CULTURAL IDENTITY IN JHUMPA LAHIRI'S THE NAMESAKE

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ABSTRACT

The Namesake, by JhumpaLahiri, is a story of culture, race, and inheritance and how these factors mold our attitudes and direct our lives in an ever-changing society. The novel follows the lives of Ashima and AsokeGanguli, and how they left behind a life in India that they had grown to know and love to live the American dream and provide the best life for themselves and their children. Gogol, their only son, and the carrier of their family name, struggles incessantly to find his identity while attempting to mold to his family's expectations and the expectations of American society. The latter dictated that adhering to the model of the Standard North American family establishes normalcy.Gogol engages in a constant struggle to remain loyal to both worlds. Hence, the major theme portrayed in the novel is one of identity. This them is illustrated vividly by examining the importance of one's culture and background, gender, and name as the definition of patriarchal lineage and destiny in life. Such factors that contribute to problems with identity are not only recognizable in Indian cultures, but can become hindrances for many immigrants who enter the United States each year.

Key words:Identity, hindrance, nostalgia, immigrants.

INTRODUCTION:

JhumpaLahiri was born in London to Indian parent's in 1967. She later moved to the United States to continue her higher education. Though she is an Indian by birth, majority of her life was spent in U.S only. As a writer, her first book was *Interpreter ofMaladies,* a collection of short stories connected with Indian-American identities and Diaspora. *The Namesake,* Lahiri's first novel was published in 2003. It deals with the themes of immigrant's experience, identity and displacement, and ties and clashes between the generations. It aims to discuss and question the sense of displacement in the lives of the characters in *The Namesake* and especially its main character Gogol Ganguli.

This means that people in post-colonial times are not necessarily forced by war or colonization to abandon their homes or live under the control of a foreign country. They have more freedom to move and choose where to live. Nevertheless, the later consequences of this movement are unknown and cannot possibly be controlled by these people. In this sense, they intentionally begin a new life in a

new place that will have its own new necessities and obligations which can be unknown and unpredictable to them. The borderline between the ethnic or cultural past and present dissipated. Therefore, effects of a powerful ethnic or cultural past are not likely to last for a considerable period of time. Moreover, American culture, which is a blend of different cultures, and being American add to the confusion of the characters in the story. The Indian immigrants involved in *The Namesake* have an internal dialogue and opposition between their ethnic culture and the culture of the country in which they abide America. For the children who were born in America, the site of the confusion is their household or parental home in America where the Indian culture and customs still exist even if in a diluted form. The life of Indian diasporic communities especially that of women and the social, cultural and religious, racial and ideological conflicts faced by them in the host country becomes highly relevant here. The concept of space is very relevant in the study of diasporic communities. Cultural otherness, generational and cultural alienation from their ethnic community leaves the Indian diasporic women trapped in a space between the culture of homeland and that of the host country.

Lahiri's*The Namesake*, a cross cultural multi-generational story examines the cultural conflicts and dilemmas of the Indian immigrants who find themselves in between the native and host cultures. The Namesake is the story of Ashima a student in degree class who becomes AshimaGanguli after her betrothal to AshokeGanguli of Alpire. After marriage they shift to Boston. The book opens with AshimaGanguli who is upset, homesick, spatially and emotionally alienated from her ancestral home, trying to recreate the taste of her favorite Indian snack, thereby trying to reconstruct her past. She thinks of her past with nostalgia of her home and spends her leisure in reading Bengali poems, stories and articles.The first generation especially Ashima finds it very difficult to ascept the culture. Pregnancy was a hard time for her as there was no one to help from the mother land. Motherhood is a glorious stage for a woman but for a migrant in a foreign alien land, loneliness and strange surroundings nearly kill such feelings. She was the only Indian in the hospital with three other American women in the adjoining room. Ashima "is terrified to raise a child in a country where she is related to no one, where she knows so little, where life seems so tentative and spare"(TN:24). After Gogol's birth she says to Ashoke, "I am saying I don't want to raise Gogol alone in this country. It's not right. I want to go back". Ashoke feels guilty for bringing her to this alien land. But she is determined to bear the pain and to give birth to the infant in an alien land for the sake of the child. She wants her grandmother who is staying in India to assign a name to her new born which shows her desire to hold fast to the conventions of her culture and the resulting disappointment because of the failure to do so. She suffers from sleep deprivation in a house alone with her baby and she visits the supermarket where everyone is a stranger to her. Often recalls her paralyzed move out and explore the world, teaches the culture of her own country but never force them to do or practice it. Ashima is always reminded

of the words of her elders who told her "not to eat beef or wear skirts or cut off her hair or forget her family" (TN:37).

But the second generation does not abide to these rules and lives a life of their own. The novel in a way portrays the problems of acculturation and assimilation faced by the first as well as the second generation immigrants. Moushumi is a new generation Bengali born and raised in America's multicultural society and is a peculiar combination of Indian, American and French identities. Her education at New York University, her frequent visits to France and England changed her perspectives and her native cultural consciousness. She has little appreciation for India or Indians and is more westernized inher attitude. She has "privately vowed that she had never grown fully dependent onher husband" (TN:247). Their marriage relationship that developed in America's multicultural ends in divorce. The second generation immigrants Sonia when they visited Calcutta did not feel alienation. She gradually assimilates bits and pieces of the new cultures unlike Moushumi have a sense of duty and marry her boyfriend a half Chinese boy Ben. She decides to look after her mother after her father's death. Ashima like many immigrants' Bengali women is not culturally immunized by America's multi culture, is a strong follower of Indian cultures and gives importance to family and relationship. She does her best to perform the role of a homemaker and tries to upload the traditional values against the materialistic values of America. The fear of losing her Bengali culture.*The Namesake* is a perfect reference for Lahiri's story about the strangeness of the Indian immigrant experience in the United States and that is somewhat true also because the child of immigrants begins in a kind of now here place. Gogol or even Lahiri is firmly of America but is not quite an American in part because they are not recognized as such by others. Gogol desires to blend in the American society. He wants to live unnoticed. But he is not viewed as an American by other Americans, even though he is a native born citizen. He tries to put a wall between his past and his present but it is not easy. The adoption of Nikhil is a part to live only in the present, but the ghost of Gogol clings to him that he signs his old name unconsciously, he does not respond immediately when he is addressed as Nikhil. He tries to become an entirely different person from what really he is. Gogol struggles to carry the burden of two names. Nikhil resembles American names, yet Gogol and his past follow him everywhere. He experiences a feeling of being in-between. JhumpaLahiri tries to focus on the issue of identity what she had faced in her childhood. The problem of Gogol's name symbolizes the problem of his identity. He wants to be connected to the strange names in the graveyard when the students were taken to the graveyard for the project. He wants to relate himself with American locate but his name hinders his way to be recognized as an American. Nikhil replaces Gogol when he enters Yale as a freshman. Here nobody knows his earlier name. He feels relief and confident. No one knows him as Gogol but Nikhil. His life with new name also gets changed. Gogol is an outsider in American society whereas he does not feel intimacy with Indianness. So who he becomes a great problem. It is the name which

determines identity. Gogol is trying to get identity. Even after making all efforts to erase his past, his failure to assert his identity is seen in his relationship with women. He does not want Ruth or Maxine to meet his parents. Such efforts are made to escape his past identity and heritage.

Lahiri uses Gogol's name to, literally and figuratively, represent the ways in which is cultural heritage serves him from the social sphere, forcing a gap between him and his American friends, and serving as a constant reminder of the depth of this disparity. He already knows that his Indian heritage sets him apart from his schoolmates, and that his inner turmoil is evident from young age. He tries desperately to distance himself from being Indian. He would rather attend art classes than Bengali lessons and he could rather listen to Beatles than his father's classical Indian music. Gogol is often unhappy because it is difficult for him to reconcile the different cultures, countries, and people that define him. For Gogol, the universal difficulties of adolescence are compounded because he is the son of first generation immigrants. He begins to address his parents in English, while they speak to him in Bengali. Gogol wants to adopt to American values and life concepts, which are firmly resisted at home.

The Namesake is a story of identities. It begins with the migration in the firstgeneration and follows with its specific concerns to the second generation. Alienationis a part of the experience of the Indian diaspora and even if people are at home inany part of the world it does not mean that they will not become victims of the sense ofalienation. The novel depicts how the immigrants face cultural dilemmas in the foreignsystem. The second generation diaspora finds their roots only after undergoing culturalimbalance. Their own children groomed to be 'bilingual' and 'bicultural' face cultural dilemmas and displacement more. But at last Lahiri also shows that all immigrants carve their own 'routes' in the course of time and it's not necessary that they should settle in the country of their own origin.

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MULITICULTURALISIM IN KIRAN DESAI'S HULLABALOO

IN THE GUAVA ORCHARD

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ABSTRACT

This novel is set in the Indian village of Shaktok (State of Punjab, India) and follows the exploits of a young boy trying to avoid the responsibilities of adult life. *Hullabaloo in The Guava Orchard* is a tale of a young man named SampathChawla who lives in the town of Shaktok, India. Kiran Desai beings her first novel with Sampath's birth at the tail-end of a terrible drought. The town has a mixed culture of traditional Indian social norms and of modern life, where in the runaway SampathChawal, who just wants to be left alone, is forced into being a holy man in spite of himself.Sampath represents the human urge to be free of constraint, without social conformity

Key words: Social, culture, freedom and modernity.

INTRODUCTION

Kiran Desai's *Hullabalnoo in the Guava Orchard* is the whimsical story of a young man who escapes from the comical confines of life, R.K. Narayan inspired North Indian town of Shahkot for the no less comical freedom of life in a Guava tree. Once timid Sampath finds himself at the centre of an adoring crowd of pilgrims who mistakes his knowledge of their private affairs for spiritual enlightenment. At first, he was filled with shame with his officious father then soon realizes his son's spirituality.

His mother finds relief in the Orchard from traditional Indian family life and middle class respectability. She devotes herself to create increasingly exotic curries. All goes well until the local monkeys start to drink. Plans rid the Orchard of their unwanted Hullabaloo but nor before Sampath is released for the endless cycle of demands. Transformed into a Guava, he is last seen being carried towards the sacred Himalayas by the hungry monkeys.

In the case of *Hullabaloo in the Guava Orchard,* the dreamer is a slovenly young man named SampathChawla, who was born in the town of Shahkot during a historic monsoon that ended months of drought. For years, Sampath has done nothing to live up to the expectations wrought by his auspicious birth. Since getting

a job at the local post office, he has spent most of his tree time reading other people's mail and thoughtful about their lives.

Although Sampath causes his go-getter father s endless grief, his grandmother prophesizes great things, "But the world is round", she declares. "Wait and see! Even if it appears he is going downhill, he will be out on the other side. Yes, on top of the world. He is Just taking the longer route (HGO,26). Hullabalo0 1s a kind of table where prophecies always come true, Sampath's grandmother is quickIy proven correct.

Not long after Sampath runs away from home and takes up residence in a Guava tree with a band of monkeys, he is being acclaimed as the hermit of Shahkot, a visionary blessed with an unusual spiritual nature. His secrecy reading of other people's mail has endowed him with a hat which seems like the power of second sight, just as his simple minded love of adages and promotes a reputation for unfathomable wisdom.

Sampath's compatibility praised as the Holy Sacred wise man, he was hallowed to Indian tradition of spiritual enlightenment. The events that accompany his newly discovered holiness read like an out and out send up of the Western religion of celebrity. Sampath's ambitious father is soon decorate up his son's orchard bower trying hard to keep a balance between the look of restricted to bare necessities and actual comfort and prepare a host of money making schemes designed to capitalize on his son's new found fame. Son, buses and rickshaws are bringing tourists to visit the famous Baba in his tree top hermitage, and making Sampath's family rich.

Sampaths many companions have developed a taste for liquor and become a growing public nuisance. A spy 1or the local Atheist Society has vowed to expose Sampath as a fraud. It was precisely people like Sampath who obstructed the progress of this nation, keeping honest. The spy thinks that educated people like him in the backwaters are along with them. These striving intelligent souls are at progress and inhibited anybody who tried to make a stand against the vast uneducated crowd, swelling and growing towards the biggest population of idiots in the world.

Kiran Desai does a clever, dexterous job of mastermind with these events, and in doing so, introduces a sprawling cast of characters rendered in a bright folk art colors. There Sampath's immediate family, of course, his pressure status conscious tact, his eccentric, silly mother and his ambitious man handling sister. Then there are the town officials, charged with containing the Hullabaloo surrounding Sampath. Vermaji, a monkey expert is puffed up with self importance.

The Brigadier would rather count the birds in his garden than preside over his troops. The Superintendent of police neglects his duties in hopes of being reduced in rank. Filling out the cast are Sampath's former colleagues at the post

office, an unfortunate ice cream vendor who catches the attention of Sampath's dominating Sister and a chorus of pilgrims and tourists.

These bumbling characters may move unsteadily on the edge of caricature, but th author delineates them with such wit. They introduce themselves in a harmful insidious manner in our minds, even as they lend the fictional town of Shahkot as felt fairy tale charmed, with Hullabaloo in the Guava Orchard, Desai has made a modest but enchanting debut.

Though the reader is allowed a slightly more privileged vantage point, occasionally listen in on the stream of consciousness of Sampath and Kulfi, Desai's breezy style preserves their enigmatic aura for both the internal and external audiences. Thus with Kulfi and later with Sampath as well, Desai confounds the distinction between solitude and silence, silence being the necessary absence of verbal communication.

This physical, oral and aural isolation is only heightened in the orchard, where Kulfi bustles about on her own terms, marching to her own drummer: "Here, in the Orchard, the hold of other people on Kulfi and her awareness of them retreated even further and, like Sampath. She discovered the relief of space (HG0,78). She preferentially keeps to herself throughout the novel, even the reader rarely encounters any vocalized expression of her thoughts, and when they do appear, they are uncensored outpourings of her mind's voice, and exclusively on the topic of alimentation.

Once SampathChawla settles down in the Guava tree, he is joined by aHorde of his family who try to commercialize his presence atop the treeAnd then follows a horde of businessmen who endeavour to sell theirWares ranging from tooth paste to mosquito repellers to the trustful touristOf the orchard. After the dreaded monkeys of the town join him the treeSampathChawla is then re-christened as Monkey Baba (HGO, 79)

Both characters engage with their reality in highly artistic ways. Kulfi does so vibrantly Sampath more weakly, as if his claim to artistry is genetically diluted. When Desai draws the curtains back so that the reader can peek into Sampath' s mind, we feel we are entering a different realm. We quiet in to leave behind the alternately persistent, prodding, and angry voices of Mr. Chawla, the mob, and government officials and things seem to come to a standstill. It is like we have entered a portal to an ante chamber cut off from the din of the outside world.

The delightful story of SampathChawla, bored post office clerk and dreamer. Who takes to the branches of a secluded guava tree in search of the contemplative life, only to find something rather different. Hullabaloo is delicious, with kindness and humor. Desai describes a magical world full of eccentric characters that, at the end of the book, one is sad to leave. Sampath sees them as a symbol of his own joy, swearing he will not live without them.

Sampath represents the human urge to be free of constraint, without social conformity. The two conflicting urges of freedom and conformity have to be kept in balance by most adults sampath, however, lacks any social sense, like the monkeys. He finally runs aways from home when he tastes the sweetness of a guava and feels its wildness within, thus shedding his last social conditioning. He takes up his home in a guava tree as the most natural home for him.

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DISLOCATION OF SELF IDENTITY IN MEENA ALEXANDER'S

MANHATTAN MUSIC

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ABSTRACT

This paper illustrates how Meena Alexander explores the prospect of outgrowing the sense of rootlessness of Asian immigrants in America in Manhattan Music. According to her it is managed by vocational and social engagements, and bonding with fellow expatriates. Alienation, search for identity and emotional insecurity of immigrants have hitherto been the dominant themes of diasporic literature. Meena Alexander's Manhattan Music analyses the impact of transplantation from natal to post-marital space in the lives of women characters. SandhyaRosenblum, Draupadi Dinkins, Sakhi and a few others despite the differences in their upbringing, experience the trauma of dislocation at first, but outgrow the same. Sandhya wrestles between her conflicting roles, a mother in New York and a daughter revisiting India, and in neither does she feel at home. But after her recovery from the shock of suicide, she escapes from racial thinking. It constitutes a rebirth of self for her. Similarly, Draupadi, the alter-ego of Sandhya, comes to realise being an American is only a part of her Self. Meena Alexander's central vision in all her writings is the need of the immigrants for adapting themselves to the changed environment to find meaning in their lives. The various dimensions of gender, culture and migration which transforms a woman; and how a search for identity to know all about herself brings forth new paramaeters of a diasporic woman's self is the crux of this paper.

KEYWORDS: Identity, Immigrant, Dislocation, Diasporic, gender, racial, culture.

Manhattan Music (1997) has an autobiographical content of Meena Alexander, and it narrates her life as a diasporic Indian writer, a married woman and a mother, Meena Alexander's novel shows her protagonist as a mother, a professor, and a poet in a multicultural New York, she tries to locate herself in different cultural locations. Her representation of the rebellious women shows the changing scenario in India in the twenty first century.

Sandhya, protagonist of Manhattan Music also becomes a victim of male violence, when she goes for some days to her friend, Madhu's home. A drunkard man tries to rape her on her way home, but Sandhya hits the man back by using full force:

"The thought, which seemed perfectly natural, filled her with an energy she did not know she had, and she pushed hard to save herself. In the few seconds after she got her legs free, she started stumbling, up through the rocks, the stone still in her hand" (Manhattan Music 18).

If women challenge forces working against them in this way as Sandhya has done, then some changes can be expected in violent and dominant ideologies working against women in the present scenario

Immigrants make every effort to fit in the alien homeland but at times in these efforts they become hybrid personalities. The novel is set in India and Manhattan, and the protagonist is trying to make sense of her life in these sweeping locations. Migration, nostalgia, memory, history, uprootedness and the final birth of hybrid identities are the major themes Alexander has dealt with in Manhattan Music.

Alexander"s treatment of violence is entirely different from other two writers selected for the study. In her semi-autobiographical novel Manhattan Music, she questions how political violence influences personal relations at times and controls psychology. Sandhya"s first migration gives a glimpse of Alexander's experiences as she writes in Poetics of Dislocation: "On my fifth birthday, I was plunged into a world with no before and no after. A child can fall into the sea, never to reappear" (178). From her other writings also, the pain of migration in her life is evident.

To tune with new culture and society, one is occasionally at a loss about one's native identity. Change of name, dress, and food habits are the basic things one has to adopt at the new place. Alexander's Sandhya also finds herself in an abyss of foreign culture where she does not feel comfortable with her native one too. This fact is apparent from her nostalgic memories; Sandhya recalls her childhood memories and longs to be with her past, and her parents in her native land:

> By fields swollen by monsoon flood, she imagined her greatgrandmother afloat in a black canoe. Then too, she remembered the cemeteries where her grandparents were buried, the houses that had held them, the rites under which they were married. But memory swelling like black water threatened to drown her. (Manhattan Music 4)

Migrated people at times find themselves alien to the foreign land and they try to alter the circumstances accordingly and at times change themselves to adjust to the new environment. Migrated people often become victims of psychological violence. They find themselves uprooted from their native culture and cannot alter the foreign culture. Same is the case with Sandhya, and she feels psychologically

displaced from the distant land. She gets married to whiteAmerican, Stephen Rosenblum. She negates the orthodox values of Indian culture that she thinks should be challenged. In her efforts to locate herself in the new culture, she finds herself more displaced. Alexander's protagonist is presenting her inner self, as she writes in Fault Lines, "I am, a woman cracked by multiple migrations. Uprooted so many times she can connect nothing with nothing" (2)

Sandhya finds herself out of the place everywhere. Her friend Draupadi serves as her alter ego, when Sandhya in spite of all her efforts to cope up with the things, cannot help it. She tries to commit suicide; her friend Draupadi helps her face the circumstances, as JaspalKaur Singh in an article "Memory of Trauma in Meena Alexander's Texts" writes

> "Draupati, her modern intellectual friend, the hybridised and diasporic subject, permitted sexual freedom, must bring Sandhya, the oppressed Indian women, into her sexuality and identity" (399).

Draupadi is hybridised and modern intellectual girl for whom sexuality and identity are both fluid aspects of life. Further, JaspalKaur has differentiated Sandhya as a meek and submissive diasporic individual as against the westernized Draupadi, who stresses sexual liberation is needed to attain womanhood

SandhyaRosenblum in Manhattan Music does not find her happiness with her husband Stephen Rosenblum. She also thinks like innumerable other women, who always feel their existence is due to their services to their male-partners. The novel Manhatan Music centers on the emotional and physical dislocations of the protagonist Sandhya. As a recent immigrant from southern India, Sandhya feels adrift in her American life and tries to create meanings for herself by committing adultery and then by attempting suicide. Thus we have a quintessential and somewhat melodramatic story of a dark woman struggling with her burden of memory-making in a transplanted location.

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FEMALE SUBJUGATION IN SHASHI DESHPANDE'S *SMALL REMEDIES*

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ABSTRACT

ShashiDeshpande is one of the noted Indian feminist writers, who have shown their serious contribution and have expressed restlessness with the traditional positioning of women. *Small Remedies* is an over ruling theme of self-discovery, it also deals with oppression and subjugation of women in a conventional Indian social order. The narrator of the novel is Madhu, who travels to Bhavanipur to write biography of SavitribaiIndorekar. Madhu's own story transforms in one traumatic moment that took away everything in her life. Madhu is overwhelmed by her own omnipotence and reached a position in her own.

Key words: oppression, traumatic, omnipotence, subjugation, phenomenon

ShashiDeshpande is one of the pre-eminent Indian novelists. Her approach to women's problems as depicted in her novels is quite distinct. Deshpande's protagonists, who are educated women and most of whom are finally independent, have not necessarily developed an anti male attitude. *Small Remedies* describes a heroine who leaves the domains of her household and her marriage. Madhu the narrator who is trying to overcome the trauma of losing a teenage son who begins to write the biography of SavitribaiIndorekar whose passion for music has made everything else secondary in her life. Savitribai's secretiveness and her concealing of certain truths complicate the story. Leela is another important character who has led an unconventional life by marrying a Catholic widower with children. Other social realities such heterogeneous religious practices and inter caste marriages form an important part of the story.

MadhuSaptarishi is the protagonist in *Small Remedies* is a lonely daughter, a sensitive and capable woman, a wife and mother, who sets long and lonely journey in her attempt to come to terms with her personal loss. She is given an opportunity to write the biography of SavitribaiIndorekar, the doyen of the Gwalior Gharana. After twenty long years she goes back to small town Bhavanipur, carrying with her the bleeding wound of the loss of her only son, Aditya. Madhu herself has a tragic past. Her lonely childhood, stay with aunt family, which rather intolerant, made her exceptionally sensitive. The initial confusion subsides when she marries Som and has a son. Madhu had no mother, but only her father and Babu, a maid servant. She never bothered of not having a mother.

She thinks mother as:

> Drab creatures, forever working, forever scolding their children, certainly
>
> They're not the women to arouse a sense of deprivation in me. The in-
>
> Control-of-herself Madhu is lost, gone forever. It's my baby's dependence
>
> That changes me; my place in the universe is marked out now. (183)

Madhu is once involved in a physical relation with someone and when she reveals it to her husband Som, the tension begins. If the same would have been done by Som, then it is not that serious because a man's act of adulteration is not at all a crime. Madhu's love for Som cannot allow her to stomach the secret of her past life that she had one night experience of sex with Dalvi and it becomes a reason for losing a piece of mind and happiness in her married life. There is a beginning of violent quarrels and arguments between Madhu and Som. She becomes suspicious of her character. Adit and Som are intertwined with this story of an unarticulated violence. Som thinks that it was an act of conversation with her son. Madhu makes an imaginary conversation with her son. In a confessional mode she says,

> What do I tell you Adit? That I slept with a man when I was a girl, a childreally, and your father can't take it? That your father is tearing himself apart, and me too, because of something happened-and only once-years ago?. (258)

Aditya is quite troubled by his parent's fight, one day her tries to interfere in the fight. One of them shouts at him to go away. He hurts so much and decides to leave his house forever. Madhu's attachment with her son for seventeen years is complete. She is filled in deep grief and emptiness at the moment when she comes to know about her son's death. Her world is shattered. Her identity as Aditya's mother is lost. After the long seventeen years she had no identity, no desire left for self.

Though, Savitribai was a successful singer, she was not accepted by the people of Neemgaon. There were some derogatory about her as she was eloped with Muslim table player Ghulam Saab. Madhu comes to know that there are different laws for men and women in this tradition bond and male dominated society. Savitribai is a delight because here at last is a woman who strongly believes in herself, focuses on her goal and has the courage to set out on her own to seek the fruition of her own genius. Savitribai is a milestone in a portrayal of women.

This novel has another important character that was Leela, Madhu's aunt. After her first husband Vasant's death, she takes up a job and the responsibility of educating her brother-in-law. Even after marrying Joe, a doctor with a good income, she continued living on her own money. Leela as an extraordinary woman and has participates in the '42 Quit India Movement. She went into underground,

she is responsible for many daring deeds, she is never caught, but an amnesty was declared. She is opposed to Satyagraha, which she believes in different action. She is a woman who lives entirely in the present and she never clung to the past, never dreamt of bright future. She does secure for herself the measure of freedom she needed but that is after he earned it by works of it. She totally accepts the consequences of her action. When she married Joe, she knew she has taken on the problem of pavla- her hostile step-daughter. She never complained in her work too though she never reached the top of the hierarchy, while men who had worked under her got there, she never complained.

As the story unfolds, Madhu travels back and forth in time, drawing out, reminiscing and retelling the stories of SavitribaiIndorekar and Leela- two men remarkably independent spirit, who give up their conventional, tradition-bound families to seek fulfillment in public life. It is the story of these two women which forms the core of *Small Remedies*. Madhu's own story is partly interwoven round the lives of two women. For MadhuAdit is the whole world, Som become part of it.

ShashiDeshpande, through *Small Remedies,* projects the quest for self-realization of Indian Women in a hostile patriarchal society. She makes honesty as an important tool in the quest for self and projects. The ability of Madhu and Leela to accept the facts of their life achieves them success in their quest. But what forms the crux of the novel is the fact that experiences of Bai, Munni and Leela, that she alone have to find her identity by understanding her life. The Indian woman has for years been silent sufferer. While she has played different roles-as a wife, mother, sister and daughter, she has never been able to claim her own individuality. She deals with the inner world of the Indian women in her novels. She portrays her heroines in a realistic manner.

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QUEST OF SELF-IDENTITY IN THE NOVEL OF

NamitaGokhale's*Shakuntala: The Play of Memory*

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ABSTRACT

In Indian Social setup a woman is a silent sufferer and is given secondary status both in the family and society. From time immemorial, attempts were made to redefine her identity in relation to man as wife, mother, daughter, sister but tradition trains a woman to think herself as an inferior being. She takes pride in suffering and lives with the idea of subjugation entrusted to her for years inculcation about the necessity to accept the rules assigned to her by patriarchy that runs all through their blood. NamitaGokhale in her novels has depicted the problem and difficulties faced by her female protagonists. In Shakuntala: The Play of Memory, presents the protagonists, Shakuntala as a victim of cultural conditionings prevalent in Indian Social set-up and also portrays her varied responses to the society she lives in. The novel reveals the woman's quest for self-identity, an exploration into the female psyche and efforts taken by the protagonist for self-assertion.

Key Words: Sufferer, Immemorial, Redefine, Subjugation, Inculcation, Patriarchy, Protagonist, Exploration, and Female psyche, Self- Assertion.

NamitaGokhale has emerged as a leading woman novelist on the Indian Literary scene. She is also a founder co-director of Jaipur Literature festival, along with the author William Dalrymple. Most of NamitaGokhale's works are female oriented with a strong touch of feminism, self- identity and woman empowerment. Being a Kumaoni by birth, her novels have   a deep influence of the Himalayas and Kumaon. In Shakuntala: The Play of Memory, is indeed a memory play. It is a story where the protagonist remembers her past, a life filled with hopes, dreams and sexual desires. She is one of the few lucky women who experiences two lives in one life time one that is socially approved as the third wife of rich man, and the other as a fallen women- that is socially approved. "Arise! Commence a new life" (SPM 15) was a message Shakuntala remembered and practiced in every stage of life!"

Shakuntala, the central character and narrator of the novel Shakuntala: The Play of Memory, has the quest of experience and knowledge. She grew up in a mountain country under harsh conditions. Her father died when she was just five years old. He was a vaidya and her mother had learnt a little from him about healing. She had a elder brother Govinda, who was destined to become the man of dharma. Shakuntala did not want to become like her mother for she was restless to see the world, to wander with the freedom of birds and clouds, although her mother cautioned her against it. Shakuntala realized that her mother was more inclined

towards her brother. When her brother along with his guru comes to visit their house, her mother is so engrossed in the hospitality that she completely ignores shakuntala. At that time Shakuntala is bestowed with womanhood and her mother dragged her to the low stoop beside the cowshed and closed the door. It dawns upon her that she had been abandoned. An anger and helplessness rose within her:

Even if I burst my lungs screaming, she would not hear me, my mother. An anger that had the feel and texture of helplessness rose within me, and I heard a scream emerge from some deep recess in my stomach. The sound fluttered like a torn pennant, defeated already in its purpose, I had been abandoned, I would bleed to death while mu brother and his proud guru were plied with jiggery sweets (SPM 31).

Shakuntala feels burdened by the oppressive dominance of her mother who always insisted on her confirming to the traditional way of life. Shakuntala decides to free herself from the bondage of her mother. So she says, "I was eager to be married, for I saw it as an escape from the bondage of my situation" (SPM 18). She is ready to break all those restrictions which are imposed on her parents and society. She finds marriage is the only way which can help her to come out of this neglected situation where she is not getting proper care and affection for her own self. But as it has been said by Simon De Beauvoir in Second Sex that in marrage two become one and he is the one. Commenting on marriage, she says:

Shakuntala is married to Srijan, a mahasamant,who was a rich man and chief of fourteen villages. He would often understand journeys to far off places for his work. He returns with a woman after one of his travels. This creates a sense of jealously in Shakuntala and she is filled with rage and anger. She is hurt by the betrayal:

But the hurt and betrayal, the prickling of thorns under the sheath of my skin- I had never known or anticipated these feeling, just as I had never expected my husband to return from his journey to the east with an exotically beautiful woman with cold and mocking eyes (SPM 58).

Shakuntala later reaches Kashi, the city of her imagination, along with the Greek traveler. But later she is filled with remorse and longs to return to Srijan, her husband and her home. She cannot return now and she blames herself:

It is the nature of night to follow day, and day to follow night. It is the nature of water to flow. It is the Nature of women to have children and grandchildren and see them grow. There is a child in my belly and I have fled from our home. What madness overcame me that day by the river. Perhaps that woman Kamilini, the dimly remembered rival, had cast a spell upon me. Perhaps it was not her doing at all, for I was born under the star of exile, like my namesake Shakuntala (SPM 166)Shakuntala becomes restless. She realizes that the time has come to leave Nearchus although she loves him. She leaves the house at dawn and goes to Kashi, her destination. There she think of going to a monastery, a Buddhist Sangha as she

thinks that they might show some consideration for a woman like her. She can become a Sakya nun like Srijan's mother. Engrossed in her thoughts, Shakuntala, with a torn womb without her baby, is carried by the Buddhist nun to her to embrace the Buddha. But Shakuntala would not bow to her wishes. She realizes that death is approaching near. She gives a brave fight but ultimately dies with determination to return again to the earth.

Shakuntala was a seeker of freedom- Freedom from her mother, Freedom from her husband, Freedom from her lover. Probably the best moment of her life was when her spirit rose from her body and started traveling back to Gangadwar. She was a soul in flight and looking at the courage of her batting spirit, the lady of burning ghats, the Devourer of desires, granted her safe passage. She describes her soul in flight as a "dazzling sight-it gleams and glitters and when the god of death hunted for it, her soul fled like a flapping radiant butterfly!" (SPM198). To achieve her freedom she had to follow the female monk's advice "Embrace the buddha- it is the only way" (SPM 197) as she placed a heavy stone on her chest to ease her breath away. Shakuntala finally found her liberation. She is filled with remorce, and the unfulfilled desire to return home, dies in Kashi, the city of her longing. Her condition can rightly be described in the words of S. B Tiwari,

Human life is suggested as a journey in Quest of Self-Identity or emancipation from the miseries of life. But influenced by man's modernism, ego and Karma and governed by fate and chance, human life moves in a zig-zag way and at last comes to the same state from which it starts but with mans self-realization of his puny stature and the truths of life in tradition-bound social set-up (Tiwari 26-27).

Shakuntala in Shakuntala: The Play of Memory, is hungry for Knowlede and experiences for which she seeks freedom. She is subjected to gender discrimination by her mother. She regards marriage as an escape as well as an avenue to rise above the existing status. She receives love from her husband initially but he betrays her. This provokes her to rebel and run away with an unknown Greek horse merchant. Here Gokhale seems to suggest that betrayal from the person you deeply rely on can lead to a revolt which does not think about the implications and consequences. But in the end she realizes that one belongs to the place where one began. Her desire of returning to the hills is thwarted by her tragic death. . As Simon De Beauvoir opines that woman is not feminine by birth, but she is made so by importunate process of socio-cultural conditioning:

One is not born, but rather becomes a woman. No biological, Psychological or economic fate determines the figure that the female presents in a society, it is civilization as a whole that produces this creation which is described as Feminine (Beauvoir 16).

In Shakuntala : The Play of Memory the novelist raises the question of the equality of woman with man as Shakuntala, the Protagonist, has the longing to travel like man but she is helpless and wants to get religious knowledge like her

brother. She Keeps mum about her opinions because she knows that scriptures are forbidden to women.

NamitaGokhale's novels constitute a broad, encompassing feminist vision which visualizes a rightful place for women in the patriarchal society. She wants women to be self-sufficient for living with self-respect. She needs to be applauded for her effort. On account of her keen concern for women, peculiar style of presenting her views and re-creation of the life she experienced, NamitaGokhale has ensured for herself a prominent place among the Indian Women novelists in English.

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CHILDHOOD TRAUMA IN TONI MORRISON'S *"GOD HELP THE CHILD"*

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ABSTRACT

Trauma is word that is often used by a large number of people to refer to the negative and stressful events that they experience in their daily life and which have a particular impact on them.The characters in Bride's life have their own pain, trauma, death, cheat, love, and losses. The action of this novel is made intense by these individual stories.Morrison shows understanding of and compassion for characters who commit horrific deeds, like, incest-rape or infanticide. This trait springs in a large part from her attitude towards good and evil, which she distinguishes from the conventional Western view of good and evil. She describes a distinctive view which she claims, black have historically held toward good and evil. Her villains are not evil, nor are her good people saints. The theme of childhood abuse as it unveils the traumatic experiences children endure at the hands of society and caretakers.

