Dr. VN Brims

Srujan

Vidya Prasarak Mandal's
Dr. V.N. Bedekar Institute of Management Studies, Thane

Publication Ethics Policy

Srujan adopts the highest international ethics policy and standards of publishing as followed by American Psychological Association (APA), Publication Manual. Srujan expects articles which are original bonafide research, duly checked for plagiarism in accordance with the turnitin software. Srujan strongly condemns any form of malpractices like fabrication or falsification of data, duplication or excessive fragmentation in accordance with the APA norms. The maximum permitted reliance on others' work is restricted to 20%.

Srujan also expects that authors must accept responsibility for their papers sent for publication. Further, authors have to base their research on "objective interpretations of evidence and unbiased interpretations of facts" in accordance with the APA Publication Manual, 6th Edition, P17.

Authors sending their papers to Srujan for publication need to validate and authenticate for the originality of their work as well as vouchsafe for their paper being free from plagiarism apart from the declaration that the paper sent has not been published before in, or submitted to, any other journal.

The Editorial Board of Srujan assures all contributors of scientific conduct and protection of their intellectual capital against any abuse or misuse to advance the research interest of any other individual or group without the prior written consent of the author.

Aims and Scope

Srujan is an annual multidisciplinary management journal, published with an aim to provide a print and online platform for management researchers, students and academicians to publish their original works and refer for knowledge enrichment. It is the official journal of Dr. V. N. Bedekar Institute of Management Studies. "Srujan" means Creation. This journal was conceptualized to promote research and development in management education and become a medium through which innovative ideas evolve. These ideas can then catalyze the creation of a body of a multi-disciplinary and global management thought, which can be useful to industry, government, teaching fraternity and the student world.

Srujan has adopted a multi-disciplinary approach to highlight the developments, innovations and intellectual research works in the extensive field of traditional and modern management, business theory and business models, intellectual contributions in management excellence and social and economic practices that contribute to business and societal growth.

Srujan considers original research works, surveys, opinions, abstracts, case-studies and essays that deliberate on ideas, suggestions and works that have global, national, or regional perspective.

Substantial research content in the specific verticals include, but not limited to, domains of finance, marketing, operations management, information systems, human resource, organizational theory and behavior, design thinking, project management, quality management, sustainable business management etc. will be considered for publication.

The journal is always open to ideas and suggestions in terms of content and publication. The ultimate goal is to increase knowledge, experience and the outcome and thereby a strong emphasis is laid on the quality and authenticity of the content.

Open Access

SRUJAN

Editorial Panel

From the Chief Editorial Desk ...✍

Srujan 2024 marks the 9th edition of our continuous efforts at BRIMS to contribute meaningfully to the diverse and evolving field of management. Our commitment to fostering research that spans a wide array of disciplines is reflected in the rich variety of articles we have received this year.

We have been privileged to receive numerous articles from distinguished authors, covering a broad spectrum of topics such as consumer behavior, tourism, data mining, artificial intelligence, marketing, and finance.

I extend my sincere gratitude to all the contributors who have entrusted us with their valuable work, as well as to the dedicated peer reviewers who have played an instrumental role in ensuring the quality and rigor of the submissions. Your collective efforts have been integral to the success of Srujan, and for that, we are truly thankful.

As we embark on this journey with Srujan 2024, I am optimistic that this edition will surpass its predecessors in terms of excellence and impact. We are committed to constant improvement, and I believe that this edition will stand as a testament to the continuous evolution of our journal both based on past experiences and outcomes for the future.

BRIMS, in collaboration with all stakeholders, will spare no effort in elevating the standards of the papers published in Srujan. Your support and cooperation are pivotal to this endeavor, and we look forward to strengthening our partnership to foster a community of excellence in management through cooperation and collaboration.

Once again, thank you for your invaluable contributions, and here is to a successful and enriching edition of Srujan in 2024.

Dr. Nitin Joshi
Director, DR VN BRIMS

Dr. Guruprasad Murthy
Director General, DR.VN BRIMS

Editorial ...✍

We are glad to publishthe peer reviewed research Journal Srujan Volume 9 on the day of the conference!The researchjournal isdedicated to exploring the realms of "Disruption and Critical Thinking in Business." In today's dynamic BANI world of business,triggered by the various crisis'sworld is facingtoday concerned with climate, pandemic, inequality and global instability, existing concepts are not appropriate for a rapidly evolving world. Change is constant, innovation is key, this journal aims to provide a platform for cutting-edge insights and fresh perspectives on the theme of disruption and critical thinning in business

As we stand on the brink of a new era marked by technological advancements and unforeseen challenges, we believe it's crucial to delve into the transformative forces of disruption and the indispensable skill of critical thinking. companies like Uber, which revolutionized the transportation industry, or Netflix, reshaping how we consume entertainment.

Tesla Electric Vehicles disrupted the traditional automotive industry by popularizing electric vehicles, offering sleek designs, cutting-edge technology, and long-range capabilities. This move challenged conventional perceptions of electric cars and forced established automakers to accelerate their electric vehicle plans.

Ola and Uber Ride-Sharing Services have disrupted traditional taxi services in India by introducing app-based, on-demand ride-sharing. This innovation has transformed the way people commute, offering convenience, real-time tracking, and competitive pricing, challenging the traditional taxi industry.Paytm along with other digital wallets, has disrupted the traditional banking sector in India by offering mobile-based payment solutions. These platforms allow users to make transactions, pay bills and even invest, reducing the dependence on traditional banking methods. IndiGo, a low-cost carrier in India, has disrupted the airline industry by focusing on operational efficiency, punctuality, and offering competitive fares. Its success has influenced the market dynamics, leading other airlines to adjust their strategies to remain competitive.Flipkart and Amazon India, e-commerce giants have disrupted the retail sector in India by providing a convenient online shopping experience. They have changed consumer behaviour and challenged traditional brick-and-mortar retailers, forcing them to adapt to the online marketplace.Reliance Jio's disrupted the Indian telecommunications sector by introducing affordable data plans, leading to a significant increase in internet penetration across the country. This move triggered intense competition, forcing other telecom operators to revise their pricing structures and improve services.

These examples showcase how disruptive innovations have reshaped industries, prompting established players to adapt or risk becoming obsolete.Coupled with this, the ability to think critically has become a fundamental skill for navigating the complexities of the modern business world. Our journal seeks to explore, dissect and provide insights into these twin forces shaping the future of business.

Our research journal presents here contributions from scholars, practitioners, and academicians offeringresearch contribution of various authors, insights on navigating disruption and fostering critical thinking skills through varied topics such as AI on consumer buying behaviour, framework-online marketing, Bibliometric analysis of metaverse research, innovation in healthcare industry, and advertising for fast moving consumer goods

We envision this event and our journal to be a hub of knowledge, showcasing innovative strategies and empowering our readers with the tools to navigate the complexities of the modern business world.

We extend our gratitude to our contributors, readers, and supporters for being part of this exciting venture. We will share more details on the conference proceedings of next year and the official launch of our next volume of research journal. Together, let's explore and shape the future of business in an era defined by disruption and critical thinking.

Editorial Committee

Dr. Smita Jape   **Dr. Dinesh Sonkul**

Associate Professor   Assistant Professor

Content

A Framework of Online Marketing Methods

Dr. Divya Alok
Sasmira's Institute of Management Studies and Research

Abstract : The prevalence of the Internet is growing as digital platforms expand in both quantity and influence. Consequently, an increasing number of persons are dedicating more time to online activities, with digital tools and websites assuming a progressively significant part in their daily lives. The internet has transformed from a specialized medium into a multimedia platform with the advent of user-friendly browsers, fundamentally changing the dynamics between businesses and consumers. Due to its widespread presence, it has evolved into a highly efficient means of communication. Furthermore, the act of buyers actively searching the internet to discover the most advantageous deal from merchants worldwide has resulted in the growing prominence of online marketing. The objective of the paper is to contribute to the current knowledge base and create a well-organized survey of literature in the area of online marketing communication. The study conducts a comprehensive analysis of the efficacy of online marketing strategies and offers a justification for employing different online marketing approaches. It aims to foster a thorough comprehension of diverse online marketing methods and their interconnections. The findings demonstrate that the initial iterations of online marketing, such as Email and Search Engine Marketing, remain extremely pertinent for contemporary company communication. Currently, organizations are largely dependent on social media, influencers, and messaging marketing as a means to acquire customers, create brand recognition, and foster loyalty.

Keywords : *Online Marketing Communication, Search Engine Marketing, Social Media Marketing.*

Introduction

The internet has profoundly influenced the operational dynamics of organizations. The marketing sector underwent a change in the past decade due to the rise of user-friendly web browsers, which have become an essential component of the internet. Given the inherent potential of online communication, marketing is expected to be significantly impacted. The inception of online marketing can be traced back to 1978 when the first promotional email was dispatched to individuals (Oetjen, 2019). In recent years, the remarkable expansion of online marketing can be attributed to advancements in information technology (Ryan, 2016). Businesses have recognized the significance of digital marketing in attaining a competitive edge and fulfilling client demands. Online advertising is an effective strategy for establishing and enhancing brand recognition, as well as driving traffic to facilitate the success of enterprises. Digital marketing has surpassed conventional advertising tactics. In addition, it possesses the capacity to facilitate economic recovery and offer substantial prospects (Munshi & Munshi, 2012). The global expenditure on digital advertising, encompassing desktop and laptop computers as well as mobile devices, amounted to $378 billion in 2020. According to Statista (2021), the anticipated amount is expected to significantly increase over the next several years, reaching $646 billion by 2024. The preceding data demonstrates the indispensability of online marketing in company communication. Nevertheless, the scholarly literature lacks clarity regarding the essence and consequences of internet marketing. Online marketing is a well-established topic in academic literature, with numerous studies being undertaken in this subject. Nevertheless, the discussion surrounding the efficacy of internet marketing techniques is rather limited (Teo, 2005).

The term "online marketing" is frequently misinterpreted and mistakenly used interchangeably with "online promotion" (Popa, 2015). Online marketing tactics are sometimes confused and employed interchangeably. For instance, influencer marketing is sometimes confused with electronic word of mouth, while messenger marketing is sometimes misunderstood for social media marketing. Consequently, the researcher elucidated the distinctions and resemblances between various online marketing techniques in order to enhance comprehension of these words and their efficacy. This will aid firms in selecting the most suitable online marketing approaches.

Research Methodology

The researcher compiled articles addressing online marketing methods and their effectiveness. To accomplish this, the researcher conducted a systematic literature review. The keywords used are online marketing methods, the effectiveness of online marketing methods, without any time restriction. The literature review also includes peer-reviewed journal articles and book chapters to ensure that it meets the quality of recent academic publications. 194 articles were found and after eliminating redundancies, 108 articles based on titles, abstracts, and keywords were considered for further analysis. We also retrieved and examined the reference lists of the above articles, after reading the full manuscripts finally 62 research papers/ articles are considered. Table 1 shows the exclusion and inclusion criteria of the selected papers articles.

Online Marketing Communication

According to Chaffey (2009), in order to acquire customers using a website's content, a corporation must initially develop marketing communication methods to entice users. Despite the presence of visually appealing websites,

clients may remain oblivious or disregard them as a result of inaccurate or inadequate online marketing efforts. Hence, it is imperative for organizations to prioritize their internet marketing techniques in order to allure people to their websites. According to Yasmin et al. (2015), email marketing, social media, affiliate marketing, search engine optimization, and pay-per-click are identified as the key components of digital marketing. Kotler & Keller (2016) identified six ways of online marketing communication: search advertising, display advertising, websites, email, social media, and mobile phones.

Methods of Online Marketing Communication

Email Marketing

It is among the most frequently employed advertising techniques. Despite the current prevalence of social media, a considerable number of people still prefer to receive information from businesses via email. It is recommended (Camilleri, 2019) to segment email based on a range of attributes, such as consumer spending patterns and preferences. Despite the fact that spam emails constitute a substantial obstacle to email marketing and lead to pointless correspondence, email remains a successful and efficient marketing instrument that can deliver benefits to businesses and consumers (Ryan, 2009). An abundance of strategies exist for enhancing the efficacy of email marketing. According to (Sahni et al., 2018), the probability of the recipient opening an email is increased by 20% when the subject line of the email is personalized (e.g., includes the recipient's name). Furthermore, (Conceicao & Gama, 2019) posits that including a question mark in the subject line of an email can also increase the likelihood of the recipient opening the communication. In accordance with this perspective, the research outcomes of (Ryan, 2016; Singhal, 2015) demonstrate that electronic mail containing the recipient's consent is among the most efficacious approaches to online marketing. The appropriate implementation of email advertising can lead to the attraction of consumers to the website of the organization. Effective email marketing campaigns can be created with the assistance of MailChimp, Aweber, Exact Target, and Campaign Monitor (Popa, 2015, p. 1273).

Search Engine Optimization (SEO)

The process of optimizing a website to appear organically in search engine results is referred to as SEO. Enhancing a company's search engine ranking is principally concerned with increasing the volume of visitors to its website. In order to promote their websites, virtually all businesses must implement SEO (Odom, 2010). In contrast to the widespread belief among researchers that SEO has ceased to exist and is a futile endeavor, Google is actively working to prevent algorithm manipulation. In order to present the most pertinent results, Google algorithmic updates occur on a regular basis. Two such updates, Panda

and Penguin, are implemented by Google to combat spam sites (Egri & Bayrak, 2014). These initiatives assist the company in incorporating SEO into its online marketing campaign in order to increase product and service awareness and attract customers. The search engine results are optimized by algorithms when a website has published pertinent information. Prominent search engine marketing platforms, namely Google Ad Words and Bing Ads, facilitate the promotion of websites in their respective search engines. Advertisers vie for sponsored links through the submission of bids on millions of keywords (Berman & Katona, 2021).

Search Engine Marketing (SEM)

Search engine marketing (SEM) endeavors to enhance the page ranking of a website in order to attain the highest possible position in search engine results, thereby increasing website traffic. On the other hand, SEO comprises a series of procedures designed to optimize a website's text and HTML in order to increase its relevance to specific keywords (Zhu, 2011). It has been established that search engine advertising is more effective than traditional marketing in terms of product characteristics (Dinner et al., 2014). Furthermore, enhanced brand equity, product visibility, and sales revenue can result from increased search engine visibility (Hinz et al., 2012). Engines of search engine optimization are highly effective in driving traffic to a business's website. SEM is offered in a variety of formats, including visual product listing ads and brief text-based advertisements. Paid search marketing is a method of purchasing advertisements in order to generate website traffic for a business. Depending on their business structure, organizations may choose between PPC (pay-per-click), CPC (cost-per-click), and CPM (cost-per-thousand impressions) models. According to Yang et al. (2016), click-through rates are increased by affiliation, conversation, and responsiveness.

Display Marketing

Banners, which are another name for display advertising, consist of a standardized ad that may contain text, logos, images, and more. Display advertisements can be utilized by websites to boost traffic, brand recognition, and purchase intent. Brand awareness is increased more effectively by display advertisements than by sales (Popa, 2015). To increase brand awareness, display marketing employs written content, images, and promotional videos to promote products and services on websites. In addition to mobile devices and social media platforms, they may manifest on web pages and applications (Turban et al., 2018).

Organizations have the ability to customize their communications in accordance with the purchasing preferences and areas of interest of the consumer. Online display advertisements are only as effective as the websites on which they appear. Simply observing display advertising, according to Ghose and Todri (2015), generates interest in

the advertiser's brand. It is noteworthy that there is a direct correlation between the duration of advertisements that customers view and their propensity to engage in search activities.

In contrast to platforms like Facebook and LinkedIn, it exhibits greater efficacy on commercial websites like Amazon and Walmart (Aushaitrakul & Mukherjee, 2017). Digital advertisements consist of content that is featured in the games' application and/or on widely used social media platforms (Terlutter & Capella, 2013). In order to be harmonious with the game's environment, digital advertisements that are incorporated into the applications should be seamless (Lewis and Porter, 2010). The display advertisements may have been created by the website owners themselves or they may have been posted by their advertisers. Mobile Advertising

Mobile marketing has emerged as the most efficacious marketing approach due to the exponential growth of mobile user base. Mobile marketing facilitates the implementation of online marketing strategies by businesses, including email marketing, app-based marketing, and social media advertising (Gosling et al., 2016). (Berman, 2016) Time spent on a smartphone, the quantity of queries conducted, and direct and indirect purchases generated by mobile devices are all indicators of the medium's significance. Concurrently, individuals divulge personal information to technology companies regarding their whereabouts and online activities; these attributes render mobile marketing an auspicious instrument for online advertising. When users enable location sharing, numerous applications notify them via push notifications of popular and preferred destinations when they approach those areas (Guzzo et al., 2012). Personalization is positively associated with the entertainment, credibility, and informativeness of the advertising message; conversely, it is negatively associated with irritation (Kim & Han, 2014). Google Admob exhibits superior resource utilization compared to other media firms, making it especially advantageous for app-based marketing (Gao et al., 2018). Google, Amazon, and InMobi are examples of companies that use app-based marketing, in which marketers and developers collaborate.

Social Media Marketing

Social media was defined by Kaplan and Haenlein (2010) as a collection of web-based applications that enable the exchange and creation of user-generated content and are founded on the technological and conceptual principles of Web 2.0. In order to increase brand awareness and sales, companies and brands establish social media profiles and interact with consumers while promoting their products and services (Whiting et al., 2019). SMM entails increasing website traffic through the utilization of social media platforms including Facebook, Instagram, Twitter, and Pinterest, among others. Facebook, Twitter, and YouTube

have been identified as the most prominent social media sites in use today (Sorrentino & Pikas, 2014). As a result, this platform offers advertisers the chance to discover the most suitable subscribers to whom they can target their advertisements and facilitates global connection and interaction (Camilleri, 2019). An additional social media platform utilized by the organization for a variety of reasons—including public relations objectives, FAQs, and as part of an SEO campaign—is a blog (Pura, 2013). Social networking sites offer an abundance of user information, which makes them an ideal platform for targeted advertising (Hajarian et al., 2019). When utilized in a suitable manner, it can aid organizations in rapidly and affordably reaching millions of people while also enhancing positive electronic word-of-mouth advertising and bolstering consumer loyalty (Smith et al., 2016; Pura, 2013).

Viral Marketing

By means of communications channels and social networking sites, a viral marketing campaign is executed. This is an outstanding strategy for generating website traffic and establishing and expanding a company's brand. At present, viral marketing has emerged as a prevalent strategy employed by marketers to promote and generate awareness of their products on a global scale (Kusumadjaja, 2014). An frequently observed instance of viral marketing involves the production of unique, unanticipated, or comedic videos that are shared on social media platforms like Facebook and Twitter after being uploaded to YouTube (Daif & Elsayed, 2019). Social networking site subscribers have the ability to effortlessly distribute online content, including Web pages, photographs, and videos, to their acquaintances and coworkers. This functionality aids in the dissemination of the message conveyed via this platform. According to Frick (2013), if a business's content is of sufficient quality to entice users to spread it on social media platforms, it can rapidly amass thousands to millions of views. In viral marketing, influencers are crucial because they can disseminate the message to their followers. In order to enhance the visibility of their offerings, organizations employ prominent social media users (Pfeiffer & Zheleva, 2018).

Videos

Approximately 50% of multinational corporations incorporate videos into their email marketing campaigns, and the corresponding percentage feature videos in some capacity on their homepages. Videos effectively capture the interest of consumers and exert an impact on their purchasing choices. YouTube has achieved worldwide prominence as one of the most visited websites due to its association with unrestricted online videos (Statista, 2021). Providing users with the choice to watch or not watch online video advertisements enhances their engagement with the content and rises the probability that they will click on it (Paskevich et al., 2012, pp.72). There is a higher propensity for users to

distribute videos that they perceive as intriguing and beneficial across diverse social media platforms. Emotional videos are disseminated among peers and have a significant propensity to achieve viral status (Nikolinakou & King, 2018). Videos are being utilized more frequently by marketers for online promotion. Digital video advertising for low-involvement products increases purchase intentions and increases the likelihood that online users will opt-in for more information, according to Stewart et al. (2019).

Influencer Marketing

Influencer marketing is among the most well-known and successful online marketing strategies. Social media-based online marketing is known as influencer marketing. It is not uncommon for influencer marketing to be implemented alongside content marketing and social media marketing. An influencer can be any individual who possesses a substantial social media following, such as an athlete or celebrity. Social media personalities are influencers who possess extensive knowledge and skill in the realm of personal branding (Jin & Muqaddam, 2019). They maintain a significant online presence on social media platforms such as Facebook, Twitter, Instagram, and YouTube, and are active in numerous industries, including gaming, fashion, politics, lifestyle, and fashion (Stoldt et al., 2019).

As an emerging celebrity endorsement model, influencer marketing is experiencing a surge in prominence owing to its capacity to engage with elusive online consumers. At present, utilizing personalities as influencers is regarded as the most efficacious approach to produce promotional content on social media platforms that does not annoy users (Lee & Kim, 2020).

Content Marketing

Content marketing is a strategic business and marketing approach that aims to generate profitable consumer behavior through the creation of valuable content that targets a specific market segment for the purpose of attracting, retaining, and interacting with them (Popa, 2015, citing Jeo Pulizzi, 2014). Content marketing of the highest caliber is critical to the success of any online marketing strategy. Conducting comprehensive research is imperative for organizations to create content that is pertinent to their intended demographic. (Baltes, 2015) Content marketing aims to educate and inform consumers with the purpose of fostering a strong relationship with them and securing their brand loyalty. Communication is the process of generating and disseminating valuable, no-cost information with the intention of establishing credibility and generating interest and brand awareness among recipients; it also serves to inform, amuse, involve, and motivate them (Montero et al., 2019; Jarvinen & Taiminen, 2016).

Electronic Word of Mouth Marketing (e-WOM)

Electronic word-of-mouth, or WOM, has experienced a significant surge in prominence ever since the inception of the Internet. Electronic word-of-mouth (E-WOM) refers to any favorable or unfavorable review expressed by prospective, existing, or past clients regarding a company or product. This information is disseminated to a vast audience of organizations and individuals via the Internet (Hennig-Thurau et al., 2004). It is simple to engage consumers with e-WOM through websites, blogs, chat forums, or email. Positive e-WOM would strengthen a company's position in the minds of its consumers, according to Ismagilova et al. (2017), whereas negative publicity can be extremely detrimental to a business's reputation (Bhandari & Rodgers, 2018). In terms of credibility and dependability, word-of-mouth is a significant component of information sources (Lopez & Sicilia, 2014). Furthermore, opinions are more significantly influenced by information derived from non-commercial sources as opposed to commercial sources.

Messengers

In 2018, more than 149 million individuals were Smartphone owners with at least one mobile messaging application. This number is projected to increase to 171 million by 2022 (eMarketer, 2018). WhatsApp and Facebook Messenger are the most widely used messaging applications globally, boasting active user bases of 1.6 billion and 1.3 billion, respectively, as reported by Statista. Mehner (2019) reports that approximately 4.6 billion people globally utilize WhatsApp, Viber, Telegram, Facebook Messenger, WeChat, and QQ on a monthly basis. Instant messaging platforms, such as Facebook Messenger and WhatsApp, are available to applications. These couriers deliver interactive, customized communications in real-time. Consequently, instant communicators serve as an exceptional medium for content promotion (Mehner, 2019). By providing a private, secure channel of communication between a company and its customers, messengers enhance business-to-consumer (B2C) interactions. Consequently, they represent an exceptionally alluring channel for electronic commerce (Rowles, 2014). Messengers have the potential to serve as a supplementary tool to email and social media marketing, or they can be integrated with additional channels including Facebook, Twitter, Google+, and more.

Augmented Reality

Augmented Reality (AR) is an emerging user interface that augments the perception of digital marketing technologies by seamlessly incorporating interactive digital content into an individual's environment (Chylinski et al., 2020). Online marketing technologies are increasingly adopting interactive systems like augmented reality (Montero et al., 2019). One rationale behind the utilization of augmented reality (AR) software by companies to market

their products is to enhance the level of engagement between organizations and their clientele (Turban et al., 2018). By enabling consumers to "situate" their thoughts, AR marketing enables businesses to influence their choices (Hilken et al., 2017).

Table 2 : Measuring the Effectiveness of Online Methods

Dimensions	Online Marketing Methods	References
Attract	Email; SEO; SEM; Display Marketing; Social Media; Mobile Marketing; viral marketing	(Zhu, 2011; Odam, 2010; Hinz et al, 2012; Frick, 2013; Ryan,2014; Kusumadjaja, 2014; Singhal, 2015; Popa, 2015; Sahni et al, 2018; Turban et al, 2018)
Engage	Display Marketing; Videos; Mobile Marketing; Social Media Marketing; Viral Marketing; Content Marketing; AI	(Frick, 2013; Kim & Han, 2014; Sorrentino & Pikas, 2014; Pulizzi, 2014; Ghose & Todri, 2015; Baltes, 2015; Jarviaen & Taminen,2016; Heppelmann,2017; Turban et al, 2018; Whiting et al, 2019; Smink et al, 2019)
Brand Awareness	SEM; Display Marketing; Videos; Social media; Viral Marketing; Content Marketing; E-WOM	(Hinz et al,2012 ; Frick,2013; Lopez & Sicilia, 2014; Popa, 2015; Baltes,2015; Turban et al., 2018; Stewart etal, 2018; Montero et al, 2019)
Brand Loyalty	Social Media; Content Marketing; E- WOM; AI	(Pura, 2013; Pulizzi, 2014; Baltes, 2015; Smith et al, 2016; Ismagilova et al, 2017; Smink et al, 2019)

Source: Data compiled by The Authors

The literature review identifies several determinants of online marketing effectiveness, as shown in Table 2. These determinants comprise brand recognition, brand loyalty, and brand awareness. The references and categorization in the table above are presented in a non-orderly fashion for the purpose of furnishing a comprehensive summary of the literature consulted for this study.

It has been determined from the preceding discourse that online marketing communication methods are efficacious in generating brand awareness and loyalty, attracting visitors to the organization's website, and engaging them. Effective continue to be the earliest forms of online marketing, including email, SEO, and SEM. In addition to directing visitors to the website of a company, they contribute to the expansion of brand recognition. By conceptualizing and executing strategies for businesses to generate and convey value to customers via online marketing channels (e.g., content marketing, email marketing, and social media), AI enhances the marketing paradigm. Social media marketing is an essential technique utilized by businesses to rapidly disseminate information to millions of individuals worldwide; it positively influences electronic word of mouth, thereby increasing consumer loyalty. In order to increase brand awareness, businesses are considering creating pages and accounts on Facebook and Instagram in addition to placing advertisements there. This would enable them to interact with and engage with online users.

Conclusion

Research and surveys conducted globally over the past decade have consistently demonstrated the expansion of digital marketing, a trend that is anticipated to persist in the coming years. The market's potential tends to expand in tandem with the proliferation of mobile phones and other devices, thereby facilitating enhanced advertising reach. As an increasing proportion of the population utilizes and dedicates more time to the internet, digital marketing's reach in India continues to grow. In addition, digital marketing has increased substantially during COVID-19, and purchasing intent has shifted substantially. Contemporary advancements in online marketing have rendered the marketing strategies more efficacious and economical. This systematic literature review facilitates the differentiation of different online marketing strategies based on their efficacy; it illustrates that corporations employ online marketing to engage consumers, establish brand recognition, and foster loyalty. This review aims to provide organizations with guidance on selecting the most suitable online marketing strategy, given the profitable and cost-effective nature of such methods. Particularly, small businesses can now reach their target markets at minimal expense and compete on an equal footing with large organizations. Additional research is necessary to ascertain how the organization integrates and implements online marketing, as well as utilizes diverse online marketing methods, in order to accomplish their marketing and communication goals, given that this study is grounded in theoretical findings.

References

1. Baltes, L. P. (2015). Content marketing- the fundamental tool of digital marketing. *Bulletin of the Transilvania University of Brasov. Economic Sciences, 8*(2), 111.

2. Berman, B. (2016). Planning and implementing effective mobile marketing programs. *Business Horizons*, *59*(4), 431-439.

3. Berman, R., & Katona, Z. (2021). The Role of Search Engine Optimization in Search Marketing.

    Marketing Science, *4*(32), 18.

4. Bhandari, M., & Rodgers, S. (2018). What does the brand say? Effects of brand feedback to negative eWOM on brand trust and purchase intentions. *International Journal of Advertising*, *37*(1), 125-141.

5. Camilleri, M. A. (2019). The use of data-driven technologies in tourism marketing.

    Entrepreneurship, Innovation, and Inequality (pp. 182-194). Routledge.

6. Chaffey, D. (2009). *E-business and E-commerce Management: Strategy, Implementation, and Practice*. Pearson Education.

7. Chylinski, M., Heller, J., Hilken, T., Keeling, D. I., Mahr, D., & de Ruyter, K. (2020). Augmented reality marketing: A technology-enabled approach to situated customer experience. *Australasian Marketing Journal (AMJ)*, *28*(4), 374-384.

8. Conceição, A., & Gama, J. (2019, October). Main factors driving the open rate of email marketing campaigns. In *International conference on discovery science* (pp. 145-154). Springer, Cham.

9. Daif, R., & Elsayed, K. (2019). Viral marketing impact on tourism and hospitality industry. *International journal of research in tourism and hospitality (IJRTH)*, *5*(3), 34-41.

10. Dinner, I. M., Heerde Van, H. J.,& Neslin, S. A. (2014). Driving Online and Offline Sales: The Cross-Channel Effects of Traditional, Online Display, and Paid Search Advertising. *Journal of Marketing Research*, *51*(5), 527–545.

11. Facebook Messenger, WhatsApp, and RCS Help Brands Connect with Customers. (2018). Retrieved from https://www.emarketer.com/content/messaging-apps-and-marketing-2018

12. Frick, T. (2013). *Return on engagement: Content, strategy, and design techniques for digital marketing*. Routledge.

13. Gao, C., Zeng, J., Sarro, F., Lyu, M. R., & King, I. (2018). Exploring the effects of ad schemes on the performance cost of mobile phones. *Proceedings of the 1st International Workshop on Advances in Mobile App Analysis*, 13–18.

14. Gosling, V., Crawford, G., Bagnall, G., & Light, B. (2016). Branded app implementation at the London Symphony Orchestra. *Arts and the Market*, 6 (1), 2-16.

15. Ghose, A., & Todri, V. (2015). Towards a digital attribution model: Measuring the impact of display advertising on online consumer behavior. *Available at SSRN 2672090*.

16. Hajarian, M., Bastanfard, A., Mohammadzadeh, J., & Khalilian, M. (2019). A personalized gamification method for increasing user engagement in social networks. *Social Network Analysis and Mining*, *9*(1), 1-14.

17. Hanna, R., Rohm, A., & Crittenden, V. L. (2011). We're all connected: The power of the social media ecosystem. *Business Horizons*, *54*(3), 265-273.

18. Helm, R., Möller, M., Mauroner, O., & Conrad, D. (2013). The effects of a lack of social recognition on online communication behavior. *Computers in Human Behavior*, *29*(3), 1065- 1077.

Impact of Artificial Intelligence on Consumer Buying Behaviour

Dr. T. Jayshree

Research Scholar, Bharathiar University

Abstract : Artificial intelligence (AI) is a constantly developing field that has the capacity to greatly influence consumer buying habits. This is a component that consistently exerts influence. Businesses can employ AI-based technologies, such as machine learning, natural language processing, and predictive analytics, to analyze customer data and get further insights into consumer preferences, routines, and behavior. This data can be employed to customize marketing initiatives and promotions, enhance customer support, and augment revenue, among other potentially advantageous uses. This article aims to elucidate the diverse methods employed by businesses to leverage artificial intelligence (AI) in understanding and shaping customer behavior, specifically in response to the influence that AI has exerted on consumer purchasing patterns. Furthermore, the paper explores the practical uses of artificial intelligence in consumer marketing and sales.

Keywords : Artificial Intelligence, Consumer Buying Behaviour, Marketing.

Introduction

The prominence of artificial intelligence (AI) in our economy is increasing. Artificial intelligence has the potential to enhance both productivity and economic growth. It possesses the capacity to generate novel products and services, markets, and industries, while simultaneously improving the efficiency and quality of decision-making processes. The comprehension of the consumer experience is more challenging. Customers communicate their requirements, wishes, attitudes, and viewpoints through various channels such as searches, comments, blogs, Tweets, "likes," videos, and dialogues (online, mobile, and face-to-face; Court, Elzinga, Mulder, and Vetvik, 2009).The continuous stream of content generated by users is increasing in terms of quantity, velocity, variety, and genuineness. Marketers are utilizing artificial intelligence (AI) to convert the extensive amount of data into valuable consumer insights. The utilization of millions of Facebook accounts by Cambridge Analytica for political objectives, as demonstrated by Solon and Laughland (2018), highlights the presence of significant concerns. In order to adhere to the latest privacy standards, marketers need to update their AI systems. These risks present opportunities for marketers and advertisers to interact with customers and improve their comprehension of them at different points in the consumer experience (Petro, 2018). In order to comprehend vast quantities of data, artificial intelligence (AI) relies on two categories of incoming input:

Organized information: Data refers to widely used and standardized collections of information, such as records of past purchases, essential customer details, or patterns of internet usage. Artificial intelligence utilizes extensive amounts of structured data to do intricate computations that typically yield instantaneous outcomes.

Unorganized data: According to Rizkallah (2017), around 80% of the daily 2.5 billion gigabytes of data created by users are unstructured. This unstructured data consists of written texts, spoken words, and photos. The capacity of artificial intelligence (AI) to rapidly evaluate extensive amounts of this category of data distinguishes it from conventional computer systems.

AI pre-processes unstructured inputs to facilitate further calculations or the construction of components. The results of these fundamental components greatly exceed our inherent knowledge, which is advantageous for advertising.

Artificial Intelligence (AI)

Computers surpass humans in various tasks such as picture identification, speech recognition, decision-making, and language translation (CXPA, 2018). Sterne (2017) argues that AI has the capacity to carry out the "three Ds" of detection, determination, and development. The capacity of artificial intelligence (AI) to recognize and discern an individual's most characteristic and predictable attributes is commonly known as "detection." AI has the ability to determine the importance of certain characteristics and disregard others. An AI's capacity to "decide" pertains to its aptitude to make a choice by thoroughly evaluating multiple factors and selecting the most significant one. Develop refers to the ability of AI to autonomously acquire knowledge by assimilating new information, conducting investigations, and carefully evaluating each element prior to altering its viewpoint. An automated system known as artificial intelligence (AI) utilizes data to do tasks that are similar to those performed by humans and have the greatest probability of achieving success. The majority of AI is comprised of Big Data. Big Data encompasses the analytical techniques and tools employed by organizations to gather information from their global online interactions with clients. Big data distinguishes itself from other historical internet data due to its substantial volume, rapid velocity, and wide-ranging diversity (Chaffey & Ellis-Chadwick, 2019). AI can effectively handle both structured and unstructured big data. Arranged standard datasets encompass several types of information such as demographic data, transaction history, and web surfing trends.AI can analyze these datasets due to its capacity for intricate computations and prompt, precise discoveries (Kietzmann, 2018). Despite being

the majority of consumer information collected on a daily basis, unstructured data is more intricate and requires processing to yield insights that are not apparent in spreadsheets (Sponder & Khan, 2018). Artificial intelligence (AI) encompasses a set of technologies developed at three distinct levels to enable computers to do activities in a manner akin to human capabilities. Artificial Narrow Intelligence (ANI) is expected to become a common part of our everyday lives. The computer is capable of doing specific tasks due to its previous training. These procedures necessitate mental abilities such as client segmentation, image identification, and predictive analysis. For example, Zalando utilizes clients' previous purchases to suggest new orders. At its second level, Artificial General Intelligence (AGI) has the ability to surpass human intelligence in numerous domains. AI has the capability to autonomously resolve issues. AGI encompasses various instances such as robotics, intelligent computers, speech recognition, language processing, and visual recognition.Artificial superintelligence (ASI), the highest degree of AI, surpasses human intelligence in all aspects by employing innovative and scientific thinking. However, ASI is currently nonexistent due to our incomplete understanding of the human brain and nature. Given its potential to devastate entire towns, the ramifications of this magnitude were unforeseeable at the time of its original occurrence (Sterne 2017; Kaplan & Haenlein 2019).

According to Jarek and Mazurek (2019), artificial intelligence (AI) can be categorized into five distinct subfields. Popular subfields in marketing include decision-making, image recognition, text recognition, and voice recognition. Autonomous robots and vehicles are frequently employed in several industries. The technology behind voice recognition, which will transform the way customers engage with businesses, is a fundamental neural network programming. The integrated voice recognition system has the capability to comprehend both the spoken words and the intended meaning of the user (Dash, 2015). Customers may make purchases by using voice commands using the Amazon Echo, which now includes Alexa, an artificial intelligence system designed for e-commerce. Consequently, Amazon emerged as the dominant force in the smart speaker market, capturing a commanding 70% market share (Avinaash, 2018). Similar to Alpine AI, the virtual assistant at the mall, text recognition employs interactive artificial intelligence. Image recognition technology enables marketers to gain deeper insights into customer behaviors by analyzing videos and images shared on social media. Forsyth and Ponce (2011) suggest that marketers might obtain valuable information about consumers' purchasing behavior by analyzing comments posted on product photos. Both Albert AI and Harley Davidson possess the capacity to oversee internet marketing initiatives during the decision-making phase. After the campaign is launched, both programs analyze the collected data and provide recommendations relevant to the campaign. According to Jarek and Mazurek (2019), autonomous robots such as Schnuck have the ability to scan shelves in stores in order to confirm the correct positioning of products and track inventories. This information is then provided to customer service staff to assist them in carrying out their duties.

