collecting the primary data through the interview schedules the researcher has used the percentage analysis and the Chi-square test for analyzing the data. The researcher was interested to know the number of respondents who recycled the waste, especially the food waste and the packaging waste. Majority of the respondents said that they don't recycle the food waste or packaging waste in their companies, but they either dump them in landfills or burn them in incinerators or dispose them in the municipality bins. The following Table No.1 highlights the percentage of respondents who dispose the food and packaging waste in the fast food restaurants.

10. FIGURES AND TABLES

Table No.1

Disposal of Food and Packaging Waste formed in Fast Food Restaurants

Opinion	Respondents	%Percentage
Dump them in landfills	15	25
Burn them in incinerators	6	10
Dispose them in municipality bins	39	65
Others	0	0
Total	60	100

Source: Primary Data

The above table No.1 highlights the fact that 65% of the respondents dispose the food and packaging waste in the municipality bins provided to them by the Municipality, 25 % of the respondents dump the waste in landfills and 10% burn them in incinerators. We could thus conclude by saying that the

majority of the fast food restaurants dispose their food and packaging waste in municipality bins provided by the municipality and are aware of reducing environmental pollution and improving sustainability marketing principles.

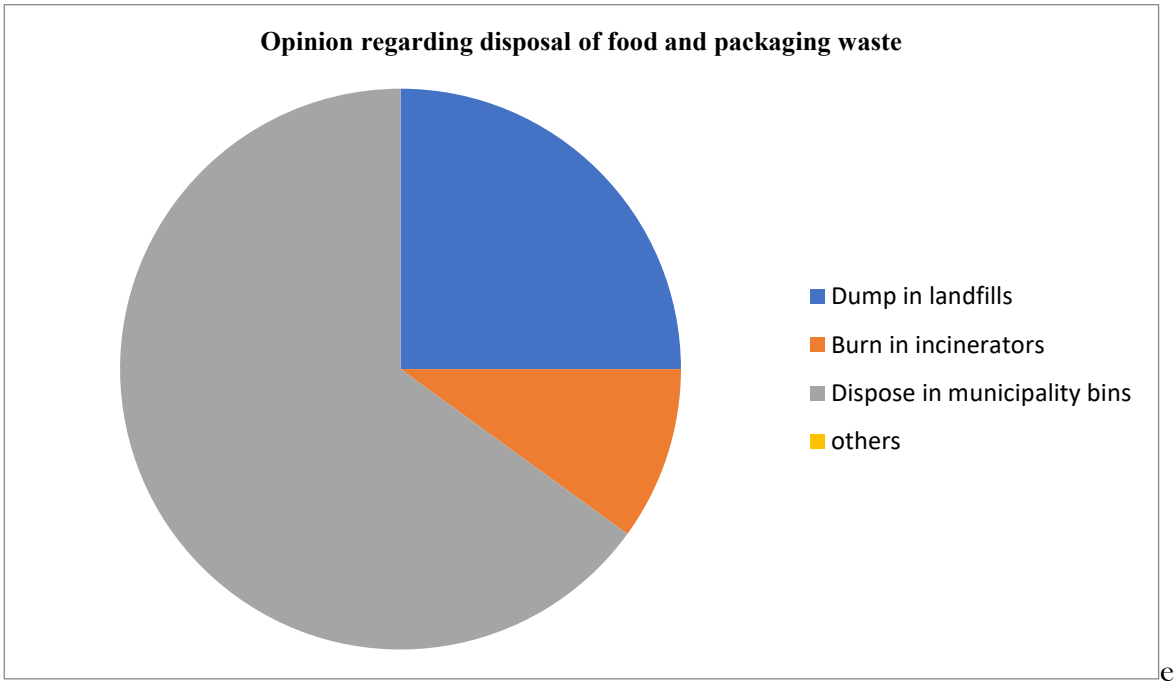


Figure 1: Disposal of Food and Packaging Waste in Fast Food Restaurants

Use of Energy –Efficient Lighting System

The researcher was interested to find out if the fast food restaurants were using energy-efficient lighting systems in their restaurants. The following Table No.2 shows its results.

Table No.2

Use of energy-efficient lighting system

Type of lighting system	Usage of respondents	Percentage
Incandescent light bulbs	12	20
LED lamps	18	30
CFL lamps	30	50
Others	0	100

Source: Primary Data

Table No.2 throws light on the fact that 50% of the fast food restaurants use CFL lamps, 30 % of them use LED lamps, and 20 % of them use incandescent bulbs in their restaurants. Hence, majority of the fast food restaurants use CFL lamps that are energy-efficient and energy saving causing less carbon footprint in the society and thus preventing greenhouse gas emissions.

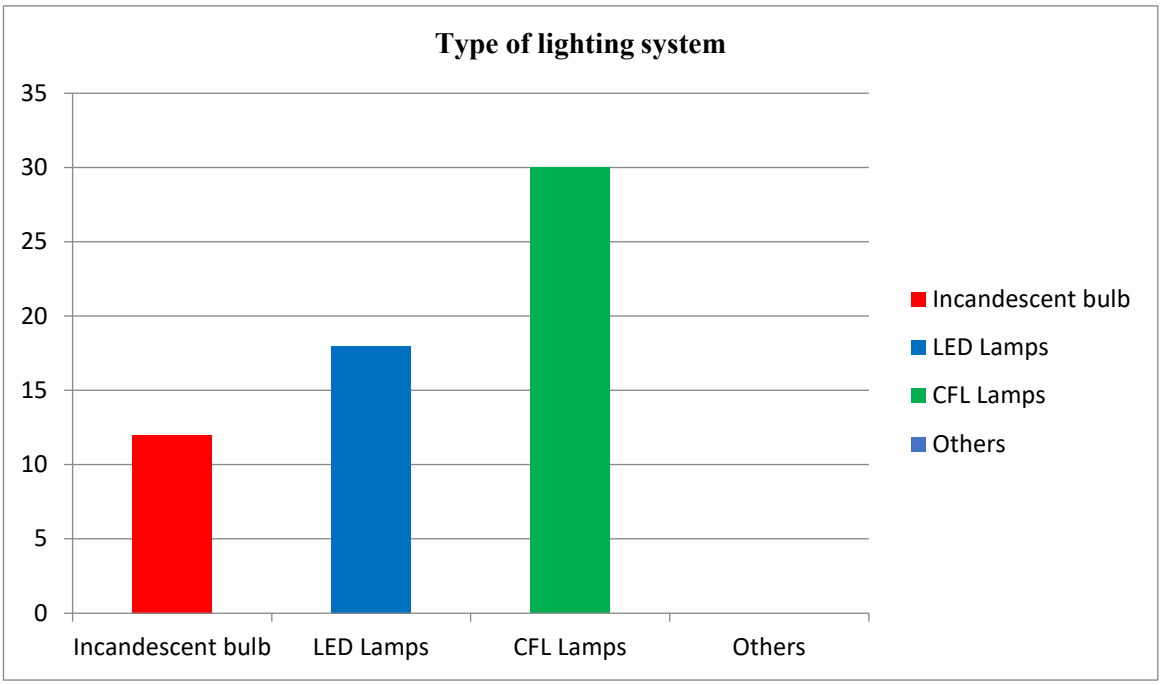


Figure 1 Type of Lighting System used in Fast food Restaurants

Food items on the menu 'below 400 calories' category

The researcher was investigating to know if the fast food restaurants were providing food to its customers in their restaurants in which its menu had food items 'below 400 calories'. The food items 'below 400 calories' was said to be healthier and environmentally sustainable. The following Table No.3 highlights its results.