Key Words:

Trauma, Horrific deeds, Infanticide, conventional Western, Society and Caretakers

Childhood Trauma in Toni Morrison's "*God Help the Child*"

Morrison's *God Help the Child* (2015) is built as a narrative quest in which the protagonist, Bride, is led to question her self-constructed adult identity and to address her past. In the course of the story, Bride's body is textually foregrounded as the privileged site for the construction of her identity, where the signs of an identity crisis will appear as symptoms of a childhood trauma. This essay aims at analyzing how the novel's revelatory structure links the apparently unrelated transformations undergone by Bride's body into a single narrative of secrecy and trauma. My approach to the novel draws on black feminism, gender studies, trauma studies, and narratology in an attempt to bridge the gap between two apparently distant aspects: the thematic prominence of the main character's body and the peculiarities of the narrative structure used to tell the story.

God Help the Child is Toni Morrison's latest novel published in 2015. As a whole, the novel carries on a discussion on Morrison's major themes in her well-known works as racial bigotry, black skin color and center-periphery relationships. It is also, as the title indicates, about

childhood and the way to confront childhood past ghosts to better reclaim the present and the future. The story of the novel revolves around Lula Ann Bridewell, Morrison's black protagonist, born to lightened skin parents, the father Louis and the mother Sweetness. As a dark baby girl, Lula Ann Bridewell was refused by her father and hated by her mother because of her black epidermal signs. Indeed, the child's dark skin embarrassed the mother to the extent that she obliges the daughter to tell her Sweetness instead of mom. She even tried once to kill her by pressing a blanket on her face, and withholds any kind of affection and love for her.

> Some of you probably think it's a bad thing to group ourselves according to skin color-the lighter, the better in social clubs, neighborhood, churches, sororities, even colored schools. But how else can we hold dignity. (GHTC: 4)

Years after leaving her mother's house, Lula Ann changes her name to Bride and works as a regional manager of "YOU GIRL", a line in a cosmetic company. She also entered into a romantic relationship with a guy named Booker Starbern who becomes the life for her. In the course of the story and through a series of flashbacks, we learn that as a child, Bride accused her innocent young teacher, Sofia Huxley, of child molestation at a court trial, and fifteen years later, to amend this terrible childhood lie, Bride has prepared many gifts and goes to visit Sofia Huxley who has just been released on parole. Yet, it is impossible for Sofia Huxley to welcome the person who once put herbehindbars;heronlyreliefisbeatingBrideuntilbleeding.BelievingthatBride sympathizes with Sofia Huxley, a child molester, Booker Starbern, Bride's lover, puts an end to their relationships and leaves Bride alone.

> She works hard and she becomes face of a popular cosmetic line; she is transformed into "Hershey's syrup "from" licorice." On the advice of her designer, she shops only for white and begins to looks like, "whipped cream and chocolate soufflé ", and "panther in the snow." (GHTC: 34)

The book becomes more challenging with the reference to another child character's story of molestation, named Adam. Adam is Booker's oldest and closest brother. When they were children, Adam had been sexually abused then killed by a man referred to in the text as 'the nicest man in the world. Booker was deeply touched by this incident and becomes obsessed by his brother's death. In addition to Booker's, Adam's and Bride's childhood ghosts, the narrative introduces other characters who suffered childhood trauma. These include Hannah, Rain andBrooklyn.

Feeling the absence of Booker, Bride sets out on a journey of search for him, which takes her from the urban city of California to a rural valley in

an unknown forest. The journey was fraught with physical and emotional hardships; the protagonist broke her leg in the middle of her journey and took refuge until healing in a house owned by Steve and Evelyn. However, Bride carries out her search for Booker, and finally, to meet him in Whisky valley and together they rescued his aunt, Olive, from fire. Booker and Bride reconciled and confessed to each other their past secrets:

Bride confesses that Huxley was innocent and the lie she told was for some reason and Booker, in his turn, tells her that he has left her because he thought she forgives a child molester like the one who once abused and killed his brother Adam. Still, Bride makes another confession telling Booker that she is pregnant. The couple accepts the child to come to the world and plan for a better future. The novel closes by making references to the regrets Bride's mother, Sweetness, feels and suggests on the abandonment of children and the scars left in theirmemories.

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NATURE IN CHITRA BANERJEE DIVAKARUNI'S *THE MISTRESS OF SPICES*

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ABSTRACT

Nature is God's precious gift to man. The Life of the human beings is highly interlinked with their environment. Literature which deals with nature is called as green literature. Ecocriticism brings connectivity tonature, literature and human life. Chitra Banerjee Divakaruni is one of the renowned diasporic writers. Her debut novel The Mistress of Spices is filled with environmental imageries. Spices in the novel are also personified to display its inevitable role in the novel. It is about the magical properties of spices and the relationship between spices and human beings. The writer has employed a lot of natural elements in the novel gives vivid descriptions. This paper studies the effects of spices, the role of nature and environment in the novel The Mistress of Spices from an Eco critical perspective.

Key Words: Ecocriticism, Ecofeminism, Woman and Nature, and Spices.

Nature in Chitra Banerjee Divakaruni's*The Mistress of Spices*

Chitra Banerjee Divakaruni is one among the most talented women writers of Indian Diaspora. She herself is an immigrant settled in America. She has written eleven novels, three anthologies, four poetry collections, and five adult children books. Her works mostly deal with the themes of diaspora, gender discriminations, and ecofeminism, etc. She is well known for her unique style of narrating the plot. The Mistress of Spices is the debut novel of Chitra Banerjee Divakaruni which is shortlisted for Orange Prize in 2000. It portrays the day- to- day life of immigrants living in California. In the novel, Chitra Banerjee Divakaruni has employed a lot of natural elements to make the descriptions more vivid. For example, spices play a key role in the novel next to the protagonist of the novel. The whole novel revolves around the protagonist and her relationship with spices. Tilo, the heroine of the novel upholds the power of sensing spices. Spices were also personified to display their inevitable role in the novel. The attempt is made in the paper to analyze the effects of spices on the pivotal character, the role of nature and environment in the novel The Mistress of Spices from an ecocritical perspective. Nature is God's precious gift to all. It provides food, cloth, and shelter. Nature is omniscient. It can be a creator, preserver, protector as well as destroyer. Nature holds an unsurpassable place in one's life.

The Life of human beings is highly interlinked with the environment they live in. As literature scrutinizes human life it has recorded the importance of nature in it. Any Literature which deals with nature is called as green literature. In the United Kingdom, the study on green literature is called as green studies, whereas in the United States it is called as Ecocriticism. Criticism which combines literature and ecology is called as ecocriticism or

green studies. According to CheryllGlotfelty, "Ecocriticism is the study of the relationship between literature and physical environment." (Barry, 239) It is an umbrella term which covers various ecological theories like anthropocentrism, ecofeminism, ecocentrism, etc. The term 'Ecocriticism' was first used by William Rueckert in his essay entitled Literature and Ecology: AnExperiment in Ecocriticism published in The Ecocriticism Reader: Landmarks in Literary Ecology by Cheryl Glotfelty and Harold Fromm in 1978. It was derived from two Greek words oikosand kritismeaning house and judge respectively. It is an earthly centered perspective in reading literature. It brings awareness about the bond between nature and life. Ecocriticism serves as a bridge between literature, nature and human beings. In The Mistress of Spices, Tilo, the heroine of the novel is a trained expert in perceiving the secret powers of spices, dedicates her life to spices. Her knowledge helps her in sensing the problems of people. Tilo (Nayan Tara) was born in India. Nayan Tara means the star of eye. She is enabled to sense the problems of people. As she was a girl child she was neglected by the family members. Once in her childhood when her mother was not able to feed due to fever nature becomes Tilo's mother and feeds her. Nature has the quality of supporting people during the critical situation. The novelists writs that: "As the cows run dry at the time of her birth she was fed with the milk of ass which helped her in getting the sight and words sooner than others".(MS 7)

The author brings the heroine closer to nature and entangles her entire life with different elements of nature from her birth. She was considered a special child as she had an inborn magical power of predicting the future which she uses for solving the problems of the villagers. She becomes luxurious and brings wealth to her family. She has really become a flower grown in the dust as her name Nayan Tara refers to. Change is the only unchangeable thing in the life. Nature serves as a bringer of change in the protagonist's life. As her fame went beyond seas and mountains pirates kidnap her and make her as queen of pirates and call her as 'Bhagyavathi'. Because they think that she will bring luck in their life. In order to describe the appearance and the wealth of the pirates Chitra Banerjee Divakaruni writes The pirates had teeth like polished stone and scimitars with handles made from the tusks of boars. Their fingers were laden with rings, amethyst and beryl and carbuncle, and around their necks hung sapphires for luck at sea. Polished with whale oil, their skin gleamed dark as mahogany or pale as birchbark, for pirates come from many races and many lands. (MS 17) She doesn't want to remain as a pirate queen. In order to escape from the pirates, she sends her calling thought over the water and it helps her with a typhoon. She gets released and is saved by the serpents of under water. Water and fire become an important part of her life that change her life from a village belle to a pirate queen and now takes her to an unknown world of spices and magic led by the serpents. She jumps into the water and in the morning she found herself naked on the shore. The nakedness mentioned here also reflects the nature and it also refers to her openness to adopt the future. Later, she is taken to a mystifying island where she is trained by the First Mother to use spices as healing elements. She is chosen by the First Mother as the spice girl and she is named as Tilo after sesame, the spice of nourishment. It means life -giver, and restorer of health and hope. The sesame seed is known for its tiny sharp flower that mothers pray for their children to have a nose shaped like it. It is golden brown in colour under the sway of planet Venus. Sesame ground into the paste with sandalwood sesame cures diseases of heart and liver. When sesame is fried its

own oil restores luster if one is lost interest in one's life. The name Tilo also refers to the ApsaraTilottama in the court of God Indra. She is the most elegant of all dancers. She is crest jeweled among women. Tilo's life is highly intertwined with nature as she has the unique power of understanding the spices. She identifies herself as a mistress of spices. She acts according to the instruction given by the spices around her. She introduces:

> I am a Mistress of Spices.I can work the others too. Mineral, metal, earth and sand and stone. The gems with their cold clearlight. The liquids that burn their hues into your eyes till you see nothing else. I learned them all on the island. But the spices are my love. (MS 1)

Tilo is running a famous spice bazaar in California. All spices in her shop bow to her command and yield their magic powers and their properties. Every Indian spice found in her store can communicate with her. And when she places her hand they speak to her and even direct her during necessary times. Even though it supports her in various situations it didn't let her go beyond the rules. As it serves as a companion to Tilo it has the rights to warn and punish her. As red chilli is a symbol of danger it warns her when she thinks about the American guy, Raven. "For a moment I hold their glances and the air around us gross still and heavy. A few chillies drop to the floor, scattering like green rain". (MS 6) In order to give importance to spices, Chitra Banerjee Divakaruni has personified the spices. They talk, sing and express their emotions. Tilo says, "In the store spices displeasure waits for me. I must beg pardon". (M S 30) Spices are not depicted simply as an ingredient added in recipes but as an embodiment of the native culture. Jayashree Singh quotes in her article Spice's Action in the Internal World as: "Divakaruni takes up the image of the spices and the woman as complimentary, and fuses them in the enigmatic and mysterious character of the mistress of the spices. But here the spices also represent the heritage of tradition that forms and restrains the mistress". (Jayshree Singh 307) The novel The Mistress of Spices is divided into 15 chapters of which thirteen chapters are named after different spices such as Turmeric, Cinnamon, Fenugreek, Asafoetida, Fennel, Ginger, Peppercorn, KaloJire, Neem, Red Chilli, Makaradwaj, Lotus Root and Sesame which reveal their powers and their origins. She has also presented an astounding story on spices with a mix of nature. Thus, Nature becomes an essential part in the setting of the novel. It helps her describe her thoughts in grandeur. It also helps her in portraying the emotions and the feeling of both the author and the narrator. It also reflects the tradition of the land the spices belong to. The First Mother lives on the island where Tilo lands and spends her time among the serene yet mystical island to learn from the old one. From the magical island of spices, Tilo is transported through the fire of Shampati (the Eastern Phoenix) to Oakland. Chitra Banerjee Divakaruni uses the elements of nature to transcend the world of nature. The novelist writes that "Seamiest, the island casts its pearl light around us." While describing the island she notes: "The sky is black and smoky. There is no sky, and no sea either." The author uses similes, metaphors, and adjectives from the nature to bring depth to her narrations and descriptions. She describes the other spice girls as "they become water wraiths, spirits of mist and salt, crying in the voice of the gulls. (MS34) Nature is filled with colours. Each colour has its own significance. Chitra Banerjee Divakaruni had cleverly employed colours to describe certain things. Yellow colour signifies the new-year where green suggests harvest, and red denotes the luck of bride. The

five elements of nature the air, water, earth, space, and fire are skillfully interwoven in the story. The Shampati fire which turns Tilo into a spice girl, the water through which Bhagawati sends messages, the names of mistresses and even the figures of speech used in the novel are eternal parts of nature. Chitra BanerjeeDivakaruni uses nature to put forth the oxymoron in the sentence "Raven, tonight lay on my windowsill amritanjan, ointment that is like cold fire, hot ice." (MS 205). Nature serves as a deciding authority in the novel. Raven, the lover of Tilo is a wealthy man addicted to the drug. His life is refreshed by the advice of a raven that he finds in a hospital. Raven is instructed by the raven to meet Tilo which brings him the joy of life. Maya, the name given by Raven to Tilo, reveals the reality of her thinking over earthly paradise "High up in the mountains, pine and eucalyptus, damp odour of redwood, bark and cone" (MS 199). However, they realise that a new world can be created from the ruins of the devastated world. This way the cycle of nature also comes along with the whole story from the beginning until the end. From the birth of Nayantara as a foreseer and further in her life journey nature is preserved and reinstated towards the end of the novel. The powers given to Tilo are taken back and is destroyed as she breaks the rules of getting emotionally and physically attached to someone else. Towards the end of the novel, the devastating earthquake symbolizes the Indian philosophy of creation, preservation, and destruction completing the cycle. The earthquake in the novel comes as dues ex machina to resolve the critical situation of Tilo. The earthquake destroys everything but not her faith to emerge from the ash. Nature is the great nurturer of life. It can protect, it can demolish, and it can rejuvenate life from the destruction. Thus, Chitra Banerjee Divakaruni's novel The Mistress of Spices is filled with the elements of nature. It portrays the inevitable place of nature in the life of the people. It has brought out the different faces of nature. Thus the novel is written with a message that nature should be protected.

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A STUDY ON IMPACT OFJUNK FOOD IN PALAYAMKOTTAI TOWN

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ABSTRACT

"Eat healthy and live healthy" is one of the essential requirements for long life. Unfortunately, today's world has been adapted to a system of consumption of foods which has several adverse effects on health. Lifestyle changes has compelled us so much that one has so little time to really think what we are eating is right! Globalization and urbanization have greatly affected one's eating habits and forced many people to consume fancy and high calorie fast foods, popularly known as .Junk foods.. Research into the possible health hazards on consumption of such high calorie foods has given an insight to avoid them, but unfortunately measures taken are not as effective as they need to be. Diseases like coronary artery disease and diabetes mellitus have seen a profound rise in developing countries and such unhealthy junk food consumption is one of the notable factors to its contribution. This global problem of consuming junk food on a large scale and its impact on health needs emphasis and health education which can greatly contribute to its limited consumption and switching over to healthy eating habits for the better living. knowledge highlighting about the eating habits, nutritional aspects, quality of unhealthy foods, their health impact and preventive measures

should be given to create awareness and renderhealth education for a change towards goodeating practices. Junk food and its impact onhealth have been reviewed from variousresources and have been systematicallypresented, so as to emphasize its ill effects andmeasures to be adapted towards healthy living.

Key Words: Diseases, Health, Junk food, Lifestyle .

INTRODUCTION

Junk or fast foods taste good and are rich in calories but they are of a very low nutritional value, fast foods are usually rich in sugar, rich in fats or rich in salt. There are many examples of junk food such as pizza, French fries, burgers, hot dogs, fried food, candy, ice cream, and soda pop. Junk food is un healthful food that is high in calories from sugar or fat, with little dietary fiber, protein, vitamins, minerals, or other important forms of nutritional value. Precise definitions vary by purpose and over time. Some high-protein foods, like meat prepared with saturated fat, may be considered junk food. the term an HFFS food (high in fact, salt and sugar) is used synonymously. Fast food and fast food restaurant are often equated with junk food, although fast foods cannot be categorically described as junk food. Most junk food is highly processed food. Concerns about the negative health

effects resulting from a junk food-heavy diet, especially obesity, have resulted in public health awareness campaigns and restriction on advertising and sale in several countries. Junk food is a pejorative term dating back at least to the 1950s. Junk food is the term given to food that is prepared and served very quickly. Any meal with low preparations time can be considered fast food; typically, the term refers to food stored with preheated or precooked ingredients. It is delicious, filling, is readily available just any of the day, being only a drive through phone call.Junk food all began in 1893, when two vendors –brothers Frederick and Louis rueckheim –at the world's fair in Chicago made a concoction of popcorn, peanuts, and molasses that was widely popular. A few years later, in 1896, their sweet invention went on to become sold commercially as Cracker Jack.The famous microbiologist Dr. Michael F. Jacobson, director of the Center for Science in the Public Interest, coined the phrase "Junk Food" in 1972 to describe unhealthy or non-nutritious food. Junk foods are typically ready-to-eat containing high levels of saturated fats, salt, or sugar, and little or no fruit, vegetables, or dietary fiber; and are considered to have little or no health benefits. Junk food has been a part of the American society for years and now it has become an addiction for many people.

REVIEW OF LITERATURE

Chamberlain, L.J., et al., (2006) analyzed and concluded that children's screen media time is significantly associated with the requests for advertised toys and foods or drinks.

Cynthia Radnitz, (2009) says that they made an attempt to give the nutritional content and attitudes toward foods in television programs to children under age of 5. Higher ratings for excessive consumption of unhealthy foods were found out.

Kolodinsky et al., (2007) have proved a nutritional course is beneficial to increase students' knowledge of a healthy diet. Nutritional knowledge of students who have completed a GCSE in Food Technology or Home Economics will be compared to those who did not choose Food Technology nor Home Economics as a GCSE option.

OBJECTIVES:

1. To study the junk food in to affect in Palayamkottai area.
2. To help to reduce the health problem of people now a days.
3. To guide people to have a healthy life style.

LIMITATIONS OF STUDY

Limiting processed fast foods high in fat, starches or sugars helps control calorie intake.   One of our cancer prevention recommendations is to limit 'fast foods' and other processed foods high in fat, starches or sugars, as this help control calorie intake and maintain a healthy weight. There is strong evidence that diets containing greater amounts of 'fast foods' and other processed foods high in fat, starches or sugars, and consuming a 'Western type' diet (characterized by a high amount of free sugars, meat and fat), are causes of weight gain, overweight and obesity by increasing the risk of excess energy in take relative to expenditure. Greater body fatness is a cause of many cancers. Most foods undergo some form of processing before consumption. More highly processed foods have

generally undergone industrial processing and are often higher in energy and lower in micro nutrients.

These foods include:
- ❖ Potato products such as chips and crisps
- ❖ Products made from white flour such as bread, pasta and pizza
- ❖ Cakes, pastries, biscuits and cookies
- ❖ confectionery

Over weight and obesity are at the highest levels ever seen globally. Increases are particularly evident in middle- income countries where 'fast foods' and other processed foods are increasingly available, as physical activity levels are declining. This is a feature of the 'nutrition transition' that accompanies economic development.

HEALTH EFFECTS OF JUNK FOOD:
Scientists and researchers have been talking about adverse effects of junk food for decades. The harmful effects hare associated with junk food eating are generally characterized as short- term effects and long-term effects.

LONG TERM IMPACTS ON HEALTH
Heart Disease
Eating "junk" is one of the primary causes of heart disease - Myocardial infarction   being one example. This occurs when plaque is formed in the arteries that are connected to the heart. These arteries have to work extra hard to pump blood downstream, which in turn creates circulation problems. Heart fatigue and heart attack can also often be associated with it.
High Cholesterol
Junk diet also creates high cholesterol which affects your liver. Continuous consumption of it may completely damage your liver, or at least disturb your met

SHORT TERM IMPACTS ON HEALTH

Reduced Energy

Though a person may eat a sufficient quantity of junk, they will still feel weakened since it contains little, if any, nutritional value.

Reduced Concentration
People who eat too much junk food, which is rich in oil and fat, may not be able to concentrate on work, they may feel drowsy, and their blood circulation may decrease.

TABLE 1.PEOPLE LIKE TO VISIT FOOD JOINT WITH:

PEOPLE LIKE JOINT WITH EAT	RESPONDENTS	PERCENTAGE
FAMILY	20	67
FRIENDS	7	23
ALONE	3	15
TOTAL	30	100

From the above table 1 it is referred as that the majority 67% of the respondents visit the food that the family followed by friends 23% and alone 15%.

TABLE 2.PEOPLE CHECK THE NUTRIENT FACT TABLE IN THE JUNK FOOD:

NUTRIENT CHECK JUNK FOOD	FREQUENCY	PERCENTAGE
DON'T KNOW	10	33
YES	15	50
NO	5	17
TOTAL	30	100

From the table2 it is referred that majority 30% of the respondents think that there is don't know of junk food nutrient check, followed by no 20%, yes 25% and sometimes 25%.

TABLE 3.PEOPLE OPINION IN FAST FOOD EATING MAKES A PERSON OVER WEIGHT:

PEOPLE OPINION	RESPONDENTS	PERCENTAGE
YES	25	83
NO	5	17
TOTAL	30	100

From the above table 3 it is referred as majority of 83% of the respondents think that yes and 17% no.

Table 4 PEOPLE MIND WHILE CONSUMING JUNK FOOD

PEOPLE OPINION	FREQUENCY	PERCENTAGE
OBESITY	14	48
CANCER	8	26
HEART ATTACK	8	26
TOTAL	30	100

From the table 4 it is referred that the majority of the 48% respondents consuming the junk food the effect of obesity, followed by cancer 26% and heart attack 26% in opinion of the respondents.

FINDINGS:

Majority of **55%** respondents think that prices of junk food are family.

- ❖ Majority of **30%** respondents think that consumption of junk food has nutrient check in junk food.
- ❖ Majority **55%** respondents junk food consumption over weight
- ❖ Majority **50%** respondents are of the view that the side effect of junk food is obesity.

SUGGESTIONS:

From the survey we can find out that the impact of junk food on society is quite high, we have to stop this or else it will be a great difficulty to maintain a good health.

- ➢ . We should substitute the junk food by the tasty food made at home. Junk food made at home is less harmful to health.
- ➢ The junk food has great impact on health because it is harmful to health. If we consume it by giving time gap then it can have no impact on health.
- ➢ The people should be given knowledge about healthy food so that this food can be stopped.

CONCLUSION

Finally, junk food should not be taken, because it can cause the people to dementia, unhealthy and can cause obesity. Junk food is ruining our people and students are becoming addicted to the taste and smell. It is causing great problems with school level people to working people. This causes many diseases and results in mortality of many people.

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IMPACT OF DEMONETIZATION ON HUMAN RESOURCE MANAGEMENT

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ABSTRACT

Demonetization is the process of changing the existing currency of a nation with newcurrency, often practiced with predetermined reasons. In India it was done twice inaddition to recent Demonetization in 2016. The main reason of this was to restrict themoney laundering, black money, corruption etc. The HR Department has a huge role to play here if it so decides. It has to alleviate the short term sufferings of employees. Many organizations have worked with the Banks and have almost brought the Banks to their doorstep. Have heard of Banks opening help desks in Corporate Offices and help employees deposit their old currencies, help withdraw limited cash as per RBI guidelines and in general help the employees alleviate their sufferings. Some have given special time off to allow employees to visit ATMs and Banks during office hours. Some have set up mobile ATMs at their premises to help employees withdraw cash.The present paper discusses thevarious impacts of demonetization on Human Resource Management. There will be various positive impacts in the labour scenario.

Key words: Demonetization, Currency

1.1   Introduction

The Demonization policy announced by Prime Minister NarendraModi at midnight on November 8, 2016, the government would longer recognizethe existing 500 notes and the 1,000 notes as valid forms of the currency of legal no tender. The Reserve Bank of India reported that between November 4, 2016, and December 23, 2016, "the amount of money in circulation has been reduced by almost half". The lack of liquidity has caused serious economic difficulties. Demonetization had a significant impact on Human Resource management in various sectors.Human resource management is a process of bringing people and organizations together sothat the goals of each other are met. The role of HR manager is shifting from that of a protector andscreener to the role of a planner and change agent. Personnel directors are the new corporate"heroes". The today focus in business is personnel. Nowadays it is not possible to show a goodfinancial or operating report unless your personnel relations are in order. The major purpose ofHRM is to increase and improve the productive contribution of personnel to the organization in more ethical, social, and administratively responsible way. This purpose emerged from commonlycalled industrial relations, personnel administration, industrial psychology and personalmanagement. Human

resource management is heavily dependent on many external factors that can be categorized into **"STEEPLE":** Socio cultural, Technological, Economical, Environmental, Political, Legal and Ethical[1]. The present paper discusses thevarious impacts of demonetization on HRM. There will be various positive impacts in the labour scenario.

1.2   Objectives of the Study

To understand effects of demonetization on Human resource management from different perspective.

1.3   Research Methodology

The study is descriptive in nature. It is based on secondary data and information which is collected from reports, newspapers and web-sites.

1.4 Impact of Demonetization on Bank employees

Out of all the people affected by the demonetization drive, bank employees are the most stressed. Demonetization has good and adverse effects on bank employees. Mental stress, physical stress, vigilance stress to maintain profitability and stressed assets management are on one side, increase in knowledge base, Digitization, wages improvement, overall management of operational sphere and futures refined HR policy are on other side. Technology is going to be even more pivotal in banking industry than ever before. People are standing in long queues outside Banks may be for the very last time. If this entire demonetization gets success all the queues in the country to pay any bills (Tax, utilities etc) will vanish and only a 5-minute transaction will suffice for everything. Cashless economy is the latest revolution and everyone should be a part of it.

1.5 Impact of Demonetization on Human Resource Management

There will be huge impact of the demonetization on the black money holders as theyare unable to change the currency. That's why media reported old currency is beingtrashed. The fake currency is now out of the market. The bank deposits increased. Asper times of India report the interest rate of home loan has been decreased by variouspublic and private sector banks[2].

There is big impact of demonetization on the HR world. Earlier many organizationswere dependent on physical record keeping system from entry to exit of the employee.The system is being changed from physical form to the digitalized. Especiallyunorganized sector and SME's where wages and salaries were paid cash moves to thedigital system. The employees' wages and salaries are being paid by bank only,irrespective of the class of the employee.

This demonetization had an effect on few sectors too. Sectors like manufacturing, E-commerce, IT/ITES, tourism, infrastructure and many more, or shall I just say, all the sectors. One department, in all these sectors, which needs to take a step forward post demonetization is – the Human resources department.

Human resources has a mammoth role to play. There are a lot of changes which Human resources needs to implement/upgrade, post demonetization. Talking about demonetization first, the whole motto behind this was digitalization or having a cashless

economy. Even at this time, when **go-green** is one of the most talked about things, HR departments of many companies use paper-pen for documentation. Offer letters and appointment letters are still given out as hard copies, one signed copy with the HR and one with the employee. Even recognitions and awards are presented in writing. Can't we just go completely digitalized? There are many software applications which can be used to monitor work and store the data in super organized ways.

Onesoftware which is very popular is **HRMS – Human Resource Management System or HRIS – Human Resource Information System**. They can help in reducing the paper work and can enable an organization in completely getting digitalized.

Coming to the cash-less part: still a lot of companies pay the housekeeping staff, gardening staff or contract staff in cash. This practice is something which is still very common. Every employee of the organization should have their salary account. It would be beneficial for all of them. Human resources needs to step up here and the get the whole process of digitalization, active and become cashless too. Human resources doesn't have to cater just to the above, rather they have a third issue in hand as well.

The unseen effect of demonetization – fear and restlessness among employees. Report says that there is going to around 35% job loss within six months, as an effect of demonetization (holds true only for few sectors). This has created a stir among employees across all sectors. Everyone is scared of losing their job. HR has to again face this challenge of bringing the faith back, among employees. HR will have to convey the message that the job loss happens when the productivity is low; the company is working just fine, even post demonetization. This can happen by sharing positive achievements of the organization through internet or by having a small day out or motivational training sessions[3].

Its time HR Departments moves to a complete Digital HR System and avoids any physical transaction. Laws don't any more insist on physical signed letters and accept digital documentation as proof/evidences.

The cloud is changing HR in a big way. Both collection and storage of data have always been a big part of HR's function and, until the cloud, meant hard drive space, piles of paper, filing cabinets, and desk drawers. Naturally, this led to inefficiencies, security issues, data loss, and chaotic office spaces. Today, all of this information can instead be stored in the cloud — documents and other pertinent information can be easily accessed online while data can be collected through simplified forms and automated processes.

We must ensure the following:
- All HR Transactions from Entry to Exit must be digitized – Recruitment, Appraisals, Recognition & Rewards, Training & Development, Career Movements, Employee Life Cycle Operations, Exit
- All Payment requests & payments to Employees must be digitized and only paid through Bank Accounts irrespective of the status of the Employee – Fulltime, Part Time, Contract, Corporate, Factory, Sales etc.
- All communications to Employees – two way – must be digitized and do away with physical notice boards
- Do away with physical attendance system and move to a digital attendance system

- Do away with Physical Personal Files and move to a digital Personal Record system and store all Employee Related records, documents & transactions in digital form
- Introduce Food Coupons or Smart Cards to pay for Canteen & other *Pay as you Use* Employee Services
- Introduce & educate employees on the use & benefits of Digital Wallets
- Give away e-coupons & digital coupons for Recognition & Rewards
- Gradually move towards a self-paced e-Learning system rather than the physical class room learning model
- Gradually decrease travel / commute for meetings and move to a virtual meeting leveraging the Internet and social media
- Leverage Social Media to engage with employees and prospective employees
- Generally, build a mindset & culture in the organisation that supports a Digital environment & ultimately transforms into a Digital Economy.

Rapid changes in technology have affected businesses in more ways than we can imagine, from globalization and adjustments to a workforce clamoring for greater transparency, instant communication & gratification, remote working, the human resources department has had to adapt swiftly to these changing circumstances & expectations. If HR wants to continue to play a critical role in helping businesses anticipate and manage organizational change, it must leverage technology to its advantage[4].

1.5   Conclusion

The present paper discussed the various positive impact of Demonetization with respect

to changing HRM practices from physical form to digital form. After demonetization employers mindset now shifted from traditional conservative approach to modern progressive approach. They are realizing the importance of new digital world. On the other hand employees are more aware about their rights and ready to cope up with new proactive changes. It's high time for HR professionals to bring reformist changes and motivate the employees and make a their contribution in country development.

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A STUDY ON OCCUPATIONAL IMPEDES ON STRESS MANAGEMENT AMONG SCHOOL TEACHERS IN *VILATHIKULAM* TALUK

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ABSTRACT

The aim of this study is to determine the sources of stress for classroom teachers working in private and public schools and methods that are usedbytheminordertocopewiththestress.Inthisresearch, qualitative and quantitative methods have been used jointly. The group consisted of 258 school teachers working. Thedatacollectiontoolforquantitativeresearchis 'The scale of determining organizational stress sources and methods of coping with stress' that is developed by Doğan.TheanalysishasbeendonethroughSPSS standard deviation mean, variance analysis, Kruskal-Wallis test and the U test of Mann Whitney have been used. The data collection tool for quantitative study is the semi-structured interview form prepared by the researchers. To analyze the data, techniques of content analysis and descriptive analysis have been used. According to findings obtained from quantitative data, reasons of stress for teachers are originated from school administration, the teaching profession and school facilities. According to findings obtained from qualitative data, issues that teachers are experiencing stress had been determined as; inadequacy of resources, constant supervision, the boredom and exhaustion of the profession, competition and ambition, irresponsible/problematic behaviors of students, high demands and expectations and not being able to spare time for themselves and etc. According to findings acquired both from qualitative and quantitative data, methods of coping with stress for teachers are; looking at things from positive side, spending time with beloved ones and creating an environment to spend time with them.

Keywords Private School, Public School, Classroom Teacher, Sources of Stress, Coping with Stress

INTRODUCTION

The stress, which has become a societal problem today, has become almost a part of our daily lives Stress is a phenomenonthathasanimpactonpeopleandaffectingtheir behaviors, their job performances and communication with their co-workers. The Research discusses teacher stress and the strategies that schools can use to support teachers in challenging situations. In particular, the report identifies causes of teacher stress, coping strategies that teachers commonly use to mitigate the impacts of stress, and specific actions that schools can take to minimize teacher stress. Stress is a well-established concept in the psychological literature, and teaching, in particular, is recognized as a highly stressful profession. Student-

teacher distress has the potential to impact on the individuals who are to become teachers, the profession and the education system.

It contends that the potential problem for prospective teachers requires a holistic approach. Stress is a biological phenomenon that is experienced by all persons regardless of their socio-economic status, occupation, or age. Job stress is a condition wherein job-related factors interact with the worker to change her psychological or physiological condition such that she is forced to deviate from normal functioning. Deterioration of power of organization and planning, increase in error rate during manipulative and cognitive task, depression and feeling of helplessness and over sensitivity are the major impact of stress on the productivity of professionals. In order to minimize stress, delegating some work, share burden with colleagues, leave and time off work with family and love ones, as well as reducing work overtime ranked highest as strategies for stress management. Based on the findings, it was concluded that stress has a great impact on the professionals and thereby affects the level of productivity. It was therefore recommended that professionals should exhibit self-control and good self-esteem; engage in continuous professional development on skills for better organization, integration of work within specified project constraints and delegation of assignment, authority and breaking work into manageable parts so as to be able to cope with stress.

SOURCES OF STRESS FORTEACHERS

If the teacher is in a stressful environment, her/his efficiency might decrease and this might be reflected upon the student and even for the whole society negatively This shows that it is possible for the same situation to be perceived differently by different people According to Turn different sources of stress affecting the teacher are; demotivated students, time pressure, workload, disciplinary environment, coping with novelty, being evaluated by others, problems with co-workers, status, administrative reasons, conflict of duties and inappropriate working conditions. had examined the stress experienced by teachers, it is observed that high level of stress causes low job-fulfillment and, in the long run, low commitment. Undoubtedly, sources of stress stated in the literature may not have the same impact on every teacher. However, these sources of stress might cause different problems and affect the school environment negatively by expending gradually. That's why attempts for providing teachers to realize reasons for streets and methods for coping with the stress should beenenhanced. On the other hand, it had examined sources of stress for teachers under different categories and these are facilities of school and supervision, school administration, the teaching profession, colleagues, students and intervention of parents.

