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"तदेव लग्नं सुदिनं तदेव

ताराबलं चन्द्रबलं तदेव ।

विद्याबलं दैवबलं तदेव

लक्ष्मीपते तेंऽघ्रियुगं स्मरामि ॥"

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"That alone is the best time that only is the best day,

that time only has the strength bestowed by stars,

moon, knowledge and Gods, when we think of the

feet of Lord Vishnu who is the spouse of Goddess

LakShmi.II"

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THE EFECT OF CASHLESS POLICY ON NIGERIA ECONOMY USING AUTOREGRESSIVE DISTRIBUTED LAG MODEL

Kolade Anna Onarakpoberu,

Bilkisu Maijamaa,

Emmanuel Chaku Shammah

Department of Statistics, Nasarawa State University, Keffi, Nasarawa State

maijamaab@nsuk.edu.ng

ABSTRACT

In a cashless economy, credit or debit cards can be used to complete transactions instead of carrying cash as the main form of paying for goods and services. The government's cashless policy discourages the usage of cash and promotes the development of electronic payment systems with an effort in reducing the amount of actual cash in-flow in the economy, though not aimed at eradicating the use of cash in completing any form of payment, but, it is to help to minimize the handling of cash and excess cash in circulation in the Economy. Recent research has shown that, in comparison to the expected outcome, the supposed contributions of cashless policies to economic growth are not very significant. Other studies claim that the cashless policy will accelerate the nation's economic growth in line with international best practices, while some view it as just another piece of economic jargon that may not achieve its expected aim. An empirical method was used for this study on the effect of cashless policy on Nigeria Economy. Secondary data was sourced from CBN from 2012-2022 using an autoregressive distributed lag Model approach and error correction model which aims to examine the effect of cashless policies on in Nigeria's economic growth and provide a broad overview of the use of different e-payment systems in Nigeria. The findings from other related study showed that there exist a positive correlation between Internet banking (IB) and the gross domestic product (GDP) and a negative correlation between automated teller machines and the GDP. The error correction mechanism showed the presence of co-integration, meaning there exists is a long-run relationship among the dependent and independent variables. The study found out that cashless policy has positive effect on economic growth in Nigeria, and recommended the Central Bank of Nigeria to make sure that all banks should provide their clients with good and functional ATM services. This is anticipated to accelerate the use of alternative payment methods, one of the justifications for implementing the cashless policy.

Keywords: Cashless Policy, Cashless Economy, Gross Domestic Product, Central Bank of Nigeria and Economic growth

1.   INTRODUCTION

In a cashless economy, transactions are expected to be carried out electronically via credit and debit cards, electronic clearing, and through payment systems like the national electronic funds transfer (NEFT) and the prompt payment service (IMPS). A cashless economy provides one the opportunity in which the purchases of goods and services can be done using credit or debit cards instead of having to carry real cash around with you as a means of trade. In an attempt to limit the quantity of cash in an economy, the government's cashless policy will help to discourage the use of cash which will boost the growth of e-payment systems. This cashless policy strategy is intended to limit the carrying of cash at hand and also reduce the amount of currency in circulation, not just completely doing away with the use of cash to complete transactions. The Central Bank of Nigeria launched the cashless policy in the year 2012. The cashless policy was tested in Lagos State beginning on January 1, 2012 and on July 1, 2013, this policy's second phase went into effect in six other states which are Anambra, Rivers, Kano, Abia, Ogun, and Abuja on July 31st , 2014, the cashless policy's full implementation began nationwide. The cashless policy, according to the Central Bank of Nigeria, was implemented for a variety of important reasons which will help to support the modernization and growth of our payment system in keeping with the vision 2020 Nigeria which is aimed at becoming one of the top 20 economies in the world by the year 2020. Despite having admirable goals, the policy's adoption was delayed soon after the Lagos pilot program came to an end due to worries about its execution at a national level. The main concern was Nigerian banks' and industry stakeholders' capability and ability to provide a reliable, effective, and conveniently accessible infrastructure across the country in order to achieve a statewide roll-out (Akeem, 2017). An effective and modern payment system is a significant contributor to economic growth and has a positive relationship with the development of an economy. The cost of banking services may reduce if various transaction alternatives are made available in reaching more customers, which will boost financial inclusion and encourage the productivity of the cashless policy to control high rate of inflation and fostering economic growth. But the Central Bank of Nigeria Act of 2007 explicitly grants the CBN the authority to supervise and control the payment networks. The Nigeria Deposit Insurance Corporation and the Nigerian Stock Exchange both supplement this function. The new cashless policy was implemented for a variety of important reasons, such as:

i. To aid the growth and transformation of Nigeria's payment system. Economic development and economic growth are both dependent on an effective and contemporary payment system.

ii. To help boost financial inclusion by providing different e-payment transaction choices reaching out to a larger crowd and reducing the running cost of banking operations.

iii. To tell how well the cashless policy helps to control inflation and improve economic growth.

The use of mobile phones and Internet services are the two key elements that have contributed to this historic growth. Even though we still use cash and cheques to make payments today, many other forms of payment, including credit and debit cards, are widely and frequently utilized. The use of paper money is wearing away gradually and slowly. The Automated Teller Machine and the Point of Sale Machine, which are utilized by customers primarily as cash dispensers and whose usage has continued to expand, are today's success stories of electronic payment in Nigeria. Within the last decade, our world has become rapidly more digitalize making use of internet platforms for purchases, financial transfers are made via USSD codes, POS transactions and the likes. According to Kumari & Khanna (2017), "adopting a cashless economy strategy improves the country's financial stability and supports the developing economy while also reducing illegally obtained income that is not declared for tax purpose" "The increase in cashless payments has the potential to cause an increase in Gross Domestic Product by using cards and reduced social cost (Choudhary, 2018)". Furthermore, cashless and digitalization have positive externalities on an economy. It will stimulate other sectors like telecom sector and e-commerce to thrive (Maurya P., 2019). (Ulfi, 2020), "Transactions that provide this convenience can also trigger a reduction in administrative costs and reduce the risk of crime which in turn for the government can increase the level of tax collection, financial inclusion and will stimulate economic growth". Because physical cash is essentially untraceable and thus becomes a useful tool in the hands of criminals, this cashless policy will assist people in handling less cash, reduce bank robberies, burglaries, and theft, as well as reduce corruption. In contrast, digital currency is less easy to exploit and is extremely traceable even when it goes to the wrong account thanks to the use of a single Bank verification number. The introduction of the cashless policy in Nigeria is anticipated to have positive impact on the country's economy but however, being a developing country, the introduction of a cashless policy appears to be hampered by the risk of fraud, numerous deductions, lack of basic technologies, insufficient power supplies, high internet data costs, illiteracy, network issues, and other factors.

2. PROBLEM STATEMENT

The 21st century has seen tremendous technological advancements in almost every aspect of human life, with the emergence of information and communication technology, which is

transforming the world into a global village and improving communication and interaction between people and businesses. Examining the justification for the emergence of Nigeria's cashless policy reveals that it is an ICT component designed to reduce the flow of illicit or illegal currency into the economy, improve transaction tracking, and make it easier to conduct financial transactions anywhere and at any time. Divergent opinions exist regarding the direction of the effect of cashless policy on the performance of the Nigerian economy because it is expected that the CBN cashless policy will positively contribute to economic growth in Nigeria, but given the recent challenges faced by Nigerians due to the Naira redesign at the beginning of 2023 and the hardship it posed to the lives of many, it is doubtful if truly these cashless policies are actually intended to strengthen Nigeria's economy given the pain and the inconveniences they caused to so many people's lives. The Nigerian government's cashless policy, which refers to a situation in which the volume of cash-based transactions is limited to an absolute minimum, aims to promote electronic payment systems rather than an outright ban on cash transactions. Although policymakers have successfully and consistently raised public awareness about the use of electronic payment platforms and some literature has shown that there is lack of data on adoption levels and patterns as well as the factors that affect the deployment of technology for efficient service delivery. Recent research has shown that, in comparison to the expected outcome, the supposed contributions of cashless policies to economic growth are not very significant. No matter how much has been written about the benefits that is associated with the adoption of e-payment and a cashless society, the general public is still not convinced that the goal is for the benefit of all. The implementation of the cashless policy has been a subject of heated discussions. Other studies claim that the cashless policy will accelerate the nation's economic growth in line with international best practices, while some view it as just another piece of economic jargon that may not be practical or may not achieve its expected aim. Many people have expressed concerns about Nigeria's crumbling infrastructure, in addition to the shortage of financial institutions in the nation. We must assess how infrastructure will affect the implementation of the "cashless economy" rather than assuming that the infrastructure platform required for the cashless economy to function will essentially come with the cashless economy. As a result, we must critically assess the cashless policy's operations to determine whether it is feasible and workable in Nigeria. In order to decide whether the cashless policy is practical and implementable in Nigeria, we must critically evaluate its operations. The Nigerian government's cashless policy refers to a system in which the least amount of transactions are conducted in

cash, which aims to promote electronic payment systems rather than an economy completely dependable on cash transactions. The lack of information on adoption levels and patterns as well as the factors influencing the deployment of technology for efficient service delivery was revealed in the literature, which is why this study was conducted despite the public awareness that policymakers have raised about the use of electronic payment platforms. This research will help to find out the effect of cashless policy on Gross Domestic product in Nigeria and the impact of the introduction to electronic means of cash payments for Cheque verification, credit authorization, withdrawal and deposit of cash through cashless mediums such as the Automated Teller Machine, Point of Sales, Internet banking and the use of Banking Apps with the help of using an econometric model called the autoregresssive distributed lag model, where the variable of interest is assumed to be a function of the past values of itself (auto-regressive) and the current and past values of other variables (distributed lag), as this model can accommodate a variety of lag structures to help separate the long-run and short-run effects and to test for cointegration or the existence of a long-run relationship among variables used, this Model seems to be the best suitable Model for this study because it is an Ordinary least square model which is applicable for both non-stationary time series as well as for time series with mixed order of integration and its approach is used irrespective of whether the series are 1(0) or 1(1) and secondly the dynamic error correction model (ECM) can be derived from the ARDL bounds testing through a simple linear transformation that will show the short-run coefficients alongside the long-run equilibrium and not losing any valid coefficient on the long-run eventually.

3.   AIM AND OBJECTIVES

The primary aim of this study is to use an econometric model with two statistical tools in examining the effect of cashless policies on Nigeria's economic growth and to provide a broad overview of the use of different electronic payment systems in Nigeria with the following broad objectives:

1. To study the various electronic platforms set up by the CBN to provide e-payment services and their impact on the Nigerian economy.

2. Using an autoregressive distributed lag model to analyze how Nigeria's cashless policy has affected the use of cheques, automated teller machines, point of sales, online transfers pay and Mobile Pay on the Gross Domestic Product in Nigeria.

3. Using ECM (error correction mechanism) to determine the long- run relationship and short-run coefficient of all the dependents variables used on the Gross Domestic Product in Nigeria.

4. Examine the variables that affect the use of cashless payment technologies in the Nigerian economy.

4. LITERATURE REVIEW

This section briefly reviewed the suitable literature that has been in existence showing the conceptual, theoretical, and empirical view of a cashless economy.

4.1 Conceptual Review

A cashless economy is an economy where payments and transactions are done without the usage of physical cash. As a result, payments are made through alternative payment methods such checks, ATMs, POS systems, Web and mobile banking, etc. According to Ejiro (2012), "a cashless economy enables businesses to be carried out without the need of actual currency as a means of exchange for transactions; instead, purchasing goods and services is done through a credit or debit card''. (Gbanador 2021), "The aim of Cashless Policy is not to do away with cash transactions entirely from the economic system. However, the rationale behind its introduction is to reduce the adoption of physical cash by offering alternative means of payment to consummate transactions". It is worthy to note that, a cashless economy does not define the total removal of the use of cash in doing transactions in totality, but, it serves as a substitute means of making payment transactions without necessarily using cash.

4.1.2 Concepts of Cashless policy instruments: The channels used to make payments in a cashless economy include automated teller machines (ATM), cheque Books, Point-of-Sale Machines, Internet/Web banking, Mobile banking, bank drafts, etc. Cashless policy instruments used are discussed as follows:

I. **Automated Teller Machines:** These are computerized telecommunication device used by banks to carry out standard teller tasks like cash deposit, money transfer, cash withdrawal, bill payments, opening of bank account, balance inquiry, etc. Using an ATM has allowed bank customers resolve their basic teller services outside the banking facility without using bank tellers.

II. **Cheques:** A cheque book is a financial document provided to customers by their various banks which serves as an instrument which one can fill an expected amount within the reach

of the customers bank account balance and given it back to the bank requesting to pay the stated amount written on the cheque to the individual whose name appears on the cheque. The amount is usually written in words and figures and duly signed. All cheques written in favour of an intermediary of not more than ₦10 million has to go through the Central Bank of Nigeria clearing house for approval. A cheque is viewed as a bill of exchange with a banker as the drawee and is payable on demand. A crossing cheque or an open cheque are the two types of cheques that we have. A crossed check can only be collected through a banker to whom the money written on it is transferred, as opposed to an open check, which is payable over the counter.

III. **Point of Sale (POS) Terminal:** It is a mobile device which allows credit card payments for goods and services. By inserting a bank card, entering a personal identification number (PIN), and completing the necessary transaction, this electronic gadget also enables one to make cash transfers, withdrawals, or payments.

IV. **Internet banking:** This is another form of an e-payment channel which enables bank customers to complete specific banking tasks through the website of the banks with the use of a desktop/Laptop or an Android phone enabled by a strong internet. Online banking, e-banking, virtual banking, or web banking are additional terms for internet banking.

V. **Mobile banking:** This electronic payment method enables bank customers to access and manage their accounts as well as help in carrying out a variety of payment transactions using a Mobile/Android phone that has the bank's software or App loaded. After entering a login, password, or PIN to confirm the transaction, the customer is given permission to conduct transactions using a mobile phone.

VI. **Bank drafts and other financial instruments:** A bank draft carries a guarantee of funds from the issuing financial institution. Personal cheques would often not be used by consumers who handle large transactions under ₦10 million. Instead, they would use bank drafts. Even if bank drafts are paid in cash, the CBN still has a three-day clearing requirement.

4.2 Theoretical Review

4.2.1 The Technology Acceptance Theory: Ajayi (2014) reported that Fred Davis who attended the MIT Sloan School of Management in the year 1985 was the one brought the idea and the use of TAM while he was doing his PhD thesis. Technology Acceptance Model (TAM) adoption in enterprises is suggested by the technology acceptance theory in order to boost economic growth (Ajayi, 2014). One

of the ideas created was to propose a good understanding on the use of information technology which brought about the technology acceptance theory. It is currently a well-known hypothesis used in information systems research to model technology acceptance and adoption.

4.2.2   Diffusion of Innovations (DOI) or Innovation Diffusion Theory (IDT):

The DOI theory which is also known as the innovation diffusion theory seeks to give details on why the need for new innovations, how important are the new innovations and at what rate these new innovative technologies and ideas can spread through diverse cultures (Ajayi, 2014). According to the diffusion of innovation theory, new concepts, habits, methods, or products spread gradually among people as opposed to all at once. Everrett Rogers publicized this idea in his book titled "Diffusion of Innovations", in the year 1962. According to him, he mentioned that Diffusion is an innovation that spreads over time among the people in a social system. According to Rogers, he further explained that the five major factors to which a new idea or ne concepts spreads is first through innovation itself, then followed by the adopters, social strata, communication routes and time.

4.3   Empirical Review

Although there aren't many empirical studies on cashless policy before now but, central banks and academic scholars have recently begun to pay more attention to the issue (Elechi & Rufus, 2016). Initiating various policies and programs that will encourage the adoption of Nigeria's cashless policy has been a priority for CBN. However, so many worries has been raised over this current move in achieving a cashless economy because there aren't enough concrete and reliable data that will help support the move now. Taiwo, Ayo, Afieroho, and Agwu (2016), collected primary data with the use of a data instrument called a questionnaire which was administered to 120 respondents randomly who are customers from UBA, First Bank of Nigeria and Zenith Bank. They came to a conclusion that even if the current Nigerian economy is dominated by the necessity to conduct cashless transactions, it will only be possible if sufficient effort is made to help fast track the utilization of an effective cashless system that will bring about the desired effect on the economy. Acha, Kanu, and Agu (2017), "The mechanics, advantages, and drawbacks of Nigeria's cashless policy", this was evaluated by them with use of descriptive statistics to carry out their analysis. In spite of the benefits that have been found, their findings revealed that Nigerians are increasingly adopting cashless solutions. One such factor is the state of the country's electricity infrastructure. In view of the above, they concluded and suggested that a healthy power supply system should be put in place to foster the cashless policy in Nigeria.

Akara and Asekome (2018), "The effect of the implementation of cashless policy on the profitability performance of commercial banks in Nigeria". The use of automated teller machine and point of sales

machine as proxies for the implementation of cashless policy, return on assets (ROA) and return on equity (ROE) as proxies for profit making, with the use of the ordinary least squares method. According to the study's multiple regression analysis, there is a strong positive relationship between Nigeria's commercial banks' profitability and the adoption of cashless policies. The adoption of the use of ATM and POS has helped to boosts bank's ROA and ROE, according to their multiple regression results. They advised strengthening the cashless policy and strategically closing any loopholes and issues with the power supply that could expose fraud.

Ignoroje & Okoroyibo (2019), "The impact of cashless policy on the performance of Deposit Money Banks in Nigeria". Data from 2009–2018 was used to carry out the study. The research design used in the study is the ex-post facto design. A descriptive analysis was done, ADF test was carried out and Philip Perron unit root tests was done, the autoregressive distributed lags (ARDL) test for cointegration among time- related series, and analysis of coefficient were the econometric methods utilized to analyze the data used. The study draws the conclusion that the CBN cashless policy has great benefits on bank's performance based on its findings.

Nwakoby C, Chukwu K.O, and Oghenetega, E.O (2019), ''The impact of cashless policy on deposit money banks' profitability". The study used secondary data from 2009 - 2019, and the auto-regressive distributed lag model approach was used. The dependent variable is Profit before Tax, while Mobile Banking, POS, ATM, and Online Payment values were the independent variables. The study's findings demonstrate that Nigeria's Deposit Money Banks' profit before tax is adversely and insignificantly impacted by the country's cashless policy. The study proposes that bank clients be made aware of the importance of the cashless policy from their findings.

Bilkisu M. and Anna K. (2020), "The Effect of Monetary Policy on the Nigerian Banking Sector using the autoregressive distributed lag model approach", the study used time series data spanning from 2004 to 2019. The error correction model was used to determine the existence of a long-run relationship and the short-run coefficient among the variables used. From the study, it showed that MPR and LQR do not have any significant relationship on bank loans and advances, but there is a significant relationship between credit reserve ratio, and money supply on bank loans and advances. Co-integration exist with the use of the error correction mechanism. The research will help monetary authorities and policy makers to implement fiscal policies that will help boost banking industries in Nigeria.

Teslim A and Moses E, (2022), "The impact of automated teller machines, point of sale terminals, and internet banking transactions on economic growth in Nigeria". The study used primary data that was gathered utilizing tables and descriptive statistics. This study's goals are to determine how automated

teller machines, point-of-sale devices, and finally the value of online banking transactions has effect on Nigeria's economic growth. Furthermore, the study came to the conclusion that the cashless policy is crucial to the Nigerian economy and that stakeholders need to continue to push the POS and ATM platforms. The report suggests that the CBN should implement further laws to improve the rules governing point-of-sale terminal activity.

5. METHODOLOGY

The research design used in the study is the "ex-post facto" research design. This study approach was chosen to prove a causal effect between variables used. The CBN Statistical Bulletin's quarterly time series data for the years 2012 to 2022 were acquired. The Gross Domestic Product (GDP) represents economic growth, while the cashless policy variable is represented by automated teller machines values (ATMV), Point of Sale Values (POSV), Online Transfer Values (OTRV), Cheque values (CHQV), and Mobile App transfer values (MATV).

5.1 Model Specification

The econometric model is given as:

GDP= f (ATMV, POSV, OTRV, CHQV, MATV)… (5.1**)**

Represented in the model below is the relationship that exists between variables used and can be expressed as:

$GDPt = \beta_0 + \beta_1 LATMVt + \beta_2 LPOSVt + \beta_3 LOTRV + \beta_4 LCHQVt + \beta_5 MATVt +$

μt …(5.2)

Where:

GDP = Gross Domestic Product.

LATMV = Log of ATM values.

LPOSV = Log of POS values.

LOTRV = Log of online transfer values.

LCHQV = Log of Cheque values.

LMATV = Log of Mobile App transfer values.