Table No.3

Food items on the menu below 400 calories

Percentage of Food Items on the menu having less than 400 calories	Respondents	Percentage
Less than 50%	9	15
50% to 74%	21	35
75% to 89%	18	30
90% to 99%	12	20
Total	60	100

Source: Primary Data

Table No.3 throws light on the fact that there were only a few restaurants (20%) that offered food items which were below 400 calories (i.e. 90% to 99% of food items were below 400 calories), 35% of the fast food restaurants offered food items which were 50 % to 74% 'below 400 calories'. Hence, majority of the fast food restaurants can encourage responsible consumption among the customers by offering a healthy menu by diversifying into salads, fruits, grilled chicken, low-fat milk, and other nutritious food items thereby reducing carbon footprint in the society and encouraging environmental and social sustainability.

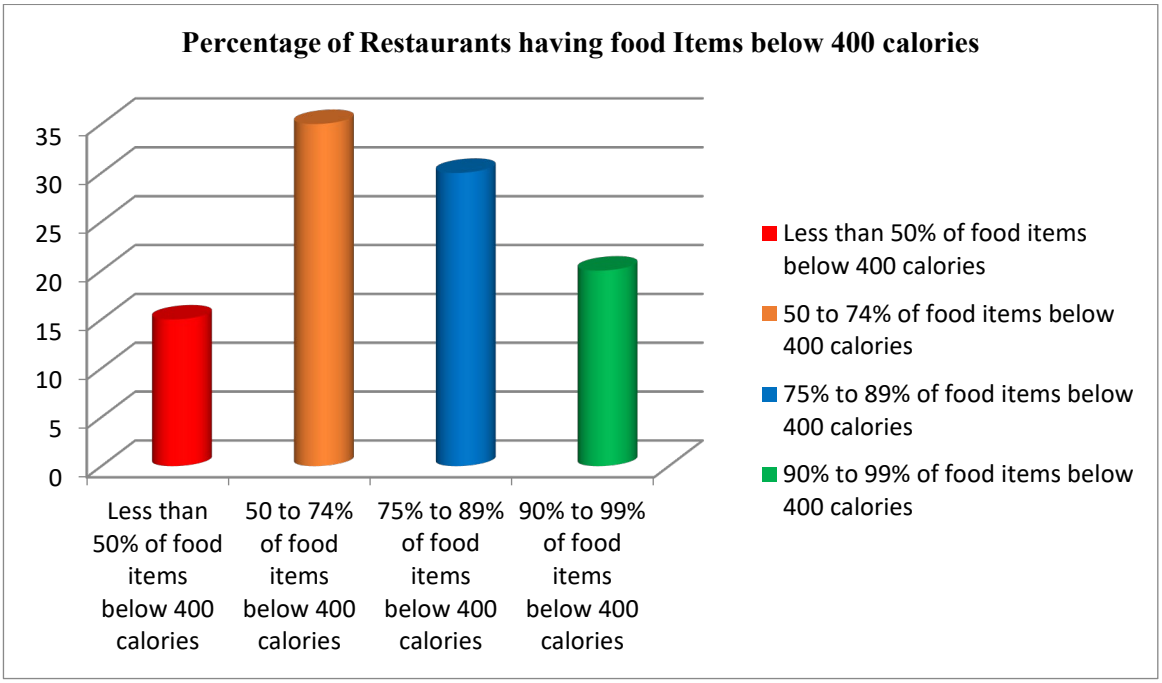


Figure 2 Percentage of restaurants having food items below 400 calories

Chi-square analysis

A Chi-square statistic was conducted by the researcher to test the statistical significance of the observed association in the cross-tabulation of the study. The researcher wanted to find out if there was a significant difference in the practices of sustainability marketing principles of the international and local fast food restaurants in the UAE. The researcher has formulated the null and alternative hypotheses of the study as follows.

H0: There is no significant difference between the practices of sustainability marketing principles of the international and local fast food restaurants in the UAE.

H1: There is a significant difference between the practices of sustainability marketing principles of the international and local fast food restaurants in the UAE.

Table No.4

Opinion of Fast Food Restaurants towards Sustainable Marketing Principles

Type of Restaurant	Opinion					Total
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	
International Fast Food Restaurant	8	6	6	5	5	30
Local Fast Food Restaurant	6	6	6	7	5	30
Total	14	12	12	12	10	60

Source: Primary Data

The formula for the Chi-square statistic is as follows:

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

Where: χ^2 is the chi square statistic.
Σ = summation symbol.
O = Number observed.
E = Number expected.

The observed frequencies and the expected frequencies were computed. The researcher now substituted these values in the Chi-square test formula and computed the calculated value of the Chi-Square test statistic.

The calculated value Chi square was: 0.619

The degrees of freedom= (m-1)(n-1), where m=number of rows and n= number of columns

The degrees of freedom=(2-1)(5-1)= 4

The level of significance=0.05

To determine whether a systematic association exists, the probability of obtaining a value of chi-square as large as or larger than the one calculated from the cross-tabulation is estimated. Now, looking at the chi-square tables, at 0.05 level of significance with 4 degrees of freedom, the critical value of the chi-square statistic is 9.488.

The calculated value being lesser than the critical value, the null hypothesis of 'no association' cannot be rejected. This indicates that the association is not statistically significant at the 0.05 level. Note that this lack of significance is mainly due to the small sample size (60).If, instead, the sample size were large, it can be seen that the value of the chi-square statistic would be large and would be significant at the 0.05 level of significance.

Since the calculated value is less than the critical value, we do not reject the null hypothesis. Thus we can conclude saying that there is no significant difference between the practices of sustainability marketing principles of the international and local fast food restaurants in the UAE.

Correlation Analysis

The correlation analysis intends to find out the strength of the linear relationship between two metric variables. In this study the researcher investigates into how strong is the relationship between 'readiness to implement sustainability marketing principles' *(dependent variable)* and the 'awareness of sustainability marketing principles' *(independent variable)*. The readiness was measured on an 11-point Likert scale. The awareness was also measured on an 11-point Likert scale. The researcher intends to explain this relationship by testing it among 12 respondents (fast food restaurants). The researcher has taken a small number of observations to make the calculations easier and simpler due to time constraints.

The Pearson's coefficient of correlation 'r' was calculated between the variables and found to be 0.9267.

As r=0.9267, a value close to 1.0, the respondent's readiness to implement the sustainability marketing principles is strongly associated with their awareness of the sustainability marketing principles. Furthermore, a positive sign of r implies a positive relationship; more the awareness of sustainability marketing principles, more will be the readiness to implement these principles.

The product moment correlation is then calculated for the population rather than a sample which is denoted by ṕ (rho).The statistical significance of the relationship between the above two variables measured by using 'r' are then tested.

The null hypothesis H0: ṕ=0

The alternative hypothesis H1: ṕ≠0

The test statistic is $t= r[n-2/1-r^2]^{1/2}$ which has a t distribution with n-2 degrees of freedom.

$t=0.9267[12-2/1-0.9361^2]^{1/2} = 8.329$

Looking at the t distribution table, with 12-2=10 degrees of freedom and at 0.05 level of significance, the critical value of t for a two-tailed test is 2.228.

Since the calculated value is greater than the critical value, the null hypothesis, i.e 'there is no relationship between the variables', is rejected. The positive sign of 'r' indicates that the respondent's readiness to implement the sustainability marketing principles in the fast food restaurants in the UAE is strongly associated with their awareness of the sustainability marketing principles and the high value of r indicates that this relationship is strong. Thereby, the research hypothesis has been validated.

The implication is that if the government of the UAE creates a strong awareness campaign about the sustainability marketing principles in the fast food industry then there would be a strong readiness to implement these sustainability marketing principles in the fast food restaurants in the UAE, thereby reducing carbon footprint and improving socially and environmentally responsible consumption among the customers.