DATA COLLECTION TOOL

The quantitative data collection tool of the study is 'the scale of determining organizational stress sources and methods of coping with stress' Thescaleconsistedof3partswhile,thefirstpart isconstitutedofdemographicinformation.Inthesecomport, questions that will reveal sources of stress for teachers are apparent while, in the third part, questions about methods of coping

with stress. The scale of sources of stress for teachers consisted of 33 items, 5 point Likert scale from 1 to 5 and 6 subscales. These subscales are; facilities of school and supervision, school administration, teaching profession, colleagues, d-students and intervention of parents

This value demonstrates that the reliability of measurement tool is not low. In the research, semi-structured interview form developed by the researcher had been used as qualitative data collection tool. While the form was being developed, related literature had been scanned in detail; plenty of questionnaires related with stress had been revised and school administrators, academicians who are expert on the subject and teacher working in private elementary schools had been asked for an advice along with searching thesis, articles, books and other resources. As a result of the investigation of experts and pre-application that had been conducted, the form is finalized in a way serving to its purpose understandable and applicable by re-arranging items in the interview form, making attachments in missing parts and making related arrangements in items.

ANALYSIS OFDATA

Analysis of quantitative study had been done by using the software program SPSS 23; standard deviation, mean, varianceanalysis,Kruskal-WallistestandtheUtestofMann Whitney had been used. The significance analysis of data had been tested in 0.05 significance level. Values of arithmetic mean and standard deviation regarding first and third sub-problems of the study had been founded. Non- parametrical tests of Kruskal-Wallis and Mann Whitney U test regarding second sub-problem of the research had been used. In qualitative study, content analysis had been used in data analysis. Research questions had been examined in title form; subjects had been reached within the scope of questions. In order to categorize opinions of interviewees into subjects, similar, different and relational connections of comments had been taking into consideration regarding obtained data. How often comments had been mentioned was founded and data had been digitized. The purpose of digitating data is; increase the reliability, enabling to make comparison between categories and decrease the bias. This is expected as implications increasing validity and reliability of research data. After the data analysis; whether findings are consistent, meaningful and in line with previously done theoretical framework, had been checked. This control had contributed to the research in terms of providing internal validity. After the interviews, the researcher had questioned whether his perception about the interview is reflecting the transferred data accurately by making summarization to participants what the researcher had comprehended and had provided external reliability. Subjects and codes had been sent to experts in order to confirm the final draft. For testing reliability, the formula of Miles and Huberma (Reliability = Agreement / Agreement + Disagreement * 100) had been used. The codification of two training administrators, who are expert on the subject, had been compared and the coherence had been calculated as 90 percent. Since the percentage of coherence is perceived as adequate with 70 percent and above,reliabilityintermsofdataanalysishadbeenprovided. Since anonymity of participants' identities had been regarded as appropriate ethically, while the findings are presented,

classifications of teachers by using short-cuts, T1, T2…. T25 had been done. Additionally, schools that teachers are employed had been represented in form of A, B, C, D.

TABLE 1: GENDER WISE CLASSIFICATION

Gender	Frequency	Percentage
Male	118	46
Female	140	54
Total	**258**	**100**

From the above table 46% of the male respondents.54% of the respondents are female category. Majority 54 % of the respondents are female among stress in their job.

TABLE 2 OCCUPATION WISE CLASSIFICATIONS

Schools	Frequency	Percentage
Private	126	49
Government	132	51
Total	**258**	**100**

From the above table 49% of the respondents are working in private schools.51% of the respondents are comes under the government schools. Majority 51 % of the respondents are working in government schools.

FINDINGS OF QUANTITATIVE RESEARCH:

Analysis regarding methods of coping with stress is demonstrated in this table

It appears that perception level regarding ''Methods of Coping with Stress'' is in high level (General average= 3,30). When averages of items are examined,theitemof"Ireceivehelpfromexpertsinorderto cope with my stress" ($\square$=2,20) has the lowest perception, while,"IprayinsituationswhenIamstressful"($\square$=2,64)is the second lowest and "I use several relaxation methods in order to cope with my stress" ($\square$ =267) is the third lowest item.Whenitemswithhighestperceptionareexamined,itis observed that; the article of "I spend time with my beloved ones situations in which I am stressful" ($\square$ =4,02) has the highest perception, while, the items of "I talk with myself positively in order to cope with my stress" ($\square$ =3,97) is the second highest and the items of "I create an environment in ordertocopewithmystressinsituationsthatIamstressful" ($\square$ =3,88) is the third highest

Methods of Coping with Stress for Teachers

Among the codes that are formed correlatively with methodsofcopingwithstressforteachersworkinginprivate elementary schools, most highlighted ones have been observed as; looking things from a positive side (f=13), spending time with beloved ones (f=12), creating an environment (f=11) and talking with people whom they trusted (f=11). For example; "I act like a Pollyanna. I try to see the positive sides of things by analyzing them." (A-T1); "I make plans with friend of mine that I adore. I spend time with him/her." (B-T24); "The most pleasant one is creating an environment. Since we do not have the chance to remain silent in the environment and being excluded from the environment, joining different environments after school makes me feel good." (C-T7); "I make a judgment related with current situation. That means I do best that I

can; However, I bring up this matter to someone I trust. When I talk about the topic, I think that she / he understands it." (B-T14).T

Table 1:Methods of coping with stress for teachers

TheTheme	Codes	Frequency (f)
Methods of Coping with Stress for Teachers	Looking things from positive side	13
	Spending time with beloved ones	12
	Creating an environment	11
	Talking with people who he/she trusted	11
	Sparing time for hobbies	9
	Using relaxation techniques	8
	Forgetting reasons for stress	7
	Confronting with the person causing a stress	5
	Praying	3
	Receiving help from experts	2
	Doing physicalexercises	2

CONCLUSION:

According to participants' opinions, sources ofstress affecting teachers originating from school facilities; lack of resources and technological facilities, lack of space, long working hours, big-small size of the school building, transformational difficulties, heating conditions of school building and eating problems. It is though provoking that even though teachers are working in private schools, they experience problems regarding resources and technological equipment. At the same time, in schools with financial concerns, having great numbers of students in small classrooms, the quality of education decreases. Argon and Ateş had determined stress factors affecting teachers as; crowded classrooms, disciplinary problems, problematic behaviors and aggressive attitudes of students, continuous changes in programs, conflicts with colleagues, insufficient administrative support [4]. Issues that teachers experience stress originating from school administration; constant supervision, lack of encouragement, excessive workload, unjustmanners,constantchangesinpractices,timepressure, work assignments, disagreeing with decisions, intervention withteacher'sduty,intensityofcourseload,workingoutside of working hours, policies of intimidation, shifting system, problems of exercising legal rights and lack in educational opportunities.Additionally,itisobservedthatthestresslevel in female teachers originating from school administrationsignificantly higher than male teachers. It is remarkable that among sources of stress for teachers working in private elementary school, mostly highlighted ones are originating from school administration. In this case, it can be said that administratorscreateintensepressureonteachersandhavea big impact on creating a stress for teachers. Unjust approach of administration and pursuing discriminatory policies may also cause as stress for teachers. Whether the hard work is praised by doing what is necessary or determination of evaluation terms depending on biased relationships may cause a stress for teachers by raising doubts. According to participants' opinions, methods used by teachersinordertocopewithstressarelookingthingsfroma positive side, spending time with

beloved ones, creating an environment, talking with people who they trust, sparing time for hobbies, using relaxation techniques, forgetting reasons of stress, confronting with the person causing the stress, praying receiving help from experts and doing physical activities

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A STUDY ON HEALTH CARE SERVICES BY PRIMARY HEALTH CENTRES IN *ARUMUGANERI*

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ABSTRACT

This study examines the health care services by Primary Health Centres in Thoothukudi district. The data was collected from 180 respondents covering the rural areas. Percentage analysis and chi-square tests are used for arriving conclusion. The finding of the study is a direct measure of a family's utilization of primary medical services is accessible and inexpensive to construct them for a target population. The research attempts to identify the behavioral varieties of beneficiaries that promote good health and tend to increase the average length of life.

Keywords: Diseases, Health Care Services, Primary Health Centres and Treatment.

INTRODUCTION

Under the Constitution, health is a state subject yet the central government's intervention to assist the state governments is needed in the areas of control and eradication of major communicable and non-communicable diseases6. A broad policy formulation, medical and para-medical education along with regulatory measures, such as drug control and prevention of food adulteration is therefore inevitable. These programs and schemes improve the nutritional and health status of both males and females in the age group of above twenty and bring about the effective co-ordination in the work of various agencies involved in child development programs. It also enhances the mother's capabilities to take care of the nutritional needs of her children.

The WHO defines "health as a state of complete physical, mental and social well-being" as presented in her constitution and reechoed in the Alma Ata Declaration. These broad aspects of well-being are well beyond what the health sector alone can handle. Considered individually, the earlier stated strategies of PHC require a very wide range of inputs from many sectors. For example, literacy improvement is mainly the task of the education sector; developing appropriate technology is multisectoral but may require key inputs from the technology and industrial sectors and poverty reduction will draw from strategic initiatives of the economic planning sectors for multisectoral implementation. Thus, PHC strategies fundamentally call for multisectoral inputs.

OBJECTIVES OF THE STUDY

1. To analyse the demographic profile of the respondents and their awareness about health related aspects.
2. To examine the respondents' opinion about the functioning of PHCs and their services.

METHODOLOGY

This research is basically focused on primary health centres in Eral with special reference in Thoothukudi District of TamilNadu, India. It encompasses both primary and secondary data. The Primary data were collected through a well structured interview schedules and the secondary data relating to health care services were obtained from published articles, journals, magazines, books, newspapers and websites. The primary data were collected from about 180 respondents' selected using random sampling method covering the village of Eral in Thoothukudi District. Version 21.0 of Statistical Package for Social Science (SPSS) was used to analyse the data. This paper is devoted to present the analysed data relating to the health care services of PHCs in an appropriate manner. For the purpose of analysis statistical tools like Percentage analysis, t-test, rank test and chi-square tests are used for arriving inferences.

REVIEW OF LITERATURE

1. **AkashAcharya (2005)** observed that health indicators in India have seensubstantial improvements in recent decades but quality and affordable health care services continue to elude the poor. Government provided health services only partially meet the needs of the rural and urban poor in the informal sector and making equitable and affordable medical care accessible to this segment remains a challenge. Health care expenditure cuts poor households budget in two ways, not only do they have to spend a large amount of money and resources on medical care but, they are also unable to earn during the period of illness.

2. **Perez, (2006)** found that the internet has a potential to change the culture ofhealthcare in which patients will be partners in care and not merely recipients of care. This has had a profound impact on society and has changed relationships between patients and their doctors. Instead of a patient calling the doctor to consult him or her about an ailment first, many are consulting the internet. In a nationwide telephone survey, it was discovered that 50 percent said health information obtained online influenced the way they ate and exercised, 70 percent said health information retrieved from the web influenced their decision about how to treat an illness or condition, 50 percent said the web information led them to ask a doctor new questions.

3. **Devadas** (1972)which indicates that defective diet, unhygienic environment, insanitary living conditions and infections, particularly communicable diseases are contributory factors for the chronic ill-health of the communities in the low socio-economic groups.

4. **Azurin and Alvero**(1974)have found that Malaria which is a vector disease, is also common in urban areas in Kerala. Stagnant water, defective water storage system in houses and dense population are the major causes for such diseases.

5. **Murray and Lopex** (1996)found communicable diseases are seen to be responsible for more than half of the burden of diseases in India.

RESULTS AND DISCUSSION

The demographic characterized of the sample are analysed and found that among the total respondents of 180, 35.6 percent of the respondents are male and 64.4 percent of the respondents are female. About 32.8 percent of the respondents fall under the age group of above 45 years, 28.3 percent of the respondents fall under the age group of 25 years - 35 years, 26.7 percent of the respondents fall under the age group of 36 years - 45 years and 12.2 percent of the respondents fall under the age group of below 25 years. About, 32.2 percent of the respondents are under graduation level, 26.1 percent of the respondents are diploma, 18.3 percent of the respondents are illiterates, 14.5 percent of the respondents are school level and 8.9 percent of the respondents are post graduate level. Majority of the respondents are working in private as large as 75.6 percent, 13.8 percent of the respondents are working in government employee and 10.6 percent of the respondents are business man. While, 35 percent of the respondents are monthly income falls under the category of Rs. 10,001 – Rs. 15,000, 22.8 percent of the respondents are monthly income falls under the category of Rs. 15,001 – Rs. 20,000, 15 percent of the respondents are monthly income falls under the category of Rs. 5,001 – Rs. 10,000, 12.8 percent of the respondents are monthly income falls under the category of Rs. 20,001 – Rs. 25,000, 8.3 percent of the respondents are monthly income falls under the category of above Rs. 25,000 and 6.1 percent of the respondents are monthly income falls under the category of below Rs. 5,000. About 66.1 percent of the respondents are married and percent of the respondents are unmarried. Most of the respondents are having above 6 members in their family as large as 55 percent, 31.7 percent of the respondents are having 4 – 6 members in their family, 18.9 percent of the respondents are having 2 – 4 members in their family and 4.4 percent of the respondents are having below 2 members in their family.

Majority of the respondents are nuclear family as large as 62.2 percent and 37.8 percent of the respondents are joint family.

TABLE 1: DEMOGRAPHIC PROFILE OF THE RESPONDENTS

Items	Counts	%	Items	Counts	%
Gender:			**Family Income:**		
Male	64	35.6	Below Rs. 5,000	11	6.1
Female	116	64.4	Rs. 5,001 – Rs. 10,000	27	15.0
Age:			Rs. 10,001 – Rs. 15,000	63	35.0
Below 25 Years	22	12.2	Rs. 15,001 – Rs. 20,000	41	22.8
25 Years – 35 Years	51	28.3	Rs. 20,001 – Rs. 25,000	23	12.8
36 Years – 45 Years	48	26.7	Above Rs. 25,000	15	8.3
Above 45 Years	59	32.8	**Marital Status**		

Education:			Married	119	66.1
Illiterates	33	18.3	Unmarried	61	33.9
School Level	26	14.5	**Family Size**		
Diploma	47	26.1	Below 2	8	4.4
UG	58	32.2	2 – 4	34	18.9
PG	16	8.9	4 – 6	57	31.7
Occupation			Above 6	99	55.0
Private Employee	136	75.6	**Nature of Family**		
Government Employee	25	13.8	Joint Family	68	37.8
Business man	19	10.6	Nuclear Family	112	62.2

Table 2 reveals the respondents' health status. It is observed that 70.6 percent of the respondents are mostly affected by diseases but only 29.4 percent of the respondents are strong enough in resistance power. This is because of inadequate official attention to health matters. The Indian population continues to be exposed to a high incidence of communicable diseases and readily preventable illnesses.

TABLE 2: RESPONDENTS AFFECTED BY DISEASES

S. No	Affecting Diseases	Frequency	Percent
1	Yes	127	70.6
2	No	53	29.4
Total		**180**	**100**

It is observed from Table 4 shows that 51.1 percent of the respondents take treatment in PHC. About 21.7 percent of the respondents prefer private hospitals for treatment and another 16.7 percent of them undergo treatment in other government hospitals. Only 10.5 percent of the respondents have taken indigenous treatment which is comparatively very less costly.

TABLE 3: SOURCES OF TREATMENT

S. No	Sources	Frequency	Percent
1	PHC	92	51.1
2	Private Hospitals	39	21.7
3	G.H.	30	16.7
4	Indigenous Treatment	19	10.5
Total		**180**	**100**

Since P values are greater than 0.05 at 5 % level of significance, so the null hypotheses are accepted. It can be concluded that there is no significant difference between the education of the respondents and causes of diseases.

TABLE 5: EDUCATION AND CAUSES OF DISEASES

Scale	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.178(a)	3	0.243
Likelihood Ratio	4.186	3	0.221
Linear-by-Linear Association	.764	1	0.378
N of Valid Cases	180		

CONCLUSION

From this study it is clear that health service provided to the people in Thoothukudi district village is considerably good as revealed in the sample respondents who widely use PHC for treating almost all diseases. It may be due to inadequate spread of information regarding availability of specialists in PHC among the people. Again the basic need indicators such as health and education are closely related with each other. The government should ensure an increased level of health status, which will definitely achieve the goal "Health for all" and it will go a long way in meeting the social needs of people.

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COMPARATIVE ANALYSIS OF CLASSIFICATION ALGORITHM ONPREDICTING DIABETES MELLITUS

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ABSTRACT

In today's human lifestyle diabetes is one of the major health challenges. It is a group of a syndrome that results in too much insulin reduction increase the blood sugar level. It is a protracted condition that affects the way the body mechanizes the blood sugar. Prevention and prediction of diabetes mellitus increasingly gaining interest in the medical field. The work aims to predict an early stage of diabetes using different machine learning techniques. In this paper, well-known classifications that are Naive Bayes, Support Vector Machine (SVM), and Random forest are used. These classification techniques used with the Pima Indians diabetes dataset. Therefore, diabetes at the different stages is predicted and the performance of different classification techniques is analyzed. In this paper, the accuracy of the different machine learning techniques for finding diabetes mellitus at an early stage is also compared.
Keywords: Diabetes Mellitus, Support Vector Machine, Random Forest, Naive Bayes

1. Introduction

Diabetes is a chronic disease in which the pancreas secretes less insulin. In Type 1 diabetes the immune system destroys insulin-making cells in the human pancreas. The children and young people are also affected by diabetes. There are three categories of diabetes Type 1, Type 2, and Gestational diabetes. The glucose needed for the body gets from the food when the body doesn't produce insulin well. In India, the survey report of 2019[1] by National diabetes and diabetic retinopathy states that there are 72.96 million cases of diabetes in the adult population of India. Male showed a prevalence of diabetes as 12 % and females as 11.7% by the survey. It is also estimated that 4 million women are affected by gestational diabetes mellitus in India.

2. Literature Survey

A detailed study for the detection of diabetic Mellitus using a machine learning algorithm has been proposed in this research paper. A brief survey of the related work is included in this section. Chandan Kumar et.al.[2] Pima Indian Diabetic data used to predict the diabetics using a machine learning algorithm model to build a knowledge model by selecting attributes responsible for diabetes. It gives accurate results on whether the patient is diabetic or not.

Pradhan.M et.al. [3] used the multilayer perceptron with a backpropagation learning algorithm and genetic algorithms are used to predict the diabetic. The network uses an error backpropagation algorithm to compare the system output to the desired output value. Deepti

et.al.[4] used the Pima Indian diabetic database which is sourced from UCI machine learning repository and the performance of SVM, Decision Tree algorithm, and naive bayes classifier algorithms are evaluated on various measures like precision, Accuracy, F-Measure. It gives the highest accuracy by Naive Bayes classifier.

Jayalakshmi T. et.al.[5] used the feedforward neural network using Levenberg-Marquardt methods to predict diabetes disease. The Error backpropagation algorithm to compare the system output to the desired output value and calculate the error to direct the training.

VeenaVijayanet. al.[6] Proposed a work to predict and diagnose diabetic Mellitus which uses the AdaBoost algorithm with decision stump as a base classifier for classification and additionally SVM, Naive Bayes, Decision tree are used as base classifiers for AdaBoost used for verification. The base classifier performed well than the other classifiers. N.Yuvraj et.al.[7] proposed a novel implementation of the machine learning algorithm in Hadoop based clusters in a cloud environment for predicting diabetes. It can produce highly accurate diabetes predictive healthcare systems.

MinyechilAlehegn. et.al.,[8] proposed a work that focused on predicting diabetes using a machine learning algorithm. The ensemble hybrid method created by combining individual techniques KNN, Naive Bayes, Random forest, and j48 into one to increase the performance and accuracy. Nasib et.al. [9] proposed a hybrid model with two-level classification using SVM and neural networks. The proposed hybrid model gained 96.09% of overall accuracy. This model was proposed to help physicians in predicting and detecting diabetes at an early stage.

3. Proposed Methodology

In this proposed work, the PIMA Indian diabetic dataset is collected from the UCI machine learning repository. The attributes included in the PIMA Indian diabetic dataset are Number of times pregnant, plasma glucose concentration, BMI, age, pedigree function skinfold thickness, and blood pressure. The proposed layout is shown in Fig. 1.

| Data collection | → | Data Pre-processing | → | Feature Selection | → | Classifier | → | Result |

Fig. 1. The Proposed Layout

The following steps are involved in the proposed work

3.1 Data Collection

The PIMA Indian diabetic dataset is collected from the UCI machine learning repository with 768 data points.

3.2 Data Pre-processing

Data pre-processing has been performed due to the data inconsistency and incompleteness of the real-world data.

3.4 Feature Selection

The major features are selected from the original features to increase the accuracy of prediction and to avoid redundancy.

3.5 Classification

The Three classifiers are used namely Support vector machine, Random Forest and KNN

- Support vector machine

It is a representation of different classes in a hyperplane in multidimensional space.

- Random Forest
  Random forest is a supervised learning method used for both classification and regression. Random forest algorithm builds decision trees on data samples and then gets the estimate from each of them and eventually chooses the best answer by voting.
- Naive Bayes
  Naive Bayes algorithms is a classification methodology focused on the interpretation of
  Bayes' theorem, firmly believing that all predictors are independent of each other.

$$P(L|features) = \frac{P(L)P(features|L)}{P(features)}$$

3.5 Result

Finally, the accuracy of the classification algorithm is obtained and analyzed. The classification accuracy is used to define the percentage of several data correctly divided by the total number of samples obtained.

$$Accuracy = \frac{Samples\ Classified}{Total\ Number\ of\ samples}(100)$$

4. Experiment Analysis

The feature selection methods used in this work to reduce the attribute set to 6 and showed the overall higher accuracy. As shown in Table 1 conclude that finding out the accuracy after attribute selection in classification produced 79.74% accuracy in the random forest algorithm.

5. Conclusion

Diabetic Mellitus is a chronic disease that is a risk for all ages. As observed from the literature survey there is a lot of work done to predict the disease in all age groups. The machine learning algorithms are used here to predict diabetes mellitus by applying SVM, random forest, and KNN algorithm and measured the accuracy. The random forest produces higher accuracy79.74 than the other two algorithms.

Future work is to predict the risk of other diseases in the diabetic Mellitus patient by using features selection and feature significance to increase the performance of prediction methods of chronic disease.

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SENTIMENT ANALYSIS USING PRODUCT REVIEW

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ABSTRACT

Sentiment Analysis is also known as an Opinion mining. It is used to review the sentence or data to identify the emotion of the sentence by the use of the Natural Language Processing (NLP). Now a days, people used to show their opinions or emotions in the form of reviews in the web and it has been increasing day by day. The Sentiment Polarity Classification is used for the process of reviewing. The main aspect of the Sentiment Analysis is for classifying and identifying the polarity of the sentences in the web. The Sentiment Analysis involves three phases for the classification of text that is Positive, Negative and Neutral. The Sentiment Analysis is the text based analysis, so that it analyzes the better and worse data or review in a sentence and it labels the data as positive and negative sentiment respectively. In this paper, one or two techniques or methods are used for analyzing the polarity and finally the accuracy is calculated.

1. INTRODUCTION

Sentiment Analysis deals with the attitude of a writer with respect to some topics or the overall sentiment polarity of a text, such as positive or negative. Sentiment Analysis works mainly on two issues sentiment polarity and sentiment score. Sentiment polarity is defined as the binary value that is positive or negative. Micro blogging and social networking websites provide rich source of information about every possible products people use on a day to day basis. People are willing to share their views about products that give them satisfaction and induce them to share their opinions through various social networking sites such as Flipkart , Twitter and etc. The assortative model focuses on social well being attributes (SWB) such as age, sex, education, no of followers of twitter users to determine whether any kind of homophily exists between them. On the other hand, sentiment score relies on one of three models. Those models are Bag-words model (BOW), part of speech (POS), and semantic relationships. BOW model is the most popular for researchers and based on the representation of terms.

 The term refers to words in Bag-of-Words model. It neglects language grammar and words ordering. POS tagging is a grammatically tagging model especially verbs, adjectives and adverbs. For example; (The book is not good.) declaring in (The/DT book/NN is/VBZ not/RB good/JJ. /.).

2. LITERATURE REVIEW

Dr. Rajesh Bose et al., has proposed that the product review analysis is widely accepted platform where consumer can easily aware about their requirements[1]. To analyze the result, we select six most popular products and users based on the plain text review and NRC emotion lexicon is used which can be categorized eight basic emotions and two sentiments. Word clouds also help our research to make comparisons between the eight emotion categories.

Two strategies that is, the fine-tune and regular constraints and thea linear output network have been proposed by **Hong-Bo Wang [2]**. The two strategies are applied into IMDB reviews, Amazon product reviews, and human activities recognition collected by the built-in gyroscope sensors data, and the experimental results verify their validity.

Hongyu Han et al., [3] has proposed a novel sentiment bias processing strategy which can be applied to the lexicon based sentiment analysis method. Weight and threshold parameters learned from a small training set are introduced into the lexicon-based sentiment scoring formula, and then the formula is used to classify the reviews. In this paper, a completed sentiment classification framework is proposed. SentiWordNet (SWN) is used as the experimental sentiment lexicon, and review data of four products collected from Amazon are used as the experimental datasets. Experimental results show that the bias processing strategy reduces polarity bias rate (PBR) and improves performance of the lexicon-based sentiment analysis method.

A method to automatically generate domain specific sentiment lexiconshas been proposed by **Ji Fang et al., [4]** for this learning purpose. Our experiment results show that the domain specific lexicons we constructed lead to a significant accuracy improvement for our sentiment analysis task.

Kim Schouten et al [5] has presented two methods. In contrast to most existing approaches, the first method presented is an unsupervised method that applies association rule mining on co-occurrence frequency data obtained from a corpus to find these aspect categories.

The semantic orientation of a phrase is calculated in the work proposed by **Peter D. Turney et al [6]** and ithas as the mutual information between the given phrase and the word "excellent" minus the mutual information between the given phrase and the word "poor". A review is classified as recommended if the average semantic orientation of its phrases is positive.

SupriyaSoni et al., [7] has proposed a detailed study about the Sentiment Analysis. The product reviews may have positive or negative sentiments. A positive sentiment contains good opinion about product and its features similarly a negative sentiment tells drawbacks and problems of product and its features. Features or aspects are part of the product or its characteristics. In this study we used feature/aspect based Sentiment Analysis and some methods for analyzing the sentiments expressed in online product reviews about the various features of products.

Sean MacAvaney et al., [8] has proposed an evaluate approach using a news corpus with article headlines acting as Pseudo queries and article content as documents, with implicit relevance between an article's headline and its content. By using our approach to train state-of-the-art neural IR models and comparing to established baselines, we find that

training data generated by our approach can lead to good results on a benchmark test collection.

Taimoor Khan et al., [9] has proposed that the nature of data is also evolving where transcribed customer-agent phone conversation are also used for sentiment analysis. This paper reviews sentiment analysis techniques and highlight the need to address natural language processing (NLP) specific open challenges. Without resolving the complex NLP challenges, ML techniques cannot make considerable advancements.

Ziyu Guan et al., [10] proposed a novel deep learning framework for reviewing sentiment classification which employs prevalently available ratings as weak supervision signals. The goal is to identify each sentence's semantic orientation (e.g. positive or negative) of a review. In recent years, deep learning has emerged as an effective means for solving sentiment classification problems.

3. METHODOLOGY

The proposed system performs the process of sentiment analysis on Amazon demonetization data. Also a performance comparison on different techniques is done. The total size of the dataset is 12000 tweets, this is varied and performance parameters are measured for 25%, 50%, 75% and 100% of the size of the dataset.

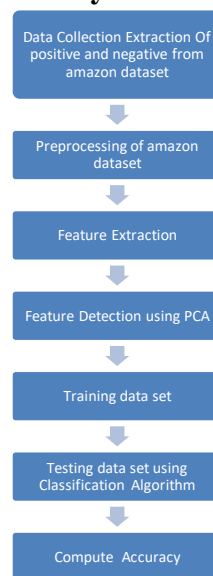**Figure 1: Overall flow of Sentiment Analysis**

Figure 1 summarizes the complete flow of modules from data extraction to sentiment analysis and performance evaluation. The description for each of the modules and algorithms used are described in the following section.

Steps involved:

1. Data Collection
2. Lexicon Analysis
   - Tokenizing
   - Data cleansing
   - Removal of stop words
   - Group words as Positive or Negative
3. Sentiment Analysis
4. Final call on positive/negative review

3.1 Amazon data collection

The Amazon demonetization tweets are being collected using web url**http://jmcauley.ucsd.edu/data/amazon/**

The data set

The first step for conducting the research includes data collection for training and testing the classifiers. The data is collected from SNAP data set because Amazon does not have an API like Twitter to download reviews with. The format of the downloaded file was one-review-per-line in JSON.

The file was converted to the Comma Separated Values (CSV) format, as it is more convenient for python to handle this type of files. The data set consists of 252000 reviews of different beauty products. Each review includes nine features as follow:

3.2 Pre-processing the Amazon data

Pre-processing involves removal of unimportant features from the data. In this phase, several techniques like Stemming and Stop word removal are applied to data set for noise reduction and facilitating feature extraction.

Tokenizing

Tokenization is the process of converting text into tokens before transforming it into vectors. It is also easier to filter out unnecessary tokens. For example, a document into paragraphs or sentences into words. In this case we are tokenising the reviews into words. Stop words are the most commonly occurring words which are not relevant in the context of the data and do not contribute any deeper meaning to the phrase. In this case it contains no sentiment. NLTK provides a library to be used for this.

Removing

In this we can remove the stand alone punctuations, special characters and numerical tokens because they do not contribute to sentiment which leaves only alphabetic characters. This step needs the use of tokenized words as they have been split appropriately for us to remove.

- **Stemming and Lemmatization:** Stemming and Lemmatization are two essential morphological processes uses during feature extraction. Stemming removes word only the inflections whereas lemmatization replaces the words with their base form.. Unlike stemming, lemmatization needs additional dictionary support for searching and indexing because of its accuracy.

- **Stop word removal:** Stop words are high frequency words like "a", "the", "of", "and", "an". Different methods available for stop-word elimination ultimately

enhance performance of feature extraction algorithm. The dimensionality of the data sets will be reduced by the stop words removal . Words to be removed are taken from a commonly available list of stop words using NLTK. Also, the tweets are searched for hyperlinks and URLs and are removed, along with punctuations and stop words.

3.3 FEATURE EXTRACTION

Feature extraction is to extract features in a format supported by machine learning algorithms from datasets consisting of formats such as text and image. Feature extraction is carried out using:

- **Bag of Words:** This technique involves the following tasks:

    o Tokenizing strings and giving an integer id for each possible token, for instance by using white-spaces and punctuation as token separators.

    o Counting the occurrences of tokens in each document.

    o Normalizing and weighing with diminishing importance tokens that occur in the majority of samples / documents.

- **TF-IDF (Term Frequency-Inverse Document Frequency):** The tf–idf transform is used in order to re-weight the count to shadow the frequencies of rarer yet more interesting features into floating point values suitable for usage by a classifier. Tf means term-frequency while tf–idf means termfrequencytimes inverse document-frequency. The equation 1 is the description for TF-IDF.

   tf-idf(t,d) = tf(t,d) * idf(t) …………….(1)

- **N Grams**: An N Gram is a contiguous sequence from a given sequence of text of *n* terms. An n-gram of size 1 is referred to as a unigram; an n-gram of size 2 is a bigram; an n-gram of size 3 is a trigram and so on.

3.4 Training the dataset and applying algorithms

Machine learning classifiers

To carry out the experiments, each classifier algorithm needs to be trained before being tested. In order to train and use the classifiers, the data was divided into two data sets as training and testing data sets. As mentioned earlier, two experiments have been conducted in this research. In each experiment, the classifiers were trained and tested once on the reviews itself and once on the review summaries. For the first experiment a corpus of 150000 data were collected as training data set and the remaining 48500 for testing the accuracy of the classifiers. The next step was to transform the review texts into numerical features before being fed to the algorithms. This was done by using the Bag of words model. The third step was to train the Naıve Bayes and SVM classifiers. The last step was to apply the trained classifiers on the

test data to measure their performance by comparing the predicted labels with the actual labels that have not been given to the algorithms. Figure 3 shows an illustration of the whole procedure.
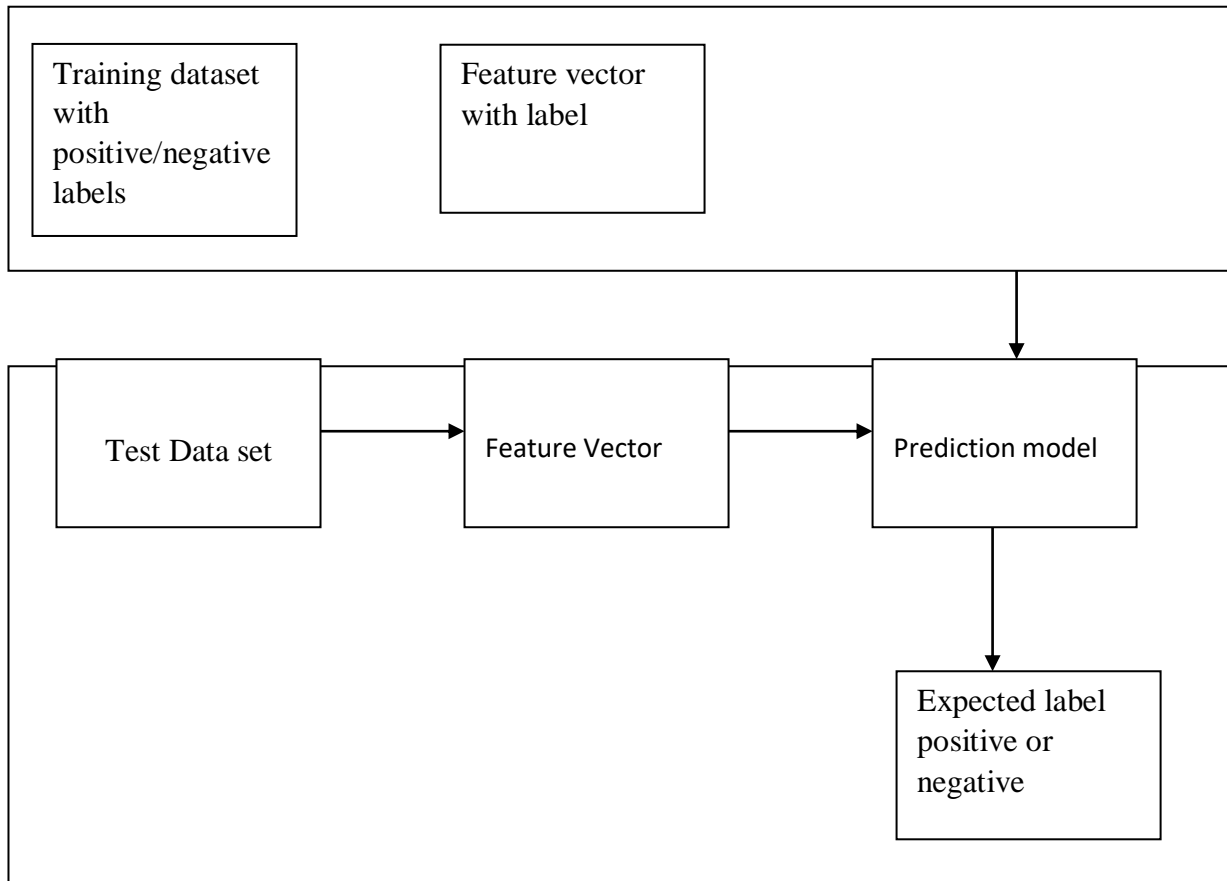
the dataset is divided into training and testing set using KFold cross validation technique with the value of k set to 10. The project implements 3 algorithms for preparing and training the model. The following are the 3 algorithms which are implemented.

