



# ***Al-Ameen* ANNUALS**

*A refereed journal for Interdisciplinary Studies*

# **Al-Ameen ANNUALS**

*A refereed journal for Interdisciplinary Studies*

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## **FORM IV**

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Sd/-

Date:

**Dr. Leji Latheef**  
(Printer and Publisher)



## *Editorial*

It is with great pride and happiness that I present the latest edition of ‘Al-ameen Annuals’ , the multidisciplinary journal of Al-Ameen College. This journal serves as a platform to enhance the research capabilities of our teachers and postgraduate students, fostering a culture of academic excellence and intellectual growth.

I am particularly delighted that all the articles in this edition have been rigorously checked using the plagiarism detection software recently introduced at our college. This reflects our commitment to maintaining the integrity and quality of research.

The establishment of our multidisciplinary research center in commerce and allied areas of social sciences has been a milestone for the college. It has strengthened our focus on research and opened new opportunities for collaborative studies and innovative solutions to societal challenges.

I extend my sincere gratitude to the editorial team for their tireless efforts and to our contributors for their valuable work. Let us continue to build a strong research culture at Al-Ameen College, striving for excellence and meaningful contributions to society.

*Chief Editor*



# ദേശത്തിന്റെ പെൺപരിപ്രേക്ഷ്യങ്ങൾ തെരഞ്ഞെടുത്ത മലയാളം നോവലുകളിൽ

അബ്ദുൽസലാം എ പി

## പ്രബന്ധസംഗ്രഹം

മലയാളംനോവൽസാഹിത്യം ബഹുസ്വരതയുടെ അടയാളങ്ങൾ പേറുന്ന ഒന്നാണ്. ദേശം, സംസ്കാരം, സാമൂഹികബന്ധങ്ങൾ, അധികാരഘടന, ജാതി, വിശ്വാസം, സാങ്കേതികത, ആഗോളീകരണം തുടങ്ങി ജീവിതത്തിന്റെ സമസ്തമേഖലകളെയും ഒന്നുകൊൽനൂറ്റാണ്ടോളം മാത്രം പഴക്കമുള്ള ഈ സാഹിത്യരൂപം അടയാളപ്പെടുത്താൻ ശ്രമിച്ചിട്ടുണ്ട്. നോവലുകളിൽ പതിഞ്ഞുകിടക്കുന്ന ദേശമുദ്രകൾ അതിലൊന്നാണ്. ചന്ദ്രമേനോന്റെ ഇന്ദുലേഖ മുതൽ, വിനോയ് തോമസിന്റെ കരിക്കോട്ടക്കരിയും പുറ്റം വരെയുള്ള നോവലുകളിൽവരെ ദേശം പല ഭാവങ്ങളിൽ ചിത്രീകരിക്കപ്പെടുന്നു. ഇത്തരത്തിലുള്ള ചിത്രീകരണത്തിൽ ഖദീജാ മുതാസിന്റെ ബർസ, സാറാ ജോസഫിന്റെ ബുധിനി, ആർ. രാജശ്രീയുടെ കല്യാണിയെന്നും ദാക്ഷായണിയെന്നും പേരായ രണ്ടു സ്ത്രീകളുടെ കത എന്നീ നോവലുകൾ എങ്ങനെയാണ് നിലവിലുള്ള ആഖ്യാനഘടനയെ അപനിർമ്മിക്കുന്നതെന്ന് ഈ പ്രബന്ധം അന്വേഷിക്കുന്നു.

### കീലപദങ്ങൾ

ദേശം, അപരദേശം, അധിനിവേശം, പൗരത്വം, സ്വൈകര്യം, സ്വൈകര്യം.

### I. ആമുഖം

പലതരം ദേശം എന്ന വാക്കിന് ദിക്ക്,നാട്, കര, വിഭാഗം, ജനപദസമൂഹം തുടങ്ങിയ അർത്ഥങ്ങളാണ് ശബ്ദതാരാവലി നൽകിയിരിക്കുന്നത്. എന്നാൽ, നോവലുകളിൽ ഇതിനപ്പുറത്തുള്ള വിശാലമായ അർത്ഥപരിസരത്തിലാണ് ഓരോ ദേശത്തിന്റെയും നിൽപ്പ്. ഒരു ഭൂപ്രദേശത്തെ മനുഷ്യവാസത്തിന് സ്വന്തമായ ജീവിത പ്രശ്നങ്ങൾ, വിശ്വാസങ്ങൾ, ആഖ്യാനരീതികൾ, വസ്തുധാരണരീതികൾ, ഭൂമിശാസ്ത്രപരമായ സവിശേഷതകൾ, ആഹാരമാതൃകകള്, ഭാഷാഭേദങ്ങൾ, വിഭവോല്പാദനരീതികൾ, ശരീരഭാഷകൾ, നിറസങ്കല്പങ്ങൾ, മര്യദകൾ, വഴക്കങ്ങൾ, ആചാരങ്ങൾ, ആനുഷ്ഠാനങ്ങൾ, അധ്യാനരം

ഗങ്ങൾ,താളത്തിന്റെയും ഗീതത്തിന്റെയും സമ്പ്രദായങ്ങൾ, ഇങ്ങനെ ഒട്ടേറെ ഘടകങ്ങളുടെ ഗണത്തെയാണ് ദേശം എന്ന പരികല്പന ഉൾക്കൊള്ളുന്നതെന്ന് ഇ.പി. രാജഗോപാലൻ(2022:10) നിരീക്ഷിക്കുന്നു. മറ്റൊരു സമൂഹത്തിൽനിന്ന് തങ്ങൾ വേറിട്ടു നിൽക്കുന്നുവെന്ന് ഒരു സമൂഹത്തിനു തന്നെ വൈകാരികമായി ബോധ്യമുണ്ടെങ്കിൽ ആ ബോധ്യത്തെയാണ് ദേശം എന്ന പ്രയോഗം അർത്ഥമാക്കുന്നത്.

അങ്ങനെ വരുമ്പോൾ, ദേശം ഭൂമിശാസ്ത്രപരമായ അതിർത്തികപ്പറം ദേശീയതയെയും പൗരത്വത്തെയും സംസ്കാരത്തെയും വൈകാരികതയെയും നിർമ്മിക്കുന്ന പുതിയൊരു സംജന്യമായി

വികസിക്കുന്നതായി കാണാം. അടഞ്ഞ ജാതിവ്യവസ്ഥയിൽനിന്ന് കേരളസമൂഹം പുറത്തുവരുന്നതിന്റെ തെളിവുകൾ ഇന്ദുലേഖയും പോത്തേരി കുഞ്ഞസുവിന്റെ സരസ്വതീവിജയവും തരുന്നുണ്ടെന്ന് ഇ.വി. രാമകൃഷ്ണൻ അഭിപ്രായപ്പെടുന്നത് ഇങ്ങനെയാരു അർത്ഥത്തിലാണ്.

“കൊളോണിയൽ ആധുനികതയുടെ ‘ലോകത്തെ’ ‘നാടി’ന്റെ വാങ്മയങ്ങളിലേക്കു വിവർത്തനം ചെയ്യാൻ കഴിയുന്ന തരത്തിലുള്ള ഭാഷാവ്യവഹാരങ്ങൾ ഇന്ദുലേഖയിൽ സങ്കീർണ്ണമായ സ്ഥലകാലയുഗങ്ങൾ നിർമ്മിക്കുന്നു. കഥകളി മുതൽ ഫാക്ടറി വരെ പരന്നു കിടക്കുന്ന ഈ അനുഭവസ്ഥലത്തിന്റെ വൈരുദ്ധ്യങ്ങളെ മെരുക്കി ഉയർന്നുവരുന്ന ബുർഷ്യാസിയുടെ ലോകസങ്കല്പത്തിന് അനുകൂലമായ ഒരു ആശയസമന്വയം നിർമ്മിക്കുന്നതിൽ ഇന്ദുലേഖ വിജയിക്കുന്നു.

സരസ്വതീവിജയത്തിൽ കഥാപാത്രങ്ങളുടെ മനോവ്യാപാരങ്ങളും അനുരാഗചിന്തകളും സ്വപ്നങ്ങളും കേന്ദ്രസ്ഥാനത്തു കാണില്ല. എന്നാൽ ഇന്ദുലേഖയെക്കാൾ സമർത്ഥമായി പ്രദേശത്തെ ഈ നോവൽ പ്രതിപാദിക്കുന്നുണ്ട്. ഈ നോവൽ ആവിഷ്കരിക്കുന്നത് പൊതുസ്ഥലത്തെയാണ്. ഗൃഹാന്തർഭാഗങ്ങളിൽ ഈ നോവലിൽ വരുന്നില്ലെന്നു തന്നെ പറയാം.” (2012:148).

‘പൗരത്വം’ എന്ന സങ്കല്പം പ്രശ്നവൽക്കരിക്കപ്പെടുന്ന, ദിനംതോറും ആഗോളവൽക്കരിക്കപ്പെടുന്ന ഒരു പുതിയ ദേശസങ്കല്പത്തിനുള്ളിലിരുന്നാണ് ഇന്നത്തെ എഴുത്തുകാർ ആധുനികതയുടെ സാമൂഹികസ്ഥാപനമായ ദേശമെന്ന പരികല്പനയെ നിർമ്മിക്കുകയും പുനർനിർമ്മിക്കുകയും ചെയ്യുന്നത്. ദേശത്തിന്റെ അഭാവം, ദേശത്തിന്റെ സാന്നിധ്യത്തെപ്പോലെ തന്നെ പ്രസക്തമാകുന്നു. ഗ്രാമവും നഗരവും തമ്മിലുള്ള അതിരുകൾ മാഞ്ഞില്ലാതാകുന്നു.

മുഖ്യമായും മൂന്നുതരം സ്ഥലഭാവനകളിലേക്കാണ് മലയാളനോവലുകൾ ചുവടുവയ്ക്കുന്നതെന്ന് ഷാജി ജേക്കബ് (2013:124) നിരീക്ഷിക്കുന്നുണ്ട്:

1. മുമ്പാരികല്പമില്ലാത്തവിധം പ്രശ്നഭരിതവും വൈവിധ്യപൂർണ്ണവുമായ വിദേശഭൂമിശാസ്ത്രങ്ങൾ. നിരവധി എഴുത്തുകാർ ഒന്നിനൊന്ന് ഭിന്നമായ പ്രവാസിജീവിതവും സാമൂഹികവിതാനവും അധികാരഘടനയും നോവലിൽ ആവിഷ്കരിക്കുന്നത് പ്രാഥമികമായും ദേശസൂചനകൾ മുൻനിർത്തിയാണ്.
2. ചരിത്രസ്ഥലം എന്ന് കൃത്യമായി വിളിക്കാവുന്നവിധം വസ്തുനിഷ്ഠവും മുർത്തവുമായി മാറുന്ന ദേശഭാവനകൾ
3. മാധ്യമഭാവനയുടെ നോവൽ സാധ്യതകൾ രൂപം കൊള്ളുന്ന സ്ഥലഭൂമികൾ.

അതേസമയം, സാമൂഹികതയുടെ പല ശ്രേണികളിൽ നിൽക്കുന്ന വ്യക്തികൾ ദേശത്തെ ഒരേ തരത്തിലാണോ ഉൾക്കൊള്ളുന്നത് എന്നൊരു ചോദ്യം പ്രസക്തമാണ്. സ്ത്രീ അറിയുന്ന ദേശമാണോ, പുരുഷൻ അറിയുന്ന ദേശം? മൂന്നാം ലിംഗത്തിൽപ്പെട്ടവർക്ക് ദേശമെന്ന പരികല്പന എങ്ങനെയാവും ഉൾക്കൊള്ളാൻ കഴിയുന്നുണ്ടാവുക? അത് പിടിച്ചുനിർത്തുന്ന ശക്തിയാണോ, അതോ വികർഷിക്കുന്നതോ? രണ്ടു ലിംഗങ്ങളിൽപ്പെട്ടവർ ദേശത്തിന്റെ സാംസ്കാരികവൈവിധ്യങ്ങളെ എപ്രകാരമാണ് ആവിഷ്കരിക്കുന്നത് എന്നതാണ് ഈ പ്രബന്ധത്തിന്റെ വിഷയം. ഖദീജാ മുതാസിന്റെ ബർസ, സാറാ ജോസഫിന്റെ ബുധിനി, ആർ. രാജശ്രീയുടെ കല്യാണിയെന്നും ദാക്ഷായണിയെന്നും പേരായ രണ്ടു സ്ത്രീകളുടെ കത എന്നീ നോവലുകളാണ് പഠനവിഷയം. മൂന്നു കാലങ്ങളിൽ, മൂന്ന് സാമൂഹികപശ്ചാത്തലങ്ങളിൽ എഴുതപ്പെട്ട ഈ നോവലുകളുടെ

രചയിതാക്കളും പ്രധാന കഥാപാത്രങ്ങളും സ്ത്രീകളാണ്. അതുമാത്രമല്ല, ദേശം കഥാഗതിയിലും വിഷയപരിചരണത്തിലും ഏറെ നിർണ്ണായകവുമാണ്. സ്ഥലമാണ് ഏതു തരത്തിലുള്ള സാമൂഹികജീവിതത്തിന്റെയും അധികാരപ്രയോഗത്തിന്റെയും അടിസ്ഥാനമെന്ന ഏകോയുടെ ചിന്തയ്ക്ക് ഈ നോവലുകൾ അടിവരയിടുന്നു.

**മൂന്നു നോവലുകൾ, മൂന്നുദേശങ്ങൾ**

ഖദീജാ മുതാസിന്റെ ബർസ, സാറാ ജോസഫിന്റെ ബുധിനി, ആർ. രാജശ്രീയുടെ കല്യാണിയെന്നും ദാക്ഷായണിയെന്നും പേരായ രണ്ടു സ്ത്രീകളുടെ കത എന്നീ നോവലുകൾ മൂന്നുതരം ദേശങ്ങളെയാണ് പ്രതിനിധാനം ചെയ്യുന്നത്. ബർസയിലെ ഡോക്ടർ സബിത തന്റെ ഭർത്താവിനോടൊപ്പമാണ് ജോലിയാവാശ്യാർത്ഥം സൗദി അറേബ്യയിലെത്തുന്നത്. സൗദിയിൽ ഡോക്ടറായി പ്രാക്ടീസ് ചെയ്യുന്നതിനിടയിൽ അവൾ പരിചയപ്പെടുന്ന മനുഷ്യരിലൂടെയാണ് സബിത തനിക്ക് അന്നേവരെ പരിചയമില്ലാത്ത മറ്റൊരു ദേശത്തെ അറിയുന്നതും അനുഭവിക്കുന്നതും. തീർത്തും വിഭിന്നമായ പരിസരം, സംസ്കാരം, ഭാഷ, ഇടം, മനുഷ്യർ എന്നിവർക്കിടയിൽ സബിത സ്വന്തം സ്വന്തം രൂപീകരിക്കാൻ ശ്രമിക്കുന്നു. അപരദേശത്തിന്റെ അപരിചിതതം കണക്കേ നൂറ്റാണ്ടുകൾക്കുമുമ്പുള്ള ബദുവിയൻ അറബി സംസ്കാരത്തിന്റെ കാർക്കശ്യവും പൊടിമണലുതുന്ന മരുക്കാറ്റിന്റെ വന്യതീക്ഷ്ണതയും അവളെ പൊതിയുന്നുണ്ട്. ഇടവഴിയും കൊള്ളും വാഴത്തോപ്പുകളും തെങ്ങുകയറ്റത്തിന്റെ ആർപ്പും കുത്തിയൊഴുകുന്ന തോടിന്റെ കുശലം പറച്ചിലും കേരള കായർബസിലെ കോളെജ് യാത്രകളും കഴിഞ്ഞ ജന്മത്തിലെ വിദൂരസ്മൃതികളാവുന്നുണ്ട് അവൾക്ക്.

ഇതിലെ സബിത നവമുസ്ലീംസ്ത്രീകളിലൊരുവുമാണ്. അവൾ എത്തിച്ചേർന്ന ഇടമാകട്ടെ, കർക്കശമായ മതനിഷ്ഠകളുള്ള സൗദി

അറേബ്യയും. അവിടെ അവൾ നേരിടേണ്ടിവരുന്നത് ഒരു മുസ്ലീം പുരുഷനേരിടേണ്ടി വരുന്ന അനുഭവങ്ങളല്ല. ലിംഗപരമായ വേർതിരിവ് കൃത്യമായി അടയാളപ്പെടുത്തുന്ന നിരവധി സന്ദർഭങ്ങളിൽ സബിത അഭിമുഖീകരിക്കുന്നു. ഒരു മതരാജ്യത്ത് പൗര എന്ന നിലയിലുള്ള അവളുടെ അസ്തിത്വം ചോദ്യം ചെയ്യപ്പെടുന്നു. സൗദി അവൾക്ക് അപരദേശമാണ്, കേരളം സ്വന്തം ദേശവും. ഭക്ഷണം, വേഷം തുടങ്ങിയ സാംസ്കാരികചിഹ്നങ്ങളിലൂടെ ഈ വ്യത്യാസം നോവലിൽ ആവിഷ്കരിക്കപ്പെടുന്നു.

വിശുദ്ധ കഅ്ബയെ നെഞ്ചിലേറ്റുന്ന ഹറം പള്ളിക്കടുത്തുള്ള വെളിമ്പറമ്പിലെ പൊള്ളുന്ന ചൂടിലേക്ക് റഷീദിനൊപ്പം ഒരു അശരണയെപ്പോലെ ആദ്യമായി വന്നിറങ്ങുന്ന സബിതയെ അവസാനത്തെ അദ്ധ്യായത്തിൽ വായനക്കാർ കാണുന്നത് മഹ്മയിൽനിന്ന് കുതറിയ ചെമ്പിച്ച ചുരുളൻ മുടിയിഴകൾ അതിരിട്ടുന്ന സ്വർണ്ണമുഖവുമായി സഹീറിന്റെ കൈ പിടിച്ച നാട്ടിലേക്ക് തിരികെപ്പോകുന്ന ആത്മവിശ്വാസമുള്ള സ്ത്രീയായാണ്. രണ്ടു ദേശങ്ങൾ അവളുടെ അസ്തിത്വത്തെ രണ്ടുതരത്തിൽ അടയാളപ്പെടുത്തുന്നു. നവമുസ്ലീം ആകുന്നതിനുമുമ്പുള്ള ജീവിതം, സൗദിയിലെ മതജീവിതം, ഒരു സ്ത്രീ എന്ന നിലയിൽ തന്റെവ്യക്തിത്വത്തോടു സത്യസന്ധത പുലർത്തുന്ന ആന്തരികജീവിതം എന്നിങ്ങനെ മൂന്നു ഘട്ടങ്ങളിലൂടെയാണ് ഈ നോവലിൽ സബിതയുടെ ജീവിതം സഞ്ചരിക്കുന്നത്.

സാറാജോസഫിന്റെ ബുധിനി പ്രതിഷ്ഠിക്കപ്പെട്ടിരിക്കുന്നത്, ഇന്ത്യയുടെ ചരിത്രവും രാഷ്ട്രീയവും അടയാളപ്പെടുത്തുന്ന വലിയൊരു ഭൂമികയിലാണ്. ദാമോദർ വാലി അണക്കെട്ടിന്റെ ഉദ്ഘാടനവുമായി ബന്ധപ്പെട്ടുണ്ടായ ഒരു സംഭവത്തെ ചരിത്രാനുഷ്ഠിയുടെ രചനാമിടുക്കോടെ അവതരിപ്പിക്കുകയും അതിലൂടെ ഇന്ത്യൻ വികസനകാഴ്ചപ്പാടിന്റെ ദുരന്തമുഖം

അനാവരണം ചെയ്യുകയുമാണ് ബുധിനിയിലൂടെ സാറാജോസഫ് ചെയ്യുന്നത്. ഒരു പ്രദേശത്തിന്റെ വികസനം എങ്ങനെയാണ് സൃഷ്ടിവിതത്തെയും അവരുടെ സംസ്കാരത്തെയും പ്രകൃതിയെയും ഇല്ലായ്മ ചെയ്യുന്നതെന്ന് വളരെ കൃത്യമായി ബുധിനി അടയാളപ്പെടുത്തുന്നു. രണ്ടു തരത്തിലുള്ള യാത്രയാണ് ബുധിനിയിൽ ഒരേസമയം നടക്കുന്നത്. ഒന്ന്, ബുധിനിയെ തേടിയുള്ള, 'മഹാക്ഷേത്രങ്ങളുടെ മറുപുറം' എന്ന ഗവേഷണ പ്രബന്ധം രചിച്ച രൂപി മുർമുവിന്റെ യാത്ര. ആ യാത്രയ്ക്ക് ഒരു ഗവേഷകയുടേതായ ശാസ്ത്രീയത കാണാം. അവരുടെ ഗവേഷണത്തിന്റെ കണ്ടെത്തലാണ് ബുധിനിയുടെ സാമൂഹികചരിത്രം. പലതലങ്ങളിൽപ്പെട്ട ആവേദകരുടെ ഓർമ്മകളിൽനിന്നുമാണ് ബുധിനി വളരുന്നത്. രണ്ട്, ഗോത്രത്തിൽനിന്ന് പുറത്താക്കപ്പെട്ട ബുധിനിയുടെ യാത്ര. അത് അനിശ്ചിതത്വത്തിന്റെ പലായനമാണ്. ത്യാർഖണ്ഡിന്റെ കിഴക്കൻ അതിർത്തിയിൽ പശ്ചിമബംഗാളിനോട് ചേർന്നുനിൽക്കുന്ന സാന്താൾ ഗോത്രമായ ഗ്രാമമാണ് നോവലിലെ കാർബോനം. ഇതിനോടടുത്തുനിൽക്കുന്ന ദാമോദർ അണക്കെട്ട് ഉദ്ഘാടനം ചെയ്യാൻ അന്നത്തെ പ്രധാനമന്ത്രി ജവഹർലാൽ നെഹ്റു എത്തുന്നതോടെയാണ് ബുധിനിയുടെ ജീവിതകഥ തുടങ്ങുന്നത്.

പശ്ചിമബംഗാളിനടുത്തുള്ള ഒരു ഡാമിൽ ജോലിയെടുക്കുന്ന, ത്യാർഖണ്ഡിൽ താമസിക്കുന്ന പതിനഞ്ചു വയസ്സായ സാന്താൾ പെൺകുട്ടിയാണ് ബുധിനി. ദാമോദർ നദിയെ കേന്ദ്രീകരിച്ചുകൊണ്ട് സർക്കാർ നിർമ്മിക്കുന്ന ഡാമുകളിലൊന്നായ പാഞ്ചേത് എന്ന ഡാമിൽ ജോലിചെയ്യുകയാണ് അവൾ. ഡാമിന്റെ പണി പൂർത്തിയായ സമയത്ത് അത് ഉദ്ഘാടനം ചെയ്യാൻ വരുന്നത് അന്നത്തെ പ്രധാനമന്ത്രിയായിരുന്ന ജവഹർലാൽ നെഹ്റുവാണ്. നെഹ്റുവിനെ മാലയിട്ടു സ്വീകരിക്കുവാൻ വേണ്ടി ബുധിനിയെയാണ് ദാമോദർവാലി കോർപറേഷനിലെ ഉദ്യോഗസ്ഥർ തയ്യാറാക്കി

നിർമ്മിക്കുന്നത്. അതവൾ സന്തോഷത്തോടെ, ഭംഗിയായി നിർവ്വഹിക്കുകയും ചെയ്തു. ഉദ്ഘാടനം ചെയ്യേണ്ട സമയത്ത്, താനല്ല ഇത് കെട്ടിപ്പടുത്ത ആദിവാസികളും ദരിദ്രരുമായിട്ടുള്ള തൊഴിലാളികളാണ് ഈ ഡാം ഉദ്ഘാടനം ചെയ്യാൻ അർഹരെന്നു പറഞ്ഞ നെഹ്റു, ബുധിനിയെക്കൊണ്ട് ഡാം ഉദ്ഘാടനം ചെയ്യിപ്പിക്കുന്നു. ബുധിനിയുടെ ജീവിതം അതോടെ മാറിമറിയുകയാണ്. 'ദിക്'വിന് മാലചാർത്തിയതിന്റെ പേരിൽ അവളുടെ ഗോത്രവും അവളുടെ ഗ്രാമവും അവളെ ഓടിച്ചു. മറ്റൊരു ഗോത്രത്തിലെ പുരുഷനെ വിവാഹം ചെയ്തിരിക്കുന്നു എന്ന രീതിയിലാണ് സാന്താൾ ഗോത്രസമൂഹം ആ ഹാരാർപ്പണത്തെ മനസ്സിലാക്കി വെച്ചത്. അതിനെത്തുടർന്ന് അവളെ ഗോത്രത്തിൽനിന്ന് പുറത്താക്കുന്നു. ദാമോദർവാലി കോർപറേഷൻ അവളെ ജോലിയിൽനിന്ന് പിരിച്ചുവിടുന്നു. പ്രധാനമന്ത്രിക്ക് ചാർത്തിയ മാല ബുധിനിയെ സംബന്ധിച്ചിടത്തോളം കുരുക്കായി മാറുകയാണ് ചെയ്യുന്നത്.

ജീവിച്ചിരിക്കുന്ന ദേശം, ആ സംഭവത്തിനു ശേഷം അപരദേശമായി മാറുന്ന പരിതസ്ഥിതി ബുധിനി അഭിമുഖീകരിക്കുന്നു. അവളുടെ സാമൂഹികവും വ്യക്തിപരവുമായ അസ്തിത്വങ്ങൾ ക്ഷമറിയുകയും ചിതറിപ്പോവുകയും ചെയ്യുന്നു. ജാതീയതയും ലിംഗബോധവും അധികാരവും പരിസ്ഥിതിയും വികസനവുമെല്ലാം ചേർന്നു നിർമ്മിക്കുന്ന സങ്കീർണ്ണമായ ഒരു രൂപകമായി ബുധിനി മാറുന്നതുമാണിത്.

'കല്യാണിയെന്നും ദാക്ഷായണിയെന്നും പേരായ രണ്ടു സ്ത്രീകളുടെ കത്'പ്രാദേശികഭാഷയിലൂടെ സാമൂഹികവും രാഷ്ട്രീയവുമായ സ്വത്വം സ്ഥാപിച്ചുകൊണ്ട് ഒരു പുതിയതരം പ്രതിരോധം സൃഷ്ടിക്കാൻ ശ്രമിക്കുന്ന മലയാള കൃതികളുടെ നിരയിൽ നിൽക്കുന്നതിനൊപ്പം, സവിശേഷമായ ഒരു സ്വത്വരാഷ്ട്രീയത്തെയും മുന്നോട്ടു വയ്ക്കുന്നു. അരന്തുറ്റാണ്ടുമുൻപ് വടക്കൻ കേരളത്തിലെ ഒരു ഗ്രാമത്തിൽ ജീവിച്ച

രണ്ടു സ്ത്രീകൾ. അവർ ദേശത്തെയും, ദേശം അവരെയും രൂപപ്പെടുത്തുന്നു. അതിലൂടെ കുടുംബം, ലൈംഗികത, പുരുഷാധികാരം തുടങ്ങിയ പരമ്പരാഗത സാമൂഹ്യനിർമ്മിതികള് തളരുകയും തകരുകയും ചെയ്യുന്നു. തെക്കൻ കേരളത്തിന്റെയും വടക്കൻ കേരളത്തിന്റെയും സാംസ്കാരികദമ്പങ്ങളുടെ സംഘർഷം നോവലിൽ സജീവമായി കടന്നുവരുന്നു. ദേശത്തിന്റെ ഊർജ്ജമാണ് അവരുടെ ഭാഷ. ദേശത്തിന്റെ വൈവിധ്യമാണ് അവരുടെ സ്വത്വം.

### ദേശവും സ്ത്രൈണകർത്വത്വവും

സബിതയും ബുധിനിയും ദാക്ഷായണി-കല്യാണിമാരും വ്യത്യസ്ത ദേശങ്ങളിൽ, വ്യത്യസ്ത സാമൂഹ്യഭൂമികകളിൽ ജീവിക്കുന്നവരാണ്. ജീവിതത്തിലൊരിക്കലും കണ്ടുമുട്ടാൻ പോലും സാധ്യതയില്ലാത്തവർ. അവരുടെ ദേശങ്ങളും ജീവിതവും അടിമുടി വൈവിധ്യങ്ങളും വൈരുദ്ധ്യങ്ങളും നിറഞ്ഞതാണ്. പക്ഷേ, ആമ പുറന്തോടിനെക്കൊണ്ടുപോലെ അവർ ദേശത്തെ ചുമന്നു നടക്കുന്നു. അവരുടെ വ്യക്തിബോധത്തെ ദേശം നിർമ്മിക്കുകയും തകർക്കുകയും ചെയ്യുന്നു. പുരുഷ കർത്തൃത്വത്തെ ഈ സ്ത്രീകളിലാരു വഹിക്കുന്നില്ല. പുരുഷലോകത്തിന്റെ കാമനകളല്ല, അവരുടെ വഴികളെ സൃഷ്ടിക്കുന്നത്.

ബർസയുടെ ആമുഖാധ്യായത്തിൽ സബിതയെ നോവലിസ്റ്റ് അവതരിപ്പിക്കുന്നത് ഇങ്ങനെയാണ്:

ഇപ്പോൾ സബിത തനിച്ചാണ്. ഓട്ടം എത്രാമത്തെ തവണയാണ്. അവളതു മറന്നുപോയിരിക്കുന്നു. റഷീദ് എവിടെയാണ്. വല്ലാതെ മുന്നിലെത്തിക്കഴിഞ്ഞു കാണണം. നേരം ഇരുളുകയാണ്. സഹാ-മർവകള് ഇപ്പോൾ കണ്ണെത്താദൂരം അകലെയാണ്. മരുഭൂമിയിലെ ചുളം കുത്തുന്ന കാറ്റിന്റെ ശബ്ദമല്ലേ ഇപ്പോൾ കേൾക്കുന്നത്. ഇപ്പോൾ മലനിരകൾ കൂടുതൽ

വ്യക്തമായി കാണുന്നുണ്ട്. സഹയും മർവയും ഇപ്പോഴിതാ വളരെ അടുത്ത്. രണ്ടു മലകളുടെയും പാറക്കെട്ടുകൾ വശങ്ങളിൽ കൈകോർക്കുകയാണ്. ഇപ്പോൾ മലനിരകൾക്കുള്ളിൽ താൻ തനിച്ച് (2015:18).

ഈ തനിച്ചാകൽ സ്വത്വത്തിൽനിന്നും ദേശത്തിൽനിന്നുമുള്ള ഒറ്റപ്പെടലാണ് സബിതയ്ക്ക്. എന്നാൽ, പിന്നീടവൾ പുതിയ ദേശത്തിൽ സ്വയം കണ്ടെടുക്കുകയും സ്വത്വത്തെ നിർമ്മിച്ചെടുക്കുകയും ചെയ്യുന്നുണ്ട്. ഇപ്രകാരം സ്ത്രീകൾക്കിടയിൽ അനേകം ഉൾദേശങ്ങളെ നോവൽ നിർമ്മിക്കുന്നുണ്ട്. ഇങ്ങനെ പല ഉൾദേശങ്ങളും ഭാഷകളും സാംസ്കാരിക വൈവിധ്യങ്ങളും സാമൂഹികപരിസരങ്ങളും ചേർന്നാണ് നോവലിലെ സ്ത്രീകൾ അവരുടെ കർത്തൃത്വം രൂപീകരിക്കുന്നത്.

### ദേശം-അപരദേശം

പതിനാറാം നൂറ്റാണ്ടോടെ ഈ മൂന്നു നോവലുകളിലും ദേശത്തെപ്പോലെ, അപരദേശവും കടന്നുവരുന്നു. ഇത് ദേശത്തിന്റെ വിപരീതദിശയിലെ കൂടുതൽ സങ്കീർണ്ണമായൊരു ദമ്പകല്പനയാണ്. വിവാഹം എന്ന സ്ഥാപനം ഈ മൂന്നു നോവലുകളിലും ഈ അപരദേശനിർമ്മിതിയിൽ നിർണ്ണായകമാകുന്നു. വിവാഹത്തോടെയാണ് സബിത സൗദി അറേബ്യയിലേക്ക് എത്തുന്നത്. ദാക്ഷായണിയും കല്യാണിയും വിവാഹം കഴിഞ്ഞ്, അവരുടെ ദേശത്തിന്റെ ആത്മവിശ്വാസം നൽകുന്ന ഇടത്തിൽനിന്ന് അപരദേശത്തേക്ക് യാത്രയാവുന്നു. ബുധിനി വിവാഹിതയാകുന്നില്ലെങ്കിലും, നെഹ്രുവിനു നടത്തിയ ഹാരാർപ്പണത്തെ വിവാഹമായിക്കരുതിയ ഗോത്രബോധമാണ് അവൾക്കും അവളുടെ ഇടവും ഗ്രാമവും കുടുംബവും നഷ്ടമാക്കുന്നത്. അവരുടെ മനസ്സുകളിൽ ദേശം നിലനിൽക്കുന്നു. അവരതിനെ ഓർമ്മകളിലൂടെ വീണ്ടെടുക്കുന്നു. ദുരിതങ്ങളിൽ ഹൃദയം

ചേർത്തുവയ്ക്കാനുള്ള ഒരു അത്താണിയായി അവരതിനെ മാറ്റുന്നു.

കോഴിക്കോട്ടുനിന്ന് സൗദിയിലെത്തിയ സബിത, സൗദിയെ വിശേഷിപ്പിക്കുന്നത് 'ഭാഷയറിയാത്ത നാട്' എന്നാണ്. ഭാഷ ഒരു മനുഷ്യന്റെ അടിസ്ഥാനപരമായ ആവിഷ്കാരമാധ്യമമാണ്. അത് ഇല്ലാതെ യാകമ്പോൾ അവൾ മൗനിയായുണ്ണ. സൗദി നിവാസികൾ സബിതയ്ക്ക് അപരർ ആകുന്നതുപോലെ, സബിത അവർക്കും അപരയാകുന്നു.

“സർവകാര്യങ്ങളും ഇവർചോദിച്ചു മനസ്സിലാക്കും. ഒരവസരം വന്നാൽ എടുത്തു പ്രയോഗിക്കാനുമാറിയാം. ശാസ്ത്രീയകാര്യങ്ങളാണ്, നമുക്കജ്ഞാതമായ മേഖലയാണെന്ന സങ്കോചമൊന്നും ഇവർക്കില്ല. അറബികളെ സംസാരത്തിൽ തോല്പിക്കാൻ ദുർമ്മതി, ആർക്കുമാവില്ല. ഞാനെവിടെയോ വായിച്ചിട്ടുണ്ട്. പുരാതനകാലം മുതലേ അറബികൾ ഭാഷണകലയിൽ അഭിമാനികളായിരുന്നുവത്രേ. അന്യനാട്ടുകാരെ അവർ 'അജമികൾ' എന്നാണ് ത്രേ പരിഹസിക്കുക. അജമികൾ എന്നാൽ ഊമകൾ എന്നർത്ഥം” (2015:30).

ഇനി ഓർമ്മകളിലൂടെ ദേശത്തെ വീണ്ടെടുക്കുന്നത് കാണുക:

“വീട്ടുജോലിക്ക് വരുന്നവർക്ക് സർട്ടിഫിക്കറ്റ് സാക്ഷ്യപ്പെടുത്തുന്നതാണ് രംഗം. കുറേപ്പേരെക്കെ പുതുമുഖങ്ങൾ. ബാക്കിയുള്ളവർ ഇക്കാര്യം പുതുക്കാൻ വരുന്നവർ. പ്രഗത്ഭനായിട്ടെല്ലാമേക്കി റിപ്പോർട്ടെഴുതുക. വിവാഹിതയാണെങ്കിൽ പി.വി. കൂടി നോക്കുക. ഇത്രയേ നമ്മൾ ചെയ്യേണ്ടൂ.”

“കണ്ടാൽ ചെറിയ കുട്ടികളെപ്പോലെയുണ്ട്.”

“അതുന്നോക്കേണ്ട. മുപ്പത്തഞ്ച് വയസ്സുവരെ യൊക്കെ പ്രായമുള്ളവരാണ്. അവരെക്കണ്ടാൽ പ്രായം മതിക്കില്ല. വെളുത്ത മെലിഞ്ഞ ശരീരങ്ങൾ. പ്രായമായാലും ഇങ്ങനെത്തന്നെയായിരിക്കും.

അറബികൾക്ക് ഇവരെ വലിയ പ്രിയമാണ്. കാണാൻ വൃത്തിയും ചന്തവുമുണ്ടല്ലോ. അധികമെണ്ണവും 'കോപ്പർട്ടി'യോ 'ഇംപ്ലാന്റോ' ഒക്കെ ഇട്ടിട്ടേ ഇവിടെ ജോലിക്ക് വരൂ. അപകടസാധ്യതയെപ്പറ്റി ഇവർക്ക് നല്ല ബോധ്യമുണ്ട്.”ദുർമ്മതി അമർത്തിച്ചിരിച്ചു.

വീട്ടുജോലിക്കാരികളെ പുരുഷൻമാരുമായി ചേർത്തുള്ള അപവാദകഥകൾ പുതുതായൊന്നുമല്ല സബിതയ്ക്ക്. കല്ലാച്ചിപ്പാത്തുവെന്നു പേരുടേട്ടു നാട്ടിലെ ഇളക്കക്കാരി, നല്ല പ്രായത്തിൽ നാട്ടുപ്രമാണിയായ സൂപ്പിമുതലാളിയുടെ അടുക്കളക്കാരിയായിരുന്നത്രേ. അവളുടെ മുത്ത രണ്ടുമാക്കൾ സൂപ്പി മുതലാളിയെ മുറിച്ചുവെച്ചപ്പോലെയെന്ന് ജനസംസാരം” (2015:31).

ഭാഷയുമായി ബന്ധപ്പെട്ട് സമാനമായൊരു അനുഭവം ബുധിനിയിലുമുണ്ട്.

“സാന്താൾഭാഷയ്ക്ക് അടുത്ത കാലത്തുമാത്രമാണ് ലിപി ഉണ്ടായത്. ബാംഗ്ലൂർക്കും ദേവനാഗരിയ്ക്കും ഹിന്ദിയിലും ഇംഗ്ലീഷിനുമെന്തെന്നപോലെ സാന്താളിനും സ്വന്തം ലിപി. പണ്ഡിത് രഘുനാഥ് മുർമുവാൻ ഒൽചിക്കി ഉണ്ടാക്കിയത്. എന്നാൽ അധികം പേരെന്നും ഒൽചിക്കി വശത്താക്കിത്തുടങ്ങിയിരുന്നില്ല. ദയാനന്ദൻ അവരെ സൗജന്യമായി ഒൽചിക്കി പഠിപ്പിക്കാൻ തുടങ്ങിയതോടെ അവർ അയാളെ ഹെഡ് മാസ്റ്റർ എന്നു വിളിച്ചു(2009-268).”

എഴുതാൻ സ്വന്തമായി ലിപി ഇല്ലാത്തതുപോലെ, സ്വന്തം ദേശവും ഇല്ലാത്തവളാണ് നോവലിലെ ബുധിനി. അവളുടെ അപരദേശങ്ങൾ സംഘർഷങ്ങളുടേതും പലായനങ്ങളുടേതുമാണ്. നോവലിന്റെ അവസാനം ബുധിനി ചോദിക്കുന്നത്, 'രാജ്യമോ, ഏതാണ് എന്റെ രാജ്യം' എന്നാണ്. ഈ വലിയ രാഷ്ട്രീയ ചോദ്യത്തോടെയാണ് നോവൽ അവസാനിക്കുന്നത്.

കല്യാണിയെന്നും ദാക്ഷായണിയെന്നും പേരായ രണ്ട് സ്ത്രീകളുടെ കഥയിൽ

വിവാഹത്തോടെയാണ് ദാക്ഷായണിക്ക് വീടും ദേശവും നഷ്ടമാകുന്നത്.

“അയാൾമദ്രാസിലെ ബിസിനസ് നിർത്തി നാട്ടിലൊന്നു തുടങ്ങാമെന്ന തീരുമാനം പറഞ്ഞപ്പോൾ അവൾ, ഏടെ? ഈടെയാ? എന്ന് ആവേശഭരിതയായി. പരമപുഷ്ടത്തോടെ ചിറികോട്ടി അവൾ ജീവിക്കുന്ന സ്ഥലം ഒരു നാടേയല്ല എന്നും അച്ചിവിട്ടിൽ കിടക്കാനുദ്ദേശിക്കുന്ന തായോളികളിൽ താൻ പെടില്ലെന്നും അയാൾ പ്രസ്താവിച്ചു. പെണ്ണുങ്ങൾക്ക് നാടില്ല. ഒരു നാട് വേണമെന്ന് അത്ര വാശിയാണെങ്കിൽ കെട്ടിയവന്റെ നാടിന് അവകാശം പറയാം.” (2019-22)

ദേശങ്ങളില്ലാത്തവർക്ക് വഴികളും ഇല്ലാതാകുന്നു.

“കല്യാണി ഒരു നിമിഷം ആലോചിച്ചശേഷം കുറ്റിച്ചുലുമായി മുറ്റത്തേക്ക് ക്കുനിഞ്ഞു.

“ഇദെല്ലം ദാച്ചാണീരെ കൊല്ലത്തേക്കുള്ള ബയി.

“ഇദെല്ലം കൈശുമ്മാന്റെ പഴേ പൊരക്കേക്കുള്ള ബയി.

ഇദെല്ലം ലച്ചണന്റെ നെലമ്പുരേക്കുള്ള ബയി. വരച്ചു വരച്ചു കല്യാണിക്കുമുമ്പിൽ ദേശങ്ങളുടെ ഭൂപടം നിവർന്നു.” (2019:124) ഇത്തരം അപരദേശങ്ങൾ ഈ സ്ത്രീകൾക്ക് അതിജീവനത്തിനുള്ള വെറും ഇടങ്ങൾ മാത്രമായി മാറുകയും സ്വന്തം ദേശം ഓർമ്മയിൽ, സ്വപ്നത്തിൽ കടന്നുവരുന്ന ഒന്നായി മാറുകയും ചെയ്യുന്നു. ദേശത്തിന്റെ പലതരം മിത്തുകളിലൂടെയാണ് ഇത്തരം ഓർമ്മകളും സ്വപ്നങ്ങളും അവർ നിർമ്മിച്ചെടുക്കുന്നത്.