CONCLUSION

This study attempts to investigate the extent to which the fast food restaurants in the UAE, both international and local, have been able to implement the principles of sustainable marketing. After a thorough analysis of the data collected from the 60 respondents through interview schedules, the researcher concluded that majority of the international fast food restaurants were implementing the sustainable marketing principles to a large extent. Though, a few small local fast food restaurants were aware of the sustainable marketing principles, yet, they were finding it difficult to implement them in practice. A few local fast food restaurants were finding it difficult to practice the principle of 'sense-of-mission marketing' and 'societal marketing' as these local restaurants were small business firms with low financial returns. It was noticed that there was no significant difference in the

implementation of sustainable marketing principles between the international and local fast food restaurants in the UAE.

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ROLE OF AI IN FITNESS

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"Reliance Chairman Mukesh Ambani on Monday (28/08/23) said that his company JIO will create AI models tuned for Indian Users. JIO promises AI to everyone, everywhere. And we shall deliver. "

INTRODUCTION

In every decade of women's life, they must take care of their fitness, mental and physical health. Women are special creation of God with extra fittings. They may face different types of health issues, mood swings, muscle aches, weight modifications and skin problems.

The secret to success in life lies in a healthy person. Having good and wholesome health will help to achieve success in life.

It is believed by many people that having a healthy and fit body will enable them to live a happy and active life with no major physical and mental issues. Health indicates the inner peace also.

Healthy living involves protecting ourselves from unwanted substances, doing regular exercises, consuming the right amount of food, sound sleep. Particularly women must take care of their mind and body by having awareness.

A survey conducted by the WHO showed that many females and teenage girls fail to meet their dietary and physical needs. Due to this many women suffered from iron deficiency.

A family's growth and wellness depend on women. Nowadays, women are participating actively in all sorts of activities. Technology rules the world while at the same time women are

doing many things over internet. This chapter discusses about the Artificial Intelligence in Fitness.

Our lives get busier, and we barely have time to practice on a regular basis. The challenge of maintaining a healthy diet is even greater! Women may have a lot of confusions: what diet works best? How should we choose a plan? All of these seem a bit scary. There's no need to worry; artificial intelligence has got you covered!

Artificial Intelligence

AI makes the computer or Robo think intelligently and act accordingly. Sometime AI takes important decisions in business also.

AI TRAINERS

Personal trainers with artificial intelligence would already be familiar with this new concept, but amateurs would also be intrigued. AI is doing wonders in collecting data accurately. Smart wearable helps to track fitness.

AI personal trainers behave like humans. They advise properly and accurately.

Women may interact with AI bots throughout their practice. It guides thoroughly. AI Trainers apps are interesting and motivational.

Computer Vision:

Computer Vision makes systems to retrieve the data from digital images and videos. So, computer vision supports in evaluating poses of human being. There are three analytical Methods.

1. Skeleton Modeling,

2. Contours Modeling

3. Modeling Volume.

Example: There is a **ZENIA app** for **Yoga Practice**

Clothes contain sensors which might be worn and it would assist correcting bio mechanic actions. The world is revolutionized highly.

Wearable Pants

Wearable pants are available for the fitness purpose.

Example:Asensei and Wearable X

Wearable X pants consist of two sensors. These have built-in speed meters and monitors. These pants produce vibrations. Measurement position are X axes, Y axes and Z axes with respect to earth's gravitational fields.

Microcontrollers

Microcontroller does the crucial task which delivers the data to Smartphone or any other device Bluetooth connected.

Microcontrollers are a battery-driven microcontroller delivers data to an app on a nearby Smartphone or Bluetooth-powered device over a Bluetooth wired connection. The batteries may be recharged through a micro-USB connection and are lithium polymers.

Diet Planning:

Diet is the most import part for one's health along with fitness. AI supports by predicting diet and suggest the wonder diet plans. People may choose vegetarian, non-vegetarian, protein rich food, carbohydrates and as their wish. AI produces the diet chart according to the need.

We have a number of AI powered applications for fitness and diet.

Example: Smart Wrist, Intelligent Foot wears , Yoga Suits/pants

CONCLUSION

Women or men can maintain their fitness and, in some way, achieve their goals. But in the future, AI apps will be used and people will enjoy with its benefits. AI is reliable for evaluating out fitness and modifies the suggestions and diets according to the daily needs. Income also be raised when the AI feature integrated with the personalized apps in fitness centers, and for physiotherapists. Physiotherapists may also take accurate prediction, make good decisions and suggest an effective fitness formula to the clients.

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Employee Retention : Invest more get more

Suresh Ramdas Suvarna, Ph.D.

Introduction:

Contemporary employees are cognizant of the contribution they make to an organization. They are consequently more likely to seek employment elsewhere if they perceive that their current employer is failing to capitalize on their abilities. In an era when many businesses struggle to retain talent, employers must invest in and provide active support for the growth and development of their employees to prevent them from seeking employment elsewhere.

Listed below are five advantages of investing in employee training programs for your organization, as well as implementation advice for said programs.

Considerations for Organizations to Make in Employee Training

Employee training offers numerous advantages for both employees and employers, including increased revenue, cost savings, and enhanced employee morale and talent retention. Employers who invest in employee training can anticipate the following advantages:

1. It facilitates the attraction and retention of exceptional talent.

Staff retention and the recruiting process could be considerably improved by implementing employee development programs that provide training for employees. To begin with, employees perceive training initiatives as a means of honing their skills, predicated on the notion that these programs impart knowledge. According to one study, 92% of employees whose participation in a training program was well-designed observed an increase in engagement.

By providing sponsorship for sales training programs, for example, your sales personnel can acquire fresh or supplementary knowledge that can enhance their selling capabilities, as well as cultivate their self-assurance and favorable work demeanor. Undoubtedly, you're standing as an employer who demonstrates concern for the professional growth of your staff will be bolstered. As you assist your staff in developing their abilities and achieving personal development, you are cultivating a talent pool of gold that will provide your company with a competitive advantage in the market.

We estimate that hiring a new employee cost an organization three to four times the salary of the position. Through the implementation of training programs that invest in current staff, businesses can ultimately reduce employee turnover and avoid recruiting expenses.

2. It is capable of determining which personnel merit promotion.

A reservoir of potential future promotion candidates may consist of trained personnel who have amassed specific levels of expertise through their tenure. When an organization possesses an established talent pool, it becomes unnecessary to conduct additional searches for qualified candidates to fill managerial or executive positions.

Frequently, these positions are most effectively filled through internal promotions. Given their familiarity with business operations and organizational structure, existing personnel possess the knowledge and skills necessary to effectively contribute to the achievement of the company's objectives.

3. Enhanced employee engagement may result.

Providing your staff with training is an excellent method to temporarily divert their attention away from their regular duties. When employees are deprived of opportunities to engage in additional beneficial activities, such as those provided through training courses, they are more likely to experience a decline in motivation and job satisfaction.

Employees who are offered learning opportunities and perceive that their employer is willing to invest in their attendance at conferences or enrollment in specialized courses are additionally inclined to exhibit greater loyalty towards the organization. This is supported by the findings of an additional SHRM study, which found that 76% of employees surveyed were willing to remain with

an organization that provided opportunities for continuing education and development. The outcomes illustrate the employees' aspiration to enhance their proficiency.

In essence, your employees will be motivated to exert maximum effort for the benefit of your organization when you demonstrate a readiness to invest in their training and growth.

4. It results in financial savings for the organization.

The most efficacious training programs enable personnel to acquire a diverse range of skills, thereby expanding their aptitudes in multiple domains.

Employers are subsequently in an enhanced position to recruit personnel with diversified skill sets and facilitate their transition to other relevant positions within the company. Employees experience a sense of empowerment as a result of assuming greater duties and responsibilities within the organization.