Support Vector Machine (SVM): Another algorithm for solving the text classification problem is Support Vector Machine (SVM). Support Vector Machine is a supervised machine learning algorithm which can be used for both classification and regression challenges. In this algorithm, each data item is plotted as a point in n-dimensional space (where n is number of features) with the value of each feature being the value of a particular coordinate. It tries to find a hyper-plane which separates the data in two classes as optimally as possible.

3.4 ALGORITHM DESCRIPTION

3.4.1 SVM

In machine learning, support vector machines are supervised learning models with associated learning algorithms that analyze data and recognize patterns, used for classification and regression analysis. Given a set of training examples, each marked as belonging to one of two categories, an SVM training algorithm builds a model that assigns new examples into one category or the other, making it a no probabilistic binary linear classifier. An SVM model is a representation of the examples as points in space, mapped so that the examples of the separate categories are divided by a clear gap that is as wide as possible. New examples are then mapped into that same space and predicted to belong to a category based on which side of the gap they fall on. The main advantage of the SVM network used as a classifier is its very good generalization ability and extremely powerful learning procedure, leading to the global minimum of the defined error function.
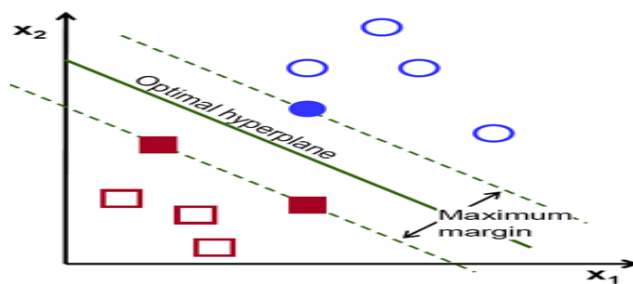
DECISION TREE

For building decision trees there is a core algorithm called **ID3** by which employs a top-down, greedy search through the space of possible branches with no backtracking. ID3 mainly uses Entropy and Information Gain to construct a decision tree.

Entropy

A decision tree is built as top-down from a root node and it also involves partitioning the data into subsets that contain instances with same values. To calculate the homogeneity of a sampleID3 algorithm uses entropy. If the sample is zero then it is completely homogeneous and if the sample is an equally divided it has entropy of one.

Information Gain

The information gain is defined as the decrease in entropy after a dataset is split on an attribute. Constructing a decision tree is to finding the attribute that returns the highest information gain.

Entropy

$$E(T,X) = \sum_{c \in X} P(c)E(c)$$

Information Gain

$$Gain(T,X) = Entropy(T) - Entropy(T,X)$$

3.4.3NAIVE BAYES Classification

Bayes theorem paves the way for the calculation of the posterior probability P(c|x), from P(c),P(x), and P(x|c). Naive Bayes classifierdefined by, assuming that the effect of the value of a predictor (x) on a given class (c) is independent of the values of other predictors. This assumption is called class conditional independence.

$$P(c \mid X) = P(x_1 \mid c) \times P(x_2 \mid c) \times \cdots \times P(x_n \mid c) \times P(c)$$

- P(c|x) is the posterior probability of class and the given predictor (attribute).
- P(c) is the prior probability of class.
- P(x|c) is the likelihood, it is the probability of predictor given class.
- P(x) is the prior probability of the given predictor.

5.OUTPUT

From the above based research work, three techniques(KNN, SVM, Decision tree) have been used for analyzing the review of the concerned data. So in this work the main aim is to check the accuracy, based on three techniques . In that , the decision tree gives the better results than the other two. From this experiment it can be found out that well trained machine learning algorithms with enough data as training data set can perform very good classification. In terms of accuracies, DT tends to do better than SVM, although the differences aren't very large, and the algorithms can reach more than 96% of classification correctly.

6. CONCLUSION

The Sentiment Analysis is the mostawating technique for analyzing the reviews. It will be either in positive or negative state. The results from the study showed that in terms of accuracy the Decision Tree approach achieves better results than the Support Vector Machine approach when the whole data set was used as training and testing data set. As the number of reviews decreased the kNN method achieved better performance than the SVM method.

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DETECTION OF GLAUCOMA USING DECISION TREE METHOD

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ABSTRACT

The title of the Project "Detection of Glaucoma using Decision Tree Method" is based on the project work carried out by the first author. Glaucoma is a neurodegenerative disorder of the optic nerve, which causes partial loss of vision. Lots of people in rural and semi urban areas suffer from eye diseases such as Diabetic Retinopathy, Glaucoma, Age based Macular Degradation etc. Glaucoma is a pathological condition of optic nerve damage and is second leading cause of vision loss. It is known as silent thief of sight. It comes along with an ongoing destruction of optic nerve head (ONH) caused by an increase in intraocular pressure within eye. The optic nerve carries image information to brain. Current diagnosis of retinal disease relies upon examining retinal fundus image using image processing. The image processing techniques to detect eye diseases include image registration, image fusion, image segmentation, feature extraction, image enhancement, morphology, pattern matching, image classification, analysis and statistical measurements. This project proposes image processing technique for the early detection of glaucoma. Glaucoma is one of the major causes which cause blindness but it was hard to diagnose it in early stages. In this project glaucoma is classified by extracting two features using retinal fundus images.

- ➢ Cup to Disc Ratio (CDR).
- ➢ Ratio of Neuro retinal Rim in inferior, superior, temporal and nasal quadrants i.e. (ISNT quadrants) to check whether it obeys or violates the ISNT rule.

A decision tree is a flowchart-like structure in which each internal node represents a "test" on an attribute, each branch represents the outcome of the test, and each leaf node represents a class label. The paths from root to leaf represent classification rules. CDR evaluation is done by using decision tree method.Disc with presence of glaucoma has CDR greater than 0.5 and it violates the ISNT rule whereas normal disc obeys ISNT rule and has CDR ratio less than 0.5. The novel technique is implemented on 50 retinal images and an accuracy of 94% is achieved taking an average computational time of 1.42 seconds.

Key words: decision tree, Glaucoma, neurodegenerative disorder

WHITE BLOOD CELL DETECTION AND COUNTING SYSTEM

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ABSTRACT

The title of theproject"White Blood Cell Detection and Counting System". is based on the project work carried out by the first author, In Medical field blood testing is considered to be one of the most important clinical examination tests. In Clinical laboratory counting of different types of blood cells is important for physician to diagnose the diseases in particular patient. Manual microscopic inspection of blood cells is time consuming and requires more technical knowledge. Therefore, there is a need to research for an automated blood cell detection system that will help physician to diagnose diseases in fast and efficient way. Many researchers have done their research for counting blood cells using different methodologies. In this project propose a new system based on Image Processing Techniques in order to recognize white blood cell in the body. The Image Processing Techniques to detect white blood cell include Image Registration, Image Fusion, Image Segmentation, Feature Extraction, Image Enhancement, Morphology, Pattern Matching, Image Classification, Analysis and Statistical Measurements. In this project, Segmentation Process is performed by using Fuzzy-C Clustering Algorithm. Noises and Unwanted regions that present after the segmentation process is eliminated by applying a morphology operation (Erosion Method) that are extracted from segmented areas. Find the restore color process and counting the white blood cells. In this project, automated system that will help to count white blood cells and its accuracy value in fast and efficiency way.

Key words: Image Fusion, Pattern Matching, Fuzzy-C

DNA COMPRESSION USING RLE AND HUFFMAN ENCODER

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ABSTRACT

Recently, the ever-increasing growth of genomic sequences DNA or RNA stored in databases poses a serious challenge to the storage, process and transmission of these data. Hence effective management of genetic data is very necessary which makes data compression unavoidable. The current standard compression tools are insufficient for DNA sequences compression. This work proposed an efficient lossless DNA compression algorithm using Huffman encoding and Run length Encoder. Due to the significant amount of DNA data that are being generated by next generation sequencing machines for genomes of lengths ranging from megabases to gigabases, there is an increasing need to compress such data to a less space and a faster transmission. Different implementations of Huffman encoding incorporating the characteristics of DNA sequences prove to better compress DNA data. These implementations center on the concepts of selecting frequent repeats so as to force a skewed Huffman tree, as well as the construction of multiple Huffman trees when encoding. The implementations demonstrate improvements on the compression ratios for five genomes with lengths ranging from 5 to 50 Mbp, compared with the standard Huffman tree algorithm. The research hence suggests an improvement on all such DNA sequence compression algorithms that use the conventional Huffman encoding. The research suggests an improvement on all DNA sequence compression algorithms that use the conventional Huffman encoding.

Key words: DNA compression algorithm, Huffman encoding

CLINICAL DECISION SUPPORT SYSTEM FOR FETAL STATE ANTICIPATION USING CLASSIFICATION TECHNIQUES

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The title of the project"Clinical Decision Support System for Fetal State Anticipation Using Classification Techniques" is based on the project carried out by the first author. Cardiotocography (CTG) is a simultaneous recording of Fetal Heart Rate (FHR) and Uterine Contractions (UC). The most common diagnostic techniques to evaluate maternal and fetal well-being during pregnancy and before delivery. By observing the Cardiotocography trace patterns doctors can understand the state of the fetus. There are several signal processing and computer programming-based techniques for interpreting a typical Cardiotocography data. The fetal health monitoring is necessary to predict the growth as well as improvement in its each stage. The fetal heart rate is a well-known source to output the status clearly. The acquired information is necessary to visualize unhealthiness of the embryo and gives an opportunity for early intervention prior to happening a permanent impairment to the fetus. Fetal Health is the indicator of fetal wellbeing and regular contact in the uterus of pregnant women during pregnancy. Most pregnancy period complication leads fetus to a severe problem which restricts proper growth that causes impairment or death. Safe pregnancy period by predicting risk levels before the occasion of complications encourage proper fetal growth. Prediction of fetal health state from a set of pre-classified patterns knowledge is a common important in developing a predictive classifier model using data mining algorithms. In this paper the University of California Irvine (UCI) Cardiotocogram (CTG) dataset is the source of information required for building a model which predicts whether the fetal is healthy or unhealthy. It consists of 2126 instances with 22 attributes obtained from FHR and UC which are multivariate datatypes. The major goal of this study is to choose efficient data mining algorithm which develops the accurate predictive model to manage knowledge of fetal health during pregnancy. Fetal movement is the major sign of fetus healthiness confirmation during pregnancy. This work includes decision tree, naive Bayes and support vector machine classifiers for the purpose of Cardiotocogram data classification. The results of the three classifiers are to be compared and the best classification technique is to be identified. The classifiers were capable of identifying Normal, Suspicious and Pathologic condition, from the nature of CTG data with very good accuracy and improves the classification performance using K-Fold Cross Validate.

Key words: Cardiotocogram, Fetal Heart Rate, Fetal Health

TREND AND GROWTH OF AVAILABILITY OF LATRINE FACILITY

IN RURAL AREA

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Abstract

Open defecation is a main imperfection on India's overall status as an emergent economy as it still remains obstinately extensive across rural India. The present paper outlines the trend and growth of availability and type of latrine facility rural in Indiain 2001 and 2011.
The objectives of the present study are:
1. To study the availability and type of latrine facility in rural India and
2. To assess the trend and growth of availability and type of latrine facility in rural Indiain 2001 and 2011. In order to analyse the trend and growth of availability and type of latrine facility in Indiain 2001 and 2011, percentage methods, co-efficient of variations, linear trend and compound growth rate have used. The secondary data collected through the internet, books, newspaper, journals records and brochures.It is revealed that the value of the coefficient of variation specifies that the growth of households across states in rural India was relatively stable. It is found that the trend coefficient was found to be statistically significant for availability and type of latrine facility in the year 2001 and 2011 in rural India. It indicates, on average, it had increased by 7.3 percent for availability for the year 2001 and type of latrine facility and 6.7 percent for the year 2011. The growth rates are found to be 8.626 percent, and 5.324 percent for availability and type of latrine facility and growth of the year for the year 2001 and 2011 in rural India. The value of R^2 indicates that the availability and type of latrine facility (0.482), and for the year 2011 and 2001 (0.545) explain variations independent variables to the extent of 48 percent, and 55 percent respectively. Thus, there is an urgent need to pace up the developmental efforts for rural sanitation to achieve the Sustainable Development Goals, along with complementary measures to focus on backward regions, weaker sections and socio-spatial position of households in rural India.
Keywords: global population, Rural Sanitation Programme, improved sanitation, latrine facility, open defecation.

INTRODUCTION

Open defecation is an extensive and tenacious health experiment in India, which is home to nearly 60 per cent of the global population that exercises open defecation (WHO and UNICEF 2015). In India, a lower middle-income country with a gross domestic product per capita of $1940 in 2017 (World Bank, 2018)

approximately 520 million people (almost 40% of the total population) do not have access to any kind of toilet, and thus defecate in the open (Sahoo et al. 2015).

The health significances of open defecation are long-lasting and life-threatening. Chief among them is diarrhoea, which is responsible for 188,000 deaths of children under age 5 in India annually (UNICEF India 2016). This can be caused by microbial contamination of water through faecal run-off. Diseases caused by faeces – such as trachoma, soil-transmitted helminthiases and schistosomiasis – can be transmitted directly or indirectly to humans through contaminated fluids, fingers, skin and foods (Mara et al. 2010). Disease transmission and inadequate dietary intake facilitated by open defecation also cause chronic undernutrition (stunting) in children, which diminishes cognitive abilities, lowers school productivity and diminishes human capital (Spears and Lamba 2015).

Open defecation has other consequences, too. It looms the dignity of women, who often choose to relieve themselves at night for privacy, leaving them vulnerable to physical attacks, including molestation, and threats such as snakebite (Sahoo et al. 2015). Inadequate access to sanitation also exposes women and girls to unsafe, and sometimes violent, situations (Jadhav, 2019).

Although India made significant strides during the Millennium Development Goal period (1990–2015), reducing open defecation by 31 per cent, the stark reality remains that nearly half (44 per cent) of India's more than 1 billion people defecate in the open (WHO and UNICEF 2015).

The Government of India has engaged in efforts to improve toilet coverage over the past several decades. For example, the Central Rural Sanitation Programme, which was founded in 1986, worked with state governments to provide subsidies for individual household latrine construction throughout India (Kullappa M., 2008).

Despite decades of government-led sanitation interventions, approximately 520 million people continue defecating in the open throughout India (WHO, 2017). Thus, toilets are necessary as a means to prevent infectious diseases, and can also help ensure physical and mental well-being. The study examines the trend and growth of availability and type of latrine facility rural in Indiain 2001 and 2011.

OBJECTIVES
The objectives of the present study are:
1. To study the availability and types of latrine facility in rural India and
2. To assess the trend and growth of availability and types of latrine facility in rural Indiaduring 2001 and 2011

METHODOLOGY
In order to analyse the trend and growth of availability and type of latrine facility in Indiain 2001 and 2011, percentage methods, co-efficient of variations,

linear trend and compound growth rate have been used. The secondary data collected through the internet, books, newspaper, journals records and brochures.

LITERATURE REVIEW

Banda et al., (2007) find that a major reason for the underuse of public latrines amongst rural populations in Tamil Nadu was that none of them had covered pits or were connected to septic tanks. Latrines were also reported to have foul odours in general and stagnant water during the monsoon, which some respondents reported as a major barrier to use.

Barnard et al., (2013) assessed the impact of the campaign on latrine use and coverage in rural Odisha three years after implementation. In Odisha, latrine coverage was 72 per cent in villages where Total Sanitation Campaign had been implemented, compared with less than 10 per cent in similar villages without Total Sanitation Campaign interventions. However, fewer than half of all households (47 per cent) reported that they used latrines at all times for defecation. In fact, a majority of the community still defecated in the open. Thus, increases in coverage were not met with equal gains in latrine use.

Coffey et al., (2014) also explore the reach of government sanitation promotion messaging on beneficiaries. The majority of respondents (61 per cent) had heard of a government scheme providing assistance in constructing toilets, but only 31 per cent reported engaging with promotional materials such as posters, wall paintings, pamphlets, plays or films about using latrines.

The World Bank (2011) estimates the combined economic consequences of inadequate sanitation – in terms of health-related impacts, domestic water-related impacts and cost-of-time impacts from shared toilets and potential lost tourism revenue – at US$53.8 billion, or about 6.4 per cent of India's gross domestic product.

Availability and type of latrine facility in rural India

The statistics of 2001 and 2011 revealed that in rural India still 78.1% and 69.3% of households are without toilet facility and the state-wise statistics is shown as under. In rural areas, still, there is more open defecation compared to urban areas, the statistics have shown the facilities in rural areas of different states in India in the year 2001 and 2011 are shown in the following table 1.

TABLE 1 A. AVAILABILITY AND TYPE OF LATRINE FACILITY IN RURAL AREA

State code	India/State/Union Territory	Total households		Water closet (Percentage of households)		Pit latrine (Percentage of households)		Other latrines (Percentage of households)		Total		No latrine (Percentage of households)	
		2001	2011	2001	2011	2001	2011	2001	2011	2001	2011	2001	2011
00	**INDIA**	**13827159**	**167826730**	**7.1**	**19.4**	**10.3**	**10.5**	**4.5**	**0.8**	**21.9**	**30.7**	**78.1**	**69.3**
01	Jammu & Kashmir	1,161,357	1,497,920	2.9	20.7	16.4	5.9	22.5	12.0	41.8	38.6	58.2	61.4
02	Himachal Pradesh	1,097,520	1,310,538	6.4	57.4	15.0	9.0	6.4	0.1	27.8	66.5	72.3	33.4
03	Punjab	2,775,462	3,315,632	6.4	42.7	26.4	27.1	8.2	0.6	41	70.4	59.1	29.6
04	Chandigarh	21,302	6,785	47.6	87.9	6.4	0.1	14.5	0.0	68.5	88	31.5	12.0
05	Uttarakhand	1,196,157	1,404,845	7.2	39.4	16.1	14.1	8.3	0.5	31.6	54	68.4	45.9
06	Haryana	2,454,463	2,966,053	2.1	32.6	20.5	23.1	6.1	0.3	28.7	56	71.3	43.9
07	NCT of Delhi	169,528	79,115	19.0	70.0	32.9	5.2	11.0	1.1	62.9	76.3	37.1	23.7
08	Rajasthan	7,156,703	9,490,363	3.2	12.6	8.1	6.8	3.3	0.2	14.6	19.6	85.4	80.4
09	Uttar Pradesh	20,590,074	25,475,071	1.9	15.9	8.3	4.5	8.9	1.3	19.1	21.7	80.8	78.2
10	Bihar	12,660,007	16,926,958	4.2	14.9	6.0	2.3	3.8	0.4	14	17.6	86.1	82.4
11	Sikkim	91,723	92,370	24.3	68.5	29.8	15.4	5.3	0.2	59.4	84.1	40.6	15.9
12	Arunachal Pradesh	164,501	195,723	6.0	26.1	24.0	20.4	17.3	6.1	47.3	52.6	52.7	47.3
13	Nagaland	265,334	284,911	5.9	35.0	47.3	32.8	11.5	1.4	64.7	69.2	35.4	30.8
14	Manipur	296,354	335,752	4.6	37.9	66.8	40.4	6.0	7.6	77.4	85.9	22.5	14.0
15	Mizoram	79,362	104,874	4.1	38.5	70.2	45.4	5.5	0.7	79.8	84.6	20.3	15.4
16	Tripura	539,680	607,779	4.6	15.1	66.0	65.3	7.3	1.0	77.9	81.4	22.1	18.5

From Table 1A and 1B, it is understood that in rural India, there are 138271559 households as a whole in the year 2001. Rural households of Lakshadweep (5351) are found at the bottom of the list among the States. Uttar Pradesh (20,590,074) has the highest proportion of households, followed by Andhra Pradesh (12,676,218) in the year 2001. Similarly, there are 167826730 rural households as a whole in the year 2011 in India. Households of Lakshadweep (2523) are found at the bottom of the list among the States. Uttar Pradesh (25,475,071) has the highest proportion of households, followed by Bihar (16,926,958) in the year 2011.

TABLE 1 B. AVAILABILITY AND TYPE OF LATRINE FACILITY IN RURAL AREA

State code	India/State /Union Territory	Total households		Water closet (Percentage of households)		Pit latrine (Percentage of households)		Other latrines (Percentage of households)		Total		No latrine (Percentage of households)	
		2001	2011	2001	2011	2001	2011	2001	2011	2001	2011	2001	2011
18	Assam	4,220,173	5,374,553	8.6	20.6	46.9	37.2	4.0	1.8	59.5	59.6	40.4	40.4
19	West Bengal	11,161,870	13,717,186	7.0	18.2	15.3	27.0	4.6	1.6	26.9	46.8	73.1	53.3
20	Jharkhand	3,802,412	4,685,965	2.2	6.2	2.1	1.3	2.2	0.2	6.5	7.7	93.4	92.4
21	Odisha	6,782,879	8,144,012	3.3	10.0	3.1	3.4	1.3	0.7	7.7	14.1	92.3	85.9
22	Chhattisgarh	3,359,078	4,384,112	1.8	10.3	1.8	4.1	1.6	0.1	5.2	14.5	94.8	85.5
23	Madhya Pradesh	8,124,795	11,122,365	2.6	10.4	3.9	2.5	2.4	0.2	8.9	13.1	91.1	86.9
24	Gujarat	5,885,961	6,765,403	11.3	26.5	8.1	6.3	2.3	0.2	21.7	33	78.3	67.0
25	Daman & Diu	22,091	12,750	20.2	50.8	9.4	0.4	2.4	0.2	32	51.4	68.0	48.6
26	D & N Haveli	32,783	35,408	16.9	25.3	0.2	0.8	0.2	0.4	17.3	26.5	82.7	73.5
27	Maharashtra	10,993,623	13,016,652	5.3	23.7	10.2	14.1	2.7	0.3	18.2	38.1	81.8	62.0
28	Andhra Pradesh	12,676,218	14,246,309	8.6	25.8	6.4	6.0	3.1	0.4	18.1	32.2	81.9	67.8
29	Karnataka	6,675,173	7,864,196	4.7	13.4	9.5	14.7	3.3	0.3	17.5	28.4	82.6	71.6
30	Goa	140,755	124,674	20.8	63.8	18.9	5.8	8.5	1.3	48.2	70.9	51.8	29.1
31	Lakshadweep	5,351	2,523	91.2	98.1	0.4	0.0	1.6	0.0	93.2	98.1	6.9	1.9
32	Kerala	4,942,550	4,095,674	62.0	59.1	12.8	34.0	6.6	0.2	81.4	93.3	18.7	6.8
33	Tamil Nadu	8,274,790	9,563,899	7.4	17.7	4.6	5.2	2.4	0.4	14.4	23.3	85.6	76.8
34	Puducherry	72,199	95,133	19.8	37.8	1.0	1.1	0.6	0.2	21.4	39.1	78.6	61.0
35	A & N Islands	49,653	59,030	18.4	55.4	12.4	4.4	11.6	0.3	42.4	60.1	57.7	39.8
	Mean (X)	4057114.15	4923662.73	13.60	34.95	18.45	14.30	6.10	1.24	38.15	50.49	61.87	49.50
	Standard Deviation (S.D)	5008686.15	6189469.40	18.83	23.40	19.53	15.85	4.99	2.48	25.63	26.92	25.62	26.93
	Co-efficient of Variation (C.V)%	123.45	125.71	138.45	66.95	105.85	110.84	81.80	6.5	67.18	53.32	41.41	54.40

Source: www.censusindia.gov.in, Census of India, 2001 and 2011.

From Table 1A and 1B, it is also understood that the availability of latrine facility services across states is also marked with a significant percent of variation in rural India during the year 2001 and 2011. The rural states of Chhattisgarh (5.2 percent), Odisha (7.7 percent), Jharkhand (6.5 percent), Bihar (14 percent), Madhya Pradesh (8.9 percent), and Rajasthan (14.6 percent) are extremely deprived off in terms of the availability of latrines during the year 2001.

As against this, the eastern states viz. Lakshadweep (93.2 percent), Kerala (81.4 percent), Mizoram (79.8 percent), Tripura (77.9 percent), Manipur (77.4 percent), Chandigarh (68.5 percent), Nagaland (64.7 percent) and NCT of Delhi (62.9 percent) are the first eight leading states in India during the year 2001. The rural state-wise statistics of 2001 revealed that in Indian states still Chhattisgarh 94.8 percent, Jharkhand 93.4 percent, Odisha 92.3 percent, Madhya Pradesh 91.1 percent and Bihar 86.1 percent households are without toilet facility.

Similarly, the rural states of Chhattisgarh (14.5 percent), Odisha (14.1 percent), Jharkhand (7.7 percent), Bihar (17.6 percent), Madhya Pradesh (13.1 percent), and Rajasthan (19.6 percent) are extremely deprived off in terms of the availability of latrines during the year 2011. As against this, the eastern states viz. Lakshadweep (98.1 percent), Kerala (93.3 percent), Chandigarh (88 percent), Manipur (85.9 percent), Mizoram (84.6 percent), Tripura (81.4 percent), NCT of Delhi (76.3 percent), Punjab (70.4 percent) are the first eight leading states in India during the year 2011. The rural state-wise statistics of 2011 revealed that in Indian states still Chhattisgarh 94.8 percent, Jharkhand 93.4 percent, Odisha 92.3 percent, Madhya Pradesh 91.1 percent and Bihar 86.1 percent households are without toilet facility.

It is also inferred from Table 1 that the growth of households across states in rural India in 2001, on an average over a period was found to be inferior to the growth of households across states in rural India in 2011. The average number of households across states in rural India in 2001 was 4057114.15 and 4923662.73 in 2011. The value of the coefficient of variation specifies that the growth of households across states in rural India was relatively stable.

Similarly, the growth of the availability of the type of latrine facility services across states in rural India in 2001, on an average over a period was found to be inferior to the growth of a type of latrine facility services across states in rural India in 2011. The average percentage of the type of latrine facility services in rural India in 2001 was 38.15 and 50.49 in 2011. The value of the coefficient of variation specifies that the growth of availability of the type of latrine facility services in rural India was relatively stable.

Whereas, the growth of the not availability of latrine facility services across states in rural India in 2001, on an average over a period was found to be higher than the growth of latrine facility services across states in rural India in 2011. The average percentage of not the availability of latrine facility services across states in rural India in 2001 was 61.87 and 49.50 in 2011. The value of the coefficient of

variation specifies that the growth of not availability of latrine facility services in rural India was relatively stable.

The trend and growth of availability and type of latrine facility in rural Indiain 2001 and 2011are shown in Table 2.

TABLE 2 TREND AND GROWTH OF AVAILABILITY AND TYPE OF LATRINE FACILITYIN THE YEAR 2001 AND 2011 IN RURAL INDIA

Particulars	Trend Coefficient		R^2	Compound Growth Rate in Percent
	A	B		
2001	7.556	0.073*(8.321)	0.545	8.626
2011	6.494	0.067*(7.637)	0.482	5.324

Figures in brackets represent 't' values
*Significant at 5 percent level.

It is found from Table 2 that the trend coefficient was found to be statistically significant for availability and type of latrine facility in the year 2001 and 2011 in rural India. It indicates, on average, it had increased by 7.3 percent for availability for the year 2001 and type of latrine facility and 6.7 percent for the year 2011. The growth rates are found to be 8.626 percent, and 5.324 percent for availability and type of latrine facility and growth of the year for the year 2001 and 2011 in rural India.

The value of R^2 indicates that the availability and type of latrine facility (0.482), and for the year 2011 and 2001 (0.545) explain variations independent variables to the extent of 48 percent, and 55 percent respectively.

CONCLUSION

We have shown considerable discrepancies in latrine coverage between different parts of India. If we can improve our understanding of the reasons underlying these differences, it would help us to identify policies to increase the rate of progress toward sanitation for all. Thus, there is an urgent need to pace up the developmental efforts for rural sanitation to achieve the Sustainable Development Goals, along with complementary measures to focus on backward regions, weaker sections and socio-spatial position of households in rural India.

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A STUDY ON WATER SCARCITY IN SEYDUNGA NALLUR AT THOOTHUKUDI DISTRICT

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ABSTRACT

Water is one of the essential resources on entire earth no creature including human begins animals plants or insects can live without water is one of precious gift be the nature future of well because water is one over time or because or overuse. The major objectives of the study about the scarcity of water in the study area. The water scarcity is mostly man made due to excess population growth and mismanagement of water resources reduction in traditional water recharging areas. Rapid construction is ignoring traditional water bodies that have also acted as ground water recharging mechanism. A significant portion of the water used for industrial and domestic purposes is wasted when returned to the streams the demand for freshwater is increasing with the growing population but the decreasing amount of supply fails to meet the needs of the people.

Introduction

Water Scarcity in India is due to both natural and human-made causes. The main factors that are contributed to water issues poor management of resources lack of government attention, and man-made waste. 18 percent of the world's population which resides in India only has access to 4 percent of usable water sources. Official data in the past decade in the past depicts how annual per capita availability in the country has plummeted significantly with 163 percent million Indians lacking access to safe drinking water. India is currently under no such stress however it is expected to become a moderate water scare country by 2050. India is a developing country which needs water for its increasing population and economy it is being projected that water demand in India is going to be as high as 24% by 2025 and 74% by 2050. As per the study conducted by the Indian institute of technology Bombay most vulnerable areas are Punjab Haryana Rajasthan Gujarat and Delhi Least vulnerable North Eastern States Jammu & Kashmir Himanchal Pradesh Uttar hand Chhattisgarh Odessa Jharkhand and Kerala. Moderately vulnerable states are Madhya Pradesh, Maharashtra Tamil Nadu Karnataka and Andhra Pradesh. It is also worth noting that western Ghats are under lowest vulnerability while windward side of the Ghats are under moderate vulnerability physical water stress is a situation when water is not available to use which highly severe condition for any region In India the most severe cases include Rajasthan Gujarat Uttar Pradesh Punjab Haryana and some parts Maharashtra Karnataka and Tamil Nadu.

Objectives:

- ➢ To analyze the water scarcity in rural areas.
- ➢ To analyze the problem, they faced for water scarcity
- ➢ To analyze the diseases caused by water scarcity

Methodology

Both primary and secondary data required for the study has been collected by the researcher from the appropriate sources. The data collected from these sources were analysed and described to realize the objectives for the study.

Primary data

A pilot study has been conducted by the researcher to get the through knowledge of the study area and to understand the nature of the data required for the present study to analyse the water scarcity in seydunganallur at Thoothukudi District. On the basis of the pilot study conducted, an interview schedule has been prepared for collecting primary data. The researcher has followed the direct personal interview method for collecting data from the selected sample respondents.

Secondary Data

Both published and unpublished records District Rural Development Agency (DRDA) reports of the state planning commission are also be referred. Books, articles, magazines and various journals etc.

Analysis of the study area

Table 1 Age of the sample respondents

Age	No of respondents	Percentage
30-50	29	48
51-70	16	27
71-90	15	25
Total	60	100

Source: Primary data

The above the table shows that the 48% of the respondent belonged to the age group in between 30-50 years, 27% of the respondent belonged to the age group in between 51-70 years and 25% of the respondent belonged to the age group in between 71-90 years.

Table: 2 Problems Faced by Scarcity of Water

Problems	No. of respondent	Percentage
Scarcity to get water	42	70.00
Personal Problem	2	3.33
No water in the tap for using motor machine	4	6.67
Health problems	12	20.00
Total	60	100

Source: Primary data

The above the table shows that the 70 per cent of the respondent said that scarcity to get water, 20 per cent of the respondent belonged to the health problems, 6.67 per cent of the respondent belonged to the No water in the tap for using motor machine and remaining 3.33 percent of the respondent belonged to the personal problems.

Table: 3.Diseases Affected by Scarcity of Water

Diseases	No of respondent	Percentage
Appendixes	12	20
Stone formation	16	27
Urinary Inflection	14	23
Others	18	30
Total	60	100

Source: Primary data

The above the table shows that the 20 per cent of the respondent belonged to the appendixes, 27 per cent of the respondent belonged to the stone formation, per cent of the respondent belonged to the urinary Inflection and 30 per cent of the respondent belonged to the affected by other diseases.

Table: 4 The Government Action

Any action	No of respondent	Percentage
Yes	25	42
No	35	58
Total	60	100

Source: primary data

The above table shows that the 42 per cent of the respondent belonged to the Yes they get action from the government and 58 per cent of the respondent belonged to the No they don't any action any government.

Conclusion

The water scarcity is mostly man made due to excess population growth and mismanagement of water resources reduction in traditional water recharging areas. Rapid construction is ignoring traditional water bodies that have also acted as ground water recharging mechanism. A significant portion of the water used for industrial and domestic purposes is wasted when returned to the streams the demand for freshwater is increasing with the growing population but the decreasing amount of supply fails to meet the needs of the people.

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A STUDY ON IMPACT OF STREET FOOD AMONG CHILDREN IN *TIRUNELVELI* CITY

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ABSTRACT

The term 'Street vendor' refers to those who are unable to get regular jobs in the remunerative formal sector on account of their low level of education and skills. However, street vending is an important activity related to urban areas. The terms Street vendors describe them are based on time or place where they work. The present study comprehensively covers the in depth views about their daily marketing and some spatial issues of street vendors near Tatanagar Rail Station, Jamshedpur. The present researchers attempt to explore the soo-economic milieu of street vendors of above said areas. The data has been collected by using observation method, interview with the structure and unstructured questionnaire and other qualitative methods including case studies. The study demonstrates that the male street vendors living into better condition with respect to income status compared to the female street vendors.

KEYWORDS: Street food, Street Safety, Vendors, Health

INTRODUCTION

Street vending is an ancient phenomenon. It is as ancient as urban settlement. It has been the mainstay of cities around the world for centuries. Street vending as an occupation has existed for hundreds of years (Bromley, 2000). Ancient and medieval period witnessed travelling merchants who sold their wares in towns by going from house to house. They also traded in neighbouring countries (SharitBhowmik, 2012). Street vending is considered as the cornerstone of cities" historical and cultural heritage. It is the most visible and active segment of the large urban informal economy. They have become a part and parcel of life in any city.

Street vendors flourish in the areas that are popular congregations of the general public. They line up near railway stations, along busy shopping streets, housing complexes, in front of religious places, major sports and entertainment centres. Markets, pathways, highways and terminuses are the other highly congested places were the street vendors sell their products. Variations are seen in the employment context of street vendors. They are heterogeneous in nature. Their

activity varies in scale, timing, locationand remuneration. It varies in terms of workforce, and types of goods and services they sell.

OBJECTIVES OF THE STUDY

1.To assess the hygienic practices of the street food vendors
2.Tostudy the contaminations particularly by *panipuri*sellers
3. To establish the potential link between food contamination and the risk factors.