Artificial Intelligence (AI), Machine Learning (ML), And Deep Learning (DL)

Artificial intelligence, commonly referred to as AI, is a specific field that is often utilized in the context of marketing. Machine learning systems are designed to learn how to obtain the required output from a given input, and their performance improves over time as they process more data using computer programs or algorithms. Utilizing properly trained machine learning algorithms can be beneficial for organizations. These algorithms are more cost-effective and reliable compared to hiring marketing specialists, as they are capable of performing tasks that humans can. In his work, Sterne (2017) asserts that supervised learning, unsupervised learning, semi-supervised learning, and reinforcement learning are the predominant algorithms employed in instructing machine learning systems. Machine learning is indispensable for artificial intelligence. In order to survive in a dynamic environment, any automated system, including AI, must possess the ability to investigate and acquire knowledge from its surroundings, similar to how humans do (Alpaydin, 2016). It falls under the domain of deep learning, a subject under machine learning (ML). Effective unsupervised learning approaches depend on neural networks that emulate the nonlinear data analysis capabilities of human brains. With the advancement of computer power, particularly in the realm of graphics processing units (GPUs), the feasibility of deep learning is steadily improving (Sterne, 2017). Deep learning has the ability to enhance AI tactics such as task augmentation, automation, profiling, and personalization. These technologies provide multiple options for customer and brand engagement and rely on data analysis using big data. Deep learning is employed in retail organizations to enhance labor assignment and scheduling by using the outcomes of profiling and data mining (Daugherty & Wilson, 2018). This facilitates enhanced personnel administration and client contentment. Advancements in machine learning, deep learning, and natural language processing will lead to the dominance of artificial intelligence (AI) in the marketing industry (Avinaash, 2018).

The Impact of Artificial Intelligence (AI) on Marketing

AI is extensively utilized in both B2C and B2B marketing. According to KRC Research, the use of artificial intelligence (AI) would enable businesses to utilize Chabot technology in order to customize interactions with clients. This development is predicted to have a more significant influence on marketing compared to social networking.

Furthermore, based on the responses of 717 marketers polled by Emarsys Forrester, 79% of them believe that AI enhances workflow by making it more strategic compared to previous methods (Avinaash, 2018). Jarek and Mazurek (2019) argue that AI significantly influences marketing operations. The retail sector showcases the most evident benefits of AI due to its frequent client interactions and generation of substantial consumer data on attributes and transactions. Artificial intelligence processes this data and promptly delivers personalized recommendations to users. Quill utilizes natural language processing (NLP), predictive analytics, and algorithms to efficiently extract customer context from brand data (Avinaash, 2018). Given that AI will fundamentally transform the way organizations engage with customers and operate, marketers will utilize it (Davenport et al., 2020). AI has provided customers with several benefits, such as enhanced efficiency through automated payments, greater search engine accuracy, and 24/7 customer support. AI provides consumers with a unique experience by offering automatic product recommendations, relevant product suggestions, personalized customer care, and post-purchase assistance. AI enhances customer-brand interactions and facilitates online consumer product evaluations. According to PwC (2017), most consumers believe that AI will improve their lives by addressing intricate issues, however others are concerned that AI may hinder their job prospects.

Artificial Intelligence and Consumers

In this section, we examine the potential impact of AI on consumer spending and behavior. Additionally, we discuss the possible distortions that may arise from algorithms, as user data plays a vital role in AI systems. Information systems are increasingly being employed to organize and choose crucial data. Examples encompass the organization of search results, the news articles that internet users consume, the multimedia content they access, and recommendations for future purchases. This feature has the potential to improve matching accuracy and reduce search costs, as robots are more proficient and unbiased than humans in identifying relevant and high-quality content. Customers derive substantial benefits from it. Algorithms can mitigate the problem of information overload by regulating the processing of information. The concept of the "algorithmic consumer" arises when customers grant algorithms the authority to influence their purchase decisions, resulting in significant changes to the decision-making process (Gal & Elkin-Koren, 2017). Algorithms can assist customers in overcoming cognitive and behavioral biases, enabling them to make more rational judgments and avoid deceptive marketing practices..

How Artificial Intelligencehas InfluencedConsumer Behaviour

Artificial intelligence refers to the process of programming computers to perform cognitive functions such as thinking, learning, problem-solving, and perceiving. Increasingly, organizations are embracing AI as it becomes a more common feature in competitive strategies. Examples of artificial intelligence applications currently available include voice-activated Google Assistants, Siri, and Alexa, which utilize Natural Language Processing to convert queries into responses, the introduction of Tesla's smart cars, and YouTube's provision of data-driven results tailored to users' browsing history and interests. Consumers respond positively when marketing teams include artificial intelligence findings into their marketing tactics. This section examines the influence of artificial intelligence on consumer behavior.

The Influence of Artificial Intelligence (AI) on Consumer Buying Behavior

Consumer buy behavior encompasses the decisions and behaviors of customers in acquiring, utilizing, and disposing of goods and services that fulfill their wants and preferences. Examining such a process can aid in predicting future behavior (Qazzafi, 2019). The customers' behaviors prior to making a purchase are evident in the five stages of the consumer decision-making process: recognizing needs, conducting an information search, evaluating alternatives, making a purchase decision, and exhibiting post-purchase behavior. The consumer has the option to omit one or more phases. The significance of people's perceptions is emphasized (Kotler et al., 2017). Comprehending customer purchasing behavior is a complex task due to its reliance on the intricacies of the human mind. Nonetheless, within the realm of a digital platform, it is feasible due to the assistance of AI in analyzing and predicting client purchasing behavior. Customers communicate their requirements, wishes, and opinions through many channels on the digital platform, such as search, comments, blogs, Tweets, likes, videos, and face-to-face chats (Court et al., 2009). Consequently, there is now a greater abundance of consumer data in terms of quantity, speed, diversity, and accuracy. AI can be utilized to convert this data stream into meaningful client insights (Kietzmann, 2018). These figures form the basis for marketers' decision-making process as they establish their marketing plan and forecast revenues. The provided data is utilized by artificial intelligence systems to provide guidance to shops regarding product categorization and display techniques (Avinaash, 2018). Artificial intelligence (AI) can assist marketers in gaining a more comprehensive understanding of the consumer journey at various stages of the customer experience (Kietzmann, 2018). To comprehend the impact of artificial intelligence (AI) on consumer purchasing behavior, it is crucial to grasp the significant role it can fulfill at every level of the customer experience.

External influences
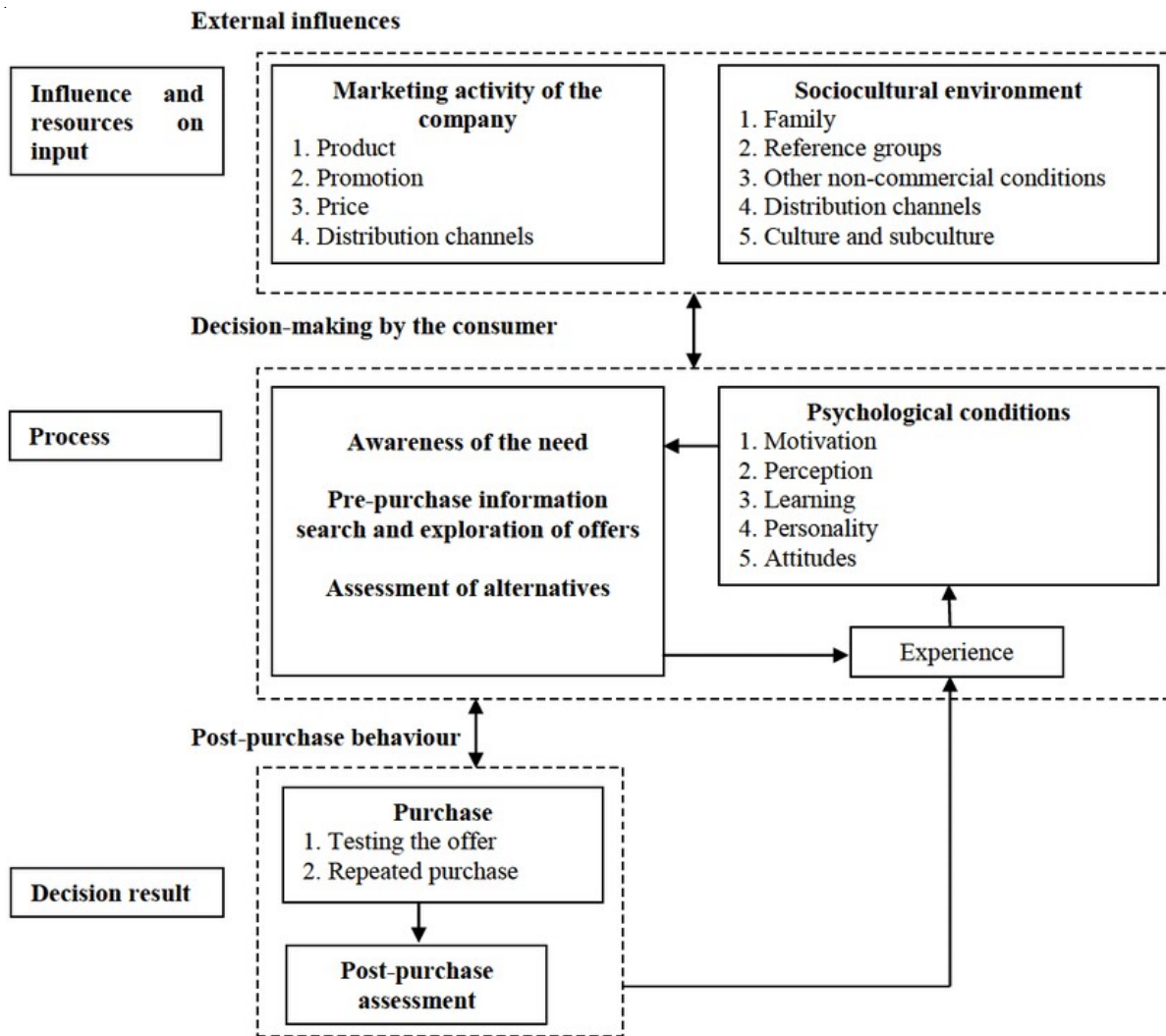
Figure : Consumer Decision-Making Process Model

Source : £odziana-Grabowska 2015a:20.

Need and Want Recognition

Tracking the moment when a demand is produced has proven to be difficult because it originates at the category level rather than the brand level (Batra and Keller, 2016). Advertisers have utilized market research, online analytics, and data mining to understand and influence consumer preferences. AI enables the rapid generation of comprehensive profiles and facilitates real-time understanding of clients' evolving requirements and preferences as they communicate online. Astro, a media company, utilizes Azure, Microsoft's artificial intelligence platform, to create profiles of its clients. The technology rapidly processes billions of data points for every individual user. The online content on Astro's platform is promptly customized to suit the needs of these users. These profiles are regularly updated by machine learning algorithms when a customer's digital footprints change due to modifications in their social network status, online comments and postings,

or purchase behaviors. Marketers can utilize AI to accurately demonstrate the demands and preferences of their target audience. Pinterest utilizes image recognition technology to analyze photographs provided by users and identify their individual interests. The website thereafter displays additional images that are pertinent to the user's preferences, facilitating the identification of specific needs or preferences. Kotler et al. (2017) argue that organizations should acknowledge that the initial phase of the customer journey is characterized by the awareness of needs. Batra and Keller (2016) argue that needs give rise to categories rather than specific brands. Consequently, it may be difficult to recall the criteria and aims of each individual. Artificial intelligence possesses the capability to comprehend the needs and preferences of clients during their online interactions. AI enables marketers to create real-time client profiles with more depth and accuracy. Customers' online activities, such as sharing updates on social media, making purchases online, leaving comments, and submitting

content, generate their digital footprints. These footprints are subsequently utilized by machine learning algorithms to automatically update customer profiles. By doing a thorough analysis of a vast amount of data, promptly recognizing users' desires, and subsequently customizing online material to align with users' tastes, Microsoft's AI platform Azure facilitated the media business Astr in generating consumer profiles.AI also assists in discerning the preferences and requirements of the client. For example, Pinterest employs image recognition technology to identify individuals' unique fashion preferences by analyzing the images they save on the platform. Subsequently, the website provides users with relevant photographs that align with their interests (Kietzmann, 2018). Moreover, the customized modeling feature of the AI-driven Adobe Audience Manager facilitated the identification of prospective customers who shared similar characteristics and interests with existing users (Michael, 2010). According to Davenport et al. (2020), internet corporations believe that AI has the capability to accurately predict the requirements and desires of its customers. Many e-commerce companies have adopted a shipping-first approach, utilizing artificial intelligence to identify client preferences and deliver things without requiring a formal request from customers (Agrawal et al., 2018). This is due to the fact that buyers have the choice to purchase, return, or swap anything that they no longer require. Upon obtaining the delivered merchandise, buyers proceed to place orders and have the option to make more purchases thereafter. Amazon exemplifies the anticipation of consumer desires by efficiently delivering products to the nearest distribution center (Avinaash, 2018). The implementation of the new business model has the potential to alter customer behaviors and retail marketing methods. Consequently, AI has the ability to identify evolving customer requirements and desires during the initial stage of recognizing demands, and subsequently offer appropriate choices throughout online buying.

Initial Consideration

When purchasers start thinking about products that fulfill their needs or desires, they take into account the brand as part of their evaluation (Batra and Keller, 2016). To enhance brand recognition, advertising can also emphasize key factors for consideration. By utilizing strategies such as search engine optimization, paid search ads, organic search, or ad retargeting, advertisers can effectively accomplish this objective. AI-powered search enables advertisers to find, rank, and display the most relevant results to meet the consumer's information requirements at a given moment. Google Adwordsassists organizations in differentiating between qualified and unqualified leads for more effective targeting. Google takes into account not only keywords, but also context words and phrases, customer activity information, and other essential data while analyzing search query data. Google utilizes this data to create user

segments that have the potential to generate profit and enhance targeting. By employing AI to construct comprehensive consumer profiles and utilizing these profiles to focus Facebook advertising, Zendesk, a customer assistance software company, observed an enhancement in the caliber and volume of leads. The subsequent stage of the consumer experience entails the quest for information. The process commences when customers develop awareness of their wants. Subsequently, they begin to contemplate potential products that could fulfill their desires and requirements. Marketers have the responsibility to ensure that their brands are included in consumers' shopping lists. Hence, marketers employ advertising techniques such as search engine optimization, paid search advertising, and organic search advertisement retargeting to enhance the exposure of their firms and effectively convey important parts of consideration (Batra and Keller, 2016). Those who embrace AI in its early stages are likely to thrive, as it acts as the driving force behind a new era of industrial change. According to a study conducted by Gartner (Avinaash, 2018), it is projected that by 2021, websites equipped with voice and visual search capabilities and AI adaptations will have a minimum 30% rise in digital commerce income.AI-powered search has the potential to assist marketers in delivering relevant results to consumers in real-time by recognizing, prioritizing, and presenting the desired outcomes. The Works, the prominent discount shop, experienced a notable 37% surge in e-commerce sales in 2017 as a result of the integration of Rich Relevance, an AI-driven website search engine, and personalization. Moreover, as stated by Avinaash (2018), Google's latest technology has the ability to predict the information requirements of users. Deep learning has the capability to analyze consumer behavior, forecast user patterns, and deliver adverts through a recommendation engine. For example, a highly profitable company known as the "Chinese Google" generates significant revenue by utilizing artificial intelligence to focus on targeted advertising.AI and machine learning enhance the likelihood of a customer clicking on a product when customizing advertising content for a certain demographic or during retargeting (Avinaash, 2018). AI has become indispensable for trend marketers since it enables them to effectively target clients and deliver personalized messaging (Avinaash, 2018). Google Adwords provides advertisers with high-quality leads to enhance targeting capabilities. Google utilizes artificial intelligence (AI) to analyze search query data by examining keywords, phrases, context words, consumer activity data, and various other extensive data sources. This analysis helps Google discover the most valuable subset of consumers. Through the utilization of artificial intelligence, Zendesk, a customer care software firm, was able to create more comprehensive consumer profiles and display targeted advertisements to Facebook users. This resulted in the generation of a substantial number of high-quality leads (Batra and Keller,

2016). In a highly competitive market, companies who are unable to produce and secure fresh leads may have challenges in maintaining their market position. By incorporating a proficient machine learning integration, it becomes feasible to accurately identify the prospects with the highest likelihood of conversion. By integrating artificial intelligence with a highly accurate search engine, the process of analyzing unorganized data and identifying possible opportunities will be streamlined. One example is Cien, a platform that uses artificial intelligence (AI) to enhance the process of evaluating potential customers and shorten the time it takes to make a transaction (Avinaash, 2018). Another example is Salesforce Einstein, which offers supplementary functionalities that can propose monitoring the original lead score. Data is collected automatically when calendar and email data are synchronized with a record (Jason, 2017). AI can assist customers by providing them with the necessary information during the information search phase of online buying, and subsequently suggesting suitable products that will meet their requirements and preferences.

Active Evaluation

The third part of the customer journey involves conducting alternative analysis. Acquiring information about the product that potential buyers desire to acquire is the initial stage. In order to choose the superior brand, customers assess and compare each individual brand (Kotler et al., 2017). Marketers utilize relevant information to convince consumers to trust their products and consider them as the optimal choice when making purchasing decisions (Batra and Keller, 2016). One advantage of adopting AI is the ability to customize material. AI is a data-driven system that generates and disseminates significant information. This information caters to the preferences and hobbies of these potential options. Indeed, each corporation has the potential to utilize this creativity in order to generate blog material. Integrating AI allows for the customization of websites, which is an additional advantage. One-to-one marketing refers to the practice of enhancing online purchasing experiences by providing tailored and personalized content, enhancing the user-friendliness and enjoyment of websites, and encouraging user engagement. Machine learning and AI algorithms have the potential to provide incentives to those visiting websites. An illustrative instance of how these incentives could enhance the likelihood of individuals converting is the AI platform Personal (Avinaash, 2018). An analysis of client browsing and purchasing behavior, encompassing factors such as social media engagement (likes and follower counts), website click patterns, and product review trends, is conducted in order to customize information. Data collecting enables marketers to provide content suggestions by analyzing customer preferences for graphics, colors, and other attributes (Sterne, 2017). In addition, marketers have the ability to personalize Facebook posts and emails based on individual client preferences.

Skilled marketers can effectively accomplish their marketing goals by creating intelligent content using AI-powered content generation (Chaffey & Ellis-Chadwick, 2019). Moreover, the process of creating content for diverse organizations and services is both costly and time-intensive. However, artificial intelligence may offer customized material at a fair expense. An example of how the combination of open-source and cloud-based APIs enabled the implementation of a cost-effective and customized marketing campaign (Avinaash, 2018). Lead scoring enables rapid identification of the most effective material for engaging potential customers. According to Avinaash (2018), Rocco is an AI-driven tool that has the potential to generate fresh content to captivate a brand's social media audience. Artificial intelligence (AI) can assist marketers in the evaluation stage by identifying clients who are likely to make a purchase and providing them with accurate and persuasive information. AI may also offer immediate personalized recommendations and notify buyers about a variety of pertinent products.

Advertising is to enhance consumer confidence in the product and convince customers that they are making well-informed choices when selecting from multiple brand alternatives (Batra and Keller, 2016). An effective strategy involves providing clients who have a strong intention to purchase with trustworthy and compelling information. These occupations derive three significant advantages from artificial intelligence:

Machine learning's predictive lead scoring enables marketing gurus to accurately forecast clients' purchase intentions. A machine-learning system enhances lead profiles for marketers by including supplementary external data on consumer behaviors and interests, following an analysis of a verified database of existing customer data to identify trends and patterns. Machine learning enables advertisers to select and modify material in real-time, including visual, audio, and natural language production, according to customer behavior. ASOS, an online clothing retailer in the UK, use Microsoft Azure to evaluate the significance of its products and the probability of a website user encountering, saving, adding to their basket, and finally purchasing a product. Users are provided with automatic recommendations of similar products as they are browsing through product listings. Marketers utilize emotion AI to analyze customer sentiment and brand perception in public platforms such as blogs, videos, and reviews, as well as to evaluate advertising before their release. Kellogg's utilized Affectiva's emotion AI engine to create a marketing campaign for its Crunchy Nut cereal. The campaign promptly removed ad executions when viewers' interest diminished after repeated viewings of the film.

Purchase

Customers determine the value of their preferred brand and their willingness to pay through a process influenced

by advertising. The goal of advertising is to persuade customers to take action by showcasing the brand's value compared to its competitors (Batra and Keller, 2016). Advertisers have the option to emphasize ease and provide information regarding purchasing locations, accompanied by warranties, guarantees, or return policies. Alternatively, they may provide incentives to encourage purchases. Artificial intelligence possesses the capability to radically transform the process by which individuals engage in purchasing transactions. Staples achieved this by transforming their "Easy" button into a "intelligent" ordering system that allows corporate customers to make orders via voice commands, SMS, or email. Marketers have the option to choose a pricing that is considered to be the most advantageous. Dynamic pricing incorporates real-time modifications to prices depending on data from demand, consumer behavior attributes, seasonal patterns, and competitor activity. During Black Friday 2017, Amazon utilized AI-powered dynamic pricing to modify the prices of 28% of their products on a daily basis. The fourth stage in the customer process entails the act of completing a purchase. Consumers evaluate the brands they have examined before to making a purchasing decision, and subsequently determine both the specific product and the location from which to purchase the brand that received the highest rating. Conversely, the environment can influence a consumer's decision to buy a product (Kotler et al., 2017).Customers are more inclined to make purchases when they begin to doubt the superiority of their preferred brands. Marketers can persuade consumers to make a purchase by highlighting the superior qualities of the brand compared to its competitors (Batra and Keller, 2016). Examples encompass the provision of coupons, guidance for making straightforward purchases, guarantees, or return policies. Staples facilitates customer purchases by offering the option to make them using voice commands, text messages, or emails, thereby simplifying the process (Avinaash, 2018). Enterprises that employed artificial intelligence observed a surge in user-generated leads. Artificial intelligence has the potential to profoundly change the process of purchasing.Artificial intelligence (AI) is increasingly making inroads in the commercial sector, including areas traditionally controlled by human workers, such as sales. These departments may benefit from using AI analytics to enhance their efficiency and intelligence. An instance of effective AI-powered sales software is Nudge, which facilitates salespeople's engagement with every prospective customer. Chorus is an additional tool that may be used to record and transcribe conversations. Conversica, an intelligent email assistant, notifies sales when a lead is ready for them. Furthermore, InsideSales assists individuals in surpassing their assigned sales targets. Tact, an AI-powered software, enables individuals to focus on sales instead of administrative duties. AI enables salespeople to make precise estimates and receive intelligent recommendations by analyzing historical data and identifying potential customers with a high likelihood of conversion (Avinaash, 2018).AI can provide the most suitable solution at each stage of the purchase decision-making process, according to the customer's requirements. Artificial intelligence enables clients to conveniently submit orders through text messages, emails, or voice instructions. AI can enhance the probability of reaching an agreement.

Post-purchase

Customers assess their level of happiness and decide whether or not to make a repeat purchase, potentially providing recommendations for the product. Advertisers strive to captivate customers by emphasizing occasions where the brand surpasses expectations or by addressing possible areas of concern (Kietzmann and Canhoto, 2013). Advertisers have the ability to reach out to customers with AI-driven "chatbots" following a sale. Autodesk employs a virtual assistant to promptly address client grievances. By discerning and projecting the intention, circumstances, and significance of inquiries, the time taken to resolve issues is reduced from 1.5 days to an average of five minutes. In addition, marketers have the ability to determine the identities of their most crucial clientele. Propensity modelling is an artificial intelligence technique that analyzes vast quantities of data to predict customer attrition, reengagement, and other significant performance metrics. To encourage the desired behavior, advertisers who are knowledgeable about these aspects may employ personalized communication as a component of a customer-relationship management campaign. Based on the customer's feedback, they may subsequently modify the communication during the continuing campaign. Post-buy behaviors, often known as the fifth stage of the consumer journey, pertain to the actions and conduct of consumers subsequent to their purchase and utilization of the chosen brands or items. In order for organizations to make informed decisions, it is imperative that they possess a comprehensive understanding of their customers' perceptions regarding their products. Conversely, if consumers are dissatisfied, problems will emerge. Satisfied customers tend to have longer retention and are more likely to engage in word-of-mouth referrals, hence enhancing sales (Kotler et al., 2017). Customers frequently express their contentment or discontentment with a product, as well as their willingness to purchase it, through verbal communication. Marketers must therefore promptly resolve any emerging difficulties and respond to any inquiries from potential customers (Kietzmann and Canhoto, 2013). Artificial intelligence can assist companies in responding to every individual lead inquiry. Marketers have the ability to engage with customers post-purchase through the use of AI-powered "chatbots". The software was developed by the company Autodesk. Customer concerns must be promptly addressed by an automated agent within a maximum of five minutes, around

the clock. Chatbot technology is based on the ideas of machine learning. Deep learning enables the adaptation of services based on client behavior, providing marketers with novel means to engage with consumers (Daugherty & Wilson, 2018). Chatbots have the ability to handle a large number of clients simultaneously due to their capacity to provide a substantial amount of information within a very short time frame. We have now reached the post-purchase behavior stage. Artificial intelligence has the capability to detect any indications of discontent and react appropriately to provide reassurance to its clients. To summarize, AI significantly enhances every aspect of the user experience. During the requirement identification step, artificial intelligence (AI) can assist marketers in generating consumer profiles with greater speed, precision, and frequency. AI may assist marketers in the information search stage by recognizing the most optimal leads for precise targeting, suggesting the most suitable product recommendations for consumers, and determining the most effective content style to align with their tastes. AI has the potential to offer consumers relevant information during their decision-making process, which can influence and convince them to make a purchase. By optimizing the process and dynamically adjusting prices at various stages of the transaction, artificial intelligence (AI) has the potential to provide clients more intelligent purchasing choices. Ultimately, AI has the capability to please consumers and evaluate their worth during the period following a purchase. AI has a role in predicting and influencing client behavior during the purchasing process.

Conclusion

The advent of AI has brought about a transformation in the understanding and targeting of consumers by the advertising industry. Future consumer insights will be driven by emerging data mining technologies provided by users, with artificial intelligence serving as the benchmark for privacy. Advertisers can collect customer data from several sources, merge it, and employ machine learning to extract current consumer insights. With this knowledge, advertisements may actively engage with consumers. In May 2018, Google CEO Sundar Pichai revealed Google Duplex, a digital assistant that offers a preview of the upcoming advancements in artificial intelligence. Duplex, an AI chatbot, employs natural language generation (NLG) to make reservations for dining, hair appointments, and check holiday hours for shopping. Its human-like conversational abilities have raised concerns about the progress of AI and the need for chatbots to disclose their non-human identity (Cipriani, 2018). Given its growing capabilities, AI has the potential to become deeply integrated into traditional advertising to the extent that distinguishing it from human involvement may become challenging. In order to remain competitive in dynamic markets, retail businesses must undergo a process of digital transformation. Artificial

intelligence (AI) is a technology that aids marketers in gaining a deeper understanding of consumers and effectively reaching their target audience. AI has a profound influence on both customer-business interactions and marketing strategies. Marketers must anticipate and ready themselves for the transformative impact that the era of artificial intelligence will inevitably bring. They require a comprehensive comprehension of how artificial intelligence (AI) may be utilized in marketing initiatives to forecast and manipulate consumer behavior. This study seeks to examine the extent to which customers follow the guidance provided by AI systems implemented in merchants' physical stores. Its objective is to shed information on the influence of artificial intelligence on consumer buying patterns in the online retail industry. The research offers a comprehensive examination of the notion of artificial intelligence, encompassing its various levels and applications. Explanations exist for Deep Learning, Machine Learning, and the utilization of AI in marketing. This text offers a comprehensive analysis of every stage of the customer journey, including need identification, information search, evaluation, and purchase decision-making processes. It also explores the impact of AI on consumer purchasing behavior.

References

1. Avinaash. M., R. Jayan, (2018), "Artificial Intelligence-The marketing game changer," IJPAM, Vol.119, No.17, PP.1881-1890.

2. Batra, R., and K. L. Keller." Integrating Marketing Communications : New Findings, New Lessons, and New Ideas." Journal of Marketing 80 (2016):122–145

3. Davenport, Thomas & Guha, Abhijit & Grewal, Dhruv & Bressgott, Timna. (2020)., "How artificial intelligence will change the future of marketing", Journal of the Academy of Marketing Science, Vol. 48, Issue 1, 1-19

4. Gal, M. S., & Elkin-Koren, N. (2017). Algorithmic consumers. Harvard Journal of Law and Technology, 30 (2), 309–352.

5. Dash, S. S., Bhaskar, M.A., Panigrahi, B. K. andDas, S.(2015)," Artificial Intelligenceand Evolutionary Computation sin Engineering Systems", Proceedings of ICAIECES, Chennai, In dia.2015

6. Jarek, Krystyna & Mazurek, Grzegorz. (2019), "Marketing and Artificial Intelligence. Central European Business Review", 8.46-55. 10.18267/j.cebr.213.

7. Kaplan, A. & Haenlein, M. (2019), "Siri, Siri, in my hand: Who's the fairest in the land? On theinterpretations, illustrations, and implications of artificial intelligence", Business Horizons, 62, 1,PP. 15-25.

8. Khan, S.I. (2022). Impact of artificial intelligence on consumer buying behaviors : Study about the online

retail purchase. International Journal of Health Sciences, 6(S2), 8121–8129. https://doi.org/10.53730/ijhs.v6nS2.7025

9. Kietzmann, J., Paschen, J., and Treen, E. (2018), "Artificial intelligence in advertising : How marketers can leverage artificial intelligence along the customer journey", Journal of Advertising Research, 58(3), 263-267.

10. Kietzmann, J., and A. Canhoto. "Bittersweet! Understanding and Managing Electronic Word of Mouth."Journal of Public Affairs 13, 2 (2013):146–159.

11. Kim, J., & Song, J. (2019). How Artificial Intelligence is Changing Marketing. Harvard Business Review, July-August 2019, 74-81.

12. Laura Abrardi, Carlo Cambini& Laura Rondi (2021) "Artificial intelligence, firms and consumer behavior : Asurvey" Journal of Economic Surveys 2021;1–23. DOI:10.1111/joes.12455

13. Li, X., Ma, J., & Shi, Y. (2019). Artificial Intelligence and Consumer Behavior : A Literature Review. Journal of Systems Science and Information, 7(5),429-441.

14. Qazzafi, Sh.(2019)," Consumer Buying Decision Process Toward Products,International Journal of Scientific Research and Engineering Development, Vol.2, Issue 5.

15. Tafesse,W.,& Solomon, M. R. (2020). Artificial Intelligence and Consumer Behavior : A Comprehensive Review and Future Research Directions. Journal of Consumer Behaviour, 19(4), 355-375.

16. Wu, S., & Zhang, B. (2020). The Impact of Artificial Intelligenceon Consumer Buying Behavior: A Review and Future Research Directions. Journal of Marketing Analytics, 8(1), 22-37.

17. Zhang, H., Chen, Y., & Lu, Y. (2021). Understanding the Impact of Artificial Intelligence on Consumer Behavior: A Frame work and Future Research Directions. Journal of Business Research, 137, 556-567.

18. Webology Cipriani, J. (2018, May 24). "What Is Google Duplex?" May 24, 2018. Retrieved 24 April, 2023, from the C Net website:https://www.cnet.com/how-to/what-is-google-duplex/

Equity Research of Indian Public Sector Banks with reference to SBI and PNB

Ms. Meenakshi Manohar

MMS Student, DR.V.N. Bedekar Institute of Management Studies

Dr. Smita Jape

Associate Professor

DR.V.N. Bedekar Institute of Management Studies

Abstract : The paper extensively explores diverse facets of portfolio management, encompassing stock selection, portfolio construction, following the application of fundamental and technical analysis, derivatives, formulation of index metrics, and utilization of technical indicators. The primary objective is to comprehensively evaluate the performance of two banks within the public sector. The intention is to investigate multiple dimensions to ascertain the feasibility of analyzing the sector for optimal investment opportunities. The fundamental and technical analyses serve as crucial tools in identifying companies with superior attributes, subsequently facilitating the creation of an index for evaluation. The overarching goal of this research is to devise a portfolio that can deliver favorable outcomes for investors. Through investment in these portfolios, stakeholders can capitalize on prevailing market conditions. Furthermore, the study incorporates a virtual business approach, exploring the implementation of diverse strategies to understand their performance across varying market scenarios and their concurrent applicability. The research also delves into the examination of medium- and long-term patterns for forecasting future movements of specific securities. Long-term patterns, such as Price Channel, Bump & Run, Triple Top, Triple Bottom, Cup with Handle, Rounding Bottom, Symmetric Triangle, Ascending/Descending Triangle, and Double Top/Double Bottom, are scrutinized to inform purchase decisions when the investment horizon exceeds one year. Conversely, medium-term patterns are employed when the investment duration is less than a year. The overarching objective is to provide valuable insights into how different strategies perform under diverse market conditions, enabling informed decision-making for optimal portfolio management in the public banking sector. The objective of study is to investigate and analyze the financial performance of public sector banks, focusing on key financial indicators, profitability ratios, efficiency ratios and liquidity metrics to gain insights into their overall economic health, conduct a comprehensive assessment of the five-year performance of public sector banks, scrutinizing key financial milestones, growth patterns, and challenges faced over the specified period, explore and assess various indicators and trading techniques to identify optimal entry points for trades related to public sector bank stocks. This involves an in-depth analysis of market trends, technical indicators, and determine whether public sector bank stocks are overvalued or undervalued. Utilize established valuation models, financial ratios, and market dynamics to make informed assessments regarding the fair value of these stocks

This paper aims to provide a comprehensive understanding of the financial health and operational efficiency of these banks. It also assesses the industry's strengths, weaknesses, opportunities, and threats, providing a holistic view for stakeholders and policymakers.

Research Design

This research focuses on a descriptive research approach, analyzing the equity of two prominent public sector banks: State Bank of India and Punjab National Bank. The study relies on secondary sources, including articles from newspapers, magazines, and research papers. The research delves into the fundamentals of these banks, drawing information from their websites, as well as annual and quarterly reports for the current fiscal year.

Data Sources: The study exclusively utilizes secondary sources such as articles from reputable publications and research papers. Information about the selected banks' performance in the current market is extracted from companies official websites NSE, BSE,RBI and annual/quarterly reports for the ongoing fiscal year. The analysis is carried out using fundamental Analysis and Daily Stock Market Monitoring This analysis involves scrutinizing key financial indicators and metrics to gain a comprehensive understanding of the banks' financial health. Throughout the study, daily stock market values are closely monitored. This real-time tracking contributes to a dynamic assessment of the banks' equity performance in conjunction with the static data obtained from annual reports.

The research focuses on two leading public sector banks, namely State Bank of India and Punjab National Bank. The selection is based on their status as major players in the market, particularly considering their total market capitalization on a consolidated basis. By adopting this approach, the study aims to provide a thorough analysis of the equity of the selected public sector banks, offering insights into their current market standing and performance dynamics. This paper has been limited to investment analysis of banking sector only (Specifically SBI and PNB).

Equity analysis of Public Banking Sector

Analyzing public sector banks in India requires a thorough assessment of various factors such as financial performance, asset quality, regulatory environment and industry dynamics.
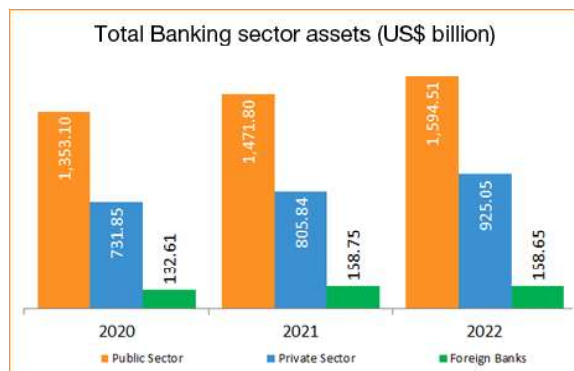
Financial performance is evaluated by analyzing key financial ratios such as Net Interest Margin, Net Profit, Net Interest Margin, Return on Equity (ROA) and Return on

Equity (ROE). Evaluate trends in profitability, asset growth and performance ratios over multiple time periods to identify potential strengths or weaknesses. asset quality of public sector banks is analyzed by metrics such as gross non-performing assets (NPAs), net asset ratio, coverage ratio and loan recovery trends. Asset quality is a critical factor in assessing the overall health and stability of a bank. Solvency position of public sector banks is analyzed using solvency ratios such as capital adequacy ratio (CAR) and Tier 1 capital ratio. A sufficient level of capital is necessary to withstand potential risks and to ensure the bank's ability to meet the requirements of the authorities. Reserve Bank of India (RBI) such as Basel III standards, stress test requirements and asset classification standards. It is important to note that capital analysis requires a combination of financial analysis, industry knowledge and qualitative assessment.

Industry Analysis

The Indian banking industry has lately adopted cutting-edge banking techniques including remittances and micro funding banks. India has recently concentrated on expanding the reach of its banking system through a number of initiatives, including the Pradhan Mantri Jan Dhan Yojana (PM J and Post Payment Banks. Along with other big banking changes including digital payments, new banking, the expansion of Indian non-banking financial and technology for finance, such programs have considerably increased financial inclusion in India and sped up the loan cycle there.

The banks belonging to the public sector are a significant category of state-owned financial institutions in India, where a subsidiary of the Ministry of Finance of the Government of India (India) or the State Ministry of Finance of several Indian state governments has the majority shareholding (i.e., more than 50%). These state-owned banks have shares listed on the stock market. Social welfare is their primary objective.