$\beta_1, \beta_2, \beta_3, \beta_4$ and β_5 = coefficients.

β_0 = Intercept.

μt = Error Term.

The ARDL model of equation (5.2) is specified below

$$\Delta GDP_t = \beta_0 + \sum_{i=1}^{m} \beta_1 \Delta GDP_{t-i} + \sum_{i=1}^{m} \beta_2 \Delta ATMV_{t-i} + \sum_{i=1}^{m} \beta_3 \Delta POSV_{t-i} + \sum_{i=1}^{m} \beta_4 \Delta LOTRV_{t-i} + \sum_{i=1}^{m} \beta_5 \Delta CHQV_{t-i}$$

$$+ \sum_{i=1}^{m} \beta_6 \Delta MATV_{t-i} + \alpha_1 GDP_{t-i} + \alpha_2 ATMV_{t-i} + \alpha_3 POSV_{t-i} + \alpha_4 OTRV_{t-i} + \alpha_5 CHQV_{t-i} + \alpha_6 MATV_{t-i} + \mu_t \ldots (5.3)$$

The ARDL specification of the ECM model of equation (5.3) is specified below:

$$\Delta GDP_t = \beta_0 + \sum_{i=1}^{m} \beta_1 \Delta GDP_{t-i} + \sum_{i=1}^{m} \beta_2 \Delta ATMV_{t-i} + \sum_{i=1}^{m} \beta_3 \Delta POSV_{t-i} + \sum_{i=1}^{m} \beta_4 \Delta LOTRV_{t-i} + \sum_{i=1}^{m} \beta_5 \Delta CHQV_{t-i} + \sum_{i=1}^{m} \beta_6 \Delta MATV_{t-i}$$

$$+ \Delta ECM_{t-i} + \mu_t \ldots (5.4)$$

The ECM is a representation of error correction mechanism and it measures and determines the speed of adjustment showing how fast a system adjusts to restore equilibrium.

5.2   Justification of Methods:

The study used the autoregressive distributed lag model approach which was developed by Pesaran. To estimate equation (3.2), this approach was used based on the facts that the model can be used not minding if the series of study are stationary at I (0) or I(1) or having both mixtures. Also, it will help to give a robust and high-quality result even though the sample size that is used is either large or small. Lastly, it takes the Error Correction Model into consideration. The ARDL model approach and the error correction mechanism analysis covers for both the existence of a long- run relationship and the short-run coefficients on variables used.

6.   EXPECTED OUTCOME

The expected outcome will be in line with some researchers who had done similar work but with variation in the data used as this research will use data spanning from 2012 – 2022. Some expected outcome from researchers who have done similar research work are cited below:

Monday A. Gbanador (2022), "The Effect of Cashless Policy on Economic Growth in Nigeria: An Autoregressive Distributed Lag Approach". The study examined the effect of cashless policy on economic growth in Nigeria using quarterly time series data. Serial correlation, heteroskedasticity, and Cusum tests were used as diagnostic tools. Unit root tests on the variables were conducted using the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) and Phillips-Peron (PP&KPSS) and the Cusum test was carried out as well. The results showed that there is a positive correlation between Internet banking (IB) and the gross domestic product (GDP), but a negative correlation between automated teller machines and the GDP. The study found out that cashless policy has positive effects on economic growth, and recommends that the Central Bank of Nigeria should not relent on their effort to make sure that all banks in Nigeria should be ready to provide their clients with high-quality ATM services as this is expected to speed up the process of using alternative payment system in Nigeria which is one of the rationale for introducing the cashless policy.

Ezie O, Adeniji S.O and Oniore J.O, (2014), "The Cashless Policy and Foreign Direct Investment in Nigeria: A Vector Error Correction Model (VECM) Approach". The study used quarterly data from 2006 to 2012 to conduct an econometric analysis on cashless policy and its success in promoting foreign direct investment to Nigeria. VECM was used to examine if automated teller machine, interbank transfer and Mobile money had any effect on foreign direct investment. The Unit root test was carried out to check for stationarity. Cointegration test was carried out and it showed the existence of a long run relationship among variables used. The granger causality test shows there exists a relationship between IBT and MM on FDI in Nigeria, while the VECM result showed that the explanatory variables

are positively significant to FDI which will help boost FDI in the country. The study recommends the continuous use of ATM, IBT and MM in Nigeria and also stressed that proper awareness should be done to showcase its benefits.

Ifeoma C.C, Onodugo I.C, Ezeamama M, (2020), "Impact of cashless policy on the economic growth of Nigeria". The study was able to determine the degree to which the cashless policy has been successful in achieving its stated objectives and the resulting effect on Nigeria's economic growth. It also helped to show the level of economic growth and determine if the cashless policy has any effect at all or not on reducing crime and corruption using cash. This study used secondary data from 2013 to 2019 which was obtained from CBN Statistical Bulletin to conduct analysis on the effect of cashless policy on economic growth in Nigeria. GDP was used to determine if there are sufficient evidence to support the cashless policy and its contribution to the economic growth, since the inception of the program, modifications and social adaptations to the cashless policy have been taken into consideration by the effect analysis. There is no proof that the Cashless policy decreased inflation, and it is unclear how much of an influence it has had on the economic development of Nigeria. It also may have opened up new chances for cyber and electronic based crimes.

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"Fintech Revolution: Transforming the Financial Landscape in the Current Market."

Dr. Rishikaysh Kaakandikar
Associate Professor
SaiBalaji International Institute of Management Sciences
r.kaakandikar@sbiims.edu.in
Prof. Rajashree Dighe
Assistant Professor
SaiBalaji International Institute of Management Sciences
r.dighe@sbiims.edu.in

Abstract

The financial services industry is experiencing a profound transformation, driven by the rapid evolution of financial technology, commonly known as fintech. Fintech has emerged as a disruptive force, reshaping the current market and challenging traditional financial institutions. This theoretical review paper explores the multifaceted role of fintech in today's financial landscape, examining its impact on financial inclusion, digital payments, wealth management, lending, blockchain, cryptocurrencies, regulation, cybersecurity, and the evolving relationship between fintech start-ups and traditional institutions. Furthermore, this paper outlines future trends and opportunities within the fintech domain.

Keywords: Fintech, Financial Inclusion, Digital Payments, Mobile wallets, Robo-advisors

1. Introduction

The introduction of fintech, short for financial technology, marks a significant turning point in the financial services sector. Traditional banking and financial processes have been upended by the rapid advancement of technology, leading to the emergence of innovative solutions, streamlined services, and a fundamental shift in how financial services are offered and consumed. This introduction sets the stage for a comprehensive exploration of fintech's multifaceted role in today's financial landscape.

Revolutionizing Financial Access: Fintech is not just an evolution; it's a revolution. It has democratized financial access by providing solutions that are more inclusive and less reliant on traditional brick-and-mortar institutions. The advent of fintech has dismantled geographical barriers, making it possible for individuals in remote and underserved areas to access banking, payment services, and lending options.

Technology as the Catalyst: The driving force behind this revolution is technology itself. As technological advancements continue at a breakneck pace, fintech adapts and harnesses these innovations to create a wave of change in the financial industry. From mobile apps and digital wallets

to sophisticated algorithms powering robo-advisors, technology is at the core of fintech's transformational power.

Aims of the Review Paper: The primary objective of this review paper is to offer readers a deep and comprehensive understanding of the numerous dimensions of fintech's role in the current market. It seeks to dissect and analyze the impact of fintech across various financial services and sectors. By doing so, it will provide insights into how fintech has reshaped traditional financial systems, practices, and customer experiences.

Fintech's role in the current market cannot be understated. It's a powerful force that has not only disrupted the financial industry but has also opened up new possibilities for financial services. As we delve deeper into the paper, we will explore these facets in detail, from financial inclusion and digital payments to regulatory challenges and the future trends that will continue to shape the financial landscape.

2. Financial Inclusion: Bridging the Gap

Financial inclusion refers to the effort to make financial services and products accessible to all segments of society, particularly those who have been traditionally excluded or underserved by the formal financial system. This concept recognizes that access to basic financial services, such as banking, savings, credit, and insurance, is essential for individuals and businesses to participate fully in the economy and improve their overall financial well-being.

Financial Inclusion Initiatives:

Mobile Banking and Digital Wallets: Mobile banking apps and digital wallets have played a pivotal role in expanding financial inclusion. For example, in sub-Saharan Africa, where access to traditional banks can be limited, mobile money services like M-Pesa in Kenya and MTN Mobile Money in Ghana have enabled people to conduct financial transactions, pay bills, and access savings and credit services using just a mobile phone. These services have reached millions of unbanked and underbanked individuals, providing them with a secure and convenient way to manage their finances.

Microfinance Institutions: Microfinance institutions (MFIs) specialize in providing small loans, savings accounts, and other financial services to individuals and businesses in underserved communities. These institutions operate in both developed and developing countries. Grameen Bank in Bangladesh, founded by Muhammad Yunus, is a well-known example. It has empowered millions of impoverished individuals, particularly women, by offering them access to credit for income-generating activities.

Government Initiatives: Many governments worldwide have recognized the importance of financial inclusion and have launched initiatives to promote it. For instance, in India, the Pradhan Mantri Jan Dhan Yojana (PMJDY) is a government-led program that aims to provide every household in the country with access to a bank account. Through this initiative, millions of previously unbanked individuals now have access to basic financial services, including savings accounts, debit cards, and insurance.

Digital Payment Solutions: Fintech companies have developed digital payment solutions that are accessible even to individuals without a traditional bank account. For example, PayPal and Square Cash allow users to send and receive money, make online purchases, and pay bills without the need for a bank account. These solutions bridge the gap by offering financial services directly to consumers through their smartphones.

Peer-to-Peer Lending Platforms: Peer-to-peer (P2P) lending platforms connect borrowers with individual or institutional lenders, bypassing traditional banks. These platforms provide access to credit for individuals who may not meet the stringent requirements of traditional banks. Prosper and Lending Club in the United States are notable examples.

In each of these examples, financial inclusion initiatives have leveraged technology, innovation, and targeted policies to bring financial services to previously excluded or underserved populations. By doing so, they have not only improved individuals' access to financial resources but also contributed to economic development and poverty reduction in various regions around the world. Financial inclusion remains a critical goal for governments, financial institutions, and fintech companies alike, as it promotes economic growth and reduces inequality.

3. Regulatory Challenges and Compliance

The rapid growth of fintech has brought about a range of regulatory challenges for both fintech start-ups and traditional financial institutions. Regulatory bodies around the world have been grappling with how to balance innovation and consumer protection, as well as ensure the stability of financial systems. Here, we'll explore some of the key regulatory challenges in fintech and provide examples to illustrate these challenges:

a. Consumer Protection:

Peer-to-peer lending platforms connect borrowers with lenders, often without the intermediation of traditional banks. While this can provide borrowers with access to credit, it can also expose them to risks if the lending platforms do not have adequate consumer protection measures. Regulatory challenges involve ensuring that borrowers are well-informed about the terms of loans and that lending platforms have mechanisms in place to handle disputes and protect consumers from predatory lending practices.

b. Anti-Money Laundering (AML) and Know Your Customer (KYC) Requirements:

Cryptocurrency exchanges have faced regulatory challenges related to AML and KYC requirements. Many governments are concerned about the potential use of cryptocurrencies for illicit activities, such as money laundering and terrorist financing. To address these concerns, regulators in various countries have imposed strict AML and KYC regulations on cryptocurrency exchanges. These regulations require exchanges to verify the identities of their customers and report suspicious transactions.

c. Data Privacy and Security:

Fintech companies handle vast amounts of sensitive customer data. The General Data Protection Regulation (GDPR) in the European Union is an example of stringent data privacy regulations. Fintech companies operating in the EU must comply with GDPR, which imposes strict requirements for the collection, storage, and processing of personal data. Non-compliance can result in significant fines.

d. Cross-Border Regulation:

Fintech services often operate across borders, making it challenging for regulators to oversee and enforce compliance. For instance, a fintech company based in one country might offer its services to customers in multiple countries. This raises questions about which regulatory authorities have jurisdiction and how they can coordinate to ensure compliance. The challenge is to create a regulatory framework that allows for cross-border fintech while maintaining effective oversight.

e. Cybersecurity:

Fintech companies are frequent targets of cyberattacks due to the valuable financial data they handle. A major challenge is ensuring that fintech firms have robust cybersecurity measures in place to protect customer information and financial transactions. Regulatory bodies often provide guidelines and standards for cybersecurity practices, and non-compliance can result in significant reputational damage and legal consequences.

g. Regulating Emerging Technologies:

Blockchain and cryptocurrencies are relatively new technologies that have presented regulators with unique challenges. Different countries have taken varied approaches to regulating these technologies. For instance, some have embraced blockchain technology while cautiously regulating cryptocurrencies, while others have imposed strict bans. Striking the right balance between fostering innovation and mitigating risks is a significant regulatory challenge in this context.

Regulatory challenges in fintech revolve around striking a balance between fostering innovation and ensuring consumer protection, financial stability, and adherence to established laws and regulations. These challenges are complex and continuously evolving as fintech continues to reshape the financial industry. Finding the right regulatory approach is crucial to harness the benefits of fintech while mitigating potential risks.

h. Cybersecurity and Data Privacy

The increasing reliance on technology in financial services has heightened concerns about cybersecurity and data privacy. Fintech companies must safeguard sensitive information from cyber threats. This section explores the measures fintech firms are taking to protect data and ensure data privacy compliance.

Cybersecurity and data privacy are paramount concerns in the fintech industry due to the sensitive financial information processed and stored by fintech companies. Ensuring the security and privacy of customer data is not only a legal requirement but also essential for maintaining trust and credibility. Here, we'll delve into these concerns and provide examples to illustrate the importance of cybersecurity and data privacy in fintech:

i. Cyber Security Concerns:

In 2020, the fintech company Robinhood experienced a data breach that exposed sensitive customer information. Cybercriminals gained unauthorized access to customer accounts, exposing personal data, including names, email addresses, and account balances. This breach highlighted the vulnerability of fintech platforms to cyberattacks.

Cyberattacks on FinTech platforms can result in financial losses for customers, reputational damage to the company, and regulatory penalties. Ensuring robust cybersecurity measures, including encryption, intrusion detection systems, and regular security audits, is crucial to protect customer data and maintain trust.

ii. Data Privacy Concerns:

The General Data Protection Regulation (GDPR) in the European Union imposes strict data privacy requirements on fintech companies operating in the EU. GDPR requires companies to obtain explicit consent for data collection, provide transparent privacy policies, and allow individuals to request access to or deletion of their data. Failure to comply can result in significant fines.

Data privacy regulations like GDPR underscore the importance of respecting individuals' rights to control their personal information. Fintech companies must establish and communicate clear data privacy practices to gain and maintain the trust of their customers.

iii. Cross-Border Data Transfer:

Many fintech companies operate globally, necessitating the transfer of customer data across borders. However, different countries have different data protection laws, which can create challenges for data transfer. The EU's GDPR, for instance, restricts the transfer of personal data to countries with inadequate data protection standards.

Fintech companies must navigate complex legal frameworks to ensure that cross-border data transfers comply with data protection laws. This may involve implementing data localization strategies or using approved mechanisms, such as Standard Contractual Clauses, to facilitate secure data transfer.

iv. Phishing and Social Engineering Attacks:

Phishing attacks targeting fintech customers involve cybercriminals impersonating legitimate entities to deceive users into revealing sensitive information like login credentials or financial details. These attacks can take the form of convincing emails, fake websites, or phone calls.

Fintech companies need to educate their customers about phishing risks and employ fraud detection systems to detect and prevent phishing attempts. Failure to address these threats can result in financial losses for both customers and the fintech platform.

v. Insider Threats:

Insider threats involve malicious actions by individuals within a fintech company, such as employees or contractors, who have access to sensitive data. These individuals may intentionally or unintentionally compromise data security.

Implementing robust access controls, monitoring systems, and conducting background checks on personnel are essential measures to mitigate insider threats. Companies must also provide employee training on data security best practices to reduce the risk of internal breaches.

Cybersecurity and data privacy are critical aspects of fintech operations. These concerns are not only essential for regulatory compliance but also for maintaining customer trust and the reputation of fintech companies. Investing in robust cybersecurity measures, complying with data protection regulations, and continuously educating employees and customers about data security risks are fundamental steps to ensure the security and privacy of financial data in the fintech industry

6. Fintech and Traditional Financial Institutions

The relationship between fintech start-ups and traditional financial institutions is evolving. Collaboration, competition, and partnership strategies are reshaping the industry. This section examines the changing dynamics and the implications for both newcomers and established players in the financial sector.

The relationship between fintech (financial technology) companies and traditional financial institutions is dynamic and evolving. Fintech firms are reshaping the financial industry by leveraging technology and innovative business models to offer financial services in new ways. Here, we'll elaborate on the interaction between fintech and traditional financial institutions:

a. Competition and Disruption:

Fintech companies have introduced disruptive technologies and business models that compete with traditional financial institutions. For example, peer-to-peer lending platforms have challenged traditional banks' lending practices by directly connecting borrowers with investors. Similarly, digital payment providers have posed competition to traditional payment processors.

This competition has forced traditional financial institutions to innovate and adapt. Banks and other established players have responded by investing in their own fintech initiatives or by partnering with fintech startups to stay relevant and competitive.

b. Collaboration and Partnerships:

Many traditional financial institutions recognize the value of fintech innovations and have chosen to collaborate with fintech companies. These partnerships can take various forms, such as joint ventures, investment agreements, or simply leveraging fintech solutions to enhance their own services.

Collaboration allows traditional institutions to access fintech's technological advancements, which can improve efficiency, reduce costs, and enhance customer experiences. Fintech companies, in turn, gain access to the established customer bases and regulatory expertise of traditional financial institutions.

c. Cross-Selling Opportunities:

Traditional financial institutions often have an extensive range of financial products and services. By collaborating with fintech companies, they can cross-sell these services to fintech customers. For example, a bank may partner with a fintech lending platform to offer savings accounts or investment products to borrowers.

Cross-selling can be mutually beneficial, expanding the customer base of both fintech and traditional institutions. It allows fintech companies to offer a more comprehensive suite of financial services, and it provides traditional institutions with access to a younger, tech-savvy demographic.

d. Regulatory Challenges:

The regulatory environment for fintech is complex and varies by region. Traditional financial institutions often have well-established compliance processes, while fintech startups may struggle to navigate regulatory requirements. This can create challenges when collaborating or merging.

Fintech companies need to work closely with traditional institutions to ensure compliance with relevant regulations. Traditional institutions can provide valuable guidance in this regard, but they must also adapt to the more agile and innovative nature of fintech operations.

e. Customer-Centric Approach:

Fintech companies are often praised for their customer-centric approach. They leverage technology to offer seamless, user-friendly experiences that cater to modern consumer expectations. Traditional institutions, which may have legacy systems and processes, are working to catch up in this regard.

Fintech's emphasis on user experience has pushed traditional institutions to improve their digital interfaces and customer service. Many have invested in upgrading their online and mobile banking platforms to remain competitive.

f. Innovation in Financial Services:

Fintech companies have been at the forefront of financial innovation, introducing concepts like blockchain, robo-advisors, and cryptocurrencies. Traditional institutions are adopting some of these innovations but often at a slower pace due to their legacy systems and risk-averse nature.

The innovations driven by fintech are influencing the direction of the entire financial industry. Traditional institutions are recognizing the need to embrace technology and innovation to stay relevant and meet changing customer demands.

The relationship between fintech and traditional financial institutions is complex and multifaceted. While there is competition between the two, there is also collaboration and a mutual recognition of the strengths each brings to the table. The evolving landscape is shaping the financial industry, leading to increased innovation and improved financial services for consumers and businesses.

7. Future Trends and Opportunities

The fintech industry is dynamic, and its future holds numerous exciting trends and opportunities that are poised to reshape the financial landscape. Here, we'll explain some of the key future trends and opportunities in fintech:

a. Decentralized Finance (DeFi):

DeFi is a movement that aims to recreate traditional financial services (like lending, borrowing, and trading) using blockchain technology and smart contracts. DeFi platforms enable peer-to-peer financial transactions without the need for intermediaries, such as banks.

DeFi has the potential to revolutionize traditional banking by offering greater transparency, accessibility, and cost-efficiency. It presents opportunities for lending and borrowing, yield farming, and decentralized exchanges, opening up new investment avenues for individuals.

b. Central Bank Digital Currencies (CBDCs):

CBDCs are digital versions of a country's national currency issued and regulated by its central bank. Unlike cryptocurrencies like Bitcoin, CBDCs are fully backed by the government and carry the same value as physical currency.