REVIEW OF LITERATURE

➤ Grace P. Perdigon (1986)[1] in his study "Street Vendors of Ready- to-Eat Food: AS a Source of Income and Food for Low Income Groups", mentioned that the daily net income of the food vendors ranged from alow P.10 per day to as higher than P.500 per day.

➤ Ma Patrocinio E. de Guzman et al., (1987)[2] [i]n their article "Street Foods in the Phllipines Health, Nutrition, Management and Livelihood Aspects", revealed that the initial capital investment of most street food business come from loans from relatives, friends or money lenders. The daily operating expenses range from P.10 to P 1000.

➤ Vashit P.D., (1990)[3] in his article "In formal sector — A Tool for Poverty Eradication", analyses that the importance, definition and the problems of informal sector. In a developing country like India, where the pressure of population is overall on the increase, the development of the informal sector can go a long way in employment generation and consequent eradication of poverty

➤ Friedman, Michelle and Hambridge (1991)[4] in their article "The Informal Sector, Gender and Development", emphasizes that the conception of work — (used in much research) has made it possible to overlook unpaid work done by women, simply by considering it as a part of the household's repetitive task.

METHODOLOGY

Primary Data:

Primary data was collected from 100 respondents through systematically prepared questionnaire through structured interview methods.

Secondary Data

The main source of information for secondary data was collected from old records and the websites books, journals, newspaper etc.

ANALYSIS AND INTERPRETATION

Table-1: Socio Economic Profile

Gender	No of Respondent	Percentage
Female	60	60
Male	40	40
Total	100	100
Age wise		
Below 25 years	20	20
25-35 years	25	25
35-45 years	30	30
45-55 years	15	15
Above 55 years	10	10
Total	100	100
Monthly income		
Below Rs 25000	25	25
Rs 25000-35000	35	35
Rs 35000-45000	21	21
Above Rs 45000	19	19
Total	100	100
Educational qualification		
Hsc	5	5
Graduate	10	10
Post Graduate	15	15
Professionals	40	40
Others	30	30
Total	100	100

Source: primary data

Table 1 shows that out of 100 respondents 100percentage of the respondents are female, Next 30 percentage of the respondents are under age group 35-45 years, Next 35 percentage of the respondents are under monthly income of Rs 25000-35000. Next 40 percentage of the respondents are professionals.

Particular	Total	Mean score	Rank
Food safety among children	365	73	2
Ulcer	275	55	5
Diarrhea	330	66	3
Head ache	313	62.6	4
Vomiting	401	80.2	1

Source: Computed data

Table-2 shows that balancing the children health affected by eating street food and it leads to vomiting ranked first score 401, next food safety among children ranked second score 365, next Diarrhea to be taken seriously ranked third score 330, next Head ache ranked fourth score 313, next ulcer with limited access to funding ranked fifth score 275.

AGEWISE CLASSIFICATION OF THE RESPONDENTS AND FOOD SAFETY AMOUNG CHILDREN

H_01 –There is no significant association between age wise classification of the respondents and food safety among children

The value of chi-square is 19.53(d.f = 16) and associated significant value is26.296. Therefore, the null hypothesis is accepted. Hence there is significance association between age wise classification and challenges faced by food safety. So it can be concluded that respondent's challenges faced by food safety for children.

Age (years)		IMPACT OF STREET FOOD AMONG CHILDRENS					
		Vomiting	Head ache	Diarrhea	Ulcer	Food Safety among children	Total
Age Wise Classification	Below 25	4	2	3	6	5	20
	25-35	5	3	4	4	8	25
	35-45	6	2	5	2	15	30
	45-55	7	2	6	1	0	15
	Above 55	3	1	2	2	2	10
Total		25	10	20	15	30	100

Chi-Square Tests			
	Calculated Value	Df	Asymp. Sig. (2-sided) Table Value
Pearson Chi-Square	19.53	16	26.296

FINDINGS

- ➢ Majority of the respondents are Male
- ➢ Majority of the respondents are age group between 35- 45 years
- ➢ Majority of the respondents are monthly income laid between 25,000-35,000
- ➢ Majority of the respondents are food safety among children

- ➢ Major problem for children eating street food and it leads to vomitting
- ➢ There is major differentiation among age wise classification and food safety among Children.

SUGGESTIONS

1. Food safety is more important amoungchildrens and it leads to many health issues so parents should be aware and concentrated in childrens food because of parents likes childrens are also addicted to eat street foods.
2. Food should be stored in some boxes are containers to secure from germs bt in street foods it will not be maintained properly. some type of fly , mosquitoes etc. will be there if it is not closed by proper containers.
3. Food need to be easily digested if it not, it leads to vomiting, ulcer, head ache etc.
4. Childrens are aadicted to streetfoods because of taste and crispiness and flavour added in the food very tasty to eat but at the same time very difficult to digest.

CONCLUSION

As per changes in the life styles of people especially among urban dwellers the demand of street food is also increased. To save time especially the working people and students majorly are depending on street food which is convenient and affordable. The other reason is Taste. As per the increase in the number of street food consumers health risks are also increasing day by day. We cannot assure the safety of food at street .consumers are thinking that food in front of malls and beside educational institutions is Hygiene.

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A STUDY ON ATTITUDE OF CUSTOMERS TOWARDS MICRO INSURANCE PLAN IN LIC IN *TIRUNELVELI* CITY

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ABSTRACT

Micro – insurance is the refuge of low- income people in resistance to specific perils in exchange for regular premium payments balanced to the possibility and cost of the risk involved. Generally, micro- insurance is for persons ignored by conventional commercial and social insurance schemes, persons who have not had access to commercial insurance nor social protection benefits provided by employers directly or by the government through employers. Since it is easier to offer insurance to persons with a expected income, even if it is a small sum, than to cover informal economy workers with irregular cash flows, the latter represents the micro- insurance boundary.

Keyword: Micro Insurance, Insurability, Moral hazard, adverse selection

INTRODUCTION

Micro insurance is a low – price, high –volume business and its success and market sustainability is dependent on keeping the transaction costs down. Hardly any adequate state- run programme of insurance benefits is now available for poor population groups, people working in the casual sector and other disadvantaged individuals- and private – sector programmes are even rarer. A number of constraints make micro insurance look unpleasant, including a lack of political will, insufficiency of public funds and absence of a practical business model. The costs of marketing and handing out appear to be too high and, in view of the very much low purchasing power of the consumer base, it cannot be easily apportioned to the target group. Such constraints make micro insurance unappealing at the quick level. Market exploration suggest that progress can be made particularly when public and private sector work together in generating demand – based and resourceful products.

OBJECTIVE OF THE STUDY:

1. To understand the study what micro insurance is.
2. To examine the awareness of micro insurance products in Tirunelveli City.
3. To study the awareness level of the micro insurance scheme among illiterate people.
4. To measure awareness about the micro insurance initiative

REVIEW OF LITERATURE

Ranta Kishore(2013)[1], in his article pointed out that the market for micro insurance in India is enormous and remains untapped. The potential market size for micro insurance in India. He has given a micro insurance business model for the existing insurance. He explains micro insurance as social security lower for the poor and brought out problems and challenges in micro insurance.

Geetha and Vijayalakshmi (2014)[2], observed that the Insurance Regulatory and Development Authority (IRDA) have created a special category of insurance policies called micro insurance (MI) policies to promote insurance coverage among economically vulnerable sections of society. Micro insurance contributes significantly to alleviate poverty and to raise the living standard of the people of the country. Hence, it is imperative to conduct a research study on the performance of MI and find out the relevant problems.

MICRO INSURANCE

In India, a few micro-insurance schemes were commence, either by non-governmental organizations (NGO) which refer to turmoil due to the felt need in the community in which these organizations were apprehensive or by the reliance hospitals. These schemes have now gathered to create partly due to the expansion of micro-finance movement and partly due to the parameter that makes it mandatory for all formal insurance companies to expand their activities to rural and well-identified social sector in the country (IRDA 2000). As a result of NGOs is negotiating with the commercial insurers for the acquirer of customized group or uniform individual insurance schemes for the low-income people. Although the reach of such schemes is still very limited, their feasible is viewed to be significant. The micro insurance regulation of 2005 was a revolutionary approach by the Insurance Regulatory Development Authority (IRDA).

METHODOLOGY
Primary data:

Primary data was collected from 315 respondents through systematically prepared questionnaire and through structured interview methods.

Secondary data:

The main source of information for secondary data was collected from old records and the websites books, journals, newspaper etc

ANALYSIS AND INTERPRETATION

Table-1   Socio economic profile

Gender	No. of Respondents	Percentage
Male	162	51
Female	153	49
Total	**315**	**100**
Age	**No. of Respondents**	**Percentage**
31-35years	75	24
36-40years	90	29
Above 40 years	150	47
Total	**315**	**100**
Educational Qualification	**No. of Respondents**	**Percentage**
Diploma	90	29
Graduate	145	46
Post graduate	45	14
Others	35	11
Total	**315**	**100**
Income	**No. of Respondents**	**Percentage**
Below 10000	35	11
Rs. 10001- Rs.15000	90	29
Rs.15001-Rs.20000	145	46
Above Rs. 20,000	45	14
Total	**315**	**100**

Source: Primary Data

Table 1, shows that out of 315 respondents 51 percentage of the respondents are male, 47 percentage of the respondents are under age group above 40 years, 46 percentage of the respondents are under income of Rs 15001-RS.20,000, 46 percentage of the respondents are post graduate.

TABLE-2 CHI- SQUARE TEST

H_o1- There is no significant association between gender of the respondents and Micro Insurance Plan in LIC

		Age and Micro insurance Plan in LIC					Total
		26 yrs	26-30yrs	31-35yrs	36-40yrs	Above 40 yrs	
Gender	Male	44	40	30	25	19	158
	female	42	39	35	23	18	157
Total		86	79	65	48	37	315
Chi-square							
		Value	Df	Asymp. sig(2sided)			
Pearson chi – square		9.49	4	0.72			

Inference

Since the calculated value (0.72) is higher than the table value(9.49) the null hypothesis is rejected.

FINDINGS:

- ➢ Majority of the respondents are male.
- ➢ Majority of the respondent's age are Above 40years.
- ➢ Majority of the respondents are post graduate
- ➢ Majority of the respondents are Rs.15001-Rs.20,000
- ➢ It is the null hypothesis rejected.

SUGGESTIONS:

1. Micro Insurance cover may also be extended for disability and healthcare of the policy holders, because, at present the policy covers only natural death and death due to accident. Even the private and public insurance companies may design different micro insurance policies in covering all the risk involved in individual life in the future.
2. Initiatives may be taken to induce all the poor people in rural area like informal workers, formal etc.

3. The awareness may be created to promotional activities and advertising local television and F.M Radio to reach rural people.

CONCLUSION

In India, A large section of people come under lower income groups and below poverty line who wouldn't afford to acquired insurance to cover risk in their life and also support the family in the future with the high premium in insurance policies available in the market. A large segment of population remains uninsured. Insurance industry is beginning to notice the vast under serviced market of low income households. To facilitate these section of the people, Micro Insurance schemes introduced by LIC of India and few other private players in the market.

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A STUDY ON CUSTOMER PERCEPTION ON WHITELABEL ATM IN *TIRUNELVELI* CITY

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ABSTRACT

The purpose of the study was to assess the effect of ATM use on customer perception in banking. The study is driven by the fact ATM use ease access to bank services beyond working hours and days. This is supported by diffusion of innovation was result of a need to initiate a computerized telecommunication device to provide 24/7 access to ATM services to arouse customer perception as reinforced is dissonance Theory. The study was guided by three researches. The managers should improve on the network signals regular servicing of ATM machines and sensitization of users to improve on the customers.

Keywords:
Depositing cash, Check account balance, Withdrawal of cash, PIN exchange, service Transfer of funds

INTRODUCTION

We are living in a world that is maximum unbalanced and dynamic. World is not only shifting but the rate of change is accelerating. We are live through change in our daily life and in marketplace too. Customer needs, wants, opportunities are changing more rapidly; customers are increasingly demanding better quality and reliability in products and services; new products and services are coming to market more quickly, competition is getting more strong and global; and technology is changing rapidly. Business are operating in an indeterminate, highly competitive, and highly complex environment. Not only small but big players are also facing complications and challenges. Top companies are loosing market share and new establishments are taking their place. They tend to bring in more and more new customers complete word of mouth communication. It improves the market position of the firm and also the profits.

OBJECTIVES

1. To examine the level of customer perception towards WLAs.
2. To analyse the problems faced by the customer accessing WLAs.
3. To know the factors creating customer perception towards WLAs.
4. To identify various fraud and security threats associated with the use of ATM.
5. To examine the important dimensions of ATM service quality.

REVIEW OF LITERATURE

Lusekto and Gervas et al., (2015) it contains that the **"analysis of the attitude customers hold towards the use of automated teller machine: a case of Irimgu municipal Tamzaina"** identified that there is a great connection between gender, age marital status, occupation, and location of the ATM and the attitude of customers on the use of ATM services.

Ameme, B., and J. Wireko (2016) it claimed in his research paper **"impact of technological innovations on customers in the banking industry in developing countries"** that in today's competitive very important role where technology plays a very important role and if we talk about banking sector or industry. The innovation approach in all aspects like products and services. Also there is a significant relationship between technological innovation and cost. As the innovation increase the cost also increases.

Methodology

This section describes the methodology which includes collection of data, construction of questionnaire and frame work of analysis.

Collection of data

The primary data have been collected directly from the mobile banking customer and internet banking customer through on questionnaire. Secondary data have been collected from standard books, articles, magazines, encyclopedia and internet.

- **Primary data**
  The study mainly based upon the primary data. Interview schedule method is used to collect the data from the respondents. Sample size of "80" respondents have been appended in the research report.

- **Secondary data**
  The substantiate and to support the primary data required particular have been gathered by referring the reputed journals, magazines, standard newspaper and book, some of the information has been gathered from authorized web source.

Analysis of Data Interpretation

Table-1
Socio Economic Profile

Gender	No of Respondent	Percentage
Male	180	55.4
Female	145	44.6
Total	325	100.0
Age wise		
Below20	32	9.8
21-30	37	11.4
31-40	74	22.8
41-50	48	14.8
51-60	51	15.7
Above 60 years	83	25.5
Total	325	100.0
Monthly income		
UptoRs.10,000	39	12.0
Rs.10,001- Rs.25,000	96	29.5
Rs.25,001- Rs.35,000	60	18.5
Rs.35,001- Rs.45,000	28	8.6
Above Rs.45,000	102	31.4
Total	325	100.0
Family size		
2	16	4.9
3	133	40.9
4	134	41.2
Above 4	42	12.9
Total	325	100.0

Source: Primary data

Table 1 shows that out of 325 respondents 55.4 percentage of the respondents are male, and 25.5 percentage of the respondents are above 60 years, and 31.4 percentage of the respondents are under monthly income of Above Rs 45000. 41.2percentages of the respondents are 4.

Table-2
Rank of Customer Perception

	Mean Score	Rank
Depositing cash	3.32	V
Check account balance	3.02	VI
Withdrawal of cash	3.49	IV
PIN exchange service	3.55	III
Passbook printing	3.76	II
Transfer of funds	3.86	I

Source: Primary data

Table-2 shows that Transfer of funds is first score 3.86 and passbook printing is second score 3.76 and PIN exchange service is Third score 3.55 and withdrawal of cash is fourth score 3.49 and Depositing cash is forth score of 3.32 and check account balance is sixth score of 3.02.

Table 4 Factors influencing the ATM - Ranks

	Mean Score	Rank
To reduce the transaction time	3.92	VII
Fulfilling cash requirement	4.36	VI
Safety of ATM transaction	4.62	III
Sufficient number of ATM	4.89	I
Safety and security of ATM centre	3.12	VIII
Transaction cost	4.58	V
ATM disputes are settled within stipulated time	4.60	IV
Overall, I would find the ATM easy to use	4.68	II

Sources: Primary Data

It is evident from table 4.3 that the source of sufficient number of ATM is the first score of 4.89 and overall, I would find the ATM easy to use is the second score of 4.68 and safety of ATM transaction is the third score of 4.62 and ATM disputes are settled with in stipulated time is the fourth score 4.60 and Transaction cost is the fifth score of 4.58 and fulfilling cash requirement of sixth score is 4.36 and To reduce the transaction time and seventh score is 3.92 and safety and security of ATM centre is 3.12.

FINDINGS

- ➤ 55.4 percentage of the respondents are male
- ➤ 25.5 percentage of the respondents are above 60 years
- ➤ 31.4 percentage of the respondents are under monthly income of Above Rs 45000.

➢ 41.2 percentages of the respondents are 4.
➢ Majority of the respondents Transfer of funds is first score 3.86.
➢ The source of sufficient number of ATM is the first score of 4.89

SUGESSTIONS:

1. The banks should position the use of such ATMs that are friendly concerned with, meaning those that are made easier to use.
2. The banks should also anticipate placing ATMs in the public places as an important strategy to customer satisfaction, which will encourage ease of access to both ATMs and finances.
3. The banks should not only dispense security measure at ATMs centers but also observer the security operations at the ATMs centers.
4. They should also create more awareness on how to ensure self-security to customers, such as to stop responding to preventable email and text message except otherwise, sharing pin with others and so on.

CONCLUSION

Most of the researches accompanied on customer satisfaction based on service quality had indicated positive simultaneity of such technologies. This research also indicated that, high number of respondents was satisfied with type of ATMs they used together in terms of their mode of procedure and access. The construct perceived ease of use and perceive availability had high positive perception of the respondents. While the security construct has destructive perception of the respondents. This generally indicated that most of the customers used the ATM as a result of its establishment of quick access to money and ease of operation but not mainly on its optimal security.

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A STUDY ON CUSTOMER SATISFACTION TOWARDS FASTRACK PRODUCTS IN THOOTHUKUDI

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ABSTRACT

Customer Satisfaction is the primary source of any business activity, retaining the customers to their product is most important in the business. Fastrack is a fashion accessory retail brand in India. The company was launched in 1998 as a sub-brand of Titan Watches. In 2005, Fastrack was spun off as an independent brand targeting the urban youth and growing fashion industry in India. It began opening retail stores throughout the country. The first store opened in early 2009. The main objective of the study is to find out the customer satisfaction towards Fastrack products. The universe of the population includes the respondents who are the consumers of Fastrack products in Thoothukudi. The research outcome indicates that, most of the customers were satisfied towards the use of Fastrack Products.
Keywords: Fastrack, Watches, Customer brand preference, Customer satisfaction, Customer value.

INTRODUCTION

Fastrack was launched in 1998 and became an independent urban youth brand in 2005. Since then it has carved a niche for itself with watches and sunglasses that are both fashionable and affordable. Fastrack extended its footprint into accessories in 2009 with a range of bags, belts and wallets. Through the years, Fastrack has emerged to be the voice of the youth- pioneering trends and creating new norms. In communication and design, we are always fun, edgy, quickly and effortlessly cool. Fastrack's provocative tongue-in-check advertising. Its unique & affordable designs & its quick extension across categories ensures its popularity with the urban youth audience, making it one of the fastest growing fashion brands within the country. Its growing presence on Facebook a fan base that now has a followership of 9 million, keeps it in touch with its audience.

With enough categories to fill up a store, Fastrack retails across the nation through 158 exclusive Fastrack stores in over 79 cities as well as authorized multi brand outlets. Today, the brand has successfully notched up the title of being the most loved youth fashion brand in the country. Fastrack is known for colourful and trendy products that suit the urban youth of this country. The brand has been

involved in providing latest trends and innovative designs to connect with its modern consumers.

REVIEW OFLITERATURE

K. Anitha and Dr.M. Uma Maheswari (2013) conducted a study on "Customer satisfaction towards Fastrack products with reference to Erode District". The study helped to gain knowledge about the different types of Fastrack products. The findings of the study revealed that Fastrack products are fast moving product and the important factors for preferring the brand include its quality, attractiveness, designs and latest new models.[1]

Anitha N. Halamata (2013) conducted a study on "Consumer behaviour and brand preference of Fastrack products-An empirical study with reference to Haveri District Karnataka". In this the analysis says that consumer satisfaction is necessary to know the opinion of different consumers to implement the most effective marketing policy of the firm. The findings of the study are that consumers of Fastrack brand watches are highly satisfied the customers having pride in owning and wearing the most sophisticated highly reliable and superior performance watch. [2]

Belli PK and Dhanya (2012) made a study on "Customer satisfaction for Fastrack products". The findings of the study reveal that majority of respondents were aware about the various range of products provided by Fastrack watches through advertisement and they concluded that on growing influence of globalization on the Indian watch industry, a number of global manufacturers are coming into the Indian watch industry. [3]

Praveen Kumar L (2015) Conducted "A study on customer satisfaction of Fastrack products in Mysore". The findings of the study say that company should ensure the availability of all models and outlets of Fastrack. The company must satisfy their loyal customers by providing them special offers. Finally, a study conducted to know about the satisfaction level of the customers of Fastrack products. [4]

Josephine Lourdes De Rose (2015) made a study on "A review on the factors contributing to the selection of a products using conjoint analysis". The findings of the study are conjoint analysis displays the key levels under each of the attributes and they concluded that Fastrack products.[5]

STATEMENT OF THE PROBLEM:

FastTrack products have gained good reputation from the public. The Fastrack products contribute a greater share in the entire market. In modern scenario both the manufacturers and dealers must know the customer's attitudes and preferences towards a product. Then only they can frame policy decision accordingly. The entire manufacturers try to identify the attitude of the customers. But Fastrack, being one of the competitors for products should know the problem

and reason for the problem to increase the sales volume of the Fastrack products. The purpose of this study is to understand the factors influencing customer satisfaction towards Fastrack products.

OBJECTIVES OF THE STUDY:
The objectives of the present study are
- ❖ To find out the satisfaction level of consumers towards FastTrack products.
- ❖ To study the factors influencing the purchase of FastTrack products.

METHODOLOGY
Methodology is an essential part of any research. It enables the investigator to look at the research problem in a systematic, meaningful and orderly way. Methodology comprises of the sources of data collection, sampling design and techniques used for analyzing the data.

SAMPLING DESIGN
With a view to study "Customer Satisfaction towards Fastrack Products in Thoothukudi", 50 respondents have been selected. The researcher has adopted simple random sampling technique for the collection of data from the respondents.

FIELD WORK AND COLLECTION OF DATA
The required information was collected from the primary and secondary sources. The field work for this study was carried out by the researcher herself. The researcher used questionnaire for the collection of primary data from the respondents. A Preliminary study was made to pre –test the questionnaire with few individuals, and on that basis the questionnaire was edited. Further interviews were conducted using the structured questionnaire. The completed questionnaires were checked and corrected. The omissions and errors were rectified by revisits to the field. The secondary data related to the present study have been collected from the Books, Journals, magazines, and Websites.

PROCESSING OF DATA
After the completion of the data collection, the filled up the questionnaire were edited properly. Codification was done on the responses collected. For further processing a master table was prepared to sum up all the information collected. With the help of master table, frequency tables were prepared for further analysis.

FRAMEWORK OF ANALYSIS
Arithmetic mean and percentage analysis have been used to describe the data. Percentage Analysis is applied to create a contingency table from the frequency distribution and represent the collected data for better understanding. Ranking index is used to rank the general opinion of Fastrack. Ranking index is

found out by dividing the total sources by the frequency of responses. Then the general opinion of Fastrackwere ranked in the order of merit.

RESULTS AND DISCUSSION

Table 1 - Type of Product

Type of products	No. of Respondents	Percentage %
Watches	38	76
Sunglasses	3	6
Bags	2	4
Wallets	7	14
Total	**50**	**100**

Source: Primary data

Table 1 shows the type of Fastrack products used. The table shows that, 76% of the respondents are using watches, 6% of the respondents are using sunglasses, 4% of the respondents are using bags and 14% of the respondents are using wallets. Thus it is inferred that the majority of the respondents are using watches.

Table 2 - Influential Factors

Factors	No. of Respondents	Percentage %
Brand image	7	14
Reasonable price	8	16
Good quality	30	60
Attractive design	5	10
Total	**50**	**100**

Source: Primary data

Table 2 shows the influential factors to buy the product. The factor that influences 14% of the respondents is brand image, 16% of the respondents is reasonable price, 60% of the respondents is good quality and 10% of the respondents is attractive design. Thus it is inferred that the factor that influence majority of respondents is good quality.

Table 3 - Reason for Selecting the Product

Reason	No. of Respondents	Percentage %
Brand value	13	26
Style	17	34
Prestige symbol	2	4
Attractive design	12	24
Durability	7	14
Total	**50**	**100**

Source: Primary data

Table 3shows the reason for selecting the product. The table shows that 26% of the respondents choose Fastrack due to its brand value, 34% of the respondents due to style, 4% of the respondents for its prestige symbol, 24% of the respondents due to its attractive design and 14% of the respondents for its durability.Thus it is inferred that the majority of the respondents select Fastrack due to its style.

Table 4 - Motivation to Purchase the Product

Factors	No. of Respondents	Percentage%
Friends	23	46
Salesman	7	14
Advertisement	10	20
Self-decision	8	16
Family members	2	4
Total	**50**	**100**

Source: Primary data

Table 4 shows the motivation to purchase Fastrack products. The table shows that 46% of the respondents were motivated by friends, 14% of the respondents were motivated by salesman, 20% of the respondents were motivated by advertisements, 16% of the respondents were motivated by themselves,4% of the respondents were motivated by family members. Thus it is inferred that majority of the respondents were motivated by friends and relatives.

Table 5 - General Opinion on Fastrack

Factors	Ranking by Respondents				Total Score	Average Score	Rank
	1	2	3	4			
Attractive Design	13	20	7	10	136	2.72	**II**
Wide variety of products	10	8	13	18	108	2.16	**III**
Customer service	12	15	17	7	93	1.86	**IV**
Quality	18	13	8	10	137	2.74	**I**

Table 5 shows the ranking of general opinion on Fast rack by customers. Quality is given the first rank, Attractive Design was ranked second followed by Wide variety of products with the third rank and Customer service got the fifth rank.

Table 6 - Place of Purchase by the Respondents

Place of purchases	No. of Respondents	Percentage %
Fastrack showroom	25	50
Fastrack website	12	24
Other shopping sites	13	26
Total	**50**	**100**

Source: Primary Data

The table 6 shows that the place of purchase of Fastrack products. The table shows that 50% of the respondents purchase from Fastrack showroom, 24% of the respondents purchase from Fastrack website, 26% of the respondents purchase from other shopping sites. Thus majority of the respondents purchase Fastrack products from Fastrack showroom.

FINDINGS AND SUGGESTIONS

It is evident from the study that majority of the respondents prefer watches among the products sold by fastrack. The study shows the fact that the factor that influences the purchase of fastrack products is good quality and the main reason for selecting fastrack product is for its style.The respondents are persuaded byfriends and relatives to purchase fastract products from the Fastrack showroom. On ranking the general opinion on Fastrack by customers, Quality was given the first rank and Attractive Design was ranked second.

The following are the suggestions:
- Fastrack should improve its customer service quality to retain and satisfy customers.
- In order to improve its sales, ad promotion should be taken care, excellent customer care should be provided and also it should reduce its service time.
- Often the product range displayed in the ads are not available in stores, so it should be ensured that product ranges are available as soon as possible.
- For common doubts & queries suitable recordings can be made. Queries & recommendations can be uploaded in website of Fastrack.
- Website of Fastrack can be improved again by including detailed information of new products, offers & promotions. It should also provide Customer's feedback option while they use online.

CONCLUSION

On the growing influence of globalization on the Indian product industry, a number of global manufacturers are coming into the Indian product industry. In such a dynamic environment, Fastrack need to be more quality conscious since the products offered are almost similar to all the watch manufacturers in the industry. Fastrack needs to take serious efforts to make itself competitive and stable in the dynamic market situation by focusing on the service quality aspects. Gaining and maintaining consumer preference is a battle that is never really won. Continued and consistent branding initiatives that reinforce the consumers purchase decision will, over time, land the product in consumer preference sets. Attaining and sustaining preference is an important step on the road to gaining brand loyalty.

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A STUDY ON IMPACT OF SOCIAL MEDIA AMONG ARTS COLLEGE STUDENTS IN TIRUNELVELI CITY

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ABSTRACT

There are numerous ways, positive and negative, in which social media impact college students. Understanding sheer volume of time and the type of activities for which college students use social networking sites is crucial for higher education administrators. Researchers have begun to empiri-cally examine impacts on students' well-being and have found some preliminary results that call for purpose of social media activities that make the difference.

KEYWORDS

Social media, Education, academic development, Students, Impacts.

INTRODUCTION

Now a day's social media has been the important part of one's life from shopping to electronic mails, education and business tool. Social media plays a vital role in transforming people's life style. Social media includes social networking sites and blogs where people can easily connect with each other. Since the emergence of these social networking sites like Twitter and Facebook as key tools for news, journalists and their organizations have performed a high-wire act. These sites have become a day to day routine for the people. Social media has been mainly defined to refer to "the many relatively inexpensive and widely accessible electronic tools that facilitate anyone to publish and access information. Collaborate on a common effort or build relationship".

Social media is a platform that lets us participate in Social networking. We can share our posts on various social media platforms to improve business visibility. Today it is the best source for news updates, marketing, education and entertainment.

In recent years technology has tried to fulfill its role in helping humanity leading to the substantial medium of interaction in the social world as well as in teaching and learning. Over the years those in higher education has explore the exciting opportunities new technologies bring to institutions, educators and

students. Technology has changed the way of people interact and has brought about the emergence of an open social platform such as social media that allows the inhabitants of this planet earth to connect with each other making the world a global village.Social media is thus an important tool that teachers can use in their classroom to make it more relevant, engaging and culturally diverse to enhance the students learning process.

OBJECTIVES OF THE STUDY

The main objective of the study was to investigate the impact of social media on college student's life. The specific objectives of the study were:

- ❖ To examine the types of social media platforms commonly used by students.
- ❖ To find out the amount of time, students spent on social media.
- ❖ To investigate the purposes for which students use social media.
- ❖ To analyze the impact of social media among college students social life.
- ❖ To examine whether college students use social media related to their studies.

REVIEW OF LITERATURE

Sushila Madan (2005), discuss about how internet works, internet governance, ways of accessing the internet, email, chat programs, news group, internet search engines, usage of internet to society. In the same manner discusses about finding business, products, services, e business and mentions that social media helps for research, education and finding people. In this book author gives guidelines to online behaviors.

Dan Zarrella (2010), this book explains social media marketing, big brands and social media, small business and social media, further explains the things which are necessary to start business, with some of the most brilliant social media pioneers, further explains about micro blogging and explains it as a quick and easy way to get into social media and promote content which helps to manage account, and business through blogging, social networking, media sharing, social news, bookmarking, etc.

HeadHonchos survey (2013) This survey explains the digital world is influencing career graphs as firms embrace technology and turn to specialized job searches and social media platform to aid in recruitment. This survey observes that most of the professionals are of the view that social profiles are important for their

careers and most of them agreed that profiles on online platforms such as LinkedIn and Facebook or even personal blog are very important for one's career. In the same way this survey observes that social media has emerged as an important platform for personal branding.

AratiVisala J. and VaishaliRawat (2016) focus their study on determining the difference among the levels of emotional maturity and self-concept of low, moderate and high users of internet. In this research two dimensions of emotional maturity have been studied that is Emotional Instability and Personality Disintegration. The results showed that low internet users have lower emotional instability, lower chances of personality disintegration and self concept. Moderate users were seen to be having a positive correlation between Emotional instability and Personality Disintegration and negative correlation with respect to self concept and High users of internet were seen to be having higher emotional instability, lower personality disintegration and low self concept.

Methodology:

Methodology is the systematic, theoretical analysis of the methods applies to a field of the study. It companies the theoretical analysis of the body of methods and principles associated with the branch of knowledge.

Primary Data:

Primary data is a type of information that is obtained directly from first-hand sources by means of surveys, observation or expectation. In primary data collection, the researcher collects data directly from the customers by means of Interview Schedule.

Secondary Data:

Secondary data is the data collected by someone other than the user. In secondary data collection, the researcher collects data from Books, Magazines, Journals, Internet, etc.

Analysis and Interpretation
Table-1: Socio Economic Profile of the Respondents

Gender	No of Respondent	Percentage
Male	45	38
Female	75	62
Total	120	100
Age wise		
Below 25 years	38	32
25-35 years	35	29
35-45 years	12	10
45-55 years	25	21
Above 55 years	10	8
Total	120	100
Monthly income		
Below Rs 25000	37	31
Rs 25000-35000	48	40
Rs 35000-45000	28	23
Above Rs 45000	7	6
Total	120	100
Educational qualification		
Diploma	5	4
Graduate	65	54
Post graduate	33	28
Professionals	10	8
Others	7	6
Total	120	100

Source: Primary data

Table 1 shows that out of 120 respondents 62 percentage of the respondents are female. 32 percentage of the respondents are under age group Below 25 years. 40 percentages of the respondents are under monthly income of Rs 25000-35000. 54 percentages of the respondents are Graduate.

Findings:

The findings of the present revealed the following

- ➢ 62 percentage of the respondents are female.
- ➢ 32 percentage of the respondents were under age group of below 25 years.

- ➢ 40 percentage of the respondents were laid on between Rs25000-35000 monthly income.
- ➢ 54 percentage of the respondents are graduate.

Suggestions:

1. Knowing that most college students own and use a smartphone regularly, adding a twitter component to major events such as graduation adds and additional dimension of participation, focus, innovation, contributions, connections and evaluations.
2. Understand the usage of social media and other forms of technology at your campus. There may be service statistics, but more importantly, you can simply ask students to show you what they use and how.
3. Educate your students about their privacy, safety and best practices about using social media. The information is constantly changing, and this is something that affects not only your students but also your faculty and staff.

Conclusion:

Social media is a really convenient and important communicate network for all the people nowadays. We can use it to know friends and keep contact with friends that came from different countries. We can also share our ideas so quickly so that all the things could develop so fast because people could tell us their ideas and we could improve it immediately. We could also learn new things on social media by watching or reading the things that people shared onto the social media. People could also sell things on social media freely which could reduce the expenditure of advertisements. Social media changed our life so much. Our life became more convenient because social media is a very useful tool for us in 21st century, it could help us to improve our life. However, we have to aware of how we use them. If we could use the social media smartly, having social media will become a good change for us.

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A STUDY ON CUSTOMER PERCEPTION AND ATTITUDE TOWARDS E-BANKING IN TIRUNELVELI DISTRICT

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ABSTRACT

E-Banking is also called Internet banking or Mobile banking. E-Banking service is the automated delivery of new and traditional banking products and services directly to customers through electronic, interactive communication channels includes the systems that enable financial institution customers, individuals of businesses, to access accounts, transact business, or obtain information on financial products and services from Internet. Customers access e-banking services using an intelligent electronic device, such as a personal computer, personal digital assistant, automated teller machine and touch tone telephone. The customers also prefer e-banking services since it reduces the waiting and enhance the customers to do their work effectively within a short span of time. Now a day's e-banking services plays a vital role in economic development in turn helps the government in collecting the tax, since every transaction is done through online no chance of fraudulent activities.