Total Banking sector assets (US$ billion)

	Public Sector	Private Sector	Foreign Banks
2020	1,353.10	731.85	132.61
2021	1,471.80	805.84	158.75
2022	1,594.51	925.05	158.65

State Bank of India

When the Imperial Bank of India was nationalized in 1955, the central government entered the banking industry. State Bank of India was the new bank's name when the Reserve Bank of India purchased a 60% interest. When the Union Government approved the State Banks of India Act, 1959 (also known as the Subsidiary Banks Act), seven additional state banks became subsidiaries of the new bank.On July 19, 1969, the Indira government nationalized 14 additional banks, marking yet another massive government intervention in the banking industry. 50 million dollars were deposited in nationalized banks in 1969. As a result, there are now more nationalized banks in India, and 84% of all branches are now governed by the government. In the 1980s, the percentage of public-sector financial institutions in the banking industry kept increasing, reaching 90% by 1991. Government-owned financial institutions in India had a total of 60,646 branches as of March 1992, with reserves totaling 1, 10,000 crore. Only one of the 21 public sector banks reported a loss, giving nearly every one of these banks profitable. During the twenty-first century, liberation Banks that have been nationalized have declared losses of 1,160 crore. A profit of 7,780 was made by public sector banks in 2002–2003, however, and this trend reversed in the early 2000s. This trend persisted throughout the decade, with a profit of 16,856 in 2008–09.By combining via its affiliate, State Bank of Saurashtra on August 13, 2008, State Bank of India launched the first merger of SBI-affiliated institutions. On August 27, 2010, it combined with itself and State Bank of Indore. State Bank of India amalgamated with its other subsidiaries, State Bank of Bikaner and Jaipur, State Bank of Hyderabad, State Bank of Mysore, State Bank of Patiala, and State Bank of Travancore, taking effect from April 1, 2017.In 2018, Bank of Baroda combined with Vijaya Bank and Dena Bank. Beginning in January 2019, IDBI Bank was categorized as a private bank.As part of the government's plan to consolidate public sector banks, the following mergers were announced on August 30, 2019 by Finance Minister Nirmala Sitharaman: Allahabad Bank and Indian Bank; Eastern Bank of Commerce and United Bank; Andhra Bank and Corporation Bank; Union Bank of India; and Syndicate Bank and Canara Bank. The mergers go effective on April 1, 2023

Literature Review

Vedashree Mali, 2021), examines equity research on a few public sector banks in India. The major goals of this paper was to investigate how fundamental analysis aids in making investment decisions and to analyze the pattern of bank stock prices and volatility. People in India are realizing that common stock has the potential to offer more attractive returns than other types of investment choices. However, as most consumers are ignorant about stock valuation, they only invest in equity shares after taking into account recommendations from brokers, friends, or relatives. The majority of investors do not want to gamble with their money, hence stock is not regarded as an investment. Analyzing the specific industry in which the investment has to be made is the first step in equity valuation. If the industry is even

remotely viable, then examination of various sector actors is carried out .The individual firm study should be performed using fundamental analysis to assess its performance and financial strength once sectorial and competitor analysis has been completed. Thisstudy begins with an examination of the foundational factors, such as the EIC- economy, industrial outlook, and corporate assessment of the chosen banks, SBI and PNB.

According to The Reserve Bank of India (RBI) recently released its 27th Financial Stability Report (FSR), presenting an assessment of the Indian financial system's resilience and risks. Despite global uncertainties and challenges, the Indian economy continues to display robust growth supported by strong macroeconomic fundamentals. The banking sector, in particular, has performed well, outshining the turmoil experienced by advanced economies.

The Indian economy shows resilience in the face of global challenges, benefiting from continuous fiscal reduction, healthy banking system, moderated inflation, reducing current account deficit, growing foreign currency reserves, and momentum in growth.The bank and corporate balance sheets are in good shape, which is encouraging a fresh lending and investment cycle and improving India's chances for long-term growth

According to The Economic Times dated on 15 June, 2023 titled with PSU bank stocks of Dalal Street. Public sector bank equities made up the majority of the volatility over the last year, even if it caused benchmark indexes to post modest gains. It is reasonable to argue that, in terms of earnings and stock performance, FY23 was the greatest ever for PSU banks. One of the banks, and the market leader, State Bank of India, posted its highest-ever earnings in FY23. In the last 12 months, at least four stocks have also been

multibaggers. Director of research at Stoxbox, Swapnil Shah, states that "We think the public sector banking stocks have gained the momentum among financiers as they have detached their businesses from the traditional framework to the current technique in which they are now paying attention to the forthcoming digital banking system."

With its headquarters in Mumbai, Maharashtra, State Bank of India (SBI) is a global public sector banking and financial services company in India. In the 2020 Fortune Global 500 ranking of the largest organizations in the world, SBI is placed 48th and 221st. On the list, it is the only Indian bank. With a market share of 23 percent and 25 percent in the loan and deposit markets, respectively, it is a public sector bank and the biggest bank in India. With about 250,000 employees, it ranks as India's fifth-largest employer. State Bank of India crossed the $5 trillion market value threshold for the first time on September 14, 2022, becoming the eighth Indian firm overall and the third lender (after HDFC Bank and ICICI Bank).

The largest commercial bank in India by profits, assets, deposits, branches, and staff is State Bank of India. SBI, whose history dates back to 1806, works hard to always give the most recent and accurate information about its financial performance. The Bank engages in several forms of communication with its stakeholders, including email, its website, conference calls, one-on-one meetings, analyst gatherings, and presence at investor conferences throughout the world. Please find below the Bank's financial results, performance analysis, and other noteworthy information that will be of interest to analysts, fund managers, and investors. SBI's core business has always been fundamentally solid, and this is reflected in its performance year after year.
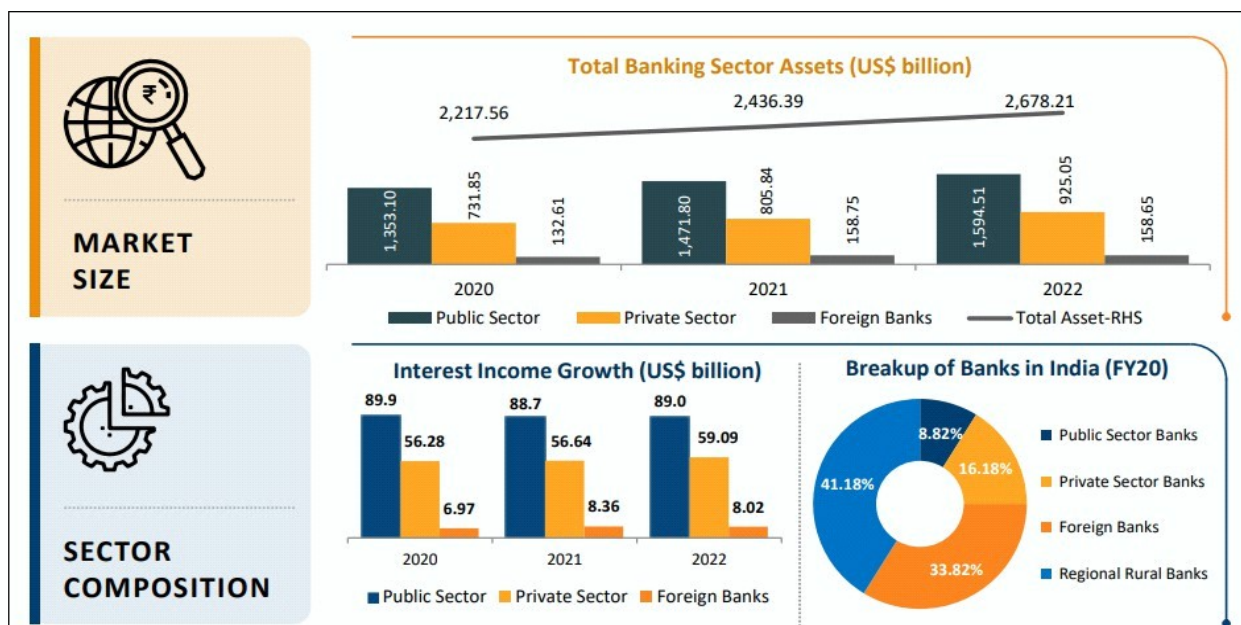
Punjab National Bank (abbreviated as PNB) is a public sector bank having its main office in New Delhi. Since its founding in May 1893, the bank has grown to become the second-largest public sector bank in India in terms of network size and the third-largest overall in terms of transaction volume. The bank's 12,248 facilities and at least 13,000 ATMs are used by more than 180 million people annually.

PNB's equity shares are traded on the National Stock Exchange of India and the Bombay Stock Exchange. It is a component of the NSE's CNX Nifty. The bank's ownership structure as of December 31, 2019, is as follows:

Shareholders	Shareholding
Promoter Group (Government of India)	83.2%
FIs / Banks / Insurance	5.6%
Resident Individual	5.7%
Mutual Funds	2.3%
Foreign Institutional Investors (FIIs)	2.2%
Others	1.1%
Total	100.0%
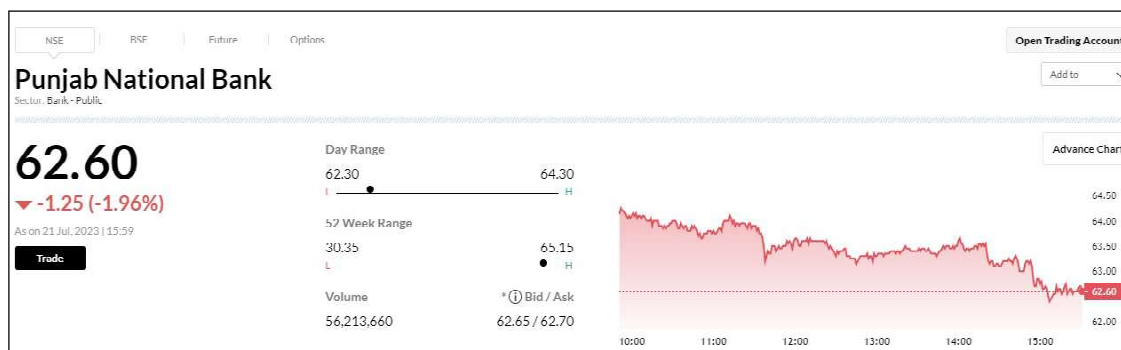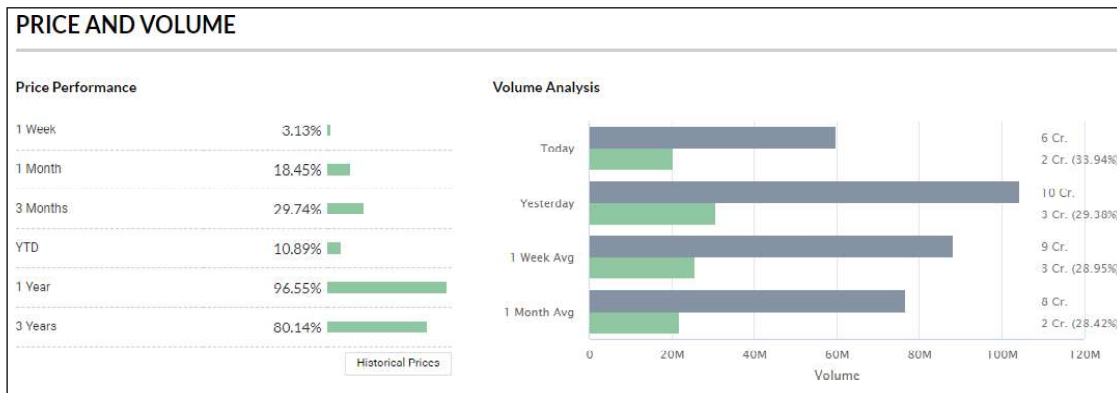
Sales, the price to earnings (P/E) ratio, profitability, earnings per share (EPS), the current ratio, and company- and industry-specific traits are only a few of the factors that fundamental analysis considers when determining stock prices. Basic assessment comprises:

1. Economic analysis

2. Industry analysis

3. Organization analysis

By concentrating on underlying elements that have an impact on the company's present and future operations, fundamental analysis is a technique used to estimate an asset's worth.

Using relevant economic and financial aspects as a guide, fundamental analysis may be used to determine a security's inherent worth.

Fundamental analysis looks at both macroeconomic (such as the state of the economy and market conditions) and microeconomic (such as the effectiveness of the company's management) factors that might affect the value of a security. Finding the essential ratios of a specific sector and comprehending how those ratios operate within that sector is the first step in studying the fundamentals of that sector.

Undervalued Stocks

Investors may determine a company's market worth in proportion to its income using the P/E ratio. The P/E ratio essentially indicates the amount the market is willing to pay for a firm right now based on its past or anticipated earnings. It assists in identifying if banking stocks and the industry as a whole are overvalued or undervalued, and based on this knowledge, judgments may be made.

PE Ratio= Share Price/Earnings Per Share. Compare each company's specific PE to the average sectors PE is compared

- Pick undervalued stocks first, then assess them.

- These are referred to as Value Pick.

Overvalued stock

- Determine whether stocks are overvalued based on the PE ratio categorization for equities that are.

- Overvalued stocks are those that are somewhat overpriced and trading at a high price. PEG Ratio = EPS growth rate / PE growth rate

- The percentage change in EPS from the previous year to the current year is known as the "EPS Growth Rate."

- Find increase, if any, in the EPS of the chosen firms during the past two years.

- Determine what needs to be accepted or rejected by dividing the PE by the growth to arrive at PEG. The value must be between 0 and 1.

- These are referred to as Growth Pick.

P E Ratio		
SBI	7.59	undervalued
PNB	15.6	Overvalued
Sector PE	10.25	

Banks	EPS (Rs.cr.)	NPM (%)	ROE (%)	P/E Ratio	Capital Adequacy Ratio
State Bank of India	62.35	15.12	18.44	10.92	14
Punjab National Bank	3.51	2.94	3.32	20.13	15

Punjab National Bank and state Bank of India

SBI Stock Performance/ Fundamental

Stock Part of Following Indices							
Name	Current Value	Change	Change %	Open	High	Low	Prev Close
NIFTY 200	10,344.10	17.8	0.17%	10,375.75	10,375.75	10,318.35	10,344.10
BANKNIFTY	45,923.05	-78.05	-0.17%	46,154.70	46,156.10	45,622.85	45,923.05
NIFTYMCAP50	10,461.20	42.25	0.4%	10,515.10	10,515.80	10,428.45	10,461.20
NIFTY TOTAL MKT	9,428.55	18.5	0.2%	9,458.95	9,458.95	9,411.70	9,428.55
NIFTY 500	16,865.15	31.75	0.19%	16,918.80	16,918.85	16,832.45	16,865.15
NIFTY PSU BANK	4,569.00	-66.9	-1.46%	4,599.50	4,602.85	4,483.85	4,569.00
NIFTY MID100 FREE	36,742.60	145.05	0.39%	36,929.65	36,944.85	36,655.25	36,742.60
MIDCPNIFTY	8,398.00	28.85	0.34%	8,447.45	8,447.75	8,376.85	8,398.00
FIN	9,755.20	0.53	0.01%	9,798.76	9,802.28	9,712.55	9,755.20

Financial Year	FY 2022-23	FY 2021-22	FY 2020-21	FY 2019-20	FY 2018-19
All Expenditure (Cr)	2,07,998.76	2,01,040.12	1,96,531.76	1,76,570.26	1,69,599.42
Operating Profit (Cr)	0.00	0.00	0.00	0.00	0.00
EBIDTA (Cr)	76,887.05	53,801.55	48,050.17	46,696.63	41,932.20
Profit Before Tax (Cr)	75,398.56	49,738.63	32,795.96	30,316.59	5,220.48
Tax (Cr)	18,840.13	13,382.46	8,516.25	12,139.76	2,151.41
Net Income (Cr)	4,73,378.14	4,06,973.09	3,85,337.89	3,68,010.65	3,30,687.36
EPS (Cr)	62.35	39.64	25.11	22.15	2.58
DPS (Cr)	0.00	0.00	0.00	0.00	0.00

Technical Analysis

Technical analysis is the examination of past market volume, price, and data. This is accomplished via behavioral economics and quantitative analysis. Analysts use historical data to make predictions about how the market will behave going forward. Technical indicators and chart pattern analysis are two examples of frequent categories.

The main goal of technical analysis is to predict whether and when the current trend will change or reverse.

Most technical analysts make use of candlestick or trendlines patterns. To forecast the most precise statistics, several methods are used. Using the conclusion, a trader decides what the prospective entry and exit points for a deal are. Most frequently, short selling is done using these entry/exist points.

Stock Part of Following Indices

Name	Current Value	Change	Change %	Open	High	Low	Prev Close
NIFTY SERV SECTOR	25,279.60	76.55	0.3%	25,373.85	25,391.75	25,234.45	25,279.60
NIFTY 500	16,865.15	31.75	0.19%	16,918.80	16,918.85	16,832.45	16,865.15
BANKNIFTY	45,923.05	-78.05	-0.17%	46,154.70	46,156.10	45,622.85	45,923.05
NIFTY100 LIQ 15	5,183.95	4.45	0.09%	5,201.20	5,202.00	5,167.15	5,183.95
NIFTY 100	19,540.45	26.45	0.14%	19,593.75	19,593.75	19,491.05	19,540.45
FINNIFTY	20,502.75	27.35	0.13%	20,607.10	20,608.00	20,411.40	20,502.75
NIFTY 200	10,344.10	17.8	0.17%	10,375.75	10,375.75	10,318.35	10,344.10
NIFTY	19,672.35	8.25	0.04%	19,729.35	19,729.35	19,615.95	19,672.35
NIFTY PSU BANK	4,569.00	-66.9	-1.46%	4,599.50	4,602.85	4,483.85	4,569.00

Stock Performance

Markets Today

High	621.25	Low	613.10
Open at	616.40	Prev Close	615.15
Volumes	1,74,44,742	Avg Price	616.65
Lower Circuit	554.90	Upper Circuit	678.20

Last Traded Details

Quantity	60	Time	15:59:33

Historical Performance

1-Year High	629.55	1-Year Low	499.35
3-Year High	629.55	3-Year Low	175.50
5-Year High	629.55	5-Year Low	149.45

1-Year Performance Indicator

616.55

499.35   629.55

▼ 0.56% down side   0.76% up side ▲

Candlestick Patterns

Candlestick charts are quite common among technical analysts. They offer a great deal of information in a really precise manner. As the name indicates, the price changes for each day are shown as a candlestick.

Red candlesticks signify selling pressure, while green candlesticks reflect purchasing pressure, which often denotes a positive price. The candlestick's shadows represent the high and low points of the day and how they relate to the open and close. The relationship between a candlestick's opening, closing, high, and low prices dictates its form.
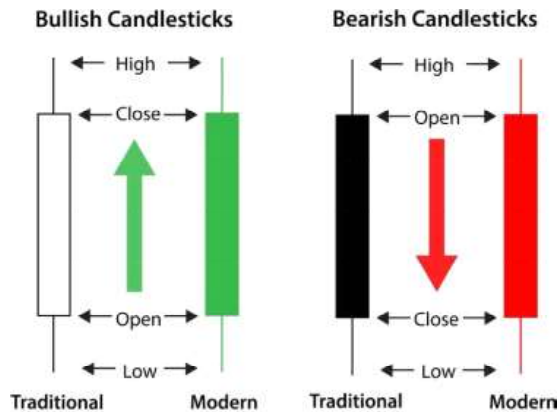
Short Term

Doji Candlestick

A Doji's significance relies on the trend or candlesticks that came before it. Doji show that supply and demand are becoming more equalized and that a shift in trend may be imminent. Hammer: After a downturn, the hammer pattern may develop as a bullish reversal. Hammers indicate a bullish resurgence following a drop. The extended lower shadow's low suggests that sellers pushed prices lower throughout the session.
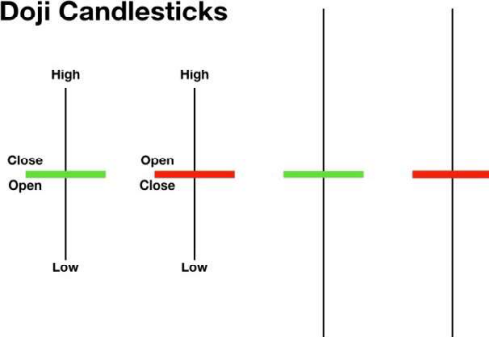
2. Hammer and Hanging Man Candlestick Pattern

- The candles for the Hammer and the Hanging Man appear to be identical. Both patterns have small bodies and long lower shadows, however the hammer pattern is bullish while the hanging man pattern is bearish. A

noteworthy candlestick pattern that emerges at the bottom of a trend is the bullish Hammer. A Hammer has a lengthy bottom shadow and a little real body at the top of the trading range. The pattern becomes more bullish as the bottom shadow lengthens. The past trend of the Hammer should be negative.

- The Hanging Man pattern is a single candlestick pattern and a top reversal pattern. Only when it follows a market high and is followed by an upswing is it classified as a Hanging Man In essence, a bearish Hanging Man pattern signals increased selling pressuInverted Hammer and Shooting Star Candlestick Pattern
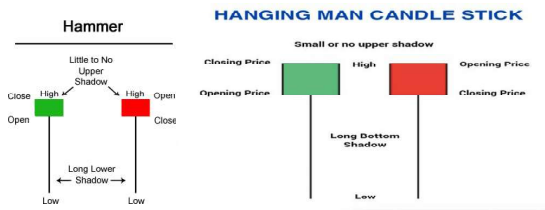
Shooting star and inverted hammer both have small bodies and long, taller shadows. Whether these candlesticks are bullish or bearish is only determined by prior price activity and additional confirmation.
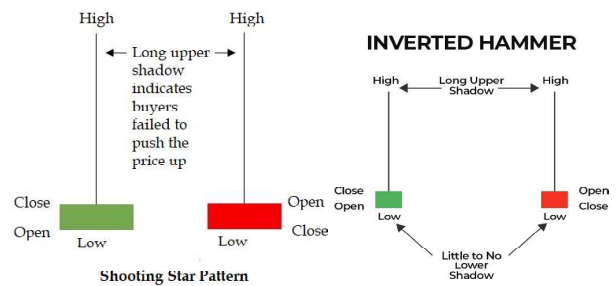
3. Bullish Engulfing and Bearish Engulfing Candle

- When it emerges at the bottom of a downtrend, the bullish engulfing candle shows a bullish reversal and suggests an increase in purchasing pressure.

- As additional buyers enter the market and drive prices further higher, this pattern causes the current trend to reverse.

- Two candles are used in the design, and the second green flame fully engulfs the body of the first red candle. The opposite of the bullish engulfing pattern is the bearish pattern. When it emerges at the peak of an uptrend, it denotes a negative reversal and a decline in prices by the sellers who are applying selling pressure. As more sellers enter the market and drive prices lower, this pattern causes the current trend to reverse.

Bullish Engulfing Bar **Bearish Engulfing Bar**
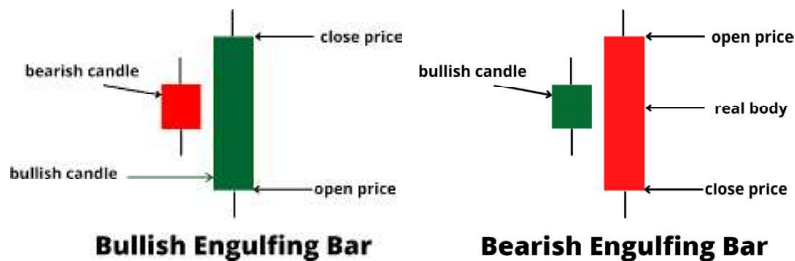
Technical Medium Term Patterns

1. Symmetrical Triangle Pattern SBI

Two converging trend lines linking a sequence of consecutive peaks and troughs define a symmetrical triangle as a chart pattern. These trend lines need to be convergent with a slope that is about equal.

2. Ascending Triangle Pattern PNB

A chart pattern utilized in technical analysis is an ascending triangle. It is produced by price movements that permit the drawing of a horizontal trendline along the swing highs and a rising trendline along the swing lows. They intersect to create a triangle. Traders frequently keep an eye out for triangle pattern breakouts.

3. Descending Triangle SBI

Drawing a trend line that links a series of lower highs and a second horizontal trend line that connects a series of lows results in the bearish chart pattern known as a descending triangle.

Technical Long Term Chart Patterns

1. Bump and Run Pattern PNB

When prices increase significantly and fast, a reversal pattern called the Bump and Run Reversal (BARR) forms. A bullish pattern known as a bump becomes apparent after drawing a rising trend line that connects at least three low points in a price series (troughs); when the trend line is broken, the pattern enters the run phase. The shares must now be sold by the investor.

2. Double Top Pattern PNB

After a protracted upswing, the double top is a significant reversal pattern that develops. The pattern, as its name suggests, consists of two roughly equivalent peaks that follow each other, with a modest dip in between. As soon as support is broken, there will be at least an intermediate change in trend, if not a long-term one, from bullish to negative.

3. Double Bottom Pattern PNB

A well-known technical analysis charting structure called a double bottom pattern indicates a major reversal in trend and momentum following a prior downward market trading action. It shows a security or index declining, rising, falling once again to the same or a similar level, and then rising once more (which can trigger another upswing). Together, the two bottoms resemble the letter "W." The twice-hit low is now recognized as a critical support level. If those two lows persist, the uptrend has new opportunities.

4. Cup with Handle Pattern PNB

The bottom of the chart is rounded out like a saucer. As the cup is completed, a trading range develops and advances to the cup's right side before the stock once more climbs upward, like a handle. We are supposed to buy when it crosses the line.

5. Head and Shoulder Pattern SBI

A reversal is indicated by the head and shoulders motif. A stock's price will likely start to decline, according to traders, if there are three sets of peaks and troughs with a greater peak in the middle. The neckline is the starting point of selling for bearish traders.

Technical Indicators

• **RSI (Relative Strength Index) SBI**

Technical analysts use the RSI, a momentum indicator, to identify whether a stock is overbought or oversold. The RSI is represented by an oscillating line graph on the screen.

For the RSI to be read, certain values must be set at 70-30 (commonly for long term) and 80-20 (usually for short term). When the line crosses the upper border (70/80), the security is becoming overbought or overpriced. A line that crosses the lower stop (30/20) suggests that the security is being oversold or undervalued.

A security is seen to be overpriced and ought to be sold when the line reaches the upper limit. Instead, a security should be bought when the line hits the lower limit.

- **Awesome Oscillator-PNB**

An indicator that is used to track price movements is the awesome oscillator. It appears in a 15-minute candle. When the first green candle forms above zero, from below, it will be time to buy. When the first red candle forms from above to below zero, a call for a short sale will be made.

Fibonacci Death Cross & Fibonacci Golden Cross-PNB

The indication can be drawn between any two important price points, such as a high and a low, making it handy. The levels between those two spots will subsequently be created by the indicator .The 21 and 55 moving averages (MA) are used in this analysis. Will accept the call for a short sale each time the 21 MA crosses the 55 MA line from up to down. When the 55 MA line is cut by 21 MA from down to up, I will answer the call to buy.

- **Supertrend SBI**

If the super trend crosses over the closing price, a super trend profit indicator sends out signals. When the super trend line crosses below the closing price and turns green, a buy signal is issued. In contrast, if the super trend line closes above the closing price and turns red, a sell signal is created.

VWAP (Volume Weighted Average Price) PNB

The volume-weighted average price (VWAP) is a technical analysis indicator for intraday charts that resets at the start of each new trading session. It serves as a benchmark for trading and displays the volume and price of a security's daily average trading price. VWAP is crucial since it provides traders with access to price data on the movement and value of an asset.

Stochastic RSI

The Stochastic RSI (Stochastic RSI) is a technical analysis indicator with a range of zero to one (or zero and 100 on some charting systems) that is created when the relative strength index (RSI) values are used as the input for the Stochastic oscillator formula instead of the usual price data. RSI readings may be used into the stochastic calculation to help traders decide whether the current RSI value is overbought or oversold. The Stochastic RSI oscillator was created to employ both momentum indicators in order to deliver a more sensitive signal that is tuned to a certain security's prior performance rather than a wide analysis of price change.

Findings

PNB is making a lot of effort to reach SBI, but SBI has high market capitalization than PNB. Banks in India are concentrating on customer service and enhancing their technological infrastructure in order to improve the customer experience and gain a competitive advantage. Making wise investing decisions requires doing extensive equity research. After assessing risk capacity and tolerance, time horizon, and investment goal, the individual portfolio provides systematic returns. Long-term, short-term, and fundamental analysis can all be used to help identify a confirm trade signal. Investors can optimize earnings and determine how long to hold the company by predicting long-term target prices.

It is recommended to review financial statements, regulatory notifications, research reports and stay informed about news and developments related to specific public sector banks and the Indian banking sector as a whole.

State Bank of India is the largest public sector bank in India and has a sizable market share in the banking sector of the nation. A broad variety of banking services and products, including retail and corporate banking, investment banking, insurance, and wealth management, are provided by SBI.

SBI is easily accessible to a large client base thanks to its broad branch network throughout India and its operation of several overseas branches. SBI has considerable government support because it is a public sector bank, which increases its credibility and financial stability. To increase client convenience and involvement, SBI has invested in digital technology and now provides internet banking, mobile banking, and other digital services.

Since SBI is a public sector organization, it may have to overcome bureaucratic obstacles that might impede innovation and slow down decision-making. SBI, like other banks, is subject to credit risks and may run into issues with non-performing assets (NPAs) and bad loans. The bank's lengthy history may have resulted in a dependence on antiquated procedures and legacy systems, which might affect productivity and customer satisfaction. Private sector banks, which could provide more responsive and customer-focused services, present SBI with significant competition.

By extending its array of financial services, including insurance, asset management, and digital payment options, SBI can continue to increase its clientele and income. SBI has a lot of room to grow in India's rural areas and reach millions of unbanked people there by expanding its offerings. SBI may increase operational effectiveness, improve customer experience, and gain a competitive edge by leveraging technology and digital innovation. SBI might investigate ways to increase its footprint in overseas markets and provide services to the Indian diaspora. The profitability and asset quality of SBI may be affected by changes in the economic climate, interest rates, and currency fluctuations.

As the use of digital banking expands, SBI must contend with an increase in Cybersecurity risks and potential breaches that might jeopardize client information and confidence. FinTech startups and technology firms are upending the traditional banking industry and threatening the market share of well- established institutions like SBI.

Punjab National Bank (PNB) is a well-established public sector bank in India, known for its extensive branch and ATM network. Catering to a diverse customer base, including individuals, businesses, and government entities, PNB offers a broad range of financial products. Despite its strengths, the bank grapples with challenges such as Non-Performing Assets (NPAs), impacting profitability and requiring increased provisioning. PNB also faces hurdles in adopting innovative technology, lagging behind private sector competitors. Corporate governance and management issues add to the challenges. Nevertheless, PNB remains a significant player in the Indian banking sector, supported by its long history, large customer base, and government backing.

Punjab National Bank (PNB) faces promising opportunities and challenges in the banking industry. Embracing digital transformation can enhance customer experience, while exploring expansion and diversification opportunities, aligned with government programs, holds growth potential. However, intense competition from both private and public sector banks poses a threat to PNB's growth and profitability. Economic fluctuations and regulatory changes, including alterations to banking rules, present additional challenges that could impact the bank's operations and profitability. Strategic navigation of these dynamics will be essential for PNB's sustained success in the evolving banking landscape.

The study focuses on employing technical indicators, specifically simple moving averages (SMA) and exponential moving averages (EMA), to analyze and generate trading signals for Bank of Baroda and Punjab National Bank stocks. The purpose is to assess price trends, identify potential buy and sell signals, and draw relevant conclusions. Key findings and recommendations are presented based on various technical analyses, including Rate of Change,

Relative Strength Index (RSI), beta values, alpha, correlation analysis, breadth of the market, and investor behavior.

Findings

SMA and EMA are utilized to smoothen short-term fluctuations in stock prices, facilitating the comparison between moving averages and security prices.A buy signal is identified when the SMA rises above the EMA, indicating a positive trend, while a sell signal is noted when the SMA falls below the EMA, signifying a potential downturn.Specifically, a lower degree of sell signal is noted for Punjab National Bank.

Rate of Change (RoC): RoC analysis reveals that both SBI and Punjab National Bank stocks exhibit volatility, oscillating between overbought and oversold regions.

Relative Strength Index (RSI): RSI indicates that both bank stocks are in the support zone, a characteristic of a bull market.

Beta Values and Alpha: SBI is identified as less volatile compared to the market index, while Punjab National Bank is deemed more volatile and risky due to a beta value exceeding 1.The negative alpha suggests that investors are not adequately rewarded for the risks associated with the stocks. Positive correlation is observed between the stock return of SBI and NSE return, with a higher degree of positive correlation for Punjab National Bank and NSE index return.

Market Breadth: In a bear market scenario, a bullish signal is indicated by the Advance/Decline line rising while Nifty is declining to a new low.

Investors can consider investing in Punjab National Bank stocks, but caution is advised due to the observed volatility in price movements. Considering the RSI in the lower range of a bull market, investors may find moderate earnings potential in bank stocks. SBI stock is for risk-averse investors, given its lower volatility compared to Punjab National Bank. The study concludes that the rate of change in bank stocks is not constant, suggesting investors consider buying at historic highs and selling at historic lows. Both SBI Punjab National Bank stocks are deemed suitable for investment, with Bank of Baroda being a lower-risk option. The use of SMA and EMA aids in predicting market trends, and while charts provide objective data, interpretations may vary based on analysts' approaches and skills.

References

1. Vasantha, International Journal Of Research In Computer Application & Management, Volume No. 1 (2011), Issue No. 10 (December) Issn 2231-1009

2 Dr. Arora. P.N and Mrs. Arora. S (2003) Statistics for Management 1st edition, S. Chand & Company Ltd.

3. Fusaro, Peter. C (2000), The Handbook of Fixed Income Securities 6th edition., New York:, McGraw-Hill. 3. Frankel. J.A, K.A. Froot and M.P. page (1990) Chartists, Fundamentalists, and Trading in the Foreign Exchange Market. The American Economic Review 7.93 said, "The rising importance of chartists".

4. Grinold, Richard. C, and Ronald. N (2000) Kahn.Active Portfolio Management 2nd edition, New York:, McGraw-Hill.

5. Pring, Martin. J (2002) Technical Analysis Explained: The Successful Investor's Guide to Spotting Investment Trends and Turning Points, McGraw Hill.

6. Punithavathy Pandian (2003) Security Analysis and Portfolio Management, 3rd edition, Vikas Publishing House Pvt. Ltd.

7. Raschke, Linda Bradford, Connors, Lawrence. A (1995) Street Smarts: High Probability Short-Term Trading Strategies. M. Gordon Publishing Group.

8. Robert D. Edwards, John Magee, W.H.C. (2007) Technical Analysis of Stock Trends 9th Edition (Hardcover), American Management Association.

9. Bessembinder, H., & Chan, K. (1998). Market efficiency and the returns to technical analysis. Financial Management, 27, 5-17.

10. Edwards, R. D., Magee, J, (2001), Technical Atuilysis of Stock Trends. (8th ed.). AMACOM Thomsett, M, C, (1998), Mastering Fundamental Analysis. Kaplan Publishing, 11. Mitra, S. K. (2010). How rewarding is technical analysis in the Indian stock market? Quantitative Finance First published on: 11 May 2010.

12. Nath, G. C. (2001). Long Memory and Indian Stock Market - An Empirical Evidence, UTIICM Conference Paper, 2001.

13. Peters, E. E. (1994). Fractal Market Analysis: Applying Chaos Theory to Investment and Economics. John Wiley & Sons: New York.

14. Pinches, G. E. (1970). The Random Walk Hypothesis and Technical Analysis. Financial Analysts Journal 26104-110.

15. Singh, J. P., & Prabakaran. S. (2008). On the Distribution of Retums & Memory Effects in Indian Capital Markets. International Research Journal of Finance and Economics, 14, 165-176.

Impact of Economic, Environmental and Social Indicators on Sustainable Development Approach of Oil and Gas EPC Companies

Mr. Vikrant Huddar

Research Scholar, University of Mumbai

Abstract : Even though sustainable development presents a significant obstacle, it is essential to a company's competitiveness as well as its capacity to survive, expand, and increase its profitability. As a sustainable indicator of oil and gas EPC firms, this research intends to investigate the individual and interrelated connections that exist between the environment, the economic, and social issues. The function that sustainable indicators have in determining the development of a firm will be investigated as part of the proposed research. According to the findings of this research, using economic, environmental, and social indicators for sustainable development may be done in a variety of ways and to varying degrees. Only a few of Indian companies, such as McDermott, Saipem, L&T, Reliance, Petrofac, Foster Wheeler, and Aker Solutions, compete in the market for oil engineering, procurement, and construction (EPC). This research study looks at several elements of EPC firms, including the following: (1) Conducts research on the level of knowledge and comprehension of sustainable development that exists among businesses and which helps such businesses to enhance their effect on an approach to sustainable development. 2) Conducts research on the present status and performance patterns of environmental, economic, and social indicators on the decision-making process of businesses. 3) Evaluates the level of environmental, economic, and social sustainability of businesses 4) Conduct research on the ways in which environmental, economic, and social factors are intertwined in the process of sustainable development for businesses. 5) As a last step, be sure to keep an eye out for the synchronization of environmental, economic, and social elements in the decision-making process for firms' Sustainable Development. The findings of this research study provide managers with assistance in enhancing their decision-making orientations for firms' sustainability policies. The process of gathering information by using both primary and secondary sources is referred to as "data collection." The collection of information will be carried out with the assistance of oil and gas engineering, procurement, and construction businesses located in the Mumbai area, with respondents being chosen at random.