CBDCs could enhance payment systems, reduce transaction costs, and increase financial inclusion. Fintech companies may develop innovative solutions and services around CBDCs, such as digital wallets, payment processing, and programmable money.

c. Artificial Intelligence (AI) and Machine Learning:

AI and machine learning are increasingly being used in fintech for tasks like risk assessment, fraud detection, customer service, and investment analysis. These technologies can analyze vast amounts of data to make data-driven decisions.

Fintech companies can leverage AI to personalize financial services, automate routine tasks, enhance customer experiences, and make more accurate predictions. AI-driven robo-advisors, for example, can provide customized investment strategies for individual investors.

d. Green Finance and Sustainability:

Environmental, Social, and Governance (ESG) considerations are gaining prominence in the financial industry. Fintech is playing a role in promoting sustainable investments and responsible finance practices.

Fintech firms can develop platforms and solutions that facilitate ESG investing, carbon tracking, and sustainability reporting. These innovations align with the growing demand for ethical and sustainable financial products.

e. Cross-Border Payments and Remittances:

Traditional cross-border payments can be slow and costly. Fintech solutions, including blockchain and digital currencies, are being explored to streamline international money transfers and reduce fees.

Fintech companies can create efficient, low-cost cross-border payment solutions that benefit individuals and businesses engaged in international transactions. This addresses a significant pain point in global finance.

f. Regulatory Technology (RegTech):

RegTech involves the use of technology to help financial institutions comply with regulatory requirements efficiently. It includes tools for regulatory reporting, risk management, and compliance monitoring.

Fintech companies specializing in RegTech can assist financial institutions in navigating complex regulatory environments, reducing compliance costs, and ensuring adherence to ever-evolving regulations.

g. Cybersecurity and Data Privacy Solutions:

As fintech continues to grow, so do cybersecurity threats. Future trends will involve the development of more advanced cybersecurity measures and data privacy solutions to protect sensitive financial data.

Fintech companies that focus on cybersecurity and data privacy will play a critical role in maintaining trust and security in the financial industry. Solutions that safeguard customer data will be in high demand.

The future of fintech is promising and filled with opportunities for innovation and growth. Emerging trends like DeFi, CBDCs, AI, sustainability, cross-border payments, RegTech, and cybersecurity solutions are likely to shape the industry in the coming years. Fintech companies that can adapt to these trends and seize the opportunities they offer will be well-positioned to drive positive change in the financial sector.

8. Conclusion

Fintech has become a driving force behind the transformation of the financial industry in the current market. This theoretical review paper has explored the multifaceted role of fintech, from promoting

financial inclusion to revolutionizing payment methods, wealth management, lending, blockchain, and more. It has also highlighted the regulatory challenges, cybersecurity concerns, and the evolving relationship between fintech start-ups and traditional financial institutions. As the fintech revolution continues, it presents a wealth of opportunities for innovation and growth in the financial sector. Understanding these dynamics is essential for stakeholders seeking to navigate and capitalize on the ever-changing financial landscape.

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THE STUDY OF IMPACT OF SOCIAL MEDIA ON BRAND LOYALTY OF FEMALE CUSTOMERS

Dr. Sampada Gupchup
Assistant Professor
Institute of Business Management and Research,Wakad, Pune
sampada.gupchup@ibmrpune.

Abstract

For companies and marketing experts, the effect of social media on female consumers' brand loyalty has become a key topic of research. This study aims to investigate the connection between female consumers' use of social media and company loyalty. A questionnaire-based survey with 100 female respondents is used to perform the study. According to the established guidelines, statistical tools andtechniques are used to analyze the survey results. Social media significantly affects female consumers' brand loyalty. The research also reveals that social media personalized marketing campaigns can increase brand loyalty among female consumers. Brands create a more individualizedexperience that can increase consumer loyalty by developing targeted campaigns that communicate directly to female customers. The findings imply that recommendations and personalized content based on customer preferences have a favorable impact on female consumers' brand loyalty. Overall, this study provides insight into the impact of social media on brand loyalty among female customers.Research findings suggest that social media can be a powerful tool for building and maintaining brand loyalty among female customers. The study explores how businesses and marketers engage with female customers on social media, work with influencers, build communities, support social causes, and personalize marketing efforts to build a loyal female customer base. The results of this research will help companies and marketers develop effective social media strategies that address theunique needs and values of their female customers. Further research can be done to examine other factors that influence female customers' brand loyalty on social media.

Keywords: Personalized Marketing, Targeted Campaigns, Recommendations, Customer Preferences, Influencers

Introduction

Social media can have a big influence on female consumers' brand loyalty. Social media may have some effects on this group's company loyalty. Social media gives female customers a platform to interact more personally and connect with the brands they adore. The brand and its female consumers may develop stronger relationships as a result of the increased involvement, which will increase brand loyalty. Female consumers are greatly influenced by social media influencers. Brands can expand their following and increase their visibility by collaborating with female influencers, which increases brand loyalty among female followers. Brands can use social media to foster a feeling of belonging among their female customers. Brands can foster a feeling of community among female customers, which will increase loyalty, by promoting user-generated content, sharing personal narratives, and establishing social media groups.

Social media has grown in importance as a tool for social activism, and companies that support their social values are frequently more popular among female customers. Brand loyalty among female consumers can be increased by companies that support social issues that appeal to them. Socialmedia enables businesses to customize their marketing initiatives to target particular groups, such as female consumers. Brands can create a more individualized experience that increases brand loyaltyby developing targeted campaigns that speak directly to female consumers. Ultimately, social media can be a key factor in fostering and sustaining female consumers' brand loyalty. Brands can use social media to develop a devoted female customer base by connecting with them, interacting with influencers, creating communities, supporting social causes, and customizing their marketing strategies.

Objectives of the study

- ➢ To identify the extent to which social media affects the brand loyalty of female customers.
- ➢ To examine the influence of social media engagement on female customers' brand loyalty.
- ➢ To investigate the impact of influencer marketing on brand loyalty among female customers.
- ➢ To explore the role of social causes in shaping brand loyalty among female customers onsocial media.
- ➢ To analyze the effectiveness of personalized marketing efforts in building brand loyaltyamong female customers on social media.
- ➢ To provide insights and recommendations for brands to leverage social media to build andmaintain brand loyalty among female customers.
- ➢ To contribute to the existing literature on the impact of social media on brand loyalty, with aspecific focus on female customers.

Review of Literature

Social media has emerged as a critical tool for brands to connect with customers, build relationships, and drive sales. One of the key benefits of social media is its ability to build and maintain brand loyalty among customers. However, the impact of social media on brand loyalty, especially among female customers, is not well understood. In this literature review, we examine the existing research on the impact of social media on brand loyalty among female customers.

i.   Social Media Engagements

Several studies have found a positive relationship between social media engagement and brand loyalty among female customers. Higher levels of engagement, such as commenting, sharing, and liking posts, are associated with greater brand loyalty. For example, a study by Gummerus et al. (2012) found that customer engagement on social media positively influences brand loyalty. Similarly, another study by Wang et al. (2018) found that social media engagement positively affectsbrand loyalty, with a stronger impact among female customers.

ii.   Influencer Marketing

Influencer marketing on social media can have a significant impact on brand loyalty among female customers. Studies have found that female customers are more likely to trust and engage with social media influencers who promote brands they like, which can lead to increased brand loyalty. For example, a study by Jin et al. (2019) found that influencer marketing has a positive impact on brand loyalty among female customers. Similarly, a study by Yang and Kang (2020) found that the perceived trustworthiness of influencers positively affects brand loyalty.

iii.   Community Building

Creating a sense of community on social media can also lead to increased brand loyalty among female customers. Brands that encourage user-generated content, share stories, and create social media groups can create a sense of belonging and foster stronger relationships with their female customers. For example, a study by Liu and Huang (2019) found that user-generated content positively affects brand loyalty among female customers on social media. Similarly, a study by Zhang et al. (2020) found that creating a sense of community on social media positively affects brand loyalty.

iv.   Social Causes

Brands that support social causes that resonate with female customers on social media can also increase brand loyalty. Female customers are more likely to support brands that align with their social values, and social media has become an important tool for social activism. For example, a study by Kim and Ko (2018) found that supporting social causes positively affects brand loyalty among female customers. Similarly, a study by Liu et al. (2019) found that corporate social responsibility positively affects brand loyalty among female customers on social media.

v.   Personalization

Personalized marketing efforts on social media can also lead to increased brand loyalty among female customers. Brands that create targeted campaigns that speak directly to female customers can create a more personalized experience, which can lead to greater loyalty. For example, a study by Lee and Kim (2019) found that personalized marketing positively affects brand loyalty among female customers on social media. Similarly, a study by Zhang and Zhao (2018) found that personalized content positively affects brand loyalty among female customers.

The literature suggests that social media can play a critical role in building and maintaining brand loyalty among female customers. By engaging with them, partnering with influencers, building communities, supporting social causes, and personalizing their marketing efforts, brands can use social media to create a loyal female customer base. However, it is important for brands to understand the unique needs and values of female customers and tailor their social media strategies accordingly. Further research is needed to better understand the specific factors that influence brand loyalty among female customers on social media.

Research Methodology

• Literature Review: Conducted a comprehensive literature review of existing studies and research onthe impact of social media on brand loyalty among female customers. This can help identify gaps in the current literature and provide a foundation for the study.

• Survey Questionnaire: Developed a survey questionnaire to collect data on 100 female customers' social media usage, brand loyalty, and purchasing behaviour. The questionnaire includes questions on social media engagement, influencer marketing, social causes, and personalized marketing.

• Sample Selection: Selected a representative sample of female customers who use social media to participate in the survey. The sample selection is based on demographics, such as age, income, education, and location. The respondents were located across India with different age groups, income levels and education.

• Data Collection: Administered the survey questionnaire to the selected sample and collecting the data. The data has been collected using online surveys, email surveys, or social media polls.

Data Analysis

In recent years, social media has become a crucial tool for businesses to connect with customers and promote their brands. This study aims to examine the impact of social media on brand loyalty among

female customers. Specifically, the study focuses on social media engagement, influencer marketing, social causes, and personalized marketing as potential factors affecting brand loyalty. The research design for this study is a survey. The questionnaire was distributed to 100 female respondents across India with different age groups, income levels, and education. The sample selection was based on demographics to ensure that it represents the population.

The questionnaire includes questions on social media engagement, influencer marketing, socialcauses, and personalized marketing. The Likert scale was used to measure the respondents' agreement or disagreement with the statements. Data analysis was conducted using SPSS software.

Social Media Engagement:

The first factor examined in this study is social media engagement. The respondents were asked to rate their level of engagement with the brand on social media platforms. The results show that 40%of the respondents engage with brands on social media frequently, 35% occasionally, and 25% rarely.
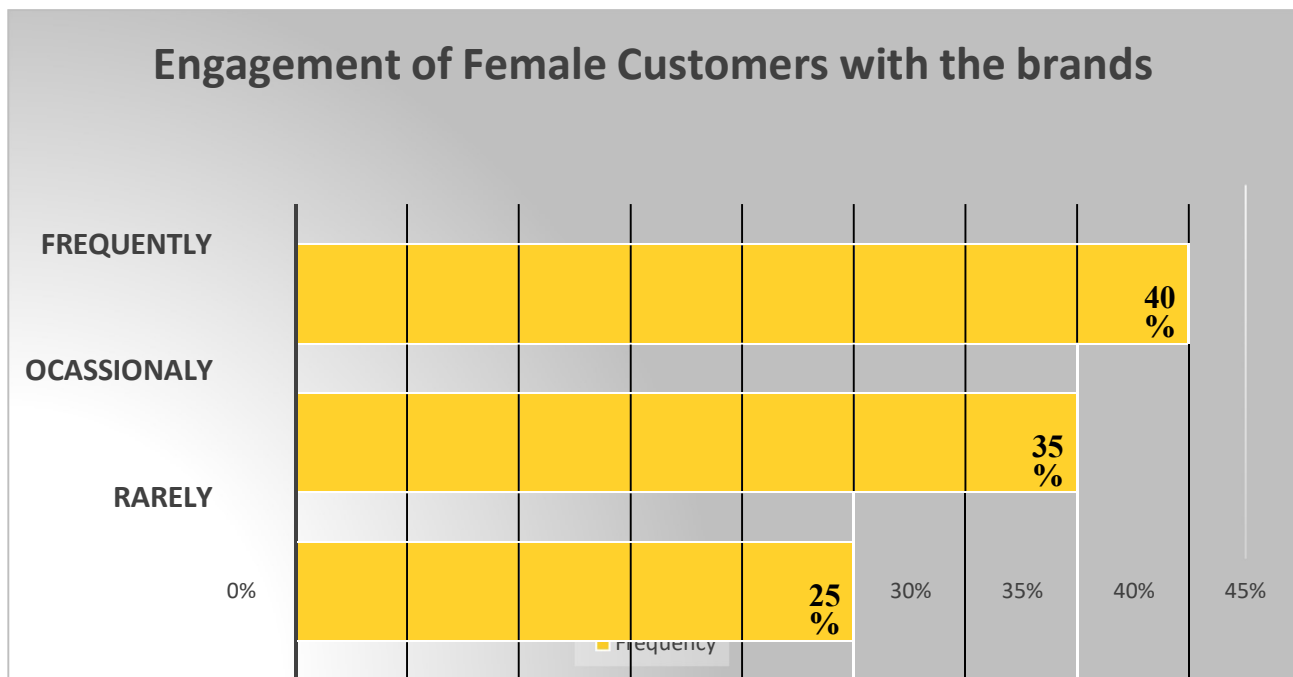
Figure 1

The survey results indicate that the majority of female respondents are highly engaged with social media. Almost all respondents (98%) reported using social media platforms at least once a day and over half of the respondents (55%) reported using social media platforms more than 3 hours per day.

Use of Social Media Platforms by Female

98%

55%

AT LEAST ONCE A DAY

MORE THAN 3 HOURS PER

■ Frequency

Figure 2

When asked about their social media activity, over two-thirds of the respondents (68%) reported commenting on posts, 62% reported sharing posts, and 75% reported liking posts.

SOCIAL MEDIA ACTIVITY

37%

33%

30%

Commenting on posts

Sharing posts

Liking posts
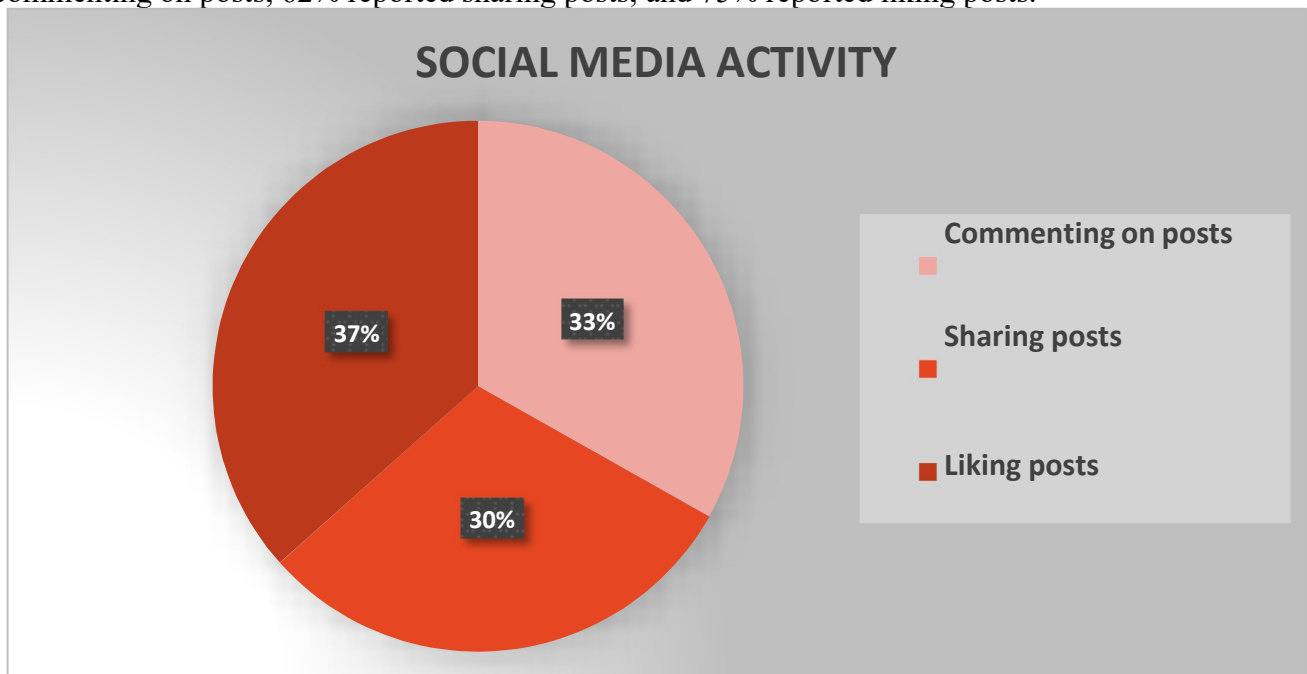
Figure 3

Influencer Marketing:

The second factor examined is influencer marketing. The respondents were asked about their opinions on influencers and their impact on their purchasing decisions. The results show that 45% of the respondents follow influencers on social media, and 35% of them have purchased products or services recommended by influencers.

INFLUENCERS AND THEIR IMPACT ON THEIR PURCHASING DECISIONS OF FEMALE CUSTOMERS
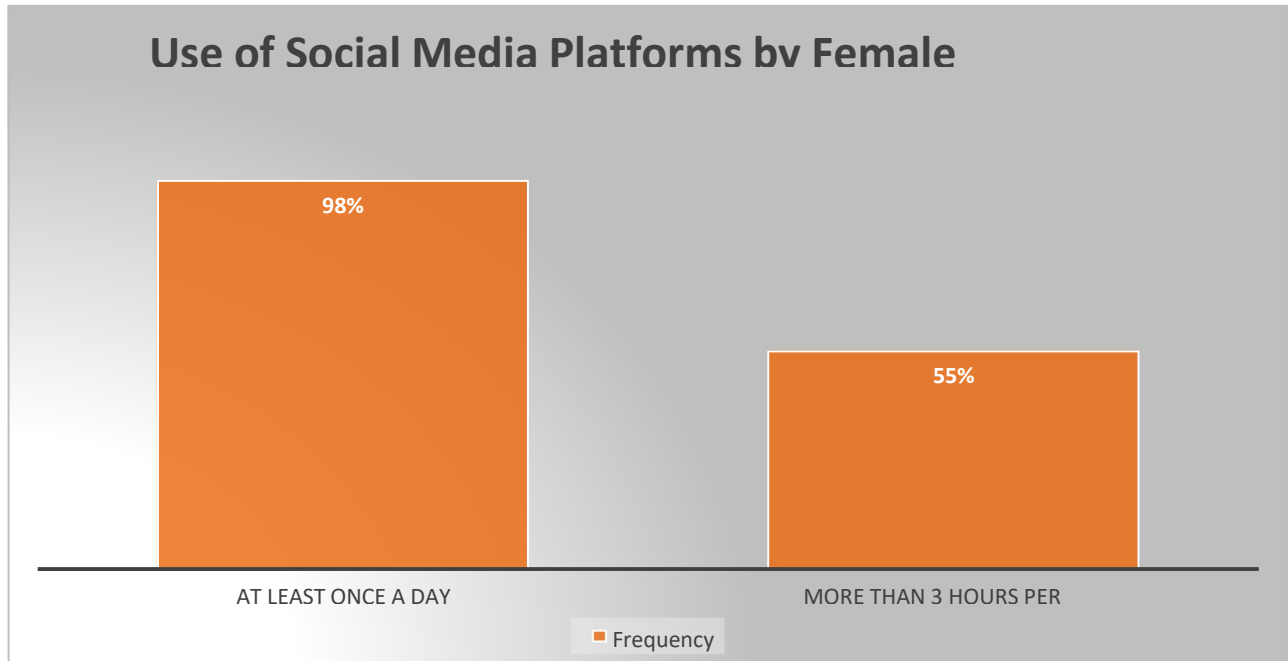
44%