INTRODUCTION: -

E-Banking is also called Internet banking or Mobile banking. Internet banking is the term used for new age banking system. Internet banking is also called as online banking and it is an outgrowth of PC banking. Internet banking uses the internet as the delivery channel by which to conduct banking activity, for example, transferring funds, paying bills, viewing checking and savings account balances, paying mortgages and purchasing financial instruments and certificates of deposits. Internet banking is a result of explored possibility to use internet application in one of the various domains of commerce. It is difficult to infer whether the internet tool has been applied for convenience of bankers or for the customers' convenience. But ultimately it contributes in increasing the efficiency of the banking operation as well providing more convenience to customers.

OBJECTIVES OF THE STUDY: -

1. To measure the awareness of customers regarding the usage of E-Banking.
2. To analyze the customer's perception and attitude towards E- Banking.
3. To analyze the problems faced by the customer using E- Banking
4. To offer suggestions related to the E-banking

REVIEW OF LITERATURE

Siam, (2006) has evaluated the effects of electronic banking on the profitability of Jordanian banks. The study investigated the reasons behind providing electronic banking services through internet, their impact on banking services in general, and banks profitability in particular. The results of the study revealed that electronic banking services have a negative impact on the profitability of banks in the short run because of increased capital costs involved in technical and electronic infrastructure, cost of training to employees and also the cost involved in creation of environment where the banks can operate smoothly. However, these services have a positive impact in the long run on the profitability of banks. The researcher recommended that banks need to carry out awareness and promotion campaigns to educate clients and make them aware them of feasibility through reduced time, cost, effort and also to hold training courses for employees to understand the e-banking business strategies .

Tyrone T. Lin, (2006) has studied "An internet banking system establishment with transaction rate uncertainly: A real options approach" This study investigates the entry threshold for providing a new transaction service channel via the real options approach, where the entry threshold is established by using an Internet banking system designed for the use of financial institutions under transaction rate uncertainty. Sensitivity analyses of related parameters are also conducted through numerical simulation. The results of the novel approach presented in this study provide a valuable reference for financial institutions to establish Internet banking systems .

Supriya Singh, (2006) has studied "The Social Dimensions of the Security of Internet banking" This paper examines the users' perspective on the security of Internet banking in Australia within the social context. This user-centered design approach supplements the technological and industrial approaches to security. The user-centered research on banking was conducted at the Royal Melbourne University of Technology University and Griffith University, both of which are part of the Smart Internet Technology Cooperative Research Centre. The author has concluded that the most effective way to increase the perception of Internet banking security is to increase ease of use, convenience, personalization and trust. Without the perception of security, there will be little trust in banking and transactions on the Internet. This will impede the use of Internet banking and e-commerce which are increasingly important aspects of the nation's critical infrastructure.

Boatang, (2006) has explored some of the issues that affected the key decisions of banks while adopting e-banking techniques. The findings of the study indicated operational constraints related to customer location, the need to maintain customer satisfaction and the capabilities of the banks. The author pointed out the need for African banks to understand customer needs, corresponding service to

offer, the resources and partnership required to offer it, and develop appropriate e-banking strategies that maximized value for both customers and banks..

METHODOLOGY

This section describes the methodology which include collection of data, construction of questionnaire and frame work analysis.

Collection of Data

The primary data have been collected directly from the mobile banking customer and internet banking customer through on questionnaire. Secondary data have been collected from standard books, articles, magazines, encyclopedia and internet.

Primary data

The study mainly based upon the primary data. Interview schedule method is used to collect the data from the respondents. Sample size of "100" respondents have been appended in the research report.

Secondary data

The substantiate and to support the primary data required particular have been gathered by referring the reputed journals, magazines, standard news paper and book. Some of the information has been gathered from authorized web source.

ANALYSIS OF DATA
Table -1: Gender Wise Classification

S No.	GENDER	RESPONDENTS	PERCENTAGE
1	Male	70	70
2	Female	30	30
	Total	100	100

Source: primary data

From the above table 1 shows that, from the 100 respondents, 70 percentages of the respondents are male and 30 percentages of the respondents are female. Hence it can be concluded that majority of the respondents are male.

Table -2:Age Wise Classification

S.NO	AGE	NO. OF RESPONDENT	PERCENTAGE
1	Below 20 years	35	35
2	21-30 years	44	44
3	31-40 years	11	11
4	Above 40 years	10	10
	Total	100	100

Source: Primary data

Table 2 shows that from the 100 respondents, 35 percentages of the respondents belongs to the age group of below 20 years and 44 percentages of the respondents belongs to the age group of 21-30 years and 11 percentages of the respondents belongs to the age group of 31-40 years and 10 percentages of the respondents belongs to the age group of above 40 years.

Hence it can be concluded that majority of the respondents belongs to the age group of 21-30 years.

Table -3: Income Level Classification

S. NO	MONTHLY INCOME	NO. OF RESPONDENTS	PERCENTAGE
1	Below Rs. 20000	18	18
2	Rs.20001-30000	23	23
3	Rs.30001-40000	20	20
4	Above Rs.40000	39	39
	Total	100	100

Source: Primary data

Table 2 shows that from the 100 respondents, 37 percentages of the respondents belongs to the age group of below 20 years and 40 percentages of the respondents belongs to the age group of 21-30 years and 13 percentages of the respondents belongs to the age group of 31-40 years and 10 percentages of the respondents belongs to the age group of above 40 years.

Hence it can be concluded that majority of the respondents belongs to the age group of 21-30 years.

FINDINGS: -

The findings of the present work revealed the following.

1. The majority of the respondents are male.

2. The majority of the respondent's age group laid down 21-30

3. The majority of the respondents were laid on between Rs.20001-30000..

SUGGESTIONS: -

1 The government should help the bankers to know more about the internet banking.

2. The safety system with regard to mobile banking should be improved.

3. The attitudinal change in the bank staff towards providing good customer service is essential.

4. Customer awareness can be created through various programmers such as seminar, cultural programmers and the like.

CONCLUSION: -

Due to economic development, increasing population as well as the technological development induce to using the internet banking and mobile banking system. Even though there is many development takes place from the above investigation there is also a need of awareness in internet banking and mobile banking. So our government conduct many awareness programmed and development programmers among the people and also the bank employees to avoid malpractice.

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FIXED POINT THEOREM IN COMPLETE L-FUZZY METRIC SPACE

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Abstract:
        In this paper we proved self- mapping for the complete L-fuzzy metric space using the property (C).

Keywords:
        L-fuzzy metric space, compatible type (P), complete, fixed point

1. Introduction and preliminaries

The introduction of the concept of fuzzy set by Zadeh[12] in 1965,many authors have introduced the concept of fuzzy metric space in different ways [1,2,6,7,8] George and Veeramani [3,4] modified the concept of fuzzy metric space introduced by Kromosil and Michalek[8] and defined a Hausdorff topology on this fuzzy metric space. Using to idea of L- fuzzy sets[5],Saadati et al[11],introduced the notion of L-fuzzy metric space with the help of continuous t-norms as a generalization of fuzzy metric space due to George and Veeramani [3] and intuitionistic fuzzy metric space due to Park and Saadati[9,10].

Here we collect the basic definitions and the lemma which are necessary for the subsequent chapters. We prove some results on L-fuzzy metric space and we define the types of compatible in L-fuzzy metric space and property (C)

And we proved fixed point theorem for compatible mappings of type(P) in L-fuzzy metric space.

Definition 1.1
A**triangular norm** (t-norm) on f is a mapping T : A→L^2 satisfying the following conditions:

        i)$(T(x, 1_f) = x$for all $x \in L$ (boundary condition)
        ii)$T(x, y) = T(y, x)$for all $x, y \in L^2$ (commutativity)
        iii) $T(x, T(y, z)) = T(T(x, y), z)$for all $x, y, z \in L^3$ (associativity)
        iv) $x \leq_L x'$ and $y \leq_L y' \Rightarrow T(x, y) \leq_L T(x', y')$(monotonicity)

Definition 1.2
        Let X be a nonempty set and $f: X \to X$ be a mappings.A point $x \in$X is called a **fixed point** of f if $x$remains invariant under fi.e.,$fx = x$

Definition 1.3

A continuous t-norm is a binary operation $*$ on [0,1] satisfying the following conditions:

i. $*$ is commutative and associative;
ii. $a * 1 =$ a for all $a \in [0,1]$;
iii. $a * b \leq c * d$ whenever $a \leq c$ and $b \leq d$ $(a, b, c, d \in [0,1]$;
iv.   The mapping $*: [0,1] \to [0,1]$ is continuous.

Example 1.4

The following examples are classical examples of a continuous t-norms.

(TL) (the Lukasiewicz t-norm). A mapping $T_L: [0,1] \times [0,1] \to [0,1]$ which defined through

$$T_L(a, b) = \max\{a + b - 1, 0\} \tag{1.1}$$

(TP) (the product t-norm). A mapping $T_P: [0,1] \times [0,1] \to [0,1]$ which defined through

$$T_P(a, b) = ab \tag{1.2}$$

(TM) (the minimum t-norm). A mapping $T_M: [0,1] \times [0,1] \to [0,1]$ which defined through

$$T_M(a, b) = \min\{a, b\} \tag{1.3}$$

Definition 1.5

An **intuitionistic fuzzy set** $P_{\varsigma,y}$ on a universe U is an object

$P_{\varsigma,y} = \{\varsigma_P(u), \eta_P(u)): u \in U\}$ where for all $c \in U$, $\varsigma_P(u) \in [0,1]$ and $\eta_P(u) \in [0,1]$ are called the membership degree and the non-membership degree respectively of u in $P_{\varsigma,y}$ and furthermore satisfy $\varsigma_P(u) + \eta_P(u) \leq 1$.

Classically, a triangular norm T on $([0,1], \leq)$ is defined as an increasing, commutative, associative mapping T : $[0,1]^2 \to [0,1]$ satisfying $T(x, 1) = x$

For all $x \in [0,1]$.

These definitions can be straightforwardly extended to any lattice $f = (L, \leq_L)$.

Define first $0_L = \inf L$ and $1_L = \sup L$.

Definition 1.6

The 3-tuple (X, M, T) is said to be an L **- fuzzy metric space** if X is an arbitrary (nonempty) set, T is a continuous t-norm on f and M is an f - fuzzy metric set $X^2 \times (0, \infty)$ on satisfying the following conditions for every in x, y, z and t, s in $(0, \infty)$

a) $M(x, y, t) >_f 0_f$
b) $M(x, y, t) = 1_f f or all t > 0\ if and only if x = y$
c) $M(x, y, t) = M(y, x, t)$
d) $\nearrow(M(x, y, t), M(y, z, s)) \leq_f M(x, z, t + s)$

e) $M(x, y, .) : (0, \infty) \rightarrow L is continuous$

In this case M is called an L **- fuzzy metric**.If $M = M_{M,N}$ is an intuitionistic

fuzzy set (see Definition 1.4),then the 3-tuple (X, M, T) is said to be an **intuitionistic - fuzzy metric space.**

Lemma 1.7

Let(X, M, T)be an f - fuzzy metric space**.**Then $M(x, y, t)$ is nondecreasing with respect to t, for all x, y in X.

Example 1.8

Let (X, d) be a metric space. Denote $T(a, b) = (a_1 b_1, \min(a_2 + b_2, 1))$ for all $a = (a_1, a_2)$ and $b = (b_1, b_2)$ in L^* and let M and N be fuzzy sets on $X^2 \times (0, \infty)$defined as follow

$$M_{M,N}(x, y, t) = (M(x, y, t), N(x, y, t)) = \left(\frac{}{.ht^n + md(x,y)}, \frac{md(x,y)}{ht^n + md(x,y)} \right) \text{for all}$$

$t, h, m, n \in R^+$.Then $(X, M_{M,N}, T)$,is an intuitionistic fuzzy metric space.

Example 1.9

Let $X = N$.Define $T(a, b) = (\max(0, a_1 + b_1 - 1), a_2 + b_2 - a_2 b_2)$ for all $a = (a_1, a_2)$ and $b = (b_1, b_2)$ in L^* and let M and N be fuzzy sets on $X^2 \times (0, \infty)$defined as follows

$$M_{M,N}(x, y, t) = (M(x, y, t), N(x, y, t)) = \begin{cases} (\frac{x}{y}, \frac{y-x}{y}) \ if x \leq y \\ (\frac{y}{x}, \frac{x-y}{x}) \ if y \leq x \end{cases} \text{ for all } x, y \in X \text{ and}$$

$t > 0$Then $(X, M_{M,N}, T)$is an intuitionistic fuzzy metric space.

Definition 1.10

A sequence $\{x_n\}_{n \in N}$is an f - fuzzy metric space $(X, M, T)$is called a **Cauchy Sequence**, if for each $\varepsilon \in L \backslash \{0_f\}$and $t > 0$,there exists $n_0 \in N$such that for all $m \geq n \geq n_0$(n $\geq m \geq n_0$), $M(x_m, x_n, t) >_L \mathcal{N}(\varepsilon)$.

The sequence $\{x_n\}_{n \in N}$is said to be **convergent** to $x \in X$in the f - fuzzy metric space (X, M, T)(denoted by $x_n \xrightarrow{M} x$) if $M(x_n, x, t) = M(x, x_n, t) \rightarrow 1_f$ whenver$n \rightarrow +\infty$ for every$t > 0$.

A f - fuzzy metric space   is said to be **complete** if and only if every Cauchy sequence is convergent.

Definition 1.11

Let S and T be two mapping from f - fuzzy metric space $(X, M, \nearrow)$ into itself and $\{x_n\}$ be a sequence in X such that $\lim\limits_{n \rightarrow \infty} S x_n = \lim\limits_{n \rightarrow \infty} T x_n = u$ for some $u \in X$.Then the mapping S and T are said to be

a) **Weakly commuting** if $M(STx, TSx, t) \geq_L M(Sx, Tx, t)$ for all $x in X$ and $t > 0$

b) **Compatible** if $\lim_{n \to \infty} M(STx_n, TSx_n, t) = 1_L$ for all $t > 0$

c) **Compatible of type (A)** if $\lim_{n \to \infty} M(TSx_n, SSx_n, t) = 1_L \lim_{n \to \infty} M(STx_n, TTx_n, t) = 1_L$ for all $t > 0$

d) **Compatible of type (P)** if $\lim_{n \to \infty} M(SSx_n, TTx_n, t) = 1_L$ for all $t > 0$

Proposition 1.12

Let S and T be compatible mapping of type (P) from an f –fuzzy metric space $(X, M, \nearrow)$ into itself. If $Su = Tu$ for some $u \in X$.
Then $STu = SSu = TTu = TSu$

Proof:

Suppose that $\{x_n\}$ is a sequences in X defined $x_n = u$ for n=1, 2,… and $Su = Tu$
Then we have $\lim_{n \to \infty} S x_n = \lim_{n \to \infty} T x_n = u$

Since S and T are compatible mapping of type (P)
We have $M(SSu, TTu, t) = \lim_{n \to \infty} M(SSx_n, TTx_n, t) = 1_L$.

Hence we have $STu = TTu$.
This completes the proof.

Definition 1.13

We say that f –fuzzy metric space $(X, M, \nearrow)$ has the **property (C)** if it satisfies the following condition $M(x, y, t) = C$ for all $t > 0$ implies $C = 1_f$

2. Fixed point theorem in Complete L-fuzzy metric spaces

Theorem 2.1

Let $\{A_n\}$ be the sequence of mappings A_i of a complete that f –fuzzy metric space $(X, M, \nearrow)$ which has the property (C), into itself such that, for any two mappings A_i, A_j, $M(A_i{}^m(x), A_i{}^m(x), \alpha_{i,j}, t) \geq_L M(x, y, t)$ for some m, here $0 < \alpha_{i,j} < k < 1$ for $i.j = 1,2, \dots \dots x, y \in X$ and $t > 0$. Then the sequence $\{A_n\}$ has a unique common fixed point in X.

Proof:

Let x_0 be an arbitrary in X and define a sequence $\{x_n\}$ in X by
$x_1 = A_1{}^m(x_0), x_2 = A_2{}^m(x_1)\dots\dots$
Then we have

$$M(x_1, x_2, t) = M(A_1{}^m(x_0), A_2{}^m(x_1), t) \geq_L M(x_0, x_1, t/\alpha_{1,2})$$

$$M(x_2, x_3, t)$$
$$= M(A_2{}^m(x_1), A_3{}^m(x_2), t) \geq_L M(x_1, x_2, t/\alpha_{2,3}) \geq_L M(x_0, x_1, t/\alpha_{1,2}\alpha_{2,3})$$

And so on. By induction, we have

$$M(x_n, x_{n+1}, t) \geq_L M(x_0, x_1, t/\prod^n_{i=1} \alpha_{i,i+1}), n = 1,2, \ldots \ldots,$$

$$E_{\lambda,M}(x_n, x_{n+1}) = \inf\{t > 0 : M(x_n, x_{n+1}, t) >_L N(\lambda)\}$$

$$\leq \inf\{t > 0 : M(x_0, x_1, t/\mathbf{G}^n_{i=1} \alpha_{i,i+1}) >_L N(\lambda)\}$$

$$= \mathbf{G}^n_{i=1} \alpha_{i,i+1} \inf\{t > 0 : M(x_0, x_1, t) >_L N(\lambda)\}$$

$$= \mathbf{G}^n_{i=1} \alpha_{i,i+1} E_{\lambda,M}(x_0, x_1) \leq k^n E_{\lambda,M}(x_0, x_1)$$

For every $\lambda \in L\backslash\{0_L, 1_L\}$

Now ,we show that $\{x_n\}$ is a sequence For every $\mu \in L\backslash\{0_L, 1_L\}$ we can find a $\gamma \in L\backslash\{0_L, 1_L\}$ such that

$$E_{\mu,M}(x_n, x_m) \leq E_{\gamma,M}(x_{m-1}, x_m) + E_{\gamma,M}(x_{m-2}, x_{m-1}) + \cdots .. + E_{\gamma,M}$$

$$\leq E_{\gamma,M}(x_0, x_1) \sum^{m-1}_{j=n} k^j \to 0$$

As $m, n \to \infty$. Since X is complete, there is $x \in X$ such that $\lim\limits_{n\to\infty} x_n = x$

Now we prove that x is a periodic point of A_i for any $i = 1,2, \ldots \ldots,$

Notice that,

$$M(x, A_i{}^m(x), t) \geq_L \nearrow(M(x, x_n, t - kt), M(x_n, A_i{}^m(x), kt))$$

$$= \nearrow(M(x, x_n, t(1 - k)), M(A_n{}^m(x_{n-1}), A_i{}^m(x), kt)$$

$$\geq_L \nearrow(M(x, x_n, t(1 - k)), M(A_n{}^m(x_{n-1}), A_i{}^m(x), \alpha_{n,i}t)$$

$$\geq_L \nearrow(M(x, x_n, t(1 - k)), M(x_{n-1}, x, t))$$

$$\to \nearrow(1_L, 1_L)$$

$$= 1_L n \to \infty.$$

Thus $M(x, A_i{}^m(x), t) = 1_L$ and we get $A_i{}^m(x) = x$.

To show uniqueness, assume that is another periodic point of A_i

Then we have $M(x, y, t) = M(A_i{}^m(x), A_i{}^m(y), t) \geq_L M(x, y, t/\alpha_{i,j}) \geq_L M(x_0, x_1, t/k)$

$$= M(A_i{}^m(x), A_i{}^m(y), t/k) \geq_L M(x, y, t/k^2) \geq_L \ldots ..$$

$$\geq_L M(x, y, t/k^n)$$

On the other hand, we have

$$M(x, y, t) \leq_L M(x, y, t/k^n)$$

Hence $M(x, y, t) = C$ for all $t > 0$.

Since $M_{M,N}$ has the property (C) ,it follows that $C = 1_L$ .i.e., $x = y$.

Also $A_i(x) = A_i(A_i{}^m(x)) = A_i{}^m(A_i(x))$.

i.e., $A_i(x)$ is also a periodic point of A_i

Therefore $x = A_i(x)$.

i.e., x is a unique common fixed periodic point of the mappings A_n , $n = 1,2,..$
This completes the proof. ■

Theorem 2.2

Let $\{A_i\}$ and $\{B_j\}$ be two sequences of self-mappings of a complete

f –fuzzy metric space $(X, M, \nearrow)$ which has the property (C) such that
i)   There exists $i_0, j_0 \in \mathbb{N}$ such that $A^{m_i}_0(X) \subseteq T(X), B^n_{j_0}(X) \subseteq S(X)$ and

     $T(X), S(X)$ are two closed subsets of X.
ii) $A_i B_i = B_i A_i$,$TA_i = A_i T$,$SA_i = A_i S$,$TB_i = B_i T$ and $SB_i = B_i S$ for all $i \in \mathbb{N}$
iii) $M(A_i^m x, B_j^n y, t) \geq_L M(Sx, Ty, k t)$ for every x, y in X,for some $n. m \in$
     $\mathbb{N}$ here $k_{ij} > k > 1$ for $i, j = 1,2,,,,.$ and $t > 0$
Then A_i, B_j, S and T have a unique common fixed point in X for all $i, j = 1,2,,,,.$
Proof:
     We have S, T and $A^m_{i_0} = A$ and $B^n_{j_0} = B$ for some $i_0, j_0 \in \mathbb{N}$ have a unique
common fixed point in X.
That is, there exists a unique $x \in X$ such that $S(x) = T(x) = A^m_{i_0}(x) = B^n_{j_0}(x) = x$

Suppose there exists $j \in \mathbb{N}$ such that $j \neq j_0$.
Then, we have $M(x, B^n_j x, t) = M(A^m_{i_0} x, B^n_j x, t)$
$$\geq_L M(Sx, Ty, k_{ij}t)$$
$$= 1$$
Hence for every $j \in \mathbb{N}$,we have $B_j^n x = x$
Similarly for every $i \in \mathbb{N}$,we get $A_i^m x = x$
Therefore for every $i, j \in \mathbb{N}$,we have $A_i^m x = B_j^n x = Sx = Tx = x$
To show uniqueness
Assume that y is another fixed point of A_i^m, B_j^n, S and T
Then we have $M(x, y, t)$ $= M(A_i^m x, B_j^n y, t)$
$$\geq_L M(Sx, Ty, k_{ij}t)$$
$$= M(x, y, k_{ij}t)$$
$$= M(A_i^m x, B_j^n y, k_{ij}t)$$
$$\geq M(x, y, k_{ij}^2 t)$$
$$\vdots$$
$$\vdots$$
$$\geq M(x, y, k_{ij}^n t)$$
$$\geq M(x, y, k^n t)$$
On the other hand, we have $M(x, y, t) \leq_L M(x, y, k^n t)$.
Hence $M(y, x, t) = C$ for all > 0 .
Since (X, M, T) has the property (C)

it follows that $C = 1_L$.

i.e., $y = x$.

Now we prove that $A_i x = x$

Since $A_i x = A_i(B_i{}^n x) = B_i{}^n(A_i x)$ and $A_i x = A_i(A_i{}^m x) = A_i{}^m(A_i x)$

Also $A_i x = A_i S x = S A_i x$ and $A_i x = A_i T x = T A_i x$

That is $A_i x$ is also a common fixed point of $A_i{}^m, B_i{}^n, S$ and T

Therefore $A_i x = x$

Similarly we can show that $B_j x = x$.

i.e., x is a unique common fixed point of $A_i, B_j S$ and T for $i, j = 1,2,,,,.$

This completes the proof.   ∎

Corollary 2.3

Let $(X, M, \nearrow)$ be   a complete f –fuzzy metric space.   Let $\{A_n\}$ be a sequence of mappings A_i of a complete f –fuzzy metric space $(X, M, \nearrow)$ which has the property (C) into itself such that.for any two mappings A_i, A_j ,

$M(A_i{}^m x, A_j{}^m y, \alpha_{ij} t) \geq_L M(x, y, t)$ for some m ;here $o < \alpha_j < k < 1$ for $i, j = 1,2, \dots, x, y \in X$ and $t > 0$. Then the sequence $\{A_n\}$ has a unique common fixed point in X .

Proof:

By theorem 2.2, it is enough to set $S = T = I$ where I is the identity map and $B_j{}^n = A_j{}^m$

Also we replace by α_{ij} by $\frac{1}{k_{ij}}$ ∎

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ON TOTAL DOMINATION NUMBER OF GRAPHS

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***Abstract** – A set S of vertices in a graph G(V,E) is called a dominating set if every vertex v ∈ V is adjacent to an element of S. A set S of V(G) is called a total dominating set if every vertex v ∈ V is an element of N(S). The total domination number $\gamma_t(G)$ of G is the minimum cardinality of a total dominating set in G.   In this paper, total domination number of some special graphs was found.*

***Keywords** – Domination, total domination and total domination number.*

I.   INTRODUCTION

The concept of domination in graphs was introduced by Ore and Berge. For domination concepts we refer [4]. Let G = (V, E) be a finite undirected graph with neither loops nor multiple edges. A set S of vertices in a graph   G (V, E) is called a dominating set if every vertex v ∈ V is adjacent to an element of S. The minimum cardinality of a dominating set of G is called the domination number of G and is denoted by γ (G). The concept of total domination in graphs was introduced by Cockayne, Dawes and Hedetnime [5]. We refer [3] and [5] for total domination concepts. A set S of V(G) is called a total dominating set of every vertex   v ∈V is an element of N(S). The total domination number $\gamma_t(G)$ of G is the minimum cardinality of a total dominating set. They defined the total dominating set, the total domination number and also obtained several results regarding the total domination number of some standard graphs. Motivated by these results, total domination number of some special graphs were obtained in this paper.

We refer [1] and [2] for graph theoretical concepts. The $(m, n) -$ ***Tadpole graph*** is a special type of graph consisting of a cycle graph on m (at least 3) vertices and a path graph on n vertices, connected with a bridge denoted by $T(m, n)$ with $m + n$ vertices and edges. The ***Friendship graph*** T_n is a set of n triangles having a common central vertex. The ***Jelly fish graph*** $J(m, n)$ is obtained from a $4 -$cycle v_1, v_2, v_3, v_4 by joining v_1 and v_3 with an edge and appending m pendant edges to v_2 and n pendant edges to v_4. The ***Jewel graph*** J_n is a graph with the vertex set $V(J_n) = \{x, y, u, v\} \cup \{u_i/i = 1,2,3, \dots, n\}$ and the edge set $E(J_n) = \{xu, xv, yu, yv, xy\} \cup \{uu_i/i = 1,2,3, \dots, n\}$. A ***Fan graph*** obtained by joining all vertices of a path P_n to a further vertex, called the centre. Thus, F_n contains $n + 1$ vertices say $\{c, v_1, v_2, v_3, \dots, v_n\}$ and $2n - 1$ edges, say $cv_i, \ 1 \le i \le n$, and $vv_{i+1}, 1 \le i \le n - 1$. The graph $A(m, n)$ is obtained by attaching m pendant edges

to the n vertices of the cycle C_n is called **Actinia graph.** The **Ladder graph** L_n is a planar undirected graph with $2n$ vertices and $3n - 2$ edges. The ladder graph can be obtained as the Cartiesian product of two path graphs, one of which has only one edge: $L_n = P_n \times P_2$.

II. TOTAL DOMINATION NUMBER OF SOME SPECIAL GRAPHS

Theorem: 2.1

For Tadpole graph, $\gamma_t(T(m,1)) = \{ \begin{matrix} \lceil \frac{m}{2} \rceil & if\ m = 4k, 4k+1, 4k+3. \\ \frac{m}{2} + 1 & if\ m = 4k+2 . \end{matrix}$

Proof:

Case (i): Let $m = 4k$

Let $V(T(m,1)) = \{v_1, v_2, v_3, \ldots\ldots, v_{4k}, v_{4k+1}\}$.

Here, $S_1 = \{v_1, v_4, v_5, v_8, \ldots\ldots\ldots, v_{4k-3}, v_{4k}\}$ and $S_2 = \{v_3, v_4, v_7, v_8, \ldots_{4k}, v_{4k-3}, v_{4k}\}$ are the minimum total dominating sets of $T(m,1)$ and $|S_1| = |S_2| = \frac{4k}{2} = \frac{m}{2}$.

$\therefore \gamma_t(T(m,1)) = \frac{m}{2}$ where $m = 4k$.

Case (ii): Let $m = 4k + 1$.

Let $V(T(m,1)) = \{v_1, v_2, v_3, \ldots\ldots, v_{4k+1}, v_{4k+2}\}$.

Here, $S_1 = \{v_1, v_4, v_5, v_8, \ldots, v_{4k-3}, v_{4k}\} \cup \{v_{4k+1}\}$ and $S_2 = \{v_3, v_4, v_7, v_8, \ldots, v_{4k-1}, v_{4k}\} \cup \{v_{4k+1}\}$ are the minimum total dominating sets of $T(m,1)$.

Also, $|S_1| = |S_2| = \frac{4k}{2} + 1 = \frac{4k+2}{2} = \frac{4k+1+1}{2} = \frac{4k+1}{2} + \frac{1}{2} = \frac{m}{2} + \frac{1}{2} = \lceil \frac{m}{2} \rceil$

$\therefore \gamma_t(T(m,1)) = \lceil \frac{m}{2} \rceil$ where $m = 4k + 1$.

Case (iii): Let $m = 4k + 2$.

Let $V(T(m,1)) = \{v_1, v_2, v_3, \ldots\ldots, v_{4k+2}, v_{4k+3}\}$

$S_1 = \{v_1, v_4, v_5, v_8, \dots, v_{4k-3}, v_{4k}\} \cup \{v_{4k+1}, v_{4k+2}\}$, $S_2 = \{v_3, v_4, v_7, v_8, \dots. v_{4k-1}, v_{4k}\} \cup \{v_{4k+1}, v_{4k+2}\}$ and $S_3 = \{v_1, v_2, v_5, v_6, \dots \dots \dots, v_{4k-3}, v_{4k-2}\} \cup \{v_{4k+1}, v_{4k+2}\}$ are the minimum total dominating sets of $T(m, 1)$.

Then, $|S_1| = |S_2| = |S_3| = \dfrac{4k}{2} + 2 = \dfrac{4k+4}{2} = \dfrac{4k+3+1}{2} = \dfrac{4k+2}{2} + \dfrac{1}{2} + \dfrac{1}{2} = \dfrac{4k+2}{2} + 1 = \dfrac{m}{2} + 1$ $\therefore \gamma_t(T(m,1)) = \dfrac{m}{2} + 1$ where $m = 4k + 2$.

Case (iii): Let $n = 4k + 3$.

Let $V(T(m, 1)) = \{v_1, v_2, v_3, \dots\dots\dots, v_{4k+3}, v_{4k+4}\}$.

Here, $S_1 = \{v_1, v_4, v_5, v_8, \dots \dots \dots, v_{4k+1}, v_{4k+3}\}$ and $S_2 = \{v_2, v_3, v_6, v_7, \dots. v_{4k+2}, v_{4k+3}\}$ are the minimum total dominating sets of $T(m, 1)$.

Then, $|S_1| = |S_2| = \dfrac{4k}{2} + 2 = \dfrac{4k+4}{2} = \dfrac{4k+3+1}{2} = \dfrac{4k+2}{2} + \dfrac{1}{2} + \dfrac{1}{2} = \dfrac{4k+2}{2} + 1 = \dfrac{m}{2} + 1 = \lceil \dfrac{m}{2} \rceil$

$\therefore \quad \gamma_t(T(m,1)) = \lceil \dfrac{m}{2} \rceil$ where $m = 4k + 3$.

Hence, $\gamma_t(T(m,1)) = $
$\begin{cases} \lceil \dfrac{m}{2} \rceil & if\ m = 4k, 4k+1, 4k+3. \\ \dfrac{m}{2} + 1 & if\ m = 4k + 2. \end{cases}$ ∎

Illustration: 2.2

Assume $k = 2$ in the above theorem,

Case (i): $m = 4k = 4(2) = 8$.
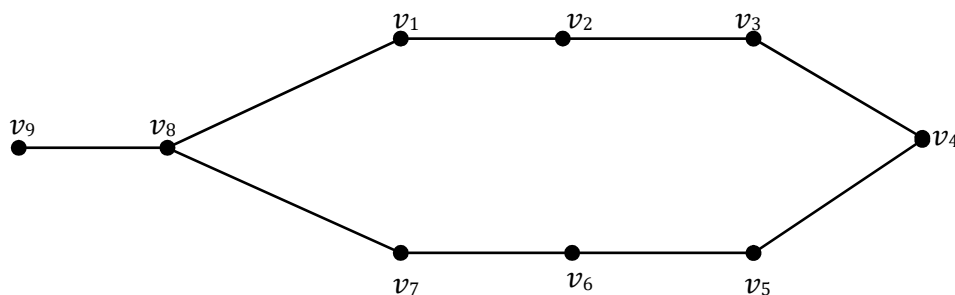
Consider the tadpole graph in figure:2.1

Let $D = \{v_3, v_5, v_8\}$ is the minimum dominating set of $(8,1)$.

$\gamma\ (\mathrm{T}(8,1)) = 3.$

Here the vertex $v_3, v_5, v_8 \notin N(D)$ and D is not a total dominating set of $(T\ (8,1))$.

Here, $S = \{v_1, v_4, v_5, v_8\}$is the total dominating set of $T(8,1)$ which is minimum and also $|S| = 4$.

Therefore the total dominating number of $T(8,1)$ is $\frac{m}{2} = \lceil \frac{m}{2} \rceil = 4.$

Hence $\gamma_t(T(8,1)) = 4.$

Case (ii):$m = 4k + 1 = 4(2) + 1 = 9.$
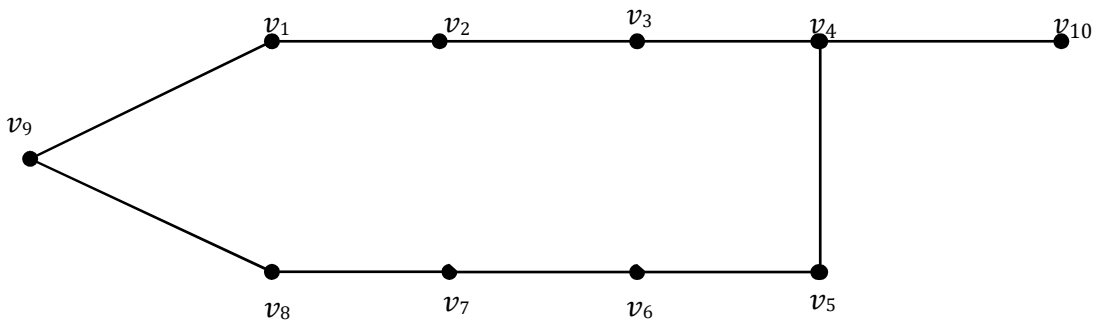
Figure: 2.2 Tadpole graph (T(9,1))

Consider the tadpole graph in the figure: 2.2

Let $D = \{v_1, v_4, v_7\}$ is the minimum dominating set of $T\ (9,1)$.