5. It shapes the trajectory of your organization's future.

When integrating employee training and development programs into an organization, it is imperative to consistently update the offerings. Anticipate the long-term implications of designing or refining training methods in order to enhance their alignment with the needs, interests, and objectives of employees.

Additionally, it is imperative that you ensure your organization remains updated on the latest industry trends and evaluate whether they necessitate a revision to your business culture or customer service brand. In such a circumstance, a novel training framework ought to be implemented as well.

Training and development of employees should be a collaborative effort between the organization, its administrators, and its employees. When meticulously designed and consistently executed, this program has the potential to stimulate substantial development on both the individual and organizational levels.

Training and development of employees should be a collaborative effort between the organization, its administrators, and its employees. When meticulously designed and consistently executed, this program has the potential to stimulate substantial development on both the individual and organizational levels.

Invest in the education of your staff to increase productivity.

When you engage personnel, you select individuals who possess the most advantageous skills for the position. However, with the constant evolution of the globe and your industry, it is easy for certain skills to become somewhat antiquated.

By providing routine training, you ensure that your team members remain current and innovative. Educating them in novel practices and methodologies enhances their efficacy in their respective endeavors. Furthermore, consistent and appropriate feedback is critical in order to ensure that these lessons are retained.

The research indicates that organizations that provide extensive employee training programs achieve a remarkable 300% increase in profitability compared to those that do not offer formal job training. Trained personnel exhibit enhanced capacity for innovative thinking, well-informed decision-making, and streamlined task execution.

You may also instruct your staff on how to participate in activities such as employee advocacy, which can generate additional sales opportunities for your organization. Training could also be utilized to transform senior staff into mentors, thereby reducing the amount of time supervisors expend responding to staff inquiries.

Providing employees with opportunities for training and development is a straightforward method of establishing trust within a team. Employees appreciate it when their superiors demonstrate a willingness to invest in their professional development through educational initiatives.

However, neglecting to provide your team members with education indicates a lack of concern on your part regarding their ability to accomplish their objectives.

60% of Indian workers, according to a survey conducted prior to the pandemic, would quit their current employer if training ceased. Thirty-one percent indicated that they had previously done so. In addition, given that it has been established that more than 80 percent would now leave for greater opportunities alone, that number is likely even higher at this time.

If an employee lacks confidence in their long-term prospects with your organization, they will be less inclined to remain when alternative opportunities arise elsewhere. Providing employees with opportunities for growth and development ensures they are not stagnating in their professional development.

Employees will respect and value the organization to a greater extent as you facilitate employee development. Through consistent training, you can demonstrate to your staff that you care about their welfare, which in turn decreases employee turnover and fortifies the corporate culture.

This results in stronger relationships among all members of your team. both among supervisors and subordinate personnel.

Disengaged team members exhibit minimal effort due to their lack of profound dedication to the organization. or to assist your organization in attaining its objectives. The converse is that consistent training reduces tension. It relieves boredom by providing opportunities for employees to attempt new things and break up the monotony of routine tasks.

A single error committed by a remote worker while connecting to a public network or by a member of staff by clicking on a hyperlink has the potential to cripple an entire organization. Alternatively, incur substantial financial penalties and sanctions.

Train individuals adequately to allow them to depart. "Be so good to them that they will not want to treat you poorly otherwise," said Richard Branson.

Many individuals contemplate pursuing professional certifications or additional education in order to improve their employability and skills; however, the financial burden of tuition and the challenge of securing sufficient funds to support their studies deter them.

In general, employers who provide financial support for professional development observe enhanced employee retention and satisfaction, as well as increased workplace innovation. Additionally, investing in your employees is one of the most effective ways to demonstrate that you recognize their potential and value them. Businesses are more likely to remain competitive and forward-thinking if they foster an environment that promotes learning.

Employers frequently inquire, "How will you manage to finish this course while maintaining your regular work schedule and devoting your full attention to your job duties?" Online education provides many students with the ideal remedy for this dilemma.

The flexibility of online courses permits you to engage in your studies at a time that is most convenient for you. Lectures are frequently made available on-demand and live (via the university's learning platform), so if you are unable to attend at the appointed time, you may rewatch them at a later time, perhaps while commuting to work via the train.

An important advantage that employers derive from allocating resources towards staff training is the infusion of fresh ideas, improved skills, and increased employee enthusiasm. Online courses at Sussex emphasize real-world scenarios and encourage students to apply classroom knowledge to their respective organizations and job functions, thereby progressively applying newly acquired concepts and resolutions in the professional environment.

By virtue of the fact that many of our academic teams provide consulting services to multinational corporations and direct project and research teams on an international scale, you gain direct knowledge from individuals who are shaping and informing industry practices. Additionally, we promote peer-to-peer learning; students collaborate on novel concepts and solutions.

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Safeguarding Privacy in Big Data : Challenges and Solutions

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Abstract:

Individuals, corporations, and governments universally acknowledge the significance of data as a valuable resource. On the other hand, the growing collection and analysis of data has heightened concerns about data privacy. Privacy-preserving analytics is a discipline that aims to find a balance between the benefits of data analysis and the need to protect confidential information. Privacy-preserving analytics refers to a set of methods and protocols that allow for the analysis of sensitive data without disclosing the actual data itself. These strategies and methods are commonly known as methodologies. The objective of this paper is to enable data analysis while ensuring the protection of individuals' and organizations' privacy. Due to the widespread adoption of digital technology, several industries, such as hospitals, banks, e-commerce, retail, and the supply chain, are generating vast amounts of data. Both humans and machines generate data through activities such as streaming closed-circuit television, website logs, and other related processes. Social media sites and mobile devices generate an immense volume of data every minute. In order to facilitate decision-making, the vast quantities of data generated from many sources can be processed and analyzed. However, data analytics has the potential to infringe upon people's privacy. Data

analytics can be utilized for recommendation systems. As a result, the importance of data analytics that safeguard users' privacy has become very crucial. This paper examines various privacy threats, and privacy preservation solutions, along with their respective constraints. Furthermore, a cutting-edge privacy preservation methodology based on data lakes is suggested as a method for effectively preserving privacy in unstructured data in order to tackle the problem at hand.

Key Words: Data Piracy, Big Data, IoT, Data Management, e-commerce

Introduction:

When handling sensitive data within a corporation, it is crucial to safeguard the confidential information of individuals. Data processing and analysis involve specific techniques and procedures aimed at safeguarding data from unwanted access, use, or disclosure. By using privacy preservation measures, firms can conduct effective research and analysis and make ethical data-driven decisions without compromising the anonymity of the data owner. Methods and technology that protect and maintain privacy. Once an individual grasps the importance of safeguarding their privacy and becomes aware of the various regulatory entities that exist to ensure data privacy, it becomes crucial to comprehend the strategies that can be employed to preserve one's privacy. Commonly employed methods include:

- Anonymization of data involves modifying personal information in a manner that makes it highly challenging to identify particular individuals.
- Techniques like pseudonymization, where personally identifiable information is replaced with fake identifiers, and aggregation.

• Encryption techniques: Techniques like homomorphic encryption facilitate the computation of encrypted data, allowing firms to make data-driven decisions without compromising the confidentiality of the underlying data. Adding noise to data or queries is a technique used to achieve differential privacy. This strategy guarantees that the output of a database query only reveals a limited amount of information regarding any specific entry. Using this approach, firms can share collective knowledge about a dataset while safeguarding individual data elements. The objective of each approach is to mitigate the possible risks to privacy associated with the processing and analysis of data. Implementation Methods to Safeguard Personal Privacy upon commencing the implementation of privacy preservation, it is necessary to apply it at two distinct levels: the operational activities of the business and the existing systems. There are three main causes for this:

• Compliance with the specified legal obligations: Data protection standards are highly rigorous in numerous countries. Therefore, the integration of privacy-preserving technologies ensures adherence to these regulations and mitigates the risk of potential penalties and legal entanglements. By proactively addressing privacy issues, you can effectively mitigate the risk of data breaches and privacy incidents.