56%

- Follow influencers on social media
- Purchased products or services recommended by influencers
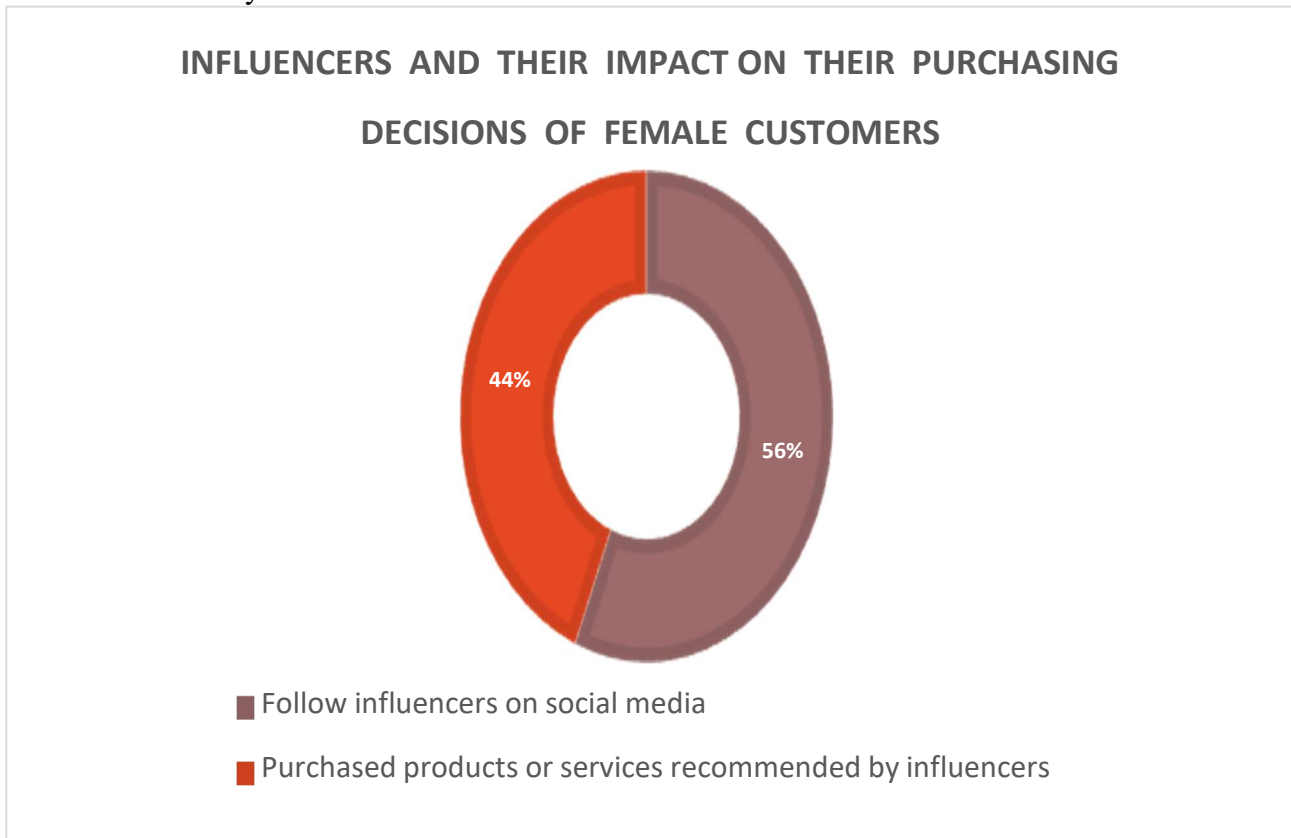
Figure 4

The survey results also suggest that influencer marketing can have a significant impact on female consumers' brand loyalty.

Social Causes:

The third factor examined is social causes. The respondents were asked about their opinions on brands that support social causes. The results show that 60% of the respondents prefer brands that support social causes, and 25% of them are willing to pay a premium price for such products.

OPINIONS ON BRANDS THAT SUPPORT SOCIAL CAUSES

25% of the Respondents are Willing to pay a

60% Prefer brands that support social
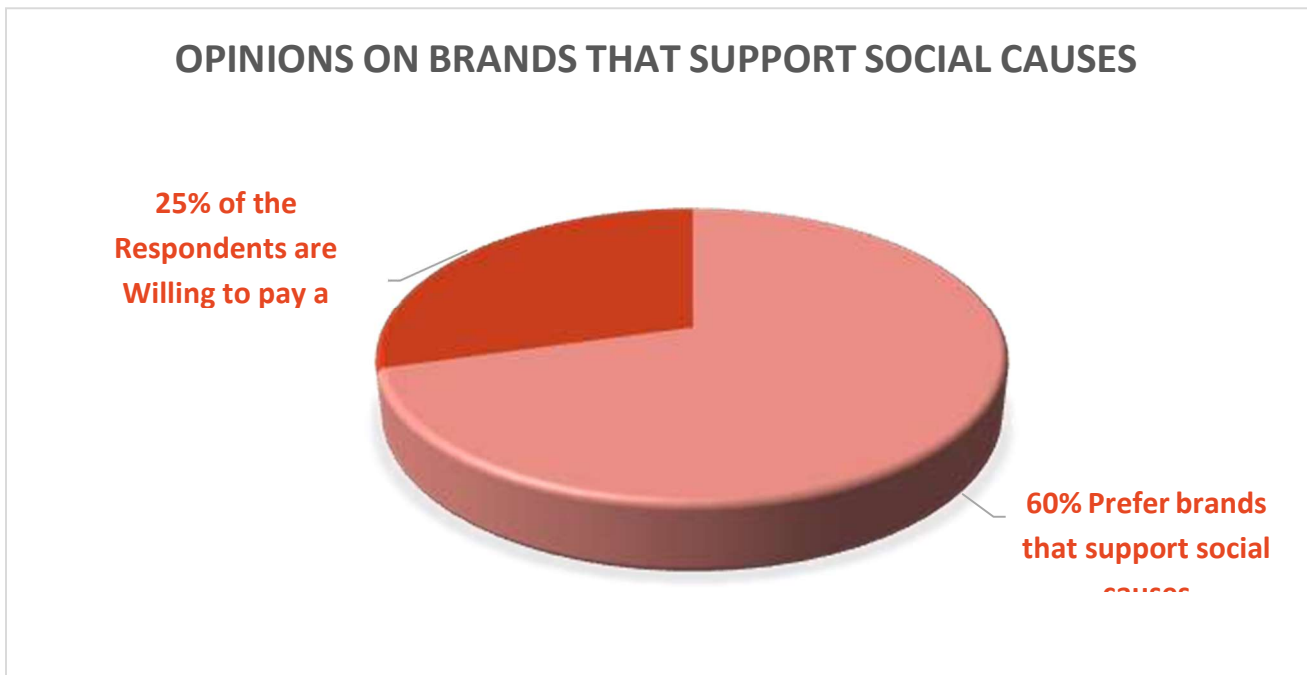
Figure 5

The survey results also suggest that supporting social causes can have a positive impact on female consumers' brand loyalty. These findings suggest that companies that support social causes can build stronger brand loyalty among female consumers.

Personalized Marketing:

The survey results also suggest that personalized marketing campaigns can increase brand loyalty among female consumers. When asked about their attitudes towards personalized marketing, over two-thirds of the respondents (69%) reported that they are more likely to purchase products from companies that provide personalized recommendations based on their preferences.
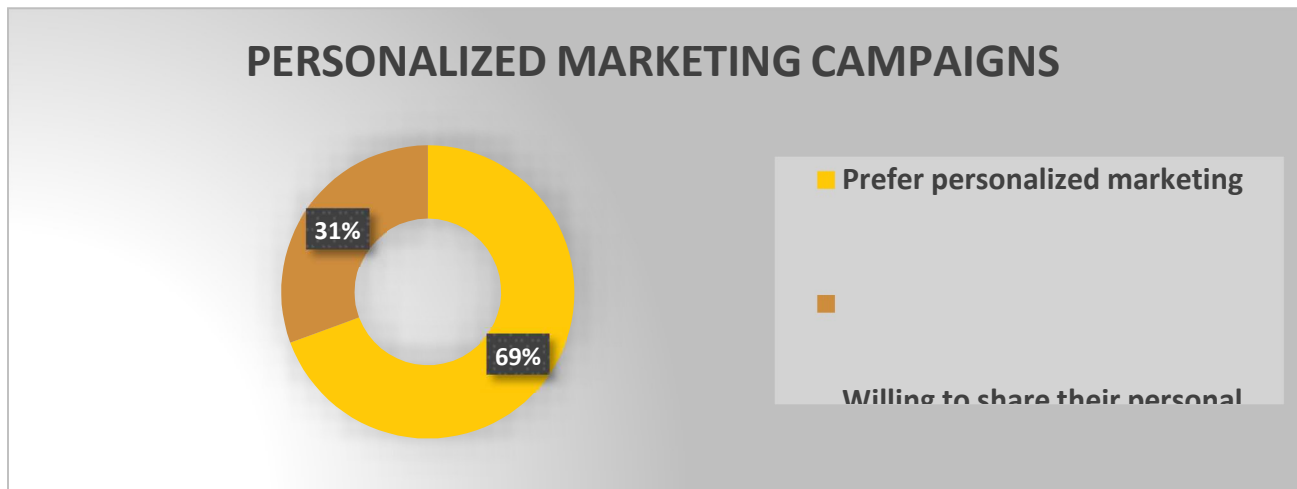
Figure 6

The fourth factor examined is personalized marketing. The respondents were asked about their opinions on personalized marketing and its impact on their purchasing decisions. The results show 31% of them are willing to share their personal data with brands to receive personalized offers. The findings suggest that personalized marketing can potentially affect brand loyalty.

Findings

Overall, the survey's findings point to the potential importance of social media interaction, influencer marketing, charitable giving, and personalized advertising in influencing female consumers' brand loyalty. The results indicate that companies and marketers should concentrate on creating social media strategies that are successful and take into account the particular needs and values of their female consumers. Companies can increase female consumers' brand loyalty by creating a feeling of community on social media platforms, supporting charitable causes, and offering tailored marketing campaigns. It is possible to conduct more study to look at additional elements that affect female customers' brand loyalty on social media.

- The findings suggest that social media engagement can potentially affect brand loyalty.
- As per the data analysis, we find that female consumers are actively engaged with socialmedia platforms.
- The data analysis suggests that influencer marketing can potentially affect brand loyalty.
- These findings suggest that influencer marketing can be an effective strategy for buildingbrand loyalty among female consumers.
- As per the data analysis we find that supporting social causes can potentially affect brandloyalty.
- These findings suggest that companies that provide personalized marketing campaigns canbuild stronger brand loyalty among female consumers.

Conclusion

According to the study, female users are constantly using social media platforms, which presents opportunities for companies and marketers to engage with them personally. Companies can create a sense of community, which can increase brand loyalty, by creating effective social media strategies that address the specific needs and values of their female customers.

According to the research, influencer marketing may be a successful tactic for fostering brand loyalty among female customers. The likelihood that a female customer will become devoted to a brand can rise thanks to the confidence that influencers' followers place in them. Supporting social causes may also have an impact on customer loyalty to a company. Businesses that share the same values as their female customers can foster a feeling of shared purpose that can increase customer loyalty. Many female customers are concerned about social and environmental problems. Additionally, targeted marketing initiatives can increase female consumers' company loyalty. Personalization can foster a feeling of exclusivity and address the particular requirements and preferences of particular consumers, which may increase brand loyalty.

The study's findings indicate that social media significantly influences how devoted female consumers are to particular brands. Effective social media strategies must be created by businesses and marketers that cater to the specific needs and values of their female consumers. Increased brand loyalty among female consumers can be attained by fostering a feeling of community, aiding social causes, utilizing influencer marketing, and offering tailored marketing campaigns.

This research emphasizes how crucial it is to comprehend the distinctive traits and preferences of female customers when creating marketing strategies. Further investigation can be done to look at additional elements, such as the effect of social media influencers, the importance of customer reviews, and the impact of user-generated content, that affect female customers' brand loyalty on social media. Understanding these elements can aid companies and marketers in creating more successful marketing campaigns to win over female consumers on social media.

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Branding Strategies of "iD Fresh Food"

Dr Meenakshi Duggal

Associate Professor

JSPM's Rajarshi Shahu college of Engineering MBA department

duggalm2@gmail.com

Mr Davender Duggal

Research Scholar

Bharati Vidyapeeth deemed University, Pune

dduggal1970@gmail.com

ABSTRACT

The case centers on Mr. Musthafa, an entrepreneur, and his enterprise, iD Fresh Foods India Ltd. With a modest beginning in 2006 as a small shop selling Idli and Dosa batter in Tippsandra, Bengaluru, iD has multiplied its growth and is now present in over 21,000 outlets across 17 cities, with plans to expand to 30 cities in the next years. With numerous awards under its belt, including "Best food marketing idea 2016," "Vocational excellence award 2016," "Best packaging design award 2015," and many others, "iD Fresh Food" would make an excellent case study for B-school students or students in other business management courses and would contribute to the literature on marketing or entrepreneurship

This case study focused on the marketing tactics used by the business to carve out a niche for itself in the crowded RTC (Ready to Cook) packaged food market in an emerging market environment. The case's central question concerns whether the business should stick to its core values of providing packaged foods devoid of artificial preservatives or diversify, as well as how long its market-leading position will be sustained by its close-knit management structure

Keywords: RTC, marketing tactics, Entrepreneurship

INTRODUCTION

"iD's philosophy is to enable the homemaker and not to replace her. As a result, all iD products are preservative-free and traditional Indian foods made the natural way, just like 'made-at-home'." **(P.C. Musthafa, Founder & CEO, iD Fresh Food)**

iD Fresh Food was once again prepared to maintain its leading position in the Ready to Cook (RTC) packaged food market in India with the launch of traditional filter coffee decoction in October 2018 and ready to squeeze and fry Vada batter pack in July 2018. The packet of decoction filter coffee was introduced in order to satisfy customer demand from coffee enthusiasts, with a forecast of INR 500 million in business in FY2018–19. Another innovation to shake up the market was a pouch pack of pre-made Vada batter with an umbrella nozzle to create properly shaped Vada with a hole, a traditional and well-liked south Indian snack. Within weeks of its release, it became one of the fastest-selling products. Both the offerings were once again aligned with the core philosophy of iD Fresh Food- to serve preservative-free products. iD named after Idly and Dosa, started in Bengaluru, in 2006 as a niche to cater the need for readymade Dosa Idli batter with no big competitorsand captured the RTC food market by producing preservative-free quality batter customized to local taste and palate. Increasing sophisticated health awareness, rising demand of hygienically packaged foods as well as Indian's food habit of consuming homemade food had driven the Indian market a perfect place for iD Fresh Food, a company making and selling readymade idly and dosa batter. The company stayed focused in creatinga brand from day one and became a pioneer in this segment very quickly.

With a humble beginning in 2006, iD received a number of accolades (List of awards is added in exhibit 1) and was able to raise an investment of INR 1.5 Billion in February 2017 from Premji Invest and INR 350 Million from Helion Venture in 2014. Once having a fund, the company planned to morph into a multi-product brand, by upgrading the existing system and to expand its business to the international geography such as the US, UK and Singapore to cater the needs for Indian consumers. P C Mustafa, CEO of iD Fresh aspired to be INR 10 Billion Company by the year 2020 as he built a strong brand in a food category with great potential to convert from unorganized to organized packaged foods.

India's RTC food industry witnessed tremendous growth in the last decade. According to the report of British Market Research Company Euro Monitor (April 2017), India would be one of the top five markets for packaged food in the world and is expected to take a third largest market position for packaged food in 2020 (Anurag More, 2018). Though the RTC market was expansive, certain factors could act as a barrier to the growth of the packaged food industry. Due to lack of customers' awareness and low clarity on regulatory mandates on packaged food, trust on packaged food continued to be low in India. Hence, it continued to be difficult to convince Indian customers about the idea of preservative-free packaged food. Further hot and humid climate in India reduced the shelf life of any RTC packaged items. iD's products had a short shelf life as there were no chemicals or preservatives added. The USP of iD for serving preservative free food posed a limitation to the company for product diversification of business. So far, the company was successful in adding products in its

Fresh product line, as mentioned at the beginning of the case. Question is how long? The company had limited option to add products in the fresh products line, which would go well with its existing business philosophy. Would iD Fresh Food need to diversify from its core principle of serving fresh, natural, no chemical packaged food category or stay with its philosophy of products at the cost of low and slow growth?

PACKAGED FOOD INDUSTRY IN INDIA & THE MARKET READINESS FOR iD FRESH FOOD

In India, the packaged food sector emerged as high growth and high-profit sector due to its immense potentials accounting for 32% of India's total food market and worth $40 billion. Food processing industry in India was again one of the largest industries and ranked fifth in terms of production, consumption, export and expected growth and was growing at a Compounded Annual Growth Rate (CAGR) of 20% (IBEF; June 2017). Post liberalization period, India, as an emerging economy was showing steady double-digit growth in "Ready to Cook" (RTC) food industry especially in tier I and tier II cities. A paradigm shift was observed in living standard and lifestyle among urban and semi-urban Indians after the year 2000. Factors like migration of youth over jobs/education, lack of ready infrastructure for cooking while moving out of their homes, rising dual- income families, diminishing culinary skills, paucity of time led to a market of convenience packaged ready- made foods- Ready to Cook (RTC) and Ready To Eat (RTE)packaged food products. Another driving force for penetration of packaged foods was the availability of refrigeration facilities in super store, retail chains, and supermarkets in India as well as the improved supply chain management.

The worth of RTC market was $233.40 million (2013) and expected to reach $754.82 million by 2022 with a CAGR of 14.59%, according to Market Research Future (MRFR). (Shagun Sachdeva, Aug 2017. Associated Chamber of Commerce and Industry of India (ASSOCHAM) survey (July 2017) stated that 76 per cent of parents in big cities, mostly both working and with children served easy-to-make meals at least 10-12 times in a month in some form or the other (IANS, 2017). In a report published in May 2018, Zurich-based investment bank Credit Suisse predicted that the Indian packaged food market would grow to $200 billion over the next decade. Credit Suisse identified three major factors, namely availability, affordability and greater investment for the growth of this sector (Isha Arora, 2018).

Indian RTC market could be segmented based on the geographic region such as north, south, central, west, east and north east market depending on the variety of the cuisine and various food choices. Among all the market, the south region took the most dominant place due to increasing urbanisation and number of migrations. Because of the attractiveness of the market, a number of foreign players tried their hands in this industry but very few companies have emerged as major market players. Nestle was the first company which entered the RTC market by introducing instant noodles. Mostly domestic players dominated this market, as they understood the localtaste and preference in a much better way than the foreign brands like "Danone", or McCain.RTC food market could be categorized into three segments – snack mix (Dhokla mix, Idli-Dosa mix etc.), dessert mixes (Gulab jamun mix, Kheer mix

etc.) and curry making enabler (Gravy mix, Masala mix etc.).

Major players in South Indian Packaged Food Market-

Some major players in this industry were MTR, Gits, ITC, Bambino, Kohinoor foods, and Nutrela.

MTR- MTR Foods, Bengaluru based company, was one of the top five processed food manufacturers. Started as a restaurant in 1924, MTR has listed as Fortune next 500 companies in 2016. In 2017, it was INR 7 Billion Company with wide ranges of products for all types of meals offering pan Indian customers. In 2013, Norwegian conglomerate Orkla acquired MTR foods. MTR was present all over India but mainly dominated theSouth Indian market with 72% market share. MTR served the market with a wide range of products synonymous with quality, taste and convenience. It served both domestic as well as major foreign markets like USA, UK, Australia, New Zealand, Singapore, Malaysia, Japan, Oman and UAE.

Gits- Pioneer brand in the packaged food industry established in 1963. Gits manufactured, sold and exported a wide range of RTE and RTC products. The company was the first company, which introduced instant mixes in India and gained immense popularity in instant RTC market because of its superior quality, intensive distribution network and brilliant marketing strategies. Gits products were widely distributed in India and outside India in more than40 countries including USA, Australia, Asia, the Middle East and Europe.

Maiyas- This was another leading brand in South Indian RTE food category. In 1924, Maiyas started MTR, which was synonymous to south Indian traditional foods. In 2007, Maiyas sold MTR to Orkla as a part of a family settlement with a contract that Maiyas would not sell any rivalry products. Targeting especially consumers of the unbranded product who were looking for authentic tastes, Maiyas already had gained popularity in snacks and RTC product categories. In mid of 2018, the company decided to shut down production following a breakdown between founder Mr. Sadanada Maiya and the private equity investor Peepul capital.

ITC- ITC, one of the major conglomerates in India had two categories of RTC foods- Aashirvaad offering a range of daily delights and Kitchen of India offering gourmet food of India. ITC's branded packaged foods business grew tremendously in last few years, with a number of brands in its portfolio in multiple categories of food like staples, spices, biscuits, confectionery, snacks, noodles, pastas, chocolates along with RTC and RTE meals. ITC aimed to outrun two major giants, Nestle and Britannia in the packaged food market.