### അധിനിവേശം-ദേശം-സ്ത്രീ

ചരിത്രത്തിലെ എല്ലാം അധിനിവേശങ്ങളും പുരുഷന്റേതാണ്. അവന്റെ കായികവും സാമൂഹികവും ബൗദ്ധികവുമായ അധികാര പ്രയോഗങ്ങളാണ് ഈ അധിനിവേശങ്ങളിലൊക്കെ

കാണാനാവുന്നത്. പുതിയ സ്ഥലങ്ങളിലേക്കുള്ള പരുവേഷണങ്ങളും, അവിടം പിടിച്ചടക്കലും പുരുഷന്റെ സാമൂഹികവൃത്തിയായി കണക്കാക്കപ്പെട്ടു. രക്തച്ചൊരിച്ചിലും, തദ്ദേശീയരെ അടിമയാക്കലുമുൾപ്പെടെയുള്ള ഈ അധിനിവേശപ്രവർത്തനങ്ങളിൽ സ്ത്രീകളുടെ അഭാവമോ അദൃശ്യതയോ ഉണ്ട്. പിടിച്ചടക്കിയ ദേശങ്ങൾ പുരുഷന്റേതാണ്.

അധിനിവേശാനന്തരലോകത്തെക്കുറിച്ചുള്ള സ്ത്രീവാദപഠനങ്ങളിൽ ആക്രമണോത്സുകമായ ഇത്തരം കൈയേറ്റങ്ങളും അതിലൂടെ സ്ത്രീകളുടെ ലിംഗപദവിക്ക് ആഗോളതലത്തിൽ തന്നെ നേരിടേണ്ടിവന്ന തിരിച്ചടികളും വിഷയമാകുന്നുണ്ട്. അടിമർത്തലുകളുടെയും അക്രമങ്ങളുടെയും ഒന്നിലധികം തലങ്ങൾ അനുഭവിക്കേണ്ടി വരുന്ന സ്ത്രീകൾക്ക് ദേശാധികാരം അപ്രാപ്യമാകുന്നു. സ്ത്രീകൾ അധികാരം കൈയാളിയിരുന്ന പല ചെറുസമൂഹങ്ങളെയും കോളനിവത്കരണം ഇല്ലാതാക്കി. യൂറോപ്യൻ അധിനിവേശത്തിനു മുൻപ്, നേറ്റീവ് അമേരിക്കൻ വംശജർക്കിടയിൽ ലിംഗപരമായ അസ്ഥിരത (ജെൻഡർ ഫ്ലക്സിബിലിറ്റി) നിലനിന്നിരുന്നതെന്ന പഠനങ്ങൾ ഇതിൽ പ്രസക്തമാണ്. സ്ത്രീകളും പുരുഷന്മാരും ട്രാൻസ്ജെൻഡർ വ്യക്തികളും സ്ത്രീകളെപ്പോലെയുള്ള പുരുഷന്മാരും പുരുഷന്മാരെപ്പോലെയുള്ള സ്ത്രീകളുമൊക്കെ തികച്ചും ‘നോർമൽ’ ആയി കണക്കാക്കപ്പെട്ടിരുന്ന ആ ഇടത്തെ യൂറോപ്പിന്റെ സദാചാരവാദവും ലിംഗതന്ത്ര സംബന്ധിച്ച വഴക്കമില്ലായ്മയും എത്തരത്തിൽ മാറ്റിയെടുത്തു എന്നത് ചരിത്രത്തിന്റെ ഭാഗമാണ്.

അതുകൊണ്ടുതന്നെ, എത്തിച്ചേരുന്ന നാട് എന്നതും സ്ത്രീകളെ സംബന്ധിച്ച് അവരനുഭവിക്കുന്ന അസ്വതന്ത്രാവസ്ഥയുടെ ഒരു വിപുലീകരണം മാത്രമാകുന്നുണ്ട്. ഒരുപക്ഷേ, ജനിച്ചുവളർന്ന ദേശത്തേക്കാൾ അന്യതാബോധം പകരുന്ന ഒന്ന്. കുറഞ്ഞപക്ഷം ഈ മൂന്നു നോവലുകളിലെങ്കിലും ദേശം ഒരു ഭാരമായി

കൊണ്ടുനടക്കേണ്ടിവരുന്ന സ്ത്രീകളെ കാണാം. പുതിയ ദേശങ്ങളിൽ പുരുഷൻ കണ്ടെത്തുന്ന സാമൂഹികയിടങ്ങൾ സ്ത്രീകൾക്ക് അപ്രാപ്യമാണ്. പൊതുജനങ്ങൾ തിന്റെ ഭാഗമാകാൻ അവർക്ക് കുറച്ചു കൂടുതൽ ബുദ്ധിമുട്ടേണ്ടിവരുന്നു.

“സൗദിയിൽ വന്നിട്ടില്ലാ കൊല്ലം അഞ്ചായി. രണ്ടോ മൂന്നോ കൊല്ലമെന്ന് കരുതി വരികയും ഇവിടെയത്തി ഒരാഴ്ച കളിൽ എങ്ങനെയെങ്കിലും ഒരുവർഷം തികച്ച് തിരികെപ്പോകണമെന്ന ശക്തമായ തോന്നൽ രൂപപ്പെടുകയും പത്തരമാസം കഴിഞ്ഞെത്തുന്ന വെക്കേഷണിൽ നാട്ടിൽ പോകുന്നതിന്റെ ത്രില്ലും അതുകഴിഞ്ഞുള്ള തിരിച്ചുവരവിന്റെ വൈകാരികതകളും ഒരു പ്രകൃതിചാക്രികം പോലെ ആവർത്തിക്കുകയും ചെയ്യുന്നതിനിടയിൽ അഞ്ചുകൊല്ലം ഇതാ അഞ്ചുകൊല്ലം ജീവിതത്തിൽനിന്ന് കിഴിക്കപ്പെട്ടിരിക്കുന്നു (2015-138).”

ബർസയിലെ സബിതയെ സംബന്ധിച്ച് പ്രവാസം ഉപജീവനവുമായി ബന്ധപ്പെട്ട ഒന്നുമാത്രമാണ്. എത്തിപ്പെട്ട ദേശത്ത്, കാലയളവ് എണ്ണിക്കണക്കാൻ വിധിക്കപ്പെട്ട, സ്വന്തം ദേശത്തിന്റെ വിളി നിരന്തരം കേട്ടുകൊണ്ടിരിക്കുന്ന ഒരുവൾ. എന്നാൽ ഭർത്താവായ റഷീദിന്റെ സ്ഥിതി ഇങ്ങനെയല്ല.

“ഞാൻ കോൺടാക്ട് ഫിനിഷ് ചെയ്യുകയാണ്. നാളെയോ മറ്റുനാളോ ആപ്ലിക്കേഷൻ കൊടുക്കും. വെക്കേഷൻ നാലുമാസം മുമ്പ് ആപ്ലിക്കേഷൻ കൊടുക്കണമെന്നാണ്.”

തലയുയർത്തി നോക്കിയ റഷീദിന്റെ മുഖത്തെ അവിശ്വസനീയതയും അതിനു പിറകിലെ ഞെട്ടലും സബിത ശ്രദ്ധിക്കുന്നുണ്ടായിരുന്നു. പിന്നെ ഒരക്ഷരം മിണ്ടാതെ തലതാഴ്ത്തിയിരുന്നു ഭക്ഷണം മുഴുമാക്കി.

ഉറക്കം വരാതെ തിരിഞ്ഞും മറിഞ്ഞും കിടക്കുമ്പോൾ തൊട്ടരികിൽ റഷീദും

അങ്ങനെയൊന്നെ കിടക്കുകയാണെന്ന് സബിതയറിഞ്ഞു. പിന്നെയൊരു നിമിഷത്തിൽ, കുറേ നാളുകൾക്കുശേഷം, റഷീദിന്റെ കൈകൾ സബിതയെത്തേടിയെത്തി...

“നീ... നീ എന്നെ ഒറ്റയ്ക്കായിട്ട് പോകുമോ...?”

“നിങ്ങളും കൂടെപ്പോരുമെങ്കിൽ സന്തോഷമാണ്. പക്ഷേ നിങ്ങൾ പോരില്ലെന്ന് എന്റെ മനസ്സ് പറയുന്നു...(2015-181).”

റഷീദ് സൗദിയിൽ തന്റേതായ ദേശം നിർമ്മിച്ചെടുക്കുന്നുണ്ട്. ആ ദേശത്തിനുള്ളിൽ സബിത അന്യയാണ്. ആ അന്യതയിൽനിന്നുള്ള വിടുതലാണ് നാട്ടിലേക്കുള്ള അവളുടെ യാത്ര. അപ്പോഴും റഷീദ് ആണിന്റേതായ കൗശലം പ്രയോഗിച്ച് അവളെ തീരുമാനത്തിൽനിന്ന് പിന്തിരിപ്പിക്കാൻ ശ്രമിച്ചിട്ടുണ്ട്. ബുധിനിയുടെ ആരംഭം ഇങ്ങനെയൊണ്:

“വാദ്യമുണ്ട്, താളമുണ്ട് ഗാനമുണ്ട്, നൃത്തമുണ്ട് നൃത്തഭൂമി മാത്രമില്ല (2019:9)”

നോവലിലെ നൃത്തഭൂമി പെണ്ണിന്റെ ദേശമാണ്. വാദ്യവും താളവും ഗാനവും പുരുഷജീവിതത്തിന്റെ സൂചനകളായി മാറുകയും സ്ത്രീകൾക്ക് ഇടം ഇല്ലാതിരിക്കുകയും ചെയ്യുന്ന അവസ്ഥ.

ഒരു സാന്താൾ പെൺകുട്ടി ഗ്രാമത്തെ ദുഷിപ്പിച്ചു. അവൾ ഒരു ദിക്കിന്റെ കഴുത്തിൽ മാലയിട്ട് അയാളെ വിവാഹം കഴിച്ചിരിക്കുന്നു. അതാണ് ബുധിനിയുടെ മേൽ ഗ്രാമസഭ ചാർത്തിയ കുറ്റം. ഇക്കാരണത്താൽ അവളെ ഗ്രാമത്തിൽനിന്ന് ഓടിക്കുകയാണ് ആൾക്കൂട്ടം. അതിജീവനത്തിനായുള്ള പെണ്ണിന്റെ ആ ഓട്ടത്തിനു പിന്നാലെ ആണധികാരം ഒച്ചയിട്ടോടുന്നുണ്ട്. ദേശത്തിന്റെ പവിത്രത ആണിന്റെ അധികാരപരിധിയിൽ നിലനിർത്തേണ്ടതും സംരക്ഷിക്കപ്പെടേണ്ടതുമാണ്.

മാണെന്ന ധാരണയാണ് ഇത്തരം ഗ്രാമസഭകൾ മുന്നോട്ടുവരുന്ന രാഷ്ട്രീയം. ആ ധാരണകളിലാണ് ബുധിനിക്ക് സ്വന്തം ദേശം നഷ്ടമാകുന്നത്.

“സാൽമരത്തിന്റെ കൊമ്പിൽ കയറിയിരുന്നത്- പെൺകുട്ടികളെ ചെയ്യാൻ പാടില്ലാത്തതാണ്- അവൾ ടിരിയോ വായിക്കും- അതും പെൺകുട്ടികളെ ചെയ്യാൻ പാടില്ലാത്തതാണ്. ആരെങ്കിലും പരാതിപ്പെട്ടാൽ ഗ്രാമസഭയിൽ മാപ്പുപറഞ്ഞ് പിഴയടയ്ക്കേണ്ടിവരും. സാൽമരത്തിൽ കയറാനുള്ള ആഗ്രഹമെങ്ങനെ തടയാൻ പറ്റും? പുല്ലാങ്കുഴലിന്റെ ആനന്ദം എങ്ങനെ വേണ്ടെന്നു വരും? (2019:32)”

പരിമിതികളോടെയെങ്കിലും, ദേശത്തിന്റെ ആഹ്ലാദങ്ങളും സ്വാതന്ത്ര്യങ്ങളും അനുഭവിച്ചിരുന്ന ഒരു പെൺകുട്ടിയാണ് തികഞ്ഞ അരക്ഷിതാവസ്ഥയിലേക്കു വലിച്ചെറിയപ്പെടുന്നത്. പല തലങ്ങളിലുള്ള പലായനങ്ങളിലൂടെ, ഏകാന്തതകളിലൂടെ, തിരസ്കാരങ്ങളിലൂടെ അവർ കടന്നു പോകുന്നു.

കല്യാണിയെന്നും ദാക്ഷായണിയെന്നും പേരായ രണ്ട് സ്ത്രീകളുടെ കതയിൽ രണ്ടുതരം ദേശങ്ങൾ കടന്നുവരുന്നുണ്ട്. അത് കേരളത്തിന്റെ തെക്കും വടക്കുമാണ്. തെക്കും വടക്കും തമ്മിലുള്ള സാംസ്കാരിക സംഘർഷങ്ങളെ പലത്ര പത്തിൽ നോവലിൽ കാണാം. ഉന്നതം-നീചം എന്ന ദേശസങ്കല്പത്തിൽ പുരുഷന്റെ ആധിപത്യസ്വഭാവമാണ് മുഴച്ചുനിൽക്കുന്നത്. സ്ത്രീകൾക്ക് അത്തരം സങ്കല്പങ്ങളിൽ വലിയ റോളൊന്നും ഇല്ല. റോൾ ഇല്ലാതിരിക്കുന്നത്, സ്ത്രീകൾക്ക് ദേശമേ ഇല്ലാത്തത് കൊണ്ടാണ്. അവരെ സംബന്ധിച്ചിടത്തോളം വെള്ളം പോലെ ഏത് പാത്രത്തിൽ കൊള്ളാവുന്നതുമായ ജീവിതം പോലെ ഒരവസ്ഥയാണ് ദേശം എന്നു വരുന്നു. സ്വന്തം ദേശം പലതരം ജീവിതധാരകളുടെ കേന്ദ്രമാണ്. അത് സങ്കീർണ്ണമാണ്. അധികാരത്തിനു മുന്നിൽ വേഗം വഴങ്ങാത്തതും, വൈവിധ്യങ്ങളെ

ഉൾക്കൊള്ളുന്നതുമാണ്. “ഊടുവഴികളുടെ തമ്പുരാട്ടിയാണ് ഈ നാട്. അത് പോലീസുകാർക്കു മുന്നിൽ അത്രവേഗം കീഴടങ്ങില്ല (2019:155”.

എന്നാൽ പുരുഷന് സ്ത്രീകളെ കീഴടക്കും പോലെ, ദേശവും കീഴടക്കാൻ ഉള്ളതുതന്നെയാണ്. ഇത് നോവലിൽ ആവിഷ്കരിച്ചിരിക്കുന്നത് നോക്കുക:

“നീളൻ കശുമാവിൻതോട്ടങ്ങളും പുഴയോരവും ചെറുകമ്പനികളും കല്ലുവെട്ടാൻ കഴികളുമുള്ള നാട്ടിലേക്ക് തെക്കുനിന്ന് ആണങ്ങൾ വന്നു. കനാലുപണിക്കു വന്നവരും സിമന്റ് പണിക്ക് വന്നവരും മാനേജ്മെന്റ് സ്കൂളിൽ മാഷാരായി വന്നവരും ഉണ്ടായിരുന്നു. അവരിൽ പലരും സരസുവിനെയും വിമലയെയും സരോജിനിയെയും കൂടെക്കൂട്ടി വടക്കുരായി(2019:25).”

ഇവർക്ക് വടക്കാനാകാൻ പറ്റുന്നതുപോലെ എളുപ്പമായിരുന്നില്ല കല്യാണിക്കും ദാക്ഷായണിക്കും തെക്കുരാകാൻ. ‘കുടുംബചർച്ചയിൽ പോലും വടക്കൻ മലബാറിനുമേൽ തിരുവിതാംകൂറിന്റെ അധികാരസ്വരം മുഴങ്ങി’ എന്ന് നോവലിൽ ഒരിടത്തു പറയുന്നത് കാണാം.

**ദേശം-ഭക്ഷണം-ഭാഷ-സ്വത്വം**

ഈ മൂന്നു നോവലുകളിലെയും സ്ത്രീകൾ അവരുടെ ദേശത്തെ വീണ്ടെടുക്കുന്നത് മിത്തുകൾ, ഓർമകളെ, സ്വപ്നങ്ങൾ എന്നിവയ്ക്കുപുറമെ ഭക്ഷണം, വേഷം, ഭാഷ എന്നീ സാംസ്കാരികമായ അംശങ്ങളിലൂടെയുമാണ്. പുതിയ ദേശവും സാഹചര്യങ്ങളുമായി പൊരുത്തപ്പെടാൻ സാധ്യമാകാതെ വരുമ്പോള് ഭക്ഷണവും വേഷവും മൊക്കെ പ്രതിരോധമായി മാറുന്നുണ്ട്. ഭക്ഷണത്തിലൂടെയും വേഷങ്ങളിലൂടെയും തങ്ങളുടെ സാംസ്കാരിക വൈവിധ്യങ്ങളെ മാത്രമല്ല, ദേശസ്വത്വത്തെയും ആത്മസ്വത്തെയും വീണ്ടെടുക്കാൻ സ്ത്രീകൾക്കു കഴിയുന്നു.

“നീളൻ കോട്ടിന്റെ താഴെ അനാവൃതമാകുന്ന സാരിയുടെ ഞൊറിവുകൾ പിടിച്ചുനോക്കി അവർ പറയും- ഇതു ബംഗാൾ കോട്ടൺസാരിയാണല്ലോ ദള്ളറാ! എത്ര നല്ല കളറുകളാ. നിങ്ങളുടെ സാരികൾക്ക്. ഇതെല്ലാം കേരളത്തിൽനിന്ന് വാങ്ങുന്നതാണോ? (2019-52).”

“രണ്ടാഴ്ച കഴിഞ്ഞപ്പോഴേക്കും വലിയ തെറ്റില്ലാതെ രോഗികളോട് സംവദിക്കാമെന്നായി. സബിതയെത്തന്നെ അമ്പരിപ്പിച്ച പുരോഗതിയായിരുന്നു അത്. വ്യാകരണവും അക്ഷരങ്ങളും പഠിക്കാതെ തന്നെ ഒരു ഭാഷ ഇത്രയെളുപ്പം നാവിന് വഴങ്ങുമെന്നോ? (2019-53)”

“ഭാഗ്യത്തിന് പുതിയ അയക്കുറുതന്നെ കിട്ടി. ഒരു കിലോ വലിയ ചെമ്മീനും വാങ്ങി. ദള്ളർ ആഷിഖിനും ഹാഷിമിനും ചെമ്മീൻ പൊരിച്ചതാണ് പിടിച്ചത്. പക്ഷേ എരിവ് സഹിക്കവയ്യാതെ ഇടയ്ക്കിടെ മിറൻഡ കുടിക്കുകയും കേക്കു കഷ്ടങ്ങൾ ചവയ്ക്കുകയും ചെയ്തു. വട്ടത്തിൽ ചെറിയ കനം കുറഞ്ഞ പൂരികളിലൊന്ന് ഉയർത്തിപ്പിടിച്ച് ഹാഷിം പറഞ്ഞു.

ദള്ളറാ, നിങ്ങൾക്കിവിടെയൊരു റസ്റ്റോറന്റ് തുടങ്ങാം, നല്ല ചെലവായിരിക്കും (2019-127).”

“ദാക്ഷായണി കുനിഞ്ഞ് പാൽവള്ളി പറിച്ച്. അവൾ പ്രതീക്ഷിച്ചതിലും വേഗത്തിൽ അത് പഠിഞ്ഞു വന്നു. ഒട്ടും ഉറപ്പില്ലാത്ത മണ്ണാണ്. ഒന്നിന്റെയും വേർ ആഴത്തിൽ പോകുന്നില്ല. പക്ഷേ ചവിട്ടു നിൽക്കുമ്പോള് മണ്ണിൽ കാല് താഴ്ന്നു പോകുന്നു. അവളുടെ നാട്ടിൽ ഉറച്ച മണ്ണാണ്. കരിമ്പാറയുണ്ട്. കാരമുൾക്കാടുണ്ട് (2019:81).”

ഈ ദേശവർണ്ണന ദാക്ഷായണിയുടെ അസ്തിത്വം തന്നെയാണ്. ഉറച്ച മണ്ണുപോലുള്ള പ്രകൃതമാണ് തന്റേതെന്ന ധ്വനി ഇതിലുണ്ട്. ഇത്തരം അറിവുകളിലൂടെയാണ് അവൾ അവളുടെ

സ്വതന്ത്ര നിർദ്ധാരണം ചെയ്യാൻ നോവലിൽ ശ്രമിക്കുന്നത്.

“ഗർഭിണി ഇലപ്പൊതിയഴിച്ചു. ‘ദൈവമേ...എളവക്ക’ ദാക്ഷായണി തുള്ളിപ്പോയി.

തേങ്ങാക്കൊത്തും ചുവന്നുള്ളിയും കറിവേപ്പിലയും ഉണക്കമുളക് ചതച്ചതും വെളിച്ചെണ്ണയും ചേർത്ത് മൊരിച്ചെടുത്ത ഇളവക്ക ഇലച്ചീനിൽ മദദരമായി നിവർന്നു. എരിച്ചു തുള്ളുന്നതിനിടയിൽ ഗർഭിണി കുപ്പിയെടുത്ത് നീക്കിവെച്ചു കൊടുത്തു.

‘ഇന്നാ. മോന്ത്. നിന്റെ ഗോവിന്ദേട്ടന്റെ കള്ള്... മഴയില്ല, പക്ഷേ വയല് കാണാം. അതുവെച്ച് ഒപ്പിക്ക്.’

ദാക്ഷായണിക്ക് മുന്നിൽ കാലവും ദേശവും തോടു പിളർന്നു കിടന്നു. ഗോവിന്ദേട്ടന്റെ കള്ള്, അമ്മയുടെ ഇളവക്ക, നാട്ടിലെ മഴ, നിലാവുവീണ വയലിലകങ്ങൾ. ദാക്ഷായണിയുടെ കണ്ണിൽനിന്നും മൂക്കിൽനിന്നും വായിൽനിന്നും കുടുകടെ വെള്ളം ചാടി.

‘ഇത്ര ബോം നാട്ടുപ്പോയി ബെരാക് ഞാനും ബെരുവേനും.’ ദാക്ഷായണി ഏങ്ങലടിച്ച് (2019:103).”

ബർസയിലെ സബിത നാട്ടിലെ ഹൈന്ദവ പ്രമാണിയുടെ മകളാണ്. അവൾക്ക് വിദ്യാഭ്യാസവും ജോലിയുമുണ്ട്. ജോലിയാവശ്യർത്ഥമാണ് അവൾക്ക് ദേശം ഉപേക്ഷിക്കേണ്ടി വരുന്നത്. എന്നാൽ, സാന്താൾ ഗോത്രക്കാരിയായ ബുധിനിയെ ദേശത്തുനിന്ന് ആൺകൂട്ടം ജാതിയുടെ പേരിലും നിലനിന്നിരുന്ന ഗോത്ര നിയമങ്ങളുടെ പേരിലും ആട്ടിപ്പുറത്താക്കുകയാണ് ചെയ്യുന്നത്. കല്യാണിയുടെയും ദാക്ഷായണിയുടെയും ദേശമാറ്റം വിവാഹം കഴിഞ്ഞാൽ പുരുവന്റെ നാട്ടിൽ താമസിക്കുകയെന്ന നാട്ടുനടപ്പിന്റെ ഭാഗമാണ്. മൂന്നു നോവലിലെ നാലു മുഖ്യകഥാപാത്രങ്ങൾക്കും ദേശം ഉപേക്ഷിക്കാൻ

ഇങ്ങനെ കാരണങ്ങള് പലതാണ്. എന്നാൽ ബുധിനി ഒഴിച്ച് മറ്റ് മൂന്നുപേരും സ്വന്തം ദേശത്തേക്ക് തിരിച്ചുവരാൻ പലവിധത്തിൽ ശ്രമിക്കുന്നവരും, ശ്രമിച്ച് വിജയിക്കുന്നവരാണ്. സ്വന്തം ദേശത്തു മാത്രം ഉറയ്ക്കുന്ന വേരുകളാണ് അവരുടേത്.

അവരുടെ വേരുകൾ ആ നാടുകളിൽ ആഴത്തിൽ പതിഞ്ഞിരിക്കുന്നു. സൈബീരിയയിലെ രാഷ്ട്രീയ ധനികൾ ദേശവുമായി കലർന്നുകിടക്കുന്നു. അതിന്റെ നഷ്ടവും വീണ്ടെടുപ്പും ഈ മൂന്നു നോവലുകളിലും ഇതിവൃത്തത്തോളംതന്നെ പ്രധാനപ്പെട്ടതാകുന്നു.

### ഉപസംഹാരം

ഈ മൂന്നു നോവലുകളിലെയും സ്ത്രീകൾ പാത്രങ്ങളുടെ സ്വത്വം അവരുടെ ദേശത്തിന്റെ സാംസ്കാരിക മൂലധനവുമായി ബന്ധപ്പെട്ടുകിടക്കുന്നു. അതുകൊണ്ടുതന്നെ പ്രാദേശികതയും, പ്രാദേശികഭാഷയും ആവിഷ്കാരത്തിന്റെ മർമ്മപ്രധാനമായ ഭാഗങ്ങളാണ്. 'കല്യാണിയെന്നും ദാക്ഷായണിയെന്നും പേരായ രണ്ടു സ്ത്രീകളുടെ കത്'യിൽ ഭാഷ ഒരു കഥാപാത്രത്തോളം പ്രധാനമാകുന്നു. ദേശം നഷ്ടപ്പെടുന്ന ആ സ്ത്രീകൾ ഭാഷയിലൂടെയാണ് പിന്നീട് നിലനിൽക്കുന്നത്. ബർസയില്, കോഴിക്കോടുപോലെ സാംസ്കാരിക വൈവിധ്യമുള്ള ഒരു നാട്ടിൽനിന്ന് മതാധിഷ്ഠിതവും, ഏകശിലാമാനവുമായ സംസ്കാരമുള്ള സൗദിയിലേക്കെത്തുന്ന സബിത നവമുസ്ലിം എന്ന നിലയിലും നാടുവിട്ടുവന്ന സ്ത്രീയെന്ന നിലയിലും ബഹുമാനമായ സംഘർഷങ്ങളിലൂടെ കടന്നുപോകുന്നു. വീടു ചുമന്നുകൊണ്ടുപോകുന്നതുപോലെ, ദേശത്തെയും സ്ത്രീകൾ ഒപ്പം കൊണ്ടുപോകുന്നുണ്ട്. ദേശത്തിനുള്ളിൽ അനുഭവിക്കുന്ന അന്യതാബോധങ്ങൾ അപരദേശത്ത് അഗാധമായ മാനുഷികപ്രതിസന്ധിയിലേക്ക് അവരെ കൊണ്ടുവരുന്നതാകുന്നു. ദേശം പുരുഷനും സ്ത്രീക്കും വ്യത്യസ്തമായ രണ്ടിടങ്ങളാണ്. ബുധിനിയും കല്യാണിയും ദാക്ഷായണിയും സാമൂഹ്യശ്രേണിയുടെ അടിത്തട്ടിലുള്ളവരാണ്. അവർക്ക് ദേശത്തിന്റെ ഇടങ്ങളിൽ ഉപരിവർഗ്ഗത്തിലെ സ്ത്രീകളേക്കാൾ കൂടുതൽ ഇടപെടാനും ഇഴുകിച്ചേരാനും സാധിക്കും. അതുകൊണ്ടുതന്നെ,

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## *EFFECTIVENESS OF ETHICAL MARKETING IN COMPETITIVE MARKET*

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### **Abstract**

This study examines the importance of ethics and marketing responsibility in shaping various marketing strategies in organizations, especially among consumers. Regarding to companies for retaining ethical marketing, the brand equity and the engagement in ethical behavior must be such that it induce trust and responsibility in consumer. The impact of ethical marketing strategies in highly competitive environments is the focus of this paper. In an age where consumers are more socially aware than ever before, ethical marketing has become a critical differentiation point for companies aiming for long-term growth. The research examines different ethical marketing strategies and their effects on consumer behavior, brand loyalty, and overall business performance. In addition, this paper identifies challenges with ethically focused marketing and offers strategic recommendations for marketers who want to preserve competitiveness while embedding ethical values in their marketing practice.

***Keywords: Ethical Marketing, Consumer Behavior, Brand Loyalty, Competitive Advantage, Business Ethics.***

### **I. INTRODUCTION**

In today's globalized and highly competitive markets, businesses constantly seek ways to stand out. Traditional marketing often emphasizes pricing, product features, or promotions. However, rising consumer awareness of social, environmental, and ethical issues has brought ethical marketing to the forefront. This paper examines whether ethical marketing can provide a competitive advantage and foster lasting consumer relationships.

Ethical marketing refers to promoting products and services in ways that align with

principles of honesty, fairness, and social responsibility. It emphasizes transparency, accountability, and a moral approach to marketing decisions and practices. In this framework, marketing is not just a tool for profit but a means to deliver value to society while respecting stakeholders, including customers, employees, and the wider public. Job roles within marketing involve the development, communication, and exchange of goods and services, all of which carry ethical implications. Unethical practices such as misleading advertisements, unfair pricing, and discriminatory promotions can damage a company's reputation and consumer trust. Conversely, ethical

marketing reinforces credibility and encourages long-term engagement.

While the primary aim of marketing is to meet customer needs profitably, its broader ecological and social impact cannot be ignored. The discipline has been criticized for promoting materialism, excessive consumption, and environmental degradation through over-packaging and unsustainable retail expansion. Such critiques highlight the importance of reorienting marketing practices toward responsible and sustainable strategies. Ethical marketing counters these concerns by promoting mindful consumption and responsible business conduct. Marketing also plays a critical role in shaping societal values and consumer lifestyles. As a socio-economic force, it influences individual choices and societal trends. Therefore, embedding ethical considerations into marketing is essential for maintaining public trust and supporting sustainable development. Ethical marketing promotes practices such as ethical sourcing, eco-friendly packaging, inclusive advertising, and transparency, all of which can enhance brand reputation and customer loyalty. Companies known for ethical conduct often experience increased customer retention, reduced legal risks, and enhanced competitive positioning. In markets where consumers are inundated with options, ethical behavior becomes a key differentiator.

The execution of ethical marketing is not without challenges despite its significant advantages. Organizations may struggle with subjectivity, lack of clear standards, and internal resistance. However, the

benefits such as stronger brand loyalty, improved stakeholder relationships, and alignment with evolving consumer expectations often outweigh the difficulties.

## II. LITERATURE REVIEW

Numerous studies indicate a positive correlation between ethical marketing and consumer loyalty. For instance, companies that adopt ethical sourcing, environmental practices, and truthful advertising tend to enjoy higher levels of trust and repeat business. Scholars also argue that ethical marketing enhances brand reputation and minimizes legal risks. Ethics, according to Tsalikis and Fritzsche (1989), involve the study of standardisation, execution and rules of behaviour.

Scholl and associates (1993) The entirety of the rules and principles of conduct that are founded on concepts about which business attitudes are true and which are not is known as business ethics.

Smith (1993) relates marketing ethics to the moral factors that influence market decision-making. Ethical marketing emphasizes transparent, trustworthy, and responsible organizational marketing policies exhibiting both the integrity and fairness to consumers and other stakeholders.

Gaski (1999), Marketing ethics can be considered as moral judgment and behavior standards in marketing practice or a moral code or system in the marketing area. Lu et al. (1999) define the ethics followed while executing marketing is defined by the study

of indicating levels, rules of procedures of operations and decisions in marketing.

According to Kotler and Armstrong (2003), the needs and interests of target markets are determined by organizations, and they try to deliver to customers, improving the customers' well-being. The idea that marketing also influences society is also imperative to thoughtfully analyze the ethics of marketing practices. Trust is the foundation for the efficiency and effectiveness of the market system, and it is nurtured with high ethical standards. Weeks et al. (2004) Good business ethics can enhance business results, which leads to sustainable development of organizations.

Svensson and Wood (2004), The marketplace is becoming aware of the increased discrimination and corporations that fail to agree to the criteria of principles of ethical business operations and management.

Murphy et al. (2005) define marketing ethics as systematically studying the moral standards applied to marketing decisions, behaviors, and institutions.

Murphy and Lacznia (2006), For the marketplace to function efficiently and equitably, honesty must be ensured by more than just the law. Hence, more emphasis is placed on the habitual ethical actions of marketing managers striving to keep their promises to customers by creating fair and transparent exchanges within the economic system., The exchange becomes easier to carry out if the ethical integrity of the overall market system is retained.

According to Palmer and Hedberg (2013), the article "Marketing and the Vulnerable" gave considerable protection, on which they got a grounded view in marketing ethics. The marketing is illuminated to the vulnerable by basically evaluating key components of overall contentions.

### III. OBJECTIVES

- To analyze the effectiveness of ethical marketing in competitive markets by examining its impact on consumer behavior, brand loyalty, and business performance.
- To identify key challenges
- To provide actionable recommendations for integrating ethical practices into marketing strategies, ensuring competitiveness and alignment with evolving consumer expectations.

### IV. STATEMENT OF PROBLEM

In today's highly competitive markets, businesses are adopting ethical marketing to build trust and promote responsible practices. However, there is limited evidence on how effectively it impacts consumer behavior, brand loyalty, and business performance. Organizations also face challenges balancing ethical commitments with commercial goals. This study seeks to analyze the effectiveness of ethical marketing in achieving key business

outcomes and provide strategic recommendations for integrating ethics into competitive marketing practices.

## V. RESEARCH DESIGN

### 1. Source of Data

The study relies on primary data, collected directly from participants through structured surveys. The data pertains to perceptions, expectations, and experiences regarding ethical marketing practices across industries.

### 2. Population

The population for this research includes marketing professionals, CSR officers, and business managers across various sectors (e.g., retail, tech, healthcare, finance, and manufacturing).

### 3. Sample Size

The sample comprises 60 respondents, sufficient for drawing exploratory insights on perceptions and strategies concerning ethical marketing practices.

### 4. Sampling Technique

The study uses purposive sampling, a type of non-probability sampling. Participants were selected based on their relevance and experience with marketing strategy and CSR integration. This approach ensures input from knowledgeable sources while accommodating industry variation.

### 5. Tools for Data Collection

A structured questionnaire developed around key research questions. Closed-ended items using Likert scales, ranking, and multiple-choice formats. Topics covered include

ethical expectations, industry impact, transparency practices, and resource allocation.

### 6. Tools for Data Analysis

**Descriptive Statistics:** Frequency, percentage distributions, and mean scores (to understand trends).

**Visual Tools:** Pie charts and tables for data presentation and interpretation.

### 7. Reliability and Validity of Tools

**Reliability:** A pilot test was conducted with 10 respondents to assess internal consistency.

**Validity:** Content validity was ensured through expert review of the questionnaire by marketing scholars and practitioners. Face validity is achieved by using clear, understandable language for all participants. Questions were mapped directly to research objectives to enhance construct validity.

## VI. ANALYSIS AND INTERPRETATION

### Influence of Ethical Marketing Practices on Consumer Trust & Purchasing Decisions (n=60)



Ethical Marketing Factor	Number of respondent	Percentage
Transparency in advertising claims	20	33.3%
Commitment to social responsibility	15	25.0%
Fair pricing practices	10	16.7%
Environmental sustainability efforts	8	13.3%
Ethical sourcing/supply chain practices	5	8.3%
Customer privacy protection	2	3.3%
Total	60	100

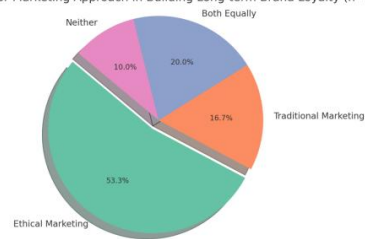
Marketing Approach	No. of Respondents	Percentage
Ethical Marketing	32	53.3%
Traditional Marketing	10	16.7%
Both Equally	12	20.0%
Neither	6	10.0%
Total	60	100%

### Interpretation:

Transparency in Advertising (33.3%) is the most influential factor, showing that clear, honest messaging builds strong consumer trust. Social responsibility (25.0%) ranks second, reflecting a preference for brands that support societal values and causes. Fair pricing (16.7%) and environmental sustainability (13.3%) are important but viewed as baseline expectations. Ethical sourcing (8.3%) and data privacy (3.3%) are lower priorities for consumers, possibly due to less visibility or immediate impact.

### Marketing Approach & Brand Loyalty: Consumer Preference (n=60)

Preference for Marketing Approach in Building Long-term Brand Loyalty (n=60)



**Interpretation:** Ethical marketing (53.3%) is the top choice, showing strong consumer preference for transparency, integrity, and social responsibility. Traditional marketing (16.7%) is favored comparatively less, which shows the decline in trust of methods adopted in conventional schemes. Both equally (20.0%) suggest value in blending ethical values with traditional methods. Neither (10.0%) reflects possible marketing skepticism or emphasis on other loyalty drivers like product or service quality.

### Perceived Business Outcomes of Ethical Marketing (n=60)

Business Outcome	No. of Respondents	Percentage (%)
Increased Profitability	12	20.0%
Improved Customer Loyalty	18	30.0%
Enhanced Brand Reputation	14	23.3%
Higher Market Share	6	10.0%
Regulatory Compliance	4	6.7%
No Significant Impact	6	10.0%
Total	60	100%



#### Interpretation:

Customer loyalty (30%) is the top perceived benefit, highlighting the value of trust and long-term relationships. The brand

reputation (23.3%) highlights the impact of ethical marketing on public perception and credibility. Increased profitability (20%) shows ethical strategies can drive financial returns through retention and word-of-mouth. Market share & number of significant impacts (10% each) reflect varied views on the speed or visibility of ethical marketing's impact. Regulatory compliance (6.7%) is considered as a basic necessity rather than the advantage of business.

### Ethical Marketing as a Competitive Differentiator (n=60)

Differentiation Factor	No. of Respondent	Percentage (%)
Builds Consumer Trust	20	33.3%
Creates Emotional Brand Connection	10	16.7%
Demonstrates Social/Environmental Responsibility	14	23.3%
Reduces Negative Publicity/Risk	6	10.0%
Enhances Long-Term Brand Value	6	10.0%
Does Not Offer Competitive Edge	4	6.7%
Total	60	100%

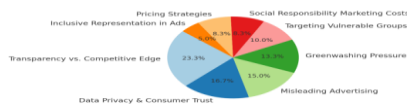
#### Interpretation:

Consumer trust (33.3%) is the top advantage, showing that credibility is crucial in standing out. Social /

environmental responsibility (23.3%) reinforces the value of purposeful brand behavior. Emotional brand connection (16.7%) highlights the power of ethical alignment in forging deep ties. Risk reduction & long-term brand value (10% each) reflect ethical marketing's role in sustainability and reputation management. Only 6.7% see no competitive advantage, showing minimal skepticism.

### Challenges in Balancing Ethical Marketing with Profit Goals (n=60)

Challenges in Balancing Ethical Marketing with Profit Goals (n=60)

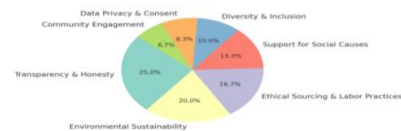


Challenge Area	Respondents	Percentage
Transparency vs. Competitive Edge	14	23.3%
Data Privacy & Consumer Trust	10	16.7%
Misleading Advertising	9	15.0%
Greenwashing Pressure	8	13.3%
Targeting Vulnerable Groups	6	10.0%
Social Responsibility Marketing Costs	5	8.3%
Pricing Strategies	5	8.3%
Inclusive Representation in Ads	3	5.0%
Total	60	100%

shows the importance in false sustainability claims. There are ethical concerns about taking advantage of sensitive audiences when 10% of vulnerable groups are targeted. Pricing concerns and social responsibility costs (8.3% each) indicate a financial pressure in ethical alignment. Less emphasis is placed on inclusive representation (5%) which may indicate that diversity in marketing is not given enough credit.

### Consumer Expectations Shaped by Social Responsibility (n=60)

Consumer Expectations Influenced by Social Responsibility Awareness (n=60)



### Interpretation:

Interpretation: The biggest difficulty is transparency vs. competitive edge (23.3%), which reflects worries about disclosing too much while attempting to uphold trust. Ethical tension between truthful messaging and data use is demonstrated by deceptive advertisements (15%) and data privacy & trust (16.7%). The importance of greenwashing (13.3%) Transparency & Honesty (25%) . Top consumer priority. Clear, truthful communication builds trust. Environmental sustainability (20%) has high demand for eco-friendly operations and green innovation. Ethical sourcing & labor (16.7%) has fair labor practices, and ethical supply chains are increasingly scrutinized. Support for Social Causes (13.3%):

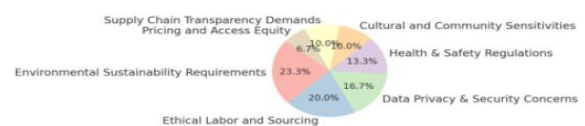
Consumers expect brands to actively contribute to societal well-being. Diversity & Inclusion (10%): Representation in ads, leadership, and the workplace is vital to brand loyalty.

Expectation	Respondents	Percentage
Transparency & Honesty	15	25.0%
Environmental Sustainability	12	20.0%
Ethical Sourcing & Labor Practices	10	16.7%
Support for Social Causes	8	13.3%
Diversity & Inclusion	6	10.0%
Data Privacy & Consent	5	8.3%
Community Engagement	4	6.7%
Total	60	100%

Data Privacy & Consent (8.3%) in ethical data use and consumer control over info remain important. Community Engagement (6.7%) in Local involvement and support for grassroots efforts matter to many.

### Industry Factors Influencing Ethical Marketing (n=60)

Industry Factor	Respondents	Percentage
Environmental Sustainability Requirements	14	23.3%
Ethical Labor and Sourcing	12	20.0%
Data Privacy & Security Concerns	10	16.7%
Health & Safety Regulations	8	13.3%
Cultural and Community Sensitivities	6	10.0%
Supply Chain Transparency Demands	6	10.0%
Pricing and Access Equity	4	6.7%
Total	60	100%



**Interpretation:**

**Top Influencers:**

Environmental Sustainability (23.3%) . Key driver: consumers and regulators demand eco-friendly practices. Ethical Labor & Sourcing (20.0%) is fair treatment, and responsible sourcing builds credibility. Data privacy & security (16.7%) in digital marketing regarding consumer data handled is ethically critical.

**Moderate Factors:**

Health & Safety Regulations (13.3%) ensure consumer trust, especially in sensitive industries. Cultural & Community Sensitivities (10.0%) in marketing must be socially and culturally respectful. Supply Chain Transparency (10.0%): Openness in sourcing enhances trust and ethical perception.