• Risk management: By securely storing your information, it remains inaccessible to unauthorized individuals, ensuring its confidentiality. Therefore, even if there is a violation of data security, your data will remain unintelligible, ensuring that your customer data is not vulnerable to disclosure. Incorporating privacy protections from the outset is an essential and fundamental action.

• Prioritize the implementation of privacy by design. This theory proposes that privacy should be prioritized and integrated into every aspect of a system, including its design and implementation. This facilitates the implementation of proactive measures, thereby ensuring that privacy is a fundamental aspect of the development process. Privacy impact assessments, commonly referred to as PIAs, must be conducted.

During the first phase of a project's development, privacy impact assessments (PIAs) are employed to identify and address any privacy concerns. They offer support to enterprises in comprehending the acquisition, utilization, and control of personal data, with the aim of ensuring that projects comply with privacy laws and principles.

• Promoting knowledge and consciousness: Provide employees with comprehensive information regarding the importance of safeguarding their privacy and the precise measures implemented by the company to accomplish this objective.

• Implementing technological measures to address the situation: Ensure the security of data when it is not actively being used, when it is being transferred across systems, and when it is being manipulated by utilizing measures such as encryption, access controls, and other technologies that safeguard privacy. The mere implementation of a privacy protection system within your organization is insufficient; there are still hurdles to surmount. Here are two major challenges that a firm may face:

• Complexity: The creation of technologies that safeguard individuals' privacy, such as homomorphic encryption and differential privacy, is a challenging and labor-intensive

undertaking. Furthermore, they exert a considerable burden on the existing resources. This can lead to a rise in computational burden, which might pose challenges to scalability.

• The charges: Enforcing measures to safeguard individuals' privacy is an expensive undertaking. To successfully adapt to the new technology, it is necessary to allocate resources for investments and provide training to your workforce. The cost of expenses can be a significant barrier for small and medium-sized businesses (SMEs).

Concluding Remarks : Safeguarding individuals' privacy is a crucial aspect of data governance. It ensures the confidentiality of your data while still allowing it to be used ethically for analysis purposes. Organizations can mitigate risks, ensure regulatory compliance, and build consumer trust by applying diverse strategies and adhering to regulatory frameworks. This enables businesses to guarantee the secure preservation of their sensitive data while also minimizing risks. Several prior surveys have examined privacy concerns in Internet of Things (IoT) contexts. These studies have extensively researched privacy concerns in the literature. The focus of these studies has mostly been on the analysis of risks and attacks targeting these systems.

A comprehensive examination is carried out from the standpoint of the Internet of Things (IoT) to analyze various threat models and categorize different types of attacks. According to the analysis, it was concluded that the training dataset used to build the machine learning model for the privacy protection system is the most vulnerable to assault. Other vulnerable assets include the model, its parameters and hyper-parameters, as well as the model's architecture. Conversely, the individuals who possess the data, own the model, and utilize the model are the actors who may have sensitivity to the situation. The research revealed that the ordinary least squares regression model, the

decision tree model, and the support vector machine model are the most vulnerable among the machine learning models.

A substantial proportion of surveys focus on examining the methodologies and frameworks employed to safeguard data privacy. Differential privacy, homomorphic encryption, and learning architectures and models are some of the challenges that humanity currently confronts. According to a study, the dangers and vulnerabilities associated with privacy protection systems on the Internet of Things can be categorized into four groups: attacks on authentication, attacks on the components of edge computing, attacks on the anatomization and perturbation schemes, and assaults on data summarization.

A further survey endeavor classifies the data generated at different levels to analyze the centralized privacy protection systems with machine learning approaches. The machine learning methodologies to ensure user safety, along with policy languages to establish user privacy preferences and negotiation strategies that enhance services while upholding user rights. They incorporated various alternative methodologies in their survey, including homomorphic encryption for training models, secure multi-party computing, and differential privacy. To protect the identities of users and the information they contribute, the author classified the models based on whether they were collaborative or aggregated situations. They conducted a study on the current tactics employed in federated learning environments.

Furthermore, the author note that differential privacy-based technologies are predominantly employed for training privacy models. However, this technique is hindered by the significant processing complexity of both the encryption and decryption procedures.

However, progress in creating privacy protection solutions for devices with minimal resources is still in its early stages. Reducing the latency and throughput of neural network training on encrypted data is a crucial challenge that must be addressed to ensure individuals' privacy. Most of the existing techniques rely on outsourcing their deep learning tasks to other entities that have ample computational resources and storage capacity. Additionally, these schemes guarantee the protection of user data, hence enhancing the schemes' exceptional computing efficiency. In order to enhance efficiency and accuracy, it is advisable to explore alternative implementations, such as quantum computing techniques, while developing systems. In light of future possibilities, there are ongoing endeavors to explore parallel learning and cost minimization, as well as network pruning and the interplay between different detrimental behaviors.

Furthermore, it is imperative for the relevant standardization organizations to exert significant efforts in order to provide standardized privacy protection measures. Examining and evaluating privacy solutions in real-world scenarios is a difficult task, especially when considering the balance between the quality of service offered by the Internet of Things and the protection of privacy.

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Enhancing Customer Retention through Big Data-Driven AI/ML Models in Retail

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Abstract

Big data analytics encompass multi-faceted capabilities of continuous reporting, sophisticated analytics, and advanced reporting that enable organizations in the retail industry to meet customer expectations, mark numerous opportunities, and make informed decisions. In particular, the challenge of retail customer retention is crucial. Given the recent surge in AI/ML techniques and strong incentives for customer retention in the retail sector, we propose a classification model that attempts to predict customer stays within the retailers' premises and can guide retail optimization efforts going forward. The proposed model combines customers' historical behavioral parameters in conjunction with weather information in a fusion approach. Our model has been trained on 120,000 data records obtained from a big luxury goods retailer to demonstrate its superior performance in comparison to state-of-the-art classification approaches. The model has also been deployed for the actual prediction of future customer stay behavior. The dynamics and challenges of the retail industry are motivating the adoption of big data analytics. Retail data sets are made up of sales records, records of items stocked, promotions, and customer information. Collectively termed big data, mining these data sets can help retailers address important questions such as risk management, customer retention, product assortment, and vendor management. In this regard, customer retention is one of the most crucial and costly aspects of the business, as once a retailer attracts a customer, it should attempt to continue to keep the customer engaged and spending. Bayesian historical data retrieval, predictive analytics, and sophisticated models outperform the state of the art in big data-driven retailer customer analysis, helping in profitable retention and acquisition of customers to optimize the retailer's business. In this paper, we will develop a model that delivers high predictive power regarding customers' stay, taking advantage of both customer transaction data and weather information, as well as employing advanced data mining methods, most notably those stemming from the fields of AI/ML. The stay duration information can help automate many of the firm's operational decisions, including staffing and scheduling tasks to maximize service levels.

Keywords: *Customer Retention, Big Data Analytics, AI/ML Techniques, Classification Model, Behavioral Parameters, Weather Information, Predictive Analytics, Retail Optimization, Data Mining, Customer Stay Prediction.*

1. Introduction

Competition in the retail sector is intense, and companies are constantly on the lookout to offer personalized services to their customers in a bid to retain their customers. Options include tailor-made product features to meet personalized preferences, lower prices through the offering of vouchers, reduction of marketing costs, and improvements to supply chain efficiency in anticipation of demand. In today's time, with cut-throat competition and high demand for a new product, there is a need to retain a customer base since it is cheaper to retain an existing customer than to acquire one. Hence, existing customers are of utmost value to retailers. Investing in acquiring a single new customer is not as prudent as investing in retaining the existing ones, considering the returns in some scenarios could be infinite. A company could end up selling its full inventory to a loyal, retained customer, potentially as we provide them with benefits. Moreover, it is plausible that highly engaged customers tend to be active standalone brand advocates too.