Keywords : Sustainability Development, Oil and Gas Companies, Economic, Environment, Social Indicators and Factors Prediction Strategy

I. Introduction

The global economy depends on the oil and gas industry. In the consumer-based economy, there is a flow of materials and energy that is both influenced by and created by industrial uses. With its negative connotations related to ecological harm and resource depletion, the manufacturing industry is unanimously recognized as being crucial for development and economic production. The standards, which encompass the three pillars of long-term viability (environmentally, economically, and socially), for Engineering, The acquisition process, and Construction enterprises, also contain financial, ethical, and environmental requirements. Only a few Indian companies—L&T, Reliance Sectors, Petrofac, Mc-Dermott, Saipem, Foster Wheeler, Aker Solutions, and Punj Lloyd—are participating in the Oil Engineering, Procurement, and Construction industry.[1]. Nowadays, businesses follow the goals of shareholders or other financial institutions and employ economic capital to make a profit. However, there have been a recent trend toward studying non-financial aspects of equity. Multicapitalism is a theory that examines how economic, environmental, and social indices affect fairness. The study's focus is on the long-term expansion of Chinese oil and gas businesses [2]. We developed a set of metrics to assist these factories maintain their resources more responsibly because 95.7% of Brazil's oil and 78.8% of its natural gas are generated by extracting facilities in the country's maritime environment. This production is responsible for negative economic, environmental, and social effects. The sustainability report, which is based on recommendations from international organizations, is now one of the instruments that the oil sector uses the most. The corporate tone of these reports, however, makes it impossible to supervise the activities of manufacturing units in a sustainable manner. The indicators were selected using a methodical process, drawing on the body of knowledge on indicators of sustainability and a study of elements crucial to the administration and operation of offshore natural gas and oil extraction units. [3]The perspective that integrates the elements of economy, society, and the environment is where the broad idea of sustainability is found. One of the major sources of human greenhouse gas emissions has been identified as the energy industry. Consequently, industry-wide enhancement of social and ecological sustainability is Sustainability is mostly connected to in the oil and gas industry. Social, governance, and environmental efficacy as well as their influence on climate change are evaluated, especially for those in the oil and gas industry. O&G infrastructure must be planned, constructed, and operated in an ecologically conscious manner in order to achieve the many key performance indicators for corporate social responsibility (CSR) and environmental sustainability [4] to the increasing amount of gas and oil in the marine environment and the growth of enterprises of different sizes and nationalities, it is essential to use technology to ensure the long-term functioning of the offshore energy extraction units.[5] Energy consumption growth was long seen as a

sign of societal and economic advancement. However, the majority of the energy sources utilized, including oil and natural gas, are going to run out. Furthermore, a radical substitute hasn't been discovered yet. As a result, it's important to handle raw materials more cheaply and make an effort to employ sustainable energy sources. Russia's land is divided into autonomous energy supply zones to the extent of up to 70%. The possible sources of independent supply of energy and their uses must thus be taken into account. Weather patterns and operational modes that are connected to the periodicity of production have a big influence. Actual loads reflect all of this. if networks are built to be used to their full capacity. In actuality, they work in modes that handle 20–30% of the load the majority of the time. In this situation, the losses match the energy that can be used. [6]. Oil deposits found in the Turkana Rift region might potentially increase government income. Given that the country is one among the low-income, aid-dependent nations in the Sub-Saharan area, these results portend a significant potential shift in the nation's situation. However, because of weak institutions, a lack of public involvement, poor communication, low-skilled labor in the oil sector, a lack of critical policies, inadequate organizational structures, and a weak governance system, the commercial utilization for this resource also poses significant social and environmental hazards for the nation. These indicators continue to have a negative impact on all activities and result in insufficient actions at the local and national levels. This might culminate in even worse outcomes including public unrest, oil industry sabotage, and resource curse phenomena [7]. For their energy requirements, the majority of nations predominantly rely on fossil fuels, which has a number of detrimental effects on the environment, like air pollution and increasing temperatures. The various health issues caused by air pollution have a significant effect on economic and social circumstances. Global agreements are adopted in an effort to lessen the effects of global warming, and these agreements eventually lead to local legislation that is tailored to the needs of each signatory nation. Nonrenewable resources are likewise depleting and may eventually become extinct or extremely limited. Despite being an objective of both the Sustainable Development Goals and the Circular Economy plan, saving resources has not yet been achieved. [10]According to a number of regional, governmental, and international policies and plans, the use rate of biomass from trees in eastern Finland was substantial and is anticipated to rise even higher in the near future. [11] Despite the fact that biofuels have numerous advantages, they also present a number of environmental, economic, and social problems that standard assessment methods like Environmental Impact Assessment can not reveal to decision-makers. [12] Generally speaking, Iran's energy usage and supply are both unsustainable. The usage and supply of non-renewable energy sources, together with an unstable and insecure energy infrastructure, have a

significant and deteriorating influence on Iran's economic, social, and environmental growth. For the last 50 years, natural gas and oil have dominated Iran's total production of energy sources. Since 1999, natural gas has also controlled total final consumption (TFC). In Iran's development, alternative resources have had a little impact. The significant role played by fossil fuels in the production and consumption of energy has significant social, economic, and environmental repercussions. Furthermore, Iran's energy industry is very susceptible and insecure due to its dependence on gas and oil supplies. 13]

II. Related Work

The approach also ties together the local and global levels of equitable growth by using the appropriate criteria. Thus, it serves as a tool for firms to assess how effectively they are adhering to the guidelines for sustainable development. [16] The primary focus of this article is based on the knowledge of industrialized nations and on business safety procedures that are widely employed globally in terms of both environmental efficiency and safety. This indicator is intended to determine how the oil and gas sector affects environmental, economic, social, and environmental indices. The creation and use of indicators is crucial for business growth plans, the removal of barriers to environmental factor change, social responsibility, and environmental safety. This is based on a variety of experiences and indices. These metrics may be used to calculate the enterprise's environmental performance rate. These indicators' universality and ability to be used in any fuel or energy complex are significant characteristicsIts specialized function (from an environmental and economical standpoint) is estimating the cost of harm. One of its distinctive qualities is its capacity to take into consideration the linkages between the economic and environmental aspects of the company. The Russian gas business already makes use of this expertise. This system so shows how it may be used to control the environment and optimize business operations. In Russia, considerable environmental management has been developed in terms of financial support for the environment and the economy, and ISA-compliant environmental impact assessments are used. [17]. The main objective is to find solutions to the issues Chinese oil and gas businesses are having with the implementation of non-financial reporting. It has been shown that SGR and non-financial indicators have a greater link than SGI does. The study's key result is that some non-financial elements strongly positively correlate with indicators of sustainable development. One instance of how the research's conclusions are being used in reality is the increase of non-monetary reporting by energy firms in China by including indicators. [18]. This paper presents the system's hierarchical design and outlines the recommended indicators depending on the social, economic, environmental, and operational elements. By identifying areas where the necessary actions and measures can be

implemented, the suggested system of indicators, which is based on multicriteria and several decision-making analyses, improves the long-term management of offshore manufacturing facilities [19]. This study describes how operators may find, measure, and reduce emissions while getting information and knowledge of their actions using analytical tools by using methane detection in equipment used for oil and gas using remote sensing technology. [20]. As a trustworthy tool for creating the sustainable management of such offshore manufacturing units, the enacted measure system encouraged an in-depth examination of the sustainability administration of offshore energy production action. [21]This is yet another justification for using autonomy sources of energy in place of centralized ones, and sometimes for switching entirely to autonomous energy sources. It should be emphasized that using independent energy supply systems in place of or in addition to centralized ones helps to solve issues related to both the economy and the environmentSome of the self-sufficient energy sources include turbines powered by gas and gas piston power stations, solar panels, an offshore wind generator, diesel generators, and petrol generators. One of these installations offers a number of benefits, and picking one relies on a variety of factors. In this article, a few independent energy sources are given. Applications and their pros and downsides are taken into account. Each one has an overview table that makes it possible for users to see and contrast their qualities [22]. This study's objective was to identify the linkages between Indonesian energy companies' financial results and their environmental and social performance as measured by social and environmental papers, the moderating influence of social and environmental exposure, and environmental concern. According to the research, there is a strong correlation with environmental and social performance, social and environment publications, engaging with exposure to the environment, and economic performance. The factors do not correlate, nevertheless, when environmental concerns are present.Results of the regression hypothesis test demonstrate that the independent variables have no bearing on economic performance. This validates earlier research that only identified a connection between these characteristics. [23].The article focuses on elements of long-term sustainable actions that call for involvement from all stakeholders and information propagation, among other things, driven by each of the four sustainability areas (political, economic, ecological, and cultural pillars), in order to avoid potential adverse effects on the country's socioeconomic development. Obtaining legal and public consent, approval, and support for the execution from the initial phase of the execution planning process until after the conclusion of the ope entails broad social and environmental baseline and impact evaluation studies, best practices in environmental management for successful impact reduction and prevention, effective environment

surveillance, close collaboration with County government, and socializing to local communities.[24] This is the outcome of concerns over how industry, governance, and civil society share risks and benefits and if social,environmentaland economic consequences are managed and mitigated.As a partial solution to this problem, the use of sustainable operating principles and development principles is advised. Two potential methods for determining how sustainable a firm's actions are are best practice code of conduct and sustainability accounting systems based on sustainability criteria and indicators. In addition, they serve as a basis for CSR and may help businesses get a social permit to operate. Estimates of the net contribution of a particular operation to sustainable development are also required. Comparing against industry standards, developing mature company practices, obtaining sustainability certification, showcasing the use of shared value creation and design for the environment techniques, and integrating sustainability assessment are a few examples of such techniques. Although there has been conceptual advancement in the application of sustainability to natural oil and gas, considerable advancement in the practical use of these tools and approaches is still required since the industry is often evaluated by the actions of the most reckless corporation. Furthermore, if standards of excellence and shared value generation are neglected in the midst of the present or future economic downturn, public skepticism against the industry will rise, and social permission may be lost and extremely harder to reclaim. [25]. with a The optimal system implementation is investigated using a multi-stage methodology that includes static computation, techno-economic evaluation of possible scenarios using economic analysis and research data, and examination of the island's environmental and social consequences. Payback, net present value, and the internal rate of return were some of the economic indicators used to confirm the system's viability. According to preliminary findings, the fuel cell capital cost—which significantly affects the ratio of investment cost and payback years—is the system's most sensitive and crucial design element. The results of this study also point to a viable option for energy generation on unconnected Greek islands utilizing an LNG-fueled SOFC technology as a first step toward the long-term objective of a CO_2-free economy. [26]. This study examines how the social-ecological system (SES) of a small town has changed over the last 30 years in relation to boom-bust economic cycles in the oil and gas sector, as well as the community's susceptibility and resilience. To better understand the impact of resource-based businesses on social-ecological systems, we developed and assessed measures for human and environmental wellbeing. The distribution of the work force, education, oil prices, revenue from households, air and water quality, and surface area and land use are the seven indicators. The population of Drayton Valley, Canada, increased by four times over this time, and more than 20%

of residents are employed in the oil and gas industry. Despite the population falling short of the national norm in terms of educational attainment, the median income increased to 42% over the national level. The mineral fluoride phosphorous, and other chemical levels in water quality tests have also fluctuated dramatically throughout this time period, suggesting a connection with fossil fuel extraction operations. According to a land cover and land use change study, there are less water bodies, wetlands, and woods, whereas there are more buildings and agricultural land. Even though financial inflows have resulted from economic boom cycles, focusing only on the advantages of the energy sector could leave those who depend on it exposed to environmental and social variables during economic downturns that are out of their control in the ever-evolving global oil economy. The "resource curse" phenomena highlights the need to be ready for recurring (or more protracted) periods of low oil and gas output. These findings imply that all facets of social-ecological systems are affected by single boom-bust economies. Communities that rely on extractive industries must adopt a development strategy that fully takes growth, environmental preservation, and smart land use planning into account in addition to income generating. [27].In this study, indicators were calculated and statistical and mathematical analysis was used to support the trends, give data for decision-making, and raise public awarenessThe fact that European countries lack abundant fossil fuel reserves won't change, but the conclusions of this inquiry could. The use of energy derived from fossil fuels, the fall in fossil fuel savings, and connections to other factors, such as energy reliance and the proportion of renewable energy in overall energy consumption, were examined in this study. It was also possible to establish that several European nations continue to significantly rely on fossil fuels. Using the Kruskal-Wallis test, no variations in total inland consumption per person were discovered. The Jazz scenario was able to forecast that by 2050, they would be just around 14% of known oil reservations, 72% of proven lignite reserves, and other fossil fuels would be in question.Given the little amount of fossil fuels that European nations have stored, if they ever need to utilize them, they will quickly run out [28]. This study's objective was to evaluate how modifications in consumption of fuel patterns will affect sustainability. We looked at the North Karelian region's fossil and woody biomass-based production of energy chains, concentrating on various economic, environmental, and social aspects. The study was based on typical values from published national and region statistics, databases, information from the National Forest Inventory, scientific literature, official policy objectives, and expert opinion. The results made it clear that switching to wood-based energy generation involves certain trade-offs. Woody biomass might replace oil in the generation of energy, increasing the local added value that stays in the area, generating jobs and lowering overall GHG emissions. However, it is expensive to produce wood for fires, chips of wood from small-diameter early-thinned trees, and wood pellets. Moreover, the manufacture of wood pellets contributed significantly to greenhouse gas emissions. The case study provided valuable reference data for additional sustainability assessments and demonstrated the importance of ToSIA as a tool for applying current information on the sustainability effects of energy-efficient manufacturing practices to assist in decision-making.[29]. I provide energy sustainability metrics and rigorously examine their trend data in order to solve these problems. These metrics aid in the better understanding of the main factors influencing economic success, social and environmental well-being, and energy sustainability among decision-makers in the public and private sectors. [30]

III. Oil and Gas COmpanies At this Era

Globally, the demand for equitable growth has grown over the last two decades as one of the most important initiatives to address and mitigate concerns like climate change, resource scarcity (such as energy, food, and water), and social issues (such as aging, poverty, and human rights). Institutions, governments, and non-governmental organizations have started integrating sustainability techniques or aspects into their various fields since it is marketed as the most important route for future growth. The 2030 Agenda for Sustainable Development, which contains 17 Sustainable Development Goals that provide a plan for prosperity and security for individuals and the environment, either now and in the future, is the most well-known global project to date.

Search in scopus database (with key words)

Phase 1: Sustainable or sustainability
AND
Oil & Gas Industry
Phase 2: social

↓

Primary review

Publication time: 2010 – 2023

Review of document type: journal, article, review, editorial

↓

Secondary review

Source: Q1 and Q2 journal

Relevance review (title, abstract, keywords)

Research objectives

↓

In-depth review (content analyze)

- Sustainability certifications, practices, application of palm oil industry
- Assessment and evaluation method for social sustainability

↓

Discuss and Conclusion

The agenda was initially presented in 2015, with a 15-year strategy to accomplish the objectives. Increasing marine protected areas for the preservation of the environment, signing the Paris Agreement on warming temperatures, creating national policies to address growing urbanization, and sustainable consumption and production are just a few of the practical steps that many nations are doing to promote sustainable development. Despite the efforts made during the last five years, further steps must be done in the decades to come to guarantee the SDGs' fulfillment. A quicker and more aggressive reaction is required to unleash the economic and social change necessary to meet the 2030 targets due to the COVID-19 epidemic, the natural environment degrading at an alarming pace, and other factors.

The oil and gas businessis under increased pressure to discuss how energy transitions may affect their business models and operations, and also how they may assist achieve the goals of the Paris Agreement by reducing greenhouse gas emissions.

The energy sector's strategic challenge is to establish a balance among short-term financial success and its long-term operational permit. The need from society is for both energy supplies and carbon reductions. Whether oil and gas companies can help provide climate solutions is the question that they must now address. Energy businesses are adept at providing the fuels that form the basis of the current energy system.

This could be accomplished, according to the findings in this paper, provided the energy industry takes the required action. The energy industry may now interact with the "grand coalition" that the IEA believes is necessary to combat climate change as a result, and some businesses have already started doing so. If additional oil and gas corporations were firmly and totally on board, this endeavor would be considerably boosted. The expenses associated with creating low-carbon technology are an investment in the long-term success of businesses.

Without the oil and gas industry, energy business transformation would be more difficult and expensive.

Absent the gas and oil sector, energy sector reforms is still feasible but would be more difficult and expensive. Businesses in the oil and gas industry must describe how changes in energy will impact their business operations and business models, and also how they may hasten the pace of change. Company agreements to cut emission or emissions intensities have already begun, and they are growing more widespread.

However, there is much more that the business can do to combat the danger of climate change. The effects of climate change will grow over the coming decades regardless of the direction the world chooses, increasing the pressure on all sectors of society to find solutions. These remedies cannot be found in the oil and gas worldview of today.
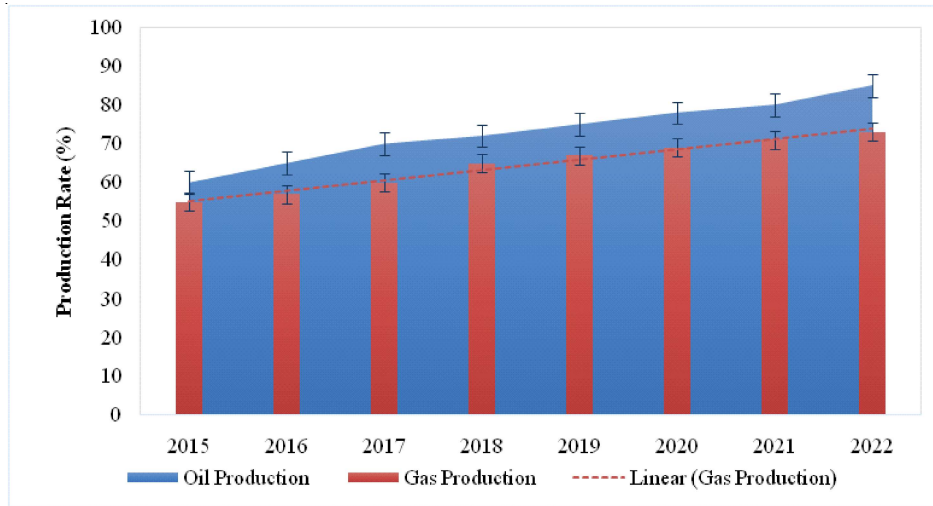
Fig.1. Production of Oil and Gas

Many oil and gas companies are facing increasing environmental and social pressure, which brings up challenging questions about the role that these fuels play in a changing energy economy and how they fit into the society in which they operate.

But in light of growing GHG emissions, the fundamental question is very straightforward: Should current oil and gas corporations be seen as solely contributing to the issue, or may they also be essential in finding a solution?

IV. Current Status of Oil and Gas Industries Impact

The future of the oil and gas industry depends on its ability to manage its carbon footprint. Reducing emissions across the supply chain, from production to consumption, requires collaboration between industry and government. We need a consumer-centered strategy to tackle scope 3 emissions which constitute 75-80% of lifecycle emissions. Various forces are reshaping the future of industries and the oil and gas industry is no different. In a recent article, we explored some of these forces and their impact on the strategic imperatives of the oil and gas sector. The industry's need to take charge and manage its carbon footprint has emerged as the most fundamental of these trends. In this article, we focus on ways to understand and minimize emissions.
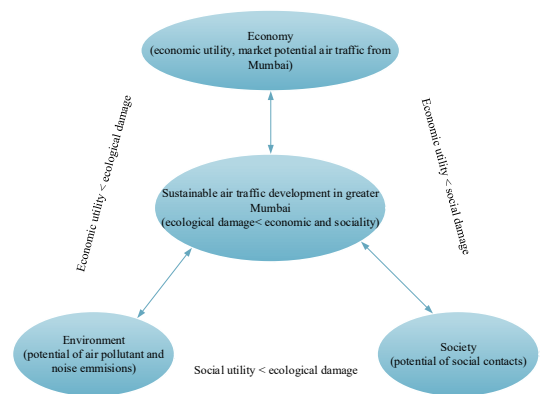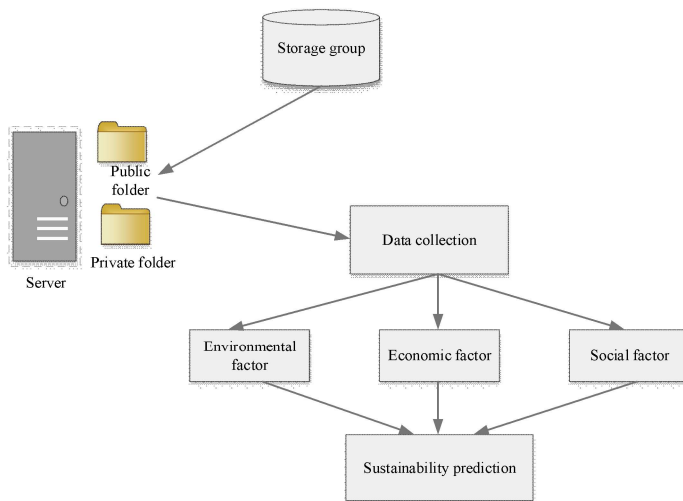
Aspects	Description
Materials	Materials used by weight or volume.
Energy	Direct energy consumption by primary energy source.
	Total amount invested in renewable energy.
	Total amount of renewable energy generated by source.
Water	Total water withdrawal by source.
Water	Water sources significantly affected by withdrawal of water.
Biodiversity	Strategies, current actions, and future plans for managing impacts on biodiversity.
Biodiversity	Number and percentage of significant operating sites in which biodiversity risk has been assessed and monitored.
Emissions	Total direct and indirect emissions greenhouse gas emissions by weight.
Emissions	Other relevant indirect emissionsgreenhouse gas emissions by weight.
Emissions	Initiatives to reduce greenhouse gas emissions and reductions achieved.
Emissions	NO_x, SO_x, and other significant air emissions by type and weight.
Effluents and Waste	Volume of formation or produced water.
Effluents and Waste	Total weight of waste by type and disposal method.
Effluents and Waste	Total number and volume of significant spills.
Effluents and Waste	Volume of flared and vented hydrocarbon.
Effluents and Waste	Amount of drilling waste (drill mud and cuttings) and strategies for treatment and disposal.
Products and Services	Initiatives to mitigate environmental impacts of products and services,and extent of impact mitigation.
Products and Services	Benzene, lead and sulfur content in fuels.

Source : GRI (2012)
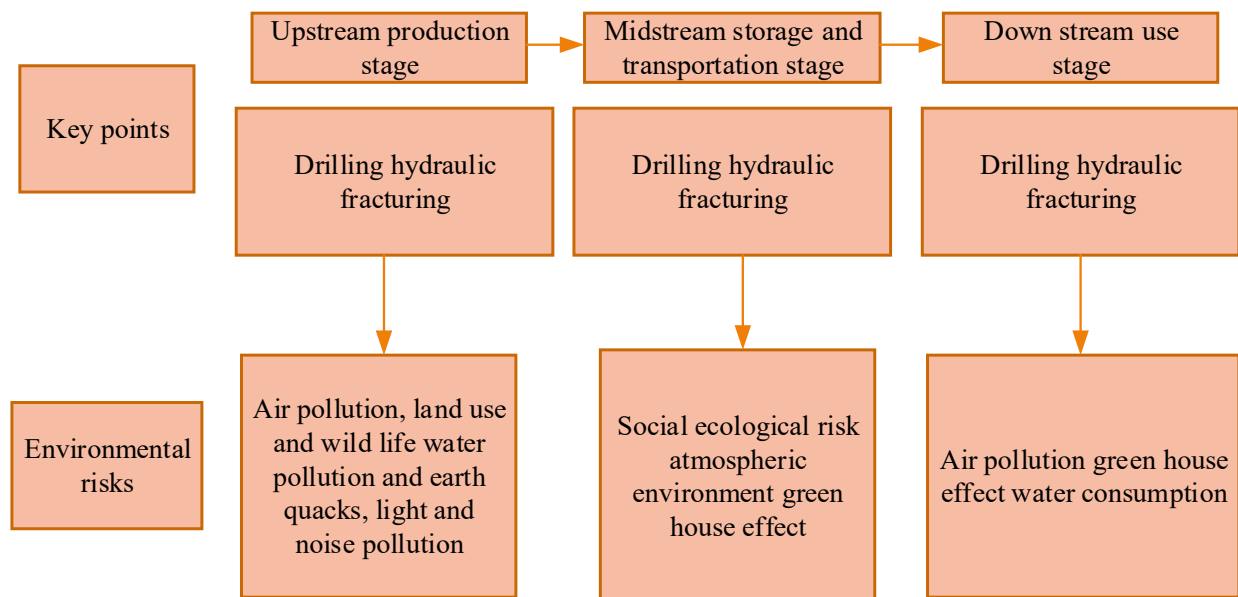
Fig. Environmental Risks for Oil and Gas Industry

Emission reduction generates vast societal benefits by directly tackling one aspect of climate change. And while reducing emissions can also be measured economically, a competitive portfolio can no longer be constructed by only considering a breakeven price, it must also include its carbon footprint. Many companies factor in this impact by adding a shadow price of carbon into project-level economics. It helps them optimize their portfolio for both direct economic returns as well as externalities on carbon intensity.

Reducing own emissions

Businesses must first minimize their own emissions from production, processing and logistics: these are the so-called scope 1 and 2 emissions. An increasing number of companies have announced groundbreaking reduction targets for scopes 1 and 2. These include a range of actions led by individual companies as well as partnerships like the Oil & Gas Climate Initiative. Action can also be taken by leveraging principles of the sharing economy. Typically, these fall into the following types of categories:

- Eliminate methane leaks, flaring and venting.

- Scale up carbon capture usage and storage (CCUS) development and deployment.

- Switch fuel and improve energy efficiency of operations.

- Utilize lower-carbon feedstocks to offer low-carbon products.

- Collaborate across the supply chain.

- Build capacities to measure emissions granularly.

The opportunity is enormous, and it is possible to achieve a lot in a profitable way. An Accenture analysis indicates that with a concerted effort from the oil and gas ecosystem to invest in scalable and profitable solutions, CO2 emissions could be reduced from 5 gigatonnes to less than 1 gigatonne per year by 2050. That is the equivalent of the European Union's combined emissions (or 80% of the US, or India and Russia combined).

Reducing emissions from consumption

Initiatives to minimize the industry's carbon footprint can help greatly. However, an even bigger and complex challenge is related to emissions from fuels that are burnt by users and consumers. These so-called scope 3 emissions are responsible for between 75-80% of the 35 gigatonnes generated annually from a lifecycle of oil and gas products.

Industry experts and policymakers continue to grapple with the definition, boundaries and questions of how to account for scope 3 emissions and how to allocate the economic burden. The figure below illustrates how complex this issue is.

Consider this practical example: a liter of gasoline used by a consumer, produced by company A, used in a car manufactured by company B, on a road built by company C and financed by bank D. How should the emissions and accountability between the consumer and companies A, B, C and D be calculated? The question is complex already, while in real life many more companies and actors are involved.

Taking control of emissions

- The oil and gas industry is striving to minimize its own emissions as well as those from the entire life cycle of its products. Own emissions – scope 1 and 2 – are well understood and a lot of effort to eliminate them is ongoing, from eliminating flaring, through to eliminating waste, to fuel-switching and CCUS.

- Nonetheless, emissions from the use of fuels by industrial and individual consumers – scope 3 emissions – constitute 75-80% of lifecycle emissions. These need to be much better understood in terms of how to count and account for them, not least how to minimize them. In any case, consumers will play a central role in addressing them, enabled by industries and governments.

- Despite all the efforts to minimize scope 1, 2 and 3 emissions, for the foreseeable future, there will be a portion of emissions from the oil and gas industry that cannot be avoided. We will discuss these issues in a follow-up article, specifically looking at carbon removal options as well as carbon markets and offsets.

V. Statustical Analysis & Reporting
Input Parameters

In our study, the following variables are altered to determine the additional oil production:

Table.1: Important Input Parameters for Production in the Oil and Gas Industry

Input Parameters	1. Footage Drilled
	2. Gas Prices
	3. Wells Drilled
	4. Accessible Injection Wells
	5. Accessible Injection Wells
	6. Recent Production Well Openings
	7. Injection and Production Ratio
	8. Water Content
	9. Annual Depletion
	10. Number of Open Wells
	11. Old Wells with Efficient Treatment
	12. GDP Growth Rate
	13. Old Wells with Efficient Treatment
	14. Newly Opened Production Wells
Output Parameters	Production rate for oil and Gas

The findings for the three major components of sustainability reporting are summarized in Table 2. We examine the previously stated subcategories—environmental indicators, safety and health indicators, and economic and social indicators—to acquire a deeper understanding. The standards for disclosing data on these subcategories differ depending on how well-versed OGCs are in sustainability reporting. They found this OGCs in GCC nations provide the least amount of environmental information (43.5%), followed by economic and social data (49%) in that order. The subcategory of safety and health information has the greatest proportion (66%).

VI. Future Directions of Sustainable Development Approach for Oil and Gas Companies

The capacity of the oil and gas sector to control its carbon footprint will determine its future. Industry and the government must work together to reduce emission across the chain of supply, from manufacturing to consumption.

In order to address scope 3 emissions, which make up 75–80% of lifecycle emissions, it requires a consumer-centered approach.

A. *Take Steps Toward a More Sustainable Future*

Decision-makers should consider a variety of options as they try to adopt more sustainable practices. Here are some suggestions:

- Create a long-term strategy for fundamental change that incorporates sustainability at every stage.

- Track, measure, and decrease emissions at every level by using data to inform choices about the adoption of sustainable practices at the planning, engineering, and manufacturing phases.

- Use delivery and transportation strategies that minimize loads and cut down on mileage, emission levels, and carbon footprint.

- Utilize resources and machinery in most energy-efficient way possible while protecting workers and the environment.

- Identify resources in the most moral and ecologically responsible way possible.

B. *Oil and Gas Companies are Diversifying*

Oil and gas businesses have increasing difficulties in their attempts to be sustainable as a result of the complexity that comes from their operations growing as they seek to diversify and look beyond the barrel. According to the poll, 50% of executives in the energy and utility sectors said that more complexity makes it harder for them to achieve their sustainability objectives.

Despite this, over half of respondents—the highest proportion of any sector in the poll of 1,000 managers from various industries—remain committed to attaining the net zero carbon objective.

Additionally, energy and utilities companies have greater visibility into many aspects of their production than other industries do thanks to modern technology, like emissions of carbon (58% vs. 43%), feasible raw material sourcing (56% vs. 50%), and the entire life cycle of byproducts (49% versus 42% for other industries).

This kind of visibility gives corporate executives crucial knowledge as they work to improve sustainable practices in the oil, gas, and utility sectors now and in the future.

VII. Conclusion

First, when storing and transporting natural gas, it is important to choose a location for the pipeline and storage that is as far away from residential areas and environmentally sensitive areas as possible. Additionally, an environmental assessment that details the specific construction and environmental risks should be prepared.

Second, improve the detection of methane and volatile organic compound leaks before implementing efficient risk management and prevention methods. continuously develop methane emissions monitoring technologies. Existing technologies, such as infrared imaging, olfactory sensor leak detection, schlieren imaging, gas detection methods, and distributed optical fibre acoustic sensor detection methods, may assist us in monitoring the leaking of natural gas pipelines.

Thirdly, improve engineering material quality control. Typically, pipeline gas engineering is built depending on its anticipated service life. The service life of the project is directly impacted by the calibre of the engineering pipes and machinery. Natural gas leaks are mostly caused by flaws in the pipe equipment. Therefore, an effective quality assurance system is needed throughout the whole process of producing pipe equipment, including design, model selection, bidding, quality inspection, procurement, and transportation before construction.

Urban gas also has the strongest connection to locals. The risk identification and management of urban gas pipelines should be increased in order to lessen the dangerous effects, frequency, and impact of unintentional gas fires and explosions brought on by the rupture of urban gas pipelines. This should comprise the planning, building, regular maintenance, and close monitoring of pipe ageing and connection. Strengthen safety education and direction, and create advance emergency preparations for accidents.

We concentrated on identifying environmental concerns such as air pollution, land usage, water use,

ecological impact, and greenhouse effect at different stages after thoroughly examining the research on the whole life cycle of the top, middle, and lower stages of the natural gas business chain. Some of the conclusions we've drawn may enable us to focus our efforts.

First off, while there are environmental dangers associated with the production and delivery of natural gas, such risks may be reduced with the help of technology and policies. Second, using natural gas results in the emission of greenhouse gases. Natural gas has a far lower impact on the climate, the greenhouse effect, and the environment than conventional energy sources like coal. Thirdly, the critical actions at various phases are identified by this literature evaluation and the identification of distinct environmental threats. During upstream exploitation, hydraulic fracturing has the worst environmental impact. The greatest environmental danger is at the transportation stage and midstream storage when methane leaks occur. varied application technologies will result in varied resource consumption and emissions throughout the downstream combustion and utilisation stage.

As a result, this article offers some policy suggestions at various phases. In the upstream stage, we advise bolstering environmental assessment management, enhancing policy requirements, creating a plan to monitor water quality, and encouraging the development of important technologies. We concentrate on system monitoring for the midstream, which includes leak detection, quality control of engineering materials, and risk identification and management, in addition to pipeline installation and site selection. We support the use of cutting-edge technologies in the downstream sector to increase thermal efficiency and lower emissions, including innovations connected to gas-fired power plants, distributed energy technologies, natural gas recycling technologies, and eco-friendly, low-carbon service technologies.

References

1. Merino, L., Rosas-Casals, M., & Gibert, K. (2016). SOCIO ENVIRONMENTAL CONFLICTS IN ECUADOR. THE USE OF PREPROCESSING AND DATA MINING TO DETECT INFLUENCING FACTORS ON VIOLENCE AND CRISIS (1985 - 2016).

2. Ladanai, S., &Vinterbäck, J. (2010). Certification criteria for sustainable biomass for energy.

3. Smiley, K.T. (2018). Manufacturing Decline and Environmental Inequality: Metropolitan disparities in industrial air pollution in the United States.

4. Uqaili, M.A., & Harijan, K. (2012). Energy, Environment and Sustainable Development. Energy, Environment and Sustainable Development.

5. Almuzaini, Y.M. (2019). Life Cycle Assessment of Dry Sewage Sludge Handling Methods for the State of Kuwait.

6. Oraka, A.O., &Egbunike, F.C. (2016). Appraisal of Environmental Accounting Information In The Financial Statements of Consumer Goods Manufacturing Companies In Nigeria.

7. Che, Q. (2016). Mitigate Water Scarcity with Intervention.

8. Yang, Y. (2016). Study on Evaluation of Nanchong Ecological Civilization Construction Based on AHP-Entropy Method.

9. Moore, M.C., Turcotte, A., Winter, J.S., & Submitter, U. (2014). Aboriginal-Canadians and Energy Literacy: A Survey of Opinions and Thoughts on Energy. Development Economics: Agriculture.

10. Newton, P., & Meyer, D. (2011). Consuming the urban environment: a study of the factors that influence resource use in an Australian city.

11. Amann, E., Baer, W., & Coes, D.V. (2010). Energy, bio fuels and development: comparing Brazil and the United States.

12. Mahravan, A. (2012). Eco-Tourism and its Architecture: A Methodological Framework for Assessing Progress towards Sustainable Development.

13. Radhi, H.A. (2010). On the Effect of Global Warming and the UAE Built Environment.

14. Hirst, R., Al-Thary, I., & Abdulaziz, M.A. (2010). Developing And Implementing An Innovative Biodiversity Management Strategy For A Large Energy Project At Balhaf, Yemen.

15. Macpherson, R.J., & Sylvester, K.E. (2007). AC 2007-3010: Demand for engineering professionals in the UAE : Development of an Abet compliant program of engineering in Abu dhabi.

16. Huddar, V., & Joshi, N. (2022). Study of economic, environmental, and social indicators on the sustainable development approach of oil and gas epc companies. International Journal of Management, Public Policy and Research

17. Huseynov, A.G. (2021). Environmental and economic indicators of sustainable development of enterprises of oil and gas complexes. SHS Web of Conferences.

18. Steblyanskaya, A.N., Mingye, A., Efimova, O.V., Kleiner, G. B., & Rybachuk, M.A. (2022). Multi-Capital Approach for Sustainable Growth: Experience from the Oil & Gas Companies. Finance: Theory and Practice.

19. Gaudencio, L.A., Oliveira, R.D., & Curi, W.F. (2021). Construction of a sustainability indicators system for offshore oil and gas production units. Revista de Gestão Costeira Integrada.

20. Esparza, A., Ebbs, M., & Gauthier, J. (2022). Application of Remote Sensing Techniques to Detect Methane Emissions from the Oil and Gas Sector to Assist Operators with Sustainability Efforts. Day 3 Wed, October 05, 2022.

21. Gaudencio, L., Oliveira, R.A., & Curi, W.F. (2020). Sustainability Indicators System Based on Multicriteria Analysis: A Tool for the Management of the Sustainability of Offshore Oil and Gas Production Units. Integrated Environmental Assessment and Management, 17.

22. Livshits, S.A., Yudina, N., Sabirzyanova, A., Akhmetova, R., Enikeeva, S.R., &Dunaeva, T.U. (2021). Determination of the optimal autonomous energy source based on its scope and economic indicators. 2021 International Conference on Electrotechnical Complexes and Systems (ICOECS), 620-623.

23. Susilowati, D. (2013). Dimensions of corporate behaviours as a proactive stance on the impact of operational externalities activities, as well as the accountability of corporate performance. (Empirical study on oil and gas companies in Indonesia).

24. Okuthe, I.K. (2015). Environmental and Social challenges of oil and gas exploration in Kenya. International journal of innovation and scientific research, 17, 164-174.