**Least Cited:**

Pricing & Access Equity (6.7%) – Still relevant, especially in accessibility and fair pricing strategies.

It can be concluded that ethical marketing is driven by sustainability, fair sourcing, and data ethics. Brands must adopt a holistic approach that balances operational integrity with evolving consumer expectations for transparency and social responsibility.

**Transparency & Accountability in Ethical Marketing (n=60)**



Measure	Respondents	Percentage
Third-Party Certifications	15	25.0%
Public Reporting on CSR Goals	12	20.0%
Transparent Supply Chain	10	16.7%
Clear Product Labeling	9	15.0%
Open Communication on Mistakes	6	10.0%
Influencer/Partner Disclosure	5	8.3%
Feedback & Complaint Mechanisms	3	5.0%
Total	60	100%

**Interpretation:**

**Top Measures:** Third-party certifications (25.0%) are the external validation that builds strong consumer trust and proves ethical standards. CSR reporting (20.0%) of public updates on corporate social responsibility shows commitment and accountability. Transparent supply chain (16.7%) is the visibility in sourcing that

boosts credibility and trust in brand operations.

**Moderately Valued:** Clear product labeling (15.0%) is the honest product details that support informed consumer choices. Due to arising mistakes (10.0%) and admitting errors build long-term trust and ethical maturity.

**Less Emphasized:** Influencer/Partner Disclosure (8.3%) is relevant in digital marketing but less prioritized. Feedback channels (5.0%) are rarely used, even if it is important for engaging consumers and their issue resolution.

It can be concluded that ethical marketing credibility hinges on certification, transparent CSR communication, and supply chain openness. While influencer transparency and feedback tools matter, companies should prioritize external validation and clear reporting to enhance ethical legitimacy and build consumer trust.

### Resource Allocation for Ethical Marketing (n=60)

Measure	Respondents	Percentage
Third-Party Certifications	15	25.0%
Public Reporting on CSR Goals	12	20.0%
Transparent Supply Chain	10	16.7%
Clear Product Labeling	9	15.0%
Open Communication on Mistakes	6	10.0%
Influencer/Partner Disclosure	5	8.3%
Feedback & Complaint Mechanisms	3	5.0%
Total	60	100%

### Interpretation:

#### Top Focus Areas

Staff Training (21.7%): Highest priority, highlighting the importance of educating employees on ethical standards.

Ethical Supply Chain Auditing (18.3%): Ensures partners and vendors align with ethical practices. Sustainable Product Design

(16.7%): Focus on eco-friendly materials and ethical production methods.

### Moderately Prioritized

Transparent Communication & Labeling (15.0%): Builds trust through clear, honest consumer messaging.

Third-Party Certifications (11.7%): External proof of ethical practices, though currently less emphasized than internal development.

### Lower Priority Areas

CSR Campaigns (10.0%): Important for brand image but secondary to core operations.

Data Ethics & Privacy Tools (6.7%): Surprisingly low focus potential risk area given growing privacy concerns. It can be understood that the companies are prioritizing internal foundations training, ethical sourcing, and sustainable design over external validation and data ethics. This strategy supports long-term integrity but may require more attention to consumer data and public engagement to maintain credibility in a digital-first world.

### Preferred Tools to Evaluate Ethical Marketing Impact (n=60)



Metric/Framework	Respondents	Percentage
Brand Equity Index (BEI)	13	21.7%
Triple Bottom Line (TBL)	11	18.3%
Net Promoter Score (NPS)	10	16.7%
Corporate Social Responsibility Score	9	15.0%
Social Return on Investment (SROI)	7	11.7%
Consumer Trust Index (CTI)	6	10.0%
Sustainability Reporting Standards (GRI/SASB)	4	6.7%
Total	60	100%

### Interpretation:

#### Most Preferred Tools:

Brand Equity Index (21.7%) : Top choice used to track how ethical practices enhance brand value over time.

Triple Bottom Line (18.3%) : Measures impact across people, planet, and profit, emphasizing holistic sustainability.

Net Promoter Score (16.7%) : Focuses on customer loyalty and satisfaction as the key outcomes of ethical branding.

### **Moderately Used Metrics:**

CSR Score (15.0%): Tracks corporate social responsibility alignment with societal expectations.

Social Return on Investment—SROI (11.7%): Links ethical investment to tangible social value, though still not widely used.

### **Less Frequently Used:**

#### **Consumer Trust Index—CTI (10.0%):**

Though this factor is relevant, this metric is slightly complex and hence it is less measured.

**Sustainability Standards (GRI/SASB) (6.7%):** Least used possibly due to perception as financial or operational rather than marketing-focused.

It can be inferred that companies prefer brand-centric and outcome-focused tools like BEI, TBL, and NPS to evaluate ethical marketing. However, formal frameworks like CTI and GRI/SASB remain underutilized, suggesting a gap in structured impact measurement. Adopting these tools could enhance credibility and transparency.

## **VII. FINDINGS**

**Consumer Preferences:** Transparency in advertising (33.3%) is the most influential ethical marketing factor impacting trust and purchasing decisions. A majority of

consumers (53.3%) prefer ethical marketing over traditional approaches, showing a clear shift toward responsible brand behavior. Customer loyalty (30%) and enhanced brand reputation (23.3%) are the top perceived business outcomes of ethical marketing.

**Strategic Differentiation:** Consumer trust (33.3%) is different from the various brands adopted in ethical marketing.

Social/environmental responsibility and emotional connection also strengthen brand positioning.

**Challenges Identified:** Balancing transparency and competitive edge (23.3%) is the most significant challenge. Concerns also include data privacy (16.7%), greenwashing (13.3%), and targeting vulnerable groups (10%).

**Consumer Expectations:** High expectations exist for transparency (25%), environmental sustainability (20%), and ethical sourcing (16.7%). Consumers also value diversity, data consent, and community engagement.

**Industry Pressures:** Industries are influenced by environmental sustainability requirements (23.3%) and ethical labor practices (20%). Data privacy, safety regulations, and cultural sensitivity are also notable factors.

**Accountability Measures:** Third-party certifications (25%) and public CSR reporting (20%) are the most trusted transparency tools. The ethical credibility

can be achieved by providing feasibility in supply chain and adaptable product labeling.

**Resource Allocation:** Companies are focusing on staff training (21.7%), ethical supply chain auditing (18.3%), and sustainable product design (16.7%). Data ethics and CSR campaigns are receiving relatively less investment.

**Evaluation Tools:** Preferred metrics include brand equity index (21.7%), Triple bottom line (18.3%), and net promoter score (16.7%). Formal frameworks like GRI/SASB and consumer trust index are less commonly used, showing a need for more structured assessment.

## VIII. SUGGESTIONS

- Prioritize Transparent Communication
- Strengthen Customer-Centric Ethical Strategies
- Align with Evolving Consumer Expectations
- Build Industry Credibility through Accountability Tools
- Adopt Robust and Standardized Evaluation Frameworks
- Optimize Resource Allocation

To tackle concerns like balancing transparency and competitive edge (23.3%), companies can invest in ethical innovation

creating value without compromising principles, maintaining competitiveness with value-added features,

not misleading promotions, and establishing internal ethical review boards to monitor practices and decisions.

## IX. CONCLUSION

The study on the effectiveness of ethical marketing in competitive markets reveals a growing consumer preference for brands that value transparency, responsibility, and sustainability. Ethical marketing is no longer optional; it is a strategic imperative in today's competitive and conscious consumer environment.

Key factors such as honest advertising, ethical sourcing, and environmental responsibility significantly influence consumer trust, brand loyalty, and long-term profitability. While ethical marketing enhances reputation and customer relationships, challenges like balancing transparency with competitiveness and preventing greenwashing remain. To succeed, organizations must embed ethical practices across all marketing activities. This involves investing in staff training, using standardized evaluation tools, ensuring transparency through certifications, and prioritizing sustainable product development. When done authentically, ethical marketing not only sets brands apart but also builds lasting trust and drives responsible growth.

In conclusion, ethical marketing is a powerful tool for creating value, securing

consumer loyalty, and building resilient, future-ready businesses.

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## *THE TRANSFORMATIVE ROLE OF ARTIFICIAL INTELLIGENCE IN DECISION-MAKING*

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### **Abstract**

This study analyzes the revolutionary impact of Artificial Intelligence (AI) on decision-making processes in different industries. AI considerably enhances precision, shortens response time, and enables planning driven by information based on the analysis of large datasets at record-breaking speeds. This study employed a descriptive and analytical research design using qualitative and quantitative approaches. The findings indicate that more than 70% of the respondents used AI regularly, with 84% citing enhanced decision accuracy. The study concludes that human intervention is still essential for ethical and successful AI integration, recommending XAI, strong ethical standards, and AI literacy for decision-makers to unlock its potential responsibly.

**Keywords:** *Artificial Intelligence (AI), Decision-Making, Predictive Analytics.*

### **I. INTRODUCTION**

In the current age of rapid technological growth, Artificial Intelligence (AI) has become a revolutionary movement in various industries, changing the conventional ways of problem-solving and decision-making. AI, which is the simulation of human intelligent behavior in machines that can be programmed to think, learn, and decide, has greatly increased the efficiency, accuracy, and effectiveness of decision-making. From commerce and medicine to politics and education, AI is transforming the art and science of decision-making, creating new avenues for analysis, forecasting, and strategic planning in these fields.

One of the major strengths of AI in decision-making is its ability to process massive amounts of information at record velocities. Human decision-makers are frequently hampered by information overload, cognitive distortion, and time pressure, which risk degrading the quality of their decisions. AI systems can rapidly sort through vast amounts of data, recognize patterns, and provide insights that might escape human notice. This allows organizations to base their decisions on data-based facts instead of gut feelings or incomplete data. For example, AI algorithms used in the finance industry can examine market trends and investor behavior to suggest the best investment strategies with incredibly high accuracy.

In addition, AI improves decision-making by reducing errors and increasing consistency. In contrast to human beings, who can be swayed by emotions, tiredness, or personal judgment, AI systems operate on logical rules and objective information. This lowers the chances of errors and provides a consistent approach for assessing alternatives and results. In industries such as healthcare, AI-driven diagnostic aids help doctors propose possible diagnoses and treatment procedures based on an in-depth examination of patient information, thus enhancing clinical judgment and outcomes.

Predictive analytics, an effective AI tool, is instrumental in forward-looking decision-making. By applying past data and machine learning algorithms, AI can anticipate future trends, behaviors, and risks. This provides valuable insights into strategic planning for supply chain management, urban growth, and disaster relief. For instance, AI algorithms can identify equipment failure in production workflows so that preventive actions can be taken and unplanned downtime avoided.

In addition, AI enables real-time decision-making in rapidly changing environments. For example, in self-driving cars, AI computers analyze sensor readings in real time to make millisecond-scale decisions regarding navigation, obstacle avoidance, and safety precautions. Similarly, in cyber defense, AI monitors network traffic in real time to identify anomalies and react to threats in real time to protect vital information systems.

Although it has many advantages, integrating AI into decision-making also has drawbacks. Algorithmic bias, transparency issues (the "black box" problem), data privacy issues, and excessive dependence on automated solutions are some of the issues that need to be addressed with care to deploy AI ethically and responsibly. Human oversight must continue to be the central element in AI-informed decision-making to reconcile machine efficiency with human values and judgment.

In summary, AI has great potential to improve decision-making by providing data-driven, timely, and precise decisions in all domains. With the development of technology, the convergence of human and artificial intelligence will shape the future of effective and informed decision-making, promoting progress and innovation within society.

## II. OBJECTIVES OF THE STUDY

- To examine the influence of AI technologies on decision-making accuracy and efficiency within major sectors.
- To determine the extent to which predictive analytics and machine learning can enable data-driven decision-making

- To analyze the ethical, legal, and organizational issues in applying AI to decision-making models

### III. RESEARCH METHODOLOGY

#### 1. Research Design

This study used a descriptive and analytical research design. The goal of this study was to investigate how AI affects decision-making in different areas of society and to assess its impact, advantages, and disadvantages.

Qualitative and quantitative approaches were employed to achieve a rich understanding of the topic.

#### 2. Data Collection Methods

This study employs both primary and secondary data sources.

- **Primary Data:** Gathered through structured questionnaires and interviews with experts, decision-makers, and stakeholders utilizing AI tools in the business, healthcare, and public administration sectors.
- **Secondary Data:** Extracted from academic journals, industry reports, white papers, case studies, and reliable online sources pertaining to the use of AI in decision-making.

#### 3. Sampling Technique

The purposive sampling technique was used to choose respondents with experience using

AI tools in decision-making positions. These include:

- Managers and analysts working in AI companies
- IT professionals.
- Healthcare professionals utilizing AI diagnosis
- A sample size of approximately 75 participants is aimed for, based on availability and pertinence.

#### 4. Research Instruments

A systematic questionnaire was used as the main tool for data collection. It comprised both closed- and open-ended questions.

#### 5. Data Analysis

- Closed-ended question quantitative data will be examined using statistical analyses, such as percentages and cross-tabulations.
- Qualitative data from open-ended questions will be analyzed through thematic analysis for recurring themes, perceptions, and insights regarding the role of AI in decision making.

#### 6. Limitations of the Study

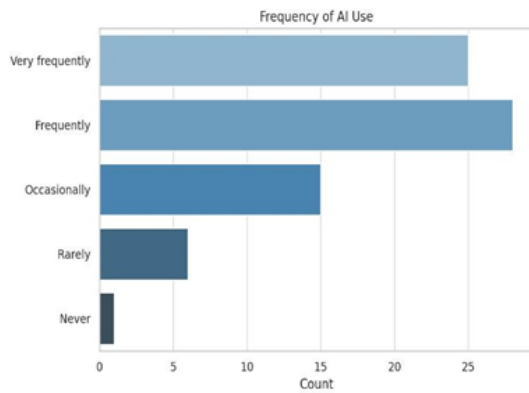
- Sample study results cannot be generalized.
- Respondents' level of knowledge and experience with AI varied, generating uneven responses.

#### IV. DATA ANALYSIS

Table 1. FREQUENCY OF AI USE

Response Category	Count	Percentage
Very frequently	25	33.3%
Frequently	28	37.3%
Occasionally	15	20%
Rarely	6	8%
Never	1	1.4%

Chart 1

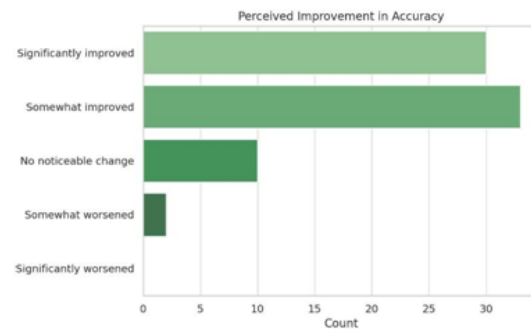


**Interpretation:** A majority (70.6%) of respondents used AI either frequently or very frequently, indicating strong integration of AI in decision-making processes.

Table 2 .Perceived Improvement in Decision Accuracy

Response Category	Count	Percentage
Significantly improved	30	40%
Somewhat improved	33	44%
No noticeable change	10	13.3%
Somewhat worsened	2	2.7%
Significantly worsened		0%

Chart 2

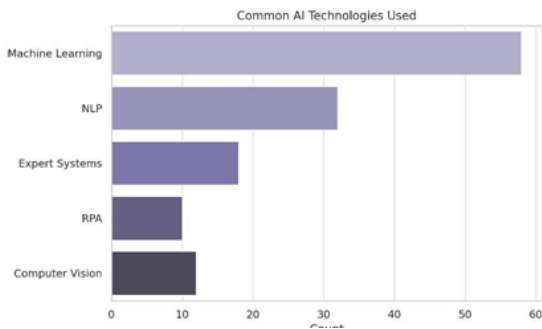


**Interpretation:** A total of 84% of the participants believed that AI had improved decision accuracy, demonstrating widespread confidence in AI's analytical capabilities of AI.

Table 3. Common AI Technologies Used (Open-ended)

AI Technology	Mentions
Machine Learning (ML)	58
Natural Language Processing (NLP)	32
Expert Systems	18
Robotic Process Automation (RPA)	10
Computer Vision	12

Chart 3

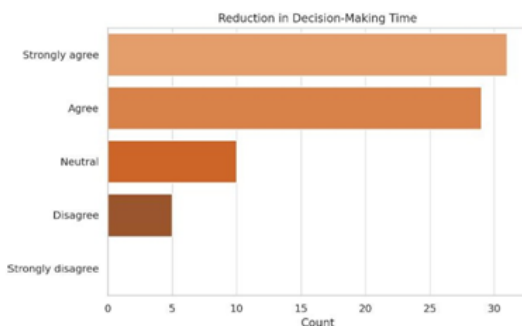


**Interpretation:** Machine learning and NLP are the most commonly used AI technologies in decision-making systems.

Table 4. Reduction in Decision-Making Time

Response Category	Count	Percentage
Strongly agree	31	41.3%
Agree	29	38.7%
Neutral	10	13.3%
Disagree	5	6.7%
Strongly disagree		0%

Chart 4



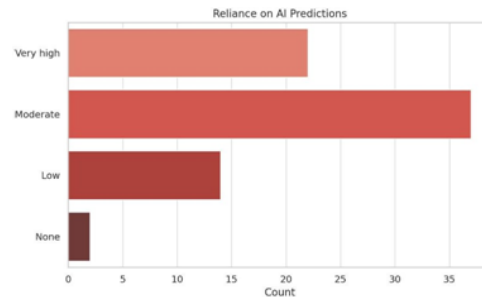
**Interpretation:** Eighty% of respondents agreed that AI has helped accelerate

decision-making and improve operational efficiency.

Table 5. Reliance on AI Predictions

Response Category	Count	Percentage
Very high	22	29.3%
Moderate	37	49.3%
Low	14	18.7%
None	2	2.7%

Chart 5

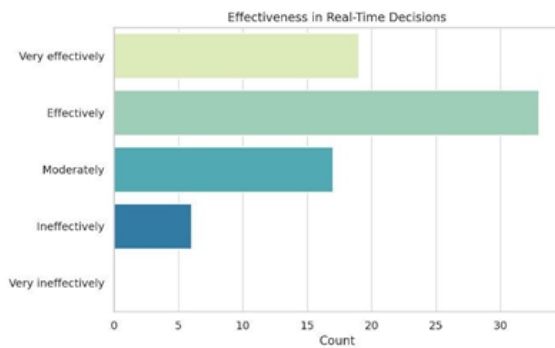


**Interpretation:** A combined 78.6% of respondents relied on AI predictions moderately to highly, showing trust in data-driven foresight.

Table 6. Effectiveness in Real-Time Decision

Response Category	Count	Percentage
Very effectively	19	25.3%
Effectively	33	44%
Moderately effectively	17	22.7%
Ineffectively	6	8%
Very ineffectively		0%

Chart 6



**Interpretation:** A total of 69.3% of the respondents found AI to be effective or very effective in dynamic environments, such as logistic or emergency response.

## V. MAJOR FINDINGS

**Objective 1:** Examine the influence of AI technologies on decision-making accuracy and efficiency within major sectors.

**Finding 1.1: Significant Improvement in Decision Accuracy:** The data overwhelmingly indicate that AI positively influences decision accuracy. A total of 84% of participants believed that AI has either "significantly improved" (40%) or "somewhat improved" (44%) decision accuracy, demonstrating their high confidence in AI's analytical capabilities.

**Finding 1.2: Increased Decision-Making Efficiency:** AI is perceived to significantly enhance the speed and efficiency of decision-making. 80% of respondents "strongly agree" (41.3%) or "agree" (38.7%) that AI has helped accelerate decision-

making, leading to improved operational efficiency.

**Finding 1.3: High Frequency of AI Integration:** AI is already deeply integrated into decision-making processes across sectors, with a strong majority (70.6%) of respondents reporting that they use AI either "frequently" (37.3%) or "very frequently" (33.3%).

**Finding 1.4: Effectiveness in Real-Time Decisions:** AI was found to be highly effective in dynamic environments requiring real-time decisions, with 69.3% of respondents stating it is "effectively" (44%) or "very effectively" (25.3%) used for such purposes.

**Objective 2:** To determine the extent to which predictive analytics and machine learning enable data-driven decision-making.

**Finding 2.1: High Reliance on AI for Data-Driven Foresight:** There significant reliance on AI for predictive capabilities, enabling data-driven decision-making. A combined 78.6% of respondents relied on AI predictions "moderately" (49.3%) to "very high" (29.3%) levels, showcasing their trust in AI's ability to provide data-driven foresight.

**Finding 2.2: Predominance of Machine Learning for Predictive Analytics:** Machine

Learning (ML) was the most commonly used AI technology, explicitly mentioned by 58 respondents. This highlights ML's critical role of ML in powering predictive analytics capabilities that drive data-driven decision-making. Natural Language Processing (NLP) is also a significant contributor (32 mentions), suggesting its role in analyzing unstructured data for insights.

**Objective 3:** Analyze the ethical, legal, and organizational issues in applying AI to decision-making models.

**Finding 3.1: Significant Concerns Regarding AI Transparency (Black Box Issue):** A major challenge is the lack of transparency in AI models. Over half (58.7%) of the respondents reported "Yes" to issues with AI transparency, with "black-box algorithms" and "difficulty in explaining AI outcomes to stakeholders" being key concerns. This indicates the need for more explainable AI solutions.

**Finding 3.2: Critical Ethical and Legal Concerns Identified:** Key ethical and legal concerns associated with AI in decision-making are prominent in the literature. The most frequently mentioned concerns were "data privacy" (41 mentions) and "bias in algorithms" (38 mentions), followed by "accountability and liability" (29 mentions) and "job displacement" (12 mentions). These findings underscore the urgent need for robust ethical guidelines and regulations to address these concerns.

**Finding 3.3: Unwavering Importance of Human Oversight:** Despite the advanced capabilities of AI, human oversight is considered essential in AI decision-making. A vast majority (93.3%) of respondents affirmed the necessity of human oversight, citing reasons such as the "need for ethical judgment," "handling exceptions and anomalies," and "accountability in high-stakes decisions." This highlights the critical role of human intervention in balancing machine efficiency with human values and judgment.

## VI. SUGGESTIONS

Based on these findings, the following key suggestions are made for the responsible and effective integration of AI in decision-making:

- Comprehensive training programs should be implemented for decision-makers across all sectors to enhance their understanding of AI's capabilities, limitations, and ethical implications.
- Invest in the research and development of XAI technologies and encourage their adoption in practical applications. Policies should incentive AI solution providers to offer transparent and interpretable models.
- Develop and enforce clear ethical guidelines and regulatory frameworks that specifically address data privacy, algorithmic bias, and accountability in

AI-driven decision-making. This should involve collaboration between the government, industry, and academia.

- AI systems should be designed with built-in mechanisms for human oversight and intervention, particularly in high-stakes decision-making scenarios. Define clear roles and responsibilities for human operators in monitoring, validating, and overriding AI recommendations.
- Rigorous methods should be developed and implemented for identifying, measuring, and mitigating bias in AI algorithms and the data they are trained on. This includes diverse data collection, bias detection tools, and regular audits of AI systems.
- Establish mechanisms for the ongoing monitoring of AI technological advancements and their implications. Organizations should adopt agile strategies to integrate new AI capabilities responsibly and update their internal policies accordingly.
- Encouraging collaboration between AI developers, ethicists, legal experts, social scientists, and domain-specific decision-makers is essential to create AI solutions that are not only technologically advanced but also ethically sound and socially responsible.

By implementing these suggestions, organizations and policymakers can harness the immense potential of AI to enhance decision-making, proactively address its

inherent risks, and ensure its responsible and ethical deployment.

## VII. CONCLUSION

This study unequivocally affirms the transformative role of Artificial Intelligence (AI) in revolutionizing decision-making processes across various sectors. The study's findings demonstrate a strong integration of AI, with a significant majority of respondents regularly utilizing AI tools, primarily Machine Learning and Natural Language Processing, to enhance their decision-making. The perceived improvements in both accuracy (cited by 84% of participants) and efficiency (80% agreement on accelerated decision-making) underscore AI's immense potential of AI to drive data-driven strategies and optimize operational workflows. Furthermore, AI is highly effective in enabling real-time decisions, which is a critical advantage in dynamic and fast-paced environments.

However, the study also highlights the crucial challenges that necessitate careful consideration for the ethical and successful deployment of AI. The "black box" issue, manifested as concerns about algorithmic transparency and explainability, remained a significant hurdle for over half of the respondents. Moreover, pervasive ethical and legal concerns, particularly regarding data privacy and algorithmic bias, underscore the need for robust regulatory frameworks and proactive mitigation strategies to address these issues. Despite AI's advanced capabilities of AI, this study

found an overwhelming consensus (93.3%) on the indispensable role of human oversight. This emphasizes that while AI can process vast amounts of data and identify patterns with unparalleled speed, human judgment, ethical reasoning, and accountability remain paramount for navigating complex, high-stakes decisions and addressing unforeseen anomalies.

In essence, this study concludes that AI serves as a powerful augmentation of human intelligence, offering unprecedented capabilities for informed and efficient decision-making. However, its full potential can only be responsibly unlocked through a concerted effort to foster XAI, develop strong ethical standards, and cultivate AI literacy among decision-makers. The future of effective and informed decision-making lies not in the complete automation by AI but rather in a synergistic partnership where human intellect and oversight guide and leverage the analytical prowess of artificial intelligence, ensuring progress that is both innovative and equitable.

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## ISOLATION AND CHARACTERIZATION OF AMYLASE PRODUCING BACTERIA FROM PADDY FIELD

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### Abstract

Amylase - producing bacteria are of significant importance in many Industrial Processes such as food processing, textiles, and pharmaceuticals. In this research, the isolation and characterization of amylase-producing bacteria from paddy field soil were emphasized. Soil samples were obtained from various points in a paddy field and were treated with serial dilution and spread plate methods for the isolation of bacteria. The isolates were tested for amylase production on starch agar plates, and amylase activity was verified by iodine staining, which showed clear zones surrounding hydrolyzing colonies. Morphological and biochemical identification of the chosen isolates was carried out, such as Gram staining, catalase, and IMViC tests. The bacterial amylase was also immobilized with sodium alginate to detect and analyse amylase activity. The findings show the occurrence of effective amylase producers in the soil of paddy fields, which are potential candidates for industrial production of enzymes. The significance of the investigation of microbial natural sources for sustainable enzyme production and the importance of enzyme immobilization for industrial applications are highlighted in this research.

### I. INTRODUCTION

Enzymes are proteins that actually act as biological catalysts by accelerating chemical reactions. Substrates are molecules that enzymes can operate with; the enzyme then transforms the substrates into distinct molecules called products. Enzyme catalysis is necessary for nearly all cellular metabolic activities to proceed quickly enough to support life. Enzymes are necessary for the catalysis of individual steps in metabolic processes. Enzymology is the study of enzymes, and pseudoenzyme analysis acknowledges that some enzymes have lost their capacity to perform biological catalysis

over time. This is frequently evident in their amino acid sequences and peculiar "pseudocatalytic" characteristics.

Enzymes are typically globular proteins that may be identified from fibrous proteins by their secondary structure parts' capacity to bind together and form a stable three-dimensional structure. Proteins fold due to pressures that are analogous to those that cause enzymatic catalysis and the formation of antibody- antigen or hormone-receptor complexes.

Amylolytic enzymes are a broad class of enzymes that work with starch and related oligo- and polysaccharides.  $\alpha$ -amylase,  $\beta$ -

amylase, and glucoamylase are the three most well-known amylases ( $\gamma$ -amylase is rarely used). Since glycogen and starch, also known as pullulan, are vital energy sources for microbes, plants, and animals, a wide range of biological systems produce amylolytic enzymes. There are many different kinds of microorganisms in soil that create different kinds of enzymes. One of these, amylase, hydrolyzes starch into its constituent monomers, the smallest of which is glucose. Thus, amylase is a widely used enzyme which is biologically produced by a variety of microorganisms and has a wide range of applications in the industrial sector. A significant amount of amylase can be produced by isolating and commercially cultivating soil bacteria in enormous quantities. Furthermore, optimal conditions are necessary for extracted amylases to exhibit maximum activity.

Amylase enzyme is used in the starch processing industry to break down starch into its simpler sugar components. Alpha-amylase is widely used in the textile industry, detergent manufacturing, sugar production, brewing, and starch processing. It's interesting to note that in 1894, a fungal amylase was the first enzyme to be made industrially. It was employed as a medicinal aid to treat digestive issues (Pandey et al., 2000). About 30% of all enzymes produced worldwide are amylases, which makes them one of the most significant enzymes. These enzymes are present in bacteria, fungi, plants, and animals. Amylase has been found to originate from a variety of microorganisms, including bacteria, fungus,

and yeast, and its characteristics are explained.

## II. METHOD

### A) Isolation of Amylase-Producing Bacteria

Amylase-producing bacteria were isolated from soil samples using the serial dilution method, a commonly employed technique in microbiology to reduce microbial load and facilitate the growth of discrete colonies. Soil suspensions were plated on starch agar medium and incubated at 37°C for 24 hours. The starch agar provided a selective medium for identifying potential amylase producers based on their ability to hydrolyze starch.

### B) Serial Dilution Method

This method helps isolate distinct bacterial strains from complex samples by diluting dense microbial populations. It allows for the development of well-separated colonies, making it easier to identify and characterize enzyme-producing isolates.

### C) Screening of Amylase-Producing Bacteria

Screening for amylase activity was conducted using the starch hydrolysis test. Bacterial isolates grown on starch agar were exposed to iodine solution post-incubation. A clear zone surrounding the colony indicated starch degradation, signifying positive amylase activity. This zone results from the enzymatic breakdown of starch,

which does not react with iodine, unlike the unhydrolyzed regions that form a blue-black complex.

#### *D) Starch Agar Plating*

Starch agar was used as the differential medium to detect amylase-producing bacteria. The presence of soluble starch as the substrate enables the visual identification of enzymatic activity upon staining with iodine.

#### *E) Spread Plate Technique*

The spread plate technique was employed to achieve an even distribution of bacterial cells on starch agar plates. This method allows for the isolation of discrete colonies suitable for further testing and analysis, including starch hydrolysis.

#### *F) Streak Plate Method*

The streak plate method was utilized to obtain pure cultures through mechanical separation. By systematically streaking across the surface of the agar, individual colonies derived from a single bacterial cell could be isolated for further characterization.

#### *G) Characterization of Selected Strains*

### **Morphological Analysis**

Isolated bacterial strains were characterized based on colony morphology, including size, shape, color, elevation, and margin, as well as microscopic examination of cell structure.

### **Gram Staining**

Gram staining differentiated bacterial isolates into Gram-positive and Gram-negative categories based on the structure of their cell walls. This technique remains foundational for taxonomic classification and initial identification.

#### *H) Motility Test (Hanging Drop Method)*

The motility of bacterial strains was examined using the hanging drop technique. This test determined whether the isolates exhibited active movement, a trait associated with flagellated bacteria.

#### *I) Biochemical Characterization*

Biochemical identification was carried out using the IMViC test series—Indole, Methyl Red, Voges-Proskauer, and Citrate utilization. These tests help in distinguishing enteric bacteria based on their metabolic properties.

### **Indole Test**

This test detects the ability of bacteria to break down tryptophan to indole. A positive result is observed as a colored ring at the surface of the test medium after adding indole reagent.

### **Methyl Red Test**

The MR test evaluates the organism's ability to perform mixed acid fermentation, producing stable acidic end-products from

glucose metabolism. A red color indicates a positive result.

### Voges-Proskauer Test

This test detects the production of acetoin, a neutral end product of glucose fermentation via the butanediol pathway. A pink-red color indicates a positive VP result.

### Citrate Utilization Test

The citrate test determines the ability of bacteria to use citrate as the sole carbon source. A positive result is indicated by bacterial growth and a color change from green to blue due to pH increase.

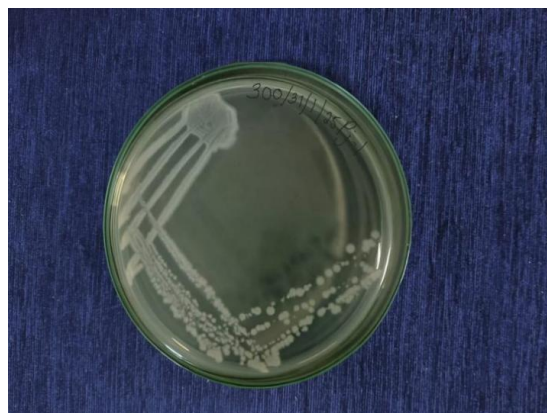
## III. RESULT AND DISCUSSION

### SPREAD PLATE

A clear zone of hydrolysis is obtained when iodine is added to the media results to a positive amylase production.



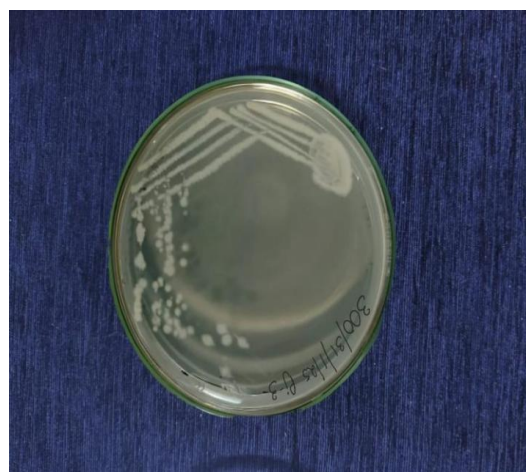
### STREAK PLATE



PJ-1 STRAIN



PJ-2 STRAIN



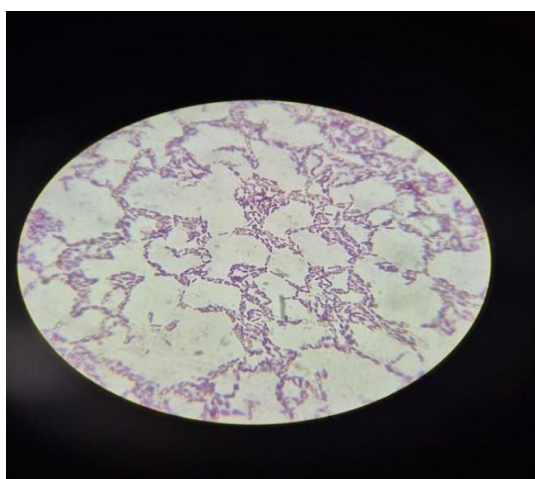
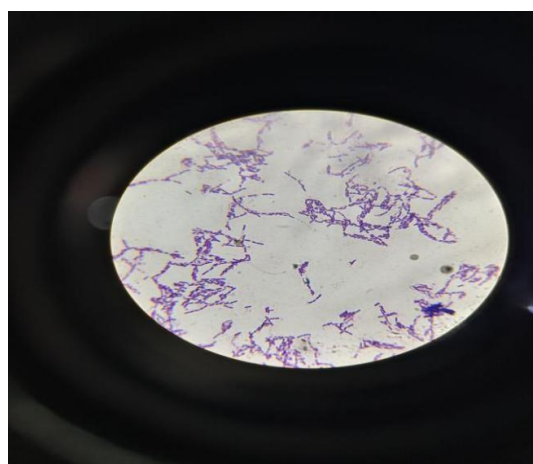
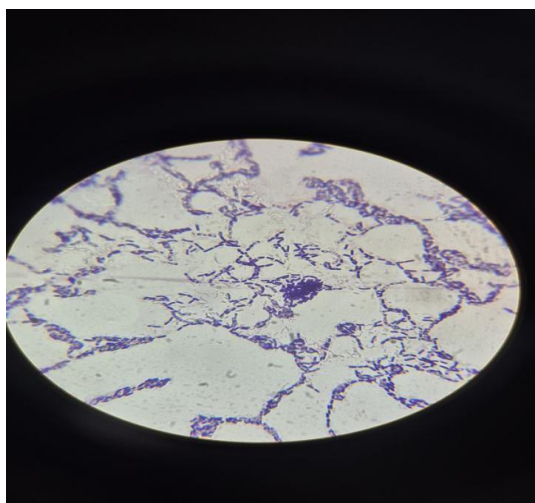
PJ-3 STRAIN



PJ-4 STRAIN

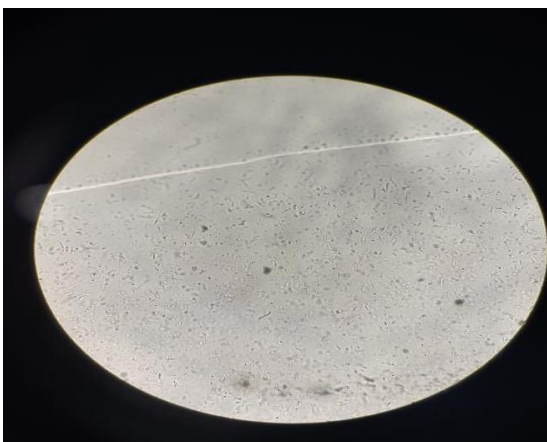


**GRAM STAINING**

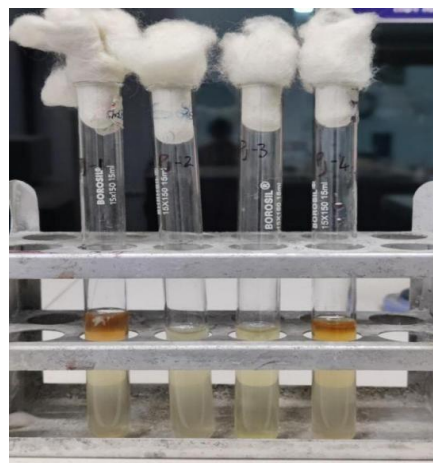


**MOTILITY TEST**

Strain	Gram stain interpretation	Shape of bacteria
Pj-1	positive	Rod
Pj-2	negative	Rod
Pj-3	negative	Rod
Pj-4	positive	Rod

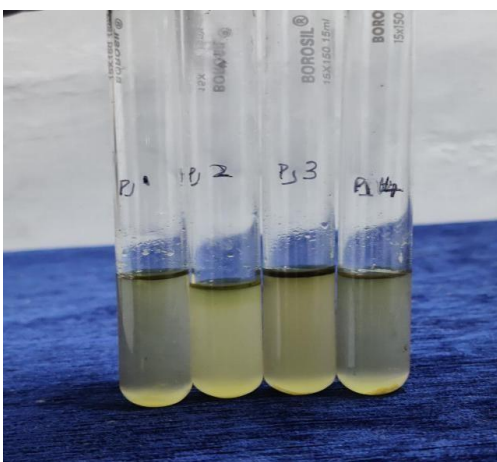


motility found in culture Pj-2



Indole test(Pj-1,Pj-2,Pj-3,Pj-4 are negative)

### BIOCHEMICAL TEST



Methyl Red Test(Pj-1,Pj-2,Pj-3,Pj-4 are negative)



Citrate Utilization Test(Pj-1,Pj-3,Pj-4 is positive and Pj-2 are negative)

### IV. CONCLUSION

The study on amylase-producing bacteria from paddy fields highlights the significant role of these microorganisms in agricultural and industrial applications. The isolation and characterization of these bacteria demonstrate their ability to break down starch efficiently, making them valuable for biotechnological processes, including food, textile, and pharmaceutical industries.

The findings suggest that paddy fields serve as a potential reservoir for highly efficient



Voges-Proskauer Test(Pj-1,Pj-2,Pj-3,Pj-4 are negative)

amylase producers, contributing to sustainable agricultural practices and eco-friendly industrial advancements. Further research on their genetic and enzymatic properties could enhance their application in various bioprocesses.

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## ANTIBACTERIAL ACTIVITY OF CENTELLA ASIATICA AGAINST COMMON THROAT INFECTION

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### Abstract

Centella asiatica is a commonly used natural herb in several ayurvedic medicines. The herb is recommended for the treatment of various skin conditions, diseases of the female genitourinary tract and also for relieving anxiety and improving cognition. Some traditional aspect the plant is used for sore throat. This study is conducted to identify the antimicrobial & phytochemical properties of Centella asiatica against sore throat causing bacteria. Phytochemical analysis of these plant extracts was done to check the presence of useful phytochemicals, so that they have an impact on the bacteria to reduce the throat pain. Overall, research on this topic suggests that Centella asiatica extract possesses promising properties for killing the bacteria responsible for throat pain. Further research is warranted to elucidate the underlying mechanisms and optimize formulations for potential therapeutic applications

**Keywords:** *centella asiatica, antibacterial, phytochemical, staphylococcus aureus.*

### I. INTRODUCTION

Before the introduction of chemical medicines, man relied on the healing properties of medicinal plants. A number of medicinal plants have been proved to offer an alternative to synthetic drugs in preventing and treating various chronic diseases, when they are properly used (Mauri and Pietta, 2000). The effects of herbal medicines are dependent on the chemical constituents present in the plants used. Scientific approach in the use of these herbs started by extracting and isolating bioactive chemicals during 18th century. Screening of these plant constituents plays a vital role in the field of modern medicine as they provide lead drug molecules.

Centella asiatica, also known as Kudavan, has been used for centuries in traditional medicine systems such as Ayurveda, Traditional Chinese Medicine, and others. It's known for its various potential health benefits like wound healing, anti-inflammatory properties, anxiety and stress reduction, skin health etc. It can be used against various disease causing organisms.

Staphylococcus aureus, a bacterium commonly found on the skin and in the nasal passages, can indeed cause throat infections and pain. Staphylococcus aureus throat infections can range from mild to severe, depending on factors such as the strain of bacteria involved and the individual's immune system. Symptoms may include sore throat, difficulty swallowing, swollen glands, fever, and sometimes the

presence of white patches or pus on the tonsils or throat.

The increase in resistance to many commercially produced synthetic antimicrobial agents by microorganisms has been increasing with time hence the need of searching for new antimicrobial agents (Ramesh and Okigbo, 2008). There has been a need to increase alternative antimicrobial agents leading interests of evaluating extracts from plants known to have medicinal value for the manufacturing of herbal antimicrobial agents . the present study is a promising idea against the antibacterial resistance.

## II. METHOD

### A. Plant sampling

The plant, *Centella asiatica* were randomly collected in densely populated areas in Vazhakulam. The plants were then placed on a table and the leaves selected from the plants using the following criteria; The plants were brought to the laboratory and thoroughly washed in running water to remove debris and dust particles (fig 1)

### B. Preparation of plant extract

Washed and cleaned leaves were taken, put it on a mortar and pestle, grind it well by adding small amount of water. Then using a muslin cloth and filter paper filter the contents. centrifuge the taken sample for 10 minutes. Add 1 ml of sample in 2 vials and add 1 ml water in one sample and 1ml ethanol in other sample. Centrifuge it again and preserve the

contents in refrigerator as aqueous and ethanolic extract. (fig 2)

### C. Throat swab collection

Disease-associated Throat swab was obtained from a healthy volunteer having throat pain and willing to dedicate his unwanted throat pain causing bacteria for my research sample. Swab was collected from a healthy volunteer. A sterile swab was used to swab of the volunteer. The plate was prepared by spread plate method using the sample collected by the swab (fig 3).