$\gamma\ (\mathrm{T}(9,1)) = 3.$

Here the vertex $v_1, v_4, v_7 \notin N(D)$ and D is not a total dominating set of $(T\ (9,1))$.

Here, $S = \{v_3, v_4, v_7, v_8, v_9\}$is the total dominating set of $T(9,1)$ which is minimum and also $|S| = 5$.

Therefore the total dominating number of $T(9,1)$ is $\lceil \frac{m}{2} \rceil = 5.$

Hence $\gamma_t(T(9,1)) = 5$.

Case(iii):$m = 4k + 2 = 4(2) + 2 = 10$.

Consider the tadpole graph in the figure: 2.3
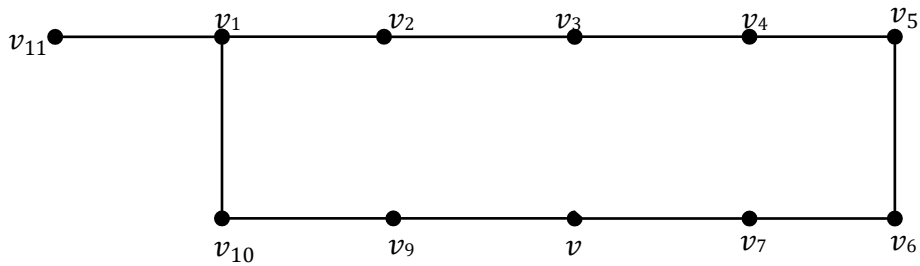
Figure: 2.3 Tadpole graph (T(10,1))

Let $D = \{v_1, v_4, v_7, v_9\}$ is the minimum dominating set of T (10,1).

γ (T(10,1)) = 4.

Here the vertex $v_1, v_4, v_7, v_9 \notin N(D)$ and D is not a total dominating set of $(T$ (10,1)).

Here, $S = \{v_1, v_2, v_5, v_6, v_9, v_{10}\}$is the total dominating set of $T(10,1)$ which is minimum and also $|S| = 6$.

Therefore, the total dominating number of $T(10,1)$ is $\lceil \frac{m}{2} \rceil + 1 = 6$.

Hence $\gamma_t(T(10,1)) = 6$.

Case(iv): $m = 4k + 3 = 4(2) + 3 = 11$.

Consider the tadpole graph in the figure:2.4.

Here, $D_1 = \{v_3, v_5, v_8, v_{11}\}$, $D_2 = \{v_3, v_6, v_9, v_{11}\}$ are the minimum dominating sets of T (11,1). Therefore, γ (T(11,1)) = |D$_1$| = |D$_2$| = 4. But they are not the total dominating sets.

Here, $S = \{v_1, v_4, v_5, v_8, v_9, v_{11}\}$is the total dominating set of $T(11,1)$ which is minimum and also $|S| = 6$.
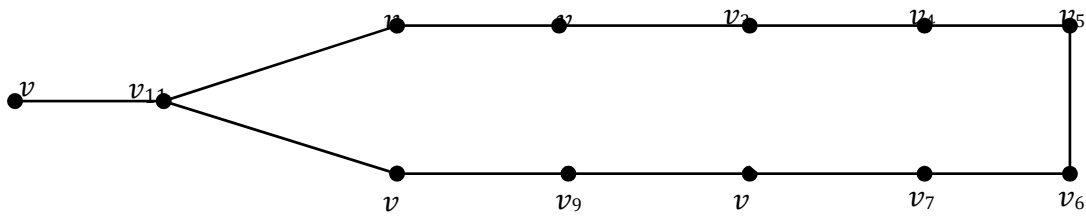
Figure: 2.4 Tadpole graph ($T(11,1)$)

Therefore, the total dominating number of $T(11,1)$ is $\lceil \frac{11}{2} \rceil = 6$.

That is, $\gamma_t(T(11,1)) = 6$.

Hence $\gamma_t(T(m,1)) =$

$$\begin{cases} \lceil \frac{m}{2} \rceil & if \ m = 4k, 4k+1, 4k+3. \\ \lceil \frac{m}{2} \rceil + 1 & if \ m = 4k+2. \end{cases}$$

∎

Theorem: 2.3

For the Friendship graph, $\gamma_t(T_n) = 2$.

Proof:

Let $V(T_n) = \{v, v_1, u_1, v_2, u_2 \ldots, v_n, u_n\}$ and v be the central vertex of T_n.

Here $D = \{v\}$ is unique minimum dominating set of T_n.

$\therefore \gamma(T_n) = 1$.

Here the vertex $v \notin N(D)$ and so D is not a total dominating set of T_n.

Consider the set $S_1 = \{v\} \cup \{v_i\}$ for some $i = 1,2, \ldots .. n$ or $S_2 = \{v\} \cup \{u_i\}$ for some $i = 1,2, \ldots .. n$ are the total dominating set of T_n which is also minimum .

$\therefore \quad \gamma_t(T_n) = |S_1| = |S_2| = 2$.

Hence $\gamma_t(T_n) = 2$.

∎

Illustration: 2.4

Consider the friendship graph T_3.
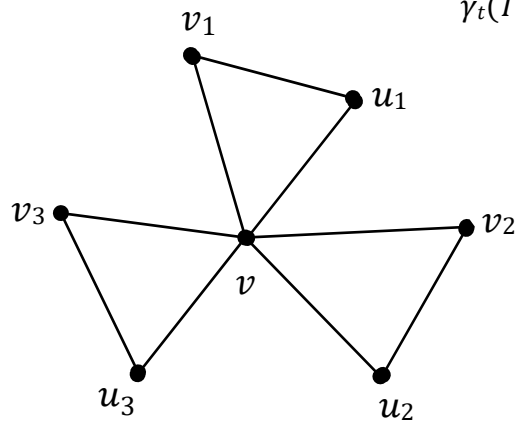
Here, $V(T_3) = \{v, v_1, u_1, v_2, u_2, v_3, \quad$ **Figure : 2.5 Friendship graph T_3**

Here $D = \{v\}$ is the minimum dominating set of T_3 .

$\therefore \gamma(T_3) = 1.$

Here vertex $v \notin N(D)$ and so D is not a total dominating set of T_3.

Here $S_1 = \{v\} \cup \{v_i\}$, for some $i = 1,2,3$ or $S_2 = \{v\} \cup \{u_i\}$ for some $i = 1,2,3$ are the total dominating set of T_3 which is also minimum.

Therefore, $\gamma_t(T_3) = |S_1| = |S_2| = 2.$

Hence, $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ $\gamma_t(T_3) = 2.$

∎

Theorem: 2.5

For the jellyfish graph, $\gamma_t(J_{m,n}) = 3.$

Proof:

Let $V(J_{m,n}) = \{x, y, u, v\} \cup \{x_i / i = 1,2,3, \dots, m\} \cup \{y_j / j = 1,2,3, \dots, n\}$ and

$E(J_{m,n}) = \{xu, xv, yu, yv\} \cup \{xx_i / i = 1,2,3, \dots, m\} \cup \{yy_j / j = 1,2,3, \dots, n\}.$

Consider the set $D = \{x, y\}$ which is a minimum dominating set of $J_{m,n}$.

$\qquad \gamma(J_{m,n}) = 2.$

Here, the vertex $v \notin N(D)$ and so D it is not a total dominating set .

Here $S_1 = \{x, v, y\}$ or $S_2 = \{x, u, y\}$ are the total dominating set of $J_{m,n}$ which is also minimum and $|S_1| = |S_2| = 3$.

Hence $\gamma_t(J_{m,n}) = 3$.

∎Illustration: 2.6Consider the jellyfish graph $J_{4,4}$
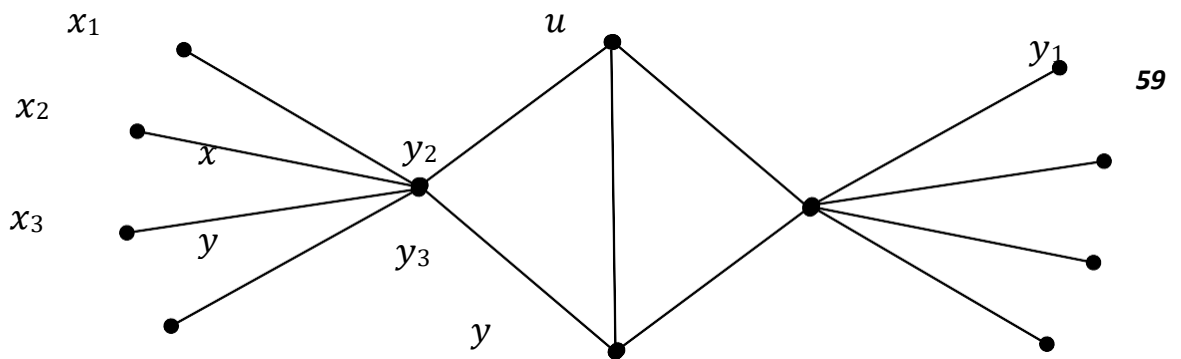
Here $V(J_{4,4}) = \{x, y, u, v, x_1, x_2, x_3, x_4, y_1, y_2, y_3, y_4\}$.

Consider the set $D = \{x, y\}$ is a minimum total dominating set of $J_{4,4}$.

Therefore, $\gamma(J_{4,4}) = 2$.

Here, the vertex $v \notin N(D)$ and so D is not a total dominating set $J_{4,4}$.

Here, $S_1 = \{x, v, y\}$ or $S_2 = \{x, u, y\}$ are the total dominating set of $J_{4,4}$ which is also minimum

Therefore S is the minimum total dominating set of $J_{4,4}$ and $|S_1| = |S_2| = 3$.

Hence $\gamma_t(J_{m,n}) = 3$.   ∎

Theorem: 2.7

      For the jewel graph, $\gamma_t(J_n) = 2$.

Proof:

Let $V(J_n) = \{x, y, u, v\} \cup \{u_i / i = 1,2,3, \dots, n\}$ and $E(J_n) = \{xu, xv, yu, yv, xy\} \cup \{uu_i / i = 1,2,3, \dots, n\}$.

Here, $D_1 = \{x, v\}$, $D_2 = \{x, u\}$, $D_3 = \{y, v\}$, $D_4 = \{y, u\}$ are   minimum dominating sets of J_n .

Therefore, $\gamma(J_n) = |D_1| = |D_2| = |D_3| = |D_4| = 2$.

Also every vertex of $V(J_n)$ belongs to the neighbourhoods of the above sets.

Therefore, the above sets are minimum total dominating sets of J_n .

Hence $\gamma_t(J_n) = 2$.

■

Illustration: 2.8

Consider the jewel graph J_3

Here, $V(J_3) = \{x, y, u, v, u_1, u_2, u_3\}$.
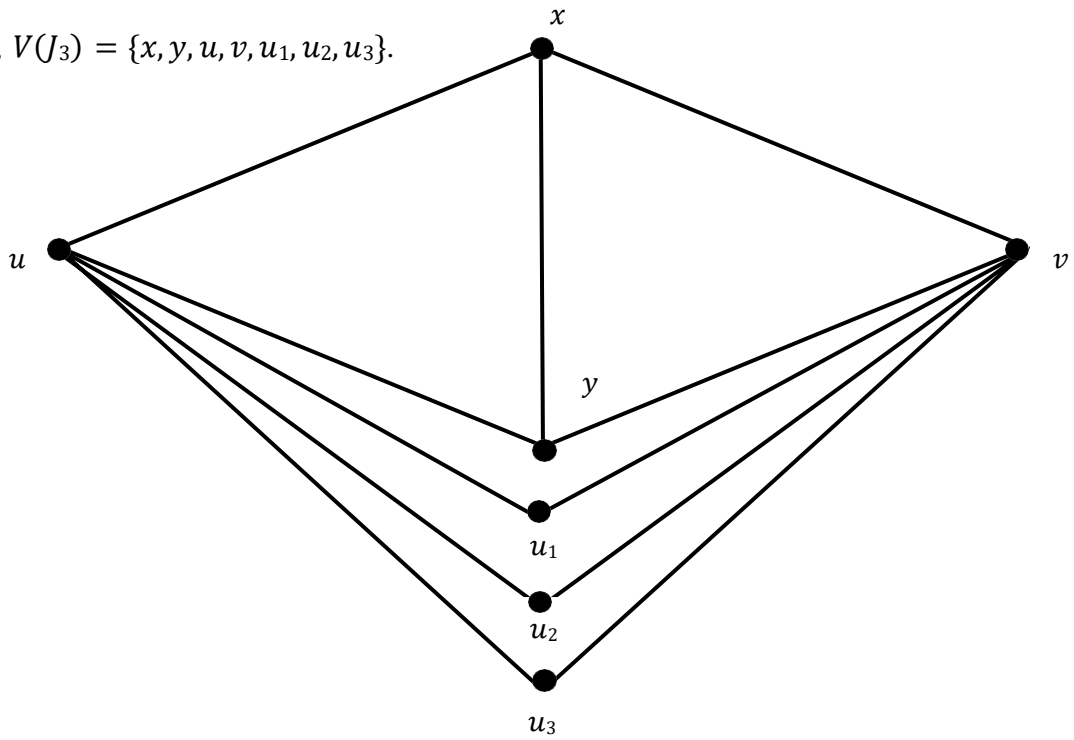
Figure: 2. 7 Jewel graph (J_3)

Here, $D_1 = \{x, v\}$, $D_2 = \{x, u\}$, $D_3 = \{y, v\}$, $D_4 = \{y, u\}$ are   minimum dominating set of J_3.

∴ $\gamma(J_3) = |D_1| = |D_2| = |D_3| = |D_4| = 2$.

Also, every vertex of $V(J_3)$ belongs to the neighbourhoods of the above sets.

Therefore, the above sets are minimum total dominating set of J_3.

Hence $\gamma_t(J_3) = 2$.

■

Theorem:2.9

For the fan graph, $\gamma_t(F_n) = 2$.

Proof:

Let $V(F_n) = \{v\} \cup \{v_i/i = 1,2,3, \dots, n\}$ and

$$E(F_n) = \{vv_i/i = 1,2,3, \dots, n\} \cup \{vv_{i+1}/i = 1,2,3, \dots, n-1\}$$

Let v be the vertex of degree n.

Here, $D = \{v\}$ be the unique minimum dominating set of F_n.

Therefore, $\gamma(F_n) = 1$.

Here, the vertex $v \notin N(S)$ and so it is not a total dominating set of F_n.

If we choose any v_i , $i = 1,2,3 \dots. n$ along with D, it will form a total dominating set of F_n.

Therefore, $S = \{v\} \cup \{v_i \ for \ some \ i = 1,2, \dots \dots n\}$ forms a total dominating set of F_n.

Therefore, $\gamma_t(F_n) = |s| = 1 + 1 = 2$.

Hence $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \gamma_t(F_n) = 2.$ ∎

Illustration: 2.10
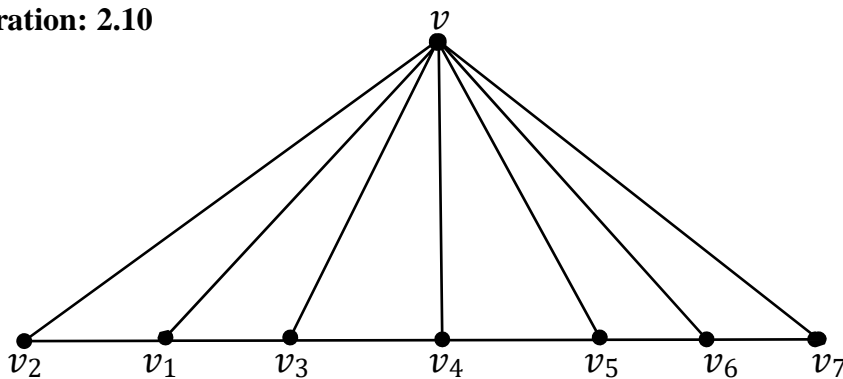
Figure: 2.8 Fan graph (F_7)

Consider the fan graph F_7.

Here, $(F_7) = \{v, v_1, v_2, v_3, v_4, v_5, v_6, v_7\}$.

Here $D = \{v\}$ is the unique minimum dominating set of F_7 . Therefore, $\gamma_t(F_7) = 1$.

But the vertex $v \notin N(D)$ and so it is not a total dominating set of F_7.

If we choose any v_i , $i = 1,2,3 \dots. n$ along with D, it will form a total dominating set of F_7.

Therefore , $S = \{v\} \cup \{v_i \, , i = 1,2, \dots \dots n\}$ forms a total dominating set of F_7.

Hence, $\gamma_t(F_7) = 2$.

∎

Theorem: 3.11

For Ladder graph, $\gamma_t(L_n) = \{\begin{array}{l} 2k \qquad where\ n = 3k. \\ 2k + 2\ where\ n = 3k + 1\ and\ 3k + 2. \end{array}$

Proof:

Let $V(P_2) = \{u_1, u_2\}$ and $V(P_n) = \{v_1, v_2, \dots, v_n\}$. Then,

$V(L_n) = V(P_2 \times P_n) = \{(u_1, v_1), (u_1, v_2), \dots, (u_1, v_n), (u_2, v_1), (u_2, v_2), \dots, (u_2, v_n)\}$.

Case(i): Let $n = 3k$, $k = 1,2,\dots$

Here $D = \{(u_1, v_2), (u_2, v_2), (u_1, v_5), (u_2, v_5), \dots \dots_{3k} \dots (u_1, v_{n-1}), (u_2, v_{n-1})\}$ is the minimum dominating set of L_n and $|D| = 2\frac{n}{3} = 2\frac{3k}{3} = 2k$.
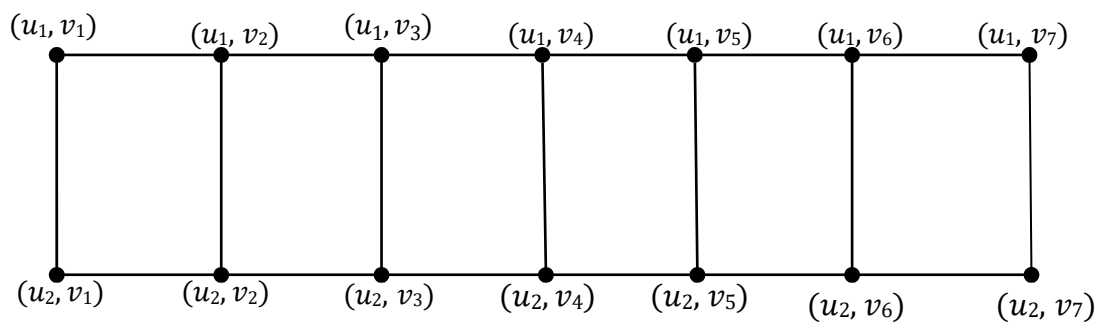
$\therefore \gamma(L_n) = 2k$.

Also, every vertex of $V(L_n)$ belongs to $N(D)$.

Therefore, D is a minimum total dominating set of L_n.

Hence, $\gamma_t(L_n) = 2k$ where $n = 3k$.

Case (ii): Let $n = 3k + 1$, $k = 1,2,\dots\dots$

Here $D = \{(u_1, v_2), (u_2, v_2), (u_1, v_5), (u_2, v_5), \dots (u_1, v_{n-2}), (u_2, v_{n-2}), (u_1, v_n), (u_2, v_n)\}$ is the minimum dominating set of L_n.

Then $|D| = 2\frac{(n-1)}{3} + 2 = 2\frac{(3k+1-1)}{3} + 2 = 2\frac{3k}{3} + 2 = 2k + 2$.

$\therefore \gamma(L_n) = 2k + 2$.

Also, every vertex of $V(L_n)$ belongs to $N(D)$.

Therefore, D is a minimum total dominating set of L_n.

Hence, $\gamma_t(L_n) = 2k + 2$ where $n = 3k + 1$.

Case(iii): Let $n = 3k + 2, k = 1,2,\dots$

Here $\hspace{6cm} D =$
$\{(u_1, v_2), (u_2, v_2), (u_1, v_5), (u_2, v_5), . (u_1, v_{n-3}), (u_2, v_{n-3}), (u_1, v_n), (u_2, v_n)\}$ is
the minimum dominating set of L_n.

Then $|D| = 2\dfrac{(n-2)}{3} + 2 = 2\dfrac{(3k+2-2)}{3} + 2 = 2\dfrac{3k}{3} + 2 = 2k + 2.$

$\therefore \gamma(L_n) = 2k + 2.$

Also, every vertex of $V(L_n)$ belongs to $N(D)$.

Therefore, D is a minimum total dominating set of L_n.

Hence, $\gamma_t(L_n) = 2k + 2$ where $n = 3k + 2$.

Hence from the three cases, we get

$\gamma_t(L_n)$
$= \begin{cases} 2k & where\ n = 3k\ . \\ 2k + 2 & where\ n = 3k + 1\ and\ 3k + 2. \end{cases}$ $\hspace{2cm}$ ∎

Illustration: 2.12

Assume k=2 in the above theorem,

Case (i): Let $n = 3k = 6$.
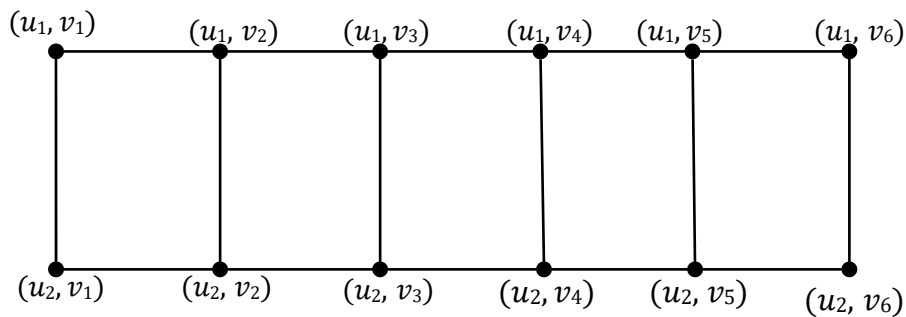
Figure : 2.9   Ladder graph (L_6)

Consider the ladder graph L_6.

Let $V(L_6) = \{(u_1, v_1), (u_1, v_2), (u_1, v_3), (u_1, v_4), (u_1, v_5), (u_1, v_6),$

$(u_2, v_1), (u_2, v_2), (u_2, v_3), (u_2, v_4), (u_2, v_5), (u_2, v_6)\}.$

Here, $D = \{(u_1, v_2), (u_2, v_2), (u_1, v_5), (u_2, v_5)\}$ is the minimum dominating set of L_6.

$\therefore \gamma(L_6) = 4$.

Also, every vertex of $V(L_6)$ belongs to $N(D)$.

Therefore, D is a minimum total dominating set of L_6.

Hence, $\gamma_t(L_6) = 4 = 2\,(2) = 2k$.

Case (ii): $n = 3k + 1 = 7$.

Consider the ladder graph L_7.

Figure: 2.10   Ladder graph (L_7)

Let $V(L_7) = \{(u_1, v_1), (u_1, v_2), (u_1, v_3), (u_1, v_4), (u_1, v_5), (u_1, v_6), (u_1, v_7)$

$(u_2, v_1), (u_2, v_2), (u_2, v_3), (u_2, v_4), (u_2, v_5), (u_2, v_6), (u_2, v_7)\}$.

Here, $D = \{(u_1, v_2), (u_2, v_2), (u_1, v_5), (u_2, v_5), (u_1, v_7), (u_2, v_7)\}$ is the minimum dominating set of L_7.

$\therefore \gamma(L_7) = 6$.

Also, every vertex of $V(L_7)$ belongs to $N(D)$.

Therefore, D is a minimum total dominating set of L_7.

Hence, $\gamma_t(L_7) = 6 = 2\,(2) + 2 = 2k + 2$.

Case (iii): $n = 3k + 2 = 8$.

Consider the ladder graph L_8.

(u_1, v_1) (u_1, v_2) (u_1, v_3) (u_1, v_4) (u_1, v_5) (u_1, v_6) (u_1, v_7) (u_1, v_8)

(u_2, v_1) (u_2, v_2) (u_2, v_3) (u_2, v_4) (u_2, v_5) (u_2, v_6) (u_2, v_7) (u_2, v_8)
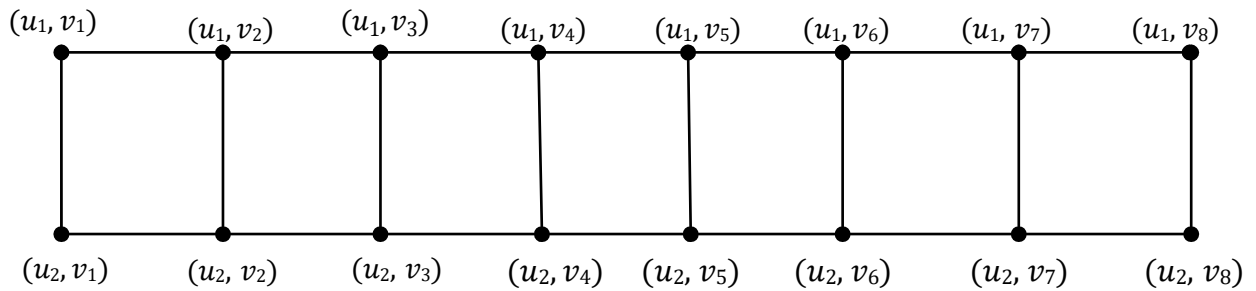
Figure: 2.11 Ladder graph (L_8)

Let $V(L_8) = \{(u_1, v_1), (u_1, v_7),$

$(u_1, v_8), (u_2, v_1), (u_2, v_2), (u_2, v_3), (u_2, v_4), (u_2, v_5), (u_2, v_6), (u_2, v_7), (u_2, v_8)\}$

Here $D = \{(u_1, v_2), (u_2, v_2), (u_1, v_5), (u_2, v_5), (u_1, v_8), (u_2, v_8)\}$ is the minimum dominating set of L_8.

$\therefore \gamma(L_8) = 6$.

Also, every vertex of $V(L_8)$ belongs to $N(D)$.

Therefore, D is a minimum total dominating set of L_8.

Hence, $\gamma_t(L_8) = 6 = 2\,(2) + 2 = 2k + 2.$ ∎

Theorem: 2.13

For the Actinia graph, $\gamma_t(A(m,n)) = n$.

Proof:

Let $V(A(m,n)) = \{v_i / i = 1,2, \dots, n\} \cup \{u_j / j = 1,2, \dots, m\}$ and $E(A(m,n)) = \{v_i v_{i+1} / i = 1,2,3, \dots, n\} \cup \{v_n v_1\} \cup \{v_i u_{ij} / i = 1,2, \dots, n \text{ and } j = 1,2, \dots, m\}$

Here, $D = \{v_1, v_2, \dots \dots v_n\}$ is the dominating sets of (m,n) .

$\therefore \gamma(A(m,n)) = |D| = n.$

For every vertex $v \in V$, we have $v \in N(S)$.

Therefore, S is a total dominating set of $A(m,n)$ which is also minimum.

$\therefore \gamma_t(A(m,n)) = |S| = n.$

Hence $\gamma_t(A(m,n)) = n$.

∎

Illustration: 2.14

Consider the Actinia graph $A(1,6)$.
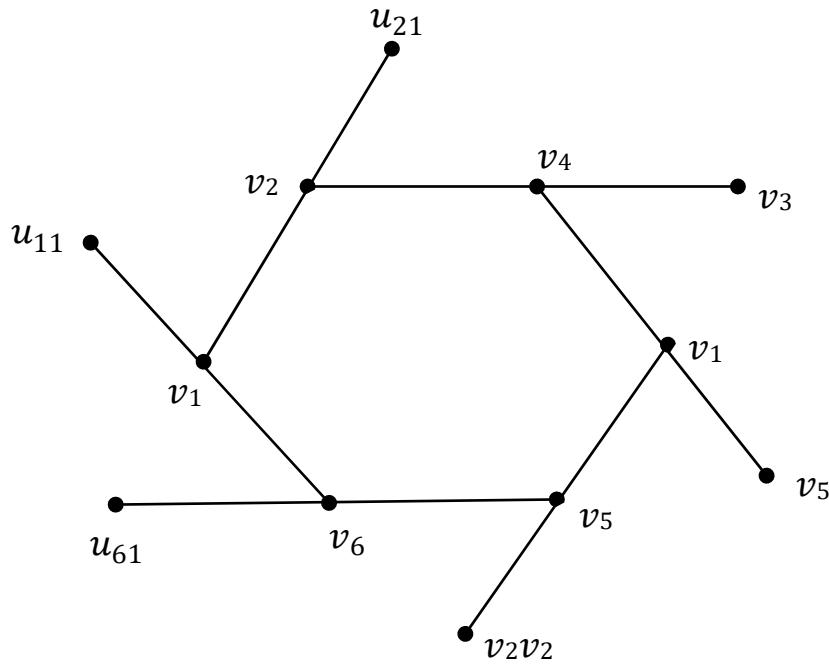
Let $V(A_{1,6}) = \{ v_1, v$ **Figure: 2.12 Actinia graph $A(1,6)$** $_1\}$

Here, $D = \{v_1, v_2, v_3, v_4, v_5, v_6\}$ is the minimum dominating set of $A_{1,6}$.

$\therefore \gamma(A(1,6)) = |D| = 6.$

For every vertex $v \in V$, we have $v \in N(S)$.

Therefore, S is a total dominating set of $A(m,n)$ which is also minimum .

$\therefore \gamma_t(A(1,6)) = |S| = 6.$

Hence, $\gamma_t(A(1,6)) = 6$.

■

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ON NON-SPLIT DOMINATION NUMBER OF GRAPHS

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***Abstract** – For a connected graph G, a set of vertices D in G is called a non-split dominating set if D is both dominating and the induced sub graph $V - D$ is connected. The minimum cardinality of a non-split dominating set of G is its non-split domination number and is denoted by $\gamma_{ns}(G)$. In this paper, non-split domination number of some special graphs was found.*
***Keywords** – Domination, non-split domination and non-split domination number*

I. INTRODUCTION

The concept of domination in graphs was introduced by Ore and Berge. For domination concepts we refer [4]. Let G= (V, E) be a finite undirected graph with neither loops nor multiple edges. A subset D of V(G) is a dominating set of G if every vertex in V – D is adjacent to at least one vertex in D. The minimum cardinality of a dominating set of G is called the domination number of G and is denoted by $\gamma(G)$. The concept of Non-split domination in graphs was introduced by V. R. Kulli & B. Janakiram [5]. A dominating set D of a graph $G=(V,E)$ is a non-split dominating set if the induced sub graph V\D is connected. The non-split domination number $\gamma_{ns}(G)$ of G is the minimum cardinality of a non-split dominating set. They defined the non-split dominating set, the non-split domination number and also obtained several results regarding the non-split domination number of some standard graphs. Motivated by these results, non-split domination number of some special graphs were obtained in this paper.

We refer [1], [2] and [3] for graph theoretical concepts. The ***Friendship graph*** T_n is a set of n triangles having a common central vertex. The ***Jelly fish graph*** $J(m, n)$ is obtained from a 4-cycle v_1, v_2, v_3, v_4 by joining v_1 and v_3 with an edge and appending m pendant edges to v_2 and n pendant edges to v_4. The ***Jewel graph*** J_n is a graph with the vertex set $V(J_n) = \{u, v, x, y, u_i / 1 \leq i \leq n\}$ and the edge set $E(J_n) = \{ux, uy, xy, xv, uu_i, , vu_i / 1 \leq i \leq n\}$. A ***Fan graph*** obtained by joining all vertices of a path P_n to a

further vertex, called the centre. Thus, F_n contains n+1 vertices say $\{c, v_1, v_2, v_3, \ldots, v_n\}$ and (2n-1) edges, say cv_i, $1 \leq i \leq n$, and vv_{i+1}, $1 \leq i \leq n - 1$. The graph A(m, n) is obtained by attaching m pendant edges to the n vertices of the cycle C_n is called ***Actinia graph***. The ***Ladder graph*** L_n is a planar undirected graph with 2n vertices and 3n-2 edges. The ladder graph can be obtained as the Cartesian product of two path graphs, one of which has only one edge: $L_n = P_n \times P_2$.

II NON-SPLIT DOMINATION NUMBER OF SOME SPECIAL GRAPHS

Theorem: 2.1

For Bi-Star graph, $\gamma_{ns}(B(r,s)) = r + s$.

Proof:

Consider the graph $B(r,s)$.

Let $V(B(r,s)) = \{u, v, u_1, u_2, \ldots, u_r, v_1, v_2, \ldots, v_s\}$.

Here, $S = \{u, v\}$ is the unique minimum dominating set of $B(r,s)$.

But $\langle V - S \rangle$ is disconnected.

$\therefore S$ is not a non-split dominating set of $B(r,s)$.

Here, the set $S_1 = \{u_1, u_2, \ldots, u_r, v_1, v_2, \ldots, v_s\}$ forms a minimum non split dominating set of (r,s).

$\therefore \gamma_{ns}(B(r,s)) = r + s$. ∎

Illustration: 2.2
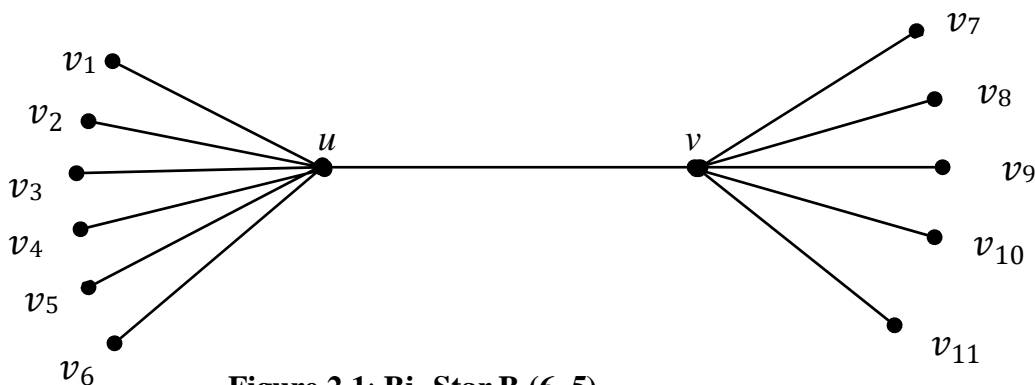
Figure 2.1: **Bi- Star B (6, 5)**

Here, $V(B(6,5)) = \{\, u, v, v_1, v_2, v_3, v_4, v_5, v_6, v_7, v_8, v_9, v_{10}, v_{11}\,\}$.

Consider the set $S = \{v_1, v_2, v_3, v_4, v_5, v_6, v_7, v_8, v_9, v_{10}, v_{11}\,\}$.

S is a minimum dominating set and the induced sub graph $\langle V - S \rangle$ is connected.

Therefore, S is a minimum non split dominating set of B (6, 5).

Hence $\gamma_{ns}(B(6,5)) = 11$.   ∎

Theorem: 2.3

For the wheel grpah W_p with $p \geq 5$ vertices, $\gamma_{ns}(W_p) = 1$.