25. Shields, D.J. (2016). Applying Sustainable Development Principles and Sustainable Operating Practices in Shale Oil and Gas Production. The Open Petroleum Engineering Journal, 9, 137-149.

26. Peloriadi, K., Iliadis, P., Boutikos, P., Atsonios, K., Grammelis, P., & Nikolopoulos, A. (2022). Technoeconomic Assessment of LNG-Fueled Solid Oxide Fuel Cells in Small Island Systems: The Patmos Island Case Study. Energies.

27. Liu, X., Ungar, M., McRuer, J., Blais, D., Theron, L.C., & Schnurr, M.A. (2020). Boom Bust Economy and Social-ecological System Relationship.

28. Martins, F., Felgueiras, C., Smitkova, M.F., & Caetano, N.S. (2019). Analysis of Fossil Fuel Energy Consumption and Environmental Impacts in European Countries. Energies.

29. Herder, M.D., Kolström, M., Lindner, M., Suominen, T., Tuomasjukka, D., & Pekkanen, M. (2012). Sustainability Impact Assessment on the Production and Use of Different Wood and Fossil Fuels Employed for Energy Production in North Karelia, Finland. Energies, 5, 4870-4891.

30. Golabi, Z. (2011). The role of energy sector in sustainable development in Iran.

Data Mining for Bank Loan Classification

Dr. Vishal Bhole
Associate Dean-Academics, IIEBM Indus Business School Pune

Prof. Neil Chavan
Assistant Professor, Dr. V.N. Bedekar Institute of Management Studies

Abstract : Banks face challenges with Non-Performing Assets (NPAs) when customers default on loans. Accurate loan classification is crucial for the bank's financial performance and minimizing defaults. Data Mining Techniques help classify loans as either default or beneficial which improves the overall bank efficiency. In the current financial landscape, with a surge in loan applications, banks need to allocate resources wisely. Data mining involves analysing data from various perspectives to extract valuable information. Common data mining techniques include classification, clustering, and association rule mining. Clustering is widely used, creating a model to categorize data points. For fraud detection and credit risk, we used classification techniques to assess their effectiveness. The objective of this research was to deploy various data mining techniques for precise loan classification and assess their efficiency by using different parameters.

LiteratureReview

Data Mining for Knowledge Discovery

Data mining is a method of analysing complex information to extract valuable insights for revenue enhancement and cost reduction. By using different techniques, it provides a multidimensional view of data, which aids in the identification and summarization of significant relationships (Kumar Arun et al., 2016). In the Information Technology Industry, vast amounts of data are available. Hence, data mining can assist in transforming this data into actionable information(Cowell et al., 1999).

The data mining process involves steps such as Data Cleaning, Data Integration, Data Transformation, Data Mining, Pattern Evaluation, and Data Presentation. Upon completion of these steps, the derived information finds applications in areas such as Fraud Detection, Market Analysis, Production Control, and Scientific Exploration (Wei Li et al., 2009).

Application of Data Mining Techniques in Banking Sector

Data mining techniques have shown to enhance the decision-making processes and produce effective consumer classification strategies in banking sector. The following are some of the areas where data mining aids the banking sector:

Marketing & Customer Relationship Management (CRM)

Data mining provides valuable insights into consumer behavior which enables banks to fine-tune their offerings and improve their efficiency.Data mining provides insights on historical trends which helps banks in predicting customer preferences andgaining higher consumer loyalty, and retention (Dr. K. Kavitha, 2018).

Risk Management

Data mining plays a key role in evaluating the credibility of customers for credit cards and loans. It assists banks in reducing risks and making informed decisions by identifying potential defaulters (Diederik P Kingma and Jimmy Ba, 2014).

Customer Relationship Management (CRM)

Data mining aids in gaining new customers, enhancing brand value, and improving customer retention. Data mining facilitates analysis of potential causes behind consumers' switching behavior. This enables banks to make improvements in service delivery and enhance customer loyalty (Tianqi Chen and Carlos Guestrin, 2016)

Credit Risk Management

Data mining can be utilized for developing credit assessment models which can assist banks in customer approval process. Data mining aids in identifying anomalies, fraud, and spending patterns and thus improves the overall quality of lending decisions (Hassani et al., 2018).

Operational and Enterprise Risk Management

Data mining also plays a key role in developing patterns to improve business operations and formulate long-term strategies. It covers the internal and external risks and thus contributes effectively to mitigate any operational breakdowns (Abbas et al., 2019).

Market Risk Management

Data mining along with artificial intelligence, is used to develop market risk assessment models. It plays a crucial role in stress testing market models by collecting and processing data and forming a robust risk management framework (Alloghanie et al., 2019).

Legal Risk Management

Data mining also assists in meeting the regulatory compliance requirements by assessing large datasets. It aids in monitoring operational and credit ratings, and minimizing any regulatory breaches (Alloghanie et al., 2019).

In summary, the usage of data mining in the financial industry include manifold such as optimization of marketing

efforts, refining risk assessment processes, and elevating customer relationship management. Thisassists banks and financial institutions to make more informed decision-making and gain operational efficiency.

Data Mining Techniques:

Logistic Regression

Logistic regression predicts a dependent variable by analyzing the relationship between one or more independent variables. The logistic function, also known as the sigmoid function, produces predictions between 0 and 1. The formula is represented below, where P is the predicted output, $\hat{a}_0$ is the bias, and $\hat{a}_1$ is the coefficient for the input value (x) (Kou et al., 2019).

$$ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 x$$

$$=> P = \frac{e^{\beta_0 + \beta_1 x}}{1 + e^{\beta_0 + \beta_1 x}}$$

K-Nearest Neighbors Classifier

K-Nearest Neighbors is a widely used classification algorithm in machine learning. It assumes that similar items are close to each other in distance. It assigns an unclassified data point to the nearest neighbour. As the value of K increases, predictions become more stable. Error rate at $K=1$ is zero for training data, and with increasing K, better predictions are made (Choi, T et al., 2017).

Support Vector Machines (SVM)

SVMs are supervised learning models for classification and regression. They use a hyperplane to separate different classes, with the objective of finding maximum marginal hyperplane (MMH). SVM divides the dataset into classes by defining a margin as the gap between two lines on the closest class points (Kou et al., 2019).

Decision Tree Classifier

Decision tree classifiers are predictive modeling tools used in data mining. These trees split data based on conditions and can be used for classification and regression projects. Classification decision trees require discrete target variable values, while regression trees use continuous values (Kao et al., 2019).

For banking sector applications, these classification techniques have proven to be effective in the extant literature (Choi, T et al., 2017; Kou et al., 2019; Kao et al., 2019).

Methodology

- **Understanding and Prioritizing Key Project Objectives**: Understand and prioritize the primary objectives of the project.

- **Performing a Comprehensive Literature Survey**: Conduct a thorough literature survey to identify prevalent research gaps and determine specific targets.

- **Defining the Problem Statement and Formulating a Strategic Approach**: Clearly define the problem statement and develop a strategic approach for effective problem-solving.

- **Choosing Data Modeling as the Research Method**: Select data modeling as the research method to derive results in alignment with the chosen strategy.

- **Analyzing Research Outcomes for Meaningful Conclusions**: Analyze research outcomes to draw meaningful conclusions that align with the overall project goals.

Algorithm

Input	Process / Model	Output	Outcome
• Gender, Married, Dependents, Education, Self_Employed, Applicant_Income, CoapplicantIncome, LoanAmount, Loan_Amount_Term, Credit_History, Property_Area	•Logistic Regression •K -Nearest Neighbours •Support Vector Machine Classifier •Decision Tree Classifier	• Predict Loan Status	• Quality Management Decision Making regarding disbursement of loan

Business Understanding

Banks prioritize lending to eligible customers for a higher likelihood of repayment. Accurate prediction of eligibility benefits the bank. In this binary classification problem, using a dataset with mixed categorical and numerical values, the goal is to decide whether to grant a loan. The data requires cleaning due to the presence of missing values.

Data Understanding:

Fictitious banking loan data was taken from Kaggle for performing loan classification

Variable	Description
Loan_ID	Unique Loan ID
Gender	Male/ Female
Married	Applicant married (Y/N)
Dependents	Number of dependents
Education	Applicant Education (Graduate/ Under Graduate)
Self_Employed	Self-employed (Y/N)
Applicant_Income	Applicant income
CoapplicantIncome	Co-applicant income
LoanAmount	Loan amount in thousands
Loan_Amount_Term	Term of loan in months
Credit_History	Credit history meets guidelines
Property_Area	Urban/ Semi Urban/ Rural
Loan_Status	Loan approved (Y/N)

Table 1: Data Variables & their Description

Model Evaluation

The models used the input variables such Gender, Marital Status, Dependents, Education, Employment, Applicant Income, Co-applicant income, loan amount, credit history and property area to identify whether the loan should be granted or not.

To evaluate the model continuously following metrics were used:

• **Precision Score:** The ratio of correctly predicted positive observations to the total predicted positive observations.

$P = \frac{TP}{TP+FP}$

where TP is the number of true positives and FP is the number of false positives.

• **Recall Score:** The ratio of correctly predicted positive observations to all observations in the actual class.

$R = \frac{TP}{TP+FN}$

where TP is the number of true positives and FN is the number of false negatives.

• **F1 Score:** The weighted average of Precision and Recall.

$F1 = 2 \cdot \frac{P \cdot R}{P+R}$

It is the harmonic mean of precision and recall.

• **Loss:** The summation of errors for each example in training or validation sets.

• **Accuracy:** The ratio of correctly predicted observations to the total observations.

$Accuracy = \frac{TP+TN}{TP+TN+FP+FN}$

where TP is the number of true positives, TN is the number of true negatives, FP is the number of false positives, and FN is the number of false negatives.

• TP is the number of true positives (correctly predicted positives).

• TN is the number of true negatives (correctly predicted negatives).

• FP is the number of false positives (incorrectly predicted positives).

• FN is the number of false negatives (incorrectly predicted negatives).

Findings:

The following results were obtained on these parameters for the 4 models:

Table 2 : Results of Model Evaluation

Model	Precision	Recall	F1	Loss	Accuracy
Logistic regression	0.894	0.422	0.557	7.118	0.802
K-Nearest Neighbors Classifier	0.663	0.273	0.364	10.13	0.718
SVM	0.000	0.000	0.000	11.304	0.686
Decision Tree Classifier	0.919	0.422	0.565	6.899	0.808

The results indicate that Logistic Regression, K-Nearest Neighbors, and Decision Tree Classifier were more effective for loan classification than SVM Classifier. Achieving an accuracy as high as 80.2%, these techniques can prove to be beneficial to supportbanksin their decision-making on loan lending. To further improve accuracy, hyper-tuning the models can be done by training on extensive historical data.

Conclusion

Data mining techniques were applied to a fictitious customer dataset for property loans by considering variables like gender, marital status, dependents, education,

employment status, applicant and co-applicant income, loan amount and term, property area, and credit history. Four classification-based techniques—Logistic Regression, K-Nearest Neighbors Classifier, SVC, and Decision Tree Classifier—were studied after preprocessing the data. This approach can help banks in identifying possible fraud or defaults and help in minimizing Non-Performing Assets (NPAs).

Managerial Implication

In banking sector, data mining plays an important role in information management and maintaining customer profiles. Techniques like Logistic Regression, Support Vector Machines (SVC), and Decision Tree Classifier enable banks to make effective loan granting decisions and enhance their ability to detect fraud. Data mining also helps in financial risk management by using techniques such as statistical regression, machine learning, and artificial intelligence. It finds potential application in assessing credit risk and classifying clients.

Data mining algorithms improve the classification accuracy. Additionally, data mining is also useful in assessing operational risk and identifying financial controls for fraud and critical issues such as bankruptcy. In market risk management, it helps in developing models that provide real-time patterns in financial markets.

This process aids consumers in building trust towards commercial banking services. Furthermore, it contributes towards enriching the economy and creating a holistic environment of customers and banks. These models offer organizations support in making informed quality decision-making by leveraging data. It helps management to improve their operational efficiency and thereby enhance technological capabilities enhance quality and drive business excellence.

7.2. Limitations

In this research, we used various classification data mining techniques for classifying bank customers applying for loans based on multiple variables. After a literature review, we chose four techniques which have proven to be effective in bank loan classification problem. We did not check the effectiveness of hybrid models which involve combining two or more techniques. This study involved studying 367 fictious customers with loan history data and was used to train the models. Results can significantly improve with large datasets and inclusion of variables relevant to the study.

7.3. Future Scope

There are several data mining tools which can support the banking system by enhancing their efficiency and decision-making knowledge. The tools used in this study can help in minimizing operating costs and gaining a competitive edge for financial firms. Future studies can involve an integration with supervised and unsupervised machine learning techniques along with digital interventions like Artificial Intelligence, Robotic Automation, Blockchain, and IoT. This would provide innovative solutions to solve conventional banking challenges and can also assist in gaining cost efficiency and enhanced risk management.

References

- Cowell, A.P ,R.G, Lauritez, S.L, Spiegelhalter, D.J (1999). Graphical models & Expert Systems. Berlin: Springer.

- Kumar Arun, Garg Ishan, Kaur Sanmeet. (2016). Loan Approval Predictions based on Machine Learning Approach, IOSR Journal of Computer Engineering (IOSR-JCE)

- Wei Li, Shuai Ding, Yi Chen, and Shanlin Yang. (2009). Heterogeneous Ensemble for Default Prediction of Peer-to-Peer Lending in China, Key Laboratory of Process Optimization and Intelligent Decision- Making, Ministry of Education, Hefei University of Technology

- Dr. K. Kavitha (2018). Clustering Loan Applicants based on Risk Percentage using K-Means Clustering Techniques,, International Journal of Advanced Research in Computer Science and Software Engineering.

- Hassani, H., Huang, X., & Silva, E. (2018). Digitalization and big data analytics in banking. Big Data & Cognitive Computing, 2(3), 18. doi: 10.3390/bdcc2030018

- Jesse C. (2018). Short-term prediction of Mortgage default using ensembled machine learning models

- Abbas, F., Iqbal, S., & Aziz, B. (2019). The impact of bank capital, bank liquidity & credit risk on profitability in post-crisis period: A comparative study of US and Asia. Cogent Economics and Finance, 7(1). doi: 10.1080/23322039.2019.1605683

- Diederik P Kingma and Jimmy Ba (2014). "Adam: A method for stochastic optimization". In: arXiv preprint arXiv:1412.6980

- Alloghani M, Al-Jumeily D, Mustafina, Hussain A, and Aljaaf A (2019). A review on the supervised & unsupervised machine learning algorithms for data science. Unsupervised & Semi-Supervised Learning, 3-21. doi: 10.1007/978-3-030-22475-2_1

- Camilla Cal and Maria Longobardi. (2015). "Some mathematical properties of ROC curve & their applications". In: Ricerche di Matematica 64. doi: 10.1007/s11587-015-0246-8.

- Choi, T., Chan, H., & Yue, X. (2017). Recent developments in the big data analytics for business operations and risk management. IEEE Transactions on Cybernetics, 47(1), 81-92. doi: 10.1109/tcyb.2015.2507599.

- Kou, G., Chao, X., Peng, Y., Alsaadi, F., and Herrera-Viedma, E. (2019). Machine learning methods for the systemic risk analysis in financial & banking sectors. Technological & Economic Development of Economy, 25(5), 716-742. doi: 10.3846/tede.2019.8740.

Bibliometric Analysis of Metaverse Research

Dr. Neelam Arora

Principal, Lala Lajpatrai College of Commerce and Economics,

Dr. Rahul Shetty

Co-ordinator M. Com., Lala Lajpatrai College of Commerce and Economics,

Rajvi Jhaveri

Student, Lala Lajpatrai College of Commerce and Economics.

Abstract : This bibliometric analysis explores the evolving landscape of Metaverse research from 2005 to 2024 using Scopus data. The Metaverse, a transformative concept blending virtual and physical realities, has seen a substantial annual growth rate of 21.59%. The 1844 documents from 820 sources reveal a contemporary focus, with an average document age of 1.54 years and an impressive 8.972 citations per document. The collaborative nature of Metaverse research is evident through 4560 authors, 327 single-authored documents, and an average of 3.74 co-authors per document. A surge in articles from 2017 onwards highlights the increasing significance of the Metaverse in academic circles. Notable sources include IEEE ACCESS, SUSTAINABILITY (SWITZERLAND), and IEEE NETWORK, while prolific authors like NIYATO D, WANG X, and KIM J contribute significantly. This analysis provides insights into the expansive, collaborative, and impactful nature of Metaverse research.

Introduction

The concept of the Metaverse has transcended its origins in science fiction and virtual reality speculation to become a focal point in contemporary discussions about the future of digital interaction and connectivity. Coined from the amalgamation of "meta-" (meaning beyond or transcending) and "universe," the Metaverse represents a collective virtual shared space that encompasses the entirety of immersive, digital, and interconnected experiences. It goes beyond traditional notions of the internet, aiming to create a seamless, persistent, and interactive virtual environment where users can engage with a myriad of digital elements, ranging from augmented reality to virtual reality.

In the Metaverse, users are not merely passive consumers of information; instead, they actively participate in a dynamic, three-dimensional space that blurs the lines between the physical and digital realms. This evolving concept is driven by advancements in augmented reality, virtual reality, artificial intelligence, and other cutting-edge technologies that promise to redefine how we socialize, work, learn, and entertain ourselves.

The Metaverse is not a singular platform but rather a collection of interconnected virtual spaces, each with its unique characteristics and purposes. It has the potential to revolutionize various industries, from gaming and entertainment to education, commerce, and beyond. As the boundaries between physical and virtual realities continue to blur, the Metaverse represents a paradigm shift in how we perceive and interact with the digital landscape, opening up new possibilities and challenges that are reshaping the way we experience and navigate our increasingly interconnected world.

Literature Review

Research Methodology

The research aims to conduct a comprehensive bibliometric analysis of Metaverse-related research using the Scopus database. The Metaverse, an emerging concept with profound implications across diverse domains, has spurred a significant body of scholarly work. This study seeks to elucidate the trends and patterns within this research landscape by employing bibliometric methods. By leveraging Scopus as the primary database, we aim to retrieve a robust dataset using the string "Metaverse" in the TITLE-ABS-KEY field and filtering the results to include only articles (DOCTYPE: "ar"). This focused approach is anticipated to yield a meaningful dataset for analysis. The primary objectives include identifying key contributors, institutions, and countries, as well as assessing the evolution of research themes over time. The research methodology will involve the utilization of R and Biblioshiny software for efficient and insightful data analysis. This integrated approach will facilitate a thorough exploration of the Metaverse research domain, offering valuable insights into its current state and future trajectories.

Data Analysis

a)	Main Information	
	Exported data	
	Description	**Results**
	Main Information About Data	
	Timespan	2005:2024
	Sources (Journals, Books, etc)	820
	Documents	1844
	Annual Growth Rate %	21.59

Document Average Age	1.54
Average citations per doc	8.972
References	80557
Document Contents	
Keywords Plus (ID)	6322
Author's Keywords (DE)	5309
AUTHORS	
Authors	4560
Authors of single-authored docs	327
AUTHORS COLLABORATION	
Single-authored docs	358
Co-Authors per Doc	3.74
International co-authorships %	31.29
DOCUMENT TYPES	
article	**1844**

The exported data provides a comprehensive snapshot of the Metaverse research landscape from 2005 to 2024, encompassing 1844 documents sourced from 820 different outlets, including journals and books. The annual growth rate of 21.59% indicates a substantial and consistent expansion of scholarly work in this domain over the specified timespan. The document average age of 1.54 signifies that, on average, the included documents are relatively recent, highlighting the contemporary focus of Metaverse research.

Each document has garnered an average of 8.972 citations, suggesting a considerable impact within the academic community. The extensive network of references, totaling 80,557, underscores the interconnectedness and depth of scholarly discourse surrounding the Metaverse.

The document contents are rich, with 6322 Keywords Plus and 5309 Author's Keywords, showcasing the diversity of terminologies and concepts associated with Metaverse research. The involvement of 4560 authors in the creation of these documents indicates a broad and collaborative effort within the scholarly community. Notably, 327 documents are single-authored, showcasing the contributions of individual researchers to the Metaverse discourse.

Collaboration among authors is evident, with an average of 3.74 co-authors per document. The international co-authorship percentage of 31.29% signifies a substantial degree of global collaboration, emphasizing the cross-border nature of Metaverse research endeavors.

All 1844 documents fall under the category of articles, indicating that scholarly articles are the predominant form of communication for disseminating Metaverse research findings. Overall, the exported data provides valuable insights into the dynamic and collaborative nature of Metaverse research, underscoring its growth, impact, and global reach within the academic community.

Annual Scientific Production
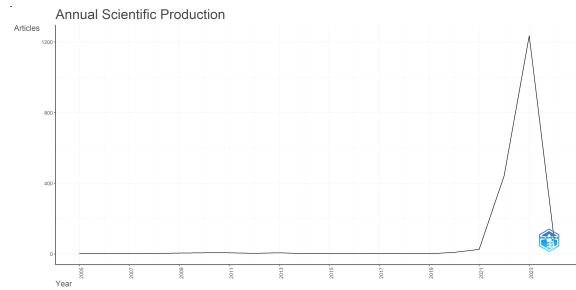
The exported data presents a temporal evolution of Metaverse-related research articles from 2005 to 2024. In the early years, from 2005 to 2008, the number of articles is relatively modest, ranging from 1 to 3 per year. However, starting from 2009, there is a noticeable increase, with the number of articles steadily growing. The year 2010 marks a significant rise to 7 articles, and this upward trend continues through 2013.

In 2014, there is a slight dip with only 2 articles, but the subsequent years, particularly 2015 and 2016, show a continued interest with 2 and 1 article(s), respectively. The number of articles experiences a resurgence in 2017, reaching 3, and maintains a relatively stable level in 2018 with 4 articles.

The years 2019 and 2020 exhibit fluctuations, with a decrease to 1 article in 2019 and a notable increase to 9 articles in 2020. The most striking observation is the substantial surge in Metaverse research articles from 2021 onwards. In 2021, the number skyrockets to 26 articles, and in 2022 and 2023, there is an exponential growth, reaching 442 and 1235 articles, respectively.

The data for 2024 shows a decrease compared to the previous year, with 82 articles. This could be indicative of a potential stabilization or a temporary reduction in research output.

Overall, the exported data illustrates the dynamic nature of Metaverse research, with a clear acceleration in scholarly output starting from the last decade and a remarkable surge in recent years, reflecting the heightened interest and significance of the Metaverse concept in academic circles.

Most Relevant Sources
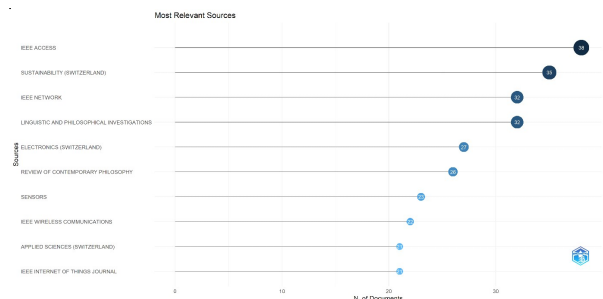
The provided data represents the exported information related to the number of articles from various sources. The table shows the distribution of articles across different journals or publications. The highest number of articles, 38 in total, is attributed to IEEE ACCESS. Following closely are SUSTAINABILITY (SWITZERLAND) and IEEE NETWORK with 35 and 32 articles, respectively. Other notable sources include LINGUISTIC AND PHILOSOPHICAL INVESTIGATIONS, ELECTRONICS (SWITZERLAND), and REVIEW OF CONTEMPORARY PHILOSOPHY, each contributing 32, 27, and 26 articles, respectively. The data indicates a diverse range of topics and research areas, covering fields such as technology (IEEE WIRELESS COMMUNICATIONS, ELECTRONICS), philosophy (LINGUISTIC AND PHILOSOPHICAL INVESTIGATIONS, REVIEW OF CONTEMPORARY PHILOSOPHY), and applied sciences (APPLIED SCIENCES, SENSORS). The information provides insights into the volume of research output from these sources, highlighting the prominence of IEEE ACCESS and other publications in the given dataset.

Most Relevant Authors
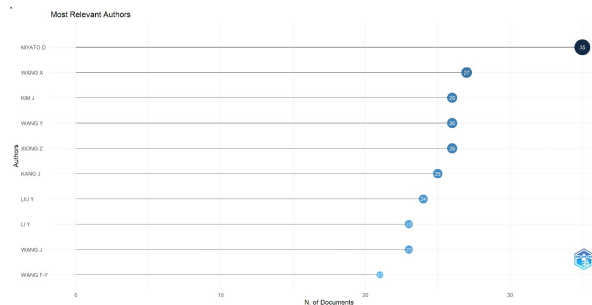
The exported data provides information about the research articles contributed by various authors, along with a corresponding fractionalized measure. The "Authors" column lists the names of different contributors, including NIYATO D, WANG X, KIM J, WANG Y, XIONG Z, KANG J, LIU Y, LI Y, WANG J, and WANG F-Y. The "Articles" column indicates the number of research articles each author has authored, with NIYATO D having the highest count at 35, followed by WANG X with 27, and so forth. The "Articles Fractionalized" column appears to represent a fractional measure associated with each author, possibly indicating some form of contribution proportion. For instance, KIM J has a fractionalized value of 6.36, suggesting a relatively higher average contribution per article compared to other authors. This data provides insights into the productivity and relative contribution of each author to the body of research.

Conclusion

In conclusion, the exported data paints a detailed picture of the Metaverse research landscape from 2005 to 2024. With 1844 documents sourced from 820 outlets, the data showcases a robust and consistently growing scholarly activity, marked by an annual growth rate of 21.59%. The relatively low average document age of 1.54 years reflects the contemporary nature of the research, while the average citations per document at 8.972 underline the impact of Metaverse-related studies within the academic community.

The extensive network of 80,557 references demonstrates the depth of scholarly discourse, and the large number of authors (4560) and collaborative efforts (3.74 co-authors per document) highlight the breadth and collaborative nature of Metaverse research. The international co-authorship percentage of 31.29% underscores the global collaboration in this field.

Analyzing the annual scientific production reveals a dynamic evolution of Metaverse-related research, with a notable surge in articles from 2017 onwards. The years 2022 and 2023 stand out with exponential growth, reflecting the heightened interest and significance of the Metaverse concept. The slight decrease in 2024 might indicate stabilization or a temporary reduction in research output.

Examining the most relevant sources, IEEE ACCESS, SUSTAINABILITY (SWITZERLAND), and IEEE NETWORK emerge as key contributors, representing a diverse range of research areas. In terms of authors, NIYATO D, WANG X, and KIM J are among the most prolific contributors, with KIM J exhibiting a relatively higher average contribution per article.

Overall, this data offers valuable insights into the expansive, collaborative, and impactful nature of Metaverse research, highlighting its growth, global reach, and the diverse array of sources and authors involved in shaping this evolving field.

References

- Azhar, A. and Dani, I. (2022). Interpersonal communication with the deaf in the metaverse age. Muharrik Jurnal Dakwah Dan Sosial, 5(2), 285-291. https://doi.org/10.37680/muharrik.v5i2.1682

- Bansal, G., Rajgopal, K., Chamola, V., Xiong, Z., &Niyato, D. (2022). Healthcare in metaverse: a survey on current metaverse applications in healthcare. Ieee Access, 10, 119914-119946. https://doi.org/10.1109/access.2022.3219845

- Bousba, Y. and Arya, V. (2022). Let's connect in metaverse. brand's new destination to increase consumers' affective brand engagement & their satisfaction and advocacy. Journal of Content Community and Communication, 15(8), 276-293. https://doi.org/10.31620/jccc.06.22/19

- Crozier, M. (2021). Equitable virtual care in canada: addressing the digital divide. University of Ottawa

Journal of Medicine, 11(S1). https://doi.org/10.18192/uojm.v11is1.5937

• Gadekallu, T., Huynh-The, T., Wang, W., Yenduri, G., Ranaweera, P., Pham, Q., … & Liyanage, M. (2022). Blockchain for the metaverse: a review.. https://doi.org/10.48550/arxiv.2203.09738

• Khan, N., Stergiou, G., Omboni, S., Kario, K., Renna, N., Chapman, N., … & Tomaszewski, M. (2022). Virtual management of hypertension: lessons from the covid-19 pandemic–international society of hypertension position paper endorsed by the world hypertension league and european society of hypertension. Journal of Hypertension, 40(8), 1435-1448. https://doi.org/10.1097/hjh.0000000000003205

• Krieger, J., Neil, J., Duke, K., Zalake, M., Tavassoli, F., Vilaro, M., … & Lok, B. (2021). A pilot study examining the efficacy of delivering colorectal cancer screening messages via virtual health assistants. American Journal of Preventive Medicine, 61(2), 251-255. https://doi.org/10.1016/j.amepre.2021.01.014

• Park, S. and Kim, Y. (2022). A metaverse: taxonomy, components, applications, and open challenges. Ieee Access, 10, 4209-4251. https://doi.org/10.1109/access.2021.3140175

• Patterson, P., Roddick, J., Pollack, C., & Dutton, D. (2022). Virtual care and the influence of a pandemic: necessary policy shifts to drive digital innovation in healthcare. Healthcare Management Forum, 35(5), 272-278. https://doi.org/10.1177/08404704221110084

• Rachmadtullah, R., Setiawan, B., &Wicaksono, J. (2022). Elementary school teachers' perceptions of the potential of metaverse technology as a transformation of interactive learning media in indonesia. International Journal of Innovative Research and Scientific Studies, 6(1), 128-136. https://doi.org/10.53894/ijirss.v6i1.1119

• Taylor, M., Shikaislami, C., McNicholas, C., Taylor, D., Reed, J., & Vlaev, I. (2020). Using virtual worlds as a platform for collaborative meetings in healthcare: a feasibility study. BMC Health Services Research, 20(1). https://doi.org/10.1186/s12913-020-05290-7

• Toraman, Y. (2022). User acceptance of metaverse: insights from technology acceptance model (tam) and planned behavior theory (pbt). Emaj Emerging Markets Journal, 12(1), 67-75. https://doi.org/10.5195/emaj.2022.258

• Tutgun-Ünal, A. and Tarhan, N. (2022). Metaverse awareness and generation to transform education. International Journal of Academic Research in Education, 8(1), 64-73. https://doi.org/10.17985/ijare.1153663

• Uysal, B. and SEMÝZ, T. (2022). A new age in health: metaverse. Gevher Nesibe Journal Iesdr, 7(18), 93-102. https://doi.org/10.46648/gnj.424

• Xu, H., Li, Z., Li, Z., Zhang, X., Sun, Y., & Zhang, L. (2022). Metaverse native communication: a blockchain and spectrum prospective.. https://doi.org/10.1109/iccworkshops53468.2022.9814538

• Yang, L. (2022). Simulation of piano teaching system based on virtual data space system and neural network. Mobile Information Systems, 2022, 1-10. https://doi.org/10.1155/2022/1076268

Competencies Required for Innovation in Healthcare Industry

Mrs. Uma Nehare
Research Scholar, University of Mumbai

Abstract : Despite the fact that there has been significant improvement in the healthcare industry, inefficiency still exists and little accomplished in understanding how to overcome those inefficiencies using innovation in healthcare. This study seeks to answer the following research questions. How do executives and practitioners define the term innovation in healthcare? How do healthcare organizations come up with innovative ideas and how do they make those innovative decisions? How do healthcare executives and practitioners roll out those innovative changes in their organizations? What strategies do these organizations apply toward the formulation of innovative decisions? What role does information technology play in the innovative process? The researchers conducted in-depth interviews to answer several research questions. The respondents included 21C-level healthcare executives from 15 healthcare units. Results of the decision-making processes used by these executives concerning innovation conclude with a practical model. Finally, implications for practitioners and policy makers and future trends complete the paper.

The fact of digitization, is that technology is reshaping society and posing new issues. As a result, businesses are being compelled to reconsider their strategy and business models in order to explore new prospects based on Technology and Artificial Intelligence (AI).

The study addresses aissue of developing competencies to drive innovation in healthcare services. It is a secondary research based on literature review. In healthcare management, the key to creating a twenty-first-century healthcare research system with Innovations, rising minimalism, integration of purpose, and diverse focus are four important shifts reshaping the business landscape. Rapid decisions, contactless care of masses, care continuum coverage with consumers at the forefront, and increasingly holistic treatment regimens with simplified workflows without sacrificing quality care are all becoming more frequent as a result. We propose developing ainternal system and management technique and framework for innovation. As a result of this progress, healthcare organisations will be able to provide novel services that are holistic and patient-centred, and patients will be benefited

Keywords: Health care, innovation, quality

Introduction

India launched a National Healthcare Innovation portal (NHInP) to serve as platform for recording replicable innovative practices in public healthcare system organised by Ministry of health and Family Welfare under national health mission. The country's healthcare sector has grown rapidly over the last 5 years with a Compound Annual Growth Rate (CAGR) of approximately 22% since 2016.Healthcare has become one of the largest sectors of the Indian economy, in terms of both revenue and employment.(NHSRC, 2021)

The aim is to improve healthcare outcomes by incorporating innovative practices in healthcare that will offer global competitiveness and Economic growth for country.Due to the intangible impact of service and a mix of diverse professional staff, the Health Care sector is by nature a complex organisation. Consumers demand quality and certainty for their health and offering fundamental standards of quality became crucial.

Despite increasing financial, human resource, and infrastructural investments, and despite exponentially advancing technologies in healthcare, the sector continues to be plagued with inefficiencies and complex problems including erratic quality, unequal access, and relatively high costs (Davis et al., 2014; Diamantes & Kotler, 2012).

Stakeholders in healthcare industry are doctors and administrators. responsibility to implement the culture of innovation lies on their shoulder, but many leaders and stakeholders have no formal training or possess no competencies of how the innovation is done and which innovation model can offer their specific hospital the maximum profit and less prone to uncertainty.Thus, the basic question is what competencies are required at all level of organization to implement innovation in hospitals.

Innovation

WHO Health Innovation Group (WHIG) defines health care innovation as improved health policies, processes, tools, software,as well as services, and delivery methods, to enhance people's health, with a special focus on the needs of vulnerable groups.it can also be defined as the "application of organized knowledge and skills in the form of devices, medicines, vaccines, procedures, and systems developed to solve a health problem and improve quality of life," (*Health Innovation for Impact*, n.d.)

Factors that need to be achieved with innovation isincreasing efficiency, effectiveness, quality, safety, and/ or affordability that adds value to stakeholders and consumers. It can be utilized for preventative, promotional, therapeutic, rehabilitative, supportive purposes. In the healthcare field, innovation entails more than only the

development of new drugs. It also includes developing instruments to aid in diagnosing, monitoring, and treating medical problems.

This is accelerated by needs-based innovation. (Schork NJ., n.d) some of the latest examples of innovation are

Genomics	Understanding people's genomes have aided the development of novel tests and treatments that promote precision medicine. When combined with data and informatics capabilities, it creates a powerful combination.
Medical devices	Medical equipment, which ranges from insulin pumps to robotic arms, serves an important part in maintaining our health and well-being throughout our lives.
Diagnostic imaging	Recent medical developments are pushing the industry to use diagnostic imaging more frequently and closer to the patient. This allows for more and improved screening as well as quicker therapeutic actions.

Competenciesneeded for innovation.

In simple terms competencies for innovation can be defined as the effective way of utilizing the resources to address the challenges of innovative culture in healthcare industry at the centre of all these structures are efficient health care professionals and they have a patient's centric approach thus innovation is secondary priority to management and practising Doctors as well. need is to clearly define the role and responsibility of who will implement the innovation in the organization. Individuals responsible for innovation should have specific competencies. The information and abilities staff members require to study, practise, and expand innovation inside their company are gathered, standardised, and curated by an innovation competence model. Research has been conducted to identify the obstacles preventing the transmission of innovations (Fitzgerald et al., 2001; Leeman et al., 2007). An integral aspect of the organisational culture must be innovation. This organisational "entrepreneurship" is extremely uncommon in highly centralised organisations; thus, it needs to be both acknowledged and fostered. According to a recent Boston Consulting Group poll, 71 percent of organizations ranked innovation as one of their top three strategic priorities. This is due in part to innovation's ability to produce distinctive products and processes that add value to consumers while also providing financial benefits to the company. linked to

improved operational and financial performance, allowing businesses to maintain a competitive advantage over time. (*Business Model Innovation Delivers Competitive Advantage*, n.d.)

Objectives

1. To investigate the awareness and understanding of stakeholders responsible for Innovation that enables Healthcare to improve their quality standard.

2. To investigate current state and performance trends of Innovation Indicators for effectiveness on Industry decision strategy.

3. To develop a framework for implementation of the innovative model for supporting Innovation.

4. To investigate the correlation between increasing efficiency and Innovation for sustainable growth of the Healthcare sector

Literature Review

To define competency for innovation Five databases were referred to conduct a detailed review of the scientific literature on health system innovation, quality trends, leaders' behaviour, the impact of innovation on the economy, quality implementation, Indian structure, and impact of innovation on medical tourism. Literature published between January 2000 to March 2022 were chose as priority. The trends and requirements reported in the reviewed study were categorized using the various quality management frameworks implemented by various countries. To accomplish the aim, of innovation and sustainability a systematic analysis of the literature in the Scopus database was carried out for articles with the terms "innovation" and "sustainability" in their titles. Encouraging green innovation is an environmental commitment and managerial concern driven by customer pressure, and environmental (Lazaretti, K., Giotto, O. T., Sehnem, S., &Bencke, F. F., 2019,) innovation in healthcare are active but not sufficient either in focus or methodological problems (Länsisalmi H, Kivimäki M, 2006)

The researcher follows doctrinal research methodology to address the development of competency forinnovation implementation issues. significant endeavour in this regard was the Pew Health Professions Commission, which in 1992 (O'Neil, 1992) identified 17 competences for aspiring physicians and subsequently increased the list to 21 (Lenburg et al., 1999; O'Neil and the Pew Health Professions Commission, 1998). Discussions focused on the validity, predictive power, and reliability of relevant measures when evaluating competency. In contrast to competencies that rely more on cognitive and critical thinking as well as challenging-to-assess interpersonal skills, nursing groups and some physicians advised against including only those that can be measured, such as those based on technical skills (Benner, 1982; Epstein and Hundert, 2002).