In pan India market, other major players in the RTC and RTE packaged food industry were Nestle, Haldiram Foods International Pvt Ltd, Himalaya International Ltd, Bambino and Kohinoor Foods Ltd and Bambino Agro Industries Ltd.

iD entered Bengaluru RTC packaged food market at the right time. During 2005-06, though a number of well- known brands namely Maiyaas, Mavalli Tiffin Room (MTR), GITS food products Pvt Ltd, ITC were available in RTC food sector, no organised player had entered

the "Readymade Idli Dosa" batter section in Bengaluru, thebirthplace of iD Fresh. A huge market was untapped and some local companies were serving the demand with poor quality products and irregular supply. The real competitor for iD was the homemade batter. Bengaluru, is a busy metropolitan city in South India, had an instant potential demand for readymade batter as it was a regular consumable item in South Indian homes. An inelastic demand was observed from day one in this category.

iD FRESH FOOD'S BIRTH & INITIAL HURDLES

Musthafa was bitten up by entrepreneurial bug at the earlier stage of his life (Prasad Usha, 2016). While doing his MBA he used to visit his cousin Nazer's Kirana stores at Thippasandra, Bengaluru during weekends and his free times. He observed that there was a lot of demand for ready-made idli dosa batter in the shop and people were buying irrespective of poor quality and irregular supply. Nazer and Jafar, his cousins suggested him to starta business to sell idli batter. Musthafa invested INR 25,000 to start the batter business. His experience and exposures with MNCs, his cousins' connections with local Malayalee's stores in Bengaluru and the authentic homemade taste of batter helped the business to grow at a quick pace. Initially, iD started with a small amount of batter and distributed as samples to the customers of the known Kirana stores. Once received positive feedback from the consumers the founders gained confidence about starting the idli-dosa batter business.

The journey of iD Fresh Food was not a cakewalk at the beginning. All the founders were from Kerala where idli was not as common as appam. Finding the correct recipe was a challenge. They could sell appam batter but that required a good amount of fermentation, which did not gel well with iD's USP of producing preservative- free food. Again, Bengaluru had a limited market for appams. In 2005, after hiring 60 square feet of space in Indira Nagar, Bengaluru, the founders took almost six months and 3 tonnes of rice to get a perfect idli dosa batter mix.

Hurdles faced by the founders to start iD Fresh Food –

- Convince people about the concept of fresh, natural and preservatives free RTC packaged food. Preservatives were added in most of the available packaged foods, so convincing consumers, retailers and even employees about the idea of preservative-free packaged products was difficult. It took some time to educate and convince people.

- Another challenge was to estimate accurate market demand for iD products. Since iD catered the fresh food segment with low shelf life, the wastage cost was high.

- The third challenge was that none of the founder members had any background in the food industry. They made many mistakes at the initial level.

- They also faced a challenge to remain focussed on ethical values and delivery of consistent quality. So initial operational costs were high.

- Cash flow was another challenge as none of the founders was from a wealthy business background. (Himnshu Kakkar (2017),

In spite of the challenges faced by Musthafa, there was profit in the business from day one (Refer to Table 2 in Exhibit). Therefore, he was never in dilemma, whether to run the business or not. By 2006, the company was able to sell to nearly 200 grocery stores in Bengaluru. Seeing the continuous growth of the business Musthafa had to make a decision to put a shape to the business, rather than just being an investor, he joined the business full time. With proper organisational structure and with the intention to run it professionally, the company started operating formally. In the beginning, the company started as "Best Food Pvt limited"; later to avoid a copyright issue, the company changed its name to "iD Fresh Food Private Limited" (Source: Marketing Dept.,iD Fresh Food).

THE ENTREPRENEUR: P.C MUSTHAFA, FOUNDER OF iD FRESH FOOD

Musthafa was born at Chennalode, a remote village in Wayanad district of Kerala in a poor family. His father was a daily wager and the family lived on the meagre earnings of his father. As a child, he used to help hisfather in his labour jobs after school and during holidays. He was an average student and failed in sixth grade. His father wanted him to join in his work for full time and discontinue his study but his Math teacher Mr. Mathew had convinced his father to pursue his education further.Mr. Mathew took special care for his studies and Musthafa continued to excel in studies. After completing his engineering in 1995, he was placed in a start- up company of Bengaluru. For the company assignment, he went to Ireland and worked there for one and half year. He found it difficult to adjust to the food habits of Ireland, and decided to shift to "Malayalee's own country- Dubai". In 2003, after seven years of stay in Dubai working with Citi Bank, he returned to Bengaluru, India. He returned, as he wanted to spend more time with his parents, to pursue higher education and above all do something for the society. Returning to Bengaluru, he joined IIM, Bengaluru and did Executive MBA programme (Jubin Mehta, 2015) (Prasad Usha, 2016).

BRAND BUILDING STRATEGIES OF iD

iD was never in hurry to penetrate the crowded market and never weaved from its basic philosophy. To create a brand for an unbranded commodity, rather than selling to every mom and pop stores, it emphasized on product quality, on own distribution models (trucks & salesmen) and sold at selected stores. In 2017, iD created its presence in 17 cities viz. Bengaluru, Chennai, Mumbai, Pune, Cochin, Coimbatore, Vijayawada, Guntur, Rajahmundry, Visakhapatnam, Vizag, Mysore, Mangalore, Sharjah, Dubai, Abu Dhabi & Ajman. In an interview with Brand Capital (Mar 22, 2018) Musthafashared the success mantras on how iD created a niche–

- Build a brand for your product.
- No credit was given to the retailers and the company was tightly managed its finance from day one.
- Consistent quality of products, no compromisation on that end.
- Any company should concentrate to make a profit from day one.
- One size does not fit all. Musthafa stated that every market had unique features.
- Innovation should be a continuous process.
- The company should focus to add value to the investors and should identify the

- right investors.
- The customer was queen-iD believed in having a strong connection with customers and a company should understand what role the products or services of the company play in a customer life. (Brand Story by Brand Capital, 2018)

iD continued to sustain its business and maintained its growth with the following marketing strategies:

Target customers

The primary target for iD fresh food were women, both homemakers as well as working women of age group 26
+ years, in the upper and upper middle class of the society (Source: Marketing Dept, iD Fresh Food). A large number of men also found iD products very handy and tasty and preferred iD's "Ready to eat Parotas".

Product, Packaging and Positioning

The preparation of iD food products followed the ultra-hygienic process in HACCP (Hazard analysis critical control point) compliant factories. Product ranges include a wide variety of products starting from Idli, Dosa batter, Udipi style Idli batter, Paneer, Curd, and ready to heat parotas like Malabar Parota, Whole wheat Parotas, Parota for Juniors, and Mini Parotas. After introducing the "Vada Batter" in handy pouches in 2018, the company filed a patent for its innovative packaging. The product was a great hit in the market and it helped iD to penetrate more. In the health food segment, iD also introduced "Ragi Batter" and batter made of Oats and other millets. Though a wide array of products in its SKUs(Stock keeping units) to cater to various needs of customers, lion share of the company's revenue came from idli dosa batter (55%) while parota contributed (30%), chapatti (7%) and the rest from dairy and other products(Source: Marketing Dept, iD Fresh Food). After receiving feedback from customers, iD had introduced a "transformed pouch" pack for dosa, idly batter with the boat-shaped bottom, which would work as a tub for storage for left out content.

Price

iD started with value-based pricing and targeted premium customers. Price of iD products was higher than competitors' products. Musthafa stated, "If the products are worth, add value to the customers, the price is always right".Price for one Kilogram idli dosa batter was Rs70 in 2017 where as competitive brands in Bengaluru, like Hallimane was sold INR55 for 1 kg, Asal for INR 65/kg, Chef's choice for INR 60/kg. Post demonetization period, iD offered some Paytm cash back offers to encourage the non-cash payment transaction. It also offered, "Combo pack" and "Family pack" to cater to diverse consumers' demands. In July 2017, withthe introduction of GST (Goods & Services Tax) by Central Government in India, iDwas running a bit short in generating revenue. The rate of GST on idli and dosa batter reduced from 12% to 5% and the traders ceased to stock the products, as they found difficult to sell the products at old rates.

Place/ Distribution

The company directly distributed the products and was extremely choosy in selecting the retailers onboard, as the products needed to be refrigerated properly. The products were sold only through those retailers who did notswitch off their chillers at night. In 2017, the number of such retailers was only 6000 out of total 65,000 retailersin Bengaluru city. To deliver fresh products the company had manufacturing unit at Bengaluru (Hoskote), Chennai, Hyderabad, Mumbai and Ajman in the gulf area. The share of revenue from different market found out to be 40% from Bengaluru, Dubai 20%, Mumbai 12%, Hyderabad 12% whereas other cities around 16% (Source: Marketing Dept., iD Fresh Food). For online selling the company collaborated with well-known online retailers Big Basket and Grofers(Team PDD (2016). In the B2B business, the company appointed dedicated sales force that catered to hotels such as Taj, Lemon Tree and Marriot, restaurants such as Adiga's and Empire outlets and well-known caterers and airline kitchens such as Oberoi flight kitchen and Sky gourmet.

Use of "State of the art Technologies"

For accurate estimation of demand, sales team usedSAP-based software "BIZOM' which worked on real-time data. This mobile app helped the company to keep track of the sales pattern in each store and to maintain zero inventory model- almost 90% of the products were sold on the same day. Musthafawasalways keen for adopting latest technologies to improve operational efficiencies and during 2015-18, the company spent around INR 20 Million on technology, which included machinery and other software like "Geofencing" (Himanshu Kakkar, 2017). Geofencing is a software using GPS technologies, which helped iD to track its supplies, ensured that supplies reach on time and finally controlled the wastage.

Promotion & Marketing Communication

According to Musthafa, word of mouth worked wonders for iD. He strongly believed that if the product was packaged right, and customers were serviced properly, half the marketing was done. This could be the cheapest form of marketing or branding. (Himanshu Kakkar, 2017).iD used a 360-degree branding and marketing approach through various communications like Above the line advertising (ATL), Below the line advertising (BTL), digital marketing, social media marketing and building public relation. ATL was mainly used to enhance brand awareness, brand recall and visibility by using strategies like bus shelter campaign, gantry advertising, and attractive digital screen display at airport and metro stations, television advertising, especially in regional channels, newspaper advertisement, radio advertisement. The company relied heavily on below the line promotional methods because of the nature of products sold. BTL helped the company to enhance persuasion of the purchase decision. For BTL promotion, iD used displays and hoarding at the point of sale, in a retail store, and YouTube viral. Occasionally it did price promotion though, the company was cautious of not diluting its premium product image. Musthafa took special care for creating public relation by attending press interviews, tv releases, trade shows,

conferences, talk shows etc. To create social awareness, iD launched a digital campaign with Army veterans, and campaigned in the month of August, during Independence Day celebration of India. iD even experimented with disruptive marketing activities like "Trust shop" at limited places where customers had the option to take products from vending machines and pay later if satisfied. This venture was not successful. Another recent ad campaign launched by iD was "MYN-Meet your Neighbour" which was all about bringing communities together by inviting neighbours to join a home-cooked meal. (Source: Marketing Dept., iD Fresh Food).

THE JOURNEY AHEAD AND THE CHALLENGES ALONG THE WAY

Growing demand for "packaged food', both in the categories of RTC and RTE were observed for the past few years and this trend would continue even in the future. Packaged food market was mainly concentrated in Urban India (around 80%). However, almost 65% of Indian Population lived in Rural India(Anurag More, 2018). With the improvement of infrastructure and an increase in wages, the rural market was coming up as a promising market. iD Fresh food was ambitious and confident to establish itself as an INR 10 Billion company in this segment by 2020(Deepti Govind, 2018). Rahul Garg, partner of Premji invest acclaimed, "There is a billion dollar opportunity in the RTC segment, where iD has achieved the market leader position due to its first mover advantage" (Kashyap S., 2017).

With raised funds from Premji Invest, and Helion Venture, company planned to upgrade the existing system, invest more in Research &Development and consider expansion to widen its reach. Company's growth plan included starting three modern plants in Bengaluru, Mumbai and Dubai, and close down old plants in Mumbai and Dubai. The company would like to increase its production capacity by seven times with new production set up. iD's expansion plan included market penetration, product development and geographic expansion. Existing RTC market across Chennai, Bengaluru, Mumbai and Hyderabad was on a steep rise because of large migrated professional and iD wanted to be a household name for the daily meal. iD planned to enter into Delhi and Ahmedabad market after its success in South Indian market. It also planned to expand its business in ten Middle East cities, specifically Muscat and Kuwait, US, UK and Singapore. Test launching started for all these overseasmarkets and the company initiated scrutinizing all possible options to enter foreign markets.

iD knew that initial success could be slowed down by stiff competitions from forthcoming local "me too" types of substitute products. Again, Western breakfast and snacks were gaining popularity due to globalisation and lifestyle changes in the urban area. Challenges even lied on maintaining global standards of food safety, creatingawareness, infrastructure backup as well as effective distribution networks in these new geographies. What would be the best way to add more products to the existing product line? Should it diversify shifting from its core philosophy of serving preservative free natural packaged food? The company reached a great height within a short span. Is it because of Musthafa's innovative and professional management style? Should the company decentralise its existing close-knit

management style to achieve rigorous expansion and achieve projected growth? Would it be able to meet the customers' expectation in overseas countries and maintain a global standard?

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MODELLING SPATIAL– TEMPORAL TRENDS ON MEASLES: A CASE STUDY OF TARABA STATE OF NIGERIA

Habiba Danjuma, Bilkisu Maijama'a
Emmanuel Chaku Shammah
Department of Statistics, Nasarawa State University, Keffi, Nasarawa State
Email: maijamaab@nsuk.edu.ng

Abstract
Measles remains a significant public health concern in many regions of the world, including Taraba State of Nigeria. The dynamics of measles transmission are influenced by various factors, including spatial and temporal trends that affect the spread and intensity of the disease. However, there is a lack of comprehensive understanding regarding the spatial-temporal trends of measles, hindering effective control and prevention strategies. This is due to the absence of a robust modeling framework that can accurately capture the spatial and temporal dynamics of measles. Therefore, the problem at hand is the absence of a robust modeling framework that can accurately capture the spatial and temporal dynamics of measles. The aim of this study is to model spatial and temporal trends of measles data relating to a series of non-overlapping areal units during multiple time periods and the objectives are to determine the robust spatio – temporal model and interaction effect on area unit data through simulations. In this study, the territory is divided into k = 1,..., K (where K = 9 areal units). This constitutes different communities with data on measles susceptibility obtained over time periods t (where t = 1, 2, 3…). Different Bayesian hierarchical logistic regression models (namely, binomial, poison and negative binomial) will be used for modeling the data, in order to get the best among them. This study is therefore expected to provide a suitable spatio-temporal model for measles' susceptibility in Taraba state of Nigeria.

Keywords: Spatial data, temporal data, measles, Areal units, modeling, forecasting

Introduction

Spatial data is any sort of data that refers to a certain geographical area or location, either directly or indirectly. Spatial data are observations made from different surrounding but non-overlapping areal units, such as constituency, ward, voting unit, and so on. Because each observation pertains to a complete areal unit, it is frequently a metric such as a mean, percentage, or total for the entire unit. The proportion of Measles incidence in the Maiduguri Northern Area of Nigeria (Isa et al 2012), the average SAT college entrance exam score among US states (Wall 2004), and the effect of noise generation in specific areas of Kwara State, Nigeria (Akeyede et al, 2020). Spatial data analysis has grown in popularity in recent years as a result of the establishment of areal unit databases, such as the national bureau of statistics (NBS) in Nigeria.

These databases provide information on a set of K areal units for T successive points in time, resulting in a rectangular array of KXT spatio-temporal observations. The goals of modeling these data are varied. Some of the motivations include estimating the effect of a risk factor on a response in selected areal units (Wakefield 2017), identifying clusters of neighboring areal units with a high risk of disease compared to bordering areas (Anderson et al 2014), and measuring the proportion of isolation in a geographical area among different clusters (Lee et al. 2018, 2021, and 2022).

However, when evaluating this data, a common challenge is spatio-temporal autocorrelation, which occurs when observations from geographically close areal units and temporally similar time periods show more comparable responses than observations and time periods that are further apart. Temporal autocorrelation arises when data from the same populations are collected in successive time periods, whereas spatial autocorrelation might occur as a result of unmeasured problems, areal unit effects, and grouping effects. The spatial data is traditionally modeled using a Bayesian inferential technique, with the spatio-temporal autocorrelation represented by sets of autocorrelated random effects. To capture this autocorrelation, conditional autoregressive (CAR) priors and spatio-temporal extensions are often provided to these random effects. To date, a variety of models have been presented, and the best model relies on the goals of the analysis,

Measles is one of the most transmissible of human infections, caused by a virus which is a member of genus Morbillivirus of the family of Paramyxoviridae (Bhella et al,2007) and it is known to communicate a disease to any persons, via airborne droplet, who have not beforehand had the disease or been successfully immunized (Heymann, 2015). It has an incubation period of 7 to 18 days from exposure to onset of fever (Heymann, 2015). In societies and areas where the immunization is not generally spread, more than 90% of people are infected by the age of 20 years. For the reason that there is no antiviral treatment for measles virus, vaccination and supportive care, such as good nutrition and adequate watery intake, are mainly used to fight measles (WHO, 2015). It is estimated that approximately 5 million of the 80 million children born each year in the developing world die and approximately the same number become crippled, blind, mentally retarded, or otherwise afflicted as a result of vaccine-preventable diseases (Okonko et al, 2019).

 The aim of elimination of measles has been reached in countries of the World Health Organization (WHO) Region of the Americas through measles vaccine and careful measles investigation. The complete eradication goals of measles are set for 2012 and 2015 in Western Pacific and European and Eastern Mediterranean regions, respectively, whereas Africa and South-East Asia have set their target for 2020 (Heymann, 2015). Consequently, many studies have revealed that the distribution of measles risks vary quite often spatially due to different risk factors such as level of immunization, susceptible population, and other indicators, many socio-economic (Chiogna et al, 2004, Zhu et al, 2013).

Despite the introduction of a safe and effective vaccination in 1953, measles remains a major cause of childhood morbidity and mortality in Nigeria. Although the population-based prevalence of measles in Nigeria is unknown, tertiary hospital-based research have found that it accounts for 1.3 to 5.1% of all pediatric admissions (Ibrahim et al,, 2019). A study to determine the statistical analysis of morbidity and mortality due to measles cases in Borno state was investigated by (Isa et al, 2012). This was undergone to provide whether there is difference between incidence of measles on children (1- 14years) and adult (15years and above), whether there are differences among male and female death due to incidence of measles, whether the

incidence of measles is independent of age and sex. This help to provide baseline data for public health policy formulation and awareness campaign for both government and other organization to know the status of incidence and death due measles cases in the state.

Statement of Problem

Measles remains a significant public health concern in many regions of the world, including Taraba State in Nigeria. The dynamics of measles transmission are influenced by various factors, including spatial and temporal trends that affect the spread and intensity of the disease. However, there is a lack of comprehensive understanding regarding the spatial-temporal trends of measles, hindering effective control and prevention strategies. This is due to the absence of a robust modeling framework that can accurately capture the spatial and temporal dynamics of measles.

Meanwhile, the existing studies on measles often focus on individual aspects such as epidemiology, vaccination coverage, or disease burden, but fail to integrate these factors into a unified spatial-temporal model. This knowledge gap limits our ability to identify high-risk areas, understand transmission patterns, and design targeted interventions to mitigate the spread of measles effectively.

Aim of the study

The aim of this study is to model the spatial and temporal trends of measles in Taraba State of Nigeria

Objectives of the study

The objectives of the study are:

i. To model spatio- temporal data relating to a set of non-overlapping areal units that are observed over multiple time periods,
ii. To determine the spatio – temporal interaction effect on area unit data through simulations,
iii. To provide a suitable model for capturing the autocorrelation via random effects using spatio - temporal extensions of conditional autoregression(CAR) priors within a hierarchical Bayesian model,
iv. To determine best model to fit and forecast the measles data at different area units using different distributions.

Literature Review

Spatial data analysis necessitates the use of an underlying geographic framework to find the spatial phenomena under investigation. Lee et al. (2021) and others have distinguished two essential approaches of describing geography: a discrete view of spatial phenomena and a continuous view of spatial phenomena.