Proof:

Let $V(W_p) = \{v, v_1, v_2, \ldots, v_{p-1}\}$.

Then $D = \{v\}$ is the unique minimum dominating set of W_p.

It is a non-split dominating set of W_p, since $\langle V - D \rangle$ is a cycle with $p - 1$ vertices which is connected graph.

$\therefore \gamma_{ns}(W_p) = 1$ ∎

Illustration: 2.4

Consider the Wheel graph W_7.
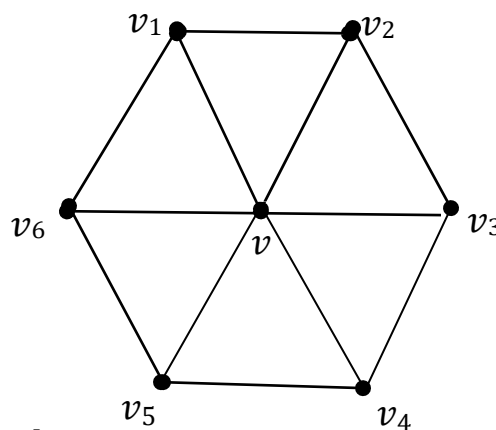
Figure 2.2: Wheel graph W_7

Here, $V(W_7) = \{v, v_1, v_2, v_3, v_4, v_5, v_6\}$. Consider the set $S = \{v\}$.

Every vertex of S is incident with $V - S$. Therefore, S is the unique minimum dominating set of W_7. Also, $\langle V - S \rangle$ is connected.

Therefore, S is the unique minimum non-split domination set of W_7.

Therefore, $\gamma_{ns}(W_7) = 1$

■

Theorem: 2.5

For banana tree graph, $\gamma_{ns}(B(n, k)) = nk + 1$.

Proof :

Let $\quad V(B(n, k)) = \{v\} \cup \{v_1, v_2, \ldots, v_n\} \cup \{v_{i1}, v_{i2}, \ldots, v_{ik}/i = 1, 2, \ldots, n\}$

Here the vertices $\{v_1, v_2, \ldots, v_n\}$, all the vertices $\{v_{i2}, v_{i2}, \ldots, v_{ik}/i = 2, \ldots, n\}$ and any one of the vertex $\{v_{i1}$ for some $i = 1, 1, \ldots, n\}$ forms the minimum nonsplit dominating set $B(n, k)$.

$\therefore S = \{v_1, v_2, \ldots, v_n\} \cup \{v_{i2}, v_{i2}, \ldots, v_{ik}/i = 2, \ldots, n\} \cup \{v_{i1}$ for some $i = 1, 2, \ldots, n\}$

This is a dominating set of $B(n, k)$ also $\langle V - S \rangle$ is connected.

Therefore, S is the unique non split dominating set of $B(n, k)$.

$\therefore |S| = n + (k - 1)$.

Hence $\gamma_{ns}(B(n, k)) = nk + 1$.

■

Illustration: 2.6

Consider the banana graph $B(2, 3)$.

Here, $V(B(2, 3)) = \{v, v_1, v_2, v_{11}, v_{12}, v_{13}, v_{21}, v_{22}, v_{23}\}$.

Consider the set $S = \{v_1, v_2, v_{21}, v_{22}, v_{23}, v_{12}, v_{13}\}$.

Figure 2.3: Banana tree graph $B(2, 3)$

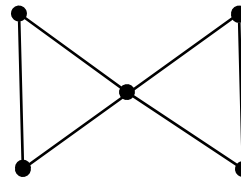Clearly, S is a dominating set. Also $\langle V - S \rangle$ is connected and $|S| = 7$.

Therefore, S is the minimum non split dominating set of B (2, 3).

Hence,$\gamma_{ns}(B(2,3)) = (2 \times 3) +$ 17.   ■

Theorem: 2.7

For Butterefly graph, $\gamma_{ns}(D_4) = 3$.

Let the vertex set of the butterfly graph be $V(D_4) = \{v_1, v_2, v_3, v_4, v_5\}$.

Figure 2.4: Butterfly graph D_4

Here, the set $\{v_1\}$ is a unique minimum dominating set. But it is not a non split dominating set.

Consider the set $S = \{v_1, v_4, v_5\}$.

S is a dominating set and $\langle V - S \rangle$ is connected.

Therefore S is a non-split dominating set of the butterfly graph which is also minimum.

Hence, $\gamma_{ns}(D_4) = 3$.■

Theorem: 2.8

For the Friendship graph, $\gamma_{ns}(T_n) = n$.

Proof:

Let $V(T_n) = \{v, v_1, u_1, v_2, u_2 \ldots, v_n, u_n\}$ and v be the central vertex of T_n.

Here, $S_1 = \{v_1, v_2, \ldots, v_n\}$ and $S_2 = \{u_1, u_2, \ldots, u_n\}$ are the minimum non split dominating sets of T_n.

$$\therefore \gamma_{ns}(T_n) = |S_1| = |S_2| = n$$

Therefore,$\gamma_{ns}(T_n) = n$.

■

Illustration: 2.9

Consider the Friendship graph T_3. Let $V(T_3) = \{v, v_1, u_1, v_2, u_2, v_3, u_3\}$.

The set $S = \{v_1, v_2, v_3\}$ is the minimum dominating set of T_3 also $\langle V - S \rangle$ is connected. Therefore, S is the minimum non split dominating set of T_3 and $|S| = 3$.
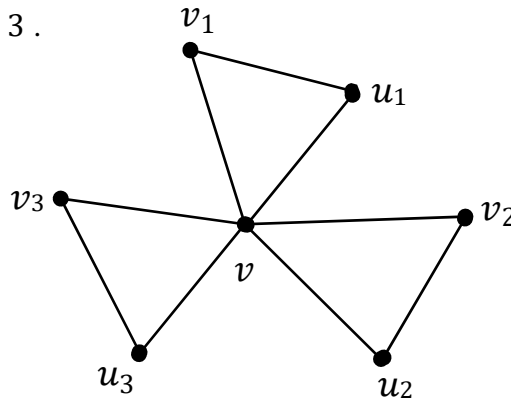
Hence, $\gamma_{ns}(T_3) = 3$.

Figure 2.5: Friendship graph T_3

Theorem: 2.10

For the jellyfish graph, $\gamma_{ns}(J_{m,n}) = m + n + 1$.

Proof:

Let $V(J_{m,n}) = \{x, y, u, v\} \cup \{x_i / i = 1,2,3, \dots, m\} \cup \{y_j / j = 1,2,3, \dots, n\}$ and $E(J_{m,n}) = \{xu, xv, yu, yv\} \cup \{xx_i / i = 1,2,3, \dots, m\} \cup \{yy_j / j = 1,2,3, \dots, n\}$.

Consider the set $S = \{x_i / i = 1,2,3, \dots, m\} \cup \{y_j / j = 1,2,3, \dots, n\}$.

Here, $S \cup \{x\}, S \cup \{y\}, S \cup \{u\}, S \cup \{v\}$ are dominating sets of $J_{m,n}$ also $\langle V - S \rangle$ is connected.

$\therefore$ The above sets are non split dominating set of $J_{m,n}$ which are minimum.

Hence $\gamma_{ns}(J_{m,n}) = |S| + 1 = m + n + 1$.∎

Illustration: 2.11

Consider the jellyfish graph $J_{4,4}$.
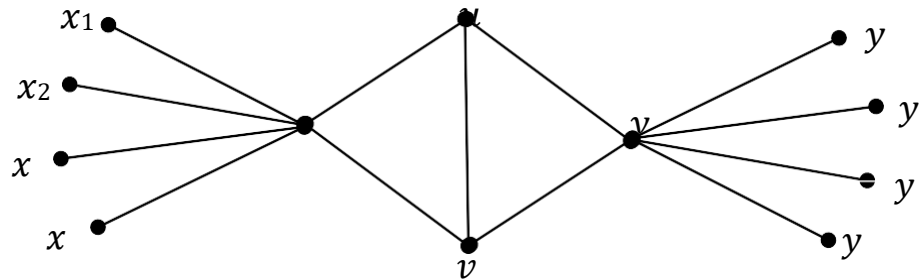
Figure 2.6: Jellyfish graph $J_{4,4}$

Here $V(J_{4,4}) = \{x, y, u, v, x_1, x_2, x_3, x_4, y_1, y_2, y_3, y_4\}$.

Consider the set $S = \{x_1, x_2, x_3, x_4, y_1, y_2, y_3, y_4\} \cup \{x\}$ which is the minimum

non split dominating set of $J_{4,4}$.

If we remove S from $J_{m,n}$ then the graph will be connected.

Also, $|S| = m + n + 1 = 4 + 4 + 1 = 9$.

Therefore, $\qquad\qquad\qquad\qquad\qquad\qquad\qquad \gamma_{ns}(J_{4,4}) = |S| =$
9 $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ ∎

Theorem: 2.12

For the jewel graph, $\gamma_{ns}(J_n) = 2$.

Proof:

Let $V(J_n) = \{x, y, u, v\} \cup \{u_i / i = 1,2,3, \dots, n\}$ and $E(J_n) = \{xu, xv, yu, yv, xy\} \cup \{uu_i / i = 1,2,3, \dots, n\}$

Consider the set $S = \{x, v\}$. It is a minimum dominating set of J_n also $\langle V - S \rangle$ is connected. Therefore, S is the minimum non split dominating set of J_n and $|S| = 2$.

Hence $\gamma_{ns}(J_n) = 2$. ∎

Illustration: 2.13

Consider the jewel graph J_3. Let $V(J_3) = \{x, y, u, v, u_1, u_2, u_3\}$.

Consider the set $S = \{x, v\}$, which is the unique minimum non split dominating set of J_3. Therefore, $\gamma_{ns}(J_n) = 2$.

Theorem:2.14

For the fan graph F_n, $\gamma_{ns}(F_n) = 1$.

Proof:

Let $V(F_n) = \{v\} \cup \{v_i / i = 1,2,3, \dots, n\}$ and $E(F_n) = \{vv_i / i = 1,2,3, \dots, n\} \cup \{vv_{i+1} / i = 1,2,3, \dots, n-1\}$

Let v be the vertex of degree n.

Here, $S = \{v\}$ is the unique minimum dominating set of F_n.

Also, $\langle V - S \rangle$ is a path P_n which is connected.

Therefore, S is the unique minimum non split dominating set of F_n and $|S| = 1$.

Hence, $\gamma_{ns}(F_n) = 1$.

■

Illustration: 2.15

Consider the fan graph F_7.

Let $V(F_7) = \{v, v_1, v_2, v_3, v_4, v_5, v_6, v_7\}$.

Consider the set $S = \{v\}$, which is the unique minimum non split dominating set of F_7 . Therefore, $\gamma_{ns}(F_7) = 1$

.Theorem: 2.16

For ladder graph, $\gamma_{ns}(L_n) = k + 1\ where\ n = 2k\ and\ n = 2k + 1$.

Proof:

Let $V(P_2) = \{u_1, u_2\}$ and $V(P_n) = \{v_1, v_2, \dots, v_n\}$.

Then $V(L_n) = V(P_2 \times P_n) = \{(u_1, v_1), (u_1, v_2), \dots, (u_1, v_n), (u_2, v_1), (u_2, v_2), \dots, (u_2, v_n)\}$
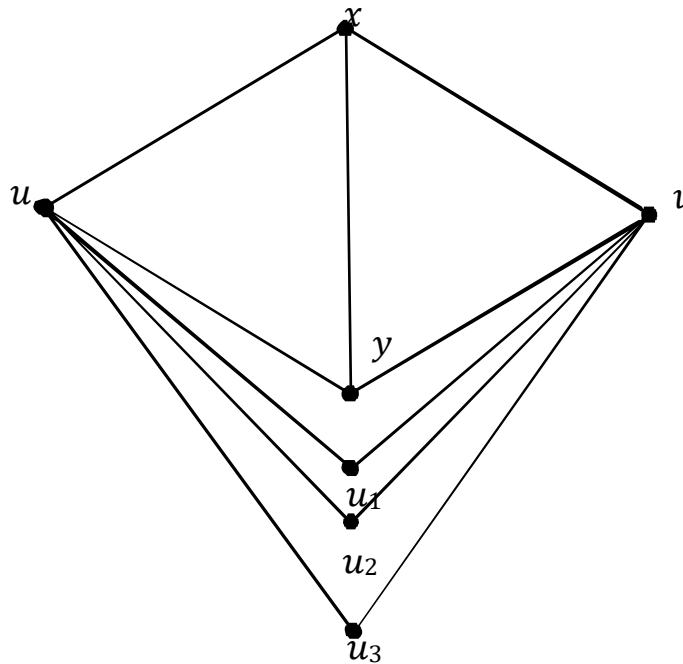
Case 1:

Let $n = 2k, k = 1,2,3, \dots$

Here, $S = \{(u_1, v_1), (u_2, v_3), (u_1, v_5), (u_2, v_7) \dots (u_1, v_{n-1}), (u_1, v_n)\}$ is the minimum dominating set of L_n and $|S| = \frac{n}{2} + 1 = \frac{2k}{2} + 1 = k + 1$.

Also $\langle V - S \rangle$ is connected.

Therefore, S is the minimum non-split dominating set of L_n.

Therefore, $\gamma_{ns}(L_n) = k + 1 \ where \ n = 2k$.

Case 2:

Let $n = 2k + 1, k = 1,2,3, ...$

Here, $S =$ $\{(u_1, v_1), (u_2, v_3), (u_1, v_5), (u_2, v_7) \ ... \ (u_2, v_{n-2}), (u_1, v_n)\}$ is the minimum dominating set of L_n and $|S| = \lceil \frac{n}{2} \rceil = \lceil \frac{2k+1}{2} \rceil = k + 1.$

Also $\langle V - S \rangle$ is connected.

Therefore, S is the minimum non-split dominating set of L_n.

Therefore, $\gamma_{ns}(L_n) = k + 1 \ where \ n = 2k + 1$.

llustration: 2.17

Figure 2.7: Jewel graph

Consider $k = 3$ in the a t

Case 1: Let n =2k=6

Consider the graph L_6.

Here, $S = \{(u_2, v_1), (u_2, v_3), (u_1, v_5), (u_1, v_6), \}$ is the minimum non-split dominating set and $|S| = \lceil \frac{6}{2} \rceil + 1 = 3 + 1 = 4$.

Therefore, $\gamma_{ns}(L_6) = 4$.
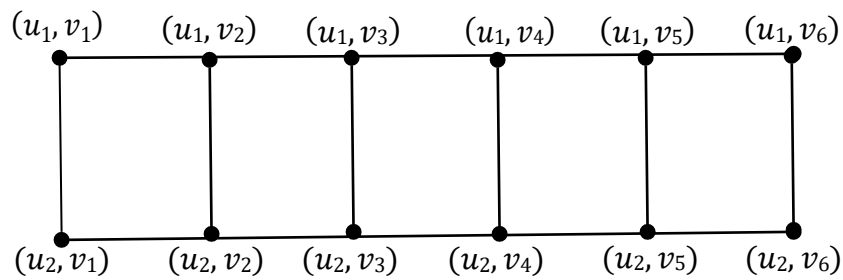
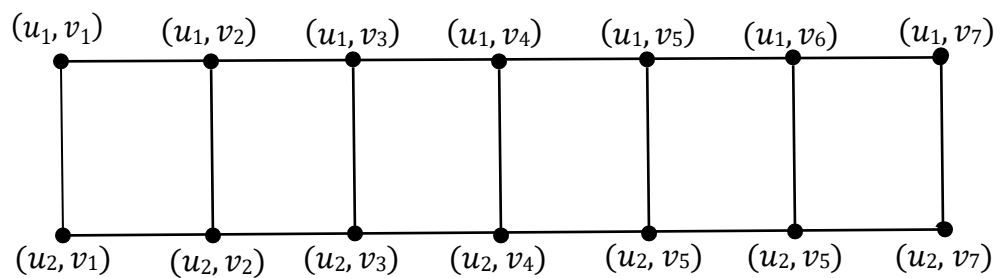

Figure 2.9: Ladder graph L_6

Case 2: $n = 2k + 1 = 7$

Consider the graph L_7.

Here, $S = \{(u_1, v_1), (u_2, v_3), (u_1, v_5), (u_2, v_7)\}$ is the minimum dominating set of L_7 and $|S| = \lceil \frac{(2\times3)+1}{2} \rceil = \lceil \frac{7}{2} \rceil = 3 + 1 = 4$.

Also the sub graph $\langle V - S \rangle$ is connected.

Therefore, S is the minimum non-split dominating set of L_n.

Therefore, $\gamma_{ns}(L_7) = 4$.

Figure 2.10: Ladder graph L_7

Theorem

For the Actinia graph, $\gamma_{ns}(A(m, n)) = mn$.

Proof:

Let $V(A(m,n)) = \{v_i/\ i = 1,2,\dots,n\} \cup \{u_j/\ j = 1,2,\dots,m\}$ and $E(A(m,n)) = \{v_iv_{i+1}/i = 1,2,3,\dots,n\} \cup \{v_nv_1\} \cup \{v_iu_{ij}/i = 1,2,\dots,n\ and\ \ j = 1,2,\dots,m\}$

Here, $S = \{v_i\}$ where $i = 1\ to\ n$ and $S_1 = \{u_{ij}\}$ where $i = 1\ to\ n$, $j = 1\ to\ m$ are the dominating sets of $A(m,n)$ where $|S| = n$ and $|S_1| = mn$.
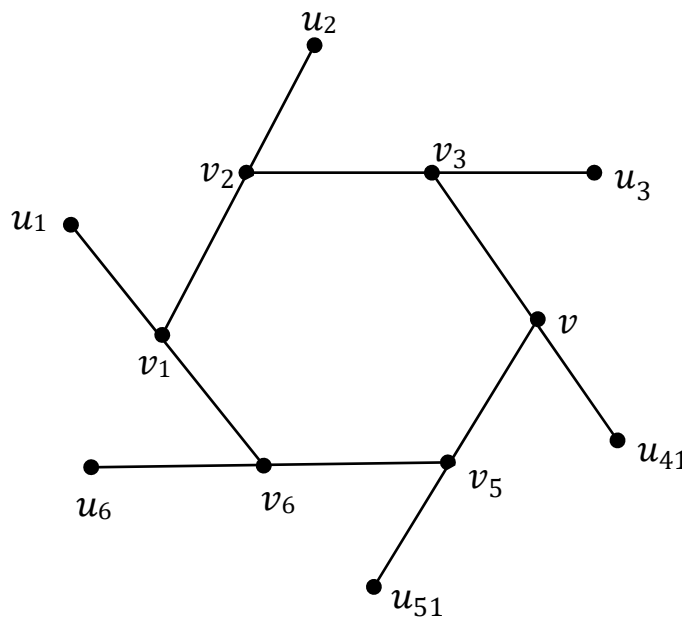
Here $\langle V - S_1 \rangle$ is a cycle $C_n$which is connected. But $\langle V - S \rangle$ is a disconnected graph. Therefore, S_1 is the unique minimum non split dominating set of $A_{m,n}$.

Hence, $\gamma_{ns}(A(m,n)) = |S_1| = mn$.

Illustration: 2.19

Consider the actinia graph$A_{1,6}$.

Let $V(A_{1,6}) = \{\ v_1, v_2, v_3, v_4, v_5, v_6, u_{11}, u_{21}, u_{31}, u_{41}, u_{51}, u_{61}\}$.

Figure 2.11: Actinia graph $A(1,6)$

Consider the set $S = \{u_{11}, u_{21}, u_{31}, u_{41}, u_{51}, u_{61}\}$ which is a dominating set of $A_{1,6}$ and also $\langle V - S \rangle$ is connected.

Therefore, S is a non-split dominating set of $A_{1,6}$ which is also minimum.

Hence, $\gamma_{ns}(A(1,6)) = |S| = 6.$

∎

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A REVIEW ON SERVERLESS COMPUTING IN THE CLOUD

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Abstract

Server less cloud computing effectively holds all the system administration procedures that are needed to form it easier for programmers to use the cloud platform. It offers an interface that prominently simplifies cloud programming and epitomizes an evolution that peers the changeover from an assembly level programming language to high-level programming languages. This paper describes the essential architecture of serverless computing within the cloud platform. Moreover, the comparisons between the microservices, containers and PaaS are prescribed along side with its applications.

1. Introduction

In 2009, "The Berkeley View on Cloud Computing" [1] help explain the exhilaration around the cloud computing technology. The past ten years have seen these advantages largely realized, but cloud users continue to bear a burden from complex operations and many workloads still do not benefit from efficient multiplexing. [1] acknowledged six potential shortfalls. They are firstly stated as severance for accessibility so that a single machine failure does not take down the service. Secondly, the geographic distribution of terminated copies to order the service just in case of disaster. Thirdly, the load balancing and request routing to powerfully utilize the resources. Fourthly, monitoring to make sure the service remains running well. Fifthly, auto-scaling in response to changes in load to scale up or down the system. Sixthly, categorizing the record messages needed for debugging or performance tuning. Cloud computing relieved users of physical infrastructure management but left them with the propagation of virtual resources to manage.[1]

To avoid these above-mentioned drawbacks, there evolved a new technology serverless computing. Serverless computing may be a partial realization of an event-driven perfect technology, during which applications are defined by Actions and therefore the Events that trigger them. This semantic is vital for active database systems, and so the event-driven works have conceived for some time about general computing systems in which actions are processed response to event streams. Serverless function platforms fully embrace these ideas, defining Actions through simple function abstractions, and building out event processing logic across the clouds [3].

Serverless computing diverges from the traditional cloud computing concepts because of the infrastructure and the platforms in which the services are running are transparent to customers. This advancement towards this technology, the customers are only concerned with the preferred functionality of their

application and the rest is proxied to the service provider[2]. The acknowledgment of these needs led to a new opportunity from Amazon in 2015 called the AWS Lambda service. Lambda offered cloud functions and depicted pervasive attention to serverless computing. Google Cloud Functions [2], Microsoft Azure Functions [3], and IBM's OpenWhisk [4] were launched in 2016.[3]

In any serverless platform, the user just writes a cloud function in a high-level language, picks the event that should ought to trigger the running of the function such as loading an image into cloud storage or adding an image thumbnail to a database table and lets the serverless system handle everything else, such as an instance selection, scaling, deployment, fault tolerance, monitoring, logging, security patches, and so on.

2. DEFINITION AND CHARACTERISTICS

Serverless computing is a type of cloud computing in which we have to pay only for the execution time we use, rather than paying for a set amount of practice even if it is underutilized. Serverless frameworks are making cloud deployment even easier by removing the need to design our server-side systems. Integrated properly, this prototype can get us applications out the door faster and free up company resources to build more.

Definitions

Even though we still do not have a recognised definition for the concept of serverless computing and its various services. So, here we present the most commonly accepted interpretation.[2]

FaaS

Function as a service (FaaS) is a prototype in here the customers can develop, run, and accomplish application functionalities without the worry of building and maintaining the infrastructure.

BaaS

Backend as a Service (BaaS) is an online facility of service that holds a specific task over the cloud, such as authentication or notifications. Both BaaS and FaaS do not need any resource management from the customer's side. While FaaS only offers to execute user's functions, BaaS deals with its services completely online.

Serverless service

A serverless service is a combination of FaaS and BaaS that incorporates the following characteristics.

Characteristics

There are several properties that a service should have to call it a serverless service. The execution environment must be transparent to the customer. The processing-node, the VM, the Container, its operating system are all hidden to the customer. The provider should provide an auto-scaling service that is, the resources

should be made available to the customer instantly per demand. The billing mechanism should only reflect the number of resources the customer used that is, pay-as-you-go billing model. The provider does its best effort to finish the customer's task as soon as because it receives the request and therefore the execution duration is bounded. The basic elements in serverless services are functions. The functions are not transparent to the provider. The provider knows their data dependencies, dependencies to external libraries, run-time environments, and state during and after execution[2]. Still, there are few more important structures of serverless computing that discrete it from traditional server-side architecture is as follows

Coding Outlines

Since serverless functions execute on their own, they can trigger other functions written in different languages or leveraging different frameworks. As long as we define the required dependencies in the deployment package, it will work well.

Upload

The process of actually getting the code to run in the FaaS framework is super easy. We literally can copy and paste it into the service provider's console. Once we adjust the other parameters, we can just click deploy.

Scaling

Scaling is almost certainly the most important feature of serverless frameworks. The cloud provider takes care of the complexity around scaling the functions. Conceptually, we could go from 10 API calls today to 15 million tomorrow and this can be confident that the infrastructure would hold into it. There is still some complication to traverse around handling various multiple replicas of the same function running in parallel. But, that is written into the functions themselves.

3. Comparison of Serverless, Microservices, Containers, and PaaS

There is a various quantity of very important architectural modifications going on in the computing and storage infrastructure world right now. Here are some of the interlocking terms relate to each other[5].

IDEA	DESCRIPTION	CONNECTION
Serverless/ FaaS	Run functions instead of servers The cloud provider manages how FaaS run.	Not Applicable
Containers	Ship the code with dependencies attached in a self-contained package. Run multiple of these on	We can deploy our application with a container-based architecture or let a provider do so with FaaS.
Microservices	Development ideas where applications are built through self-contained components.	A microservices focused on architecture that can be deployed on a serverless platform, a VM-based platform, and a container-based platform. This is a way to scheme applications and fragmented them up.
Platform as a Service (PaaS)	A more packaged version of traditional cloud computing where the vendor also manages things like the OS and databases	Serverless can be viewed as a type of PaaS, but PaaS usually requires to worry about scaling. Serverless platforms spin up and shut down servers for every request, while PaaS providers do not shut down the server for every request.

Table 1 shows Comparison of Serverless, Microservices, Containers, and PaaS

4. Applications of Serverlesss Computing

Some of the list of applications of serverless computing in the cloud is shown as follows

Real-time Collaboration and Analytics

The stateless environment of serverless facilities makes them an attractive platform for real-time collaboration tools such as instant messaging and chatbots. Serverless services are also utilized for data analytics applications [3]. The various sources stream their real-time data to a serverless service into these applications. The service gathers, analyses, and then represents the information of data analytics. The auto-scaling feature of serverless computing makes the handling of concurrent massive data streams possible.[2]

Video Processing

Serverless approaches have been proposed for video processing. Sprocket is a serverless video processing framework that exploits intra-video parallelism to achieve low latency and low cost. [2]

Internet of Things (IoTs)

Serverless computing model has been exploited for various IoT domains. a serverless

fog computing approach to support data-centric IoT services. The smart Internet of Things approaches using serverless and microservicearchitecture.[2]

Security

The power of serverless computing has been leveraged for providing security for various systems and infrastructures. Serverless services have also been operated for intrusion detection. StreamAlert is a serverless, real-time intrusion detection engine built upon Amazon Lambda. Serverless approaches have been also used for confirming data security. A method for automatically securing sensitive data in the public cloud using serverless architectures has been introduced[2].

5. CONCLUSION

Serverless computing introduction offers some unique benefits over common cloud computing that make it an attractive option for many businesses. There is no need to manage or interact with a server. The computing resources are supplied as needed to scale a site automatically. Even the resources are allocated precisely rather than in chunks. The customer can pay only for the resources that are consumed by them. Though there are many advantages to using this new technology, it still posses some limitations and challenges. It is stateless and its security features still need to improve since it is an emerging technology.

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Bio-Mediated synthesis and Characterization of Nickel Nanoparticles using

Catharanthusroseus Leaf Extract

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EXTENDED ABSTRACT

The growing awareness toward the environment is increasing commercial demand for nanoparticles by green route syntheses. Green nanoscience and technology have developed to a great extent due to their wide applications in catalysis, sensors, drug delivery and biomedical purposes. There has been increasing research on the utilization of phytomolecules in the area of green synthesis [1]. Thus, several investigators have used various phytochemicals from different biological sources such as roots, fruits, barks, flowers, and leaves. Among them, leaves are a rich source of polyphenols, amides, and proteins, which are utilized in the synthesis of noble metal (Au, Ag, Pd, Pt, and Cu) and metal oxide (TiO_2, NiO, ZnO, and CdO) nanoparticles [2]. In the present study, eco-friendly and economically viable, Ni nanoparticles were produced by biogenic preparation using *Catharanthusroseus* leaf extract. The progress of the reaction was monitored most probably observing change in colour of obtained solution. Thephysiochemical properties of green synthesized nickel nanoparticles were characterized by UV-Visible spectrophotometer (UV-Vis),X-ray diffraction (XRD) and Scanning Electron Microscope (SEM). The UV – Vis spectroscopyshowed an absorption peak at 280 nm which confirmed the formation of nickel nanoparticles [3]. In powder XRD the peak 2θ = 25, 26.5, 26.7, 28, 32, 42 and 54 which correspond to the characteristic of face centered cubic of nickel lines indexed at (200), (210) and (221) [4]. SEM images confirmed the size of the Ni nanoparticles were found to be 200 nm. This route is rapid, simple without anyhazardous chemicals as reducing or stabilizing agents andeconomical route to synthesized Ni Nanoparticles. In further study we will investigate the antimicrobial activity and catalytic activity of Ni nanoparticles.

Keywords: Green Synthesis,*Catharanthusroseus*, Nickel nanoparticles, UV-Vis, XRD and SEM.

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GREEN SYNTHESIS AND CHARACTERIZATION OF CADMIUM OXIDE NANOPARTICLE USING AEGLE MARMELOS

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EXTENDED ABSTRACT

Nanotechnology is a new and emerging technology with wealth of applications. It involves the synthesis and application of materials having one of the dimensions in the range of 1–100 nm.[1].Present investigation focuses on plants based green synthesis of CdO NPs using *Aegle marmelos*leaf extract as an effective reducing, stabilizing and capping agents for their potential applications.

Aeglemarmelos(bilva) leaves were collected within Sri Sarada College campus, Tirunelveli during the month of January 2020. Healthy leaves were selected and washed with distilled water. About 20 g of Aeglemarmelos leaves were weighed and taken in a beaker and 200ml of distilled water was added to it. This was heated for about one hour at 60° C. The extract was filtered by whatmann.no1 filter paper. To100ml of this filtrate 1 g of Cadmium nitrate was added. The solution was mixed homogenously using magnetic stirrer at 400rpm for 60mins. The solid deposit was purified and centrifuged at 1400rpm for 30mins. It was then dried in oven at 300°C.[2].The resulted powder of cadmium oxide synthesised using Aeglemarmelos leaf extract obtained was characterized using XRD, UV-Visible , FTIR and SEM analysis.

The XRD Diffraction characterized the crystalline shape of CdO nanoparticles. The UV-Vis Spectrum analysis shows that the absorption values for cadmium oxide nanoparticles was at 290 nm confirmed the nano size of synthesized CdOnanoparticles(2). In FTIR spectrum studies showed an absorption band at $572cm^{-1}$ indicated the formation of CdO . From SEM data, the obtained nanoparticle size was 123.1nm.The biological applications were studied which reveals that the CdO nanoparticles have excellent anti bacterial and antifungal activities.[3]

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CORPORATE MANAGEMENT RECRUITMENT SYSTEM

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EXTENDED ABSTRACT

Corporate Management Recruitment System (CMRS) is a web guide device to reduce communication gap between Job Contributors and Job Seekers and this project has been developed in .NET. The Main goal of this panacea is to make easy the recruitment process of any organization. This CMRS Project is designed by keeping in mind both people Job Contributors and Job Seekers. CMRS allows Job seekers to register their details like intelligence and experience with the system, and then on the other hand even it allows job providers to post their requirements with the system.

This Project is supportive for the job Contributors and Job Seekers (for both Experience and fresher). The main purpose of this project is for job seekers to find out about the job offer through IT Technologies. CRMS will automatically send mails to all job seekers whose skills are matched with the requirement. Job seekers can check there job application status from their account. This project is a database related project and best front end GUI through which user can easily modify and manage his data. This project will reduce time and cost of hiring for job contributors.

This project is to overcome manual errors and make a computerized system. This project can be used very easily in the process of decision making in new recruitments. This Project serves as a link between job seekers and employers. Reliable and consistent way of searching jobs. Sending Email notification to all job seekers. Database to store the candidate's details securely. This Project helps to decrease in the cost of hiring.

Keywords: Job Contributors, Job Seekers, Database, CMRS

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ELECTRONIC ROAD TRANSPORT OFFICEMANAGEMENT SYSTEM
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EXTENDED ABSTRACT

Now a day's many people are purchasing two-wheelers, four-wheelers, etc. So the Road Transport Office employees having a lot of work burden of making registration, License issue, transfer, etc., which required a lot of paperwork. As a result, people cannot get things done atthe right time, which waste the time, energy. Similarly, the vehicle owner sometimes forgets to carry the license and forgets the insurance date at the time of inquiry. The increasing problems of vehicle registration management, license registration, emission, insurance, etc.for RTO departments and to handle user and vehicle document verification by traffic police officers.

E-RTO Management system is that maintain all the records like issuing the vehicle registration, vehicle owner transfer, and its related features. Once all these get computerized, the work efficiency of the employee will get increases. E-RTO Management system has been designed to automate the process of registration of the vehicle and issuing driving license process. The system can make daily activities efficient and providing a fast response to store and retrieve information to the people by using E-mail. People have not spent more time on license tests. And the people collect their licenses from posts and travel from long distances for issuing licenses. So, people waste their money. With the use of this E-RTO Management system, we can easily reduce the time for license tests. It can reduce the amount of money spent, manpower, time, and all the paperwork.

This system will be used in two modules which are Administrator, the user. As all of these have diverse specifications, the modules are designed to meet their needs and try to avoid any type of confusion. In this system, data modeling includes information about admin, registration, contact us and download forms, feedback, RTO test, and results.By using this system, we can get information about RTO. The pieces of information such as driving license, learning license, and all the RTO service online.The system helps the customer to find his/her requirement in various RTO information online. It also provides online RTO tests. We can get the information at any time by using this system. This abstract shows only about the preliminary work of the RTO system online. In the future, more enhanced works will be available.

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ONLINE TEACHING SYSTEM

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EXTENDED ABSTRACT

Online Teaching System is a communication platform between student and teacher. In this Online Teaching System there are three user's teacher, student and admin. Admin is an owner of a whole system. Teacher and student both of them is registered user of our site. They have username and password for login in to website. The teachers who are registered can upload material for their subject after login to system. Online Teaching System provide facilities for students to learn online subject and read material and also download material for their subject after becoming a member of this site. Registered student can download and read material online from everywhere using internet. Students and teachers can send and receive messages to each other.

In this new era of electronics, we all know the concept of e-learning which does not include the use of paper and pen. There are many advantages of e-learning system. In this online learning system we can assign projects to students and can share documents and more easily.

This system has three modules including student, teacher and admin. Registered students have access to main menu, calendar, projects, documentation, to upload, view the things uploaded by the teachers, knowledge books and also send messages to teachers. Teachers can login and have access for viewing, uploading documents and projects. Admin can login and manage the teachers and student details and also view projects. This is how the new concept of online learning came into existence, which is an easier and smarter system for colleges.

The students are used to learn online subject and read material and also download material for their subject after becoming a member of this site. Student those who are registered can download and read material online from everywhere using internet.

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