A review of various papers almost starting from the 19th century were reviewed and figures out how the development of Innovation is critical for understanding the relationship between various factors. The Indian healthcare system has adopted the Baldrige Excellence Framework thus more emphasis was given to literature that will enhance the implementation. Authors presented theoretical background for assessing Innovation activities and Innovation management by means of Excellence models and concluded the excellence models in the area of innovation can play a very crucial role

The core competencies for Health care professionals are – Provide patient cantered care 1. Employ evidence-based practice 2. Apply quality improvement and 3. Utilize informatics (Greiner AC, 2003. Chapter 3)

Authors mentioned research gap need to inspire industries to assess and compare their innovation management skills to improve them with excellence models.

Identification of Variables

The above studies emphasise the need for development of competencies for cultivating innovative culture in healthcare organization. To achieve customer satisfaction 45% of the studies done on innovation treated innovation as dependent variable innovation processes, and studies applying mainly quantitative methods with innovation as either the dependent or independent variable)

This studyInnovation is considered as dependent variable whereas competencies are considered as independent variable. The following relation of competencies that can lead to innovation is clearly stated.
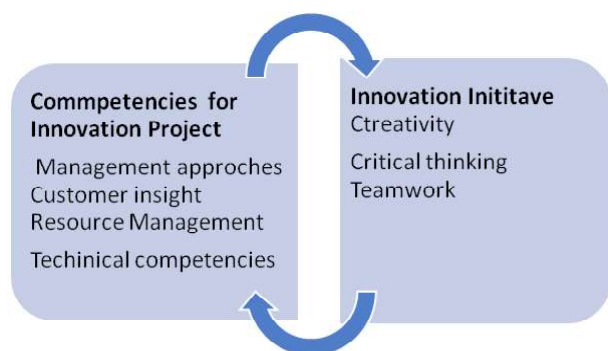
These competencies include skills such as understanding the fit with internal and external strategies and innovation opportunities, building networks, evaluating risk, negotiating, and managing a team, among others.for the landmark innovations the authorities need to develop the favourable environment for conscious innovation instead of random innovation. building right infrastructure. In today's increasingly competitive market, retaining a competitive advantage requires innovation. this paper wishes to study the effect of implementing quality service

by introducing four critical shifts that the industry needs to adopt for fulfilling the changing landscape of the post-pandemic world.On the other hand, while dealing with innovation factors like managements approach towards Scientific Innovation (R&D)- A holistic approach to health innovation includes the discovery, development, and delivery of health products and services. Secondly emphasis on Social Innovation for customer insight - Finding and scaling up the business is the need of the hour. Business Innovation that are financially sustainable solutions would impact the customer insight program require business innovation as well. It could include measures to overcome various types of market failures and form new, synergistic alliances using open-access policies. The data of customers could give a futuristic view of what customers require and customers profile and organizations can track and engage patient'sactivities. Resource management is also crucial for competent manager as the right person has to be employed for right job and to innovate in service industry, the stake holders should be highly technical competent

Developing theoretical construct and hypothesis

Research Hypotheses

Ha1: There is positive awareness about implementing business excellence to lead an innovative environment in the Healthcare sector.

Ha 2: There is a positive relation between Innovation and competencies.

Ha3: Right competencies have significant impact innovation.

Conclusion

In order for adequate "service delivery" to take place, proper "leadership and governance" should make the appropriate "resources," which include human resources, finances, infrastructure and supplies, knowledge and information systems, available. Health systems should be understood as dynamic, open systems where interactions and shifting equilibriums take place among 3 broad components. According to their paradigm, "infrastructure and supplies" refers to things like pharmaceuticals, medical equipment, and vaccines, while "knowledge and information systems" include things like electronic medical records, telemedicine, and patient decision aids.

Leadership and governance -

The CEO of the company welcomed feedback and challenges. Emerging delivery models with opportunities to help providers be successful in ensuring access to communities. Investing in advanced telehealth capabilities to provide care in rural and underserved areas. (Tello & Barbazza, 2016)

Strategic planning -

Organizations are putting a lot of effort into developing an agenda for innovation and transformation that is focused on innovation capability, public policy, and field in order to create enhanced value for the stakeholders. A Strategic Plan for the years 2022–2024 was created by the American Hospital Association (AHA). the goal that will serve as a foundation for innovation and quality in the future. The Association wants to provide patients who can create more value with better treatment. The financial security of hospitals and health systems is a goal of AHA policies. Each pillar will have a significant effort and strategies that will involve both the public policy arena as well as the healthcare industry. They aim to increase the public's trust and confidence in hospitals and the healthcare system, address workforce challenges and improve the healthcare consumer experience.

Focus on customer and market -

Since identifying consumer needs and enhancing product service and design are the most important tasks, the healthcare business must adhere to contingency situational theory.Examining the patients' needs in-depth, finding latent desires, and offering new healthcare services that they haven't explicitly requested are all components of a good marketing plan. Modern life now demands that patients participate in the accomplishment of the medical act, with vast and intricate ramifications that affect beneficiaries' lifestyles, eating habits, and medication in addition to altering physicians' mindsets. As the routine processes change, change will be crucial to the main purpose of our existence: life. The relationship's ability to balance the need for wellness will also undoubtedly be hampered by this.

Development of human resources -

Human resources for health are managed in light of the following factors: the workforce's central role in the health sector; the numerous challenges presented by health system reforms; the requirement to foresee the impact of various macrosocial trends on health systems on the health workforce (and, consequently, on service provision).To update the way the policy-making procedure is carried out in the creation of human resources for health (HRH), four ideas have been made.To foster a more proactive mindset among human resources (HR) policy-makers and managers; To move beyond the traditional approach of personnel administration to a more global concept of HRM; To give more weight to the integrated, interdependent, and systemic nature of the different components of HRM when preparing and implementing policy; (*Policies and Practices to Promote Women in Leadership Roles in the Private Sector*, n.d.)

The usefulness of health policies -

Management techniques Around the world, sensors are utilized to advance nanotechnology, mobile devices, virtual and augmented reality, and artificial intelligence. Since their introduction, sensor technologies have significantly enhanced healthcare. In order to convert health data into detectable electrical impulses, sensors have been extensively used. 17 Health information including heart rate, blood pressure, blood sugar level, stress level, oxygen saturation level, temperature, weight, and blood pressure is typically recorded by sensory smart devices and delivered as electrical pulses for additional processing. Particularly during the COVID-19 epidemic, sensors continue to revolutionize healthcare systems all around the world and provide new potential for virtual treatment. In order to record and process health data remotely, sensors have been successfully integrated with smartphones, smart wearables, and IoMT. Biosensors, in particular, arefor better clinical diagnostics and the monitoring of biological molecules, sensors, particularly biosensors, are turning into increasingly important tools in the medical industry. 19 Wearable sensors are further divided into flexible and non-flexible categories and have been utilized for remote patient monitoring in the healthcare industry, among other functions**.** (ElliotMbunge, 2021)

Information and analyses

We are actively seeking novel new approaches to provide healthcare and maintain the health of patients. Here are a few instances:Emerging delivery options that can give providers the chance to succeed in securing access to communities. To deliver care in remote and underserved locations, improved telehealth capabilities should be invested in. Artificial intelligence will help with advancements in areas including patient communication, early disease diagnosis, clinical decision-making, and hospital command centres.Social determinants of health are addressed via data analytics, and blockchain is used to improve digital security and harness the power of data.To address care coordination, shortages, competency development, and technology, new workforce models are needed. creative collaborations with many community groups.Solutions and integrative tactics for behavioural health. Enhanced leadership tactics, aptitudes, and responsibilities for board members and hospital leadership.

Contribution of research -

The frame work developed will want to boost public confidence in hospitals and the healthcare system, increase workplace challenges for healthcare consumers, and emphasise the importance of mental health and equitable treatment to policymakers. The public policy sector as well as field leadership will be involved in each pillar's signature initiatives and strategies. Operational objectives and plans

will support the strategic plan and direct our activities and priorities. (*AHA's 2022–2024 Strategic Plan | AHA*, n.d.)Individual customers, employer payers, and governments are still influenced by affordability issues. As a result of the nation's experience with COVID-19, there is an increased need for coordination and integration of behavioural health with improvements in physical health. As the overall cost of healthcare keeps rising, the efficiency of value-based payment models as a cost-saving measure is the best adopted option today. the frame work offers health care delivery system that will provide solution to already struggling financial sector and will prove a boon to survive throughthe additional strain as a result of growing inflation.

References

1. *Aggarwal, A., Aeran, H., & Rathee, M. (2019). Quality management in healthcare: The pivotal desideratum. Journal of oral biology and craniofacial research, 9(2), 180–182. https://doi.org/10.1016/j.jobcr.2018.06.006.*

2. *AHA's 2022–2024 Strategic Plan | AHA*. (n.d.). American Hospital Association. Retrieved June 28, 2022, from https://www.aha.org/strategy

3. Anh Chi Phan, Ayman Bahjat Abdallah and Yoshiki Matsui. (2011). Quality management practices and competitive performance: Empirical evidence from Japanese manufacturing companies. *International Journal of Production Economics*

4. *A bibliometric and thematic review of business excellence journal papers from 1990 to 2020.* (2020, December 7). Taylor & Francis Online. Retrieved June 28, 2022

5. *Biggest healthcare shifts we'll see in 2022 as per experts.* (2022, January 17). The World Economic Forum. Retrieved June 28, 2022,

6. *Business Model Innovation Delivers Competitive Advantage.* (n.d.). BCG. Retrieved June 28, 2022

7. *CII Public Health.* (n.d.). CII. Retrieved June 28, 2022

8. Dussault, G., Dubois, CA. (n.d.). Human resources for health policies: a critical component in health policies. *Human Resources for Health, 1*

9. ElliotMbunge. (2021). Sensors and healthcare 5.0: transformative shift in virtual care through emerging digital health technologies.

10. *Health innovation for impact.* (n.d.). WHO | World Health Organization. Retrieved June 28, 2022

11. Honigman, B. (n.d.). *7 Biggest Innovations in Health Care Technology in 2014 [INFOGRAPHIC]*

12. *Initiatives to Promote Indian Healthcare Industry.* (2021, July 20). Press Information Bureau. Retrieved June 28, 2022

13. Jing Zeng a,n, Chi Anh Phan b, Yoshiki Matsui. (2015,). The impact of hard and soft quality management on quality and innovation performance: An empirical study. *International Journal of Production Economics.*

14. Jonathan G. (2014, April 26). *The 7 Biggest Innovations in Health Care Technology in 2014.* https://www.linkedin.com/.

15. Länsisalmi H, Kivimäki M. (2006). Innovation in healthcare: a systematic review of recent research.

16. Lazaretti, K., Giotto, O. T., Sehnem, S., &Bencke, F. F. (2019). Building sustainability and innovation in organizations. *Benchmarking: An International Journal.*

17. Machnik-S³omka, J. (2020). The importance of excellence models in assessing the innovative activity of enterprises

18. McCain, K. (2022, February 14). *Experts Predictions: What are the biggest healthcare shifts in 2022*

19. Mehran Charles Ferdowsian. ((2016)). Total Business Excellence - a new management model for operationalizing excellence.

20. Murrell, D. (n.d.). *Modern medicine: Infectious diseases, timelines, and challenges.* Medical News Today. Retrieved June 28, 2022, from

21. Nwabueze, U. (2011). "Implementing TQM in healthcare: The critical leadership traits. *Total Quality Management,*

22. *Policies and Practices to Promote Women in Leadership Roles in the Private Sector.* (n.d.). OECD. Retrieved June 28, 2022,

23. Purcarea V. L. (n.d.). The impact of marketing strategies in healthcare systems. *Journal of medicine and life, 12(2), 93–96.*

24. Schork NJ. (n.d.). Artificial Intelligence and Personalized Medicine. *Cancer Treat Res. 2019;178:265-283.*

25. Tello, J., &Barbazza, E. (2016, October 17). *Integrated care models: an overview.* WHO/Europe. Retrieved June 28, 2022, from

26. Ullmann, A. (2022, May 2). *Louis Pasteur | Biography, Inventions, Achievements, Germ Theory, & Facts.*

Green Marketing Versus Conventional Marketing

Prof. Vivek Sharma

Research Scholar, JJTU, Rajasthan

Abstract : The biggest need of the hour in this age of globalisation is to find ways to draw in customers and keep them around without harming the environment. The consequences of environmental pollution and other environmental challenges, such as global warming, are well known to today's consumers. Therefore, no marketer could imagine controlling the market by making a concession on any of these issues. Green marketing is a result of consumers' and manufacturers' concern for the environment. Green marketing mainly refers to the marketing of goods and services in a way that satisfies consumer wants while also having the least negative impact possible on the environment. In India, green marketing is still in its infancy. Green is progressively becoming more familiar to local customers. In such a case, it is critical to first select the product category in which it may be introduced safely and successfully.

Keywords : Green Marketing, Conventional Marketing, global warming, Green products Environmental pollution

Introduction

Man has long used natural resources for a better and more comfortable living without giving much thought to the effects. Natural resource extraction was fairly slow up to the 18th century. However, as the Industrial Revolution began, the globe became armed with new breakthroughs, technology, and discoveries, and a race to become a superpower broke out among the nations. In order to outperform the competition, which led to the creation of new machinery and the flood of items onto the market, huge profits were sought at the expense of the environment and natural resources (Padhy, 2014). The industrial revolution has had unwanted results, such as pollution, acid rain, land degradation, ozone layer depletion, and rising sea levels, in addition to depleting resources.Industrial operations have also generated a large amount of waste in the form of residual raw materials, process effluents, abandoned packaging, and finally environmental degradation. Furthermore, many species have died off, and the ecosystem has suffered as a result. Aside from these, globalisation causes a number of economic, social, and environmental issues such as resource depletion, excessive energy use, air and water pollution, scandals and scams, increased intensity of competition, value systems, and consumer changing preferences, as well as increased risk to sustainability, despite the fact that it has attracted a large amount of foreign investment, resulting in economic transformation and development. However, by the end of the twentieth century, the globe had realised the reality of climate change and began to express alarm about it.The topic of global warming attracted interest and sparked an increasing amount of discussion. The Rio Summit in 1992, the Kyoto Protocol in 1997, and the subsequent Doha Amendments were some UN initiatives that compelled countries to reevaluate their economic development and find ways to prevent the depletion of non-renewable natural resources and pollution. They also established legal constraints for developed countries to reduce their GHG emissions.2017's UN climate summit, COP 23, in Bonn, Germany, came to a conclusion with a "Talanoa Dialogue Roadmap." The conference brought the wealthy nations under one roof to make their pre-2020 commitments to keep the global average temperature rise within 2 degrees Celsius by the end of this century and make efforts to keep it below 1.5 degrees Celsius. The conference's main focus was on framing rules to implement the Paris Agreement in 2015. Implementing the 2015 Paris Agreement, which takes effect in 2020, was the main topic of discussion at the COP 24 UN climate summit in Katowice, Poland, in 2018.

Meaning and Evolution of Green Marketing

Green Marketing

Defining the word "green marketing" is a difficult issue. Various studies have interpreted it differently, but there is no widely agreed definition. In general, green marketing is the promotion of items that are thought to be environmentally friendly. It encompasses a costly and comprehensive variety of actions, including as product and manufacturing process modification, product customization, refashioning of advertising messaging, and packaging modification, among others. Green marketing is defined as "organisational efforts to produce, promote, package, and recover products in an environmentally sensitive or responsive manner" (American Marketing Association, 2014). The American Marketing Association defined the notion of green marketing into three parts. Green marketing is popular in the retail industry. Green marketing in retail refers to the promotion of environmentally friendly items, whereas social marketing refers to the evolution and marketing of products designed to reduce negative natural environment effect and improve quality. The environmental definition focuses on organisations' sensitive or responsive ecological considerations in production, promotion, packaging, and product reclamation.

According to Pride and Ferell (1993), green marketing is understood to be environmentally and sustainably friendly. According to Mintu and Lozada (1993), the goal of marketing tools is to facilitate transactions that include organisational and personal goals in a way that supports the preservation, protection, and improvement of the natural world. Green marketing steers clear of goods that could

potentially be harmful to consumers' or others' health, seriously harm the environment during production, use, or disposal, consume a lot of energy, albeit disproportionately, produce unnecessary waste, use materials sourced from threatened or endangered species or environments, use non-essential animal testing, or have a negative economic impact on other nations (Elkington, 1994). Accordingly, green marketing refers to a comprehensive management strategy that takes into account identifying and satisfying the requirements and wants of both consumers and society in a positive and sustainable way (Peattie, 1995). Environmental statements about a product's attributes or the systems, policies, and procedures of the companies that make or sell it are used in green marketing to promote it (Prakash, 2002).

Green Marketing Evolution

Green awareness expands around the world throughout the 1960s and early 1970s. The key issues that gave birth to this campaign were negative consumption patterns, the influence of economic expansion, and expanding population, all of which had a negative impact on the natural environment (Cohen, 2001). After a workshop in which a number of academicians, practitioners, and public policymakers gathered in one place to inspect the impact of marketing on natural environment and spurred on green lifestyle and products, the American Marketing Association (AMA) published the first book on green marketing, titled 'Ecological Marketing' in 1975.

However, green marketing became popular in the 1980s when some corporations began to release CSR reports to investigate their environmental impact. Two publications titled 'Green Marketing,' written by Kinnear (in the UK) and Jacquelyn Ottman (in the US), also served as watershed moments in the growth of green marketing. The phrase "sustainable development" was coined by the World Conference on Environment and Development in 1987. They described society's obligation to future generations as being concerned with future generations' needs as well as their own (Bhalerao, 2014). Green marketing is separated into three stages, according to Peattie (2001). During the first stage of ecological marketing, company affairs were focused with environmental challenges and remedies. The focus of environmental marketing in the second phase switched to the development of innovative home products that use clean technology to help reduce waste and pollution. The final stage of sustainable marketing is expected to commence in the 1990s and early 2000s. At this point, the marketing discipline had begun to green and was referred to as green marketing (Mohammad Azam, 2014). However, green captivated the public imagination in 2007, when there were 2400 trademark applications for terms involving green and 900 for the word 'eco', which climbed by 32% in 2008 for trademarks containing the word 'green' and 90% for the word 'eco' (Chaudhary et al., 2011).

Four Stages of Green Marketing Evolution
Table No.1

Stage	Decade	Activities in green marketing history
1st stage	1980s	Ecological items were introduced; ecological products were equivalent to green products; green consumption was extremely low.
2nd stage	Early-1990s	High concern about environmental issues; yet limited consumption of green products; corporations engage in using less raw materials and squandering fewer resources; corporate initiatives in recycling, energy efficiency, and corporate responsibility
3rd stage	Late-1990s	Production process, technological, and resource changes; sustainability marketing Environmental concerns are part of whole quality management.
4th stage	2000s	Going green is becoming more and more popular among organisations and consumers, and the term "sustainable green marketing" has been established. Green products and services are also on the rise..

Source: Ilona Solvalier (2010)

3. Conventional Vs Green marketing

The origins of the green marketing concept arise from the concept of conventional marketing. Green marketing is a result of manufacturers' and customers' growing awareness for natural resources and ecosystems. Although green marketing and traditional marketing are nearly identical, there are some variances. These are discussed below:

Difference between Conventional and Green Marketing

		Table No.2	
		Conventional	**Green**
Objective		The purpose of conventional marketing is to satisfy customers and achieve organizational goals.	The purpose of green marketing is to satisfy the customers keeping in mind environmental compatibility and achieve organizational goal.

Focus	Short term planning as it deals with the direct benefits of the product.	Long-term planning and promote eco-labeled products.
Decision making	It required fragmented thinking	It requires integrated thinking where social and environmental issues arematched with economic desires.
Risk	Limited product risk	Risky
Expensive	Moderate and sometimes costly	Consumers are required to pay apremium as it involves high cost and value-added features.
Corporate Responsibility	Economical responsibility	The social responsibility which goesbeyond the laws

Reasons for adopting Green Marketing

Green marketing has a number of positive effects, but the most significant one is that it contributes to a sustainable planet. Green marketing strategies offer significant advantages for the economy, the environment, and consumers. Green marketing techniques help combat climate change because they put an emphasis on reducing pollution, greenhouse gas emissions, and the use of fossil fuels. Green marketing strategies include a number of financial advantages, including the reduction in price of individual green items owing to green economies of scale and the predicted increase in customer demand for green goods and services.In addition to that, green marketing lowers costs by using less energy, generating less trash or diverting garbage from landfills and incinerators through recycling, as well as by reducing consumption or reusing. Consumers can benefit from green marketing strategies in a number of ways, including safety, comfort, good taste, and energy conservation.

Green Marketing has gotten broad acceptance and extensive adoption by different enterprises around the world but in India it is still in its evolving stage. Multiple reasons have been provided by various research for the organizations to 'go green' (Mohanasundaram, 2012; Chaudhary et al., 2011). Few of them are as followes

Opportunity

Consumer demand for green products is growing, which has created new opportunities for businesses. To take advantage of this potential and gain a competitive edge over rival companies manufacturing non-green products, business organisations are implementing a number of green initiatives.

Stakeholders pressure

Businesses have been under pressure to develop green marketing strategies due to societal awareness of the environment. Increased environmental rules and regulations, green consumerism, and an exponential increase in the amount of media coverage of disasters have compelled businesses to develop environmentally friendly products. EHS (Environment, Health and Safety) policies are increasingly being adopted by businesses, and they now apply to their supply chain partners as well.

Competition

Another strong motivator for businesses to use environmental marketing is competition. Competitors' adoption of green marketing tactics puts a lot of pressure on rival businesses, forcing them to change their traditional business practises to green marketing practises in order to maintain their competitive position.

Technology

Technical advancements like fuel cell technologies, super-conductivity technology in magnetic trains are helping manufacturers to produce the products with environmental friendly components.

Corporate Social Responsibility

Businesses have a moral and ethical obligation to operate in an environmentally sustainable manner since they are an integral component of society. In order to fulfil their social obligation, the organisations are using green marketing strategies, and they are basing their goals on the triple bottom line (People, Planet, and Profit) strategy.

Green Marketing Mix

The 4Ps of the marketing mix were first introduced by Mccarthy in 1960, and they are a technique used by businesses or marketers to sell their brands and products on the market. Marketing mix was described by Kibera et al. (1996) as a methodical and deliberate process for building a marketing strategy made up of controllable variables. He claims that the following 7Ps make up the green marketing mix:

Green Product

The environmental harm caused by conventional products can be reduced, and green products have the added benefit of generating resources on their own. According to Kellerman (1978), ecological aims should be incorporated into product planning in order to reduce resource depletion

and contamination and maximise the sustenance of limited resources. Recycled materials, used items, and their raw materials make up the majority of the upgrading of green products. The 6R theory of sustainability–recovering, reusing, recycling, redesigning, reducing, and remanufacturing–lays the foundation for the improvement and improvement of green products (Tomasin et al., 2013).

Green Price

When it comes to price, it has emerged as a significant element that is crucial to the mix of green marketing strategies. Going green is a fantastic operation, but it comes with a commercial burden because it requires a variety of plans of action, including new technology, tools, and trained personnel. As a result, the price of the goods increases even further, leading to premium pricing. Therefore, the green price can be considered a premium pricing. There is a good chance that the businesses will be able to cover this increased cost thanks to their target market, who is ready to pay more for environmentally friendly items.

Green Place

First things first, green items need to be placed in a location where target buyers can easily access them and purchase them. If the location and availability of products are known and confirmed in advance, it has a significant impact on the intention of businesses to tempt their customers. Customers have very little opportunity to purchase a green product. Additionally, according to Larashati et al. (2012), the location and corporate identity must complement one another. The phrase "green place" refers to the choice of channels in a way that minimises harm to the environment.

Green Promotion

One of the main promotional strategies for green products is advertising. But educating the herd about green products, their availability, and their long-term advantages is just as crucial. The primary objective of the green promotion is to entice clients. Companies continue to design and produce greener products, but they also promote these items and their prestigious images by communicating their greenness to customers through a variety of media. The main messages of being green can be spread via the following strategies: advertising, public relations, direct marketing, and sales promotion. The last two procedures are increasingly employed as venues for showcasing a company's bright future.

Green Process

Green procedures cement sustainability with the operation of projected organisational growth as a result of the tailored plan and marketers' dedication to achieving

standards. When it comes to adopting green marketing as a business strategy, specific customisation to internal procedures is of the utmost importance. It is crucial to redesign the business process. It is no less than a fool's errand to predict that the marketing department of an organisation will completely effect a turnaround through green marketing. Other organisational activities must be painstakingly integrated, and their actions and decisions must necessarily be in alignment with, for this turnaround to be a tremendous success.

Green People

Customers that favour green products have a propensity to favour direct marketing channels. By utilising public relations, a company can develop its untouchable good reputation. According to Gopalkrishanan and Gananandanam (2013), a company must perform market research to identify the specific demands of its customers and educate consumers about the benefits of eco-friendly products. A company can strengthen an organisational commitment to the green marketing philosophy, but only if it ensures that all of its staff and employees are given technical training and instilled with a respect for the environment.

Green Physical Evidence

One of the essential components of the green marketing mix that embodies either the adoption of a policy or framework that continuously and consistently spreads the sustainability ideals is physical evidence. Additionally, the tangible proof exemplifies what customers are expected to accomplish to elevate sustainability. This creates a set of frameworks for both internal and external clients that may eventually result in sustainability. Since physical proof helps buyers judge the quality of a product or service before making a purchasing decision, marketers should make an effort to produce it (Blythe, 2006). environment.

Green Marketing Strategies

Ginsberg Jill Merdith and Bloom Paul (2004) talked on the four dimensions of green marketing: lean green, defensive green, shaded green, and extreme green. Both production companies and service organisations are covered by these green marketing methods.

Lean Greens

Lean greens are more concerned with becoming good citizens than they are with promoting and publicising their green efforts. They frequently look forward to reducing expenses and improving efficiencies through environmentally friendly operations in order to provide, barring competitive advantage, a reduced cost competitive advantage. They willingly follow the law and strive for long-

term solutions that are self-sufficient. However, they do not expect to profit significantly from the green market sector. Lean greens hesitate to promote environmentally friendly practises and environmentally friendly product features out of concern that they would be held to the highest standards and unable to meet expectations or set themselves apart from other competitors.

Defensive Greens

Defensive greens frequently use green marketing techniques to counter the acts of their fellow competitors. They recognise that it isn't sensible or realistic to distance themselves from the green market segments, considering them to be the dominant and lucrative domain, thus they are constantly working to improve brand image while minimising damage. Despite their genuine and ongoing environmental initiatives, they choose to hold back on fully promoting and advertising them due to their incapacity to set themselves apart from their rivals in terms of greenness. Advocating for quick and easy ecologically friendly programmes and events is made easier by playing it safe.

Shaded Greens

Shaded greens invest significantly in a widespread, long-lasting environmentally friendly procedure that requires a significant amount of both financial and non-financial dedication. These businesses view green as a margin of opportunity in their quest to develop products and technology that will meet future needs and put them in a better and more advantageous position. Although there is a good chance that they could differentiate themselves based on their greenness, they choose not to. However, they are able to make money by highlighting other qualities. First and foremost, shaded greens promote and offer customers clear, explicit, and material benefits while allowing their items to be offered in the most popular way.

Extreme Greens

Extreme environmentalists are more likely to adhere to holistic theories and sets of beliefs. These companies' whole business and product life cycle processes are permeated by environmental concerns. Greenness is frequently seen as the company's underlying driving force from the beginning. The most beneficial practises included are life cycle pricing techniques, manufacturing, and overall quality environmental management. According to their products and services, which are supplied through specialist channels or boutique boutiques, extreme greens seldom supply their services to niche markets.

Conclusion

Green marketing is necessary in today's global marketplace. Green practises and products will aid in environmental protection and sustainable economic development. Companies should begin integrating green marketing techniques into their everyday operations. Demanding more ecologically friendly products from consumers is the only way to drive businesses to employ more green marketing strategies. Numerous problems might be solved with small environmental conservation efforts, and in the long term, we might be able to save our ecosystem. In India, green marketing is gaining popularity but also requires more government assistance.

References

1. Azam, M. (2014). Green Marketing: Eco-friendly Approach. International Journal of Innovative Research & Development, 3(2).

2. Bhalerao, S.A. (2014). Green marketing: A new marketing strategy for environmentally compatible products. International Journal of Development Research, 4(8), 1531-1538.

3. Blythe, J. (2006). People, process and physical evidence, Principles and Practice of Marketing. UK: Thomson Learning.

4. Chaudhary, B., Tripathi, S. and Monga, N. (2011). Green marketing and CSR. International Journal of Research in Finance and Marketing, 1(6).

5. Cohen, M. (2001). The Emergent Environmental Policy Discourse on Sustainable Consumption. (M.Cohen and J. Murphy, Eds.) London: Pergamon

6. Elkington, J. (1994) Toward the Sustainable Corporation: Win-Win-Win Business Strategies for Sustainable Development. California Management Review, 36, 90-100.

7. Ginsberg, M.J., & Bloom, N.P. (2004). Choosing the Right Green Marketing Strategy. MIT Sloan Management Review, 79- 84.

8. Gopalakrishnan, M.S., & Muruganandam, D. (2013). A micro analysis on dissect of consumer's to procure green products. Life Science Journal

9. Kibera, F. N. (1996). Introduction to Business: A Kenyan perspective. Nairobi: Kenya Literature Bureau.

10. Larashati, H., Hudrasyah, H., &Chandra, N. (2012). 7Ps of green marketing as factors influencing willingness to buy towards environmentally friendly beauty products

11. Mintu, A., & Lozada, H. (1993). Green Marketing Education:A Call for Action. Marketing Education Review, 3 (3), 17-23.

12. Mohanasundaram. V. (2012). Green Marketing – Challenges & Opportunities. International Journal of Multidisciplinary Research, 2 (4) ,66 – 73.

13. Padhy, S. C. (2014). A study of green marketing practices in selected automobile companies and its effect on the consumers in pune and Aurangabad. Padmashree Dr.D.Y.Patil University. Navi Mumbai. India.

14. Peattie, K. (1995). Environmental Marketing Management: Meeting the green challenges. London: Pitman Publishing.

15. Peattie, K. (2001). Towards Sustainability: The third age of green marketing. The Marketing Review, 2 (2), 129-146

16. Prakash, A. (2002). Green marketing, public policy and managerial strategies. Business Strategy and the Environment, 11, 285-297.

17. Pride, W.M. and Ferrell, O.C. (1993) Marketing: Study Guide, Business and Economics.

18. Tomasin, L., Pereira, G.M., Borchardt M., & Sellitto, M.A. (2013). How can the sales of green products in the Brazilian supply chain be increased? Journal of Cleaner Production, 47, 274-282

Valuation through DCF Model : A Case Study of Maruti Suzuki

Nishi Singhavi

MMS Student, Thakur Institute of Management Studies and Research

Someshwar Topre

MMS Student, Thakur Institute of Management Studies and Research

Dr. Shebazbano Khan

Assistant Professor, Thakur Institute of Management Studies and Research

Abstract : There is a wealth of literature about discounted cash flow valuation. In this paper, we will discuss the Valuation of Maruti Suzuki with their valuation model and financial analysis. This paper illustrates and analyzesthe in-depth analysis of Company's financial statement with forecasting and assumptions. Also. This paper is a live case study on Maruti Suzuki valuation.

Keywords: DCF, Valuation, Financial statements, intrinsic value

Introduction

Maruti Suzuki India Limited (formerly Maruti Udyog Limited) is the Indian subsidiary of Japanese automaker Suzuki Motor Corporation. As of September 2022, the company had a leading market share of 42 percent in the Indian passenger car market.

The discounted cash flow (DCF) analysis represents the net present value (NPV) of projected cash flows available to all providers of capital, net of the cash needed to be invested for generating the projected growth. The concept of DCF valuation is based on the principle that the value of a business or asset is inherently based on its ability to generate cash flows for the providers of capital. To that extent, the DCF relies more on the fundamental expectations of the business than on public market factors or historical precedents, and it is a more theoretical approach relying on numerous assumptions. A DCF analysis yields the overall value of a business (i.e. enterprise value), including both debt and equity.

Key Components of a DCF

- Free cash flow (FCF) – Cash generated by the assets of the business (tangible and intangible) available for distribution to all providers of capital. FCF is often referred to as *unlevered free cash flow*, as it represents cash flow available to all providers of capital and is not affected by the capital structure of the business.

- Terminal value (TV) – Value at the end of the FCF projection period (horizon period).

- Discount rate – The rate used to discount projected FCFs and terminal value to their present values.

DCF Methodology

The DCF method of valuation involves projecting FCF over the horizon period, calculating the terminal value at the end of that period, and discounting the projected FCFs and terminal value using the discount rate to arrive at the NPV of the total expected cash flows of the business or asset.

Literature:

Fernández (2001) shows that the discounted value of tax shields is the difference between the present values of two different cash flows, each with its own risk: the present value of taxes for the unlevered company and the present value of taxes for the levered company. This implies as a first guideline that, for the particular case of a perpetuity and a world without costs of leverage, the discounted value of tax shields is equal to the tax rate times the value of debt (i.e. Fernández (2004), Myers and Modigliani-Miller). The discounted value of tax shields can be lower, when costs of leverage exist. In that case, it is shown that, since the existence of leverage costs is independent of taxes, a second guideline for the appropriateness of the valuation method should be that the discounted value of tax shields when there are no taxes is negative.

Twenty-three valuation theories proposed in the literature to estimate the present discounted value of tax shields are analyzed according to their performance relative to the proposed guidelines. By analyzing perpetuities, the author is able to eliminate 8 theories that not only do not provide us with a value of the tax shield of DT (as the candidates for a world without cost of leverage should), but also fail to provide us with a negative VTS when there are no taxes (as the candidates for a world with leverage cost should). The 8 candidates eliminated due to a lack of consistent results include Harris-Pringle (1985) or Ruback (1995), Miles-Ezzell (1980), and Miller (1977).

By analyzing constant growth companies, the author is able to see that there is only one theory that provides consistent results in a world without leverage cost. In accordance with this theory, the VTS is the present value of DTKu discounted at the unlevered cost of equity (Ku). It is not the interest tax shield that is discounted.

The author finds three theories that provide consistent results in a world with leverage cost: Fernández (2001)7, Damodaran (1994) and Practitioners. Only Fernández (2001) is fully applicable, while the other two are applicable up to a certain point. The differences among the theories can be attributed to the implied leverage cost in each of them.

Based on above Literature, The researcher has found certain gaps and decided to conduct the study on below objectives-

- To study the value of the Maruti Suzukicompany through DCF Model

- To recommend Investors whether to buy, sell or hold the stock of Maruti Suzuki.

Research methods:

This research is based on secondary data. The data is gathered from Companies Annual report from the period 2019- 2023. The forecasted data is analysed for the period 2024- 2028. Assumptions are forecasted based in Historical data, Economy analysis like GDP and growth rate. The data analysis consists of profit and loss statement, Balance sheet statement and DCF Valuation model.