Customer retention in a retail business is a multi-faceted problem and could be approached by offering a multitude of incentives and discounts, having two-way communication, innovating their experience with improved offerings, etc., or just investing in customer engagement. Loyalty programs and reward redemptions are successful among retailers in driving both customer engagement and loyalty. Two methods commonly pursued to retain customers are either rewarding them for existing behavior or, based on predictions from historical data, rewarding them proactively in anticipation of upcoming behavior. However, little is understood about the actual contribution of these different drivers of customer retention, specifically from integrating several simultaneously into retailer data analytics models. The data analytics model, with numerous customer data points, can help to identify purchase behavior patterns of customers and infer customer-led retail strategies. Individualized shopping histories are stored in their databases and can be used to identify potential customers to encourage their visit. By utilizing enablement, our customers can have new business practices that help achieve profitable growth and enhance customer engagement.

1.1. Background and Significance of Customer Retention in Retail

Knowing what a customer will buy and when is critical information for the retail industry. It will determine whether a customer comes back to the same store or moves to a competitor. Thus, even small incremental gains in understanding customer behavior can lead to substantial financial benefits for retail businesses. This fundamental data challenge has been transformed over the years, particularly due to the rise of the Internet and social media, which have changed how consumers shop. Furthermore, the increasingly consumer-centric use of technology in this digital age has made brick-and-mortar retailing more

challenging than ever. Today, businesses want you to be their customer, whether it is a discount app on your mobile phone when you are walking past a store or when you are browsing on the web. This effect has created a fundamentally competitive retail market.

Most retail businesses make profits on a high percentage of repeat customers rather than largely through first-time buyers. There can be substantial costs involved in acquiring first-time buyers, and they might not always generate large net positive profits. The repeat customer, on the other hand, will likely spend more per visit and is also cheaper to engage. Secondly, an existing customer is also more likely to recommend that store to a friend, generating positive purchase social proof effects. Finally, a recent surge in research has demonstrated the existence of a substantial retention benefit from using customer data to create personalized communication strategies. In this new consumer environment, personalization is a crucial consideration in the development of these strategies. However, addressing these issues is not straightforward. Many businesses maintain little or no long-term transaction data on their customers. Along with the inefficiencies of actually merging enterprise database systems that can handle big data, these suboptimal outcomes can result in substantial losses of possible customer value.

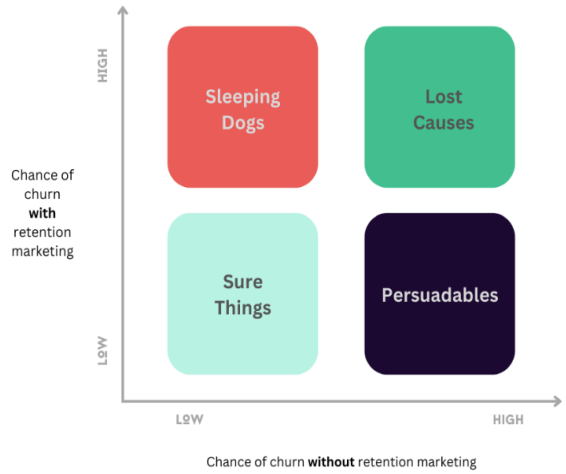

Fig 1 : Customer Retention Model

2. The Role of Big Data in Retail

The retail industry has been the face of business and the destination for consumers for a very long time. Information gathered through the daily activities of the business or information collected by the organization's relationship with its various stakeholders are examples of the data that a company has or collects. However, the data of a retail organization is almost always offline and consists of purchase history, store visit details, and other transactional details of a retail customer. With online shops gaining momentum and every physical store having an online presence, retail organizations have been increasingly converting offline business into online sales and returning customer transactions. This characteristic has made the data collected by retail organizations increase rapidly, and the volume has become very high in total. A high volume of data assets or big data in this particular industry provides a platform for digital transformation initiatives and

investments that leverage data to achieve the strategic goals of the organization.

Retail data is unique and provides different intrinsic characteristics and challenges when compared to the customer data collected within the organization's operations or other business models. Customer data generated through online shopping platforms, search engine activity for online price comparison, digital advertising activity, and data collected externally provide insights or behavioral data specific to a certain customer group, region, category, product, or unit of the product sold. Retail data analysts are required to analyze and model this data to understand customer behavior and preferences to create customer retention strategies that allow the organization to attract customers increasingly and lift customer spending from the resting state. Big data that is created and used in a retail organization provides a total view of the customer in addition to operational functions such as categorization, space allocation, product management, pricing, and risk management, and as a result, is the focal point for data-driven transformation programs that help the retail business enhance customer experience and operational efficiency.

2.1. Definition and Scope of Big Data

Big Data technologies and practices are evolving at a dramatic rate, with potentially huge implications for the retail industry. However, there is continued vagueness in what precisely Big Data is. While some researchers favor the traditional 3Vs definition, Big Data experts have lately started to question the adequacy of that definition, including the relevance of the three Vs composition (volume, variety, and velocity). Key notions such as value and causality relations with smartness must also be factored into how Big Data is distinct from traditional data storage technologies.

The scope of Big Data can be supported by the following brief outlines. The volume forms the backbone of Big Data technology, harnessing storage technologies in the zetta- and container-byte scale. Variety boosts the significance and business value of Big Data, aiming to plug in diversified data streams from social media, images, voices, and natural language texts that cover structured and unstructured compositions. Velocity brings in the temporal-spatial perspectives, which determine both the "when" factor and the geo-coding intelligence in some data science applications. The veracity factor addresses the noise and uncertainty of data, as well as the trustworthiness traits and biases to be identified for delivering reliable inferences. The important value notion elevates "ecology thinking" that represents the entire business value chain and its stakeholders who can realize the social, business, and environmental benefits of analytics strategies.

Equation 1 : Customer Lifetime Value (CLV) Prediction

CLV is crucial for understanding the potential value of customers over their

entire relationship with your brand.

$$CLV = \left(\frac{\text{Average Purchase Value} \times \text{Purchase Frequency} \times \text{Gross Margin}}{\text{Churn Rate}}\right)$$

Where:

- **Average Purchase Value** = Total Revenue / Number of Purchases
- **Purchase Frequency** = Total Number of Purchases / Number of Unique Customers
- **Customer Lifespan** = Average Duration a Customer Remains Active
- **Churn Rate** = Percentage of Customers Who Stop Buying Over a Period

2.2. Benefits of Big Data in Retail

Retail is a fast-paced industry largely dependent on customer behavior. There are millions of different customer profiles, but the main difference is loyalty, i.e., repeat visits. If retail companies could identify what drives users to come back and create models to simulate those actions, they could build better products and services to retain clients. Big Data, AI, ML, and computer science in general offer a unique opportunity for retailers in broad internal operations and customer-related tasks. One general characteristic of retail trade is that it is common to have large amounts of data from client behavior, such as which items are bought, the hour and day in which an item was bought, credit card provider, etc. These are named the 3Vs: volume, velocity, and variety, in the Big Data field due to the large amount of retail company customer information being generated and stored as daily operations. With this information, some interesting solutions could potentially emerge for an advanced or newly created retail company, so there is a natural drive for the implementation of AI/ML models for retailers in this data-driven society.