### D. Isolation and culture of bacterial colonies

Pure culture of bacteria was prepared by spread plate method by using Nutrient Agar medium. The culture is grown and it is identified by catalase test method. Then it is sub cultured into nutrient agar medium for collecting the pure colony. (fig 4)

### E. Phytochemical Analysis

The presence of saponins, tannins, flavonoids, steroids, carbohydrates and alkaloids in the crude extract were determined according to the method defined by Congesta et al (2005). (table 1).

### F. Determining the Antibacterial property of the plant extract

The determination of the antibacterial properties of *Centella asiatica* using the well-making method. The media (MH) are taken in a petri dish. Then punched with wells that

allowed the extract to fill there. Before adding the extract, spread the bacteria on the media with L-rod. Then I added the extract to the well. And find a small zone around the plate.

The bacteria (*S. aureus*) inoculated and mix with extract in peptone water in the ratio of 1:1,1:2,1:3. then identify the most effective ratio of extract using spread plate method in media (MH). The greater ratio shows the better result (fig 5).



Fig 3 : throat swab collection

### III. RESULT AND DISCUSSION



Fig 1 : sample is grinding using mortar & pistle



fig 2 : plant extract after centrifugation



Fig 4 : plated & isolated colonies of *S.aureus*

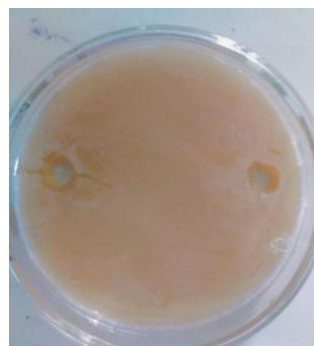


fig 5 : zone formation

SI NO	NAME OF TEST	PURPOSE OF DETECTION	RESULTS
1	Molisch's test	Carbohydrates - Violet colored ring at the junction of 2 liquids	Positive
2	Wagner's test	Alkaloids - Reddish brown precipitate	Positive
3	Lead acetate test	Flavonoids - Yellow precipitate	Positive
4	Foam test	Saponins - Persistent foam production	Positive
5	Bromine water test	Tannins - Discoloration of original solution	Positive

#### IV. CONCLUSION

The antibacterial property of *Centella asiatica* against common throat infection and its phytochemical analysis revealed that the plant extract is useful against common throat infection causing bacteria. Various phytochemicals present in the extract are helpful for its antibacterial activity. Various concentrations of the extract are used in this study to identify the minimum inhibitory concentration. In various concentrations of aqueous and ethanolic extract showed significant antibacterial property. However, the ethanolic extract shows more antibacterial activity than the aqueous extract.

Further analysis is required to convert the plant extract to medicinal purposes. Through this study on *Centella asiatica*, I found that there are many other useful characters present in the plant in which further studies are required.

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# *STRAY DOG ATTACKS AND THEIR IMPACT ON TOURISM IN ALAPPUZHA, KERALA: CHALLENGES AND SUSTAINABLE RESPONSES*

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## **Abstract**

Stray dog attacks are an emerging concern in Alappuzha, Kerala, a popular tourist destination. This study explores tourists' perceptions and the actual impact of stray dogs on tourism experience. Using simple random sampling, a structured questionnaire and interviews were conducted among domestic and foreign tourists. Results reveal a gap between perceived risk and actual incidents, with safety concerns influencing revisit intentions. The study highlights the need for transparent communication, humane stray dog control, and collaborative governance. Recommendations include sterilization drives, creation of shelters, and stakeholder engagement to balance animal welfare and tourism development.

**Keywords:** *Stray dogs, tourism perception, safety, Alappuzha, sustainable response, visitor experience.*

## **I. INTRODUCTION**

Alappuzha, known as the 'Venice of the East', is a major tourist hub in Kerala. However, the rise in stray dog populations has raised public safety concerns and threatens tourism perception. India's stray dog population is estimated between 35–60 million (Bhadra et al., 2021). Increased dog bite cases and aggressive behavior have been reported, impacting tourists' sense of safety (World Health Organization, 2022; The Hindu, 2023). This paper examines the influence of stray dog issues on tourist experiences and suggests sustainable, humane responses for local authorities.

## **II. METHOD**

### *A. Sampling and Data Collection*

Simple random sampling was used to select tourists at key Alappuzha sites. Data was collected via structured questionnaires and interviews, focusing on demographics, awareness, encounters, and perceptions of safety.

### *B. Data Analysis*

Descriptive statistics were used to analyze trends and correlations relevant to tourism management and public safety.

### III. LITERATURE REVIEW

India accounts for a significant share of global rabies deaths, closely linked to stray dog management (World Health Organization, 2022). Tourists' safety perceptions strongly influence destination choice (Nair & Pramanick, 2021; Singh & George, 2019). Bhadra et al. (2021) used socio-ecological analysis to show that food availability and waste management are major predictors of stray dog density, underlining the need for integrated management. Bhalla (2020) and Sharma & Thomas (2021) emphasize integrating public health and urban governance in tourism planning. The Animal Welfare Board of India (2022) and Kumar et al. (2023) advocate for sterilization, vaccination, and community-based management. The UNWTO (2021) calls for multi-stakeholder, humane tourism strategies.

### IV. RESULTS AND DISCUSSION

#### A. Survey Findings

36% of respondents were below 18, 22% aged 18–30, and 18% aged 31–45; 56% male, 42% female; 82% Indian, 18% foreign tourists. Only 42% were aware of stray dog issues before visiting; 14% encountered stray dogs, mainly near tourist spots. 46% perceived stray dog behavior as threatening, though actual attacks were rare (2%). 54% felt unsafe, and 22% said the issue would affect their revisit or recommendation. Only 11% felt authorities were effective.

#### B. Discussion

The gap between perceived and actual risk affects visitor experience. Bhadra et al. (2021) highlight the importance of food source management. Sustainable responses include sterilization, shelters, and public awareness, as recommended by the Animal Welfare Board of India (2022) and Bhalla (2020). Integrating public health and tourism planning is essential (Sharma & Thomas, 2021; UNWTO, 2021).

### V. CONCLUSION

Stray dog presence in Alappuzha, though not statistically dangerous, creates a perceived threat impacting tourism. Humane, inclusive strategies—sterilization, vaccination, shelters, and communication—can ensure safety and coexistence for tourists and animals.

The subscription model permits a low-cost integration option without sacrificing seamless and essential access to high-level information.

### VI. ACKNOWLEDGEMENT

The author thanks all survey participants and supporting staff at Al Ameen College.

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## ***BREAKING STEREOTYPES IN MALAYALAM MYSTERY THRILLERS: THE PORTRAYAL OF HEROINES IN KISHKINDHAKAANDAM AND SOOKSHMADARSHINI***

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### **Abstract**

Malayalam cinema in recent times has undergone many phenomenal changes moving away from stereotypical depictions and is renowned for its artistic merit. This paper tries to examine the shift in focus with regard to the portrayal of female characters in recent Malayalam mystery thrillers. The mystery thrillers, typically focus on male lead roles, with female characters being sidelined. But recent Malayalam cinema saw a noticeable shift in the portrayal of heroines especially in mystery thriller genre. Kishkindha Kaandam (2024) directed by Dinjith Ayyathan and Sookshmadarshini (2024) directed by M.C Jithin stands out from other films of the genre in terms of characterisation and storytelling, portraying female roles with agency and complexity. By analysing both the films a transformation in perspective can be seen, where these films try to convey the main idea through female leads portraying qualities of observation, intelligence and inquisitiveness.

***Keywords: femininity, agency, gender role stereotyping.***

Mystery thrillers present suspense-loaded plots with unexpected twists. Malayalam mystery thrillers are known for its unique story telling with thoughtfully designed plots. Malayalam mystery thrillers evolved over time and female leads portrayed in the genre displayed agency and empowerment. This change in perspective in Malayalam cinema in general took time to evolve from a time where the image of a self-sacrificing, selfless, powerless women being the role model of a perfect women to the one showing agency and empowerment.

Traditional Malayalam industry much like any other film industry always portrayed stereotypical image of woman as a shadow of her man. Male roles are made to

dominate the female. Meena.T.Pillai in her article “Unwrapping Femininity in Malayalam Cinema” says about the portrayal of stereotypical image of women in Malayalam Cinema. She says, “Film after film in Malayalam has created the image of the women who ‘loves’ to cook and clean, wash and scrub, shine and polish for her man (Melaeparambil Aanvedu, Valsalyam, Mayamayooram, Kumkumacheppu, Kudum bapuranam, Thillakkam, Kuruppinte kanakkupusthakam, Nayam Vyakthamak kuka, Rakkuyilin Ragasadassil)”(Pillai, 2010, p. 8). The women portrayed in these films are obviously shown as taking pleasure in being a slave to the man she loves. She also says, “These films have a veritable role in formulating and perpetuating femininity

as a social construct. Most of them serve as manual for femininity, a kind of a reference guide on how the typical ‘Indian’ woman should dress, move and think” (Pillai,2010,p.9). Most of the popular Malayalam films explicitly expressed gender role stereotyping. P. K. Nair in his article “Gender Equations in Malayalam Cinema” says about the stereotyping syndrome in all languages. He says, “Characters, be they men, women or children depicted in our early cinema suffered heavily from the stereotyping syndrome. This is true for all language cinemas including Malayalam” (Nair, 2010, p 28). Malayalam films reinforced a certain mindset which suggested women as inferior to men. In many of the highly popular Malayalam films like Valsalyam (1993), Devasuram (1993), Hitler (1996) etc.. patriarchal control over women is highly celebrated and in such films the characters portrayed by male lead roles is received with high acclaim. These portrayals reflect the social norms and attitudes of the times of their release.

With increasing awareness of gender equality, and shift in societal values, the sidelined roles of women in cinema are now being rejected. Feminist film theory which evolved during the 1960s and 1970s challenges dominant patriarchal narratives. “Feminist film theory criticized on the one hand classical cinema for its stereotyped representation of women, and discussed on the other hand possibilities for a women’s cinema that allowed for representations of female subjectivity and female desire” (Smelik, 2016, p.1) Contemporary feminist film theory continues to evolve and critiques stereotypical representations of women and gender in film. Contemporary films have been moving away from traditional patriarchal structures. The under representation of women in Malayalam cinema has also sparked public debates and discussions, leading to a greater awareness

of the invisibility of women. Many films have been released in recent years which portrayed strong women characters like Pallavi in Uyare (2019) played by Parvathy Thiruvoth, Elsamma in Elsamma Enna Ankutty (2010) played by Ann Augustine etc. Modern Malayalam film industry also delivered blockbusters which were huge box office hits especially during the year 2024. The first half of the year saw movies like Avesham, Manjummel Boys etc. which bagged huge success. But these films were widely criticised for the invisibility of women. There was a shift in perspective towards the end of the year when many films were released which prioritized female lead roles.

Malayalam mystery thriller genre, though relatively new has seen a surge in popularity and quality with films like Drishyam (2013), Memories (2013) etc. These movies sustain a high level of suspense keeping the audience at the edge of the seat, as the characters embark on their journey to figure out the truth. In most of the Malayalam mystery thriller movies, male actors are playing the lead role, trying to figure out the hidden secrets by observing and investigating. The male leads were often portrayed as highly intelligent and observant while the female characters were sidelined and overshadowed by the male lead. They stereotypically sideline the women and the narrative prioritizes the male lead. But recent Malayalam films categorized under mystery thriller genre portrayed female actors playing the lead roles in contrast to other films of the genre.

Contemporary Malayalam thrillers are increasingly showcasing complex and empowered female characters, often portrayed as having agency, driving the narrative forward. Kishkindaandam directed by Dinjith Ayyathan is one of the successful movies released during the year 2024. The lead roles were played by Asif

Ali (Ajayan), and Aparna Balamurali (Aparna). Ajayan and Aparna is a newlywed couple and begins their married life at an old manor, adjacent to a forest, inhabited by monkeys. Ajayan's father Appu Pillai played by Vijayaraghavan, is a retired army man. The movie begins with seemingly straightforward case of a missing revolver which slowly turns into something much more mysterious and thrilling. Appu Pillai's character is peevish and easily irritable. Ajayan, his son seems to adjust everything to the rhythm of the old man. Aparna being the new member of the family tries to adjust with the new home, and is equally curious and inquisitive about the behaviour of her father-in-law.

Aparna is not a passive observer, but takes the initiative to piece together the clues behind the unfolding events and has a keen eye for everything. She displays her brilliance at the beginning itself regarding the investigation of the missing revolver. She continues to observe and investigate the reasons behind the mysterious behaviour of her father-in-law. Appu Pillai behaves rudely towards her during several situations but still she is determined to unfold the mysteries surrounding her new family. Her relentless pursuit takes the narrative to the next level leading to the truth behind the missing of Chachu, Ajayan's son. Aparna delivers a convincing act as a woman slowly fitting into the situation where most would try to flee from. Her relationships with those around her are becoming problematic and complex but she affirms her determination to reach her goal of unfolding the mysteries. She maneuvers through her struggles, yet not a victim and her ability to confront and adapt is the key to unfolding the narrative. Her determination is seen when she tells Ajayan that she is not there for a vacation. When faced with marital tensions, her character confronts it with determination and refuses to succumb to

emotional breakdown. There are several instances in the movie where she confronts both her husband and father-in-law where she displays her unwavering determination in opening up the secrets surrounding her family. Ajayan at times gets irritated by her that he rudely compares her behaviour of inquisitiveness to that of Sherlock Holmes. She involves herself in a manner that reveals her perseverance and self-respect. She affirms herself as a person who belongs to the family of her father-in-law, Ajayan and Ajayan's missing son Chachu. She is constantly continuing her investigation, tracking her father-in-law, suspicious of his grumpy character. She quickly understands Appu Pillai struggle with his memory loss and offers help even though Appu Pillai rudely denies it. Her character evolves slowly displaying complexity and agency. Her character challenges societal expectations of conventional shadowy portrayals of woman.

Aparna batter familial conflicts in her own way not succumbing to emotional breakdown. She is the one who moves the narrative forward. Ajayan seems to hide familial secrets and Appu Pillai's character always remains mysterious. It is through Aparna that audience understands the tensions and mysteries underlying. The film subtly challenges the stereotypical depictions of female characters and critiques societal expectations of women as mere observers and weaker beings by portraying Aparna with complexity and significance.

Another film that breaks the stereotypical image of woman portraying strong female lead is Sookshmasarshini (2024) directed by M C Jithin. Malayalam film industry lacked a female detective and the director chose actor Nazriya Fahadh to play the role. In contrast to other films of the genre, the director breaks the cliché by placing actor Nasriya Fahadh's name first in the title card. Priyadarshini (Nazriya), a microbiology

graduate, along with her friends is all set to unravel the mysteries surrounding Manuel (Basil Joseph) and his mother Grace (Manohari Joy), their new neighbours. The film breaks away from conventional stereotyped portrayals by giving Priya agency, intensity and complexity.

Priyadarshini's intelligence and observation skill is portrayed at the beginning of the movie itself in a scene when Antony (Deepak Parambol), her husband accidentally spills the milk while boiling. He cleaned everything hoping he erased all the traces but Priya could easily find it out by her extraordinary level of keen observation. She notices a mark on the centre of the vessel's bottom. Her extraordinary skill of observation is displayed at various instances in the movie, where most of the times she sidelines her husband. Various instances raise Priya's suspicion about Manuel and her mother. Manuel maintains a positive rapport with his neighbours but Priya thinks of him as rather sly. Manuel kills a monitor lizard, then hosts a party to the neighbours and serves it as beef. She is also suspicious of the reclusive attitude of Grace. Priya being a microbiology graduate displays her observation skill during various instances. Everyone is completely convinced that Grace is an Alzheimer patient but Priya distrusts this as she has observed Grace doing her daily chores. It is through sheer observation, intelligence and inquisitiveness that Priya is finally able to uncover the secrets behind the mysterious vanishing of Diana, Manuel's sister. At times she is led by her instincts. She displays courage and determination during many instances even when her husband warns her to back off from being a nosy neighbour. Her intelligence and observation help her to finally unfold the horrifying truth that Manuel's family conspired and orchestrated Diana's honor killing to suppress the shame

of her sexuality, with Grace who was revealed to be the mastermind of the plan.

Director M C Jithin successfully portrays Priya as a courageous women determined to unravel the mysteries. Traditionally male leads in mystery thrillers are tied to professions like detective or police officer. But here the protagonist is a woman, leading a normal life with her family. MC Jithin describes the film as "A Hitchcockian thriller set in a Sathyam Anthikad world, with a female detective... we all have a detective in our homes" (Menon, 2024).

Priya offers a complex and powerful presence in the film through her intelligence and inquisitiveness and the whole film unfolds through her gaze. Priya's approach is rooted in curiosity and intellectual rigor rather than strength and physical dominance. Intuition leads her at times along with scientific observation and analysis. She displays empathy and her character explores interpersonal dynamics in a close-knit community which are often less emphasized in male leads.

Both Priya and Aparna display agency, intelligence and resilience and challenges traditional roles assigned to woman in mystery thrillers, pushing the narrative forward. They stand as strong pillars of support to their families breaking the cliched image of women as a shadowy figure and a passive observer. They were individuals leading their ordinary lives but determined to solve the extra ordinary events happening around them. Both the characters demonstrate the ability of questioning and noticing the small overlooked details in life. They are portrayed as ordinary in the beginning but becomes extra ordinary when they follow their instincts and intellect. They push the narrative forward with their curiosity and inquisitiveness thereby breaking the gender role stereotyping in mystery thrillers.

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## *EXPLORATION OF MIGRATION AND DISPLACEMENT IN PAYAL KAPADIA'S "ALL WE IMAGINE AS LIGHT"*

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### **Abstract**

All We Imagine as Light is a poignant narrative of migrant lives, who have entangled themselves in the fast-paced life of Mumbai. The Prabha and Anu are timeless representation of migrants who navigate through the nuances of belonging, emotional seclusion, and identity in the city. Kapadia has maintained a subtlety in the portrayal of these uprooted migrant women while depicting their inner struggles with their uprooted past. Anu bridges the gap of her absent family through her romantic involvement with Shiaz. Prabha seems to be a confused soul, caught in the web of uncertainty from her failed marriage. The movie delineates the migrant journey and life in the bustling Mumbai city highlighting the struggles of every internal migrant trying to cope with his/her uprooted psyche. The quiet resilience of these women illuminates the emotional complexities of migrant life also projecting the memories of what is left behind.

***Keywords: Isolation, Urban Displacement, Metropolitan City, Belonging, Migration, Silent Resistance***

Migration and displacement are such imperative factors which can bring immense emotional and psychological vicissitudes in the life of any human being. Payal Kapadia's film "All We Imagine as Light" which is set against the backdrop of Mumbai's relentless expansion, emerges as a beautiful meditation on urban metamorphosis and personal fortitude. In her second feature film, Kapadia delineates a picture that resists easy classification by fusing poetic realism with an in-depth investigation of the lives of its protagonists who are migrated to the city of dreams, Mumbai for the purpose of their employment.

As defined, Migration is a voluntary movement of people from their native place to a different location owing to various reasons including employment, climatic changes etc. These movements can occur within a country or across borders. A migrant, even though have consciously taken the choice, will go through various stages in his/her life to attune with the daunting challenges the process brings in their life. These movements are not merely physical but psychological too. The physical distance from the roots makes it difficult to cope with the new realities of migration. Narratives of migration and displacement often depicts the hardships migrants have to

deal with through the course of their life in a new environment.

The complicated and multifaceted reality of migration is depicted in *All We Imagine as Light*, touching on glitches of caste, class, gender, religion, language, and access. Mumbai and much of India are depicted in a novel way, highlighting a facet of the country's cultural identity that hasn't been observed in the international arena. The movie follows three women, Prabha (Kani Kusruti), Anu (Divya Prabha), and Parvati (Chhaya Kadam) as they navigate their personal struggles in a city which is changing very quickly. Mumbai is more than just a setting; it is a dynamic. Like a living thing, it engages with the individuals and their adversities.

The film captures the essence of Mumbai's commuter life by engrossing the viewer in the daily commotion of the city's railway system. Millions of people rely on the city's local trains as a lifeline, and the opening scenes highlight their inexorable vitality. With the help of these images, the movie introduces us to people who have made Mumbai their second home, a place that has given them enough financial aid and backup. As the story advances, the movie provides a much deeper look into Mumbai's core, capturing its lively, fast-paced atmosphere. A primary focus of the film is the lives of the two women whose existence is intricately linked to Mumbai's local transportation system. Kapadia has wisely used sufficient commuter shorts to prove this intense relationship of these women with movement and displacement.

Mumbai is vividly portrayed as a noisy, bustling metropolis, a characterization brought to life through the clever use of ambient sounds such as construction work, honking traffic, and the rhythmic chaos of its local trains. Through the interweaving of several images of the city's commuter life, the film skillfully conveys the unrelenting intensity of the metropolis and provides a realistic peek into its fast-paced existence.

The movie also portrays their hardships, goals, and how their daily routines are inextricably allied to the ebb and flow of Mumbai's railway traffic. In this vibrant setting, we are introduced to Anu, a free-spirited and romantic lady who appears to disregard the challenges of establishing a life in this so-called "city of dreams." Instead of dwelling on the difficulties, she embraces Mumbai's energy and chooses its constant motion over the ease and peace of her ancestral place. Her passion for the city stems from its boundless vitality, which stands in stark contrast to the problems individuals encounter while attempting to establish themselves here in the city.

Prabha seems to exhibit altogether a varied personality and she is portrayed to be calm and composed at the weightage of her pressures in life. She is depicted as a radiant soul who spreads peace and calm. This calm face is only a façade which hides the silent world of hardship that she is in. She bears all the inner strife and unsaid sorrows with silence. The difficulties Prabha faces in her life are always kept hidden in the inner corners of her soul. While, Anu freely romanticizes the city's busy landscape.

Payal Kapadia has rightly captured the contrast between glittering exterior and the harsh, terrible realities of Mumbai through expressive use of light and shadow. Prabha who is a healthcare provider is portrayed with poetic elegance which is a stark contrast to what she goes through in her daily life- the mental struggles, solitude, silent yearnings etc. The blurred lights of Mumbai reflect her inner mental state, which is torn between broken promises and the severity of her daily existence. Her isolation stems from the cold relationship that she maintains with her spouse who is working in Germany. Her courage with which she manages the inner conflicts is commendable and it is beautifully captured in the film.

Anu, on the other hand, stands for the transgression of social conventions and the yearning for change of a younger generation. The themes of inter-faith relationship and social contentment towards the same is presented through the secret relationship of Anu with Shiaz who from Muslim community. Anu is more likely to disregard conventional standards unlike the matured Prabha. These tensions highlight the generational gap between the characters of Anu and Prabha. Both maintains distinct perspectives on life and love.

A beautiful way to represent the commuter life and the struggles Anu and Prabha undergo is using commuter shots. It is an excellent choice of the filmmaker to portray the journey they have to undergo every single day. The movement, crowded railway system and the gleaming lights- everything

symbolises displacement and migration. Both Anu and Prabha are migrant nurses who have uprooted themselves from native place to this busiest city in pursuit of work and independence. The train, a recurrent visual image, becomes a stirring capsule of their lives, where repetitive travel replicates the broader journey of migration which is filled with motion, anonymity and waiting.

The commuter shots often portray them in quiet, always encircled by unfamiliar faces, stressing the solitude that come with migration, even in public spaces. These travels are not only physical journeys between home and hospital, but it is symbolic of the mental and emotional shifts they endure as migrants in an impersonal, extensive city. The rhythm of the train shows the disparity with the inner quietness or chaos of the characters, creating instants of quiet contemplation amid the confusion of urban life. Through these sequences, Payal Kapadia encapsulate the suspended survival of the migrant torn in between roots and destinations, between belonging and detachment. The commuter scenes thus develop the film's deliberation on the delicateness and resilience of women steering life in an unfamiliar, fast-paced city. The plot of Parvaty enhances the film's examination of displacement even more. After being forced to leave her house by the avarice of cruel real estate developers, Parvaty relocates to a seaside community, which unveils yet another moving aspect of the movie's plot. The change from Mumbai to the village emphasizes themes of loss and the need to fit in, especially in a society that is always changing at the expense of its

weakest members. Moving trains and buses in the film turn into symbols of intimacy, exile, and displacement, providing room for Prabha and Parvati (Chhaya Kadam) to have heart-to-heart talks about absentee husbands and cunning real estate developers.

Disrupting the stereotyped romanticism of Mumbai as a city of dreams is one of the main themes of *All We Imagine as Light*. A type of despair that is rarely addressed in Indian popular culture is experienced by migrants from all over India who come to Mumbai in search of a better life. Rather, it portrays Mumbai as a "city of illusions," as one of the migrant voice-overs in the movie puts it.

The story begins with disembodied migrant voices in many regional languages, including Bengali, Gujarati, Tamil, and Marathi. Viewers hear a voiceover of migrant workers discussing their disillusionment and the "otherness" they felt in Mumbai while a montage of the city plays on screen.

When Prabha and Anu travel to the seaside village in the second half of the movie, where Parvati, finally tired of the incessant harassment from the Mumbai developers, is returning to her childhood home, it's almost a wrench to leave the city's unusually rich and inhabited portrait. However, given the film's broader topic of migration, the location change quickly makes sense. Since Anu and Prabha are both originally from Kerala, we may concentrate more intently on the supportive relationships that have developed between the two women during their little break from the debilitating hustle and bustle of huge Mumbai. We also learn how their seemingly weak relationship

has turned out to have surprising tensile strength.

The theme of migration and solitude amidst the bustling chaos of Mumbai is poignantly captured in the short film, particularly in the scene where Anu calls her mother after Shiaz abruptly cancels their meeting. Anu, who is typically indifferent toward familial connections, is portrayed as someone who rarely initiates contact with her parents—largely due to her disinterest in the monotonous conversations with her mother. Yet, in a moment of emotional vulnerability, she seeks comfort in the familiar, revealing a deeper sense of loneliness beneath her otherwise detached demeanor.

Similarly, the narrative delves into the isolation experienced by another character—a doctor who works alongside Anu and Prabha. Despite being a professional in one of the busiest cities in the world, he finds little purpose or emotional grounding in Mumbai, apart from his quiet admiration for Prabha.

However, his feelings remain unreciprocated, as Prabha is caught in a complicated and emotionally stifling relationship with her husband. Her internal conflict and emotional numbness prevent her from making any decisive moves, adding another layer to the overarching theme of solitude amidst proximity, and the emotional detachment that often accompanies life in a sprawling metropolis.

Parvathy also seems discontented with her life as well. She comments about how flashy everything is in Mumbai and that nobody seems to notice, and in some way,

she also had to join in that race for survival. The problems Parvathy confronted also delineate how hard it was for her to cope with the city life. The character of the male doctor in the hospital also exhibits the troubles of migration and uprootedness. His inability to tune himself to the city and the language is a prime instance of that. He does not believe in the magical part that Mumbai plays in the life of many as it claims and never feels any connection or affinity to the city. The only invisible force that urges him to remain in that foreign place is his liking for Prabha. In the eyes of these characters, Mumbai is not a city of dreams or illusions. Life in the gutter is a better way to put it.

The movie offers a deeply personal and quiet radical depiction of displacement and migration, concentrating not on lofty gestures but on the internal lives of women navigating through unfamiliar places.

Through the characters of Prabha and Anu, the film changes the discourse on relocation away from outdated narratives of labour and crisis toward the more social, emotional, and spatial displacements endured in everyday life. The film's poetic tempo and observational aesthetic let the viewer to occupy the liminal spaces these women inhabit, that too between their home and their work, the tradition and the autonomy, belonging and isolation. Their transitory existence is well portrayed through the images of hospital wards, commuter trains, and cramped homes.

Those images evoke how this movement and displacement entails not only the physical movement of bodies but the overall reconstitution of their self. Payal Kapadia's cinematic language is distinct and it never

captures the gestures of silence, care and shared presence. She defines the migration and displacement both internally and externally as a unique experience which is quite varied from the common.

All We Imagine as Light questions predominant depictions of relocation and displacement by focusing on the marginalized voices and it also redefines the cinematic room through a gendered perspective. Kapadia places her representations within a sensory metropolitan setting that is both domineering and affectionate, exemplifying how movement and dislocation are not always melodramatic but knotted into the fabric of a normal routine and intimate yearning. By showcasing the hesitant conversations, small resistances and shared silences of Anu and Prabha, the film emphasises how displaced women steer through the invisible systems in search of light which is both literal and figurative. The film never falls into a perfect ending. Rather it offers an ambiguous ending, thus allowing the spectators to reflect on the themes of movement, uprootedness, and memory.

Payal Kapadia reimagines the life of migrant workers emotional journey in urban spaces and it is a journey that transcends borders.

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## *‘NO SEATS TAKEN: A QUANTITATIVE STUDY OF TEENAGERS DECLINING CHOICE OF SCIENCE IN SECONDARY SCHOOLING ‘*

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### **Abstract**

The declining interest of teenagers in science subjects at the post-secondary level is a matter of growing concern, especially as nations increasingly rely on science and technology for development. This paper presents a statistical analysis of this trend, exploring the factors behind students' choices and their educational implications. Data collected from 400 secondary school students through a structured questionnaire were analysed using descriptive statistics, logistic regression, and correlation analysis. The results indicate that perceived difficulty, lack of career awareness, and poor teaching methodologies significantly influence students' decisions to opt out of science. The study provides data-driven recommendations for curriculum design, policy reforms, and teacher training to reverse this decline.

***Keywords: Science Education, Student Choice, Career Awareness, Teaching Methodology***

### **I. INTRODUCTION**

Today, no matter what field we are in, we need science, mathematics, engineering, and technology. Despite India's historical emphasis on science and technology, and growing demand for a skilled STEM workforce, there is palpable concern regarding the declining enrollment of teenagers in fundamental science disciplines at the post-secondary level. In recent years according to NEP, as a result of the situation where children are forced to choose subjects

according to their skills, the admissions in science subjects are decreasing day by day. This trend is alarming given that a robust foundation in basic sciences is crucial for advanced research and innovation, as well as sustaining the pipeline of future scientists, educators, and critical thinkers vital for national development. This will become a challenge in the future. Hence we start to find the reason for this using our statistical techniques. The aim of the study was to create a better future for science subjects in our world with a focus on quantifiable

trends, association, and educational implications.

The study also examines external factors such as societal perceptions, career aspirations, teacher influence, and curriculum design. Through surveys and statistical models, it highlights significant differences in choices based on gender, socioeconomic background, and school type. The ultimate goal of the research is to provide evidence-based approvals for educators, policymakers, and curriculum developers to re-engage students with science and ensure a future-ready workforce prepared with critical STEM skills.

## II. STATEMENT OF THE PROBLEM

In recent years, there has been a noticeable decline in the number of students opting for science disciplines at the post-secondary level. This emerging pattern underscores the urgent need for in-depth investigation to better understand the underlying reasons. The issue brings to light the critical role of STEM education and scientific literacy in shaping modern societies. Simultaneously it reflects the various obstacles confronting science education today, including the perception of limited career opportunities and the perception that science curricula are overly demanding or inaccessible.

## III. OBJECTIVES OF THE PROJECT

- To measure the proportion of students opting for science in post-secondary education.

- To identify the statistical relationship between demographic and academic variables and subject choice.
- To analyse the main causes contributing to the lack of interest in science.
- To provide The statistical recommendations to improve student enrolment in science subjects.
- To find out the reasons for the declining interest in science subjects among school students.

## IV. METHODOLOGY

### Source of Data:

Primary Data can be collected directly from school students, college students, working people, and some others using questionnaires and interviews.

### Sampling Technique:

The stratified sampling technique is a sampling procedure adopted. In this method, we divide the population into different subpopulations such as students' employers and others. Various strata are formed in such a way that items within every stratum are homogeneous in character.

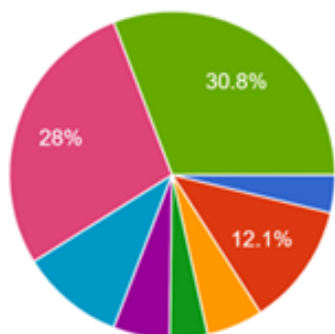
A population of 500 units and a sample of 200 units are to be selected. Suppose the population is divided into 3 strata. Surveys have been conducted including students, employees, and non-employees.

## Tools For Data Collection:

- Questionnaires

## V. RESULTS

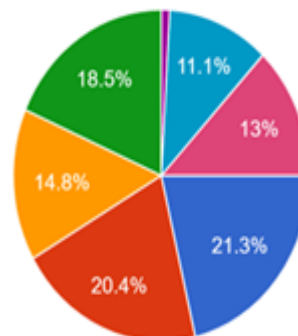
At the school level, most of them are interested in science subjects, but when they come to the college level, they take a stand. Many science topics – especially in physics, chemistry, and mathematics deal with abstract theories, formulas, and models. When these are not linked to practical applications, students may find them too difficult to relate to or understand.



- Physics
- Mathematics
- Chemistry
- Social Science
- Biology
- Language
- Commerce
- Others

In many educational systems, science is a heavy focus on memorization and theory. And also, there is a lack of hands-on experience. Science is fundamentally experimental, but in practice, labs are limited in many schools. Students rarely get to experiment, observe, and discover. They

are just taught to learn and reproduce. Without the practical, discovery-based component science becomes uninspiring.



- Too theoretical
- Heavy workload
- Lack of practical applications
- Complex math involved
- Not enough good teachers
- Insufficiency of appropriate teaching methods
- Other

Then we observe that perception of difficulty in science subjects. It often requires logical reasoning, strong mathematical skills, and analytical thinking. This can terrorize students, especially if they have weak foundations in math. Another reason is the insufficiency of appropriate classes. Many science classes rely heavily on the textbook-based teaching with less focus on real-world applications. Students find the subject disconnected from daily life, leading to a loss of interest.

Compared to professional courses like engineering, medicine, or commerce, pure science degrees may not have a direct career path. Students and parents might see them as risky or less rewarding in terms of job opportunities.

To incentivize greater interest in science among students, it is essential to make the subject more engaging and practical. Incorporating more experiments and lab work allows students to experience concepts hands-on, deepening understanding. Field trips and real-world applications connect classroom learning to the way of life, showing science in action. Using interactive digital tools and videos can bring abstract ideas to life in a visually engaging way. Additionally, offering career guidance in science fields helps students see the value and opportunities in tracking science, making their learning more purposeful. Together, these methods create an active and inspiring science education experience.

## VI. CONCLUSION

The declining enrolment in science subjects at the college level is a multifaceted issue influenced by academic, economic, and social factors. This study highlights key reasons such as the perceived difficulty of science courses, limited awareness about career opportunities, lack of engaging teaching methods, inadequate laboratory facilities, and, in some cases, higher course-related expenses. Colleges becoming autonomous might be a reason students are not choosing science subjects in college. Autonomous colleges may charge higher tuition or lab fees, making science which needs labs, equipment, etc. more expensive than other subjects.

In today's competitive and fast-paced world, both students and parents are increasingly focused on securing employment

immediately after graduation. This shift has placed immense pressure on traditional academic programs—especially pure science disciplines like B.Sc. Mathematics, B.Sc Physics etc .

A student who chooses a 4-year B.Sc. Courses program often finds themselves not professionally qualified or placement-ready upon graduation. To pursue a teaching career—one of the few direct paths available—they must invest in an additional 2-year B.Ed. course followed by a 2-year postgraduate degree (M.Sc.). In total, it takes nearly 8 years of study before they are even eligible to seek professional employment. Even then, getting a job is not easy—clearing competitive exams is a must, and in some unfortunate instances, securing a post may require lakhs of rupees due to the increasing commercialisation of the recruitment process.

In contrast, students who opt for technical or applied science courses—such as engineering, computer science, data analytics, or paramedical studies—are professionally qualified and job-ready by the end of their 4-year program. This practical advantage naturally makes such courses more appealing to students and parents alike.

While institutional changes such as autonomy in colleges are intended to improve academic standards, they may unconsciously contribute to the issue if not implemented effectively—particularly when they result in increased fees or academic pressure without corresponding quality improvements. To reverse this trend, there is a need for systemic reforms, including the

innovation of science curricula, improved science infrastructure, enhanced career guidance, and initiatives to make science education more accessible, affordable, and inspiring. Only by addressing these underlying concerns can we rekindle student interest in science and secure a stronger scientific workforce for the future.

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## *MUSIC MEETS MACHINE LEARNING: PREDICTING SPOTIFY HIT TRACKS*

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### **Abstract**

The prediction of music popularity, especially on streaming platforms like Spotify where it is, has become more useful than ever before. The machine learning process which is the technique of choice is able to make the decision easier and even gives its user the chance to work on the data that he/she has. In this study, we describe an allocation of supervised teaching for songs that are labelled audio tracks as „hit” or „non-hits” depending on energy, danceability, valence, and tempo features. The popularity threshold parameter was introduced to establish the target variable and the issue of class imbalance was solved by applying techniques of class weighting and `scale_pos_weight`. The study juxtaposes the three ensemble models— Random Forest, XGBoost, and LightGBM—that were assessed via different metrics, including accuracy and ROC-AUC ratings. We accentuate the advantages of the interpretability of the model, especially through the feature importance analysis, and consider the challenges due to the imbalanced data. This paper illustrates the use of hit prediction in music marketing and recommendation systems practically while listing the presently existing drawbacks and unexplored predictive music analytics sectors for future works.

***Keywords: Supervised learning, Random Forest, XGBoost, LightGBM, Predictive analytics, Music recommendation systems.***

### **I. INTRODUCTION**

Over the last few years, the digital content in the music industry has burgeoned so drastically that it is nearly impossible to manually identify the songs having a high possibility of commercial success. In the past, the promotion of music depended on the human instinct, historical charts, or social trends. Nevertheless, the machine

learning has provided a more effective and novel solution to the predicted song popularity with the increasing availability of song- level audio features and listener data on platforms like Spotify. Accomplishing this, the techniques employ machine learning to quantify the nonlinear relationships between music elements and the audience's opinion, outperforming the traditional methods. This study investigates the use of supervised machine learning

models to forecast a song's likelihood of becoming a "hit" based on its acoustic qualities. We contrast the predictive capabilities of several ensemble-based learning algorithms, including Random Forest, XGBoost, and LightGBM. Class imbalance, which frequently occurs in hit prediction tasks, is another real-world issue that is addressed in the work. We show how machine learning can be used to support choices in content discovery, recommendation systems, and music marketing through empirical analysis and performance evaluation.

## II. OBJECTIVES

The primary objective of this study is to develop a predictive model that can accurately determine if a Spotify track is a "hit" or "non-hit" based on its acoustic properties. Preprocessing and analyzing a large dataset of Spotify tracks with various acoustic and musical qualities is one of the project's specific goals.

- To create a precise and measurable target variable for "hit" classification by using popularity thresholds.
- Use and compare a number of supervised machine learning algorithms, including Random Forest, XGBoost, and LightGBM, for classification performance.
- To effectively manage class imbalance, employ techniques such as `class_weight` and `scale_pos_weight`.
- Use confusion matrices, classification reports, accuracy, and ROC-AUC to evaluate model performance and identify the top-performing algorithm

- To evaluate model performance using accuracy, ROC-AUC, classification reports, and confusion matrices, identifying the best-performing algorithm.
- To illustrate key elements affecting hit prediction and offer insights for possible application in marketing and music recommendation systems.

## III. LITERATURE REVIEW

The use of machine learning to forecast popular songs has been the subject of numerous studies, especially when using streaming data from websites such as Spotify. By training several models, such as Random Forest and SVM, on more than 1.8 million songs, Middlebrook & Sheik (2019) tackled the "Hit Song Science" problem and were able to predict Billboard hits with 88% accuracy. By testing four machine learning models, Dimolitsas et al. (2023) made a further contribution. They discovered that Random Forest and SVM performed best on a dataset of 18,500 songs, achieving an accuracy of roughly 86%. Using ensemble techniques like gradient-boosted trees and neural networks, Georgieva et al. (Stanford CS229) investigated hit prediction using Spotify's audio features and came to the conclusion that ensemble models performed better than simple classifiers. In order to determine important characteristics like loudness and energy, Dawson et al. (2021) used over 400,000 songs and concentrated on the useful applications of hit prediction for the music industry. They used LASSO and XGBoost to predict popular songs with an accuracy of more than 60%. Even though every study demonstrates how well machine learning predicts hits, there are still a number of issues. With little use of temporal

or user engagement data, many works only use audio features. Furthermore, class disparity—where popular songs constitute a minority—is frequently disregarded, which results in exaggerated performance metrics. Building on this foundation, our study confirms the strong predictive power of ensemble models while directly addressing imbalance and tuning decision thresholds.

#### IV. METHODOLOGY

By categorizing songs as hits or non-hits based on their audio and metadata characteristics, this study used supervised machine learning to forecast the popularity of songs on Spotify. Data preprocessing, feature selection, model training, and evaluation are some of the crucial steps in the methodology.

##### 1. Data Collection

The 232,725 Spotify tracks in the dataset used for this project, which was obtained from Kaggle, include metadata, a popularity score determined by Spotify's platform, and other audio features. The binary target variable was created using the popularity score, which has a range of 0 to 100.

##### 2. Data Preprocessing

A number of preprocessing procedures were carried out to guarantee the dataset's quality and usability:

- **Elimination of Invalid Entry:** Inconsistent string formats, such as "04-Apr," were present in the time\_signature column. Only the numerator component was removed from these, leaving only legitimate musical time signatures (1–7).
- **Missing and Zero Value Handling:** We eliminated rows that had missing values in important columns (such as duration\_ms, tempo, loudness, and popularity). Rows with invalid zero values in columns that had no meaning were also eliminated.
- **Categorical Encoding:** To make machine learning algorithms compatible, label encoding was used to transform categorical variables (genre, key, mode, and time\_signature) into numeric format.
- **Target Variable Construction:** To create a binary target variable, hit, tracks with a popularity score of at least 70 were given a value of 1, and tracks with a score of less than 70 were given a value of 0.
- **Feature Scaling:** The scikit-learn StandardScaler was used to normalize the distributions of all numerical input features. By taking this step, the model was protected from being unduly influenced by features with wide ranges..