Data analysis:

Table No: 1 Statement of Profit and Loss Account (Actual)

PARTICULARS	ACTUAL				
	March 31, 2019	March 31, 2020	March 31, 2021	March 31, 2022	March 31, 2023
INCOME					
I Revenue from operations	8,60,685.00	7,56,600.00	7,03,720.00	8,83,298.00	11,75,713.00
II Other income	25,616.00	33,344.00	29,363.00	17,447.00	21,407.00
III Total Income (I+II)	**8,86,301.00**	**7,89,944.00**	**7,33,083.00**	**9,00,745.00**	**11,97,120.00**
IV EXPENSES					
Cost of materials consumed	4,50,257.00	3,46,348.00	3,32,964.00	3,97,396.00	4,66,696.00
Purchases of stock-in-trade	1,50,266.00	1,87,672.00	1,72,541.00	2,63,975.00	3,99,851.00
Changes in inventories of finished goods, work-in-progress and stock-in-trade	2,116.00	-2,387.00	2,736.00	-931.00	-4,039.00
Employee benefits expense	32,850.00	34,162.00	34,316.00	40,514.00	46,346.00
Finance costs	759.00	1,342.00	1,018.00	1,266.00	1,870.00
Depreciation and amortisation expense	30,208.00	35,284.00	30,341.00	27,890.00	28,257.00
Other expenses	1,16,385.00	1,18,896.00	1,08,375.00	1,26,727.00	1,58,055.00
Vehicles / dies for own use	-1,221.00	-1,217.00	-728.00	-1,445.00	-1,373.00
Total expenses (IV)	**7,81,620.00**	**7,20,100.00**	**6,81,563.00**	**8,55,392.00**	**10,95,663.00**
V Share of profit of associates	**1,273.00**	**1,175.00**	**1,588.00**	**1,464.00**	**1,558.00**
VI Share of profit of joint ventures	**284.00**	**9.00**	**102.00**	**155.00**	**216.00**
VII Profit before tax (III – IV + V + VI)	**1,06,238.00**	**71,028.00**	**53,210.00**	**46,972.00**	**1,03,231.00**
VIII Tax expense					
Current tax	29,338.00	13,765.00	11,562.00	14,310.00	22,496.00
Deferred tax	394.00	487.00	-2,243.00	-6,133.00	-1,375.00
	29,732.00	**14,252.00**	**9,319.00**	**8,177.00**	**21,121.00**
IX Profit for the period (VII - VIII)	**76,506.00**	**56,776.00**	**43,891.00**	**38,795.00**	**82,110.00**

X Other Comprehensive Income					
A (i) Items that will not be reclassified to profit or loss					
(a) gain / (loss) of defined benefit obligation	-436.00	-718.00	545.00	223.00	-343.00
(b) gain / (loss) on change in fair value of equity instruments	(1,745)	-3,902.00	4,704.00	3,170.00	929.00
(c) gain / (loss) on share of other comprehensive income in associates and joint venture	0.00	0.00	10.00	4.00	0.00
	-2,181.00	**-4,620.00**	**5,259.00**	**3,397.00**	**586.00**
A (ii) Income tax relating to items that will not be reclassified to profit or loss	150.00	203.00	-123.00	-268.00	8.00
B (i) Items that will be reclassified to profit or loss					
(a) effective portion of gain / (loss) on hedging instruments in a cash flow hedge	2	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
B (ii) Income tax relating to items that will be reclassified to profit or loss	(1)	0.00	0.00	0.00	0.00
Total Other Comprehensive Income (A (i+ii)+B(i+ii))	**(2,030)**	**-4,417.00**	**5,136.00**	**3,129.00**	**594.00**
XI Total Comprehensive Income for the period (IX + X)	**74,476.00**	**52,359.00**	**49,027.00**	**41,924.00**	**82,704.00**
Profit for the year attributed to:					
Owners of the Company	76,491.00	56,760.00	43,891.00	38,795.00	82,110.00
Non controlling interest	15.00	16.00	0.00	0.00	0.00
	76,506.00	**56,776.00**	**43,891.00**	**38,795.00**	**82,110.00**
Other comprehensive income for the year attributable to:					
Owners of the Company	-2,030.00	-4,417.00	5,136.00	3,129.00	594.00
	-2,030.00	**-4,417.00**	**5,136.00**	**3,129.00**	**594.00**
Total comprehensive income for the year attributable to:					
Owners of the Company	74,461.00	52,343.00	49,027.00	41,924.00	82,704.00
Non-controlling interest	15.00	16.00	0.00	0.00	0.00
	74,476.00	**52,359.00**	**49,027.00**	**41,924.00**	**82,704.00**
Earnings per equity share					
Basic	253.26	187.95	145.30	128.43	271.82
Diluted	253.26	187.95	145.30	128.43	271.82

Table No: 2 Statement of Profit and Loss Account (Forecasted)

PARTICULARS	March 31, 2024	March 31, 2025	March 31, 2026	March 31, 2027	March 31, 2028
			FORECASTED		
INCOME					
I Revenue from operations	15,87,212.55	21,42,736.94	28,92,694.87	39,05,138.08	52,71,936.40
II Other income	28,899.45	39,014.26	52,669.25	71,103.48	95,989.70
III Total Income (I+II)	**16,16,112.00**	**21,81,751.20**	**29,45,364.12**	**39,76,241.56**	**53,67,926.11**
IV EXPENSES					
Cost of materials consumed	6,76,709.20	9,81,228.34	14,22,781.09	20,63,032.58	29,91,397.25
Purchases of stock-in-trade	5,05,811.52	6,39,851.57	8,09,412.23	10,23,906.47	12,95,241.69
Changes in inventories of finished goods, work-in-progress and stock-in-trade	-4,026.88	-4,014.80	-4,002.76	-3,990.75	-3,978.78
Employee benefits expense	48,315.71	50,369.12	52,509.81	54,741.48	57,067.99
Finance costs	3,103.51	3,103.51	3,103.51	3,103.51	3,103.51
Depreciation and amortisation expense	56,815.26	76,700.60	1,03,545.81	1,39,786.84	1,88,712.24
Other expenses	1,80,182.70	2,05,408.28	2,34,165.44	2,66,948.60	3,04,321.40
Vehicles / dies for own use	-	-	-	-	-
Total expenses (IV)	**14,66,911.01**	**19,52,646.62**	**26,21,515.13**	**35,47,528.74**	**48,35,865.30**
V Share of profit of associates	-	-	-	-	-
VI Share of profit of joint ventures	-	-	-	-	-
VII Profit before tax (III - IV + V + VI)	**1,49,200.99**	**2,29,104.58**	**3,23,848.99**	**4,28,712.82**	**5,32,060.81**
VIII Tax expense					
Current tax	44,760.30	68,731.38	97,154.70	1,28,613.85	1,59,618.24
Deferred tax	-	-	-	-	-
	44,760.3	68,731.38	97,154.70	1,28,613.85	1,59,618.24
IX Profit for the period (VII - VIII)	**1,04,440.70**	**1,60,373.21**	**2,26,694.29**	**3,00,098.98**	**3,72,442.57**
X Other Comprehensive Income					
A (i) Items that will not be reclassified to profit or loss					
(a) gain / (loss) of defined benefit obligation	-343.00	-343.00	-343.00	-343.00	-343.00
(b) gain / (loss) on change in fair value of equity instruments	929.00	929.00	929.00	929.00	929.00

(c) gain / (loss) on share of other comprehensive income in associates and joint venture	0.00	0.00	0.00	0.00	0.00
	586.00	586.00	586.00	586.00	586.00
A (ii) Income tax relating to items that will not be reclassified to profit or loss	8.00	8.00	8.00	8.00	8.00
B (i) Items that will be reclassified to profit or loss					
(a) effective portion of gain / (loss) on hedging instruments in a cash flow hedge	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00
B (ii) Income tax relating to items that will be reclassified to profit or loss	0.00	0.00	0.00	0.00	0.00
Total Other Comprehensive Income (A (i+ii)+B(i+ii))	**594.00**	**594.00**	**594.00**	**594.00**	**594.00**
XI Total Comprehensive Income for the period (IX + X)	**82,704.00**	**82,704.00**	**82,704.00**	**82,704.00**	**82,704.00**
Profit for the year attributed to:					
Owners of the Company	82,110.00	82,110.00	82,110.00	82,110.00	82,110.00
Non-controlling interest	0.00	0.00	0.00	0.00	0.00
	82,110.00	**82,110.00**	**82,110.00**	**82,110.00**	**82,110.00**
Other comprehensive income for the year attributable to:					
Owners of the Company	594.00	594.00	594.00	594.00	594.00
	594.00	594.00	594.00	594.00	594.00
Total comprehensive income for the year attributable to:					
Owners of the Company	82,704.00	82,704.00	82,704.00	82,704.00	82,704.00
Non-controlling interest	0.00	0.00	0.00	0.00	0.00
	82,704.00	**82,704.00**	**82,704.00**	**82,704.00**	**82,704.00**
Earnings per equity share					
Basic	271.82	271.82	271.82	271.82	271.82
Diluted	271.82	271.82	271.82	271.82	271.82

ASSUMPTIONS: -	ACTUAL				
Sales (Y-o-Y Growth)		-10.87%	-7.20%	22.87%	32.90%
Cost of Materials Consumed as % of Sales)	50.80%	39.08%	37.57%	44.84%	52.66%
Purchases of Stock-in-trade (as % of Sales)	16.95%	21.17%	19.47%	29.78%	45.11%
Changes in Inventories of Finished goods, Stock-in-trade & Work-in-progress (as % of Sales)	0.24%	-0.27%	0.31%	-0.11%	-0.46%
Employee Benefits Expenses (as % of Sales)	3.71%	3.85%	3.87%	4.57%	5.23%
Other Expenses (as % of Sales)	13.13%	15.05%	14.78%	14.07%	13.20%
Other Income (Y-o-Y Growth)		30.17%	-11.94%	-40.58%	22.70%
Tax Rate	27.62%	19.38%	21.73%	30.46%	21.79%

Table No: 3 Assumption for the Statement of Profit and Loss Account (Forecasted)

ASSUMPTIONS: -	FORECASTED				
Sales (Y-o-Y Growth)	35.00%	35.00%	35.00%	35.00%	35.00%
Cost of Materials Consumed (as % of Sales)	45.00%	45.00%	45.00%	45.00%	45.00%
Purchases of Stock-in-trade (as % of Sales)	26.50%	26.50%	26.50%	26.50%	26.50%
Changes in Inventories of Finished goods, Stock-in-trade & Work-in-progress (as % of Sales)	-0.30%	-0.30%	-0.30%	-0.30%	-0.30%
Employee Benefits Expenses (as % of Sales)	4.25%	4.25%	4.25%	4.25%	4.25%
Other Expenses (as % of Sales)	14.00%	14.00%	14.00%	14.00%	14.00%
Other Income (Y-o-Y Growth)	35.00%	35.00%	35.00%	35.00%	35.00%
Tax Rate	30.00%	30.00%	30.00%	30.00%	30.00%

Table No: 4 Statement of Balance Sheet

PARTICULARS	March 31, 2019	March 31, 2020	March 31, 2021	March 31, 2022	March 31, 2023
ASSETS					
Non-current assets					
Property, plant and equipment	1,49,862.00	1,47,905.00	1,41,785.00	1,28,261.00	1,66,921.00
Capital work-in-progress	16,001.00	13,443.00	11,993.00	26,462.00	28,152.00
Intangible assets	4,511.00	4,067.00	2,242.00	3,499.00	5,479.00
Intangible assets under development	0.00	0.00	2,975.00	2,903.00	889.00
Right-of-use Assets	0.00	6,181.00	5,860.00	5,712.00	5,904.00
Financial assets					
Investments	3,24,581.00	3,62,692.00	3,45,291.00	3,79,346.00	4,91,843.00
Loans	2.00	2.00	2.00	2.00	2.00
Other financial assets	344.00	365.00	369.00	375.00	595.00
Other non-current assets	20,591.00	17,216.00	16,867.00	25,204.00	21,485.00
Deferred tax assets	0.00	0.00	0.00	1,411.00	2,794.00
Total non-current assets	**5,15,960.00**	**5,51,871.00**	**5,27,384.00**	**5,78,621.00**	**7,29,813.00**

Current assets					
Inventories	33,226.00	32,139.00	30,490.00	35,323.00	42,835.00
Financial assets					
Investments	50,455.00	12,188.00	84,157.00	41,001.00	0.00
Trade receivables	23,128.00	21,298.00	12,799.00	20,345.00	33,014.00
Cash and bank balances	1,878.00	290.00	408.00	351.00	373.00
Other bank balances	0.00	0.00	30,063.00	30,071.00	43.00
Loans	161.00	170.00	230.00	305.00	297.00
Other financial assets	4,964.00	5,075.00	6,427.00	25,930.00	21,934.00
Current tax assets (Net)	4,277.00	5,272.00	5,407.00	5,446.00	5,749.00
Other current assets	5,638.00	7,974.00	15,462.00	14,608.00	17,660.00
Total current assets	**1,23,727.00**	**84,406.00**	**1,85,443.00**	**1,67,934.00**	**1,16,156.00**
Total assets	**6,39,687.00**	**6,36,277.00**	**7,12,827.00**	**7,46,555.00**	**8,45,969.00**
EQUITY AND LIABILITIES					
Equity					
Equity share capital	1,510.00	1,510.00	1,510.00	1,510.00	1,510.00
Other equity	4,69,411.00	4,92,620.00	5,23,496.00	5,51,825.00	6,16,403.00
Equity attributable to owners of the Company	4,70,921.00	4,94,130.00	5,25,006.00	5,53,335.00	6,17,913.00
Non-controlling interest	176.00	192.00	0.00	0.00	0.00
Total equity	**4,71,097.00**	**4,94,322.00**	**5,25,006.00**	**5,53,335.00**	**6,17,913.00**
Liabilities					
Non-current liabilities					
Financial liabilities					
Lease liabilities	0.00	598.00	392.00	329.00	249.00
Borrowings	80.00	54.00	28.00	0.00	
Provisions	395.00	516.00	447.00	844.00	884.00
Deferred tax liabilities (Net)	6,139.00	6,575.00	4,454.00	0.00	
Other non-current liabilities	20,371.00	21,158.00	21,295.00	21,812.00	25,850.00
Total non-current liabilities	**26,985.00**	**28,901.00**	**26,616.00**	**22,985.00**	**26,983.00**
Current liabilities					
Financial liabilities					
Borrowings	1,496.00	1,063.00	4,888.00	3,819.00	12,158.00
Total outstanding dues of micro, small and medium enterprises	682.00	481.00	698.00	1,087.00	1,769.00
Total outstanding dues of creditors other than micro, small and medium enterprises	95,695.00	74,507.00	1,00,983.00	96,565.00	1,16,086.00
Lease liabilities	0.00	103.00	74.00	80.00	66.00
Other financial liabilities	14,420.00	9,040.00	12,720.00	20,272.00	18,537.00
Provisions	6,254.00	6,807.00	7,428.00	8,613.00	9,624.00
Current tax liabilities (Net)	6,729.00	6,962.00	8,547.00	11,113.00	11,584.00
Other current liabilities	16,329.00	14,091.00	25,867.00	28,686.00	31,249.00
Total current liabilities	**1,41,605.00**	**1,13,054.00**	**1,61,205.00**	**1,70,235.00**	**2,01,073.00**
Total liabilities	**1,68,590.00**	**1,41,955.00**	**1,87,821.00**	**1,93,220.00**	**2,28,056.00**
Total equity and liabilities	**6,39,687.00**	**6,36,277.00**	**7,12,827.00**	**7,46,555.00**	**8,45,969.00**

Table No: 5 Assumptions (Actual)

ASSETS & DEBT SCHEDULES: -	ACTUAL				
PARTICULARS	**March 31, 2019**	**March 31, 2020**	**March 31, 2021**	**March 31, 2022**	**March 31, 2023**
PPE		1,49,862.00	1,47,905.00	1,41,785.00	1,28,261.00
Add: Capex		33,327.00	24,221.00	14,366.00	66,917.00
Less: Depreciation & Amortization	30,208.00	35,284.00	30,341.00	27,890.00	28,257.00
Ending PPE (INR in crores)	**1,49,862.00**	**1,47,905.00**	**1,41,785.00**	**1,28,261.00**	**1,66,921.00**
Depreciation & Amortization (% of PP & E Open Bal)		24%	21%	20%	22%
Capex (as % of Sales)		4.22%	3.30%	1.59%	5.59%
Depreciation & Amortization (as% of Sales)	3.41%	4.47%	4.14%	3.10%	2.36%
Total Debt (INR in crores)	1,576.00	1,818.00	5,382.00	4,228.00	12,473.00
Average Debt		1,697.00	3,600.00	4,805.00	8,350.50
Interest Expense	759.00	1,342.00	1,018.00	1,266.00	1,870.00
Interest Cost %	48.16%	73.82%	18.91%	29.94%	14.99%

WORKING CAPITAL SCHEDULE:	ACTUAL				
Avg receivables	23,128.00	21,298.00	12,799.00	20,345.00	33,014.00
Avg Inventories	33,226.00	32,139.00	30,490.00	35,323.00	42,835.00
Avg Payables	96,377.00	74,988.00	1,01,681.00	97,652.00	1,17,855.00
Working Capital	-40,023.00	-21,551.00	-58,392.00	-41,984.00	-42,006.00
Changes in Working Capital		18,472.00	-36,841.00	16,408.00	-22.00
Accounts Receivable (Days)	9.52	9.84	6.37	8.24	10.07
Inventory (Days)	26.93	33.87	33.42	32.44	33.50
Accounts Payable (Days)	78.13	79.03	111.46	89.69	92.17

Table No: 6 Assumptions (Forecasted)

ASSETS & DEBT SCHEDULES: -	FORECASTED				
PARTICULARS	**March 31, 2024**	**March 31, 2025**	**March 31, 2026**	**March 31, 2027**	**March 31, 2028**
PPE	1,66,921.00	1,69,528.69	1,73,049.08	1,77,801.60	1,84,217.50
Add: CapEx	59,422.95	80,220.99	1,08,298.33	1,46,202.75	1,97,373.71
Less: Depreciation & Amortization	56,815.26	76,700.60	1,03,545.81	1,39,786.84	1,88,712.24
Ending PPE(INR in crores)	**1,69,528.69**	**1,73,049.08**	**1,77,801.60**	**1,84,217.50**	**1,92,878.97**
Depreciation & Amortization (% of PP&E Open Bal)	21%	21%	21%	21%	21%
CapEx (as % of Sales)	3.68%	3.68%	3.68%	3.68%	3.68%
Depreciation & Amortization (as% of Sales)	3.52%	3.52%	3.52%	3.52%	3.52%
Total Debt (INR in crores)	8,350.50	8,350.50	8,350.50	8,350.50	8,350.50
Average Debt	8,350.50	8,350.50	8,350.50	8,350.50	8,350.50
Interest Expense	3,103.51	3,103.51	3,103.51	3,103.51	3,103.51
Interest Cost %	**37.17%**	**37.17%**	**37.17%**	**37.17%**	**37.17%**

WORKING CAPITAL SCHEDULE: -	FORECASTED				
Avg receivables	44,277.04	59,774.01	80,694.91	1,08,938.12	1,47,066.47
Avg Inventories	59,327.93	86,025.50	1,24,736.97	1,80,868.61	2,62,259.48
Avg Payables	1,66,859.80	2,41,946.71	3,50,822.74	5,08,692.97	7,37,604.80
Working Capital	-63,254.83	-96,147.21	-1,45,390.86	-2,18,886.23	-3,28,278.85
Changes in Working Capital	-21,248.83	-32,892.38	-49,243.65	-73,495.38	-1,09,392.62
Accounts Receivable (Days)	10.00	10.00	10.00	10.00	10.00
Inventory (Days)	32.00	32.00	32.00	32.00	32.00
Accounts Payable (Days)	90.00	90.00	90.00	90.00	90.00

Table No: 7 Valuation Model (Actual)

	VALUATION SHEET	HISTORICAL				
	PARTICULARS	March 31, 2019	March 31, 2020	March 31, 2021	March 31, 2022	March 31, 2023
	Net Income	76,506.00	56,776.00	43,891.00	38,795.00	82,110.00
+	Depreciation	30,208.00	35,284.00	30,341.00	27,890.00	28,257.00
+	Interest*(1-T)	549.40	1,081.92	796.80	880.31	1,462.49
-	Capex	-	33,327.00	24,221.00	14,366.00	66,917.00
+/-	Changes in working capital		18,472.00	(36,841.00)	16,408.00	(22.00)
	Free Cash Flow to Firm	**1,07,263.40**	**41,342.92**	**87,648.80**	**36,791.31**	**44,934.49**
	Date		**2020**	**2021**	**2022**	**2023**
	FCFF (explicit forecast)		41,343	87,649	36,791	44,934
	Terminal value					
	Present value of "explicit forecast period" - till 2028E		36,502.98	68,328.24	25,323.67	27,307.90
	PV of Terminal Value					

Table No: 8 Valuation Model (Forecasted)

	VALUATION SHEET	FORECASTED				
	PARTICULARS	March 31, 2024	March 31, 2025	March 31, 2026	March 31, 2027	March 31, 2028
	Net Income	1,04,440.70	1,60,373.21	2,26,694.29	3,00,098.98	3,72,442.57
+	Depreciation	56,815.26	76,700.60	1,03,545.81	1,39,786.84	1,88,712.24
+	Interest*(1-T)	2,172.46	2,172.46	2,172.46	2,172.46	2,172.46
-	Capex	59,422.95	80,220.99	1,08,298.33	1,46,202.75	1,97,373.71
+/-	Changes in working capital	(21,248.83)	(32,892.38)	(49,243.65)	(73,495.38)	(1,09,392.62)
	Free Cash Flow to Firm	**1,25,254.29**	**1,91,917.66**	**2,73,357.87**	**3,69,350.91**	**4,75,346.17**
	Date	**2024**	**2025**	**2026**	**2027**	**2028**
	FCFF (explicit forecast)	1,25,254	1,91,918	2,73,358	3,69,351	4,75,346
	Terminal value					**81,26,173.29**
	Present value of "explicit forecast period" - till 2028E	67,209.12	90,923.82	1,14,346.13	1,36,413.13	1,55,008.01
	PV of Terminal Value					**26,49,904.42**

VALUATION ASSUMPTION	
Terminal growth rate	7.00%
Cost of debt	**14.99%**
Beta	0.9
Risk free rate (r_f)	6.90%
Market Rate of Return (Rm)	14.00%
Cost of Equity	**13.29%**
WACC CALCULATION	
Total Debt (D)	12,473.00
Shareholders' equity (E)	6,17,913.00
Capitalization : (D+E)	**6,30,386.00**
Debt: Equity	2.02%
Debt: Total Capital	1.98%
Equity: Total Capital	98.02%
WACC	**13.26%**
EV COMPUTATION	
Present value of "explicit forecast period" - till 2028E	7,21,363.00
PV of Terminal Value	26,49,904.42
Total Valuation	**33,71,267.42**
Total Debt	12,473.00
Total Valuation	**33,58,794.42**
No of O/S Shares	302
Value of Share	**11,118.65**

Market Price as on 29th Dec 2023 = 10302*

Results and discussion based on above analysis:

The financial analysis of Maruti Suzuki India Ltd. reveals positive trends and financial health.

1. Maruti Suzuki is expected to experience significant revenue growth from 11,75713 Mn in 2023 to 52,71,936 Mn in 2028, reflecting an 8% compound annual growth rate (CAGR). This growth projection is based on industry expectations and the company's historical performance.

2. The company's profit before tax has shown a notable increase from 1,03,231 Mn in 2023 to 5,32,060 Mn in 2028. This upward trend indicates improved profitability and effective management.

3. Maruti Suzuki's commitment to future growth is evident in the rise of capital expenditure from 66,917 Mn in 2023 to 1,97,373 Mn in 2028. This suggests strategic investments in the company's operations and infrastructure.

4. The reduction in total debt from 12,473 Mn in 2023 to 8,350 Mn in 2028 signifies responsible financial management and a commitment to deleveraging the company. This reduction is a positive indicator for investors.

5. The analysis of free cash flow, considering explicit forecast period and terminal value, indicates a robust financial position. With a present value of 7,21,363 Mn and a terminal value of 81,26,173 Mn, the company is generating substantial cash for its shareholders.

6. The WACC at 13.26% provides insight into the cost of capital for the company. This metric is crucial for evaluating the company's efficiency in generating returns for its shareholders relative to the cost of capital.

7. The intrinsic value per share is calculated at Rs. 11,118, resulting in a total value of 33,58,794 Mn for 302 Mn shareholders. This valuation reflects the perceived worth of the company based on various financial factors.

8. Considering that the market price of the share as of 29th Dec 2023 is Rs. 10,302, which is near or below the intrinsic value, it is advisable for investors to hold the shares of Maruti Suzuki India Ltd. This recommendation is based on the alignment of the market price with the intrinsic value, indicating potential for future appreciation.

In summary, Maruti Suzuki demonstrates positive financial indicators, including revenue growth, profitability improvement, responsible debt management, and strong cash flow, making it a favorable investment choice for potential shareholders.

References:

• Abarbanell, J. S., and V. L. Bernard. (2000). "Is the U.S. Stock Market Myopic?" Journal of Accounting Research 38, 221-243.

Google Scholar

- Beaver, W. H., and S. G. Ryan. (2000). "Biases and Lags in Book Value and their Effects on the Ability of the Book-to-Market Ratio to Predict Book Return on Equity." Journal of Accounting Research 38, 127-148.

Google Scholar

- Brief, R. P., and R. A. Lawson. (1992). "The Role of the Accounting Rate of Return in Financial Statement Analysis." The Accounting Review 67, 411- 426.

Google Scholar

- Brown, L. D. (1993). "Earnings Forecasting Research: Its Implications for Capital Markets Research." International Journal of Forecasting 9, 295-320.

Google Scholar

- Brown, S. J., W. N. Goetzmann, and S. A. Ross. (1995). "Survival." Journal of Finance 50, 853-873.

Google Scholar

- Claus, J. J., and J. K. Thomas. (2001). "Equity Premium as Low as Three Percent? Evidence from Analysists' Earnings Forecasts for Domestic and International Stocks" Journal of Finance. Forthcoming.

- Colander, D. (1992). "Retrospectives: The Lost Art of Economics." Journal of Economic Perspectives 6, 191-198.

Google Scholar

- Edwards, E. O., and P. W. Bell. (1961). The Theory and Measurement of Business Income. Berkeley, CA: The University of California Press.

- Fairfield, P. M., R. J. Sweeney, and T. L. Yohn. (1996). "Accounting Classification and the Predictive Content of Earnings." The Accounting Review 71, 337-355.

Google Scholar

- Fama E. F., and K. R. French. (2000). "Forecasting Profitability and Earnings." Journal of Business 73.

- Feltham, G. A., and J. A. Ohlson. (1995). "Valuation and Clean Surplus Accounting for Operating and Financial Activities." Contemporary Accounting Research 11, 689-731.

Google Scholar

- Francis, J., P. Olsson, and D. R. Oswald. (2000). "Comparing the Accuracy and Explainability of Dividend, Free Cash Flow, and Abnormal Earnings Equity Value Estimates." Journal of Accounting Research 38, 45-70.

A Bibliometric Analysis of Blended Learning Research Trends and Impact

Prof. Darshana Murkibhavi

Sheila Raheja School of Business Management and Research

Prof. Krishnakant Lasune

Dr. V. N. Bedekar Institute of Management Studies

Abstract : This bibliometric analysis delves into a decade of blended learning research (2015-2024), with a particular focus on its implications in the dynamic educational landscape of India. Leveraging Scopus and R Biblioshiny, we identified 2,147 articles from 608 sources. Despite a negative annual growth rate, the literature's average age (4.11 years) and citation impact (14.03 citations per document) affirm its enduring relevance. Collaboration is evident, with 5839 authors and an average of 3.1 co-authors per document. The international co-authorship percentage of 13.79% underscores the global collaborative nature of research. Noteworthy authors and influential sources reflect the diverse contributions shaping the blended learning discourse. The thematic map reveals "blended learning" as the central theme, intricately connected to key terms. This analysis offers a nuanced understanding of blended learning's current landscape in India, paving the way for future research directions in the transformative realm of education.

Introduction

In the dynamic landscape of education, the adoption of innovative pedagogical approaches has become imperative, especially in a diverse and rapidly evolving country like India. Blended learning, an instructional strategy combining traditional classroom methods with digital resources and online platforms, has emerged as a promising solution to address the diverse learning needs and challenges faced by the Indian education system.

India, with its vast and varied demographic, presents a unique set of opportunities and obstacles in the realm of education. The introduction of technology in the form of blended learning holds the potential to bridge geographical gaps, enhance access to quality education, and cater to the diverse learning styles prevalent across the nation. As the world increasingly embraces digitalization, India stands at the threshold of a significant educational transformation, where blended learning is poised to play a pivotal role in reshaping the traditional classroom experience.

This paper seeks to explore the landscape of blended learning in India, examining the current state of adoption, the challenges faced, and the potential impact on educational outcomes. By delving into the nuances of blended learning implementation across various educational levels and settings, we aim to provide a comprehensive overview of how this pedagogical approach is unfolding in the Indian context. Furthermore, the examination of key success factors and barriers will contribute to a nuanced understanding of the role and future trajectory of blended learning in India's educational ecosystem.

Research Methodology

1. **Keywords Selection:** The research process began with the identification of relevant keywords for the study. Using the Scopus database, an extensive search was conducted with a primary focus on "blended learning." The selected keywords aimed to encompass the diverse aspects of blended learning, ensuring a comprehensive coverage of the literature.

2. **Database and Software:** Scopus, a widely recognized academic database, was employed as the primary source for retrieving scholarly articles related to blended learning. To streamline the bibliometric analysis and visualization, R Biblioshiny, a powerful tool for bibliometric research, was utilized. R Biblioshiny offers an interactive interface for data exploration and visualization, facilitating a dynamic and user-friendly analysis.

3. **Data Collection:** The data collection period for this study commenced on January 1, 2024. This specific timeframe was chosen to provide a snapshot of the most recent developments and trends in blended learning research. All articles available up to the date of data collection were included in the analysis.

4. **Initial Retrieval:** The initial search on Scopus using the chosen keywords yielded a total of 2,147 articles related to blended learning. These articles form the foundation of the dataset for the subsequent bibliometric analysis.

5. **Data Cleaning and Preprocessing:** Prior to analysis, the retrieved data underwent a thorough cleaning process to eliminate duplicates, irrelevant records, and ensure consistency. Only peer-reviewed articles, conference papers, and reviews were retained for a more focused analysis.

6. **Bibliometric Analysis:** R Biblioshiny was utilized to conduct a bibliometric analysis, employing various statistical and visualization techniques. Key metrics such as publication trends, authorship patterns, citation networks, and thematic clusters were explored to uncover the structural and intellectual landscape of blended learning research.

7. **Data Validation:** To ensure the accuracy and reliability of the findings, the dataset underwent a validation process. This involved cross-referencing and verification of the bibliometric results against the original articles on Scopus.

8. **Ethical Considerations:** Throughout the research process, ethical considerations were paramount. Respect for intellectual property rights, proper citation practices, and adherence to ethical guidelines in the field of bibliometrics were prioritized.

The methodology outlined above provides a robust framework for systematically analyzing and visualizing the blended learning literature, leveraging the capabilities of Scopus and R Biblioshiny.

a) Main Information:

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2015:2024
Sources (Journals, Books, etc)	608
Documents	2147
Annual Growth Rate %	-19.36
Document Average Age	4.11
Average citations per doc	14.03
References	81798
DOCUMENT CONTENTS	
Keywords Plus (ID)	2497
Author's Keywords (DE)	4778
AUTHORS	
Authors	5839

Authors of single-authored docs	367
AUTHORS COLLABORATION	
Single-authored docs	396
Co-Authors per Doc	3.1
International co-authorships %	13.79
DOCUMENT TYPES	
article	2147

The dataset covers a comprehensive timespan from 2015 to 2024, providing a thorough examination of blended learning research trends over the past decade. With 608 distinct sources, including journals, books, and other publications, the dataset reflects the diverse and expansive nature of the scholarly outlets contributing to the discourse on blended learning. The 2,147 documents within the dataset underline the substantial body of literature dedicated to this educational approach. Despite the apparent richness of the dataset, the negative annual growth rate of -19.36% suggests a decline in the number of new publications in recent years. However, it is essential to interpret this cautiously, taking into consideration potential fluctuations and variations in research output. The average age of the documents at 4.11 years and the average citations per document at 14.03 indicate a relatively recent and well-cited body of literature, highlighting the ongoing relevance and impact of blended learning research. The substantial number of keywords and author collaborations further emphasizes the multifaceted nature of the field, with 5839 authors contributing to a total of 2147 documents. The collaborative nature of the research is evident in the average co-authors per document at 3.1, while the international co-authorship percentage of 13.79% highlights a global dimension to blended learning research. Finally, the exclusive presence of articles as the document type reinforces the focus on in-depth research and scholarly analysis within the dataset.

b) Most relevant authors

Most Relevant Authors
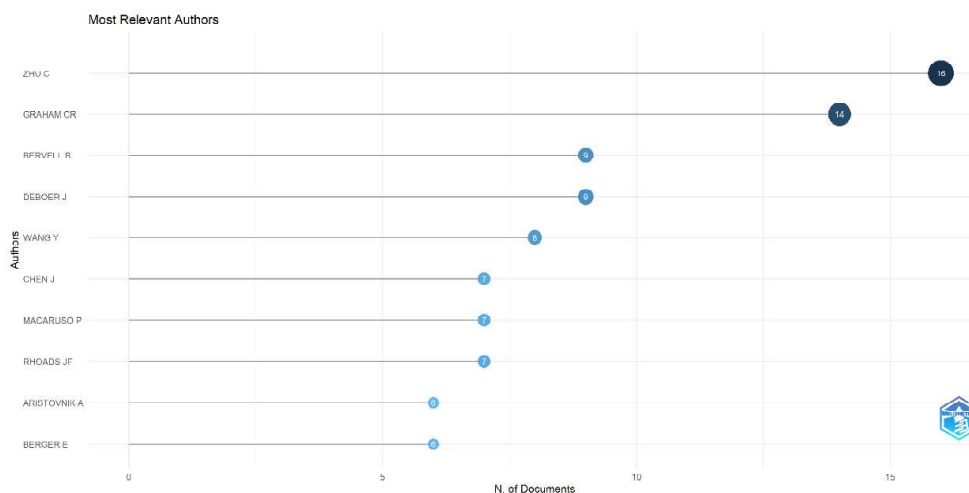
The exported data reveals the prolific contributions of various authors to the field of interest. Notably, author ZHU C leads with a substantial contribution of 16 articles, and the fractionalized count of 6.38 indicates the author's involvement in collaborative or multi-author publications. Following closely is GRAHAM CR with 14 articles, showcasing a significant research output. Authors BERVELL B and DEBOER J both demonstrate noteworthy contributions with 9 articles each, and the fractionalized values of 2.95 and 1.88, respectively, suggest their involvement in collaborative endeavors. The diverse array of contributors is further exemplified by authors such as WANG Y, CHEN [...] ARISTOVNIK A, [...] contributions to th[...]

provide insights into the extent of collaboration for each author, highlighting the collaborative nature of research in the field. This data not only acknowledges the individual scholarly impact of each author but also underscores the collaborative and collective nature of knowledge production in the domain under consideration.

c)   **Most Relevant Sources**

Most Relevant Sources
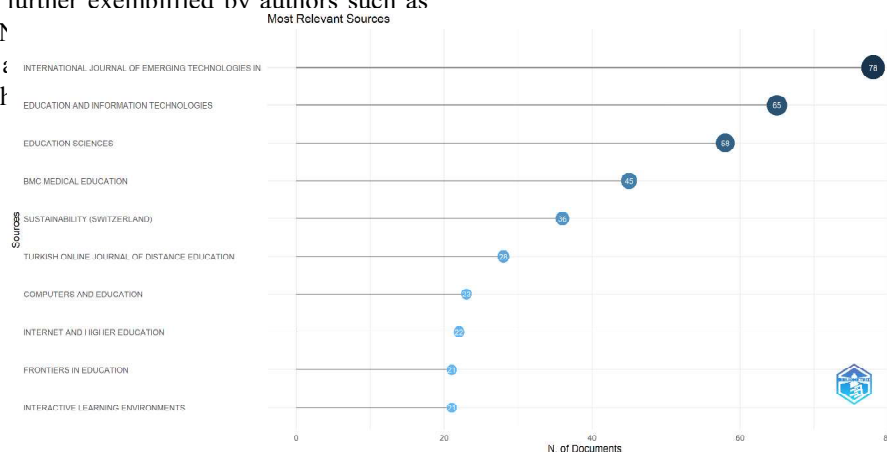
The exported data provides valuable insights into the key sources contributing to the body of literature on the topic

under consideration. The "International Journal of Emerging Technologies in Learning" emerges as the leading source, featuring prominently with 78 articles. This suggests the journal's significant role as a platform for disseminating research in the field, showcasing its influence and standing within the academic community. Following closely, "Education and Information Technologies" and "Education Sciences" contribute substantially with 65 and 58 articles, respectively, indicating their pivotal roles as reputable outlets for scholarly work in the domain of education and technology. "BMC Medical Education," with 45 articles, demonstrates a specialized focus on the intersection of medical education and technology. Other noteworthy sources include "Sustainability (Switzerland)," "Turkish Online Journal of Distance Education," "Computers and Education," "Internet and Higher Education," "Frontiers in Education," and "Interactive Learning Environments," each making valuable contributions to the diverse facets of blended learning research. The distribution of articles across these sources reflects the multidisciplinary nature of the field, emphasizing the importance of various journals in shaping and disseminating knowledge in the intersection of education and technology.

d)   **Thematic Map**
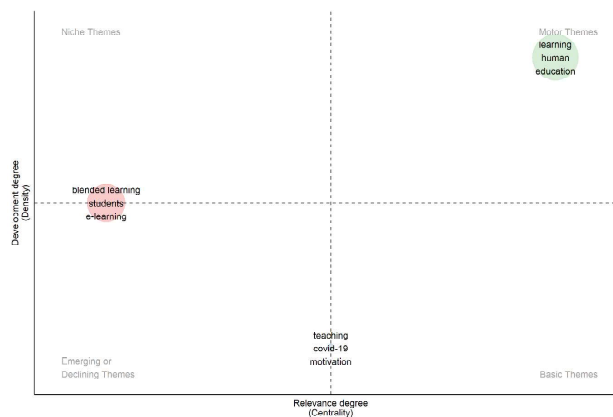
The exported data presents a cluster analysis of occurrences, words, and centrality measures related to the theme of

blended learning. The "blended learning" cluster emerges as the predominant focus, with 294 occurrences, signifying its central role in the analyzed content. The centrality measures further reinforce this significance. Betweenness centrality, at 83.43, indicates the high level of influence "blended learning" has in connecting various elements within the cluster. The closeness centrality and pagerank centrality values (0.00192 and 0.0335, respectively) suggest that while "blended learning" is integral, it is not isolated and is well-connected with other terms in the cluster.

The term "students" is the second most frequent, occurring 248 times, emphasizing its importance within the context of blended learning. Despite having a lower betweenness centrality (142.56) than "blended learning," it still holds a considerable position in connecting various elements within the cluster. E-learning, learning systems, curricula, and computer-aided instruction are other significant terms in the cluster, each contributing to the multifaceted nature of blended learning. Notably, "e-learning" stands out with a high betweenness centrality (830.07), indicating its influential role in connecting different elements in the cluster.

The cluster label "blended learning" appropriately encapsulates the core theme, and the identified terms collectively underscore the diverse components and concepts integral to the discourse on blended learning. This cluster analysis provides a nuanced understanding of the interconnectedness and relative importance of various terms within the overarching theme of blended learning.