Hull et al. (1983) described a measles outbreak in a Nigerian hamlet, which they revisited three and nine months later to examine the disease's impact. According to the findings, children who had been exposed to measles had a considerably higher probability of dying following the acute

infection than community controls. Deaths occurred throughout the 8-month follow-up period. The extra death rate appeared to be especially high for children under the age of one year. Other studies in Nigeria and Burkina Faso (Aaby et al, 1989) indicate an increase in mortality for several months following measles infection. Charts resulting from spatio-temporal analysis of variations in measles incidences are often used to identify changes over time and areas of a region or a country with most disease occurrences in order to plan for a proper intervention and targeted distribution of help to most affected areas (Zhu et al, 2013). They are certainly regarded as useful tools for geographically targeted interventions, monitoring, and evaluation of infectious diseases such as measles. However, because of confidentiality issues, spatio-temporal analyses of disease surveillance data, such as measles data, are often presented in aggregated form over time or an area. Nevertheless, health decisions might be needed at lower administrative boundaries from the levels where data were originally collected.

Furthermore, a research in Guinea-Bissau (Aaby et al. (1984)) revealed that the excess mortality continues into the following year; comparable observations of extra mortality delayed for more than a year were also made in Guinea-Bissa during 1984 for an outbreak that began in early 1983. At least two studies have looked into delayed morbidity after measles infection (Shahid (1983) and Bhaskaram. (1984)).Early measles virus exposures Children who are exposed to measles in their early months of life suffer more severe consequences than those who catch the disease later in life. In Guinea-Bissau, for example (Aaby et al., 1990), the mortality rate among children who lived in residences where measles had occurred during the first 6 months of their lives was three to four times greater than that of community controls. Following measles outbreaks, this behavior has been reported several times in Bissau, the capital.

Approaches for dealing with spatial and temporal dependence in areal data in a Bayesian framework can be found, among others, in Ugarte et al. (2012), Rushworth et al. (2014), Lawson (2018), and Napier et al. (2018). Beraha et al. (2021) investigate the issue of spatially dependent areal data and propose modeling the data obtained for each areal unit using a finite mixture of Gaussian distributions. A logistic transformation of Gaussian multivariate CAR models is used to introduce spatial dependency via a joint distribution for a set of vectors on the simplex. Based on an extended linear mixed effects model, Nicoletta et al. (2022) offer a Bayesian model for spatiotemporal data. Fischer and LeSage (2015), in the spirit of the current paper, compute the posterior prediction probabilities for the assignment of areal units to clusters using a spatio-temporal stochastic panel relationship of economic variables such as income and human capital.

In addition, in Cadonna et al. (2019), the spatial domain is a normal bivariate grid of the Milan metropolitan region, whilst the proximity matrix is given by nearby Italian administrative provinces. We emphasize that we present a Bayesian model for grouping areal specific time series of unemployment rates with cluster estimates that do not alter over time. Time-varying provincial clustering would necessitate a different modeling method, as demonstrated by Page et al. (2022). Instead, De Iorio et al. (2022+) cluster time series of Mexican stock exchange share prices using subject-specific factors from a BNP prior.

Mozdzen et al. (2022) employed a conditional autoregressive prior to include spatio-temporal random effects, where the temporal correlation is handled by an autoregressive mean decomposition and the spatial correlation by the precision matrix inheriting the surrounding structure. Their combined distribution is a Gaussian Markov random field with a sparse precision matrix that allows efficient sampling procedures to be used. They used a nonparametric prior to cluster the areal units, learning latent partitions of the areal units. The

model's performance is accessed through an application used to investigate regional unemployment patterns in Italy. The suggested model provides more exact estimates when compared to existing spatial and spatiotemporal competitors. The additional information provided through clustering enables a more comprehensive economic explanation of the unemployment rates in the Italy.

Despite the fact that there are several ways for dealing with geographically (SP) time-to-event data (e.g., Lee and Pettersson, 2021; Choi and Lawasn 2011), present SP models either neglect spatial autocorrelation and interaction effects entirely (Banerjee and Carlin, 2004). We provide the best model that can overcome these restrictions while also allowing researchers to model geographic clustering in their disease data. As a result, this study proposes Bayesian hierarchical models for predicting spatiotemporal data on linked simulated data and measles data in Taraba state. The following are the primary contributions of this study to the analysis of spatiotemporal areal data: (a) execute model-based clustering of areal time series using time- and areal-specific predictors as well as CAR-modeled random effects; and (b) account for spatiotemporal random effects using the CAR specification.

Methodology

This study's population consists of 16 local government areas in Taraba state, nine (9) of which were chosen from the state's three senatorial districts. Data on measles cases were collected in each local government area for 30 years to analyze the spatial-temporal effect across the region and time. Samples are selected using simple random sampling procedure. The research covers the following local government areas in Taraba state, Bali, Gashaka, Gassol, Takum, Donga,Wukari, Jalingo,Zine and Lau.

Furthermore, simulation was also carried out based on the distributions stated below to pick the best among them. Bayesian hierarchical logistic regression models (binomial, poison, and negative binomial) will be used to model the fraction of children susceptible to measles. The tiers of our Bayesian hierarchical model are as follows:

$$Y_{kt} \sim bin(N_t, \theta_{kt})$$

$$Y_{kt} \sim pois(N_t, \theta_{kt})$$

$$Y_{kt} \sim nbin(N_t, \theta_{kt})$$

$$\ln\left(\frac{\theta_{kt}}{1 - \theta_{kt}}\right) = Y'_{kt}\beta + \delta_t + e_t \qquad (1)$$

The logit measles probabilities are represented as a linear combination of a $px1$ vector Y_{kt} of covariates and their related regression parametersβ, as well as two random effects δ_t and e_t

On the regression parameters, a diffuse multivariate normal prior distribution, N (0,I), is applied.

$$\beta \sim N(0, I)$$

Where I_{pxp} is the identity matrix? Once the covariate effects have been accounted for, the random effects δ_t and e_t are included to describe the geographical and temporal trends and autocorrelation in the data. First, the temporal random effects $e_t = e_1, e_2, \ldots, e_N$ have the following random walk of order one prior distribution:

$$e_t \sim N(e_{t-1}, \sigma^2), t = 1, 2, \dots, N$$

The e_t will be varied for different prior distributions as follows

$$e_t \sim Unif(e_{t-1}, \sigma^2), t = 1, 2, \dots, N$$

$$e_t \sim exp(e_{t-1}, \sigma^2), t = 1, 2, \dots, N$$

$$\sigma^2 \sim inversegamma(0.1, 0.1)$$

The effect at the preceding time period e_{t-1} is the mean of the temporal random effect e_t at time period t. Thus, the temporal random effects describe the region's overall temporal trend in measles susceptibility.

Spatio-Temporal Interaction Effect for areal unit data

The most common modeling approaches utilize a main effect, interaction effect or an autoregressive structure (as in Knorr-Held, 2000 and Rushworth et al, 2014). Different levels of this effect will be examined on the model. Data simulation techniques are used to estimate the numbers of susceptible measles cases (y_{it}) per year and the number of children visit the hospital (n_{it}). The interaction effect (γ_{kt}) is incorporated in (1) to give (2) as follows

$$\ln\left(\frac{\theta_{kt}}{1 - \theta_{kt}}\right) = X'_{kt}\beta + \delta_t + \gamma_{kt} + e_t \qquad (2)$$

$$\gamma_{kt/\mu_t \sim N(0, \mu_t^2)}$$

Where θ_{kt} is estimated probability of having measles at a particular region and time? The remaining terms in the linear predictor are $\delta = (\delta_1, \delta_2, \dots \delta_N)$ and $e = (e_1, e_2, \dots, e_N)$. what are the general regional and temporal patterns in the estimated probability _kt? Both are conditional autoregressive (CAR) models with various variations of the interaction effect.

$\gamma_{kt/\mu_t \sim N(0, \mu_t^2)}$ Being interaction effect its mean values will also be varied in the simulations to investigate the levels spatio- temporal interaction effect on the data.

Spatio-Temporal Models for M_kt

All models in this study introduce spatial autocorrelation into the response data Y through the latent component M, which is accomplished through a K neighbourhood matrix W = (w_kj). W typically contains binary elements, with w_kj = 1 if two areal units (S_k, S_j) share a common border (i.e. are geographically close) and 0 otherwise. Furthermore, w_kk = 0. This indicates that (Mkt, M_jt) values for spatially adjacent areal units (S_k, S_j) are spatially autocorrelated, whereas values for non-neighboring areal units are conditionally independent given the remaining Mit values. This binary specification of W based on sharing a common border is the most widely employed for areal data, while CARBayesST simply requires W to be symmetric and include non-negative elements.

(i) Spatio-Temporal (ST) CARlinear - fits a model comparable to Bernardinelli et al.'s (1995) spatially variable linear time trends model).

(ii) Spatio-Temporal (ST) CARanova - fits a model comparable to Knorr-Held's (2000) spatial and temporal main effects and space-time interaction model.

(iii) Spatio-Temporal (ST) - fits a model comparable to Napier et al.'s (2016 and 2019) overall temporal trend and independent spatial surfaces model. This model can only be used with binomial or Poisson data.

(iv) Spatio-Temporal (ST)- fits Rushworth et al.'s (2014a) spatially autocorrelated autoregressive time series model.

These four models are considered to fit our simulated data of different categories of distributions, parameter values/ levels, levels of interaction effect, autocorrelaton levels and sample sizes in order to estimate the susceptibility of measles across the regions. The details of the models description are given as follows

1. Spatio-Temporal (ST) CARlinear

The model is based on Bernardinelli et al.'s (1995) proposal and is given by

$$M_{kt} = \beta_1 + \emptyset_k + (\alpha + \delta_k)\frac{(t-\bar{t})}{N} \qquad (3)$$

$$\emptyset_k \sim N\left(\frac{\rho_{int}\sum_{j=1}^{k}w_{kj}\emptyset_j}{\rho_{int}\sum_{j=1}^{k}w_{kj}+1-\rho_{int}}, \frac{\tau_{int}^2}{\rho_{int}\sum_{j=1}^{k}w_{kj}+1-\rho_{int}}\right)$$

$$\delta_k \sim N\left(\frac{\rho_{slo}\sum_{j=1}^{k}w_{kj}\delta_j}{\rho_{slo}\sum_{j=1}^{k}w_{kj}+1-\rho_{slo}}, \frac{\tau_{slo}^2}{\rho_{slo}\sum_{j=1}^{k}w_{kj}+1-\rho_{slo}}\right)$$

$$\tau_{int}, \tau_{slo} \sim Inverse - Gamma(a,b),$$

$$\rho_{int}, \rho_{slo} \sim Uniform(0,1),$$

$$\alpha \sim N(\mu_\alpha, \sigma_\alpha^2).$$

In this case, $\bar{t} = \frac{\sum t}{N}$, and the modified linear temporal trend covariate is $(t-\bar{t})$, and it runs over a centered unit interval. Each areal unit k has its own linear temporal trend, with a spatially variable intercept $\beta_1 + \varphi_k$ and slope $\alpha + \delta_k$. The β_1 term is derived from the covariate component in (1). The CAR prior introduced by Leroux et al. (1999) is used to describe each set of random effects $\emptyset = (\emptyset_1,\ldots,\emptyset_k)$ and $\delta = (\delta_1,\ldots,\delta_k)$ as spatially autocorrelated and mean centered.

ρ_{int}, ρ_{slo} are spatial dependency parameters, with one indicating strong spatial smoothness, which is equal to the intrinsic CAR prior described by Besag et al. (1991), and zero indicating independence. For the spatial dependency parameters (ρ_{int}, ρ_{slo})), flat uniform priors on the unit interval are specified, whereas conjugate inverse-gamma and Gaussian priors are specified

for the random effects variances (ρ_{int}, ρ_{slo})) and overall slope parameter, respectively. The user can select the corresponding hyper-parameters (a, b, μ, α, σ^2 α), and the default values are $(a = 0.001, b = 0.001, \mu_\alpha = 0, \sigma_\alpha^2 = 1000)$. Alternatively, rather than being estimated in the model, the dependence parameters (ρ_{int}, ρ_{slo}) can be fixed at values in the unit interval [0, 1] by passing arguments to the ST.CARlinear method.

2. Spatio-Temporal (ST) CARanova

The model is a version of Knorr-Held's (2000) proposal, and it is given by

$$M_{kt} = \emptyset_k + \delta_t + \gamma_{kt} \qquad (4)$$

$$\emptyset_k \sim N\left(\frac{\rho_S \sum_{j=1}^k w_{kj}\emptyset_j}{\rho_S \sum_{j=1}^k w_{kj}\emptyset_j + 1 - \rho_S}, \frac{\tau_S^2}{\rho_S \sum_{j=1}^k w_{kj}\emptyset_j + 1 - \rho_S}\right)$$

$$\delta_k \sim N\left(\frac{\rho_T \sum_{j=1}^k w_{kj}d_{tj}\delta_j}{\rho_T \sum_{j=1}^k d_{tj} + 1 - \rho_T}, \frac{\tau_T^2}{\rho_T \sum_{j=1}^k d_{tj} + 1 - \rho_T}\right)$$

$$\tau_S^2, \tau_T^2, \tau_I^2 \sim Inverse - Gamma(a, b),$$

$$\rho_S, \rho_T \sim Uniform(0, 1),$$

$$\gamma_{kt} \sim N(\mu_\alpha, \tau_I^2).$$

In this case, the spatio-temporal autocorrelation is represented by a common set of spatial random effects $\emptyset = (\emptyset_1, \ldots, \emptyset_k)$ and a common set of temporal random effects $\delta = (\delta_1, \ldots, \delta_k)$, both of which are represented by the CAR prior given by Leroux et al. (2000). Additionally, the model can include an optional set of separate space-time interactions $\gamma = (\gamma_{11}, \ldots, \gamma_{kt})$, which can be given in the function call by the argument interaction (the default). All random effect sets are mean-centered. For the remaining parameters, fixed uniform (ρ_S, ρ_T) and conjugate $(\tau_S^2, \tau_T^2, \tau_I^2 I)$ priors are supplied, with the latter having default specifications of (a = 1, b = 0.01).

Here the spatio-temporal autocorrelation is modeled by a common set of spatial random effects $\emptyset = (\emptyset_1, \ldots, \emptyset_k)$ and a common set of temporal random effects $\delta = (\delta_1, \ldots, \delta_k)$, and both are modelled by the CAR prior proposed by Leroux et al. (2000). Additionally, the model can incorporate an optional set of independent space-time interactions $\gamma = (\gamma_{11}, \ldots, \gamma_{kt})$, which can be specified by the argument interaction=TRUE (the default) in the function call. All sets of random effects are mean centred. Fixed uniform (ρ_S, ρ_T) and conjugate $(\tau_S^2, \tau_T^2, \tau_I^2 I)$ priors are specified for the remaining parameters, and the default specifications for the latter are (a = 1, b = 0.01). Alternatively, rather from being estimated in the model, the dependent parameters (ρ_S, ρ_T) could be fixed at values in the unit interval [0, 1]; see the help file for this function for further information.

3. Spatio-Temporal (ST) CARspatial

The approach, which is a generalization of the one proposed by Napier et al. (2016), illustrates the data as two components: an overall temporal trend and independent spatial surfaces for each time period that share a similar spatial dependency parameter but have individual spatial variances. If the goal is to estimate both a common overall temporal trend and the extent to which the geographical variance in the response has changed over time, this model is appropriate. The model specifications are provided below.

$$M_{kt} = \emptyset_k + \delta_k \qquad\qquad (5)$$

$$\emptyset_k \sim N\left(\frac{\rho_S \sum_{j=1}^k w_{kj}\emptyset_j}{\rho_S \sum_{j=1}^k w_{kj}\emptyset_j + 1 - \rho_S}, \frac{\tau_S^2}{\rho_S \sum_{j=1}^k w_{kj}\emptyset_j + 1 - \rho_S}\right)$$

$$\delta_k \sim N\left(\frac{\rho_T \sum_{j=1}^k w_{kj}d_{tj}\delta_j}{\rho_T \sum_{j=1}^k d_{tj} + 1 - \rho_T}, \frac{\tau_T^2}{\rho_T \sum_{j=1}^k d_{tj} + 1 - \rho_T}\right)$$

$$\tau_1^2, \dots, \tau_N^2, \tau_{IO}^2 \sim Inverse - Gamma(a, b),$$

$$\rho_S, \rho_T \sim Uniform(0,1),$$

$$\gamma_{kt} \sim N(\mu_\alpha, \tau_I^2).$$

This model fits an overall temporal trend to the data $\delta = (\delta_1, \dots, \delta_k)$ that is shared by all areal units, and it is supplemented by a separate (uncorrelated) spatial surface $\emptyset_t = (\emptyset_{1t}, \dots, \emptyset_{kt})$a for each time period t. The CAR prior suggested by Leroux et al. (2000) models both the general temporal trend and each geographic surface, with the latter having a similar spatial dependency parameter ρS but a temporally-varying variance parameter τ_t^2. Thus, the collection$\tau_1^2, \dots, \tau_N^2$) enables one to investigate how the size of the spatial variance in the data has changed over time. It is worth noting that because S is not orthogonal to τ_t^2, any changes inτ_t^2, would not immediately correspond to changes in spatial variance over time if it varied. The random effects, like all other models, are zero-mean centred, with flat and conjugate priors specified for (ρ_S, ρ_T) and $(\tau_1^2, \dots, \tau_N^2)$. Alternatively, rather of being estimated in the model, the dependence parameters (ρ_S, ρ_T) can be fixed at values in the unit interval [0, 1].

Note that here we fix ρS to be constant in time as it is not orthogonal toτ_t^2, thus if it varied then any changes in τ_t^2would not directly correspond to changes in spatial variance over time. As with all other models the random effects are zero-mean centred, while flat and conjugate priors are specified for (ρ_S, ρ_T) and $(\tau_1^2, \dots, \tau_N^2)$ respectively. Alternatively, the dependence parameters (ρ_S, ρ_T) can be fixed at values in the unit interval [0, 1] rather than being estimated in the model.

4. Spatio-Temporal (ST) CARar

This model is available in two variants, each based on a first (AR(1)) or second (AR(2)) order temporal autoregressive process. Rushworth et al. (2014) presented the first order model, which describes the spatio-temporal structure using a multivariate first order autoregressive process with a spatially autocorrelated precision matrix. The second model takes this a step further by employing a multivariate second order autoregressive process with a spatially autocorrelated precision matrix. These models are suitable for estimating the evolution of the spatial random effects surface over time. In both circumstances, the model specifications are provided below.

Autoregressive [AR (1)] Model

$$M_{kt} = \emptyset_{kt} \qquad\qquad (6)$$

$$\emptyset_{t/t-1} \sim N(\rho_T \emptyset_{t-1}, \tau^2 Q(W, \rho_S)^{-1}), t = 1, \dots, N$$

$$\emptyset_1 \sim N(0, \tau^2 Q(W, \rho_S)^{-1})$$

$$\tau^2 \sim Inverse - Gamma(a, b),$$

$$\rho_S, \rho_T \sim Uniform(0, 1),$$

AR (2) model

$$M_{kt} = \emptyset_{kt} \qquad\qquad (6)$$

$$\emptyset_{t/t-1,t-2} \sim N(\rho_{T_1} \emptyset_{t-1} + \rho_{T_2} \emptyset_{t-2}, \tau^2 Q(W, \rho_S)^{-1}), t = 1, \dots, N$$

$$\emptyset_1, \emptyset_2 \sim N(0, \tau^2 Q(W, \rho_S)^{-1})$$

$$\tau^2 \sim Inverse - Gamma(a, b),$$

$$\rho_S \sim Uniform(0, 1),$$

In this case, $\emptyset_t = (\emptyset_{1t}, \dots, \emptyset_{kt}$ is a vector of random effects for time period t that evolve over time via a multivariate first or second order autoregressive process with temporal autoregressive parameter ρ_T (AR(1) model) or (ρ_{T_1}, ρ_{T_2}) (AR(2) model).. The function's input AR=1 or AR=2 determines which of these two alternatives is selected. Thus, the mean induces temporal autocorrelation, whereas the variance $\tau^2 Q(W, \rho_S)^{-1}$. Induces spatial autocorrelation. Leroux et al. (2000) provided the corresponding precision matrix $Q(W, \rho_S)$, which correlates to the CAR models utilized in the other models above.

Expected outcome

This study is therefore wished to extend the work of Lee and Pettersson,2021 where existing SP models either ignore spatial autocorrelation and interaction effect altogether. Thus we shall present the best model which has the power to overcome these limitations as well as the flexibility for researchers to model spatial clustering in their disease data. This study is therefore expected to provide a suitable spatio-temporal model for measles' susceptibility in Taraba state of Nigeria.