For retail-related AI/ML models, generally, supervised learning is the major data analysis approach for models that predict customer lifetime value, churn, and customer lifetime value. However, in retail, there are so many different ways data can be interpreted, and interesting new outcomes, missing labels (e.g., when clients cancel a product, this means churn), and ensembling predictions. Associative learning or unsupervised machine learning models are very commonly used for generating clusters of customers, and in the majority of big retail stores, the two main unsupervised learning algorithms used are k-means and self-organizing maps. The main drivers of retail-oriented models are predictive capabilities, and they are used for internal price, operation, and inventory management models to customer personalization, influencing, and guiding customers toward specific goals. The real power of AI/ML models for decision-making is that they obtain predictions best in processes of learning from data, not rigidly following the prebuilt decision models to fulfill specific objectives. A clear example is forecasting; the best method is to rely on a growing amount of data rather than on a predefined model when you have to forecast a growing amount of detailed

information.

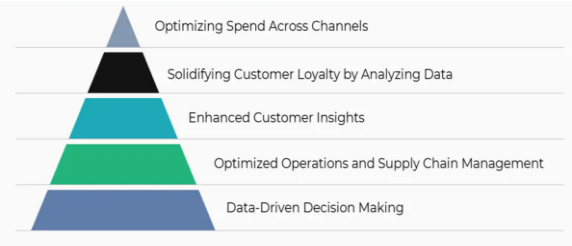

Fig 2 : Retail Big Data Analytics

3. Introduction to AI and ML in Retail

AI and ML are not only transforming how businesses operate through advances in multimodal NLP, computer vision, interactivity, and data integration and retrieval processes, but also transforming customer engagement and experiences via AI techniques for conversation, speech, social listening, and human graphics. The retail industry has been at the forefront of AI and ML applications, especially since it is data-rich and can monitor customer actions. The retail industry is increasingly using AI to leverage customer data to perform many activities that were earlier impossible or too costly. Descriptive analytics reports predict future purchases and prescriptive analytics provide specific recommendations or actions to meet customer satisfaction and needs. Retailers use AI to improve the customer experience in multiple ways. For example, they personalize product selection and store layout for each customer and provide personalized recommendations. They use AI to monitor customers in stores, perform behavior analysis, and more. Beyond enriching the omnichannel customer experience, adding AI to the customer engagement model offers the scalability, efficiency, and price point that retailers require to maintain their margins. Retailers in a wide variety of formats will come to rely on AI not just to energize engagement but to power the price/risk/sales-rebalancing process.

3.1. Overview of Artificial Intelligence and Machine Learning

As we live in the consumer age, acquiring and maintaining customers play huge roles in retailing. This study presents a research design of big data-driven artificial intelligence and machine learning in the context of retailing to enhance customer retention. This chapter begins by explaining background information organized in 3.1 and continues with detailed information related to research steps in 3.2. The chapter ends by providing research contributions in 3.3.

Artificial intelligence (AI) is a technology and computer science that attempts to replicate or simulate, in the form of a machine, rational behavior such as deducing, induction, classification, etc., along with some of the activities associated with human intelligence. Machine learning (ML) is a subfield of AI and a data mining technique. The aim is to develop systems where algorithms learn and make predictions based on historical data. AI/ML is important for both academia and industry because it is used in various industries such as automotive, robotics, healthcare, and so on. Furthermore, AI/ML can support companies in accomplishing specific goals such as increasing customer retention.

Recently, companies achieved these goals using AI-driven models.

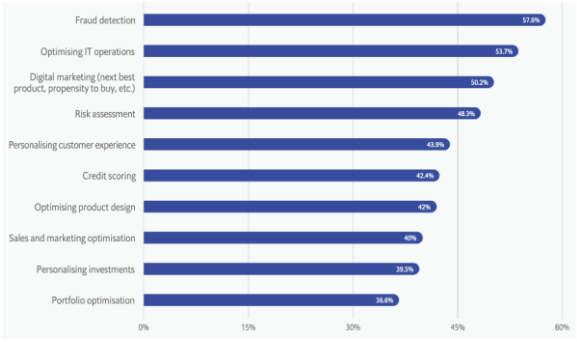

Fig 3 : To What Extent does your Organisation use AI for the Following Business uses

3.2. Applications of AI/ML in Retail

In the present era of data, AI/ML has become an inherent part of many fields. The application of inductive reasoning and iterative model-based learning holds the potential to extract vital inferences and predictions through the utilization of large and varied sources of available data within the complex business environment. Numerous companies have adopted AI/ML because of its ability to improve business outcomes through the real-time availability of both consumer preferences and emerging patterns in consumer behavior. Retail is one such business sector where the vast potential of AI/ML can be realized by computational analysis of big data. The retail ecosystem has seen a massive transformation due to the onset of the era of big data. AI/ML has successfully been shaping and predicting consumer behavior, automating processes for enhanced efficiency, reducing the possibilities of loss and theft, and delivering a personalized customer experience, which is practically indispensable for any retail business to thrive.

AI/ML has come a long way from simply being a tool for product recommendations. Various business functions such as e-commerce, demand forecasting, inventory optimization, back office and loss prevention, pricing, and marketing, manufacturing, and OTB are relevant and challenging problems in retail: 1) Recommendation systems entail the recommendation of items, typically one of two types: (a) personalized recommendation for individual consumers, (b) non-personalized recommendation for a set of consumers. 2) Forecasting demand is the problem of predicting the number of each item the merchants will sell, typically at the product/store level, over a future period. The accuracy of inventory demand forecasting has an enormous impact on stock availability and out-of-stock rates. 3) Price optimization refers to the act of setting price levels to improve all important metrics simultaneously. AI/ML for personalized pricing assumes that each customer has a willingness to pay, which creates an opportunity to maximize revenue. 4) Personalized advertising refers to the personalized display of product advertisements to customers based on their recently made purchases, their current shopping cart, and specific individual buying history. It involves displaying the right product ad to the right customer at the right time over the right channel.

4. Customer Retention Strategies in Retail

The retail industry has been evolving rapidly due to significant changes in customer behavior and preferences, primarily due to the sheer amount of data available and advancements in technology. Customer retention has always been one of the most important strategies for retailers. They cannot afford to lose their customers, especially now, in this age of cutthroat competition. The moment a product is out of stock and the customer's immediate need is not met, the customer will look at another platform where it is available and make the purchase. This would result in a missed opportunity for the retailer. This is one of the typical examples where retailers need to make the stock available for their customers, or they need to be ready to face the consequences. Furthermore, when customer retention rates increase by about 5%, profits can rise from 25% to 95%. So, customer retention is crucial to improving retailer performance. It's always said and proven that the cost to acquire a new customer is higher than the cost to retain an existing customer. Hence, retailers should retain customers and keep them happy rather than using that money to attract new customers.

Equation 2 : Customer Segmentation

Segmenting customers helps tailor marketing strategies and improve retention.

K-Means Clustering:

$$J = \sum_{j=1}^{k} \sum_{i=1}^{n} \left\| x_i^{(j)} - c_j \right\|^2$$

Where:

- J = Objective function to minimize (sum of squared distances)
- k = Number of clusters
- x = Data points (customer features)
- **C_i** = Cluster i
- μi = Centroid of cluster i

4.1. Traditional Customer Retention Strategies

Customer retention strategies exist on different levels, such as product or service features, pricing, transaction functioning, and relationship-based strategies. When it comes down to customer-retention-centered features in products or services, providing high-quality products or free additional services that complement the primary product may be applied. Additionally, pricing and transaction structure-based features can be used; these are referred to fundamentally by special pricing models, volume or frequency discounts, and loyalty or club membership programs. These membership programs usually aim to enhance customer loyalty by providing additional services, discounts, or reward mechanisms when customer expectations are met. Besides product and service level features and reward models, relationship-based strategies such as personalized announcements or friendship management can be exploited.