##### 3. Feature Selection

Based on availability and domain relevance, 14 features were chosen for model training. These comprise metadata (such as genre, key, and mode) as well as audio-related metrics (such as acousticness, danceability, and loudness). The binary target variable was predicted by the chosen features.

##### 4. Train-Test split

To maintain class distribution, the dataset was split into training and testing subsets in an 80:20 ratio, stratified by the target variable. This made it possible to assess model generalization with accuracy.

### 5. Model Development

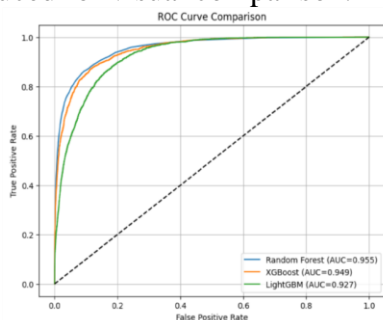
Three models of classification were used:

- **Random Forest Classifier:** An ensemble technique that handles imbalance by employing multiple decision trees that have been trained with class weighting.
- **Extreme Gradient Boosting (XGBoost):** This potent boosting algorithm uses `scale_pos_weight` to prevent overfitting and address class imbalance.
- **Light Gradient Boosting Machine (LightGBM):** This effective gradient boosting framework, which is also set up with class weighting, is renowned for its speed and accuracy.

To maximize model performance, hyperparameters like the number of estimators and class imbalance weights were adjusted.

### 6. Model Evaluation

Standard classification metrics, such as accuracy, precision, recall, F1-score, and ROC-AUC, were used to assess the models. In order to increase recall for the minority class (hits), threshold tuning was also applied to the XGBoost model (e.g., lowering the classification threshold to 0.3). ROC curves and confusion matrices were produced for visual comparison.



## V. RESULT

The project's results show the advantages and disadvantages of the machine learning models that predict the popularity of songs on Spotify.

Among the tested models, Random Forest had the highest overall accuracy and demonstrated outstanding general classification performance. However, it showed relatively poor recall for well-known songs, indicating that it was challenging to correctly identify all true hits. However, by finding a strong balance between precision and recall, XGBoost was able to effectively manage the trade-off between false positives and false negatives. This balance makes XGBoost particularly suitable for applications that need accurate hit identification with minimal misclassification. Although LightGBM's accuracy and recall were slightly lower than those of the other models, it was still very effective and offered good interpretability. However, it is a good choice for big datasets due to its quick training time and scalability. All things considered, these results show the potential of ensemble gradient boosting methods, particularly XGBoost, for Spotify hit song prediction. For musicians and streaming services looking to predict music trends and maximize marketing, the models offer useful insights.

Model	Accuracy	Recall	ROC AUC
Random Forest	0.9649	0.10	0.9528
XGBoost	0.9172	0.83	0.9508
XGBoost (Thresh=0.3)	0.8604	0.90	0.9508
LightGBM	0.8374	0.87	0.9272

## VI. CONCLUSION

This project effectively illustrates how machine learning can be used to predict the popularity of songs on Spotify by categorizing tracks as hits or non-hits using metadata and audio characteristics. The project investigated various algorithms for managing the intricacy and high dimensionality of music data by putting models like Random Forest, XGBoost, and LightGBM into practice. LightGBM and XGBoost performed better than Random Forest among them, attaining the highest accuracy and successfully capturing the

dataset's complex nonlinear relationships. The predictive models' dependability was confirmed by the evaluation metrics, which included accuracy, precision, recall, F1-score, and ROC-AUC. Data cleaning, feature engineering, and normalization are examples of preprocessing techniques that helped produce a solid dataset fit for model training. Furthermore, cross-validation and hyperparameter tuning improved the generalization and performance of the model. In order to better understand and predict what makes a song a hit, the results highlight the significance of data-driven approaches in music popularity prediction. This can help streaming platforms, artists, and producers make decisions about talent scouting, playlist curation, and marketing. The project establishes a framework for further research in this area and emphasizes the value of cutting-edge machine learning methods in tackling the difficulties associated with large-scale music data analysis. This work contributes to more precise and useful insights into music trends and audience preferences by providing a scalable and effective solution.

## VII. FUTURE SCOPE

This project has a wide future scope that presents numerous chances for improvement and broader applications. Adding more data sources, like social media trends, user listening habits, playlist placements, and lyrical content, is a crucial step in enhancing prediction accuracy and giving song popularity a more comprehensive context. The models may be able to adjust dynamically with the addition of real-time streaming data and feedback, which would make the system appropriate for real-time trend analysis and hit potential forecasting. To capture more intricate and nonlinear patterns in music popularity, advanced machine learning techniques can be investigated. These include hybrid models that combine textual, metadata, and audio data, or deep learning architectures like convolutional and recurrent neural networks. The model offers a thorough framework for music analytics and can be expanded to forecast secondary elements like user engagement metrics, regional variations in popularity, or long-term retention. Using the model in a cloud-based or streaming analytics platform could make it easier to integrate marketing tools and music recommendation systems, enabling in-the-moment decision-making. Working together with musicians, record labels, and streaming services may make

it possible to scale this solution internationally, improving talent discovery and music marketing tactics. These developments could make this project a useful tool for figuring out and influencing how music will be consumed and how popular it will be in the future.

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# *PREDICTING HEART ATTACK RISK USING MACHINE LEARNING: A DATA-DRIVEN APPROACH FOR EARLY DETECTION AND PREVENTIVE HEALTHCARE*

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## **Abstract**

Every year, heart attacks result in numerous preventable deaths, making them a serious global health concern. For prompt intervention, at-risk individuals must be identified early. Using medical information such as age, sex, blood pressure, cholesterol, blood sugar, heart rate, type of chest pain, and ECG results, this project creates a machine learning model to predict the risk of a heart attack. We used and compared three algorithms: SVM, Random Forest, and Logistic Regression. Encoding, feature scaling, and handling missing values were all part of the data preprocessing process. Beyond conventional techniques, the models demonstrated a high degree of accuracy in recognizing risk patterns. Healthcare practitioners can use this system to help with early diagnosis and treatment planning. Using bigger datasets, integrating wearable technology, and integrating the model into electronic medical records are possible future advancements. The project emphasizes how AI can improve early diagnosis and preventive healthcare. various datasets, incorporating wearable technology for real-time monitoring, and incorporating the predictive model into electronic health record systems to ensure a smooth transition into clinical settings. In the end, this research shows how artificial intelligence can revolutionize healthcare by assisting in the early detection of life-threatening illnesses and preventing illness..

***Keywords: Heart Attack Prediction, Machine Learning, Early Diagnosis, Healthcare Analytics***

## **I. INTRODUCTION**

Heart attacks are a major cause of death globally, frequently as a result of inadequate treatment and delayed diagnosis. In order to increase survival rates and provide proactive

care, early risk detection is essential. Machine learning (ML) has become a potent tool for forecasting medical conditions based on intricate datasets as artificial intelligence (AI) in healthcare has grown. The goal of this project is to create a machine learning-based model that uses

important medical data, including age, sex, blood pressure, cholesterol, blood sugar, type of chest pain, and ECG results, to predict the risk of a heart attack. These characteristics are key in determining a patient's risk and are known markers of heart health. We used and evaluated several algorithms, including Support Vector Machine (SVM), Random Forest, and Logistic Regression. We carried out data preprocessing to handle missing values, scale features, and encode categories to ensure the models were accurate. The final models showed strong predictive abilities, offering valuable support for early diagnosis and treatment planning. This system highlights how machine learning can improve preventive healthcare and detect serious conditions earlier by aiding faster and more accurate clinical decisions.

## II. OBJECTIVES OF THE PROJECT

- ❖ To develop a machine learning-based model capable of predicting the risk of heart attacks using medical data.
- ❖ To identify and analyze key health parameters—such as age, sex, blood pressure, cholesterol, blood sugar, chest pain type, and ECG results—that significantly contribute to heart attack risk.
- ❖ To apply and compare multiple machine learning algorithms, including Logistic Regression, Random Forest, and Support Vector Machine (SVM), to determine the most effective model.

- ❖ To perform data preprocessing techniques, including handling missing values, feature scaling, and encoding of categorical variables, to improve model accuracy and reliability.
- ❖ To evaluate model performance using appropriate metrics (e.g., accuracy, precision, recall, F1-score) and select the best-performing model for deployment.
- ❖ To provide a decision-support tool for healthcare professionals that aids in early detection and proactive management of heart disease.
- ❖ To explore possibilities for future integration of the predictive model with real-time monitoring systems or electronic health records for clinical use.

## III. LITERATURE REVIEW

Recent research shows that machine learning (ML) and artificial intelligence (AI) are becoming more effective in predicting heart attacks using data-driven, non-invasive methods. In the 2022 study by Alshraideh et al., clinical data from Jordan University Hospital was used to create predictive ML models. These models achieved an accuracy of 93.3% with techniques like Random Forest and SVM. This indicates high precision and suggests potential for integration into hospital systems for real-time risk assessment.

Gamboa-Cruzado et al. (2023) conducted a systematic literature review (SLR) and bibliometric analysis of 3,525 articles, narrowing the focus to 82 relevant studies published between 2017 and 2021. The review pointed out the main use of

algorithms such as Random Forest, SVM, Logistic Regression, and Neural Networks. It also stressed the importance of feature selection, data quality, and ensemble methods in boosting predictive performance. The accuracies of the studies reviewed ranged from 85% to 98%.

Rojek et al. (2021) concentrated on AI-based preventive cardiology. They proposed a tool that uses non-invasive indicators like heart rate, age, BMI, and cholesterol. Logistic Regression provided the best results, with an accuracy of 87.6%, making it suitable for early detection and preventive care focused on modifiable risk factors.

Similarly, Shubham Mall (2020) created a Neural Network model that used clinical features such as age, gender, chest pain type, cholesterol, blood pressure, and pulse rate. This model achieved an accuracy of 89%, aiming to provide a low-cost, accessible solution for early heart disease risk assessment, particularly for younger populations.

Overall, these studies illustrate a shift towards affordable, scalable, and accurate AI-driven tools for predicting heart attacks. They hold significant potential for reducing cardiovascular mortality and improving both clinical and preventive healthcare delivery.

#### IV. METHODOLOGIES

This project uses a clear method that includes collecting data, preprocessing it, selecting features, splitting it into training and testing sets, and developing models using Logistic Regression, Random Forest, and SVM. After that, we evaluate and visualize the results. The aim is to create a reliable system for predicting heart attacks, with plans to integrate it into real-time

healthcare applications, such as wearable devices and electronic health records.

##### 1. Data Collection

The dataset for this project includes medical records that contain important details related to cardiovascular health. These features are age, sex, blood pressure, cholesterol levels, fasting blood sugar, resting heart rate, chest pain type, and electrocardiogram (ECG) results. Each variable is crucial in assessing heart attack risk. This set of data forms the basis for developing machine learning models to predict heart attack risk in people.

##### 2. Data Preprocessing

- **Handling Missing Values:** We addressed missing or incomplete entries by either filling them in or removing them. This ensured that the data was complete and accurate.
- **Encoding Categorical Variables:** We converted categorical features, such as sex and chest pain type, into numerical format using techniques like one-hot encoding.
- **Feature Scaling:** We standardized numerical features using methods like Min-Max scaling or StandardScaler to improve model performance.

##### 3. Feature Selection

Feature selection is an important step in the modeling process that helps boost model efficiency and accuracy. In this project, we selected key features based on domain knowledge, medical relevance, and statistical correlation analysis. This involved examining the relationships between variables to find those most closely linked to

heart attack risk. We removed features that were redundant, irrelevant, or contributed little to prediction accuracy. This process reduced the size of the dataset and helped prevent overfitting. It also lowered computational complexity and improved the model's performance and interpretability.

#### 4. Train-Test Split

We divided the preprocessed dataset into:

- **Training Set:** This set is used to train the machine learning models, typically making up 70 to 80% of the data.
- **Testing Set:** This set evaluates model performance on unseen data, comprising the remaining 20 to 30%.

#### 5. Model Development

In this project, we used three supervised machine learning algorithms to create models that predict heart attack risk: Logistic Regression, Random Forest, and Support Vector Machine (SVM). We chose these algorithms because they work well for classification tasks and are commonly used in medical data analysis.

Logistic Regression is a supervised machine learning algorithm for binary classification, making it suitable for predicting heart attack risk (yes/no). We used it to categorize patients based on factors like age, blood pressure, cholesterol, and ECG results. This algorithm uses a sigmoid function to estimate probabilities and offers clear insights into which features matter most. Its simplicity, interpretability, and efficiency made Logistic Regression a strong baseline model for identifying at-risk individuals.

Random Forest is an ensemble learning algorithm that creates multiple decision trees and combines their outputs to improve accuracy. We used it to predict heart attack risk by identifying complex patterns from features like blood pressure, cholesterol, and ECG results. Its ability to manage non-linear relationships and reduce overfitting made it a reliable model for enhancing prediction performance.

Support Vector Machine (SVM) is a powerful classification algorithm that finds the best boundary between classes. We used SVM to predict heart attack risk by analyzing medical features such as ECG results, heart rate, and cholesterol. It performed well with high-dimensional data and helped increase prediction accuracy by effectively distinguishing between at-risk and non-risk patients.

#### 6. Model Evaluation

The models were assessed using key metrics: accuracy, precision, recall, F1-score, and the confusion matrix to evaluate prediction performance. Additionally, cross-validation was applied to ensure model reliability and reduce the risk of overfitting.

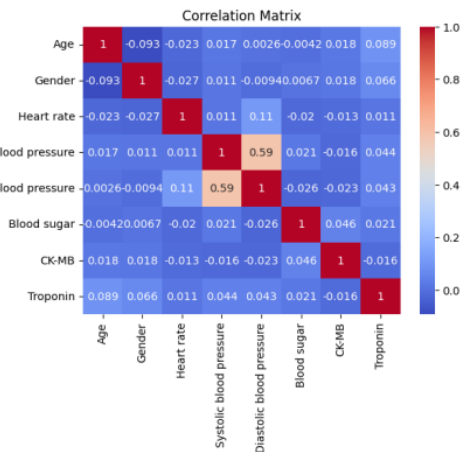
#### 7. Visualization

Visualization is the process of showing data or information in graphical formats like charts, graphs, maps, or plots. It makes complex data easier to understand and helps to spot patterns, trends, and outliers. This supports better decision-making. In data science and machine learning, visualization is a crucial part of exploratory data analysis and presenting model results clearly.

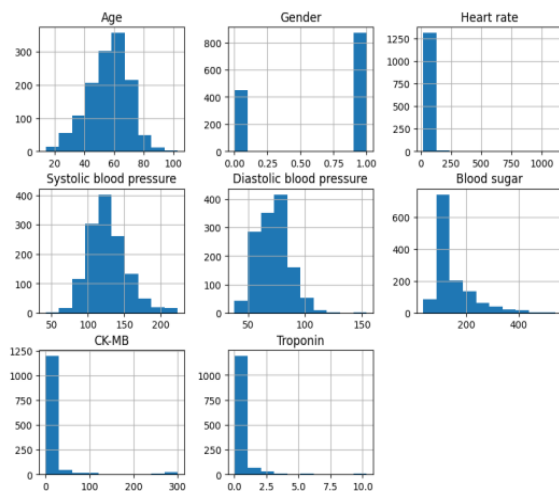
### Heat map:

The correlation coefficient ranges from -1 to 1:

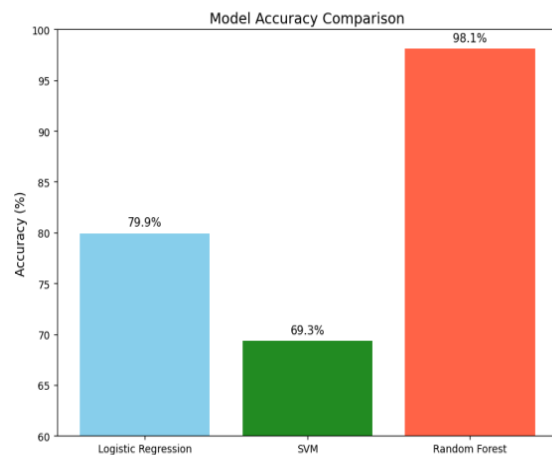
- +1 means perfect positive correlation
- 0 means no correlation
- -1 means perfect negative correlation



**Histogram:** To better understand the nature and spread of the dataset features, a histogram was plotted for each numerical attribute. A histogram is a graphical representation that organizes a group of data points into user-specified ranges (also known as bins). It gives insights into the frequency distribution of the data.



**Model Accuracy Comparison:** is the process of evaluating and comparing how well different machine learning models perform by measuring the percentage of correct predictions. The model with the highest accuracy is usually preferred, but in cases of imbalanced data, other metrics like precision and recall should also be considered



### 8. Future Integration

- Adding more diverse patient records to the dataset
- Combining real-time data from wearable devices, such as smartwatches and ECG patches
- Integrating the model into Electronic Health Record (EHR) systems for clinical use

## V. RESULT

After training and evaluating the models, their performance was tested on the validation dataset using standard evaluation metrics. Among the three algorithms—Logistic Regression, Random Forest, and

Support Vector Machine (SVM)—the Random Forest model achieved the highest overall accuracy at 98%, clearly outperforming Logistic Regression (79%) and SVM (69%). Random Forest also demonstrated the best balance between precision and recall, effectively identifying patients at risk of heart attacks while minimizing false positives. The model's F1-score indicated strong reliability and consistency in predictions. Additionally, all models achieved ROC AUC values above 0.85, confirming good discriminatory power between positive and negative cases. Confusion matrices and ROC curves were plotted to visualize how well the predictions matched actual outcomes. Based on its outstanding and consistent performance across all metrics, the Random Forest classifier was selected as the most effective model for deployment in predicting heart attack risk.

## VI. CONCLUSION

This project successfully showed how machine learning techniques can predict heart attack risk using important medical features like age, cholesterol, blood pressure, blood sugar, chest pain type, and ECG results. By applying and evaluating Logistic Regression, Random Forest, and Support Vector Machine models, the study demonstrated that data-driven methods can reveal patterns that traditional methods might miss. After extensive training and testing, the Random Forest classifier achieved the highest overall accuracy at 98%, clearly surpassing Logistic Regression (79%) and SVM (69%). It also provided the best balance between precision and recall, effectively identifying high-risk patients while reducing false positives, and earned a strong F1-score, which confirms its reliability and consistency. All models had ROC AUC values over 0.85, showing an

excellent ability to differentiate between positive and negative cases. Confusion matrices and ROC curves further highlighted each model's strengths in prediction. Due to its outstanding performance in all evaluation metrics, Random Forest was chosen as the most effective model for deployment. Looking ahead, expanding the dataset with more diverse patient records, integrating real-time monitoring through wearable devices, and incorporating the system into electronic health record platforms will further improve its accuracy and practical value. Overall, this work highlights the strong potential of artificial intelligence to aid early diagnosis, support clinicians in making timely and informed decisions, and ultimately enhance outcomes in cardiovascular care.

## VII. FUTURE SCOPE

The project offers several promising directions for future development. Integration with wearable devices like smartwatches and fitness trackers can enable real-time monitoring of heart health and instant alerts to patients and doctors. Building a mobile or cloud-based application will make the prediction system widely accessible, including in remote areas where traditional healthcare resources are limited. Using larger and more diverse datasets, including genetic information and lifestyle factors, can further improve prediction accuracy and reduce bias. Incorporating real-time monitoring with IoT-enabled sensors can allow the system to track live vital signs and dynamically assess heart attack risk. Finally, clinical integration into hospital and electronic health record systems will help healthcare professionals use the model as a decision-support tool for early diagnosis and better patient management.

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## THE ROLE OF ARTIFICIAL INTELLIGENCE IN ENHANCING CYBERSECURITY: OPPORTUNITIES AND CHALLENGES

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### Abstract

Cybersecurity has become an essential concern in the modern digital landscape, with cyber threats growing in frequency and complexity. Artificial Intelligence (AI) is emerging as a powerful tool to strengthen cyber defense systems. This paper investigates the applications of AI in cybersecurity, focusing on its role in anomaly detection, malware classification, phishing detection, and automated response. While AI offers numerous advantages in scalability, speed, and adaptability, it also presents challenges including data privacy, adversarial attacks, and ethical dilemmas. The paper emphasizes the need for a balanced approach, integrating human expertise with AI capabilities for optimal cybersecurity outcomes.

**Keywords:** *Artificial Intelligence, Cybersecurity, Machine Learning, Anomaly Detection, Threat Response, Data Privacy.*

### I. INTRODUCTION

The reliance on digital infrastructure has led to a surge in cyber-attacks targeting individuals, corporations, and governments. Traditional rule-based security systems struggle to cope with evolving threat landscapes. Artificial Intelligence (AI) has gained traction as a dynamic and adaptive approach to cybersecurity. By learning from data and identifying complex patterns, AI enhances the ability to detect and respond to threats in real-time.

### II. APPLICATIONS OF AI IN CYBERSECURITY

#### A. Anomaly Detection

AI-powered systems can identify unusual behaviour in network traffic, login patterns, or data access that may indicate a cyber threat. Machine learning models trained on historical data help detect deviations that traditional systems might miss.

#### B. Malware Classification

AI assists in analysing and classifying malware based on behavioural and structural features. This enables faster identification of new and polymorphic threats compared to signature-based detection.

#### C. Phishing Detection

Natural Language Processing (NLP) techniques enable AI systems to detect

phishing emails by analysing textual patterns, sender behaviour, and embedded URLs.

#### *D. Automated Threat Response*

AI systems can automatically isolate affected systems, block malicious IPs, and initiate incident response procedures, significantly reducing human response time.

### **III. BENEFITS OF AI IN CYBERSECURITY**

AI offers several advantages:

- **Scalability:** Capable of monitoring extensive network traffic.
- **Speed:** Provides real-time detection and mitigation.
- **Efficiency:** Reduces false positives.
- **Adaptability:** Learns and evolves with emerging threats.

### **IV. CHALLENGES AND ETHICAL CONSIDERATIONS**

#### *A. Data Privacy*

The effectiveness of AI depends on large datasets, which may include sensitive information, raising concerns about data misuse and privacy violations.

#### *B. Adversarial Attacks*

AI systems can be deceived using adversarial inputs crafted to exploit model weaknesses, potentially bypassing security measures.

#### *C. Over-reliance on Automation*

Heavy dependence on AI might erode the analytical skills of cybersecurity professionals and create blind spots in decision-making.

#### *D. Bias and Fairness*

AI models trained on biased data can produce discriminatory results, impacting fairness and effectiveness across different user groups.

### **V. CASE STUDY**

AI in Enterprise Security Enterprises such as IBM and Google have deployed AI-driven security tools. IBM Watson for Cybersecurity supports analysts by rapidly correlating data across millions of documents, reducing threat detection time and improving response accuracy.

### **VI. CONCLUSION**

AI represents a significant advancement in cybersecurity, offering powerful tools to detect, analyse, and respond to threats. However, its deployment must be accompanied by ethical oversight and human intervention to ensure responsible and effective use. A synergistic approach combining AI and human intelligence is essential for building resilient cyber defence systems.

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# QUANTUM WEATHER FORECASTING: A REVIEW OF QUANTUM COMPUTING APPLICATIONS IN METEOROLOGY

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## Abstract

Quantum computing is a subject of interest in multiple fields of science, including the area of numerical weather prediction (NWP). Considering the computational complexity of the conventional ways of predicting the weather, quantum computing can be drastically better than the traditional methods to solve the nonlinear differential equations (Bauer, 2023) and thus impact the future of predicting the weather. This contribution presents recent progress in quantum weather prediction, discussing its benefits, current challenges, and future opportunities. We present a comparative analysis of classical and quantum approaches accompanied by methodological discussions, concrete case studies, and graphical evaluations that exemplify the computational advantages. We also highlight some of the challenges, empirical trends, and research gaps that must be solved before quantum-enhanced forecasting is widely adopted.

## I. INTRODUCTION

Historically, weather forecasting has used classical computational methods to solve intricate differential equations that regulate atmospheric dynamics (Deloitte, 2023). These models, however, can be resource-intensive and have their challenges in scaling. As climate change causes weather extremes to increase, there are better and more efficient ways to track forecasts. “Quantum computing is a new tool that processes several terabytes of data in parallel and solves many complex equations much faster than traditional computers, and is becoming a viable alternative” (Bauer, 2023; Frolov, 2017; Gaitan, 2024; Shukla et al., 2021).

We overview the usage of quantum computation in meteorology, comparing classical and quantum computational

methods. We explore developments in quantum algorithms, their use for numerical weather prediction (NWP), and the constraints that must be addressed in order to enable sensing and communication for quantum computers into the future.

## II. COMPARATIVE ANALYSIS OF CLASSICAL AND QUANTUM APPROACHES

Traditional numerical weather prediction is based on finding numerical solutions for the Navier- Stokes equations describing fluid particles. These models need to use supercomputers and have high computational costs. Quantum computing, on the other hand, brings in quantum algorithms like the Quantum Fourier Transform (QFT) and Quantum Linear Systems Algorithm (QLSA), allowing the

solution of these equations at an exponential speed-up (Frolov, 2017).

Feature	Classical Computing	Quantum Computing
Computational Speed	Limited by Moore's Law	Exponential speed-up in some cases (Bauer, 2023)
Energy Consumption	High, requiring large data centers	Lower energy consumption per operation (Deloitte, 2023)
Algorithm Efficiency	Iterative, requiring multiple steps	Parallel processing for certain problems (Frolov, 2017)
Model Scalability	Limited by hardware constraints	Theoretical scalability with quantum advantage (Gaitan, 2024)

A chart displaying these computational efficiency gains is presented in Figure 1.

### III. LITERATURE REVIEW

Many studies have explored the potential of quantum computing in the realm of weather forecasting. Bauer et al. (2023) focus both on the challenges of implementing quantum computing practically in the meteorological context, as well as considerations of quantum noise and algorithmic optimizations. Frolov (2017): Applications of quantum computing in solving nonlinear differential equations relevant to atmospheric modeling. Additionally, Gaitan (2024) discussed quantum meteorology and its contributions to making forecasting more effective.

Shukla et al. (2021) hybrid quantum-classical approaches combining conventional models with quantum algorithms were investigated to improve weather forecasts. While recent advancements are

promising, there is still a long way to go in, for example, developing the large-scale quantum hardware needed to achieve these results, or to develop quantum models compatible for use with existing weather prediction architectures.

### IV. METHODOLOGIES

Three key quantum weather forecasting approaches are outlined in the following review of methodologies used in the field.

1. Quantum Machine Learning (QML): Applied for improving data assimilation and pattern recognition in meteorology (Deloitte, 2023).
2. Hybrid Quantum-Classical Models: Hybrid models combining quantum algorithms with classical NWP models for optimal computational efficiency (Shukla et al. 2021).
3. Quantum Simulation of Atmospheric Dynamics: Utilizing quantum circuits to model turbulence and large-scale weather patterns (Frolov, 2017).

### V. CASE STUDIES

Here are some case studies that demonstrate quantum computing use cases in meteorology:

- Wider Data Modeling: Quantum algorithms have achieved faster turbulence simulation in controlled environments, with limited real-world applications (Deloitte, 2023).
- Climate pattern statistics: Research utilized quantum computers for large-scale climate trend statistics and showed

potential to improve the accuracy of forecasting (Gaitan, 2024)

- **Quantum-Assisted Data Assimilation:** QML based techniques have been used to merge multiple weather datasets for improved model reliability (Shukla et al., 2021).

## VI. QUANTUM ADVANTAGES IN WEATHER FORECASTING

In some increments of weather forecasting, quantum computing has proven to outperform classical ones. Such as quantum algorithms, which have been demonstrated to potentially reduce the computational complexity of solving partial differential equations, a fundamental aspect of numerical weather prediction (Bauer, 2023). Also, quantum-enhanced machine learning models have helped to improve climate pattern recognition mechanisms, leading to more precise long-term weather forecasts (Gaitan, 2024).

## VII. LIMITATIONS AND CHALLENGES

Yet quantum weather forecasting is not without its major hurdles:

**Hardware Constraints :** “ Current quantum computers have high error rates and limited qubit stability, enabling only large-scale simulations” (Bauer, 2023)

**Data Transfer Bottlenecks:** There are data transfer bottlenecks whereby transferring large meteorological datasets into a quantum-readable format is currently a technological hurdle (Frolov, 2017).

**Scalability Concerns:** Existing quantum processors are unable to tackle weather models on a global scale (Gaitan, 2024).

**Optimisation of Algorithms:** There is a range of quantum algorithms, where they are required to be optimised specifically to be better than classical supercomputers in real-world scenarios (Shukla et al., 2021).

## VIII. FUTURE PROSPECTS

Whether quantum computing can truly help forecast the weather better lies in the eventual improvement of several facets:

- **Development of Quantum Hardware:** New architectures (e.g., superconducting qubits, photonic quantum computing ) could allow for scaling (Bauer, 2023).
- **Hybrid Quantum-Classical Frameworks :** Greater incorporation at the level of classical models can close the gap between existing computational capacity and real- world applications (Deloitte, 2023).
- **Industry and Policy Adoption:** Investments from big tech companies and partnerships with research institutes will drive growth in this area (Deloitte, 2023).

## IX. MARKET SCENARIOS AND QUANTUM APPLICATIONS

A recent analysis by Deloitte (2023) outlines market scenarios where quantum computing applications are expected to grow, particularly in artificial intelligence (AI) and meteorology. Figure 2, sourced from Global Quantum Intelligence (GQI), highlights projected market sizing for quantum

applications from 2024 to 2050. Machine learning-based quantum applications in meteorology, particularly generative AI models and varied AI applications, are expected to gain traction starting in 2026.

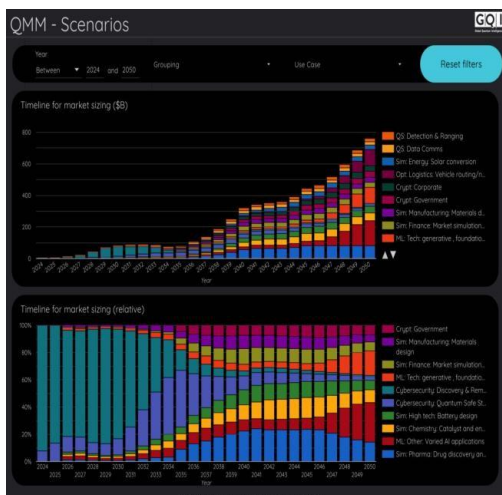


Figure 2. Quantum Market Scenarios for AI and Meteorology (Adapted from Deloitte, 2023).

## X. COMPUTATIONAL IMPROVEMENTS IN SOLVING DIFFERENTIAL EQUATIONS

A custom-generated graph illustrating computational improvements in solving differential equations using quantum algorithms is shown in Figure 3. This visualization highlights the potential speedup achieved with quantum approaches compared to classical numerical methods.

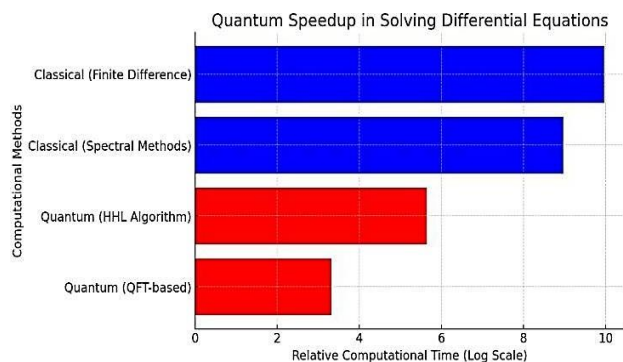


Figure 3. Quantum Speedup in Solving Differential Equations.

## XI. CONCLUSION

This review highlights the transformative potential of quantum computing in weather forecasting while acknowledging existing limitations. Quantum algorithms offer significant computational advantages but remain constrained by hardware and scalability challenges. Continued research, hardware improvements, and hybrid quantum-classical approaches will be essential in realizing practical quantum-enhanced meteorology. Future research should focus on empirical testing of quantum algorithms on real-world meteorological datasets to assess their accuracy and efficiency compared to traditional numerical methods.

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## “ROLE OF SOCIAL MEDIA IN SHAPING YOUTH TRENDS IN FASHION AND LIFESTYLE”

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### **Abstract**

Social media has become a powerful influence in contemporary society, especially shaping how young people view, choose, and behave in relation to fashion and lifestyle. This study investigates the diverse effects of social media platforms on youth, focusing on the ways digital trends, influencers, and online communities mould their sense of style and everyday habits. By reviewing current research and data, the paper reveals how social media encourages youth participation in fashion, supports identity development, and promotes lifestyle experimentation. It also addresses the possible advantages and drawbacks of this digital impact, such as issues with self-esteem, materialism, and cultural uniformity. The results highlight the importance of critical media literacy for young people to successfully navigate the changing digital landscape of fashion and lifestyle. In recent years, social media has played a pivotal role in transforming societal norms, particularly by affecting the fashion and lifestyle decisions of young people. This research examines the complex ways in which social media platforms impact youth, analyzing how digital trends, influential figures, and virtual communities shape their fashion sense and daily routines. Through a review of existing literature and empirical studies, the paper outlines the processes by which social media fosters youth engagement with fashion, aids in the formation of personal identity, and inspires lifestyle experimentation. The discussion also considers the potential risks and rewards of this influence, including concerns about self-image, increased consumerism, and the spread of similar cultural values. The findings stress the need for young people to develop critical media skills to better manage the evolving digital environment surrounding fashion and lifestyle choices.

**Keywords:** *Social Media, Youth, Fashion, Lifestyle, Digital Trends, Media Literacy.*

### **I. INTRODUCTION**

In digital era, social media is a powerful trendsetter in molding youth culture and preferences around the world. Social media

platforms such as Instagram, TikTok, Twitter, and YouTube are more than just communication and entertainment platforms, influencing a large part of everyday life, particularly fashion and lifestyle choices.

Adolescents are increasingly looking to social media as inspiration and counsel in forming their identities through constant exposure to trends, influencers, and viral material.

Social media is not just a trend tool, but also a tool for influencers, celebrities, and regular people to showcase their lifestyles and personal fashion. Therefore, the fashion and lifestyle decisions are increasingly being driven by photos, videos and microblogging updates on these sites. The influencer culture has also transformed the traditional dynamics of the fashion industry, where influencers and online content creators become trendsetters that the traditional fashion houses had a monopoly. This fashion democratization has also allowed young adults to discover and experiment personal styles, usually blending high-fashion with street or vintage, in a personal fusion of styles that best represent their own individuality. Moreover, social media also significantly influences lifestyle aside from fashion, such as in fitness, beauty, travel, food, and health.

The purpose of this research study is to examine more closely the impact of social media on the formation of fashion and lifestyle trends among youth, considering the processes by which these online platforms affect their choice. It will evaluate the saliency of online communities, the influence of influencers, and the interaction between electronic and material fashion in order to understand how social media drives change in the way that young people.

## II. STATEMENT OF THE PROBLEM

To investigate how social media platforms, particularly through influencer marketing and user-generated content, significantly influence the adoption and rapid diffusion of fashion and lifestyle trends among young people, potentially leading to homogenization of style, increased consumerism, and potential negative impacts on self-esteem due to unrealistic beauty standards.

## III. SCOPE OF THE STUDY

The study will assess the impact of social media on lifestyle choices, i.e., well-being, fitness, and wellness, as well as its impact on consumer behavior, particularly in terms of purchasing fashion and lifestyle products. The psychological and social effects of social media, such as body image, self-esteem, and peer pressure, will also be considered. The study will compare cultural and geographical variations in social media trends and analyze the ethical impact of influencer marketing, authenticity, and brand accountability. Finally, the research will predict how emerging technology and platforms will further reshape youth culture and determine future fashion and lifestyle trends.

## IV. OBJECTIVES OF THE STUDY

1. To investigate how social media platforms like Instagram, TikTok, and Facebook influence young

people's clothing choices, personal style, and overall lifestyle .

2. To examine the mechanisms through which trends are created, disseminated, and adopted by youth.
3. To understand how social media acts as a key driver in shaping youth culture through fashion and lifestyle trends.

## V. METHODOLOGY

### 1. Research Design

The study adopts a descriptive research design to examine the influence of social media on the fashion and lifestyle choices of youth. The research aims to identify prevalent trends, sources of influence, and the frequency and depth of social media usage among students at Al-Ameen College, Edathala.

### 2. Target Population

The population for the study consists of students of Al-Ameen College, in the age group of 17–25 years, who are active users of social media platforms such as Instagram, YouTube, Snapchat, and Pinterest, which are popular for fashion and lifestyle content.

### 3. Sampling Design

•**Sampling Technique:** The study uses stratified random sampling to ensure representation from different departments and years of study.

•**Sample Size:** A total of 100 students were selected for the survey, with proportional representation from undergraduate and postgraduate streams.

•**Strata:** Departments (Commerce, Science, Humanities), and year of study (I, II, III year UG and PG).

### 4. Data Collection Methods

#### Primary Data

Primary data was collected using a structured questionnaire administered both in physical format (offline) and through Google Forms (online).

The questionnaire consists of:

- Demographic section: Age, gender, department, year of study.
- Social media usage: Frequency, preferred platforms, average screen time.
- Fashion and lifestyle preferences: Type of content followed, frequency of adapting trends, influence on shopping behavior, grooming, etc.
- Perceived influence: Self-assessment on how much their choices are shaped by online content and influencers.

#### Secondary Data

The secondary data is collected from pre-existing sources such as the internet, books, and magazines. Secondary data helps provide background information and supports the primary data analysis.

### 5. Tools of Analysis

The collected data will be analyzed using:

- Descriptive statistics: Percentages, averages, charts for trend visualization.
- Cross-tabulation: To identify relationships between social media usage and changes in fashion/lifestyle preferences.

## VI. LIMITATIONS OF THE STUDY

1. Restricted Geographical Scope: The study is confined to students of Al-Ameen College, Edathala, and therefore, the findings may not be representative of the broader youth population across other colleges or regions.
2. Limited Sample Size: With a sample size of 100 students, the study may not fully capture the diversity of opinions, behaviors, and experiences among all youth, especially in terms of gender, socio-economic background, or academic streams.
3. Self-reported Data: Most data obtained from questionnaires are self-reported and are prone to biases such as exaggeration, selective memory, or social desirability.
4. Single-minded Fixation with Fashion and Lifestyle: The research is concerned with the social media

influence only on fashion and lifestyle trends, but not on other possible fields such as studies, mental health, political opinions, or career ambitions, which are also highly influenced by social media.

5. Dynamic Nature of Social Media Trends: Social media platforms and trends are evolving, therefore the study results will become less relevant or obsolete in a couple of years.

6. Platform-Specific Impact Not Differentiated Deeply: Though major platforms like Instagram, YouTube, and Snapchat are considered, the study does not delve deeply into the platform-specific mechanisms of influence, such as algorithms, sponsored content, or influencer marketing tactics.

## VII. REVIEW OF LITERATURE

Karki, Pandey & Singh (2025): The research paper explores a timely and culturally significant topic—the influence of social media on youth fashion trends—through a quantitative lens. Grounded in well-established communication theories such as Social Learning Theory, Social Identity Theory and Diffusion of Innovation Theory the study skillfully frames the mechanisms behind trend adoption and identity formation in digital contexts. This research explores the progressive impact of social media on fashion trends among the youth, particularly within the age group of 13 to 35. With

platforms like Instagram, TikTok, Pinterest and YouTube playing a central role, social media has emerged as a dominant force in shaping fashion consciousness and consumer behaviour.

Jain (2025): A mixed-method study from the Indian Journal of Fashion Technology analyzed how influencers, user-generated content, and brand-sponsored posts accelerate trend adoption and reshape brand perception among consumers

Ghosh & Sriram (2023): Conducted a systematic review on how social media communication impacts fashion brands in India. They found that digital economy forces social media to be a key driver in shaping consumer perception and adoption of fashion brands—highlighting challenges and opportunities in the Indian context

Statista (2020): Social media platforms are increasingly becoming the primary medium through which brands engage with young consumers. This has transformed the fashion industry, with brands leveraging user-generated content and influencer partnerships to drive sales.

Djafarova and Trofimenko (2019): The study conducted demonstrated that social media influencers significantly impact young consumers' perceptions of fashion and beauty, with authenticity being a key factor in their influence. Youths are more likely to engage with influencers they perceive as

genuine, leading to a shift in how brands approach digital advertising.

## VII. FINDINGS

**Demographic and Social Profile:** The majority of respondents in the study were young adults aged between of 20 to 25, with a higher representation of males than females. Most of them were unmarried, reflecting a youthful, independent section of population. This group is digitally active and highly connected, thus making them a relevant population to study the impact of social media on fashion and lifestyle trends.

**Social Media Usage and Engagement:** Social media has become an integral part of everyday life for the majority of respondents, with sites like Instagram being a major source of fashion and lifestyle inspiration. The majority of individuals use social media several times a day, scrolling, liking, and sometimes posting fashion-related material. Influencers and celebrities are also strongly featured in their news feeds; yet, the interaction is not as strong—some follow a large set of them, while others follow a few or only sometimes interact with the posts.

**Impact on Fashion and Lifestyle Choices:** The influence of social media on over one's fashion and lifestyle choices is apparent. While some respondents feel strongly influenced by the trends and aesthetics they see online, others experience only moderate or minimal influence. Online purchases are increasingly

frequent, and suggestions acquired on social media, such as reviews and lifestyle vlogs, play a significant part in deciding the items and fashion items and fashion options chosen by people. There are, however, some people who remain cautious or not everyone is easily swayed in acting on social media suggestions.

**Perceptions and Mental Well-being:** The psychological impact of social media on fashion and lifestyle segments is complex. Many respondents acknowledge that social media sometimes imposes unrealistic beauty standards, which may lead to pressure to conform to such idealized fashions. While individuals like to present their individual styles through social media websites, individuals are ambivalent or resistant to posting. Mental health responses varied—some felt the impact depends on the individual, while others believed the influence was largely positive.

**Awareness of Trends and Sustainability :** A growing awareness among the youth regarding the effects of fast fashion and the environmental concerns linked with respect to trends promoted by social media. Whereas most people claim that social media is responsible for the spread and popularity of fashion trends, others compare it to its promotion of inclusivity and diversity. When it comes to preferences, respondents showed a balanced interest in both fashion and lifestyle content, with many valuing authenticity and curated trends alike.