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IMPORTANCE OF MENTAL HEALTH IN EDUCATION SYSTEM IN INDIA

Priyanka Prajapati
Research scholar
Faculty of social Work, Parul University, Waghodiya, Vadodara
priyanka.prajapati181197@gmail.com
Dr. Dipak Makwana
Faculty of social Work, Parul University, Waghodiya, Vadodara

Abstract

Early adolescence is the period of the emergence of most mental disorders contributing significantly to the mental health burden globally, including India. The major challenges in India are early identification of mental health problems, treatment gap, lack of professionals, and interventions that address the same. This review aimed to assess the effectiveness of mental health interventions among adolescents in India. Most of the school-based programs used a life skills curriculum. Additionally, coping skills and resilience curricula showed improvement in depressive symptoms, cognitive abilities, academic stress, problem-solving, and overall mental well-being. The multi-component whole-school intervention was quite promising and helped in improving the overall school climate and various other mental health outcomes. Hence, school-based programs should be implemented as an entry point for screening mental health problems. However, there is a need for a more comprehensive mental health program in the country for adolescents. Additionally, there is a need to address the gap by conducting more interventions for early and out-of-school adolescents.

Keywords: adolescents; interventions; mental health; school health

Introduction

Mental health is fundamental to good health and well-being, and it influences social and economic outcomes throughout life. Childhood and adolescence are crucial for laying a foundation for healthy development and good mental health. The increasing burden of mental health problems among this population is a growing concern globally. Most mental disorders begin before 25 years of age, more often between 11–18 years. The burden associated with

common mental disorders (depressive and anxiety disorders) rises in childhood and peaks in adolescence and early to middle age (10–29 years). A meta-analysis estimated that the global prevalence for any mental disorder among children and adolescents is 13.4%. India is home to the largest number of adolescents globally, comprising about a fifth of its population (243 million). India has the highest youth suicide rate globally, and suicide is the leading cause of mortality in this population. The overall treatment gap for mental health disorders in India is as high as 90%. The government of India has also started the National Adolescent Health Program (Rashtriya Kishor Swasthya Karyakram) , which has mental health as the priority area. Still, there is a huge gap in addressing the mental health needs of adolescents, and unfortunately, the situation has worsened since the COVID-19 pandemic. Thus, it makes a crucial case to take mental health at the forefront of the issues that need to be addressed.

Mental and behavioural problems are increasing part of the health problems the world over. The burden of illness resulting from psychiatric and behavioural disorders is enormous. The psychiatric disorders account for 5 of 10 leading causes of disability as measured by years lived with a disability. The overall DALYs burden for neuropsychiatric disorders is projected to increase to 15% by the year 2020. At the international level, mental health is receiving increasing importance as reflected by the WHO focus on mental health as the theme for the World Health Day (4th October 2001), World Health Assembly (15th May 2001) and the World Health Report 2001 with Mental Health as the focus. At the national level, mental health policy has been the focus of Indian public health initiatives during last two decades. Currently India is implementing a national level programme of integrating mental health with primary health care, the largest such effort in a developing world.

There was hardly any research data available on mental health in India at the time of independence. Sir Joseph Bhore in 1946 and Dr. A.L. Mudaliar in 1959 have made observations in their reports about non availability of data on psychiatric morbidity in India.

Mental health in India: A perspective

Mental disorders are now among the top leading causes of health burden worldwide, with no evidence of global reduction since 1990. In 2017, an estimation of the burden of mental health conditions for the states across India revealed that as many as 197.3 million people required care for mental health conditions. This included around 45.7 million people with depressive disorders and 44.9 million people with anxiety disorders. The situation has been exacerbated due to the Covid-19 pandemic, making it a serious concern world over.

The staggering figures, however, are void of millions of others directly, or indirectly impacted by the challenge and those who face deep rooted stigma, many times rendering them unable to seek help.This growing challenge in dealing with mental health issues is further compounded by a lack of information and awareness, self-diagnosis and stigma. It is important to understand that the determination of mental illness can only be by setting benchmarks for screening. There is an urgent need to counter the notion that mental health exclusively means the absence of mental illness. The World Health Organization defines mental health as a state of well-being, where an individual realises their capabilities, can cope with the normal stressors of life, work productively, and is able to contribute to their community.

Mental illness is an amalgamation of biological, social, psychological, hereditary, and environmental stressors. The social determinants of health predispose individuals and populations to poor physical and mental health, increased risk for many physical and mental illnesses, and poorer outcomes of such illnesses, when they occur. In a genome-wide linkage study published in the *Nature* journal the heritability of depression has been estimated to be approximately 40 per cent. This increases to approximately 70 per cent when biological twins with recurrent and severe major depression are examined. Thus, social factors and institutions, like gender, race and ethnicity, are responsible for mental health conditions.

We have come to understand that social gradient affects not only the risk of disorder, but also access to services. The ability to cope effectively is also dependent on social arrangements – like family structures and income capacities. There are individuals with diagnosed mental illness experiencing periods of well-being, and those not diagnosed with illness, but have poor mental health- making this a wide spectrum. Access to mental health services is not limited to only those suffering from mental health conditions, but also to those facing challenges at a lesser intensity, but find them affecting their day-to-day activities.

Literature Review

A deterioration in mental health among the average Indian has been a matter of concern for psychologists and social scientists for long. However, it has been one of the least addressed issues in an age of massive technological advancement and tough competition in the job market.The Covid pandemic has made matters worse, with joblessness and illness at a high. On December 7, the Centre said in Rajya Sabha that 10.6 per cent of adults in India face some kind of mental disorder.Given the severity of the illness, Niti Aayog has over time

recommended that the government include mental health treatment in primary healthcare arrangements.

"Three major diseases cancer, cardiovascular diseases and renal conditions and neglect in regard to mental health conditions have of late shown worrisome trends," according to the **Niti Aayog's 'Heath Care in India Vision 2020'**.

Post Covid-19, governments must encode mental health in their policy frameworks by improving their approach towards mental health services and improving public attitudes towards the issue**, Niti Aayog**

Study based on the United States population shows that the share of adults with symptoms of anxiety or depressive disorder was 11 per cent during January-June 2019 (pre-pandemic), which rose to 41.1 per cent in January 2021 (during the pandemic).The results showed that people in the age group of 18-24 were most affected and more than half of the population was going through some kind of mental disorder.

Impact on teen

Not just adolescents, but the pandemic's impact on the mental health of teens was also severe. Their confinement in homes or having been stuck away from their families for long, combined with uncertainty in the educational pattern, were believed to be taking a toll on their mental health.Children may experience a range of psychological issues such as anxiety, fear, worry, depression, difficulty in sleeping and loss of appetite, according to the department of psychiatry, NIMHANS, Bengaluru. It released a report on 'Guidance for General Medical and Specialised Mental Health Care Settings' to highlight the issue of mental illness due to the pandemic.Increased screen time, strained family relations or a sedentary lifestyle at home pose additional challenges, the UNICEF highlighted.

Kumar, Devvarta (2021) School mental health program (SMHP) has proven efficacy in the holistic growth of children.It strengthens abilities, such as resilience and stress tolerance, that are needed for the overall growth of children. SMHP in India is running with a piecemeal approach and for all practical purposes, it is nonexistent for the majority of school going children. The sporadic efforts (such as conducting some sensitization program for school teachers) are praiseworthy; however, they are insufficient for a comprehensive and sustainable SMHP. Neglect of mental health of children has significant short- and long-term negative repercussions. Therefore, a countrywide comprehensive SMHP (covering both urban and rural

areas) based on the promotion, prevention, and early intervention (PPEI) model is urgently required. It can happen only if there is proper inter sectoral coordination and stakeholders' involvement.

Devika Mehra (2022) Mental Health Interventions among Adolescents in India: A Scoping Review

The study show that mental health promotion interventions for adolescents were effective in school-based settings. We found promising evidence from interventions delivered using a multi-component whole school approach and life skills curriculum to improve mental health outcomes. We identified the feasibility and effectiveness of integrating mental health with other issues, such as sexual and reproductive health, nutrition, HIV, and substance use in school and community settings, and improving the knowledge of adolescents on these issues along with improving their overall mental well-being.

Bhuvana Shridhar (2023) Why mental health support should be integrated into education?

This article shown that The path of higher education is critical in every student's life, as it determines their future. Over the past two years, the pandemic-led lockdowns and the uncertainties associated with them have had a detrimental effect on mental well-being. Young adults, especially, have been exhibiting particularly high rates of insecurity, unruly behaviour, drug abuse, distress, depression, anxiety, and suicidal tendencies. Limited or lack of access to digital learning, absence of appropriate counselling and support, and the inability to connect with peers triggered loneliness and anxiety, further exacerbating the situation. It mentioned few steps for the educators and educational institutes for the student's mental well-being.

THE NEEDED STEPS

Establishment of a steering body:

Implementation of any nationwide program, that has to sustain in long-run, requires an organization or steering body that can centrally regulate, coordinate (with various agencies and stakeholders), and monitor the program. Various stakeholders such as educationists; representatives of ministries related to health, education and child development; and representatives of parent groups, teachers, and school administrators should be part of this group. This body should be effectively coordinating between central and state agencies related to health, education, and child development and in consultation with all the stakeholders and

concerned agencies decide the process of implementation of SMHP on the PPEI model. This body can also coordinate research related to need and outcome assessment, publication of resource materials, and training of workforce.

Aactive involvement of the stakeholders:

Various stakeholders and agencies can perceive their role in running a comprehensive SMHP only when they feel that their larger goals will be supplemented by their active participation in the SMHP. For example, the Ministry of Women and Child Development is likely to be forthcoming in participating in SMHP activities if there is realization that SMHP can be augmentative in achieving their mission of "well nurtured children with full opportunities for growth and development in a safe and protective environment,"[14] that it can help in effective implementation of the Integrated Child Development services, and that the problem of juvenile delinquency can be prevented in a substantial way if schools run mental health promotion programs where children and adolescents spend significant amount of time.

Training of the teachers:

In order to ensure that the teachers have an understanding of the importance of SMHP and are able to actively participate in its delivery, it is important that there is an inbuilt system of training the teachers for this purpose. It can be at two levels: first, inclusion of topics related to SMHP, such as child and adolescent development and various life-skills, in the curriculum of Bachelor of Education (B. Ed.) program and second, provision for intensive in-service training for teachers in conducting life-skills related programs such as enhancing resilience, emotional regulation, problem-solving, and healthy interpersonal relationship. In addition, the teachers should be sensitized to various child and adolescent mental health issues, ways to work as gatekeepers for suicide prevention and steps to conduct preliminary crisis intervention. As of now the B. Ed. curriculum has just a small component on child development. As suggested above, it should be more inclusive of topics related to child and adolescent development, mental health, and life-skills.

What institutes can do

Here are some ways to strengthen mental healthcare services on education campuses across India:

- Create youth-driven activities and promote volunteers and personal mentors who can be trained as frontline support to address issues around mental health within the campus.

- Establish a tailored curriculum that supports and interests students, and a teaching methodology which motivates them.

- Develop resilient educators who can handle students with varying needs and take a keen interest in connecting with their world.

- Host mental health counselling camps, wellness weeks, as well as interactive sessions within the campus to teach students self-calming or anxiety-coping techniques.

- Build a safe and interactive classroom environment that includes organising activities to help manage stress and promote well-being.

- Have an open-door policy to help students feel comfortable in sharing their problems and seeking appropriate support.

- Ensure that trained professionals are on hand to provide in-house medical assistance, counselling and telehealth offerings on confidential matters.

- Encourage social time by promoting co–curricular activities to build self-esteem and social skills.

For the educators

Apart from institutional efforts, teachers and professors also need to take action on their part. For example, pay attention and be mindful of how they communicate with the students. The tone must be warm yet professional. Educators should take students' concerns seriously, offer validation and acceptance, and avoid shaming. They should motivate students by emphasising their positives, encouraging teamwork and collaboration, and giving constructive feedback.

Conclusion

Mental health promotion interventions for adolescents were effective in school-based settings. There should also be a focus on strategies for the reduction of stigma, which hinders individuals from accessing mental health services, despite the need. It is important that adolescents can utilize services through mechanisms apart from community sensitization and educational trainings and more innovative approaches such as digital platforms etc., which can build their capacity for self-reliance and resilience to individually deal with mental health problems. Additionally, there is a need for the use of contextualized and validated tools in local settings.

It suggested that Mental health and wellness should be added to school curriculum. There is a great need for guidance and counseling in education these days as school children are not able to opt for choosing the best career for themselves. To Solve mental health disease through Indian Art – Craft, painting, Classical music- not by only counseling. It aim For not vocational education, but education using real life activities as a medium of spiritual self-evolvement, exploration of social entrepreneurship skills with the perspective of ecological sustainability and social justice.

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Study on Investment Options Available in The Modern Era

Prof. Pramila Pareek

JSPM's Rajashri Shahu College of Engineering

pramilapareek@rediffmail.com

Dr. Amey Choudhari

JSPM's Rajarshi Shahu College of Engineering

ameyachoudhari@gmail.com

ABSTRACT

People today are more concerned about the future than the present. Everyone desires financial freedom and stability. It is vital for them to make financial decisions for this aim. It is critical to be aware of and knowledgeable about various investment possibilities in order to make the best investment selection. Investing is the most effective approach to achieve financial security. The goal of investment is to enhance investors' earning potential. This study includes an overview of modern investment possibilities as well as a brief summary of investment paths connected to short, medium, and long tenure. The study's goal is to clarify investment possibilities and their associated rewards. The study will be carried out in a descriptive manner using secondary data. An attempt is made to research the various investment options available in the Indian market. Investing in both financial and non-financial products is possible.

Keywords- Income, Investment, Tax benefits, Investment options in India

INTRODUCTION

An investment is a financial commitment to one or more assets that will be held over time. The two most significant aspects of investing are the current sacrifice and the future benefits. One method that people might save money is by controlling their excessive costs. Everyone wishes to expand their personal independence, sense of security, and ability to purchase the things they desire in life. Investment is vital because it promotes financial interdependence, income development, the achievement of personal goals, and the reduction of future dangers.

Just like blood is required for survival, saving and investing are required for meeting future demands and hazards. The future is always full of unexpected and unforeseen occurrences that must be prepared for with adequate saving and investment. Because of the great number of industrialists, businessmen, government and private organizations in India, there is a large

scope for saving and investing, and money circulation is also quite substantial. Investors are concerned about the safety of their investments. They require trust in their investment. The government and other agencies devise new methods to mobilize people's savings, which may then be utilized to benefit the economy's development. It is necessary for the investors to have adequate awareness and knowledge about the various investment avenues so as to take rational decisions regarding the investment of their savings.

Investment is the commitment of finances for future periods in exchange for a sufficient return to compel parting with money. In general, it refers to repaying debt through investing money in productive endeavors. All investment decisions are the result of a trade-off between current and future consumption. Investment is the practice of utilizing resources in order to boost future income and manufacturing output.

Investment attracts people of diverse occupations, education levels, age, gender, and so forth. Investment can result in more revenue or growth in valve. When choosing an investment option, keep in mind that the investment should not result in an increase in taxable income. Every investment entails some level of risk. The risk level varies depending on the investment mode, instrument, and term. Individuals, the economy, and society all benefit from investment.

1. REASONS FOR INVESTMENT
(a) **Security of family:** The investment's primary goal is to provide security and safety for the family. Investment achieves the primary goals of the family file provision for children's education and marriage.
(b) **High Returns:** Investors always invest their saving to earn regular and high returns. The return on investments is the reward to the investors. To earn capital appreciation investment can be made in both financial and non-financial assets.
(c) **Tax benefits:** while selecting an investment option, care has to be taken that investment should not result in increase in taxable income. Most of the investors make investments for getting the tax benefit in the form of exemptions under the Income Tax Act, 1961. Tax benefits is important consideration for an investor as proper tax will help to improve the efficiency of investor's investments
(d) **Liquidity:** Investors generally prefer those investments which offer higher liquidity. It is considered as one of the important factor which is to be considered before making an investment. Liquidity means an ability of an investment to be converted into cash as and when required.
(e) **Retirement plans:** Investors, while investing their hard earned money consider those investment plans which help them after retirement to meets their future needs like provision for old age and sickness, provision for house construction and provision for dependents.

Difference on the basis of following features of investor and speculator
(a) **Planning period**: An investor always kept his holding for the longer period whereas the speculator prefers to invest for a very short period.
(b) **Owned funds**: Investors always used his own fund whereas a speculator generally resorts to borrowing.
(c) **Expectation of return**: An investor seeks moderate rate of return with limited risk whereas a speculator always looks for a high rate of return.
(d) **Risk:** An investor is willing to take moderate risk whereas speculator willing to assume

high risk.

Factors affecting investments
(a) Safety of money
(b) Children marriage and education
(c) Security of life after retirement
(d) Tax saving
(e) Regular and best returns
(f) Educational level

2. REVIEW OF LITERATURE

C.Sathiyamoorthy (2015) investigated investment with the hope of a return. Various characteristics, such as age, education level, and income of the investors, must be considered while making investment decisions.

Rajeshwari Jain, (2014) conducted the survey in the city of Ahmadabad to know the income & investment pattern awareness amongst the working women. The sample size was 250 respondents and finding reveal that high returns, tax benefits, retirement plans, security for family, children education& marriage are the most important objectives of the women behind the investing theirsaving in different investment avenues.

Varsha Virani, (2014) analyzed the various avenues of investment & concluded during the study that teachers have been saving for the future in spite of them having a low level of income. They save and make investment in most profit options in which low risk is involved. Most of the respondents prefer to invest in bank deposits as it involves low risk and provide regular return. High rate of return & tax benefit has influence the investment decision of the respondents.

P.Bhanu Sireesha and Sree Laxmi, (2013) studied that investors were more interested in the safety of their investment than other benefits arising from the investments. Most of the investors prefer those investment options which had medium risk factor.

P. K. Bandgar and Mahesh Arun Mahajan, (2012) explained in their study the management of portfolio which investors in Mumbai city followed to invest their saving for their secure life and for bright future. Their study will help the investors to choose the proper investment avenue and to create profitable investment portfolio.

Dhiraj Jain & Parul Jain, (2012) analyzed that demographic factors plays an important role & have a great impact on the investment decisions of the investors. Income level, age, marital status, education level, occupation etc affects the decision & market knowledge of the investors in Rajasthan. It is concluded from study that most of the teachers are saving for their children education, marriage and their family future needs.

A.Lalitha and M.Surekha, (2008) concluded in their study that investors are more stay with the traditional investment avenues than latest options like LIC and bank/ post office deposits. Investors believe that traditional options are more secure and free from risks as compared to the modern investment options. They also observed in their study that the retail investors don't have proper investment awareness and knowledge.

3. OBJECTIVES OF THE STUDY

- To identify the various investment options available for investment in India.
- To find out the main reasons for Investment.

4. RESEARCH METHODOLOGY

Present study is based on secondary data, hence it is descriptive. Data has been collected from the published records/ periodicals
/publications. In addition to this the data collected from various newspapers, magazines, books, websites, and journals etc.

5. INVESTMENT OPTIONS AVAILABLE IN INDIA

There are large numbers of investment avenues are available in the market of India.

(a) **Post office saving schemes**: All the post office schemes is purely safe and no risk investment option. Recurring deposits, kisan vikas patra, senior citizen saving schemes are some of the best post office saving schemes.

(b) **Insurance policies:** Insurance policies include life insurance with investment portion, pension scheme, and tax savings scheme. It provides moderate risk and return.

(c) **Public provident fund and provident fund**: One can open its PPF account with any nationalized bank .PPF fixed tenure is 15 years and one can withdraw half of the amount after seven years. The interest income is not taxable and there is tax benefitunder section 80C of the Income Tax Act.

(d) **Bank deposits**: It is one of the most largely safe and secures type of investment option. Rate of interest is depends on the period of deposit. Current account, saving account, recurring account, fixed deposit account are the main types of bank deposits.

(e) **Share capital**: Investment in share is highly risky investment but earn high rate of return. Knowledge of share market is essential requirement on the part of investors.

(f) **Bonds and debentures**: Bond and debentures are the types of debt instruments which are issued by the companies. Investment in bonds/debentures provides regular interval return.

(g) **Real estate**: As the investment in real estate provides benefits in the near future over a period of time. It is one of the long term investments option and include huge amount of money. Risk and return on the real estate depends on factor associated with markets. It is subjected to capital gain tax also.

(h) **Mutual funds**: Mutual funds are subject to market risk. It is scheme that pools the money from a number of investors and invests money in a different numbers of financial securities. Equity, debt, and balances fund, Index fund, fixed income funds etc. are the types of mutual funds.

(i) **Pension funds**: This is one of the latest and important option of investment in India. Under this scheme the investor can invest in both equity and debt. Investor has a choice about the percentage which he has to invest in debt and equity. Till the age of 35 years exposure to equity and debt is 50%. The contribution is decided according to the age of the investor.