Loyalty programs are widely used to retain customers and to develop long-lasting relationships with customers in the business world. In general, from a consumer perspective, loyalty programs refer to a

structured marketing strategy designed to attract and retain customers by encouraging them to prioritize specific brands in terms of purchases. A variety of methods, including discount coupons, utility bonuses, and special items, can be included in the structure of loyalty programs to increase the customer's preference for one brand over another. Most consumer behavior experts agree that rewards are very important in the design and implementation of a successful loyalty program. Businesses typically launch a loyalty program to retain customers and encourage repeat purchases. Some customer relationship management platforms provide multiple solutions specifically focused on creating and maintaining effective customer loyalty programs.

4.2. Challenges Faced in Customer Retention

The major challenges faced in retaining customer information and preparing the model are as follows.

Poorly maintained customer data: Some of the company's customer data is being poorly maintained. The design of the models might have a major impact due to the customer data generally being outdated and incomplete.

Unavailability of purchase records: In the case of fraud protection, the company maintains all of the old purchase records. These records help the company design better models. However, to retain customers with proper insights, the company must store the data with proper security and privacy policies.

Mining the factors that are responsible for customer abandonment: Understanding the sales trends and actively engaging with the right and reliable insights yields numerous benefits. Using the model that best fits the customer retention problems in financial savings sectors, sales that proactively retain more loyal customers can be properly identified.

Optimal campaign: In promotional strategies, it is important to understand the right factors and conduct the right sales when consumers are fully engaged. In conclusion, being prepared with the right information and accuracy is beneficial for addressing customer abandonment problems and maintaining appropriate customer retention models.

Fig 4 : Customer Retention Strategies for Sustainable Growth

5. Integration of Big Data and AI/ML in Customer Retention

Big data analytics allows both raw and structured data to be combined and interacted with in a much faster cycle compared to traditional database management. Together with AI/ML models, big data is processed in acceleration and synchrony in a synergistic combination. The AI/ML models aim to

predict the future with the help of data, and the value generated impacts the business either qualitatively or quantitatively. This results in more efficient process execution and time savings for all tasks. The footprint of big data is more substantial in retail; alongside other sectors such as finance, telecommunication, and energy, the retail industry exploited the potential of big data first. The spectrum of the retail sector, including online and offline, ranges from internet-only businesses to large multi channel superstores. An increasing number of companies either already use AI/ML to leverage their data or plan to do so shortly. AI/ML models help make business operations more efficient and help companies promote their products more effectively. AI-related technologies, in combination with cognitive computing, natural language processing, machine learning, and deep learning, comprise a new digital era for customer interaction. Brand experience, online and offline, is enhanced through various devices and touchpoints with consumers. Hyperpersonalization finalizes the customer and response model, transforming them into real-time, on-the-spot, and just-in-time strategies. Providing consumers with the goods they want in the right space, time, and form for them, using AI has become remarkably efficient. In retail, AI/ML maintenance is widely leveraged for marketing, demand management, customer retention, personalization, and merchandising. Product development is an area where the retail AI system could be better implemented.

Equation 3 : Personalized Experience Optimization

Tailoring offers and experiences to individual customer preferences.

Utility Function for Personalization:

$$U_{ij} = \alpha \text{Relevance}_{ij} + \beta \text{Personal Preference}_{ij}$$

Where:

- **U_{ij}** = Utility score of offer j for customer i
- **α** and β = Weights for relevance and personal preference
- Relevance ij = Relevance score of offer j for customer i
- Personal Preference ij = Personal preference score for offer j for customer i

5.1. Data Collection and Analysis

The best, and by now in fact the only reliable data for customer behavior models is derived from historic and new interactions between customers and the retailer. In many cases, such data can be purchased through loyalty programs, whether or not the retailer offers the program. Both demographic and transactional data are crucial, and while demographics can be compiled from customers' addresses, the most valuable data comes from purchase histories, but also with a precise purchase location and times. New incentives can help gather the necessary data. We receive the

transactional level data of customers who opt into this service. Moreover, through such partnerships, with both ethical and financial trades, retailers can help stimulate the local economy and, at the same time, better contextualize their employees to engage their local customers.

Similarly valuable are international anonymized transactional data, which we are currently pursuing. Regardless of whether data is directly collected or purchased, similar ethical questions and fiduciary responsibilities to customers are replicated when using these types of third-party data assets. Data of this type is first-party since it is directly taken from the business or the organization. It is also useful for training machine learning models. Since data can be queried at will, most companies are familiar with these types of data.

5.2. Predictive Analytics and Personalization

Personalizing the user experience is an oft-stated necessity for customer retention. Data is the modern gold. The more retail companies know about their customers, the more they can predict their next actions. Ninety percent of the data has been collected in the previous two years, and its volume is rapidly increasing. Each person uses a device that collects and transfers phone numbers, email addresses, and physical addresses. Thanks to GPS sessions, the information on the site can also be described. Enterprise solutions allow companies to pay you with promotions based on your location and movements across the shops. This valuable data contributes to learning what can be relevant to your customers and pushes the limits of personalization. It does so in two ways: predictive analysis and profiling. The challenges are to work for privacy and personalization at the same time and to respect the requirements of the GDPR.

Predictive analysis refers to the use of data to obtain predictions about the client's future behavior. The principle of efficiency is simple: the more data available allows the learning algorithm to improve its forecast. The algorithm's power increases by doing this. Hence the term "big data." Thanks to a presence in the market, some retail stores can collect data on the online and in-store shopping habits of several million customers. The data is classified, stored, and phased out over time in secure environments. This virtually unlimited flow of customer details allows progressive retail chains to develop anticipatory models tailored to their customers. They use developments in the field of artificial intelligence and diverse learning systems combined with programming interfaces that connect the models to different applications. They comprise postal mail bids that appeal to customers physically, online actions on smartphones, and devices close to consumers. Customer opinions are integrated into voice services. For personalized recommendations and notifications, interesting models are developed.

6. Conclusion

The innovative use of big data-driven cloud-based AI/ML models in retail can provide insights to encourage customer retention and confidence in the Internet of Things. The use of technological solutions can lead to more competitive customer offers and greater customer responsiveness and agility. They enable continuous holistic assessment of the potential implication of business decisions as well as the ability to understand differences in presented offers, which may increase the perceived discrimination capabilities by the end customer. As such, the use of AI/ML models may increase customer engagement with the retailer which is more associated with positive customer experience and may contribute to the increase in sales and enable an increased understanding and lifecycle management of the customer by the retailer continuously versus more traditional approaches.

Of course, not all businesses in a competitive retail environment have the time and money to invest in R&D and innovation platforms to solve these problems. Many of these areas should be solved in a collaborative environment, attracting multiple businesses or business experts, government, and of course, universities. As recent data environments evolve with combined platforms, big data solutions that may require extensive data engineering may be placed on shared platforms to enhance data engineering and bring AI/ML directly to the data. Governments can incentivize shared models and data to evolve and maintain national and international success through tested incentive schemes, while universities can contribute through existing AI/ML knowledge and the formation of extended research partnerships between universities and companies.

6.1. Future Trends

The 21st-century growth in online retail and the resultant powerful Internet giants are built on a foundation of monitoring and data collection, with a heavy reliance on AI and ML models to deliver intelligent personalization to their users. Much of the real work done by the models and the personalization is hidden, including recommendation engines for products or content, deep learning to identify unique styles from vast product inventories, image recognition systems, etc. However, much of this investment comes with a potential for further development and scrutiny, and so it is likely that both AI/ML-driven models in retail and the models themselves will come under pressure in several areas including a) the attainment of full personalization; b) the efficacy and impact of AI/ML models; c) the control of AI/ML biases; and d) ethical impacts. In addition, a new trend of real-time 'etail' is likely to put further pressure on traditional retail.

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