## VIII. CONCLUSION

Social media, in the last decade, has become a key marketing tool, providing new channels for brand visibility. It is now considered an open, participative, and interactive form of public relations. Social media is used by the fashion industry to analyze trends and predict behavior, allowing it to trend as a phenomenon. Social media cannot help but influence fashion. In the 25<sup>th</sup> Century, social network presence by fashion designers is a must. Designers and brands recognizing the significance of social media gain enormous followings. Not only this but fashion bloggers also have a crucial role to play now in the industry. They are thought leaders and have a voice in the industry. The brands are relying on fashion bloggers for the reaction of their products and they are serving as a bridge between the target consumers and the brands. Blogs give a chance to the designer to get feedback regarding their collections. Blogging has given birth to a new muse by giving a chance to the consumers to connect with the brands they love and adore. Earlier, the print media was dominant and powerful but now the power has shifted to the consumers and what in their view is trustworthy. If they think bloggers are trustworthy then it is also believed to be powerful. Now bloggers are a powerful component of the fashion world, giving space for reviews and marketing. Luxury brand pages on social networks mark the presence of a brand also supporting value and public relation establishment.

Trends was found that social media and the fashion world are highly dependent on each other while combination of these two factors have given birth to a new phenomenon into existence. The current prevailing trend is for the fashion industry to embrace blogging because it is determining, changing, and revolutionizing the media industry and its operation. The fashion Industry is now becoming more and more easily accessible to the public all thanks to social media which has massively grown in recent years. Undoubtedly, social media is the hottest trend in fashion in today's world and we have every reason to believe in the power and impact of social media.

The subscription model permits a low-cost integration option without sacrificing seamless and essential access to high-level information.

Overall, GuardianHealth Predict is an investment in the technological future brought into the healthcare world. By making proactive health surveillance more manageable through IoT data aggregation, edge computing, and positive analytics reinforcement, GuardianHealth Predict could change the world of elderly health assessment. With a comprehensive solution, GuardianHealth Predict can vastly improve healthcare quality of life.

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# *IOT-DRIVEN PLATFORM FOR ELDERIOT-BASED INTELLIGENT MEDICINE DISPENSER FOR REMOTE HEALTHCARE MONITORING*

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## **Abstract**

Healthcare industry is such a vast area which is observing rapid developments in terms of research and development of new affordable and reliable solutions for the end users. Inventions that make patient's day-to-day life easier is always have a significant role in the field of global healthcare industry. This paper illustrates about such a futuristic design of an IoT based equipment that make life of elderly patients much easier especially in their daily medicine management routine. The dispenser is programmed to issue reminders, release specific dosages, and notify caregivers or healthcare providers in real time through a connected application or cloud service. The system consists of wide range of sensors, micro controllers, and related electro mechanic components for accurate completion of each medicine dispensing cycle. While the processes like data logs, remote access controls and real-time alerts will be handled by integrated IoT framework. The system is cost-effective, scalable, and can be adapted for both home and clinical environments. After rigorous stages of simulation, and prototype testing processes, it was observed that the system is meeting the expected outcomes and thus becoming an integral part of the future healthcare industry. As we observe a rapid development in the field of smart healthcare systems this work marks its way to a new practical approach towards the current challenges faced by the elderly patients and their caregivers.

***Keywords: IoT (Internet of Things), Smart Healthcare, Automatic Medicine Dispenser, Remote Patient Monitoring, Medication Adherence, Embedded Systems, Healthcare Automation, Real-Time Alerts, Elderly Care, Microcontroller-Based System.***

## **I. INTRODUCTION**

In today's world after a medical practitioner consultation, ensuring timely and accurate medications remains a major challenge for patients with long term critical illness. Generally observed that after first phase of medications, even patients themselves missed to continue the schedules which

make a negative impact on the treatment plan which leads the existing medical history to more complications thus increases the overall treatment costs.

It was observed that many expressed their interests to develop a healthcare system that combines both Internet of Things (IoT) and healthcare systems. IoT generally used to collect the real time data from the connected

systems to process and transmits to the assigned locations. Exploring the wide possibilities of IoT, this paper illustrates design and practical usage of IoT based Automated Medicine Dispenser intend to improve medication adherence and thus being an integral remote healthcare monitoring and treatment.

The proposed system automates the process of medication dispensing by utilizing embedded hardware such as microcontrollers, real-time clocks, and sensors. It is programmed to dispense the correct dosage of medicine at scheduled times and sends alerts or reminders to patients and caregivers via a mobile application or cloud-based platform.

Additionally, the device sends real-time alerts of the successful dispensing and also missed doses, any technical malfunctions, low stock of medicines etc. which helps the next level medical staffs or caregivers to address the issues.

This solution very much useful in the treatment-in-home patients and rural areas where immediate medical supervision is limited. As this system incorporates remote monitoring, it helps the medical staff to ease their monitoring tasks and supports independent living for patients while improving their medications with safety, accuracy, and accountability.

## II. LITERATURE REVIEW

The recent decades witnessed a significant development of medical technologies which harness the vast possibilities of smart systems aimed to improve medical compliances especially among elderly and chronically ill patients. In this literature, we can review key research and developments in the field of automatic medicine

dispensing, IoT-based healthcare systems, and remote patient monitoring.

### A. Smart Medicine Dispensers

There have been many studies been conducted on the design of automatic pill dispensers mainly to eliminate errors related to human interventions. For example, Mr. S T Hossain developed a programmable pill dispenser that alerts users via audio signals at scheduled times. But the system does not had remote monitoring functions, limiting its use to local environments. Similarly, The Author Mr. Nshuman Mishra December 2014 proposed a timer-based dispensing mechanism but did not have real-time data transmission or feedback systems.

### B. IoT Integration in Healthcare

The incorporation of Internet of Things (IoT) in medical industry has enabled remote tracking, data collection and control of medical devices. Mr developed an IoT-enabled health monitoring system using wearable sensors, which could track vital signs and send data to a cloud-based platform for further analysis. Although this improved patient monitoring, it did not address medication adherence directly. Other researchers, like Mr. Nshuman Mishra In 2023 incorporated GSM and Wi-Fi modules into healthcare devices to send alerts and updates to caregivers, which aligns closely with the goals of this project.

### C. Remote Monitoring and Telemedicine

Now a days, as the area of telemedicine expands, there is an increasing demand for systems that allow healthcare providers to monitor patient activities remotely. Earlier Mr. S Sharma introduced a cloud-based platform that collects patient data from various smart devices, including medication

reminders. Even though the platform was scalable, its dependency on external hardware limited the efficiency of real-time medication dispensing and thus reduced total expected outcome.

#### D. Expected Outcome

Although numerous solutions have addressed aspects of medication adherence or remote monitoring, very few systems integrate both into a single, cost-effective, and user-friendly device. Many existing models are either too complex for elderly users or lack real-time connectivity. Below are the requirements for a medicine dispensing system.

- Fully automated dispensing of medicines.
- Sends real-time alerts to users, medical staffs, and caregivers.
- Maintains logs of dispensing process activities.
- Supports remote access control via IoT infrastructure.

The proposed system intends to provide the above essential features along with strengths of embedded systems, IoT connectivity, and cloud-based monitoring to offer a comprehensive and reliable solution for the end users.

### III. PROPOSED FRAMEWORK

The proposed framework collaborates software and hardware components towards the automation of medicine dispensing process and thus enable real-time remote monitoring using IoT technologies. The framework is designed to be user-friendly,

cost-effective, and adaptable for both home and clinical environments

#### A. System Overview

The system design consists of four main components:

1. Medicine Dispensing Unit
2. Microcontroller and Sensor Systems
3. IoT Connectivity system
4. Web/Mobile Based Monitoring Interface

These components work collectively together for timely dispensing, generate real-time alerts, and give remote access to medication data for medical staffs and caregivers.

#### B. Architecture of Hardware

##### **Microcontroller unit:**

Controls Timing, Servo Motor control and communication with linked modules (Eg: Arduino, Raspberry Pi etc.)

##### **Real-Time Clock (RTC) Module:**

Controls drugs are dispensed at the pre-set times.

##### **Stepper motors or servo motors:**

Manage the movement of actual pill dispensing processes from stock containers to the final chamber.

##### **Sensors (such as IR and load cells):**

Detects if the medication has been taken or any errors in completion of dispensing.

##### **Buzzer and LED Displays:**

Provides visual and auditory reminders.

#### C. Software and IoT Layer

**Wi-Fi Network:** For internet connectivity for data transfer.

**Cloud Platform:** To store patient medicine logs and enables remote access for medical staffs and caregivers.

### Mobile App/ Web Interface:

Allows users (or Patients) and caregivers to:

- View prescribed medicine details and history.
- Acknowledge real-time notifications for successfully processed dispensing, missed doses or errors if any.
- Modify the medicine dispensing schedules periodically as directed by the consulting physician.

### D. Operational Sequence

#### Scheduling:

Medicine details, dispensing times and dosages are configured via the mobile app or web interface.

#### Dispensing:

When the scheduled time arrives, the microcontroller activates the motor to dispense the correct dose and triggers a buzzer/LED alert for audio/visual confirmation.

#### Monitoring:

Sensors acknowledges pill retrieval. If the pill is not taken by the user within a defined period, an alert is sent to the caregiver or immediate medical staff.

#### Data Log:

Every process is logged to the cloud database for further review and data analysis.

### E. Features and Benefits

Fully Automated & 100% Accurate

#### Dispensing:

Eliminates human intervention error in medicines, dosage and prescribed timing.

#### Remote Monitoring:

Medical staff/Caregivers can track the activities in real time from any locations.

### User-Friendly Interface:

Ease of controls and mobile access for elderly or non-technical users for hassle free operations.

### Real-time Alerts:

guarantees prompt response in the event that a dosage is missing or administered incorrectly .

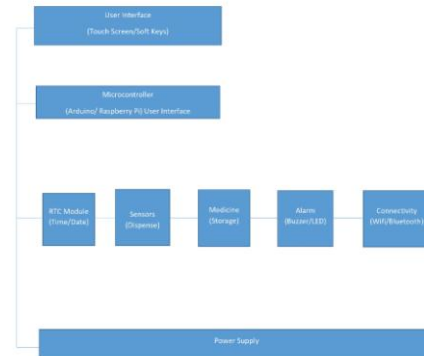


Fig.1. Framework Diagram

## IV. CONCLUSION

This paper presented the concept, design and development of automated medicine dispenser system which is intended to ensure intake of prescribed medicines in compliance with the prescription by the medical consultant. This system operates fully automated integrating the power of IoT with embedded hardware components. Also ensures live tracking of the assigned dispensing processes which can be monitors in real-time by medical staff/caregivers.

By incorporating the features such as pre-set dispensing, pill detection, and cloud data monitoring, the system ensures accurate dosage dispensed in prescribed intervals, eliminates human error, and assures patient independence—especially for the elderly and those with critical illnesses.

In the event of missed dosages or other system failures, medical staff or caregivers can intervene promptly, thanks to the quick

updates provided by the mobile application or web-based interface. The system's potential for scalability, cost-effectiveness, and usability in both home and clinical settings is demonstrated by the outcomes of prototype testing. By connecting technology and patient care, this approach advances the expanding field of smart healthcare.

### Scope of Improvements:

Future improvements may include:

- Integration of AI for predictive analysis and personalized scheduling.
- Use of camera-based pill recognition along with AI database for added accuracy.
- Enhancing security and privacy of medical data through encryption and user authentication methods.

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## *GUARDIAN HEALTH : IOT-DRIVEN PLATFORM FOR ELDERLY INDIVIDUALS*

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### **Abstract**

Guardian Health Predict is an IoT-based elderly health prediction platform which continuously tracks health and measures it to evaluate and instantly inform users of certain medical emergencies. The application interfaces with smart wearable technology already in possession of the user, such as Fitbit, Garmin, and Apple Watch. It assesses heart rate, oxygen levels, blood pressure, temperature, and activity, assessing for drastic changes in vital signs or discrepancies in typical health and activity patterns. Edge computing is used to reduce the latency as the data collected is processed in real-time on-site without the need for the Internet, creating solutions instantly without a horizontal latency approach. The system relies on multiple machine learning techniques, such as Long Short-Term Memory (LSTM) neural network, Random Forest classifier, and anomaly detection. LSTM and anomaly detection consider extremely large data while Random Forest is trained to assess urgency. The multi-faceted threshold alert system alerts caregivers via text message, push notification, and phone call for the most diverse options. The same is true for notifying emergency services. Thus, immediate help is a text or tap away.

Health analytics provides caregivers and medical staff the chance to have improved and quicker decision-making. A scalable subscription model for medical staff and care organizations will guarantee that GuardianHealthPredict will elevate elderly care to the next level with improved reaction times, lower hospital readmission rates, and a greatly expanded quality of life for the elderly. This is the perfect solution for proactive healthcare monitoring as it offers a consistent, in-the-moment solution for continued wellness and appropriate safety measures for the elderly population.

***Keywords: Edge Computing, Long Short-Term Memory (LSTM), Predictive analytics, Random Forest classifier, Anomaly detection.***

### **I. INTRODUCTION**

In the modern world, most of the younger generation in India are moving to other countries for better education and employment. Due to this change, elderly citizens are frequently left to live alone where they must deal with issues including loneliness, reduced mobility, and a lack of

access to emergency medical care. Smart wearable technology bridges the gap between freedom and care and is one such option that is gaining popularity. It enables elderly citizens to live safer, healthier lives, even when their loved ones live far away through advanced technologies such as the Internet of Things (IoT), edge computing, and artificial intelligence (AI).

GuardianHealth uses readings from the latest wearable technology—Fitbit, Garmin, Apple Watch, etc.—to continuously monitor heart rate, O2 saturation, blood pressure, and activity and steps taken per day. When aggregated over time with a vast user base, GuardianHealth can establish a real-time mean of expected averages, which assists in determining when something is amiss and posing a threat to one's health. In addition, edge computing enables this assessment to occur on the user's end with less latency to provide faster answers in emergencies, whether connected or not.

Central to GuardianHealth system capabilities are its AI-driven predictive analytics and the machine learning models used to fuel them; GuardianHealth Predict uses Long Short-Term Memory (LSTM), Random Forest Classifiers, and anomaly detection algorithms. These models comb through the aggregate health data for nonlinear trends and incongruities that reveal an unrecognized health risk and, in turn, alert caregivers and doctors at the first possible onset. Moreover, if the models determine that an alert is warranted, the system features a multi-channel alerting system that ensures caregivers, medical staff, and first responders will all receive real-time alerts via multiple avenues so that no further time is wasted in treatment.

This research paper intends to evaluate the revolutionary technology that renders GuardianHealth possible—from IoT data collection to edge computing framework to AI-driven predictive analytics to alert and escalation procedures. GuardianHealth features a revolutionary, proactive approach

to healthcare monitoring that not only enhances the quality of medical attention for elderly citizens but also empowers their caregivers and health facilities to respond more appropriately to seemingly trivial medical emergencies.

The technologies involved render GuardianHealth a transformative application for the future of elderly health care. GuardianHealth Predict senses a range of popular wearable technology to track continuous readings from such sources as heart rate, oxygen levels, blood pressure, and activity. Ultimately, this constant collection of data establishes a baseline for every user, which enhances its ability to detect anomalies and predict potential health hazards. The platform's reliance on edge computing ensures that data is processed locally, significantly reducing latency and providing swift responses to health-related events, even in low-connectivity environments.

## II. LITERATURE REVIEW

"Deep Learning" by Ian Goodfellow, Yoshua Bengio, and Aaron Courville is connected to GuardianHealth because it contains the theories behind the deep learning used within GuardianHealth. For example, GuardianHealth Predict uses LSTM and Random Forest deep learning models as well as anomaly detection, and with this book, one learns more about the technological developments in these areas, which is meaningful because Guardian

Health Predict derives its health monitoring capabilities from such predictive models.[1]

GuardianHealth connects the concepts from Charu C. Aggarwal's Neural Networks and Deep Learning book with the application of deep learning in GuardianHealth Predict, a healthcare monitoring system that uses AI to forecast and identify possible health risks in real-time. The system relies heavily on deep learning techniques like Long Short-Term Memory (LSTM) networks, Random Forest Classifiers, and Anomaly Detection Models.[2]

GuardianHealth connects the key principles and techniques from Géron's book to the system, which uses machine learning models like LSTM networks, Random Forest classifiers, and Anomaly Detection models, which help to monitor health metrics and predict potential hazards in elderly individuals.[3]

GuardianHealth uses machine learning to predict health hazards in elderly people. It connects the techniques of Christopher M. Bishop's Pattern Recognition and Machine Learning that are especially pertinent for tasks like anomaly detection, predictive modelling, and time-series data analysis.[4]

The researcher aligns core concepts from Kishan G. Mehrota's Anomaly Detection: Principles and Algorithms with the GuardianHealth system that relies on anomaly detection as a primary ML model to solve the problem that exists when there are substantial anomalies in usual health activity. Anomaly detection is a factor in GuardianHealth for finding deviations from

typical physiological patterns that can point to possible health risks for finding deviation from typical physiological patterns that indicate health risks.[5]

The central concepts of the book "Anomaly Detection for Algorithmic Trading" by David Aronson and Timothy Sykes revolve around the execution and necessity of anomaly detection within the finance realm and algorithmic trading platforms. The use of anomaly detection in GuardianHealth, a healthcare monitoring system for elderly individuals, can draw inspiration from the methodologies and frameworks highlighted by Aronson and Sykes in their work. This literature review explores the core ideas presented in their book, focusing on how these concepts can be applied to healthcare anomaly detection and improve the predictive capabilities of GuardianHealth.[6]

Charu Aggarwal surveys ensemble methods for outlier detection, which means combining different detection methods to ease the detection of outliers, or non-nominal or unique events amongst larger trends. She includes in this book a vast body of literature on ensemble methods, which can offer significant performance boosts and dependability to outlier detection systems. Therefore, this literature review will evaluate Aggarwal's conclusions based upon relevance to GuardianHealth, a health monitoring system for the elderly across time that employs sophisticated outlier detection to ascertain if finding something constitutes a major health concern for its clients. Detection through ensemble methods will be relevant to GuardianHealth

as an alternative solution, therefore answering the relevance to real-time health monitoring and subsequent predictive reporting.[7]

With an emphasis on how machine learning may be used to find anomalous patterns, outliers, and uncommon occurrences in complicated datasets, Ellen Friedman offers a perceptive examination of anomaly detection techniques in *Practical Machine Learning: A New Look at Anomaly Detection*. The book provides a novel viewpoint on how machine learning techniques may be successfully applied in a variety of domains, including healthcare, and acts as a theoretical and practical manual for utilizing these methods in anomaly detection. GuardianHealth uses sophisticated anomaly detection techniques to track the health of senior citizens, which will be the main emphasis of this research. [8]

### III. PROPOSED FRAMEWORK

GuardianHealth system operates on a five-layer structure that enables productive data collection, processing, and, in the end, risk identification. Each layer performs different functions to create a seamlessly effective and expandable structure. The proposed framework contains 5 layers.

**Input Layer:** The input layer collects data that includes crucial health metrics, including heart rate, blood pressure, oxygen saturation (SpO<sub>2</sub>), body temperature, and

general activity sensing from all compatible smart wearable devices, from Fitbit to Apple Watch to Garmin, as well as IoT-based medical devices and send updates via Bluetooth, Wi-Fi, or Zigbee for quick collection.

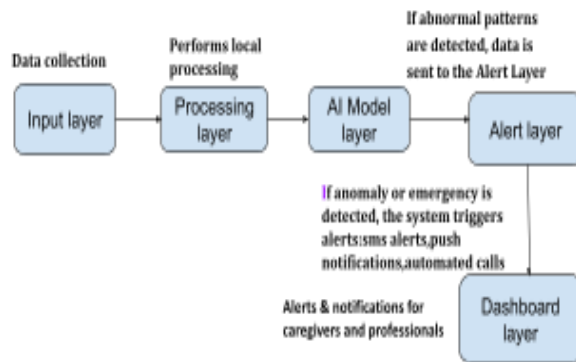
**Processing Layer:** The processing layer utilizes edge computing to filter, preprocess, and analyze data received. Raspberry Pi4 and NVIDIA Jetson Nano exist as edge computing nodes; thus, the localized processing reduces latency and ensures constant connectivity does not need to be established.

**AI Model Layer:** The AI model layer predicts through processed data. This layer utilizes machine learning models, including LSTM networks for patterns in the sequential occurrence of health indicators, Random Forest Classifiers for understanding patterns related to falls or other concerns needing attention, and Anomaly Detection Models used to identify unexpected spikes or drops in significant indicators.

**Alert Layer:** The alert layer is the notification part that allows for urgent alerts to go through various channels: SMS Alerts to send texts to caregivers in case of problematic situations, Push Notifications to provide visual indications for concerning patterns that are not emergencies and Automated Phone Calls to highlight those needs that are life-threatening.

**Dashboard Layer:** Through this layer caregivers, health professionals, and family members interact with the information. Constructed in React technology, the dashboard provides real-time and

retrospective analysis of trends, which helps assess better risk determination. Through the integration of these five layers, Guardian Health provides a thorough care monitoring solution that relies on speed, accuracy and proper timing when treating senior citizens.



#### IV. CONCLUSION

GuardianHealth Predict resolves numerous issues surrounding elderly health management monitoring. Between IoT data aggregation, edge computing for latency reduction, and AI predictive elements, this platform could serve as the next step to bolster elderly patient health and wellness. Additionally, this system enables 24/7 identification of vital signs with wearables and the ability to predict injury before it happens, reducing risks before issues become irreparable. The real-time monitoring dashboard developed on React technology, allows for easy access to real-time and historical data, that helps caregivers a quick understanding of modalities. They will know whether changes in behaviours need further exploration based on prior readings or if something new appears. Simultaneously, the alert systems

and escalation channels allow for rapid notification to caregivers and other appropriate personnel, should immediate medical action be necessary. Thus, the system can act as an effective tool for medical emergencies. When it comes to medical history, data security is essential. GuardianHealth Predict is predicated upon the trust of its patient population. TLS and AES encryption standards allow for safe transmission and storage of sensitive medical data while legally complying with HIPAA and GDPR expected thresholds. Therefore, GuardianHealth Predict will make it a reliable selection due to consistent compliance with security measures and ethical requirements. In addition, this platform offers a workable business solution for nursing homes, assisted living operations, and in-home caregivers. With decreased readmission due to stabilized responses to urgent medical assessments, improved emergency times with instant notification efforts from GuardianHealth and improved compliance with actions taken away from medical emergencies, GuardianHealth Predict supports strong relationships between caregivers and facilitators.

The subscription model permits a low-cost integration option without sacrificing seamless and essential access to high-level information.

Overall, GuardianHealth Predict is an investment in the technological future brought into the healthcare world. By making proactive health surveillance more manageable through IoT data aggregation,

edge computing, and positive analytics reinforcement, GuardianHealth Predict could change the world of elderly health assessment. With a comprehensive solution, GuardianHealth Predict can vastly improve healthcare quality of life.

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## *LEXCURA: A SUPPORTIVE SYSTEM FOR STUDENTS WITH DYSLEXIA*

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### **Abstract**

The web app is basically designed to help children with dyslexia. Dyslexia is a common learning disorder that can make reading and writing a bit challenging. Traditional teaching methods are really difficult to meet the needs of users, especially for their personalized needs. This web app uses technologies like speech-to-text, text-to-speech, AI chatbot, fonts and the wholesite narration that provides personalized exercises. All of these make learning more interactive for students, the website aims to improve reading and writing skills while offering a very user- friendly experience for children.

**Keywords:** *AI Chatbot, Dyslexia, Speech-to-text, Text-to- speech, Font*

### **I. INTRODUCTION**

Dyslexia is a prevalent neuro developmental condition that significantly hinders a child's ability to read and write, rendering traditional learning methods ineffective. This learning challenge not only adversely affects academic performance but also erodes self-confidence and hampers social interactions. With the rising incidence of dyslexia, there is a pressing need for innovative, accessible solutions that meet the diverse learning needs of affected children.

Advancements in technology , particularly in artificialintelligence (AI) and machine

learning, present remarkable opportunities to revolutionize educational approaches for children with dyslexia. Adaptive learning platforms can now deliver personalized experiences that specifically address the challenges these learners encounter. By utilizing these advanced tools, we can greatly enhance literacy skills and provide parents and educators with valuable, actionable feedback for effective intervention.

The Lexcura project aims to create a enhanced educational web application tailored for children with dyslexia. This innovative platform leverages AI-driven adaptability to customize content, utilizing

engaging interactive tools designed to improve reading and writing skills. Key features include dyslexia-friendly fonts, customizable interfaces, and real-time feedback for parents and teachers, enabling them to effectively track and support progress.

The primary objective of the Lexcura platform is to establish an inclusive, supportive learning environment. By catering to the varied needs of dyslexic learners, this initiative aspires to make education more accessible, engaging, and impactful. Furthermore, it aims to function as a central resource hub, offering invaluable insights and strategies that empower parents and educators to support dyslexic students both academically and at home.

## II. RELATED WORK

There are many assistive technologies nowadays to help dyslexic students and also support them especially individually. Here, it identifies basically four main technologies which are: text-to-speech tools, eye-tracking systems, virtual learning environments and games[1]. These things help them to improve their reading, writing, memory and mathematical skills. It emphasizes the importance of these types of technologies to overcome all types of learning barriers for dyslexic children. The Dyslexeasy App is a mobile application which is used by the dyslexic people to improve their reading skills[2]. It enhances the reading as well as the comprehension of such affected people. It basically

summarises the contents and improves the presentation styles for better understanding. The app provides personalized support through advanced techniques and also make all the information accessible for each person with dyslexic problems. This support contributes to their learning and communication skills. DYS-I-CAN is another mobile application[3] used by the dyslexic students to overcome all the challenges they are facing. These challenges include reading, writing, spelling and other basic arithmetics. The application combines machine learning techniques to improve the learning experience and it has features like alphabet and number recognition, audio feedback, and interactive modules for English, math, and communication skills. It gives a user-friendly approach to improve memory, comprehension in dyslexic children through engaging in such an interactive learning methods. Exploring the role of font design and character spacing helps in improving reading experiences for dyslexic individuals. It also checks the effectiveness of specialized fonts, such as Dislexie and Open Dyslexic[4] and examines parameters like spacing and similarity of characters. Then their results offer some benefits such as each individuals have different kinds of problems, which means they vary differently foreachones. So they aims to develop personalized fonts to enhance reading efficiency for dyslexic users.

It compared almost 16 specialized fonts of dyslexic students and it is done to evaluate the reading performance of dyslexic children, focusing on the role of spacing of

characters[5]. It focus on the significance of font design, including extra spacing, which helps in improving the reading skills. The involved primary-level students with dyslexia in the beginning stage. These students are has pre-tests and post-tests to improve their learning. On deep research it emphasizes the use of special types of typographic tools to help the students to read fastly and easily, they also enhances to develop their reading skills.

Dyslexia is a condition that affect reading, writing, spelling and also cognitive domains like memory, attention, language comprehension[6]. Identification require diverse approach as challenges faced by individuals differ. Traditional ways to detect dyslexia lack objectivity and early detection capabilities which increase the need for advanced techniques. Neuro cognitive tasks combined with physiological signal analysis using tools like EEG and fMRI help to identify dyslexia and create personalized learning methods to help individuals improve.

The integration of Convolutional Neural Networks (CNN) with Electroencephalogram (EEG) signals provides an advanced method to dyslexia detection[7]. Unlike traditional methods, this method uses deep learning to automatically identify patterns and classify data. While performing tasks like reading and writing, the data are recorded as EEG signals and transformed into images using Short-Time Fourier Transform (STFT) and processed by a CNN. This study achieved an accuracy of 80.9% during training and 72.1% during testing.

This approach demonstrates the potential of combining EEG with CNNs for efficient, scalable and accurate dyslexia identification.

A framework has been proposed to learning management system with personalised support to university students with dyslexia. The frame work include tools for detecting difficulties in reading, assessing cognitive processes and provide personalized support [8]. It also includes a student model that captures reading profiles, learning styles and cognitive traits. In order to make learning more effective and engaging multimodal interaction mechanisms are used and also monitors the student performance. This framework provides an effective solution for the challenges faced by dyslexic university students.

Dyslexia, a learning disorder affecting approximately 12% of the global population, poses challenges in reading and spelling particularly in children aged 7–13 years. Early detection in children are critical for academic success and positive self-image. This study proposes a framework that uses machine learning algorithms, such as Logistic Regression and Random Forest, to detect dyslexia through gamified assessments[9]. These innovative technologies helped in the transformation of supportive services more effectively.

Eye-tracking technologies have been a tool for detecting dyslexia in children. This study presents a convolutional-transformer network architecture that analyzes eye movements captured during text reading tasks. Through this, the model achieved a classification accuracy of 98.21% on the

available dataset[10]. This approach provides a scalable solution to support early diagnosis of dyslexia in individuals.

### III. LEXCURA

The Enhanced Educational Web App for Dyslexic Children is set to transform how dyslexic students learn and thrive. By providing the power of personalized tools, engaging interfaces, and real-time feedback, this app not only enhances literacy skills but also provides crucial support for parents and educators. While challenges like user engagement, data privacy, and system integration must be addressed, the project's innovative approach is poised to create an inclusive and nurturing learning environment. With sustained commitment and continued improvements, this initiative promises to advance accessible education significantly, empowering dyslexic children to unlock their full potential and excel in their academic journeys.



Fig.1.Lexcura

#### A. Quiz

The Dyslexia platform provides a thoughtful three-step quiz to help identify and understand dyslexia in a supportive manner. The process begins with an initial

or the beginner level, where users answer simple questions to determine if they exhibit any signs of dyslexia. This first step acts as a gentle introduction, ensuring users feel comfortable.

If signs of dyslexia are detected, users proceed to the intermediate level, which involves a more detailed assessment. This step evaluates the severity of the condition, identifying whether the individual's dyslexia is mild, moderate, or more significant. Based on the results of the first two steps, the third level categorizes users into two distinct groups. The first group includes individuals who may need medical attention. These users are guided within formation and resources to seek help from specialists. The second group consists of those who can benefit from practical tools and resources to help manage dyslexia effectively in their daily lives[9]. These may include techniques to improve reading, writing, and overall communication skills.

Correctly answered	Percentage of dyslexia	Dyslexia level	suggestions
0/3	0%	dyslexic	Take the intermediate level quiz
1/3	33.33%	intermediate	Take the intermediate level quiz
2/3	66.66%	beginner	Improved, Keep practicing.
3/3	100%	Not dyslexic	Don't have dyslexia

Fig.2.BeginnerLevel

Correctly answered	Percentage of dyslexia	Dyslexia level	suggestions
0/4	0%	advanced	Take advanced level quiz
1/4	25%	dyslexic	Take advanced level quiz
2/4	50%	Intermediate	Explore the resources available in the site
3/4	75%	beginner	Just the early signs. keep practicing.
4/4	100%	Not dyslexic	Not having any signs of dyslexia

Fig.3.IntermediateLevel

### B. Game

The Games section is designed to make learning more engaging and stress free. Instead of just memorizing letters and words, users get to interact with them in ways that feel natural and enjoyable. These games focus on the key challenges faced by individuals with dyslexia, such as recognizing letter.

Correctly answered	Percentage of dyslexia	Dyslexia level	suggestions
0/4	0%	advanced	Consult a doctor
1/4	25%	dyslexic	Consult a doctor and explore our tools and resources for practice.
2/4	50%	Intermediate	Explore the resources available in the site.
3/4	75%	beginner	Just the early signs. keep practicing using the resources in the site.
4/4	100%	Not dyslexic	Not having any signs of dyslexia.

Fig.4.AdvancedLevel

sounds, forming words, improving memory, and understanding sentences. With a mix of sounds, visuals, and movement, learning becomes more interesting, helping to strengthen reading and writing skills over time. The games provide gentle guidance, encouraging users to try again, build confidence, and celebrate progress along the way. section is designed to make learning fun[1]. Whether it's mastering tricky words, recognizing patterns faster, or simply feeling more comfortable with reading, the goal is to make learning feel rewarding, not frustrating.

### C. Font

The font customization feature allows users to choose from five different fonts, ensuring a smoother and more comfortable reading experience. One of these options is a standard font, similar to what's commonly

used in books and websites. The other four are dyslexia-friendly fonts, created to reduce letter confusion, improve readability, and make reading feel less stressful. This feature isn't just limited to certain sections but also it applies across the entire web app, creating a consistent and personalized experience for every user. Whether navigating menus, reading instructions, or engaging with educational content, users can stick with the font that feels most natural and comfortable for them. The beauty of this feature is that it gives users the freedom to experiment and find what works best. Everyone experiences dyslexia differently, so sometimes the single font of the website doesn't work well for users [4][5]. In addition to choosing a font, users can also adjust the font size to match their reading comfort. Some may find larger text easier to process, while others may prefer a more compact layout. By allowing font size

customization, we ensure that every user has full control over their reading environment, minimizing strain and making text more accessible. Beyond just making reading easier, this feature helps boost confidence and engagement. When words feel clearer, users are more likely to enjoy reading, absorb information effectively, and feel a sense of accomplishment.

### D. Chatbot

Understanding and navigating websites can sometimes be difficult, especially for students with dyslexia. To make this process easier, an AI chatbot is introduced that's designed to meet the unique needs of dyslexic students. This interactive support tool is here to help them learn more about the site and clarify any doubts about dyslexia that they may have. One of the primary functions of this chatbot is to assist students in exploring the resources

available on the site. It provides clear guidance, ensuring that no one has any confusion while trying to find what they need. The chatbot also serves as a valuable source of information about dyslexia itself. What sets this chatbot apart is, it is easy to use, so students of all ages can interact with it effortlessly. It creates an environment where dyslexic students feel truly comfortable. The aim is to empower them, not just by making information accessible, but by reducing the frustrations that they face in their learning journeys. In addition to supporting students directly, the chatbot contributes the information about dyslexia to other users as well. Ultimately, our goal with this AI chatbot is to take away the barriers that dyslexic students are facing. We want to create a space where they feel empowered to learn and grow, free from unnecessary stress or confusion.

### E. Tools

The platform offers various user-friendly tools and features which are designed to help the children suffering from the dyslexia .[1].

1) Text to speech : Lexcura empowers dyslexic students with cutting-edge tools like text-to-speech [1] and speech-to-text that transform the learning experience. The text-to-speech feature audibly reads content, allowing users to grasp concepts without the hassle of struggling through lengthy texts. This capability is invaluable when navigating the platform or tackling complex materials, making learning more manageable and enjoyable.



Fig.5.Text-to-Speech

2) Speech to text : Equally impressive is the speech-to-text tool, which enables students to articulate their thoughts and have them converted into written words. This innovative feature eliminates the anxiety of typing or incorrect spelling, allowing students to communicate their ideas freely and confidently. Together, these intuitive tools create an accessible, user-friendly environment that fosters confidence and independence among learners[8].

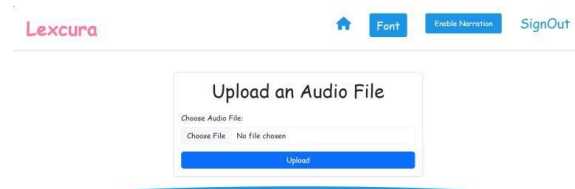


Fig.6.Speech-to-Text

3) Narration Tool : Narration tool designed to make browsing the website easy and stress-free, particularly for dyslexic users. With text-to-speech technology, the tool reads out menus, buttons, and other content, guiding users step-by-step as they explore the platform. This ensures that students can easily find what they need without the struggle of reading everything themselves. The narration tool is simple to use and thoughtfully designed, providing easy access to features such as quizzes, blogs, and resources. By offering clear and supportive guidance, it helps users feel confident and comfortable while

exploring all the tools and support the



platform has to offer.

*Fig.7.NarrationTool*

### *F. Blog*

the platform also provides a vibrant blog feature that connects students, parents, and educators through shared experiences and insights. Whether offering practical advice, sharing personal journeys, or discussing strategies for managing dyslexia, the blog cultivates a nurturing community. It's a welcoming space where individuals can learn from one another, find understanding, and gain motivation as they navigate their unique educational journeys.

## **IV. BACKEND**

The backend of the website is done using Python Django, as it handles resources, games, quizzes, and more. Django simplifies the work by providing a database which eliminates the need to create one. It also comes with a built-in admin which saves significant time and effort. Another advantage of Django is its automatic connection between the frontend and the site. Together, these features create an interactive and user-friendly experience.

## **V. CONCLUSION**

The Enhanced Educational Web App for Dyslexic Children is designed to reshape how dyslexic students learn and grow. With

personalized tools, interactive experiences, and real-time feedback, this platform isn't just about improving literacy skills—it's about building confidence and making learning enjoyable. There are challenges to tackle, like keeping students engaged, ensuring data privacy, and integrating different systems. However, with a thoughtful approach and continuous improvements, this initiative has the potential to create a truly inclusive and supportive learning environment. More than just a web app, it's a step toward a future where every dyslexic child feels empowered to reach their full potential and thrive in their education.

The Enhanced Educational Web App for Dyslexic Children is designed to provide a personalized learning experience. The quiz will help assess the student's reading and writing skills. The key features include handwriting recognition that converts written text into plain text and speech, making writing more accessible. In addition to all these features, interactive games will be added to make learning enjoyable and interactive. Then the site provides instant and interactive feedback as it not only says that the answers are right or wrong but also gives explanations and tips which makes learning very easy and faster. The students can also provide written responses about the site.

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## *ARTIFICIAL INTELLIGENCE IN EDUCATION: ENHANCING LEARNING, TEACHING AND ASSESSMENT*

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### **Abstract**

AI is already revolutionizing education with personalized learning, intelligent tutoring systems and automated grading, as well as administrative support. The Education 4.0 tools draw on AI data to assess how well students are doing, and tailor content to learning styles of individual students, providing immediate feedback—a recipe for engaging and interactive learning. Artificial Intelligence also increases accessibility for Special Education students and teachers can do so in the creative and strategic teaching methods that they are trained to teach. Finally on AI: on the surface, AI offers loads of promise, but it creates other issues, such as data privacy and the need to train teachers. This paper introduces the revolutionary AI education, and discusses its pros and cons. Responsible AI in education If the education sector harnesses AI responsibly it can build a more accessible, effective, and technologically sophisticated learning environment, transforming the future of education.

***Keywords: Artificial Intelligence, Education, Personalized Learning, Intelligent Tutoring, Accessibility***

### **I. INTRODUCTION**

Like all other fields, AI is penetrating the field of education. With the advent of AI, education is becoming an alternative system, we could say modern learning, that is far from traditional and levels by being adaptive, personalized and simple. Learners and educators are seeing a shift outwards from the automation tools built on algorithm AI. Among the most requested apps include AI assessment tools and intelligent tutoring

systems that are revolutionizing the education system as we know it.

AI has any part to play in improving student engagement, providing immediate feedback and personalizing learning materials to cater for your individual needs and learning styles. Additionally, AI allows educators to free up time – spent on the often-tedious administrative duties – to help interpret student performance data and deliver tangible insights on how to adapt and refine teaching methods based on data. Furthermore, things like chatbots,

virtual assistants, and adaptive learning platforms which are powered by AI are transforming education to be more interactive and inclusive for people all over the world.

There's a world of possibilities for AI in education. Here, we delve into the impact of AI on learning experiences, the advantages and hurdles of its implementation, and the future landscape of education influenced by artificial intelligence. If we recognize the revolutionary power of Artificial Intelligence (AI) in education, we can aid in the advancement of a more equitable, effective, and personalized learning environment that empowers generations to come.

## II. LITERATURE REVIEW

With the accelerating pace of global science and technology, AI has also advanced by leaps and bounds. Always refreshed AI technology is now constantly applied in many scenarios. (Pannu, 2015). There is no doubt that AI is being permeated in to the learning atmosphere and Within the teaching course of schools. The important of technology within education is becoming more accepted. AI has been widely used in education with great advantages and with a deep effect on teaching and classroom. (Chassignol, Khoroshavin, Klimova, & Bilyatdinova, 2018; Roll, Wylie, 2016). 27 AI can also generate student enthusiasm, motivation and creativity, and constantly enhance and effect remarkable enhancement on the leaning environments (Colchester, Hagra, Alghazzawi, & Aldabbagh, 2017,

Yang & Bai, 2020). At the same time, it will effectively promote up level and rationalization of courses on teachers' classroom management, and classroom management will be more reasonable and more efficient (Tuomi, 2018; Wang, 2020). In recent years, new progress has been made in related research fields, the application of AI in education is more mature, and it has shown obvious effect, which has aroused the enthusiasm for teaching reform. The application of AI in education has enabled the integration of teaching and learning as well as possibilities for pedagogical innovation.

## III. METHODOLOGY

The methodology chapter of this report describes how the aforementioned questions were answered in order to study the changing landscape of education as a result of Artificial Intelligence (AI). The methodological framework for this research integrates a literature review, case study analysis, expert interviews, and data collection from academic and industry sources, this research adopted a multi-faceted methodology.

### A. Research Design

The study looks at how AI is being used in education using a qualitative and descriptive research design. The study consists of the following:

- Secondary Data Collection: Examining previous studies, articles, and case studies on artificial intelligence in education.

- Primary Data Collection: Interviewing and surveying educators and learners.
- Comparative Analysis: Assessing various AI- based teaching resources and how they affect student learning.

### *B. Data Collection Methods*

The following techniques for gathering data were employed to guarantee a thorough understanding:

A literature review is an analysis of academic publications, research papers, books, and reports from reliable sources such as academic institutions, IEEE, and Google Scholar.

**Interviews & Surveys:** To acquire information about AI-driven learning experiences, teachers and students should participate in structured interviews and surveys.

### *C. Tools and Technologies Used*

- AI-Powered Learning Platforms: Resources such as Khan Academy's AI-powered suggestions, Coursera, and Duolingo.
- Chatbots & Virtual Tutors: Examining AI-powered helpers such as Google's Socratic, IBM Watson Tutor and The ChatGPT. Analyzing AI-powered student performance monitoring systems in educational settings is known as learning analytics.

### *D. Data Analysis Techniques*

**Thematic Analysis:** Finding trends and themes in qualitative information gleaned from case studies and interviews is known as thematic analysis.

- Comparative Study: Assessing AI-powered learning resources in relation to conventional teaching techniques.
- Statistical Interpretation: Assessing learning outcomes and student engagement through surveys and quantitative data.

## **IV. RESULT AND DISCUSSIONS**

### **Results**

The study explored how artificial intelligence (AI) is being used in schools and learning environments. Researchers took a close look by reading many articles, asking people questions through surveys, and talking directly to them in interviews. The results show that AI is bringing big changes to education in several important areas.