(j) **Gold/Silver and precious articles:** Investment in metals gold/silver and precious article like painting, sculptures, coins, stamps etc are the common form of investment. It provides social status and liquidity. Investment in precious article and metals are less risky and for the long term. It provides liquidity at any time as they can be converting into cash on demand.

There are some investment options and schemes which provide the tax befits to the investors. Such types of schemes must be promoted by the Government to encourage the investors to invest in these schemes which provides maximum tax benefits to them.In some schemes, the entire investment is made tax free also.

There are many risk associated with investment types. Risk may be low, medium and high risk. The investment avenues accordingthe risk associated are classified:

Table 1: Investment avenues according to risk

Low Risk Investment avenues	Medium Risk Investment avenues	High Risk Investment avenues
(a) Public Provident funds (b) Fixed bank deposit (c) Post office saving schemes (d) Life insurances	(a) Mutual Funds (b) Gold/Silver & Precious articles (c) Bonds & Debentures	(a) Real estate (b) Chit funds (c) Share market

Table 2: Investment benefits to different sectors

Benefits of investment to individual	Benefits of Investment to corporate sector	Benefits of Investment to the Government
(a) More income (b) Tax benefits (c) Safety and security (d) Liquidity	(a) Permanent capital (b) Credit worthiness (c) No fixed burden	(a) Leads capital formation (b) More employment (c) More revenue for development ofthe economy as a whole

6. FINDINGS OF THE STUDY
(a) There are various investment avenues are available in India.
(b) To attract the investors various new attractive schemes must be launched.
(c) Investment in share market should be popularized.
(d) Saving should be pooled and invested in the most productive investments.
(e) Many investment schemes are available in the market which must be reached to the investors which motivate them for savingand investment.
(f) Investors himself identify and select the best options according to their needs after studying merits and demerits of differentoptions.
(g) Different educational programmes can be organized to increase the awareness level about the investment avenues

7. CONCLUSION
Finally, the study concludes that investment is a need of all the classes of the society. It is clearly found out that if you want to secure your future whatever the future needs you had, all these needs can be fulfill by best investment made. Saving and investment cannot be neglected in present days as it provides surety about strong financial stability in future. To

cope up with the increasing needs of all the sections of the society saving and investment are the best options to secure and fulfill all the present and future needs.

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Meesho -The E-Tailer Downsizing Workforce

Prof. Pooja Karekar

Assistant Professor, International Institute of Management and Human Resource Development (W)

p.karekar@iimhrd@edu.in

Prof. Girish Chavan

Assistant Professor, SaiBalaji International Institute of Management Sciences.

g.chavhan@sbiims.edu.in

Abstract

This case study discusses the issue of layoffs. Meesho one of the leading ecommerce platforms and very popular among the online customers downsized the workforce two times consecutively in 2022 and 2023.As the company realised that there were errors in the man power planning and hiring strategy. Meesho being an online seller and doing a prodigious business setting an example to all start-ups. The company is into the business from last 8 years. Extensive use of Artificial Intelligence (AI) and the growing popularity of such disruptive technology in the IT sector in India, where unemployment, and surplus manpower are prevalent. The case study focuses on Messho an online marketplace for resellers selling a range of consumer products. The has decided to reduce a big chunk of its existing workforce by citing over hiring a greater number of employees. Now, the challenge is its impact on the manpower planning, hiring as well as employees' motivation and engagement. The dilemma in such cases is how to go about it in such a way that it does not affect employees negatively and have a smooth transition. The case highlights the issues of manpower planning, addressing layoffs and managing the recruitment cycle.

Functional area of case and keywords

MBA program/PGDM program – Human Resource Management course – To discuss various issues related to Talent Acquisition, Manpower Planning, layoff, Recruitment and Selection, downsizing.

Pedagogical Objectives

The case study is proposed to achieve following teaching objectives:

- To discuss the concept of layoff and downsizing.
- To discuss the manpower planning process in the changing scenario.
- To identify the possibilities of redeployment of manpower and recruitment plan.

- To recommend the plan in facing the challenges of HR managers in implementation of such change.

Introduction-

In May 2023, Meesho a legit reselling E-commerce platform in India one of the India's best earning app, the company again announced layoffs.

After firing employees in April 2022 exactly a year ago, the same global tech cos which have cut jobs after pandemic fueled growth. Meesho aims to turn sustainable amid a larger reset in the technology. The two main goals of the startup were to empower the housewives of the country and support micro, small and medium enterprises.

Meesho joins a growing list of Indian startups that have been downsizing amid changes in the technology industry globally. The layoffs affected employees across the board in all functions at the company.

Vidit Aatrey, cofounder, Meesho, said "the job cuts were not based on performance".

This was Meesho's second round of job cuts. After Meesho reconstructed its grocery business Farmiso.

Meesho-the E-commerce unicorn

Meesho, founded in 2015 based in Bengaluru founded by IIT-Delhi batchmates Vidit Aatrey and Sanjeev Barnwal, links producers with resellers, who eventually market the products to consumers through social media platforms such as WhatsApp and Facebook.

The company offers services such as payments and logistics to these resellers, that enables ease of transactions. Meesho currently has more than 45 million customers and average 120 million monthly users on its platform. Meesho provides an online marketplace for resellers selling a range of consumer products. The company offers products such as clothing, home and kitchen appliances, beauty products, jewelry, accessories, electronics, and more.

Meesho has crossed the 1 million-seller mark on its platform — a feat it has achieved in eight years (and two years since it pivoted to a pureplay e-commerce model). More than 80 per cent of its 1.1 million registered sellers are 'new-to-ecommerce' and selling online for the first time. Of the total seller base, more than 600,000 are small business.

Nearly 50 per cent of Meesho sellers hail from Tier 2+ regions, including remote corners like Pulwama in Kashmir, Una in Himachal Pradesh, Nagamangala in Karnataka, Jowai in Meghalaya and Mount Abu in Rajasthan, and so on. Meesho's zero-commision policies allowed small-town sellers to list their entire assortment on the e-commerce platform without

the fear of listing fees. Additionally, Meesho sellers also clocked a 3X growth in their average revenues.

Besides Y Combinator, it has raised funds from Softbank, Prosus Ventures, Meta, Shunwei Capital, Venture Highway Knollwood Investment, Fidelity Management and B Capital Group. Its other investors include Footpath Ventures, Trifecta Capital, Good Capital.

Softbank backed Meesho in 2021

After initially been backed by Facebook, Meesho has raised $300 million in a new round of funding led by SoftBank Vision Fund 2, catapulting the social commerce startup's valuation to $2.1 billion. The company's latest capital raising exercise has almost trebled its valuation compared to when it last raised $125 million in 2019.

Meesho is focused on expanding the vision from focusing on enabling aspiring women entrepreneurs to creating Meesho as a single ecosystem that will enable all small businesses to succeed online. Meesho had seen a tremendous growth across small businesses and entrepreneurs seeking to move their businesses online and this opportunity was grabbed by Meesho to be one of the most successful ecommerce platforms in India

Meesho's plan was to enable 100 million small businesses and entrepreneurs digitise their businesses while investing heavily in hiring and growing its team across technology, product and other functions.

Softbank had observed Meesho for 18 months and they had been impressed by their growth, daily engagement of customers metrics, focus on unit economics and capability to create a strong team. Softbank also was sure that Meesho will be an efficient platform for SME suppliers and social resellers to onboard the e-commerce revolution in India and will provide tailored experience to consumers.

In September 2021 after funding round, Meesho had claimed that its aim was to reach 100 Mn monthly transacting users and the funds will be used to grow the technology and product teams by 2.5x and increase its marketplace. Exhibit-1

From "Farmiso" Grocery Expansion to Downsizing

Farmiso was started as a experimental model in Karnataka last and it mainly targeted tier-II cities and customers with an emphasis on lower prices rather than accessibility of faster delivery, which e-commerce players like Swiggy's Instamart, Zepto and others have been focusing on. It targeted on set of internet users that focusses on community buying models same like Dealshare and Flipkart's Shopsy. This grocery vertical concentrates on six states– Karnataka, Maharashtra, Telangana, Andhra Pradesh, Gujarat and Madhya Pradesh. It also plans to make Superstore available in 12 different states.

Now Meesho has integrated its grocery business, Farmiso, within its core application. The company is also rebranding Farmiso to Meesho Superstore. The grocery business currently provides 500 products across categories like fresh fruits, fresh vegetables, groceries, home care

and packaged food among others. Driven by user-first mindset, the amalgamation will provide online customers of Meesho user a unified shopping experience. This will also give the company an opportunity to drive stronger collaborations across areas such as customer acquisition, technology & product and talent. In April 2022, Meesho rebranded Farmiso to Superstore, with an aim to highlight its continued focus to fulfill consumer demand for daily essentials. The same month, Meesho laid off employees, mostly from Farmiso, as it aimed to integrate its grocery business within the core application.

But this integration ended with firing of 300 employees.

The company explain the layoff situation as to boost efficiencies in the light of the integration, a small number of full-time roles and certain third-party positions on six-month contracts at Meesho Superstore were reassessed to remove redundancies with the core business." The company said that it will not impact any positions at the core Meesho marketplace business, where we continue to hire and grow talent."

No end to layoffs! -The Layoff Scenario Continues

After the pandemic boom of few years, most of the technology companies globally ended with a miserable stance. Across the sector, thousands of jobs were cut to correct the over hiring of the covid period and support for what experts call a period of slower growth for the e-commerce sector. The social commerce platform earlier laid off employees in the first wave of the pandemic. **Exhibit-2**

Meesho had also fired employees when it shut down Farmiso and integrated it with the core Meesho app in August 2022 and nearly 300 Meesho employees have lost jobs after the shuttering of Meesho Superstore and restructuring, this was the first round of layoff. The reason of the job cut given by the company was low revenue and a high cash burn and that is why the decision to wind up operations. Even when Meesho had raised fund -a massive $570 Mn round in September 2021. The layoffs at Meesho come less than seven months after raising the funds.

Meesho in the year as off year 2023 is valued at $4.9 Bn. The Y Combinator-backed startup had claimed in that has over 13 Mn individual entrepreneurs on its platform and is catering to 45 Mn customers.

In May 2023 despite 10x growth in last 2 years the company Meesho decided to sack employees. The firm laid off around 251 employees of its workforce on citing organisational restructuring as the company looks to turn profitable in a deteriorating startup funding environment.

This was Meesho's second round of layoff in just over a year, which would affect employees representing 15 per cent of its workforce.

The employees received an email from the company's co-founder and CEO Vidit Aatrey that said "I have a difficult news. We are reducing the size of the Meesho workforce by 15 per cent, affecting 251 employees."

He mentioned that the about the challenging macroeconomic environment for the decision and supplemented that the company made 'judgement errors in over-hiring ahead of the curve'. "At the same time, we could have run our organisation structure in a more effective and lean manner overall,".

Meesho has been on a cost-cutting strategy since 2022. Meesho is growing and with COVID tailwinds, aggressive investments, the company is expected to reach all new heights in coming future. But in this VUCA world, even when company monitored the track of their future plans the macro climate indisputably and significantly changed. As a result, Meesho had to fast-track the timeline to profitability as part the strategic decision. Though the firm is readapting GMV (Gross Merchandise value) growth goals to 30 per cent YoY. The company had made sure about the cash reserves buffer for such severe environments, the firm felt a need to stay highly sensible on the cost front.

According to, the company it had already rationalised all its costs before taking the decision, which included infrastructure costs, discretionary growth spends, tool costs, support and other indirect costs.

The main aim was to have leaner organisational structure to achieve sustained profitability.

Meesho now has to handle the entire situation with integrity and consciously. With lot of things going on in the background the company had to take such important decision. This was not only going to affect the laid off employees but also the internal working of the organization. Now the company has to rigorously go through the restructuring and manpower planning.

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Questions-

1. Identify the reasons of layoffs at Meesho of both first round of layoff and second round of layoff.
2. Discuss the importance of a rigorous manpower planning strategy.
3. Do you think extensive technology and automation in the companies will replace the workforce by machines?
4. What benefits would give to the laid off employees? Give your recommendations to the company.
5. As a HR manager how would you have handled such layoff situation?

Teaching Notes-

Answer-1

Reasons for first round of layoff.

1. Low revenue and a high cash burn and that is why the decision to wind up operations.

2. Integrate its grocery business within the core application.

Reason for second round of layoff-

1. Organisational restructuring as the company looks to turn profitable in a deteriorating startup funding environment.
2. Challenging macroeconomic environment for the decision and supplemented that the company made 'judgement errors in over-hiring ahead of the curve'.
3. Running organisation structure in a more effective and lean manner overall,".
4. The macro climate indisputably and significantly changed. As a result, Meesho had to fast-track the timeline to profitability as part the strategic decision.

Answer 2

Manpower Planning which is also called as Human Resource Planning consists of putting right number of people, right kind of people at the right place, right time, doing the right things for which they are suited for the achievement of goals of the organization.

Human Resource Planning has got an important place in the arena of industrialization. Human Resource Planning has to be a systems approach and is carried out in a set procedure. The procedure is as follows:

1. Analysing the current manpower inventory
2. Making future manpower forecasts
3. Developing employment programmes
4. Design training programmes

Answer 3

The implementation of automation can bring many benefits, such as increased productivity, efficiency, and improved quality and safety. However, it also poses challenges and potential negative impacts on the economy and job market. Automation can lead to job displacement, income inequality, and dependency on technology.

As AI continues to advance, it is likely that even more job opportunities will be created, offsetting any potential job losses. In conclusion, while it is true that AI has the potential to automate many tasks currently performed by human workers, it is unlikely that it will completely replace humans in the workforce.

Answer 4

1. severance package that includes a one-time severance payment of 2.5 to 9 months, continued insurance benefits, job placement support and accelerated vesting of ESOPs.

Severance: It said that the affected employees will receive full pay for notice period and 1 additional month along with a tenure based payment of 15 days pay for every completed year of service, rounded up to the the nearest year.

Equity: The e-commerce firm said that it will relax ESOP vesting norms so the departing employees remain shareholders in the company.

Healthcare: It said that the company will extend the family insurance coverage till March 31, 2024.

Relocation: Meesho will also provide relocation allowance to employees who moved to Bengaluru since 1st January, 2023 till 5th May.

Gratuity & Leave Encashment: It will also offer gratuity and leave encashment as per applicable law.

2. one month of extra severance pay beyond the notice period as well as ESOPs irrespective of the period they have been with the company.

Answer 5

1. Plan ahead

The first step in handling layoffs effectively is to plan ahead. HR should start planning for layoffs in advance. A well-structured plan will help the company minimize the impact on employees and maintain the business's operations. HR should create a plan that outlines the process, including the selection criteria for employees who will be laid off, the timeline, and communication strategies. It's important to consider the company's legal obligations and ensure compliance with labor laws.HR should also work with the company's leaders to identify potential cost savings measures and alternative options to layoffs. For example, the company could consider reducing employee hours, implementing furloughs, or freezing hiring until the economic situation improves.

2. Provide training for managers

Managers play a crucial role in the layoff process. They are responsible for communicating with employees and implementing the plan. HR should provide training to managers on how to handle layoffs effectively, including the communication process, providing support to employees, and dealing with emotional reactions. This helps to ensure that the process is carried out professionally and with empathy.Managers should also be trained on how to manage the remaining employees after the layoff process is completed. This includes communicating any changes in the company's operations or strategy, addressing concerns about job security, and maintaining employee morale and productivity.

3. Maintain confidentiality

HR should maintain confidentiality during the layoff process to avoid creating rumors or panic. HR should ensure that only those who need to know are informed of the layoffs. This helps to maintain employee trust in the company and reduces the risk of potential lawsuits.HR should

also ensure that any personal information about the affected employees is kept confidential and only shared on a need-to-know basis. This includes information about the reasons for the layoff, the selection criteria, and the severance packages offered.

4. Explore alternatives

Layoffs must be the last resort; organizations must explore their options first so they don't have to let their staff leave permanently. This is especially important when you are required to lay off only a few employees.

For example, furlough can effectively address a temporary cash-flow problem without resulting in the loss of valuable employees. Pay cuts or reduced employee perks and benefits for a short while can also be great solutions if you can make your employees understand why these measures are necessary to stay afloat.

5. Help them find a new job

Companies can help their laid-off employees find new jobs by leveraging the flexibility and convenience of remote work opportunities. With the current shift towards digitalization, many companies are now offering remote positions, providing an opportune platform for laid-off employees to showcase their skills and experience.

Organizations can also look into various job boards in order to connect with potential job seekers and provide them guidance on how to land a new job. Popular job boards such as Indeed and Monster are widely used by employers, recruiters and job seekers alike due to their user-friendly interface and features that facilitate easy navigation. Similarly, LinkedIn is another excellent tool for discovering new job opportunities as it is not just a platform for creating professional profiles but also allows users to search for jobs that match their expertise. Furthermore, online platforms such as Freelancer, Upwork and Fivver are excellent resources when it comes to finding freelance jobs in any field. These sites provide a broad range of services that can be easily accessed from home or any other location with internet access.

6. Understand compliance

Layoffs must always be compliant with the employment laws in your country. So, make sure that every HR team member is aware of the employment acts. For example, according to the WARN Act in the US, workers must be provided with a minimum of 60 days' notice for the transition.

7. Consider offering severance pay

US employers are not liable to pay severance to laid-off employees unless explicitly mentioned in the employment contract. But you can still choose to offer moderate severance pay to communicate to employees that they are valued. This safeguards the employer brand and reassures remaining employees who may be anxious about their job security.
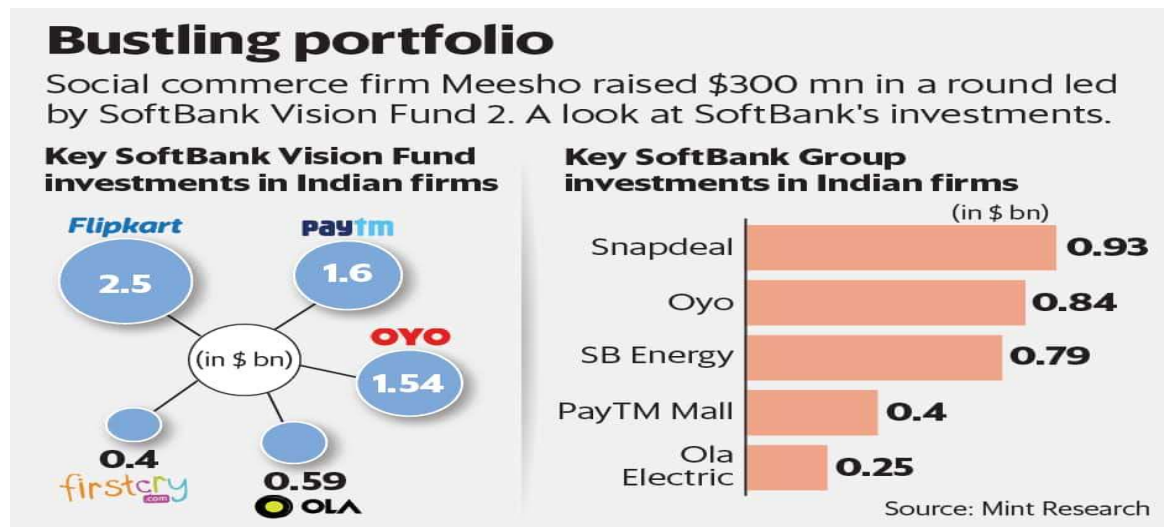
8. Prioritize employee well-being

Layoffs can have a significant impact on the affected employees' well-being. HR should ensure that employees receive support during the transition, such as counseling and access to resources

that can help them cope with the stress of losing their jobs.HR should also offer assistance in finding new employment opportunities, such as resume writing, job search strategies, and interview skills.

HR should also ensure that employees who are staying with the company are aware of any changes in their roles or responsibilities and are provided with the necessary training and support to adapt to these changes. This helps to maintain employee morale and productivity during difficult times

Exhibits-

Exibit-1

Source-Mint Research

Exhibit-2

TECH LAYOFFS GLOBALLY

Amazon **18,000**	Google **12,000**	Meta **11,000**
Microsoft **10,000**	IBM **3,900**	SAP **3,000**

(Source: Company announcements, media reports)

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SaiBalaji Education Society
SaiBalaji International Institute of Management Sciences

Sr. No. 54, Nere-Dattawadi, Tal-Hinjewadi IT Park,
Pune - 411033
Ph. 020-66547514

E-mail us at : research@sbiims.edu.in
www.sbiims.edu.in