Conclusion:

In conclusion, this bibliometric analysis offers a comprehensive exploration of blended learning research trends and impact, particularly within the context of the evolving educational landscape in India. The study has successfully navigated through a decade of literature, spanning from 2015 to 2024, to provide a nuanced understanding of the multifaceted nature of blended learning.

The dataset, comprising 2,147 documents from 608 distinct sources, reflects the richness and diversity of scholarly contributions in the field. Despite a negative annual growth rate, the data's average document age of 4.11 years and an average of 14.03 citations per document indicate the enduring relevance and impact of blended learning research. This suggests that, although the growth rate may have declined, the existing body of literature continues to shape educational discourse.

The collaborative nature of research is evident in the substantial number of authors (5839) and their collaborations, with an average of 3.1 co-authors per document. The global dimension is emphasized by the international co-authorship percentage of 13.79%, highlighting the collaborative efforts transcending geographical boundaries.

Noteworthy authors, such as ZHU C, GRAHAM CR, and others, showcase the significant contributions of individual researchers, while leading sources like the "International Journal of Emerging Technologies in Learning" play a pivotal role in disseminating knowledge within the academic community.

The thematic map provides a detailed exploration of the key terms and their interconnections within the blended learning landscape. "Blended learning" emerges as the central theme, with its influential role indicated by high betweenness centrality. Other significant terms, including "students," "e-learning," and "learning systems," contribute to the richness and diversity of the thematic landscape.

This study contributes valuable insights into the current state of blended learning in India, shedding light on adoption trends, challenges faced, and potential impacts on educational outcomes. The findings not only provide a snapshot of the existing literature but also lay the groundwork for future research directions. As India stands on the brink of a significant educational transformation, the role of blended learning is poised to play a crucial part in reshaping traditional educational paradigms.

References:

a)   Han, B. (2023). Research on the deciding factors of blended learning effect of law students under the background of metaverse., 1144-1153. https://doi.org/10.2991/978-94-6463-040-4_171

b)   Huda, N., Arianto, F., & Ayubi, N. (2022). The application of blended learning with a community science technology approach to improve student learning outcomes in higher education. International Journal of Emerging Technologies in Learning (Ijet), 17(14), 246-252. https://doi.org/10.3991/ijet.v17i14.32927

c)   Jemakmun, J. (2022). Application of blended learning to increase mathematics learning outcomes from beginning mathematics ability. International Journal of Education Teaching and Social Sciences, 2(4), 88-96. https://doi.org/10.47747/ijets.v2i4.883

d)   Nida, N., Usodo, B., & Saputro, D. (2020). The blended learning with whatsapp media on mathematics creative thinking skills and math anxiety. Journal of Education and Learning (Edulearn), 14(2), 307-314. https://doi.org/10.11591/edulearn.v14i2.16233

e)   Suartama, I., Setyosari, P., Sulthoni, S., & Ulfa, S. (2019). Development of an instructional design model for

mobile blended learning in higher education. International Journal of Emerging Technologies in Learning (Ijet), 14(16), 4. https://doi.org/10.3991/ijet.v14i16.10633

f) Wang, L., Huang, Y., & Omar, M. (2021). Analysis of blended learning model application using text mining

method. International Journal of Emerging Technologies in Learning (Ijet), 16(01), 172. https://doi.org/10.3991/ijet.v16i01.19823

g) Ye, L., Kuang, M., & Liu, S. (2022). Ict self-efficacy, organizational support, attitudes, and the use of blended learning: an exploratory study based on english teachers in basic education. Frontiers in Psychology,

Study and Analyze the Impact of GST in India

Ms. Binita Pradhan

Dr. Smita Jape

Dr.V.N. Bedekar Institute of Management studies

Abstract : This research paper delves into the Goods and Services Tax (GST) regime in India, focusing on its impact on Micro, Small, and Medium Enterprises (MSMEs) in Mumbai. The study aims to provide a holistic understanding of the taxation system in India post-GST implementation and analyze the entrepreneurial mindset towards this significant fiscal reform. Leveraging statistical tools and data sourced from the GST portal, the research offers valuable insights into the GST mechanism and its implications on businesses.

Keywords : Goods and Services Tax, Micro, Small, and Medium Enterprises

The study revolves around the study of MSME sector industries in Mumbai with understanding of Taxation system in India and the entrepreneur mindset towards GST. Goods and Services Tax (GST) which is a significant fiscal reform implemented in many countries, including India, to streamline the taxation system and promote economic growth. This executive summary provides a concise overview of a comprehensive study conducted on GST, highlighting key findings and insights. Using Statistical tools and Data from GST portal.

GST, Goods and Services Tax, is an indirect tax that has replaced several other indirect taxes in India, including excise tax, VAT, and service tax. The Goods and Services Tax Act was enacted by the Parliament on March 29, 2017, and came into effect on July 1, 2017. GST is imposed on the supply of both goods and services. This tax law in India is comprehensive, structured in tiers, and based on the destination principle. GST represents a unified national indirect tax regulation that applies uniformly throughout the entire country.

GST Mechanism :- On a purchase invoice, typically details included are A unique transaction ID, Invoice date,Purchase order number , Quantity of goods or services ordered, Unit price for each item , applicable discounts, Taxes that appl, total amount due ,Buyer's name and address ,Seller's name and address. Creating a purchase invoice is essential, especially for small businesses, as it plays a vital role in tracking revenue and expenses. Additionally, it provides a written record of delivered goods and services, along with their associated charges, simplifying the tracking of completed and outstanding accounts. Maintaining a detailed invoice record also streamlines the process of calculating and paying business taxes, offering a clear overview of the revenue collected during the relevant tax year.Purchase orders and purchase invoices can sometimes be mistakenly interchanged. These financial terms pertain to communication and agreements concerning payment conditions. A purchase order, also known as a PO, is a documentation outlining the specifics of the purchased products, including type, quantity, pricing, terms, and payment details. In a purchase order, Date of the order Unique order identifierDetailed product specifications. Buyer's name and address,Seller's name and address, Stipulated terms and conditions, Authorization signature. An organized database of purchase orders enables businesses to efficiently monitor inventory sold to individual customers, keep track of invoice due dates, and determine when inventory needs replenishing. Furthermore, maintaining an order history aids in preventing inventory overstocking, reduces the risk of order mix-ups, and ensures timely delivery of customer orders. Merchants have the flexibility to transmit invoices either in a paper format or electronically to their customers, and payment can be made in one lump sum or through installments, contingent upon the agreed-upon payment terms.

Research Methodology

Objective of the study includes analyze GST collection, contribution of GST towards Indian GDP, views of entrepreneurs of MSME towards GST and Complications of GST on MSME sector, E-Invoice WAY Bill, Inputs credit mechanism in India

Literature Review

(Dr. Arundhati Roy, 2020) PAJEE- The COVID-19 pandemic has had a significant impact on the Indian economy, with GST collection and MSMEs particularly affected. The pandemic and subsequent shutdowns have disrupted supply chains, halted operations and leading to lower demand, resulting in lost revenue for governments and businesses. The MSME sector, which is more vulnerable due to its small size and limited resources, has faced serious challenges including cash shortages, production shutdowns and difficulty meeting financial obligations. Various measures have been taken by the government, including debt deferrals, aid programs and policy changes to support MSMEs and encourage business recovery. Research shows that digital transformation, policy adjustment and financial support are critical to the recovery of the MSME sector and the economy as a whole. It also emphasizes the need to adapt to new working environments, improve digital capabilities, and explore opportunities in areas such as local manufacturing and digital technology. The analysis provides

valuable insight into the economic impact of COVID-19 on India, it is important to note that the situation is volatile and subject to change. Government policies, global economic conditions and the evolution of the pandemic can all influence future outcomes.

(Anand Nayyar, 2018) Indian Journal of Finance- The article "A Comprehensive Analysis of Goods and Services Tax (GST) in India" talks about various aspects of the Goods and Services Tax (GST), including its historical context, significance, models adopted in different countries and its implementation in India. The author highlights the need for tax reforms and the benefits of implementing GST in the Indian tax system. GST is considered as a comprehensive and unified tax system that replaces multiple taxes and harmonizes the taxation of goods and services.

The objectives and scope of the research are outlined in the text. The study aims to understand the concept of GST, its impact on the Indian economy, its benefits, challenges and role in business, government revenue and consumer welfare. This highlights the importance of the GST Council in governance and decision-making related to GST implementation. Various GST models are discussed including Kelkar-Shah model, Bagchi-Poddar model and foreign models like Australia, China, USA, Brazil, Canada and India. These models highlight the different ways in which GST can be structured and implemented, taking into account the division of taxing powers between the country and the states.

The presented text deals with various aspects of implementation of Goods and Services Tax (GST) in India. Here is a summary of the main points:

1. Taxation in history: the beginning of the text deals with the concept of taxation, its historical roots and importance in financing public goods.

2. Taxation in India: It traces the history of taxation in India from ancient times to the British colonial period and the modern tax system. It highlights the division of taxing power between the central and state governments under the Constitution of India.

3. Problems with the previous tax system: The text highlights the problems with the previous indirect tax system, including complexity, distortions, lack of coordination between countries and multiple taxes.

4. Introduction of GST: The Goods and Services Tax (GST) is introduced as a comprehensive tax reform aimed at simplifying the tax system by replacing several indirect taxes. It explains the concept of GST and its benefits like reduced cascading effects, uniform taxation and ease of doing business.

5. GST Council: The formation and responsibilities of the GST Council are discussed. The Council has a crucial

role in determining GST rates, exempted products and other related matters.

6. GST Models: The text describes various GST models including Kelkar-Shah model, Bagchi- Poddar model and foreign models like Australia, Canada and others.

7. Impact on Indian Economy: The impact of GST on various economic sectors is discussed. It explains how GST can boost GDP growth, slow inflation, benefit manufacturers and challenge service sectors.

8. Challenges and Future Research: GST implementation challenges such as tax rates, technology infrastructure and tax administration are highlighted. The limitations of the studies are mentioned and the need for continued research in the field is emphasized.

Overall, the text provides a comprehensive overview of the implementation, implementation and potential impact of GST in India.

In conclusion, this section provides an overview of the Goods and Services Tax (GST), its historical development, significance, various models and implementation in India, laying the foundation for a comprehensive understanding of the subject.

(Dani, 2016) Business and Economics Journal- The article" A Research Paper on an Impact of Goods and Service Tax (GST) on Indian Economy" discusses the concept of Goods and Services Tax (GST) in India, its potential advantages and disadvantages.

The Goods and Services Tax (GST) is a comprehensive tax system in India that simplifies the taxation structure by unifying various taxes into a single national tax. It applies to the manufacturing, sale, and consumption of goods and services. GST aims to create a uniform tax system and reduce the overall tax burden on consumers, currently estimated at 25-30%.

Under GST, consumers pay the final tax, but an efficient input tax credit system ensures that there is no tax-on-tax, which was common in the previous tax regime.

(Gour, 2023) The Management Accountant- The introduction of Goods and Services Tax (GST) in India has brought significant changes to the country's indirect tax system. GST has replaced many taxes with a unified tax system, simplified the tax process and promoted the principle of "one country, one tax". This unified tax regime took effect from 1 July 2017, replacing various taxes such as value added tax, service tax and central excise tax.

India's textile industry, an important industry for job creation and economic contribution, has been affected by the implementation of GST. This paper reviews the existing literature on the impact of GST on the textile industry and

presents a comparative analysis of the key financial ratios of selected textile companies before and after GST implementation.

The objective of the study was to understand the impact of GST on key financial ratios of Indian textile companies. Assumptions made for the study include assessing changes in current and quick ratios, total debt-to-equity ratios, net profit margins, and return on capital employed. asset turnover, inventory turnover, basic earnings per share, and dividends per share.

Overall, the introduction of GST in India has had both positive and negative effects on the textile industry, shaping various aspects of the financial performance and operating dynamics of the industry.

(Nath, 2017) International Journal of Applied Research - This research paper focuses on the concept of Goods and Services Tax (GST) and its implementation in India. The paper provides an overview of GST, its benefits, and its impact on various sectors of the Indian economy. It discusses the timeline of GST's introduction in India, the final tax rates under GST, and the anticipated effects on different industries.

The study highlights that GST is a comprehensive tax system aimed at simplifying the complex tax structure in India. It subsumes various indirect taxes and aims to eliminate the cascading effect of taxes, leading to a more efficient and equitable tax regime. The paper also mentions that around 160 countries worldwide have already implemented GST.

The impact of GST on different sectors is discussed in the paper:

1. Employment Sector: GST is expected to attract foreign investments, which can lead to job creation and stability in the economy, reducing unemployment.

2. Manufacturing Sector: GST aims to eliminate the cascading effect of taxes, which will reduce production costs and enhance manufacturing efficiency.

3. Information Technology Enabled Services: GST will simplify taxation for software services and products, leading to uniform and reduced tax rates.

4. Textiles Industry: GST is expected to address the complexities in the textile industry's taxation system, leading to reduced costs and improved efficiency.

5. Small Enterprises: The introduction of GST is likely to benefit small-scale enterprises by reducing payable taxes, promoting compliance, and expanding the tax base.

6. Fast Moving Consumer Goods (FMCG) Sector: GST is anticipated to bring positive changes to the FMCG sector, making Indian goods more competitive in the international market.

The benefits of GST include simplifying the tax regime, promoting exports with zero rates, introducing an effective logistics system (IGST), and reducing tax cascading. The paper concludes that GST is expected to have a positive impact on various sectors and contribute to the overall economic development of India.

The study is based on secondary data from various sources, including academic literature, journals, newspapers, and websites. It provides insights into the potential effects of GST on the Indian economy and various industries, highlighting its role in creating a more efficient and streamlined tax structure.

(Dr.Ravikiran, 2023) The article is like a continuation of the previous content and focuses on different aspects of Goods and Services Tax (GST) in India. It discusses the historical context of GST, constitutional remedies, unique features of GST, and various mechanisms and concepts related to GST compliance, such as Composition schemes, E Way bill, compliance scoring, anti-profit measures, and more. It also covers topics such as HSN (Harmonized System of Nomenclature) and SAC (Service Accounting Code), unrated supplies for export, and calculation for general credit.

Overall, this text provides an overview of the key components and features of the GST system in India, explaining what it means for businesses, consumers and the economy at large. It aims to provide a comprehensive understanding of how GST works and its impact on different aspects of the economy.

(Dr. Shakir Shaik, 2015) IOSR-JBM- "Does Goods and Services Tax (GST) Leads to Indian Economic Development?" text deals with the concept of Goods and Services Tax (GST) and its potential impact on the Indian economy. The introduction emphasizes the importance of taxes in financing public goods and the need for an effective, efficient and fair tax system. The role of tax policy in economic efficiency and fairness is emphasized.

After that, the text examines the literature related to the topic and refers to the opinions of various scholars on the merits of the introduction of GST in India. Research by Nishitha Gupta's shows that GST can lead to economic development and benefit industry, commerce, agriculture and consumers. Jaiprakash's research indicates that GST can provide relief to various sectors and help broaden the tax base. Saravanan Venkatachalam's research analyzes the consequence of GST on ASEAN countries and its impact is found to be mixed.

The research problem is defined as understanding the concept of GST and its impact on the Indian economy. The

purpose of the study is to explore the concept of GST, understand its functioning in India and examine the benefits and challenges of GST in the Indian context.

The research methodology involves an extensive review of secondary data such as books, journals, government reports and website publications to gather information on various aspects of GST. The text explains the concept of GST, emphasizing it as a comprehensive indirect tax on goods and services at the national level. It replaces the various existing indirect taxes and creates a simplified and unified tax system. Discusses the impact of GST on the Indian economy, including expectations for improving the tax-to-GDP ratio and controlling inflation. It is expected that the manufacturing industry may benefit, while the service sector may face challenges.

Challenges related to the implementation of GST in India are cited, including the need for uniform implementation across states, clarity of tax transactions, proper identification of goods and services, and the importance of raising awareness among professionals. Finally, the text highlights the importance of tax policy and the potential benefits of GST implementation in India. It urges professionals to prepare for the changes that GST will bring to India's tax system and encourages the country to follow global taxation and corporate practices.

- **E-Invoice System in GST**

The introduction of TGST e-invoicing represents a revolutionary system. In this approach, taxpayers are required to submit their B2B and Export invoices to the government portal for clients, in return for receiving a unique Invoice Reference Number (IRN). This system operates in a faceless manner, with a strong emphasis on facilitating API interactions, enabling the electronic sharing of data across the ecosystem. Through the e-Invoice Portal, taxpayers receive the Signed QR code and Signed invoice. The implementation of a standardized e-invoice format, aligning with international standards like UBL/PEPPOL, has led to enhanced machine readability, improved interoperability, and consistent interpretation throughout the entire ecosystem.

- **E-Way Bill**

For both intrastate and interstate delivery of products in India, an Electronic Waybill (E-way Bill) is a necessary document. It is a mechanism that was implemented in India as part of the Products and Services Tax (GST) regime to guarantee the efficient and effective movement of goods as well as to stop tax evasion. The paper-based waybill system will be replaced by the electronic version.

Fig. Number of E- way bill generated
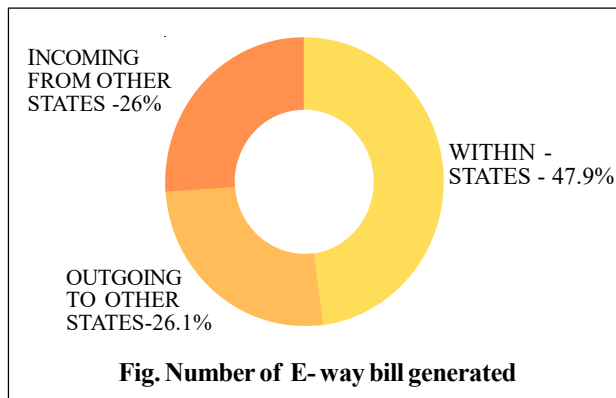
Input Tax Credit

In India and many other nations with comparable value-added tax systems, the Goods and Services Tax (GST) system includes a mechanism called the Input Tax Credit (ITC). It enables businesses to deduct the tax they have paid on inputs (goods and services) from the tax they owe on the provision of their goods or services. ITC's goal is to avoid double taxation and make sure that companies only pay taxes on the value they add to the goods or services. By preventing double taxation, the input tax credit. It is the core of the GST. Additionally, the ITC gets rid of taxes' snowball consequences. Purchasing raw ingredients to create a product is one example. When he buys the supplies, he pays a particular tax. On development, it is referred to as input efforts. However, the final items are known as the output when he sells the product manufactured from the same raw material. He claims the tax credit for the output after having already paid the vendor or supplier for it. Therefore, he is just required to pay the remaining tax debt.
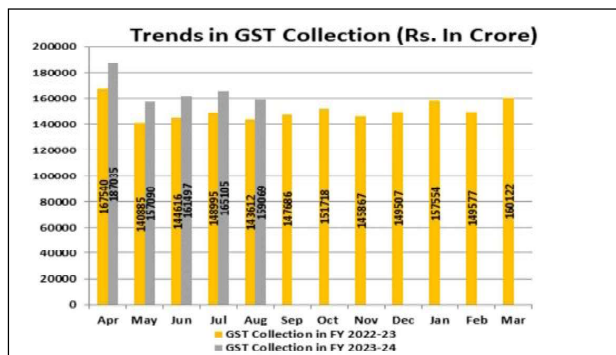
Analysis and Findings : GST collection of 2023

In April 2023, the gross GST revenue amounted to ₹ 1,87,035 crore, comprising ₹ 38,440 crore for CGST, ₹47,412 crore for SGST, ₹ 89,158 crore for IGST (which includes ₹ 34,972 crore collected from goods imports), and ₹ 12,025 crore for cess (including ₹ 901 crore from goods imports). The government has distributed ₹ 45,864 crore to CGST and ₹ 37,959 crore to SGST from IGST. After the regular settlement, the combined revenue for the Centre and

the States in April 2023 stands at ₹ 84,304 crore for CGST and ₹ 85,371 crore for SGST.

In May 2023, the total gross revenue from Goods & Services Tax (GST) amounted to ₹ 1,57,090 crore. This total consisted of ₹ 28,411 crore for Central GST (CGST), ₹ 35,828 crore for State GST (SGST), ₹ 81,363 crore for Integrated GST (IGST), which includes ₹ 41,772 crore collected on imported goods, and ₹ 11,489 crore as cess, including ₹ 1,057 crore collected on imported goods.

After settling the amounts, the government allocated ₹ 35,369 crore to CGST and ₹ 29,769 crore to SGST from IGST. Consequently, the final revenue figures for May 2023 were ₹ 63,780 crore for CGST and ₹ 65,597 crore for SGST, for both the Central and State governments.

In July 2023, the total GST revenue collected was ₹ 1,65,105 crore, comprising ₹ 29,773 crore for CGST, ₹ 37,623 crore for SGST, ₹ 85,930 crore for IGST (including ₹ 41,239 crore from import of goods), and ₹ 11,779 crore from cess (including 840 crore from import of goods). After settling

₹ 39,785 crore to CGST and ₹ 33,188 crore to SGST from IGST, the combined revenue for the Centre and the States in July 2023 was ₹ 69,558 crore for CGST and ₹ 70,811 crore for SGST.
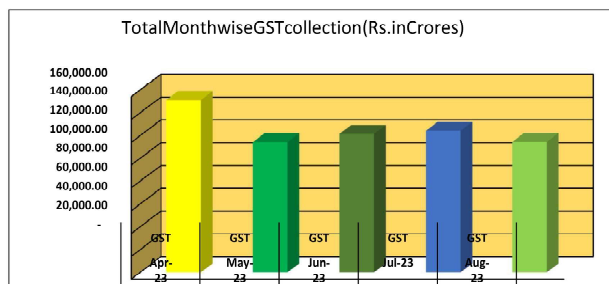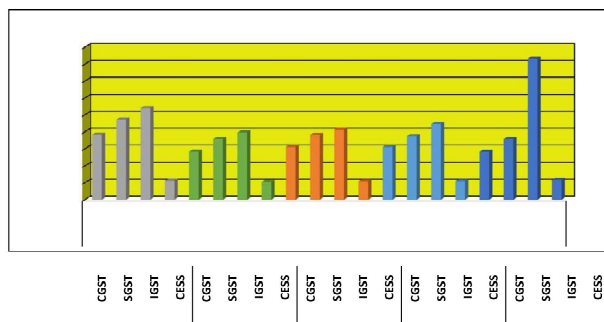

Contribution of GST contributions towards Indian GDP

Year	GDP
April-June 2017	5.7%
July -September 2017	6.3%
October- December 2017	7%

January- March 2018	7.7%
April- June 2018	8.2%
July- September 2018	7.1%
October- December 2018	6.6%
January- March 2019	7.7%
April- June 2019	6.9%
July- September 2019	4.5%
October- December 2019	4.7%
January- March 2020	4.2%
April- June 2020	6.9%
July- September 2020	4.5%
October- December 2020	4.7%
January- March 2022	4.1%
April- June 2022	13.5%
July- September 2022	6.3%
October- December 2022	4.4%
January- March 2023	6.5%

While GDP is typically calculated annually, there are occasions when it's computed quarterly as well. In the United States, for instance, the government provides an annualized GDP estimate for each fiscal quarter and the entire calendar year. The data points included in this report are expressed in real terms, meaning they are adjusted for price fluctuations and therefore exclude the impact of inflation.

3.18 lakh crores USD (2021)
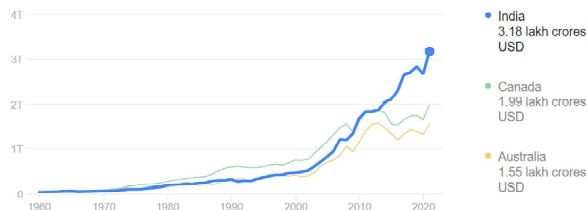
Since its introduction in July 2017, the Goods and Services Tax (GST) has a wilde significant influence on India's Gross Domestic Product (GDP). To gauge its role, we can dissect its impact across several crucial dimensions:

1. **Enhanced Tax Collection:** A primary aim of GST was to elevate tax collection. By replacing a 2multitude of indirect taxes with a unified system, GST has streamlined tax collection processes. This, in turn, has bolstered tax compliance and government revenue, thereby contributing to GDP growth.

2. **Formalization of the Economy:** GST provides incentives for businesses to register and function within the formal economy. In the past, many businesses

operated informally to evade taxes. With GST's transparent and technology-driven framework, there's a stronger impetus for compliance, resulting in an expansion of the formal sector, which positively impacts GDP.

3. **Reduction in Tax Cascading:** GST eradicates tax cascading by allowing businesses to claim input tax credits on taxes paid in earlier stages of the supply chain. This lessens the overall tax burden on businesses, leading to reduced production costs and potentially lower consumer prices. This economic stimulus contributes to GDP growth.

4. **Ease of Doing Business:** The simplification of the tax structure and the reduction in tax complexities have improved India's ease of doing business. This has attracted both domestic and foreign investments, nurturing economic growth and job creation, both of which are substantial GDP drivers.

5. **Expanded Tax Base:** GST has broadened the tax base by encompassing sectors previously untaxed or undertaxed, such as the informal economy and the services sector. This expansion of the tax base has amplified government revenue, directly augmenting GDP.

6. **Enhanced Transparency and Compliance:** The GSTN (Goods and Services Tax Network) has elevated transparency and minimized tax evasion through digital transaction tracking. This technological advancement has furthered tax compliance and revenue collection, indirectly contributing to GDP growth.

7. **Impact on Consumption and Industries:** GST has had varying effects on different industries, with some benefiting from reduced tax rates while others face increased rates. Consumer and business behavior changes in response to these alterations can sway overall economic activity and GDP.

8. **Exports and International Trade:** GST has streamlined and simplified export processes, enhancing the competitiveness of Indian products in global markets. This has the potential to escalate exports, a vital driver of GDP growth.

While GST undeniably makes a positive contribution to India's GDP through enhanced tax collection, formalization of the economy, tax cascading reduction, and business-friendly reforms, a comprehensive assessment of its impact on economic growth must also encompass challenges such as compliance issues, tax rate adjustments, and sector-specific repercussions. Additionally, the broader economic and policy context should be considered when evaluating GST's role in India's GDP.

Views of entrepreneurs towards GST:-

Descriptive Statistics

	N	Mean	Std Dev	Kurtosis	S.E. Kurt	Skewness	S.E. Skew	Minimum	Maximum
Turnover	33	2.12	1.08	-.98	.80	.53	.41	Less than ₹10 lakhs	Over ₹10 crores
GStCompliance	33	2.15	.67	-.64	.80	-.18	.41	Yes	Not Sure
Satisfaction	33	2.76	1.00	.59	.80	.72	.41	VS	VDS
types	33	1.61	.66	-.53	.80	.63	.41	Manufacturing	Trading
Employees	33	2.09	1.07	-.82	.80	.62	.41	1-10	Over 100
Familiarity	33	3.52	1.64	.32	.80	.31	.41	SA	8.00
Smiplified	33	3.52	1.64	.32	.80	.31	.41	SA	8.00
TAx_burden	33	2.58	1.15	-.51	.80	.40	.41	SA	SDA
Working_Capital	33	2.73	1.04	.00	.80	.24	.41	Improved Significantly	Worsened Significantly
Structure_Favourable	33	2.67	.89	.33	.80	.45	.41	SA	SDA
Interstate_transportation	33	1.55	.83	-.68	.80	1.06	.41	Positively	No significant impact
Valid N (listwise)	34								
Missing N (listwise)	1								

1. Positive Skewness: A positive skewness value suggests that the distribution of responses is skewed to the right, meaning that there may be a longer tail on the right side of the distribution. In the context of this survey, it could mean that more respondents are leaning towards positive or favorable views about GST and its impact on MSMEs.

2. Negative Excess Kurtosis: Negative excess kurtosis indicates that the distribution is platykurtic, which means it is flatter and has thinner tails compared to a normal distribution. In this context, it might suggest that responses are more widely spread and not concentrated around a central value.

Reliability Statistics

Cronbach's Alpha	N of Items
.81	7

Researchers often aim for a Cronbach's alpha of at least 0.7 to 0.9 for good reliability. Which means the data taken for the research is reliable.

Hypothesis Testing:

1. Hypothesis 1: GST Impact on Working Capital

- Null Hypothesis: GST has not affected the working capital of businesses.

- Alternative Hypothesis: GST has affected the working capital of businesses.

Paired Samples Test

			Paired Differences						
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	S.E. Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Turnover - Working_Capital	-.61	1.48	.26	-1.13	-.08	-2.36	32	.025

As the result of Paired test shows that p value is 0.025 which is less than 0.05, we reject null hypothesis saying that GST has significantly affected the working capital of the businesses.

2. Hypothesis 2: GST Compliance Challenges and Business Satisfaction

- Null Hypothesis: compliance challenges does not affect satisfaction with the GST system.

- Alternative Hypothesis: Facing compliance challenges affects satisfaction with the GST system.

Correlations

		GStCompliance	Satisfaction
GStCompliance	Pearson Correlation	1.000	-.177
	Sig. (2-tailed)		.324
	N	33	33
Satisfaction	Pearson Correlation	-.177	1.000
	Sig. (2-tailed)	.324	
	N	33	33

The correlation test on GST Compliance and satisfaction to the system shows that there is no significant relation in between the compliance challenge to the satisfaction of the business owners towards GST.

3. Hypothesis 3: Impact of GST on Interstate Transportation and Business Type

- Null Hypothesis: The application of GST on interstate transportation does not vary significantly by business type.

- Alternative Hypothesis: The application of GST on interstate transportation varies significantly by business type.

Test Statistics

	Chi-square	df	Asymp. Sig.
Interstate_transportation	16.91	2	.000
types	8.91	2	.012

According to the Chi Square test we accept null hypothesis as p Value is less than 0.05, there is no significant variation.

4. Hypothesis 4: There is a relationship between the impact of GST on working capital and the reduction of the overall tax burden on businesses.

- Null Hypothesis: The impact of GST on working capital is not related to the reduction of the overall tax burden on businesses.

- Alternative Hypothesis: The impact of GST on working capital is related to the reduction of the overall tax burden on businesses.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
TAx_burden	Between Groups	11.46	4	2.86	2.62	.056
	Within Groups	30.60	28	1.09		
	Total	42.06	32			

```
ONEWAY /VARIABLES= TAx_burden BY Working_Capital.
```

The test suggests that null hypothesis is rejected and accept alternative hypothesis that is changes in working is associated with changes in the overall tax burden due to GST.

6.1 Data Collection

The data was collected using questionnaire mix of open ended and close ended questions total thirtyfour MSMES responses where noted. The participants where business owners from sectors like Manufacturing, Trading and service sectors. The Questions covered few demographic variables like Name of the Business Type of Business, Annual Turnover, Number of Employees familiarity of owners with the Goods and Services Tax (GST), GST has simplified the tax structure in India for MSMEs? Impact of GST on overall tax burden on business, GST impact on working capital? any challenges related to compliance with GST regulations? compliance challenges faced, the GST rate structure, competitiveness of MSMEs in India due to GST regime, input tax credit facilities, E- way Bill, GST-related benefits or schemes for MSMEs, etc

Findings

The study concentrated on a thorough analysis of different GST (Goods and Services Tax)-related issues, particularly as they pertain to Mumbai's MSME (Micro, Small, and Medium Enterprises) sector. The study aimed to shed light on the following goals:

According to our analysis, the MSME sector has faced numerous complexity and difficulties as a result of the GST system. These difficulties mostly centre on compliance problems, various tax rates, and complicated administrative procedures. The sector could gain greatly from the GST structure's simplification and streamlining. The GST new framework adoption of the E-Invoice system has shortened documentation procedures, decreased errors, and increased transparency. However, during its rollout, certain early

teething problems were noticed, which should be rectified for more efficiency advantages. According to our analysis of GST revenues in 2023, the tax collecting system has been successful and significantly increased government revenue. These collections are a reflection of the nation's economic activity and tax compliance, which has an effect on the overall fiscal situation. The study highlights the complex character of the GST system in India, its effects on the MSME sector, and its contribution to the development of the nation's economic system. GST presents difficulties, particularly for MSMEs, despite having made a considerable contribution to government income and GDP. By addressing these issues and raising awareness, the GST system can function more effectively and be more well-liked by business owners. A more unified tax system could significantly streamline the tax system and promote economic growth.

7. Findings

1. GST has positively impacted the taxation system.

2. The Business owners are positive in accepting GST.

3. As for the Tax burden there is no such tax burden to the business owners.

4. MSMEs have a hard time keeping up with the constant changes in GST laws and rates.

5. The use of electronic invoices has increased transparency and decreased tax avoidance.

6. Many companies, notably MSMEs, encountered initial difficulties when converting to this digital system.

7. The dual GST structure, which involves both the federal and state governments, is what distinguishes the current taxation system in India.

8. The system is complicated due to the various tax slabs, exemptions, and special rates.

Benefits of GST include

1. Introduction of a One-Country-One-Tax regime.

2. Consolidation of central and state-level indirect taxes.

3. Widening the tax base to cover goods and services.

4. Reduction in cascading effects, improving the competitiveness of products and services.

5. Lowering prices, potentially increasing consumption.

6. Creating a more business-friendly environment and improving the tax-GDP ratio.

However, there are concerns regarding GST's implementation:

1. India adopted a dual GST system involving coordination between the central government and multiple states, potentially leading to economic and political challenges.

2. Proposed GST rates, especially for luxury goods, could lead to inflation.

3. The success of GST depends on a robust IT network, which India currently lacks.

4. The taxation of e-commerce transactions and the classification of products as goods or services remain uncertain.

5. Exclusion of key sectors like petroleum, electricity, real estate, and liquor from GST could impact inflation and economic development.

6. The taxation of newspapers and advertisements under GST could have unintended consequences. In conclusion, while GST offers the potential to simplify India's tax system, its success depends on addressing various challenges and uncertainties. The government should carefully consider the impact on different sectors and reach a consensus on critical issues before implementing GST.

Complications of GST on MSME Sector

• Dual Control- GST is a single tax system but, in real it's not true businesses have to pay to both central and state government that both at equal rate of GST. That SGST, CGST and IGST.

• Excess Working Capital Requirement- An elevated need for working capital, particularly concerning stock transfers and associated tax implications, can substantially affect financial requirements. The extent of this impact hinges on factors such as the speed at which warehouse stock is replenished, the duration of the credit cycle with customers, the volume of stock being transferred, among others. When the working capital demand increases, it leads to higher interest costs, ultimately contributing to an escalation in the cost of finished products.

• No Tax Differentiation for Luxury Items & Services- Tax neutrality serves as a key differentiation between luxury and regular commodities. Luxury goods and services are subject to increased taxation by both central and state governments. The implementation of GST mandates a uniform tax rate for all products and services, potentially exacerbating income inequality by benefiting the wealthy while adversely affecting the less affluent. This situation is detrimental to MSMEs in their competition against larger corporations.

• The Burden of Higher Tax Rate For The Service Provider- The situation in the service industry will be affected due to the introduction of Centralized

Registration. In this scenario, each unit located in different states will need to obtain individual registrations. Consequently, even when services are provided by one of the company's units in State A to another unit in State B, separate taxes will still be applicable.

- Threshold Limit - Tax neutrality under the GST system doesn't differentiate between everyday necessities and luxury items. Historically, federal and state governments have imposed higher taxes on luxury goods and services. However, with the implementation of GST, all products and services are subject to the same tax rate.

Consequently, this can exacerbate wealth disparities, benefiting the affluent while potentially disadvantaging the economically disadvantaged. This situation may not be conducive for small and medium-sized enterprises (SMEs) in their competition against large corporations

References:

- Anand nayyar, i. S. (2018). A comprehensive analysis of goods and services tax . *Indian journal of finance* ·, 58-78.

- Dani, s. (2016). A research paper on an impact of goods and service tax (gst) on indian. *Business and economics journal*, 1-2.

- Dr. Arundhati roy, b. B. (2020). Impact of covid-19 on goods and services tax (gst) with. 2-7.

- Dr. Shakir shaik, d. S. (2015). Does goods and services tax (gst) leads to indian economic . *Iosr-jbm*, 1-5.

- Dr.ravikiran. (2023, july). Unique features of gst the game changer of the. *The management*, pp. 50-53.

- Gour, d. D. (2023, july). The impact analysis of indian textile firms after Implementation of gst. *The management accountant*, pp. 54-56.

- *Hydropack india pvt. Ltd*. (n.d.). Retrieved from https://hydropackindia.com/

- Nath, d. B. (2017). Goods and services tax: a milestone in indian economy. *International journal of applied research*, 2-3.

- Singh, s. (2023, may 30). *Smb story*. Retrieved from yourstory.com: https://yourstory.com/smbstory/gst-related-complications-big-hurdle-msmes

Web Links

- https://blog.saginfotech.com/gst-impact-on-gdp-india

- https://taxguru.in/goods-and-service-tax/july-2023-gst-revenue-collection-11-percent-yoy- growth.html#:~:text=Analysis%3A%20 In%20July%202023%2C%20the,since% 20the%20introduction%20of%20GST.

- https://tutorial.gst.gov.in/offlineutilities/gst_statistics/6YearReport.pdf

- https://einvoice.gst.gov.in/einvoice/newsandupdates/e-Invoice-Exemption

- https://www.gst.gov.in/

- https://icmai.in/upload/Institute/Journal/TMA_July_2023.pdf

- https://einvoice1.gst.gov.in/Documents/eInvoice_System_newsletter.pdf

- https://www.worldscientific.com/doi/abs/10.1142/S0218126622500025

- https://scholar.google.com/

- https://www.wikipedia.org/

- https://www.tritorc.com/