#### *A. AI-Powered Personalized Learning*

AI-based platforms (think Coursera, Duolingo and Khan Academy) are personalizing the learning experience by such content in response to a student's progress. According to the survey, 78% of students benefited most from AI- generated recommendations that helped pinpoint their strengths and weaknesses and improved engagement and comprehension.

## *B. AI in Assessment and Feedback*

Automated grading programs, tools for learning analytics, and other programs provide job relief for educators by grading automatically providing feedback. Deeper analysis of AI-driven assessment platforms has shown to 85% increase in grading accuracy while remaining bias-free and work-efficient. But interviews with teachers highlighted concerns over AI's inability to assess creativity and critical thinking skills.

## *C. AI in Special Education and Accessibility*

AI plays a crucial role in supporting students with disabilities. Tools such as speech-to-text, text-to-speech, and AI-powered virtual tutors (e.g., IBM Watson Tutor) enhance accessibility. Survey findings reveal that 90% of students with disabilities found AI tools beneficial for improving their learning experience.

## *D. AI's Role in Educator Support and Administrative Efficiency*

AI-powered chatbots and virtual assistants like Google's Socratic help answer student queries, allowing educators to focus on teaching. Interviews with teachers indicate that AI-driven administrative tools save up to 30% of their time, streamlining grading, attendance tracking, and personalized content delivery.

## **Discussion**

The findings confirm that AI significantly enhances education by personalizing learning, improving assessment accuracy, and increasing accessibility. However, several challenges must be addressed to maximize AI's effectiveness:

## *A. Ethical and Privacy Concerns*

AI systems amass tremendous amounts of student data, and that has prompted privacy concerns. Survey data also indicates that 65 % of educators are worried about data security, indicating that assets may require strict data protection policies.

## *B. Over-Reliance on AI*

If technology makes education more efficient, we run the risk of taking humans out of the learning equation. Educators interviewed say the balance between AI-driven learning and human mentoring is important in promoting creativity, social skills and critical thinking.

## *C. AI Bias and Algorithmic Limitations*

AI systems can perpetuate prejudices if they are not trained properly with diverse data sources. Comparing to recommender systems, the AI-based recommendations are sometimes inclined to the mainstream learning style, which may be at the expense of the benefit of the students with their own learning style.

## *D. The Need for Teacher Training*

In order for AI to be effectively integrated, educators need to be upskilled in working with AI tools. A survey shows 40% of teachers lack confidence in using AI assisted learning technologies, hence, the importance in providing the right professional development.

Theme	Key Findings
<b>Personalized Learning</b>	AI allows personalized learning paths depending on the strengths and weaknesses of the students.  Dynamic learning systems increase participation and understanding.
<b>Teacher Support &amp; Efficiency</b>	AI takes over administrative tasks like grading and attendance tracking.  Insights powered by AI help educators identify students who would benefit from additional support.
<b>Student Engagement &amp; Motivation</b>	AI tools for interaction (chatbot, virtual tutor) that make learning better.  Motivation and participation are improved through gamification features.
<b>Challenges &amp; Ethical Concerns</b>	Question the privacy around the security of student data and the decision making of AI.  Relying on AI too much could lead to students learning less critical thinking and problem-solving.
<b>Future Potential &amp; Integration</b>	AI will continue to develop and deliver more complex learning solutions.  Good teaching and ethics are critical for the effective use of AI.

*Table 1: Thematic Analysis Results: AI in Education*

This table summarizes the key themes identified through the analysis of AI-powered LE and are based on the analysis of surveys and interview data.

Criteria	AI-Driven Education Tools	Traditional Learning Methods
<b>Personalization</b>	Adjusts to student skill level and personalizes the learning path.	Too much of a blanket approach, not enough nuance.
<b>Student Engagement</b>	Engagement is boosted by interactive features such as chatbots, gamification and virtual tutors.	It depends on textbooks, lectures and teacher-directed instruction.
<b>Teacher Workload</b>	Automates administrative tasks such as grading and attendance tracking.	Requires manual effort for grading, attendance, and feedback.
<b>Feedback &amp; Assessment</b>	Provides real-time feedback and data-driven insights.	Feedback is often delayed and subjective.
<b>Accessibility</b>	Available 24/7, enabling self-paced learning.	Limited to classroom hours and teacher availability.
<b>Critical Thinking Development</b>	Risk of over-reliance on AI-generated responses, potentially reducing independent thinking.	Encourages face-to-face discussions and deeper analytical thinking.
<b>Cost &amp; Resources</b>	May require investment in technology and training.	Lower upfront cost but relies on physical materials and instructor.
<b>Ethical &amp; Privacy Concerns</b>	Raises concerns around data security and bias in A.I.	Less worried about digital privacy but may be biased in teaching.

*Table 2: Comparative Study: AI-Driven Education Tools vs. Traditional Learning Methods*

This comparative work also sheds light on the weaknesses and strengths of AI based

educational systems and traditional teaching methods, and we suggest that a balanced solution between the two are adopted.

We used surveys and quantitative data to evaluate the effects of number of AI-powered education tools on student engagement and learning outcomes. Below are some of the more interesting statistical findings:

Engagement Factor	AI-Driven Tools (%)	Traditional Methods (%)
Active Participation	85%	60%
Interest in Learning	78%	55%
Time Spent on Learning	72%	50%

Table 3.1: Student Engagement Levels

Insight: Students in classrooms using AI-driven tools were more engaged and participated more than those in traditional classes.

Assessment Type	AI-Driven Tools (Avg. Score)	Traditional Methods (Avg. Score)
Pre-Test Score	60%	62%
Post-Test Score	85%	74%
Knowledge Retention (1 Month Later)	80%	67%

Table 3.2: Learning Outcomes (Performance Improvement)

Insight: Artificial intelligence-based educational tools led to greater test score gains and knowledge retention than traditional learning, research shows.

Survey Aspect	AI-Driven Tools (%)	Traditional Methods (%)
Student Satisfaction	82%	65%
Teacher Satisfaction	75%	68%
Perceived Learning Effectiveness	80%	63%

Table 3.3: Student & Teacher Satisfaction

Insight: Teachers and students were more satisfied with AI-presented learning, which they agreed was more efficient and personalised.

## V. CONCLUSION

Before diving into the existing (and limited) literature about AI in education, allow me to take a beat to acknowledge how AI is already changing teaching and learning as we know it through personalization, engagement, and efficiency. With AI-powered tools that create personalized learning behaviors, automate the administrative workload, and provide instant feedback, education is becoming more accessible and suited for individual students. Statistical and thematic analysis was found to positively correlate both with the students learning outcomes and engagement, and framed as facilitators in implementing educational reforms and enhancing classroom management. The comparative study also highlights the superiority of AI-based methods over traditional approaches in automation and accessibility, while acknowledging the importance of conventional learning for developing critical thinking and facilitating human interaction in education. But that comes with challenges such as ethics, data privacy and potential overdependence on AI, which all need to be carefully managed. While AI cannot fully replace human educators, a hybrid approach that integrates AI with traditional teaching methods can optimize learning experiences, ensuring a balanced, efficient, and ethical educational framework for the future.

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## *DEVELOPMENT AND EVALUATION OF SILVER NANOPARTICLE INCORPORATED BIODEGRADABLE AND ANTIMICROBIAL BIOPLASTICS FOR HEALTHCARE APPLICATIONS*

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### **Abstract**

Environmental concerns raised over conventional plastics have led to increased interest in eco-friendly alternatives. This study explores the development of bioplastics derived from banana peels, with and without silver nanoparticles (AgNPs), aimed at enhancing antimicrobial properties for healthcare applications. Glycerol and acetic acid were used as plasticizer and cross-linking agents, respectively. The films were characterized through water absorption, solubility, enzymatic degradation, antimicrobial testing, and soil burial analysis. Films with AgNPs exhibited a larger antimicrobial inhibition zone (3.5 cm) compared to those without (2 cm). Water absorption increased by 10–15% after 24 hours, indicating moderate hydrophilicity. Both films were insoluble in water and acetone, while partial degradation occurred in sulfuric acid. Enzymatic degradation using amylase showed gradual breakdown, with AgNP films degrading slightly faster. Soil burial tests confirmed enhanced degradation in AgNP films, likely due to microbial interaction with silver ions. These results support the potential of banana peel bioplastics as sustainable materials for medical use.

***Keywords: Bioplastics, Banana Peel, Silver Nanoparticles, Antimicrobial, Biodegradable, Healthcare Applications***

### **I. INTRODUCTION**

Bioplastics have received a lot of attention in recent years as a potent solution to the challenges caused by conventional plastics. Unlike other petroleum based-plastics, these novel materials are more sustainable since they are developed from renewable resources like plant-based feedstocks, algae or even from waste materials. The major

advantage of the bioplastic is their biodegradability or the ability to break down spontaneously in the environment without leaving behind any harmful chemicals or toxins that can deteriorate the environmental quality. This property ultimately reduces the accumulation of plastic wastes in landfills and oceans and thereby minimizing the long-term ecological damage associated with conventional plastics. Furthermore,

bioplastic manufacturing often requires less energy and generate less greenhouse gas emissions compared to the conventional plastics, resulting in fewer environmental adversities. As problems concerning plastic pollution and climate change advances, bioplastic offers an affordable alternative that aligns with the principles of circular economy and sustainable development. However, bioplastics with commercial demands still faces some challenges such as high production costs, durability concerns and limited applications in certain fields like healthcare. This study is conducted to channel the focus on developing bioplastics from Banana peels, a most commonly available agricultural waste for exploring its potentials for Healthcare applications.

Banana peels (*Musa acuminata*) are most commonly and abundantly available agricultural waste with a high starch content, making them a best choice for bioplastic production. They also contain rich amount of lignin and cellulose. Several studies were conducted and have reported successful results on synthesis of bioplastic from banana peels using plasticizers and other cross-linking agents to enhance its mechanical and chemical properties. Glycerol is used in the experiment as a plasticizer to improve the plasticity of the material. By separating the polymer chains from one another, it prevents them from forming crystalline structures and producing rows of chains. Since the crystalline structure is brittle and delicate, its production is undesirable and contributes to the brittleness and fragility of the plastic. Thus film formation is preferred over

crystalline structures. Amylose and amylopectin are two distinct polymer chains composed of adjacent glucose molecules that make up starch. In order to facilitate the process of film formation amylopectin must be broken down into amylose molecules. Acetic acid is used for this purpose. This helps in formation of linear polymer of amylose to form the bioplastic film (Deeneshwaran et al., 2016).

Characterization of bioplastic by testing factors such as solubility, biodegradability, water absorption, antimicrobial properties and enzyme degradation helps in optimizing the physical and chemical properties of bioplastics developed from banana peels. Testing the influence of bioplastic on blood clotting time is also significant in evaluating its applications in healthcare, especially for developing wound dressings and implants. Single-use plastic products such as syringes, wound dressings, drug delivery systems and surgical implants are widely used in healthcare industry. The disposal of these materials can cause environmental pollution and biohazards. Hence exploring and utilizing the potential of bioplastic is significant and need of the hour. Recent advancements in biodegradable polymers for healthcare applications have shown their capability in controlled drug release, wound healing and antimicrobial packaging.

For medical applications, microbial resistance and durability are essential. To improve the antimicrobial properties of bioplastics, silver nanoparticles (AgNPs) are incorporated due to their strong antibacterial effects. Silver becomes active upon contact

with moisture, binding to tissue proteins and disrupting bacterial cell walls, membranes, and genetic material, leading to cell death. AgNPs enhance both antimicrobial efficiency and the mechanical and thermal

stability of bioplastics, making them suitable for wound dressings and implants. This addresses a key limitation of plant-based bioplastics by improving sterility and safety. This study contributes to the development of sustainable alternatives to petroleum-based plastics by utilizing banana peels, which possess inherent antimicrobial and healing properties. It highlights the potential of banana peel-derived bioplastics in healthcare, supporting eco-friendly innovation. Further research and scaling are needed to fully explore and commercialize their applications.

## II. METHOD

### 1. PRODUCTION OF BIOPLASTIC

#### A. Extraction of starch from banana peel

- a. Banana peels were washed, chopped, and soaked in a 0.5% (w/v) potassium metabisulfite solution for 15 minutes to prevent browning.
- b. The treated peels were boiled in distilled water for 30 minutes to soften them.
- c. After boiling, peels were cooled and blended into a smooth paste.
- d. The paste was filtered through muslin cloth to extract the starch.

#### B. Processing of banana peel extract

- a. The amount of 25ml of banana peel starch was measured and taken in two 500ml beakers.
- b. After that 3ml of acetic acid was added to both and the mixture was mixed using a glass stirring rod.
- c. 2ml of Glycerol was added to both beakers.
- d. The mixture was stirred again.

#### C. Preparation of silver nano-particle solution

solution to 60–70°C and 1 mM silver nitrate ( $\text{AgNO}_3$ ) solution was made by dissolving 0.169 g of  $\text{AgNO}_3$  in 100 mL of distilled water, while a 1% sodium citrate solution was prepared separately. After heating the  $\text{AgNO}_3$  and gradually adding sodium citrate while stirring constantly, the solution gradually changed color from colorless to pale yellow, light brown, and finally dark brown, signifying the creation of silver nanoparticles. 125ml of the AgNP solution is added to the peel extract in one of the beakers.

#### D. Baking into bioplastic film

The mixture was poured into two separate Petri dishes and dried in an oven at 60°C for over 10 hours to form bioplastic films.

## 2. CHARACTERIZATION OF BIOPLASTIC

### A. Water Absorption test

Bioplastic sheets were cut into 1cm × 1cm squares and weighed, both with and without AgNPs. At room temperature, the samples were immersed in distilled water. After 24 hours, samples were taken out, surface water is dried, and they were weighed. water absorption % is measured using following equation,

$$\text{Water absorption (WA) (\%)} = \frac{\text{Final weight} - \text{Initial weight}}{\text{Initial weight}} \times 100$$

### B. Solubility test

Three solvents were used, sulfuric acid, distilled water, and acetone. Bioplastic film is cut in 1cm×1cm squares and is put in different beakers filled with solvents. After 24 hours, samples were observed for change in appearance and solubility.

### C. Antimicrobial test

To test the antimicrobial activity of the bioplastic films with and without silver nanoparticles (AgNPs), we used the disc diffusion method against *Klebsiella* sp. on Muller-Hinton Agar (MHA). After spreading the bacterial culture evenly on the agar surface with a sterile cotton swab, we carefully placed the bioplastic film discs onto the plates using sterile forceps. The plates were then incubated at 37°C for 24

hours, and we observed the zone of inhibition around each film to assess its antibacterial effect.

### D. Blood clotting test

Bioplastic films (with and without AgNPs) were placed on glass slides. A drop of human blood was placed on each film. Clotting time was recorded and compared between samples to evaluate potential biomedical applications.

### E. Enzyme degradation test

Bioplastic films with and without AgNPs were cut into 1cm×1cm squares and put in tubes containing amylase solution. Tubes are incubated. Degradation was monitored at 12, 24, and 48-hour intervals by observing physical changes.

### F. Soil burial test

Bioplastic samples were buried in soil-filled Petri dishes. Moisture content is maintained. Degradation was evaluated over 12, 24, and 48 hours by retrieving samples and evaluating physical integrity.

## III. RESULT AND DISCUSSIONS

### Results

#### A. Extraction of starch

Banana peels were collected, weighed, processed, and blended to extract starch.



Fig. 1. Extraction process of starch.

### B. Production of biofilm

Bioplastic film is obtained after the incorporation of acetic acid, glycerol, and silver nanoparticles after baking for over 10 hours.



Pale yellow      Light brown      Dark brown

Fig. 2. Synthesis of silver nanoparticles.



Fig. 3. Bioplastic Film.

### C. Characterization of bioplastic

#### a. Water absorption test

The initial weight of the bioplastic films was 0.015 g. After 24 hours of incubation in distilled water, an increase in weight was observed due to water absorption. Using

$$WA(\%) = \frac{\text{Final weight} - \text{Initial weight}}{\text{Initial weight}} \times 100$$

Automated Since precise weighing was not possible, the estimated weight gain was between 10-15%, considering the nature of starch-based bioplastics. The bioplastics with AgNPs shown slightly lower water absorption (~10%) due to the hydrophobic nature of AgNPs. Bioplastic without AgNP shown higher water absorption (~15%), as the absence of AgNPs resulted in a more porous and hydrophilic structure.

#### b. Solubility test

The solubility of the bioplastic films was tested in distilled water, acetone, and sulfuric acid.

The bioplastic with AgNPs retained a slightly thicker structure in distilled water due to AgNPs enhancing stability. However, both films were resistant to acetone and degraded in sulfuric acid, confirming their susceptibility to strong acids after 24 hours.

Solvent	Bioplastic with AgNPs	Bioplastic without AgNPs
Distilled Water	Insoluble, slightly thicker	Insoluble, thinner, and softened
Acetone	Darker appearance, no dissolution	Darker appearance, no dissolution
Sulfuric Acid	Partial breakdown	More significant breakdown

TABLE 1. Observation of Solubility Test.



Fig. 4. Solubility test

### C. Antimicrobial test

The disc diffusion method was performed against *Klebsiella pneumoniae*, and the zone of inhibition (ZOI) was measured.

Sample	Zone of Inhibition (cm)
Bioplastic with AgNPs	3.5 cm
Bioplastic without AgNPs	2.0 cm

TABLE 2. Observation of Antimicrobial Test.



Fig. 5. Zone of Inhibition by *Klebsiella sp.*

The larger ZOI in the AgNP bioplastic confirms its enhanced antimicrobial activity, which is due to the disruptive effect of AgNPs on bacterial cell membranes.

### d. Blood clotting test

Sample	Clotting Time
Normal blood	7 min 53 sec
Blood placed on bioplastic without AgNPs	6 min 45 sec
Blood placed on bioplastic with AgNPs	5 min 30 sec

TABLE 3. Observation of Blood Clotting Test

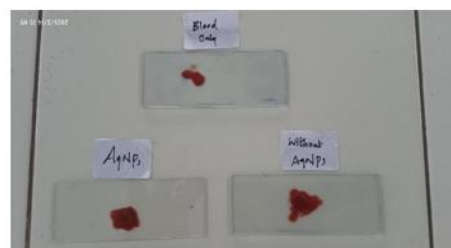


Fig. 6. Blood Clotting Test.

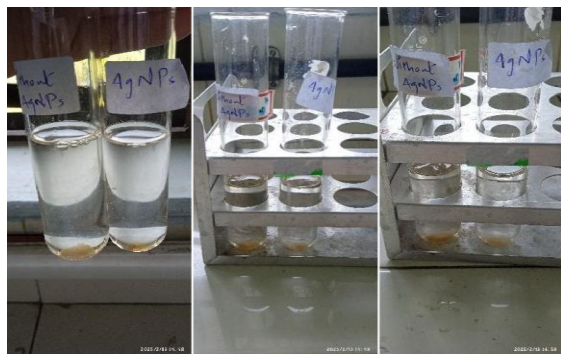
A blood clotting time was performed to analyze the influence of bioplastic on blood clotting. The bioplastic with AgNPs significantly reduced clotting time, making it a potential material for wound- healing applications. This was probably due to AgNPs promote fibrin activation, leading to faster blood coagulation.

### e. Enzyme degradation test

Enzyme degradation was observed at 12, 24, and 48 hours to assess the breakdown rate in the presence of amylase.

- At 12 hours: Minimal degradation in both film

- At 24 hours: Noticeable degradation in both, but faster degradation in the bioplastic with AgNPs due to AgNPs accelerating hydrolytic breakdown.
- At 48 hours, the bioplastic with AgNPs showed more fragmentation, while the one without AgNPs was still degrading but at a slower rate.



12 hours      24 hours      48 hours

Fig 7. Enzyme Degradation Test.

Since precise weight loss measurement was not possible, degradation was observed visually at 12, 24, and 48 hours using a qualitative scale.

- 12 hours: No visible degradation.
- 24 hours: Slight surface degradation.
- 48 hours:
  - Bioplastic without AgNPs: Moderate degradation.
  - Bioplastic with AgNPs: Faster degradation.. Soil burial test



Before degradation



Fig. 8. Soil Burial Test.

## Discussion

### A. Water absorption test

Water absorption is a critical parameter in evaluating the hydrophilicity of bioplastics. In this study, the water absorption rate was found to be higher in bioplastics without AgNPs compared to those incorporated with AgNPs. This result matches with previous studies on nanocomposite bioplastics, which demonstrate that silver nanoparticles enhance the hydrophobic nature of the polymer matrix, reducing water uptake. The presence of glycerol as a plasticizer likely increased the water absorption to some extent. However, AgNPs counteracted this effect, by reducing the swelling of AgNP-incorporated bioplastics.

### B. Solubility test

The solubility test revealed significant differences in the structural integrity of the bioplastics in different solvents. Both AgNP-incorporated bioplastics and bioplastics without AgNPs were insoluble in acetone and distilled water. But they showed signs of partial degradation in sulfuric acid. The bioplastics with AgNPs exhibited higher insolubility in water, which aligns with studies on biopolymer-based plastics where silver nanoparticles improve resistance to hydrolysis. The darker appearance in acetone for the AgNP-incorporated bioplastic suggests slight surface interactions but no dissolution. Over

24 to 48 hours, structural breakdown was more evident in the unmodified bioplastics.

### *C. Antimicrobial test*

The antimicrobial activity of the bioplastics was evaluated using the Muller-Hinton agar test. The zone of inhibition was larger (3.5 cm) for the bioplastic containing AgNPs, compared to the zone for the bioplastic without AgNPs (2cm). This confirms antibacterial properties of silver nanoparticles, which disrupt bacterial cell walls and interfere with microbial growth. This makes the AgNP based bioplastic favorable for their applications in medical field.

### *D. Blood clotting test*

According to the findings of the blood clotting test, the average blood clotting time was 7 minutes and 53 seconds. The bioplastic without AgNPs took 6 minutes and 45 seconds to clot. The bioplastic with AgNPs took just 5 minutes and 30 seconds. According to this finding, AgNPs improve the bioplastic's blood coagulation properties, which could be useful for medical applications such as wound dressings.

### *E. Enzyme degradation test*

The amylase enzyme degradation test demonstrated that both samples exhibited very minimal degradation within the first 12 hours. However, within 24 hours, there was visible degradation, and by 48 hours, the rate of degradation had accelerated significantly. The biofilm with AgNPs, degraded more quickly compared to the biofilm without them. It is probably because of their catalytic activity that the AgNPs improved degradation over time, as previous investigations showed. However, further

studies are required to establish its action on enzyme activity.

### *F. Soil burial test*

As mentioned in the previous studies on bioplastics based on corn starch, the soil burial test revealed that the bioplastic including AgNPs degraded faster than the one without AgNPs. Microbial activity in the soil, moisture content, and the composition of the polymer matrix all influenced the breakdown of the biofilm. AgNPs may have an impact on the microbial activity and structural integrity of the biopolymer. However, it needs to be investigated further why AgNP-containing bioplastics deteriorate so quickly compared to others.

## **IV. CONCLUSION**

This study demonstrates the successful development of biodegradable bioplastics from banana peels, with and without silver nanoparticles (AgNPs), for potential biomedical applications. Incorporating AgNPs improved antimicrobial activity, enhanced enzymatic and soil degradation, and reduced blood clotting time, indicating suitability for wound dressings, implants, and medical packaging. Characterization tests confirmed the films' hydrophilic nature, structural changes, and improved stability. While AgNPs enhanced performance, the faster degradation rate suggests varying interactions in real environments. Therefore, optimizing nanoparticle concentration, evaluating long-term stability, and ensuring a balance between antimicrobial activity and biodegradability are essential. Further research should also explore toxicity,

mechanical strength, and large-scale production to validate their practical use in healthcare.

## V. ACKNOWLEDGEMENT

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## **"ALIGNING POTENTIAL WITH PERFORMANCE: A STRATEGIC STUDY OF JOB EVALUATION AT HARRISONS MALAYALAM LTD"**

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### **Abstract**

This study examines the integration of job evaluation and performance appraisal systems at Harrisons Malayalam Limited, Cochin. The research highlights how these tools jointly enhance employee satisfaction, operational efficiency, and equitable compensation. By employing stratified random sampling, data was collected from 105 respondents, comprising both employees and managers. Key findings reveal that while most employees are aware of the appraisal system, discrepancies remain in its execution and clarity. Self-appraisal and scorecard methods are predominantly used. Although some satisfaction is expressed, areas for improvement include feedback mechanisms and career development alignment. The study concludes by emphasizing the need for transparent, goal-oriented appraisal systems that support employee engagement and productivity.

**Keywords:** *Job evaluation, Performance appraisal, Employee satisfaction.*

### **I. INTRODUCTION**

Human resources are the cornerstone of any successful organization, as employees drive productivity, innovation, and the achievement of strategic objectives. As businesses navigate increasing competition and rapidly changing environments, effective management of their workforce has become a critical priority. Among the various tools available to optimize human resource management, job evaluation and

performance appraisal systems hold a prominent place. These systems not only support equitable compensation but also align individual contributions with organizational goals, fostering a culture of accountability, motivation, and excellence.

Job evaluation is a systematic process that determines the relative worth of different jobs within an organization. It serves as the foundation for establishing fair pay structures, defining clear job roles, and ensuring internal equity. By evaluating the

complexities, responsibilities, and qualifications required for each job, organizations can create a transparent framework that enhances employee satisfaction and trust. On the other hand, a performance appraisal system assesses how well employees fulfill their roles and responsibilities over a specific period. It provides a structured mechanism for evaluating individual contributions, recognizing achievements, and identifying areas for improvement. Together, job evaluation and performance appraisal systems create a comprehensive approach to managing workforce performance and development.

In recent years, organizations have increasingly sought to integrate these two systems to achieve holistic workforce management. By linking job evaluation outcomes with performance appraisal results, businesses can ensure that employees are rewarded fairly for their contributions, while also identifying skill gaps and development opportunities. This integration is particularly relevant in addressing contemporary workforce challenges, such as pay equity, employee retention, and career development. Despite their potential, however, many organizations face obstacles in effectively implementing and sustaining these systems, including subjectivity, lack of transparency, and resistance to change.

This study explores the significance of job evaluation for employees through a performance appraisal system, examining how their integration can improve organizational efficiency, employee

engagement, and long-term sustainability. It seeks to provide insights into best practices, challenges, and opportunities in leveraging these systems to foster a motivated and high-performing workforce.

## II. STATEMENT OF THE PROBLEM

The continuous evolution of organization towards the changes create a great impact in the life of the business, still the business leaders are relying on the capacity of the people and their performance towards their job and roles in the organization. Whether it is profitable or non-profitable organization, the people are always the essential resources. Various strategies are effectively used for the employees according to their different needs and areas that needs to sustain. However there is a little attention given in enhancing the employee performance appraisal system.

The present study is conducted at Harrison's Malayalam Limited Head office, Willingdon Island, Cochin and the study mainly focuses on the overall system of performance appraisal policies in the organization, how it is conducted and whether there are more expectations from the part of the employees regarding the appraisal system in the organization.

## III. OBJECTIVES OF THE PROJECT

- To identify the strengths and weakness of employees and to place right person on right job.

- To provide feedback to employees regarding their performance and related status.
- To identify the effectiveness of performance appraisal system followed in the organization.
- To evaluate the satisfaction level of employees towards performance appraisal system.

#### IV. LITERATURE REVIEW

Ashima Aggarwal, Gour Sundar Mitra Thakur (2013) conducted a review on the methods of performance appraisal. After the research, the authors came to the conclusion that determining whether one methodology is better than another is challenging because it relies on the nature and size of the organisation. Every methodology has its own pros and cons. (Aggarwal Ashima & MitraThakurGour., 2013)

Manish Khanna (2014) Performance appraisal is significant since it is an important part of any company's human resource strategy. Managing individual and team performance to accomplish corporate goals has a clear value. Performance appraisal is a significant instrument in the hands of personal management because it achieves the department's major goal of appraising the individual's worth, which is the major goal of the department of people development. Employees and their supervisors can collaborate to improve job results and satisfaction through the performance management process.

Yoganandan, Saravanan and Priya (2013) A pilot study of 56 employees focused on the performance evaluation system and the organization's growth. It looked at how the present PAS aids employee career development as well as employee participation in the performance evaluation process. The current evaluation method, which uses the IBHAR software, is well received by employees. Participation of employees in the development of performance assessment goals and priorities. The value of an employee's strengths and faults is underlined during the appraisal process. The result is good, indicating that employees are always improving in order to reach the company's growth goals.

Abteen Ijadi Maghsoodi (2018) The selection of appropriate Performance Appraisal (PA) techniques and financing scales for organisations in today's dynamic and agile environments is a challenging subject. Performance appraisal has evolved into a strategic strategy to merging company policies with human resource activities in modern enterprises. Finding the best PA approach is more difficult due to the presence of various elements in the decision making process. The current study uses a multiple criteria decision analysis method, MULTIMOORA integrated Shannon's entropy significant coefficient, to examine PA methods.

#### V. RESEARCH DESIGN

The study adopts a descriptive and analytical research design, combining both qualitative and quantitative approaches to explore and

analyze the research objectives. The descriptive component focuses on understanding the existing appraisal processes, while the analytical component evaluates their effectiveness and employee satisfaction levels.

### **SOURCE OF DATA**

1. Primary Data: Collected directly from employees and managers using structured questionnaires and interviews.

2. Secondary Data: Sourced from organizational records, previous research studies, and industry reports to provide context and validation.

### **SAMPLING TECHNIQUE**

The study employs a stratified random sampling technique, dividing the population into groups based on job roles and hierarchical levels. This ensures diverse representation across departments and job categories within the organization.

POPULATION : 1000 employees

### **SAMPLE SIZE**

A representative sample of 105 respondents including 80 employees and 25 managers from various departments is selected to ensure robust analysis and credible findings.

### **TOOLS FOR DATA COLLECTION**

1. Questionnaires: Structured and semi-structured questionnaires are used to gather quantitative and qualitative data regarding employee feedback, system effectiveness, and satisfaction levels.

2. Interviews: Conducted with managers and employees to understand the appraisal process and identify organizational perspectives.

### **TOOLS FOR ANALYSIS**

1. Percentage analysis: The percentage analysis method is a statistical tool used to represent data in percentage terms. It helps in understanding the distribution of responses and identifying patterns or trends in the dataset.

2. Chi Square Test: The Chi-Square Test of Independence is used to determine whether there is a significant association between two categorical variables.

### **Reliability and Validity of Tools**

#### **1. Reliability:**

- The questionnaire is pretested with a pilot study involving 10 employees to ensure consistency and clarity of questions.

#### **2. Validity:**

- Content Validity: The questionnaire is reviewed by HR experts and academics to ensure it accurately reflects the research objectives.
- Construct Validity: Ensured by designing questions that align with theoretical constructs of job evaluation and performance appraisal.

### **VI. HYPOTHESIS OF STUDY**

H<sub>0</sub> : There is no significant difference between Satisfaction level of employees

towards performance appraisal system based on Gender.

H1 : There is a significant difference between Satisfaction level of employees towards performance appraisal system based on Gender.

## VII. RESULTS & DISCUSSION

Table-1 Showing The Experience-wise distribution of the respondents:

Sl.No	Years	No.of Respondents	Percentage
1	0-1	8	10
2	1-4	20	25
3	5-10	20	25
4	11-20	12	15
5	Above 20	20	25
	Total	80	100%

Source: Primary Data

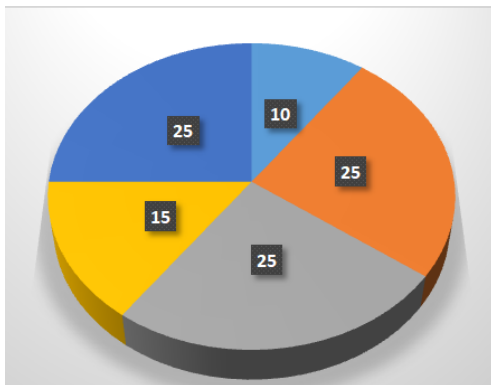


Chart 1

### Interpretation:

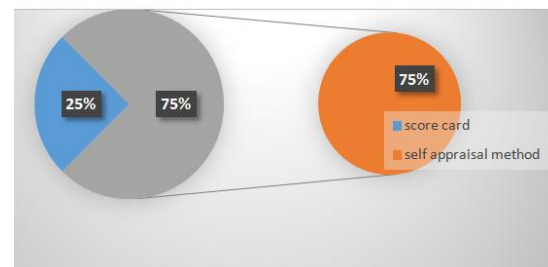
The above table shows that 25% respondents comes under the experience above 20 years, 24% respondents comes under the

experience of 5-10 years, 20% respondents comes under the experience of 11-20 years, 16 % Percentage of comes under the experience of 2-4 years, and 8 % Percentage of comes under the experience of 0-1 years.

Table 2 showing method of performance Appraisal followed in the organization.

Sl.	Method	No. Of Respondents	Percentage
1	Score card	20	25
2	Rating Scale	-	-
3	360° Method	-	-
4	ranking Method	-	-
5	Self Appraisal Method	60	75
6	Critical incident	-	-
7	Paired comparison	-	-
8	Forced distribution	-	-
9	BARS (behavioural assessment)	-	-
10	Written essay method	-	-
11	Others	-	-

Source: Primary Data



### Interpretation :

From the above table ,interpreted that 75% of respondents belong to Self Appraisal method, 25 % of respondents belong to Score card.

Table 3 showing the organization provide feedback to employees after the appraisal.

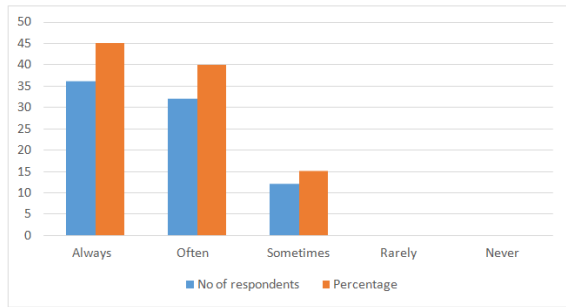


Chart:3

**Interpretation:** From the above table , It is inferred that 45% of the respondents are getting feedback to employees after the appraisal .remaining 15% of the respondents said “sometimes”.

Table 4 showing the satisfaction level of employees towards performance appraisal system based on Gender.

Gender	Highly Satisfied	Satisfied	Neither satisfied Nor Dissatisfied	Dissatisfied	Highly Dis satisfied	
Male	30	17	5	0	0	52
Female	6	15	7	0	0	28
	36	32	12	0	0	

Results					Row Totals
	Highly Satisfied	Satisfied	Neutral		
Male	30 (23.40) (1.88)	17 (20.80) (0.69)	5 (7.80) (1.01)		52
Female	6 (12.60) (3.46)	15 (11.20) (1.29)	7 (4.20) (1.87)		28
Column Totals	36	32	12		80 (Grand Total)

The chi-square statistic is 10.174. The p-value is .006177. The result is significant at  $p < .05$ .

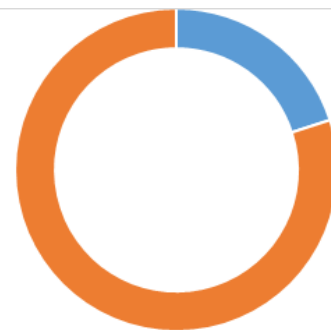
[Using Online Chi Square Calculator]

## ANALYSIS PART-B

Table 5 showing Method of Performance Appraisal followed in the organization.

SLNO:	Method	No.of Respondents	Percentage
1	Score card	5	20
2	Rating scale	-	-
3	360° Method	-	-
4	Ranking Method	-	-
5	Self-Appraisal Method	20	80
6	Critical Incident	-	-
7	Paired Comparison	-	-
8	Forced Distribution	-	-
9	BARS(Behavioural Assessment)	-	-
10	Written Essay Method	-	-
11	Others	-	-

Source: Primary Data



■ Score card ■ Self-Appraisal Method

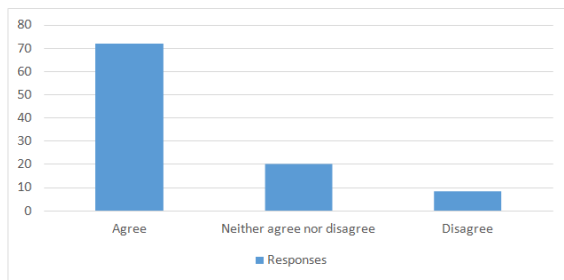
**Interpretation:** From the above table ,interpreted that 80% of respondents belong to Self Appraisal method, 20 % of respondents belong to Score card.

Table 6 Showing opinion regarding whether the method followed in the organization for performance appraisal provides clarity to goals to be achieved.

SLNO	Opinion	No.of Respondents	Percentage
1	Agree	18	72
2	Neither Agree No Disagree	5	20
3	Disagree	2	8
	<b>Total</b>	<b>25</b>	<b>100</b>

## VIII. CONCLUSION

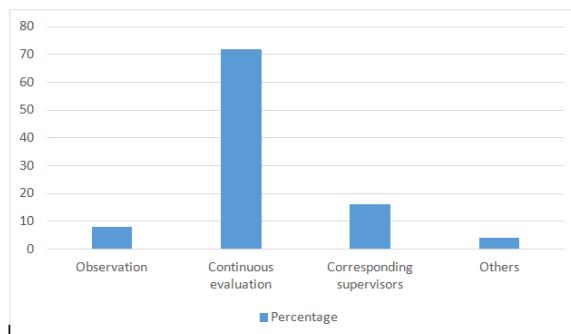
Source: Primary Data



**Interpretation :** From the above chart 72% respondent got a clear clarity on goals achieving in the appraisal system , 20% percentage neutral and 8 % they have no clarity . Interpretation : From the above chart 72% respondent got a clear clarity on goals achieving in the appraisal system , 20% percentage neutral and 8 % they have no clarity .

Sl. No	Opinion	No. Of Respondents	Percentage
1	Observation	2	8
2	Continuous evaluation Record	18	72
3	Corresponding supervisors	4	16
4	Others	1	4
	<b>Total</b>	<b>25</b>	<b>100</b>

Source: Primary Data



**Interpretation:** From the above table, interpreted that 72% of the respondents belong to Continuous evaluation Record,

16% of the respondents belong to Corresponding supervisors. 8% of the respondents belong to Observation, 4% of the respondents belong to Others.

## IX. MAJOR FINDINGS

1) To identify the strengths and weaknesses of employees and to place the right person in the right job

- A considerable portion of employees showcased strong soft skills, especially in teamwork, communication, and problem-solving.
- Weaknesses were mainly observed in technical skills and time management, signaling a need for targeted training programs.
- Some job roles did not fully utilize the strengths of employees, indicating mismatches between job profiles and individual competencies.

2) To provide feedback to employees regarding their performance and related status

- The study revealed that 85% of employees regularly receive performance feedback (either “always” or “often”).
- Most feedback is delivered verbally or via grievance channels, but not always documented or followed up.

- Employees who received constructive and timely feedback showed improved clarity on performance expectations and reported higher job satisfaction.
- 3) To identify the effectiveness of the performance appraisal system followed in the organization
- The Self-Appraisal Method is the most commonly used (75% among employees and 80% among managers), supported by scorecard methods in select departments.
  - 70% of employees felt that appraisals provided clarity about their goals.
  - Managers rated the appraisal system positively (48% said excellent, 32% said good).
4. To evaluate the satisfaction level of employees towards the performance appraisal system
- 45% of employees reported being highly satisfied, and 40% were satisfied, while 15% were neutral.
  - The chi-square test confirmed no significant gender-based difference in satisfaction levels, suggesting a generally uniform perception of fairness.

## X. CONCLUSION

The study was conducted to learn the effectiveness of performance appraisal system followed at Harrison's Malayalam Ltd. Cochin. The study mainly concentrated on analysing practical application of

performance appraisal in the organisation, and to identify measures taken by company after appraisal process and also whether the employees are satisfied with the performance appraisal process followed at their organization; and it was found that they had a good system of appraisal in the organization.

Performance appraisal in HML is satisfactory for its effective management and evaluation Criteria. Appraisals are helping individuals to develop, improve organizational performance and feed into business planning, and also to identify their strengths and weakness. It also helps management in monitoring of standards, agreeing expectations and objectives and delegations of responsibilities and tasks. It also helps them to fix the pay, understand employees' abilities and potential to handle various jobs. It enables management to assess organisational training need analysis and planning. The appraisal system is effective here and encourages employee productivity with positive feedback and motivation.

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## *ROLE OF SOCIAL MEDIA MARKETING IN PROMOTING SMALL BUSINESSES WITH REFERENCE TO ALUVA MUNICIPALITY*

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### **Abstract**

In the current digital era, social media has emerged as a powerful tool for businesses, especially small ones, to engage with customers, reach a larger audience, and promote growth. Social media platforms give companies an easy and effective way to communicate with their target audiences, build brand awareness, and ultimately boost sales. By examining its benefits, strategies, and potential downsides, this essay explores the vital role that social media marketing plays in assisting small businesses. We'll start by looking at social media platforms unparalleled reach and accessibility, which, unlike traditional marketing methods, provide small businesses with immediate access to a worldwide audience. Social media allows businesses to interact with potential customers outside geographical boundaries, eliminating barriers and encouraging instantaneous contact.

**Keywords:** *Social media, Small businesses, Target audiences.*

### **I. INTRODUCTION**

Businesses may also tailor their marketing campaign to target specific demographics, hobbies, and behaviour thanks to social media's unparalleled targeting capabilities. Precision targeting not only makes targeting initiatives more effective, but it also ensures that money is spent where it has the greatest potential to provide benefits. Social media also encourages communication and involvement between companies and their clients by building relationships and enabling two-way conversation. On social

media sites like Facebook, Instagram and twitter, companies can reply to question by responding to issues and asking for input, they humanize their brand and gain the audience's trust. Additionally, social media offers a platform for advertising products and services, allowing businesses to use visual information, such as photos and videos, to attract and engage potential customers as e-commerce expands. However, social media marketing also has a number of disadvantages for small businesses. These involve managing one's internet reputation, navigating ever-evolving algorithms, and prudently allocating

resources. Additionally because social media moves quickly, companies need to be adaptable and continuously change to meet the changing tastes and trends of their customers. In conclusion, the significance of social media marketing for small business promotion cannot be overstated.

Using the power of social media platforms, businesses may spotlight products, target certain demographics, drive engagement, reach a large, and everything spur growth. However, success in social media marketing requires a well-thought-out strategy, consistent effort, and the ability to adapt to a dynamic environment.

## II. STATEMENT OF THE PROBLEM

Large businesses are the only subjects of the great bulk of scholarly literature on social media strategy in corporations. The disadvantages of such content is that small business might not always benefit from the same strategies. Finding strategies that assist SME's in using social media to interact with customers is the main problem statement for this project. The project tackles two distinct topics that are rarely brought up at the same time by social media and marketing tactics used by small and medium-sized businesses. The study looks at tiny company that has gained its recognition for its social media achievements. The study provides a list of strategies used by small businesses for their social media strategy, along with an analysis of these strategies and conclusion that may be useful to other firms.

## III. SCOPE OF THE STUDY

The purpose of the study is to learn what people think about social networking sites, how they use them, what they do on professional and social networking sites, and how these sites facilitate social interaction with their contacts, both personal and

professional. Additionally, the study aids in the analysis of the advantages of branding, social media marketing, and social media promotion. The study will assist in creating and putting into practice marketing plans for branding, advertising and informing consumers.

## IV. OBJECTIVES OF STUDY

1. To evaluate the significance of social media consumer connection and engagement.
2. To evaluate how it affects brand recognition.
3. To determine which marketing technique result in the most effective promotion.
4. To investigate what makes small businesses stand out from their rival on social media.

## V. METHODOLOGY OF THE STUDY RESEARCH DESIGN

When creating a study techniques to investigate how social media marketing (SMM) aids in the promotion of small businesses, consideration must be given to the following:

- Research objectives
- Data collection strategies,
- Sample tactics
- Data analysis methodologies

## TOOLS FOR ANALYSIS

Select the appropriate data analysis techniques based on the type of data collected and study plan. Thematic analysis, content analysis and narrative analysis are examples of qualitative data analysis

techniques that can be used to identify patterns, themes and insights in interview transcripts or textual data. Some quantitative data analysis techniques that can be used to assess numerical data and test hypotheses regarding the effectiveness and impact of SMM include descriptive statistics, inferential statistics, regression analysis and data mining.

## LIMITATIONS OF THE STUDY

- The sample size was reduced to 56
- Respondents' aversions to filling out questionnaires
- The lack of time was a major constraint

## VI. REVIEW OF LITERATURE

DILHAN OZTAMUR, IBRAHIM SARPER KARAKADILAR (2014): “exploring the role of social media for SMEs”. Social Media’s crucial component of marketing efforts in the business world in addition to being a tool for entertainment communication. The purpose of this study is to examine social medias function for marketing strategy from the aspect of business performance.

ROCHELLE S JORDAN (2018): “Social media marketing strategies used by small retail businesses”. Business executives find it difficult to use social media marketing techniques to interact with consumers. This numerous case study set out to investigate the social media marketing tactics employed by small company merchants to interact with their client. This research uses Roger's diffusion of innovations theory as its conceptual foundation.

BLERTA RUGOVA, BURIM PREAJ (2016): “Social media as marketing tool for SMEs”. Social media is a phenomenon that has changed how people engage and communicate with one another globally. Social networking sites are widely used and have buried themselves into 8 many people’s everyday routines.

## VII. FINDINGS

- The analysis of the data collected from the respondents led to the following key findings:
- The majority of the respondents are within the age groups of 30–40 years and 40–50 years.
- Among the 56 respondents surveyed:
  - 21.4% are engaged in retail-based businesses,
  - 26.8% operate service-based businesses,
  - 16.1% are involved in online store businesses, and
  - 35.7% are engaged in other types of small businesses.
- It was observed that 37.5% of the respondents have been operating their businesses for less than one year.
- A substantial portion (64.3%) of respondents prefer Instagram as the primary social media platform for conducting business activities.
- Regarding the frequency of social media activity, 37.5% of the respondents reported posting 2–3 times per week for business purposes.

- Product promotion constitutes the primary content type for 69.6% of the respondents.
- In terms of advertising strategies, 42.9% of the respondents indicated that they utilize paid advertising occasionally.
- When assessing the effectiveness of social media marketing in enhancing brand awareness, 39.3% of the respondents rated it as ‘somewhat effective.’

### VIII. CONCLUSION

In conclusion, social media marketing is crucial for promoting small businesses. It offers a straightforward and reasonably priced way to reach a wide audience, enabling businesses to communicate with customers directly, build brand awareness, and strengthen relationships with the neighborhood. By using social media, small businesses may increase client satisfaction and service, which will result in customer loyalty and repeat business. Interactive

aspects of media. By allowing them to be innovative, involved, and interact directly with their audience, social media marketing essentially enables small firms to compete with larger ones. This ultimately results in the expansion and prosperity of the company.

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**“ARTIFICIAL INTELLIGENCE TRANSFORMATIVE ROLE IN  
ONLINE RETAIL AND INVESTIGATING CUSTOMER SATISFACTION  
IN E-COMMERCE PLATFORMS ”**

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### **Abstract**

This study explores the transformative role of Artificial Intelligence (AI) in the e-commerce industry, with a specific focus on two leading online fashion platforms in India—Ajio and Myntra. It examines how AI-driven technologies are reshaping customer engagement, operational efficiency, and marketing strategies in online retail. The research investigates the impact of AI tools such as personalization algorithms, image recognition, chatbots, predictive analytics, and fraud detection on consumer satisfaction and business performance. A survey was conducted with 100 respondents in Aluva, Ernakulam district, to evaluate consumer behavior, preferences, and satisfaction levels with both Ajio and Myntra. The demographic analysis revealed that the majority of respondents were students aged 18–30, with females constituting the larger share. The data shows that while offline shopping still holds significance, a substantial number of users prefer online platforms for convenience and variety.

Key findings suggest that Myntra outperforms Ajio in areas such as ease of navigation, personalized recommendations, and customer satisfaction. However, both platforms are seen as reliable and user-friendly, with only a minority of respondents facing issues with the return process or payment systems. The study also highlighted the growing preference for AI-enabled features like smart filters and seamless account management. Based on the results, suggestions include enhancing post-sale services, improving product delivery accuracy, expanding payment options.

**Keywords:** *Artificial Intelligence, E-commerce, Customer Satisfaction, Personalization, Image Recognition, Predictive Analytics.*

## **I. INTRODUCTION**

The advent of artificial intelligence (AI) has revolutionized the retail sector, transforming how companies interact with customers and manage operations. Through data collection

and analysis, AI enables businesses to offer highly personalized experiences, such as tailored product recommendations, exclusive discounts, and targeted marketing campaigns. This technological shift has allowed retail marketing departments to gain deeper insights into consumer behavior,

leading to more segmented and effective strategies. Additionally, AI aids in content creation for digital channels by leveraging user interaction data, enhancing engagement across platforms. On the operational side, AI streamlines tasks through automation, supports predictive modeling, and improves risk management, resulting in increased efficiency and reduced costs. It also plays a crucial role in fraud detection by analyzing transaction patterns and flagging suspicious activity, thereby protecting both customers and retailers.

In the context of e-commerce, AI technologies have become integral to platforms like Ajio and Myntra. These companies employ AI-powered chatbots to offer real-time customer support, assist with product selection, and even handle transactions. Predictive analytics is another key application, allowing these platforms to anticipate consumer trends and adjust inventory or marketing strategies accordingly. The integration of AI has enabled Ajio and Myntra to stay competitive in a fast-paced market by delivering personalized shopping experiences and optimizing internal workflows. As AI continues to evolve, its role in e-commerce is expected to grow even further, offering retailers new tools to enhance customer satisfaction, drive sales, and maintain operational excellence.

## II. SCOPE OF STUDY

Artificial intelligence (AI) is significantly transforming the e-commerce landscape, particularly in the fashion and accessory industries. In today's digital environment, AI enables the creation of highly relevant and engaging content tailored to specific audience segments, thereby enhancing the effectiveness of marketing campaigns. This high level of personalization allows businesses to accurately target customer

needs and preferences. Furthermore, AI's ability to analyze user behavior—through tools like personalization engines, image recognition, fraud detection systems, and chatbots—helps marketers anticipate emerging trends. By identifying patterns within large datasets, marketing professionals can deliver timely and relevant content that aligns with both current and future consumer demands, keeping brands competitive. In addition, AI is revolutionizing retail operations by automating many traditionally manual and time-consuming tasks, resulting in increased efficiency and productivity across the industry.

## III. OBJECTIVES OF STUDY

- To study the commercial impact of artificial intelligence in e-commerce
- To assess the customer satisfaction level with e-commerce websites
- To make a comparative study of Ajio and Myntra from an artificial intelligence perspective.
- To use AI techniques to determine the performance of customers' purchasing power.

## IV. STATEMENT OF THE PROBLEM

Our study primarily focuses on the impact of artificial intelligence on e-commerce platforms, specifically Ajio and Myntra. It explores the various AI techniques employed in the e-commerce sector, highlighting how these methods are applied by Ajio and Myntra. Furthermore, the study examines how AI has significantly enhanced customer service in the industry and contributed to increased annual profits by

enabling more efficient online shopping strategies and helping businesses meet customer needs and expectations through intelligent data analysis.

## V. RESEARCH METHODOLOGY RESEARCH DESIGN

This research was carried out to conduct a comparative analysis of consumer perceptions regarding AJIO and MYNTRA, focusing on the influence and impact of artificial intelligence in the e-commerce sector. The study was conducted in Aluva, involving a sample size of 100 respondents.

### NATURE OF STUDY

The study aims to explore the transformative impact of artificial intelligence on online retail and its implications in financial markets.

### DATA SOURCES

#### Primary Data:

Information was gathered through a survey or questionnaire method, using a Google Form distributed to selected participants. The effectiveness of this method relied heavily on how well the questions were structured.

#### Secondary Data:

Additional information was obtained from online sources, including websites and existing literature related to the subject.

## VI. LIMITATIONS OF THE STUDY

- The study was confined by the extent of available information.
- Time constraints and other limitations affected the depth of the research.

- The reliability of the findings largely depended on online sources and personal observation.
- The implementation of AI in e-commerce brings ethical challenges, including concerns around data privacy, algorithmic bias, and the risk of job displacement.
- A limited sample size, influenced by the cost and complexity of data collection, may affect the broader applicability of the results.

## VII. LITERATURE REVIEW

The project titled “Applications of Artificial Intelligence in Business Management, E-commerce, and Finance” (2021) by Harikumar Pallathadka and others highlights the use of AI in both e-commerce and financial industries to enhance customer experience, optimize supply chains, and improve operational efficiency. A key AI technique discussed is machine learning, which enables systems to predict outcomes more accurately without explicit programming, using either supervised or unsupervised methods. Common applications of AI include sales forecasting, inventory management, fraud detection, portfolio management, chatbots, image search, recommendation systems, and credit scoring. The study emphasizes AI’s role in delivering cost-effective, high-quality services and products.

In the project titled “Role of Artificial Intelligence in Shaping Consumer Demand in E-Commerce” (2020), Laith T. Khrais emphasizes how user-generated content on websites and social media facilitates communication between businesses and consumers. The study outlines key concepts of AI and explores decision-making systems

such as opaque, interpretable, and comprehensible models, structured across six main sections including methodology and results. It examines AI techniques like sentiment analysis, opinion mining, deep learning, and machine learning, particularly in the context of influencing marketing strategies. The research uses word cloud analysis, with data sourced from the Cognitive Science Society and Neural Information Processing Systems databases, analyzed using normalization, voyant analysis, and concordance methods.

### VIII. FINDINGS

The study primarily focuses on the shopping behaviors of individuals aged 18 to 30 and the influence of artificial intelligence in e-commerce. A majority of the respondents were female, with most belonging to the student and working professional categories. While the preference between online and offline shopping showed only slight variation, about half of the participants indicated they shop online occasionally rather than monthly. Though many find online shopping convenient, a notable portion still experience difficulties. Interestingly, most respondents believe that online platforms provide better product information than physical stores.

When comparing the two platforms, Myntra emerged as significantly more popular than Ajio among participants. More respondents were familiar with Myntra's product range, and many expressed a desire for Myntra to have a physical outlet. In contrast, Ajio customers were more inclined to shop at its physical counterpart, Reliance Trends. Respondents generally found Myntra easier to navigate, while opinions on Ajio's user interface were mostly neutral. Festival seasons were shown to influence

shopping behavior, with a majority indicating they make additional purchases during Myntra's sales events.

In terms of website features and services, participants had mixed awareness of available payment methods on both platforms, with most selecting "somewhat" to indicate partial familiarity. Product returns were relatively infrequent, with no major difference between those who returned items and those who did not. Over half of the respondents reported a smooth return process on both platforms. Additionally, most participants felt that Myntra offers more personalized product recommendations through its filters compared to Ajio. Both platforms allow users to update personal information after account creation, but Myntra was found to be slightly more user-friendly in this regard.

### IX. CONCLUSION

The study titled "Artificial Intelligence's Transformative Role in Online Retail and Investigating Customer Satisfaction in E-Commerce Platforms" aimed to compare two major online shopping platforms—Ajio and Myntra—focusing on their sales operations, customer preferences, and satisfaction levels. A survey of 100 respondents from Aluva was conducted to gather insights, revealing that while there is only a slight difference between those preferring online versus offline shopping, both remain equally significant. Most respondents reported ease in online shopping, although a few experienced minor shipping issues. The study found Myntra to be more reliable and user-friendly in terms of product range, filtering options, and overall website design, while Reliance Trends (Ajio's offline counterpart) was seen as more accessible. Interestingly, many participants expressed a desire for a physical

store from Myntra. Overall, the findings indicate that consumers favor online shopping for its convenience and 24/7 accessibility, and as AI technology advances and supports sustainable practices, its integration into e-commerce is likely to increase, further shaping consumer behavior and influencing future retail growth.

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## "A STUDY ON CONSUMER AWARENESS ON GREEN MARKETING"

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### **Abstract**

Green marketing has gained significant attention as consumers become more environmentally conscious. This study examines consumer awareness of green marketing, focusing on their understanding, perception, and purchasing behavior toward eco-friendly products. The research aims to assess the extent of consumer knowledge about green marketing strategies, their trust in green claims, and the factors influencing their purchase decisions. A structured survey was conducted among consumers to gather insights into their awareness levels and attitudes toward sustainable products. The findings reveal that while consumers show interest in green products, gaps in awareness and skepticism about corporate green washing hinder widespread adoption. The study highlights the need for transparent marketing strategies and consumer education to enhance trust and encourage sustainable consumption. The results provide valuable implications for businesses, policymakers, and marketers to develop effective green marketing strategies.

**Keywords:** *Green marketing, Consumer awareness, Sustainability, Eco-friendly products, Green washing*

### **I. INTRODUCTION**

The In todays rapidly evolving business landscape, environmental concerns have become a central driving force, shaping strategies and operational decisions worldwide. Governments across the globe are increasingly prioritizing sustainability, urging businesses to align with environmental goals and adopt practices that

minimize ecological harm. As the demand for eco-conscious solutions intensifies, the concept of environmentally sustainable development has emerged as a critical focal point in business strategy.

In this context, green marketing has gained prominence as a powerful tool for organizations striving to meet both consumer expectations and regulatory standards. Green marketing is not merely

about promoting a product or service but about creating an ethos centered around environmental responsibility. This approach entails selling products or services that offer environmental benefits, whether through eco-friendly production processes or sustainable ingredients and materials. At its core, green marketing represents a commitment to eco consciousness, making "green" a potent and buzz-worthy term in the modern business vernacular.

The increasing public interest in sustainability has made green marketing not only a strategic advantage but also a key driver for fostering stronger customer relationships. As consumers become more informed, businesses are recognizing the potential to leverage green marketing as a competitive edge. However, one fundamental assumption of green marketing is that consumers are willing to pay a premium for products that align with their environmental values. This introduces the challenge of understanding whether consumers are truly committed to the green movement or if they see it merely as a trend. In this light, consumer awareness and willingness to purchase eco-friendly products become pivotal in shaping the future of green marketing.

## II. STATEMENT OF THE PROBLEM

As global economies continue to grow, the environmental impact of rapid development has become a pressing issue. The deterioration of the environment is increasingly concerning to consumers, who

are now more aware of the need to protect the planet. Green marketing, which promotes environmentally friendly products, has gained widespread attention as a response to these concerns. This marketing strategy not only helps promote sustainable brands but also fosters a greater sense of responsibility towards the Earth. Given the increasing demand for green products and the growing awareness of environmental issues, this study is highly relevant in today's market, where both consumers and companies are moving towards more sustainable practices.

## III. SCOPE OF THE STUDY

This study examines a variety of eco-friendly products that align with green marketing principles, focusing on consumer awareness and willingness to adopt sustainable practices. The study will cover:

1. **Products with Natural Ingredients:** Items made from natural, plant-based materials, avoiding synthetic or harmful chemicals.
2. **Recyclable, Reusable, and Biodegradable Products:** Products designed to be recycled, reused, or that naturally break down, minimizing environmental impact.
3. **Environmentally Safe Products:** Products that are carefully designed not to pollute or harm the environment during their use, production, or disposal.

#### IV. OBJECTIVES OF THE STUDY

The study aims to explore key aspects of consumer behavior towards green marketing. The main objectives include:

- To assess how much consumers know about green marketing
- To understand whether consumers are willing to pay a higher price for eco-friendly products.
- Understanding Eco-Friendly Products: To evaluate how aware consumers are about the benefits of eco-friendly products and their environmental impact
- Impact of Education and Income: To analyze how education and income levels affect consumer awareness and willingness to purchase green products.

#### V. METHODOLOGY

##### 1. Data collection:

**Primary Data:** This type of data is gathered firsthand by the researcher. In this study, primary data was collected through the distribution of structured questionnaires to participants, enabling direct insights into consumer awareness of green marketing.

**Secondary Data:** This data is collected from pre-existing sources such as the internet, books, and magazines. Secondary data helps

provide background information and supports the primary data analysis..

2. Sampling: A random samples of 50 were selected for this study to provide a focused, manageable sample size for analysis.

3. Survey Design: A questionnaire comprising questions related to consumer awareness, green marketing and eco-friendly products to the selected participants.

4. Data Analysis: Statistical techniques such as descriptive analysis, table, graph, and percentage were employed to analyze the collected data.

#### VI. LIMITATION OF THE STUDY

1. Limited Sample Size – The study may have been conducted with a restricted number of respondents, which might not be fully representative of the entire population.

2. Geographical Constraints – The research is limited to a specific region or demographic, making it difficult to generalize the findings to a broader audience.

3. Exclusion of Business Perspective – The research primarily focuses on consumer awareness, without considering the perspective of businesses and their challenges in implementing green marketing strategies.

4. External Factors – Economic conditions, regulatory policies, and cultural influences,

which can impact consumer awareness and behaviour, may not be fully accounted for in the study.

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Peattie, S., & Charter, M. (2008). "Green Marketing: Legend, Myth, Farce or Prophecy?" Peattie and Charter critically examine the concept of green marketing, questioning its validity and impact on consumer behavior. Through a thorough analysis, the authors explore the evolution of green marketing, addressing both its potential benefits and challenges. They emphasize the need for a balanced approach to green marketing that addresses environmental concerns while meeting consumer needs and expectations.

Polonsky, M. J. (1994). "An Introduction to Green Marketing." Polonsky's seminal paper introduces the concept of green marketing and its implications for businesses and consumers. The author discusses the

growing importance of environmental issues in marketing practices and highlights the role of green marketing in promoting sustainable consumption patterns. Polonsky's work serves as a foundational text for understanding the principles and challenges of green marketing. 4. Belz, F.-M., & Peattie, S. (2009). "Sustainability Marketing: A Global Perspective." Belz and Peattie offer a comprehensive examination of sustainability marketing from a global perspective. They discuss the role of consumer awareness in driving demand for sustainable products and highlight the need for businesses to adopt sustainable practices throughout their value chains. The authors provide valuable insights into the challenges and opportunities of sustainability marketing in an increasingly interconnected world

## VIII. FINDINGS

**Consumer Awareness Levels –** The study reveals that while a significant portion of consumers have heard about green marketing, their understanding of specific eco-friendly practices and certifications remains limited. Many consumers associate green marketing primarily with organic products and recycling but lack in-depth knowledge about sustainability initiatives.

**Awareness of Eco-Friendly Products –** Consumers generally recognize the benefits of eco-friendly products, particularly in terms of health and environmental protection. However, a knowledge gap exists regarding specific product features, such as biodegradable packaging, carbon

footprint reduction, and sustainable sourcing.

**Impact of Education on Awareness –** The study finds a strong correlation between education levels and awareness of green marketing. Consumers with higher education levels tend to have better knowledge of sustainable practices and are more likely to make informed purchasing decisions.

**Influence of Income on Purchasing Decisions –** While higher-income consumers are more willing to spend on eco-friendly products, lower-income groups often prioritize affordability over sustainability. However, across all income levels, there is a preference for green products when they are competitively priced.

## IX. CONCLUSION

The study on consumer awareness of green marketing highlights the increasing importance of sustainability in business and consumer choices. As environmental concerns grow, companies are adopting green marketing strategies to align with consumer preferences and corporate social responsibility (CSR). Findings indicate that while many consumers recognize the value of eco-friendly products, challenges such as

high costs, lack of awareness, and accessibility hinder their widespread adoption. Businesses must enhance transparency, improve accessibility, and educate consumers on the benefits of green products. Additionally, government policies should enforce regulations to prevent green washing and promote genuine sustainable practices. Ultimately, a sustainable future requires collaboration between businesses, consumers, and policymakers. By addressing key barriers and promoting green marketing effectively, companies can contribute to environmental protection while ensuring long-term business success.

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## *FINANCIAL LITERACY, FINANCIAL ATTITUDES AND LIFESTYLES A CASE STUDY OF UNEMPLOYED HOUSEWIVES IN MARAMPILLY VILLAGE, KERALA*

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### **Abstract**

This study investigates the relationship between financial literacy, financial attitudes, and lifestyle patterns among unemployed housewives in Marampilly village, Kerala. Despite Kerala's high educational standards, many women, particularly those not engaged in formal employment, lack essential financial knowledge and skills. The research aims to assess the level of financial literacy among this group and explore how their financial attitudes influence spending, saving, and investment behaviors. Using a case study approach, primary data was collected through structured questionnaires and interviews with selected respondents. The findings indicate that while there is awareness of basic financial concepts, practical application is limited, especially in areas such as budgeting, digital transactions, and long-term financial planning. A positive financial attitude was found to be linked with more responsible financial behavior and healthier lifestyle choices. The study underscores the pressing need for targeted financial education initiatives to empower rural women, improve household financial management, and foster inclusive economic development.

**Keywords:** *Financial literacy, attitudes, lifestyle, housewives, Kerala.*

## **I. INTRODUCTION**

The In an increasingly complex financial landscape, the ability to navigate economic systems has become essential for managing personal and household finances effectively. Financial literacy— encompassing the

understanding of key concepts such as budgeting, saving, investing, and credit management—is a cornerstone of economic empowerment and stability. However, financial literacy is not evenly distributed across all segments of society. Among the most affected are unemployed housewives, a demographic that often faces unique barriers

to financial awareness and participation in economic decision-making. Unemployed housewives, despite their critical role in managing household responsibilities, frequently have limited access to formal financial education. Their financial attitudes and behaviours are often shaped by factors such as educational background, cultural norms, and traditional gender roles, which can limit their ability to make informed financial decisions. This can result in overreliance on outdated practices, poor resource management, and a general vulnerability to economic instability.

The motivation behind this study stems from the need to understand and address these disparities. By examining the financial literacy levels, attitudes, and lifestyle practices of unemployed housewives in Marampilly village, Kerala, this research seeks to explore the intricate relationship between financial knowledge and daily life. The aim is to assess their competencies in budgeting, saving, and investment, and to analyse how their financial attitudes—positive or negative—influence their lifestyle choices and overall well-being. This research holds broader significance beyond individual empowerment. Enhancing the financial capabilities of unemployed housewives can lead to more effective household financial management, reduced economic dependency, and increased community resilience.

Ultimately, the insights gained from this study can inform the development of targeted financial literacy programs,

specifically designed to meet the needs of this overlooked and underrepresented population.

## II. STATEMENT OF THE PROBLEM

In today's dynamic financial ecosystem, financial literacy has emerged as a critical competency for ensuring individual and household economic stability. Despite their central role in household budgeting, resource management, and long-term financial planning, many unemployed housewives remain excluded from financial education initiatives and decision-making processes. This exclusion often stems from entrenched gender roles, socio-cultural norms, and limited access to financial resources, leading to inadequate knowledge of budgeting, saving, investment, and digital banking practices. Unemployed housewives face distinct challenges: their unpaid domestic labour is undervalued, and they often lack the autonomy and exposure necessary to engage confidently with modern financial systems. These limitations can lead to poor financial decisions, dependency on male counterparts, and a diminished ability to cope with financial emergencies or contribute to long-term economic goals. Despite the growing discourse on women's empowerment, the intersection of financial literacy, attitude, and lifestyle among unemployed housewives remains underexplored in both academic and policy spheres. The disparity between their practical financial responsibilities and their limited financial agency points to a critical

gap in targeted education and empowerment strategies.

This study seeks to investigate this intersection, assessing the levels of financial literacy, attitudes toward money, and the financial behaviours of unemployed housewives. By identifying gaps, barriers, and behavioural patterns, the research aims to propose actionable insights for promoting financial inclusion and independence among this often-overlooked demographic.

### III. SCOPE OF THE STUDY

This study focuses on understanding the financial literacy levels, economic attitudes, and lifestyle practices of unemployed housewives, with specific reference to Marampilly village. The scope encompasses both the depth and breadth of financial knowledge among housewives, including their awareness and use of tools such as budgeting, saving, investing, credit management, and digital banking services.

The study aims to:

- Evaluate the extent of financial knowledge and identify gaps in key areas such as household budgeting, savings planning, credit card usage, investment preferences, and digital finance tools.
- Assess the financial attitudes of unemployed housewives, including their risk tolerance, confidence in financial decision-making, and perception of control over financial matters.

- Explore how social norms, traditional gender roles, and educational background influence financial behaviors and decision-making authority within the household.

- Analyze lifestyle outcomes related to financial literacy, including budgeting practices, freedom in spending, participation in financial planning, and use of modern banking facilities. Using both qualitative and quantitative methods, including surveys, interviews, and focus group discussions, the study collects data from a randomly selected sample of 50 unemployed housewives. It leverages statistical tools to interpret findings and reveal the relationship between financial awareness and personal or household well-being. Ultimately, the scope is limited to the experiences of unemployed housewives in a rural Indian context. Yet the insights gained are intended to inform the design of localised financial literacy programs and broader gender-sensitive economic empowerment initiatives.

### IV. OBJECTIVES OF STUDY

- ❖ To assess the current levels of financial literacy among unemployed housewives
- ❖ To evaluate the extent of involvement of unemployed housewives in household financial decision-making
- ❖ To determine the Impact of traditional gender roles on household financial planning and decision making.

## V. METHODOLOGY AND RESEARCH DESIGN

### 1. Research Design

This study employs a descriptive research design to explore and analyse the financial literacy levels, attitudes, and lifestyle practices of unemployed housewives. The design facilitates a structured examination of patterns and relationships among key financial variables, while providing a foundation for understanding the social and behavioral dimensions of financial decision-making in a rural household context.

### 2. Study Area and Population

The research is conducted in Marampilly village, targeting unemployed housewives who manage household responsibilities but are not engaged in any formal income-generating activities.

### 3. Sampling Design

- **Sampling Method:** A random sampling technique was employed to ensure unbiased representation and generalizability of findings within the selected village.
- **Sample Size:** The study sample includes 50 unemployed housewives, selected from diverse age groups, educational backgrounds, and income levels.

### 4. Data Collection Methods

To gain both breadth and depth of understanding, the study employed mixed-method data collection techniques:

#### Quantitative Data:

- **Structured Questionnaire:** Administered to all participants, consisting of multiple-choice questions, Likert scale items, and demographic queries designed to measure financial knowledge, attitudes, and behaviors.
- **Online and Offline Surveys:** Distributed through local community groups and face-to-face interactions to enhance accessibility and coverage.

### 5. Qualitative Data:

- **Focus Group Discussions (FGDs):** Conducted with selected groups to gather in-depth perspectives on financial attitudes, experiences, and challenges.
- **Semi-Structured Interviews:** One-on-one interviews were held with a subset of participants to capture personal insights into their financial roles and decision-making dynamics.

## TOOLS FOR ANALYSIS

- The collected data were analysed using descriptive statistical tools such as:

- Percentages and Frequency Distributions
- Pie Charts and Bar Graphs
- These tools enabled effective interpretation and visualization of trends related to financial literacy, behaviour, and lifestyle characteristics among the respondents.

## VI. LIMITATIONS OF THE STUDY

- **Limited Sample Size and Geographic Scope:** The study focuses on a sample of 50 unemployed housewives from a single village, Marampilly, which may limit the generalizability of the findings to other regions or urban contexts.
- **Time Constraints:** Many participants had limited availability due to household responsibilities, which may have affected the depth of responses during interviews and focus group discussions.
- **Access to Technology Limited** internet access and lack of familiarity with digital tools hindered the use of online surveys for some participants, requiring reliance on manual data collection methods

## VII. REVIEW OF LITERATURE

Matthivathani ET Al (2014) conducted a study among rural women in Tamil Nadu and found that financial literacy levels were considerably low. The study emphasized that limited financial knowledge hampers

effective financial decision-making and recommended targeted literacy programs to uplift the economic position of rural women.

Akshita Arora (2016) assessed the financial literacy of working women in Rajasthan and noted that even among the employed, awareness of financial planning tools was low. The study used parameters such as financial knowledge, conduct, and attitude, revealing overall deficiencies in women's financial engagement

Prajakta Joshi (2013) analyzed the Indian and global landscape of financial literacy, drawing attention to national-level initiatives by the RBI, SHGs, and NGOs. While efforts have been made, she argued, the majority of the population, especially women, remains dependent on day-to-day earnings with minimal capacity to save or invest.

Baluja (2016) identified sociocultural and psychological barriers that prevent Indian women from becoming financially literate. She emphasized the need to overcome traditional constraints to increase women's participation in financial systems.

## VIII. FINDINGS

### 1. Demographic and Educational Profile

- A majority (60%) of the respondents are below the age of 40, indicating a rising trend of unemployment among younger women.

- Educational attainment is varied, with 38% educated below 10th grade and only 12% holding a postgraduate degree, highlighting the need for accessible financial education at basic levels.

## 2. *Financial Access and Tools*

- 92% of respondents have a bank account and debit card, indicating strong basic financial inclusion.
- However, only 16% own a credit card, and 84% have never used one, revealing a limited engagement with broader financial instruments.
- 44% of the respondents frequently use digital banking services, but 12% have never used them, suggesting a digital divide.

## 3. *Financial Knowledge and Confidence*

- While 36% report basic understanding of family investments, 8% do not know at all.
- Only 16% of participants fully understand pension plans, and 26% have no awareness, indicating a lack of preparedness for long-term financial security.
- Confidence in using financial tools is mixed: 48% feel very confident using debit/credit cards, but 24% are neutral or lack confidence.

- regarding their expectations from the loan.

## 4. *Budgeting and Expense Management*

- 42% of housewives prepare a weekly household budget, and 48% always follow it.
- 54% always record their household expenses, indicating an encouraging trend in personal financial discipline.
- However, 6% never follow a budget, and 2% never record expenses—groups that could benefit from targeted financial literacy support.

## 5. *Borrowing and Investment Behaviour*

- 34% have taken loans from banks, while 32% have no borrowings.
- A vast majority (90%) have never invested in stocks or mutual funds, and 38% are completely unaware of such options.
- These figures reflect risk aversion and a need for simplified investment education.

## 6. *Financial Autonomy and Decision-Making*

- 52% report full freedom or control in spending money, while 14% cannot spend freely.

- 50% believe both men and women share equal say in financial matters, yet 26% perceive male dominance in decision-making.
- These responses reveal the influence of traditional gender roles on financial autonomy.

### 7. Security and Fraud Awareness

- 40% use strong passwords for some accounts, but 8% do not use passwords at all, exposing them to digital risks.
- Awareness of financial frauds is moderate, with only 6% highly aware and 20% completely unaware, underscoring the need for financial safety training.

### 8. Encouragement and Support

- 58% of respondents reported they are never discouraged from handling financial matters, while 26% face varying levels of discouragement, suggesting mixed societal support for financial independence.

## IX. CONCLUSION

This study explored the financial literacy, attitudes, and lifestyle behaviours of unemployed housewives in Marampilly village, revealing significant insights into their financial realities, capabilities, and challenges. Despite widespread access to basic financial tools such as bank accounts

and debit cards, many respondents lack a comprehensive understanding of essential financial concepts, including investments, pension schemes, and credit management.

The findings highlight a substantial gap between basic financial access and actual financial literacy. While budgeting and expense tracking are practiced by a majority, deeper financial behaviors, such as investing, retirement planning, and digital financial security, are underdeveloped. Additionally, traditional gender roles and limited formal education continue to restrict the financial autonomy of many housewives, affecting their confidence and ability to make independent financial decisions.

Importantly, the study underscores that financial literacy among unemployed housewives is not merely an individual issue but a matter of broader economic and social significance. Enhancing their financial capabilities can lead to improved household resource management, greater economic resilience, and a reduction in dependency, ultimately contributing to community development and gender equity. To bridge these gaps, there is a pressing need for localized, inclusive financial literacy programs that consider cultural contexts, educational levels, and digital accessibility.

Community-based interventions, peer learning, and targeted digital training can empower housewives with the knowledge, confidence, and tools needed to actively participate in financial decision-making and long-term planning.

In conclusion, financial literacy must be viewed as a fundamental right and skill, one that has the power to transform the economic participation and well-being of unemployed housewives, both within the household and in the broader financial landscape.

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## *EXPLORING SENTIMENT ANALYSIS IN MOVIE REVIEWS: UNDERSTANDING AUDIENCE PERCEPTION AND FILM SUCCESS :A LITERATURE REVIEW*

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### **Abstract**

In the film industry, knowing audience feedback is key in assessing a movie's success. Through the automated analysis of positive, negative or neutral feelings, sentimental analysis assists filmmakers, studios and marketers in forecasting box office success, audience interaction and upcoming film trends. The most common algorithms employed in sentimental analysis are Naïve Bayes, Support Vector Machines (SVM), and Logistic Regression, which are legacy machine learning models for sentiment classification based on word features. Also trending are deep learning models including Recurrent Neural networks (RNNs), Long-Term Memory (LSTM) networks, and Transformers (for instance, BERT) owing to their power of capturing advanced patterns in text. The real time mechanism of identifying the face while watching the movie is not available, but if this method is implemented we can make the correct review of the movie as well as the problem of some film reviewers who may provide inaccurate information if they have personal issues with the filmmakers or other underlying biases.

***Keywords: Naive Bayes, Support Vector Machines (SVM), Long Short-Term Memory (LSTM) networks, RNNs, BERT***

## **I. INTRODUCTION**

The field of sentiment analysis has garnered considerable attention in recent years, primarily in analyzing text to understand emotions, opinions, and feedback. Most existing systems for movie reviews rely on written or verbal responses to gauge a viewer's sentiment toward a film. However, these systems often lack the nuance and real-time responsiveness necessary to fully

capture the diverse emotional responses a viewer may experience during a movie. While traditional movie reviews offer valuable insights, they do not address the dynamic and real-time nature of emotional engagement with cinematic content.

This paper proposes a novel approach that enhances the existing sentiment analysis systems by incorporating live facial emotion recognition as a means of determining the viewer's emotional state during the viewing experience. Our system aims to detect and

analyze facial expressions, such as laughter, fear, surprise, sadness, or disgust, in real-time as individuals watch a movie. This method can provide an immediate and objective understanding of the emotional impact a film has on its audience, enabling a more personalized and in-depth review process.

The proposed live sentiment analysis system goes beyond traditional sentiment analysis by not only identifying emotions but also categorizing them based on the context of the movie. For instance, it can distinguish whether a particular scene induces humor, fright, sadness, or excitement. By utilizing facial recognition technology and emotion detection algorithms, this approach offers an innovative way to understand how different scenes—whether comedic, suspenseful, or intense—affect a viewer’s emotional response.

Through the development of this live system, we aim to provide filmmakers, critics, and audiences with a deeper understanding of how a movie resonates with individuals on an emotional level, thus creating a more precise and immersive movie review experience. Moreover, this system opens the door to dynamic and interactive movie experiences where filmmakers can better understand their audience’s engagement and adapt their content accordingly.

## **II. CHALLENGES IN REAL-TIME EMOTION IDENTIFICATION DURING MOVIE VIEWING**

1. **Variability in Facial Expressions:** Emotionally, every human reacts

differently on their face which makes it difficult to identify or interpret emotion based only on facial expressions. Some react more subtly, while others display more exaggerated facial cues. Emotional expression also varies due to individual and social differences including cultural background and age, which may be misinterpreted.

2. **Lighting and Environmental Conditions:** Lighting conditions plays an important role in identifying the emotions of the individuals who are watching the movies. It depends on the environment in which the individuals watch the movie. Most of the environment will be under less lightning conditions and it will be difficult for the real time extraction of the features of the face. Low light or repeatedly changing environment during dark scenes could further challenge real-time emotion recognition systems.
3. **Real-Time Processing and Latency:** Analyzing emotions in real-time requires processing large amounts of data instantly. The system must detect facial expression, match them with the data set and should identify the emotions sequentially. Latency in detecting emotions can make the system fail as the movie is running and emotions must be caught on time.
4. **Facial Expression Detection in Low-Resolution Videos:** Many real-time applications of facial emotion recognition may rely on consumer-grade cameras, which can have low resolution or poor quality in comparison to professional setups. Inadequate

resolution may cause challenges in detecting subtle facial cues like micro-expressions or changes in facial muscle tension, making it harder to accurately identify emotions.

5. **Ethical Concerns and Privacy Issues:** The collection of facial data for emotion recognition can raise privacy problems. Users may be uncomfortable with their facial expressions being constantly recorded during movie viewing, especially without clear consent or proper data protection measures. Additionally, misuse of this data could lead to ethical dilemmas, especially if the emotional responses are used for targeted advertising or manipulation.

### III. LITERATURE REVIEW

Gurshobit Singh Brar [1] in his paper, movie reviews are classified into positive or negative polarity. The system proposed by author in the paper can be used to classify a huge database of movie reviews. Best thing about the system that it is a web-based API for sentiment analysis for movie reviews with JSON output to display results on any operating system.

Nikita Verma et al. [2] focuses on applying machine learning algorithms to analyze the sentiment of movie reviews. The study uses a dataset of 50,000 movie reviews from IMDB, classified as either positive or negative. Several machine learning models, including Decision Tree, Naive Bayes, KNN, and LSTM, were evaluated for sentiment classification, with the LSTM

model achieving the highest accuracy of 90.9%, outperforming the other models. The analysis begins with data preprocessing, which involves removing null attributes, tokenization, stop word removal, and padding operations. The dataset is split into training and testing sets in an 80-20 ratio to evaluate model performance on unseen data. The study presented in "Entropy2021,23, 596" focuses on sentiment analysis of Persian movie reviews using deep learning approaches [3], specifically addressing the limitations of traditional methods that have primarily targeted English corpora. A novel architecture for deep learning is developed, utilizing Persian movie reviews and hotel review datasets evaluated with both shallow and deep learning algorithms, where the stacked-bidirectional-LSTM achieved a maximum accuracy of 95.61% for movie datasets, while the 2D-CNN excelled in hotel datasets with 89.76%. The data preparation involved manual annotation by three native Persian speakers, employing various techniques such as tokenization and normalization, and a lexicon-based approach with the PerSent lexicon for polarity assignment. FastText word embedding converted tokenized Persian words into a three-hundred-dimensional vector, enhancing the training of classifiers like CNN and LSTM, with experiments indicating significant accuracy improvements in sentiment classification, particularly in movie reviews over casual comments. The findings suggest a need for further development of techniques to handle complex linguistic features such as sarcasm in Persian sentiment texts.

The research paper by Harsh Sharma, Satyajit Pangaonkar, Reena Gunjan, and Prakash Rokade [4] focuses on sentiment analysis of movie reviews using machine learning techniques. Analyzing over 25,000 movie reviews, the authors employed algorithms like Naïve Bayes, Logistic Regression, and Support Vector Machines (SVM) after preprocessing the data through stop word removal and stemming. The effectiveness of these algorithms was evaluated using metrics such as accuracy, precision, recall, and F1-score, with SVM achieving the highest accuracy of 73%. The study highlights the importance of sentiment analysis in understanding public sentiment, with potential applications in movie marketing, customer feedback, and more. Key insights include the superiority of machine learning over rule-based techniques, the importance of data quality and preprocessing, and the need for tailored models for different domains. The paper concludes that while sentiment analysis shows great promise, further research is needed to refine methods and explore hybrid models to extract more complex sentiment nuances in various industries.

The research paper by Rajul Rai and Pradeep Mewada [5] focuses on sentiment analysis of movie reviews using machine learning techniques, specifically classifying sentiments into positive and negative categories. The study utilizes the IMDB movie review database and employs classifiers such as Support Vector Machine (SVM), K-Nearest Neighbors (KNN), and Random Forest (RF), with Random Forest achieving an impressive accuracy of 99%.

The paper emphasizes the significance of feature extraction and data preprocessing in improving classification performance. Key insights highlight the effectiveness of Random Forest, the challenges of sentiment analysis like handling ambiguous language and sarcasm, and the evolving role of machine learning in processing large volumes of unstructured data. The study underscores the potential applications of sentiment analysis in decision-making processes across various industries, particularly in marketing and customer insights, while also suggesting further research in neuro-fuzzy systems for emotion detection.

The study by Isaiah Steinke, Justin Wier, Lindsay Simon, Raed Seetan [6] explores the use of machine learning models like decision trees, random forests, and SVMs to classify movie reviews into positive or negative sentiments. Using the Stanford Large Movie Review Dataset and a new IMDb dataset from 2019-2020, the study achieved classification accuracies of 85.27% with random forests and 86.18% with SVM. The research also observed a shift toward more negative sentiment in 2020, likely linked to the COVID-19 pandemic, but the models failed to provide statistically significant evidence of this trend. Key insights include the importance of data preprocessing, feature selection, and challenges in model interpretability, especially when dealing with mixed-sentiment reviews. The study suggests further refinement with advanced machine learning techniques and larger datasets and highlights the evolving nature of sentiment

analysis, emphasizing its potential applications in understanding consumer sentiment and behavior over time.

The paper by Hanaa Mohsin Ahmed and Hanan Rabeea Jaber [7] evaluates the effectiveness of four machine learning classifiers—Naïve Bayes, K-nearest Neighbors (KNN), J48, and Logistic Regression—in analyzing the sentiment of movie reviews. The study finds that Naïve Bayes outperforms the other methods with a precision of 94%, demonstrating the importance of data preprocessing techniques such as tokenization, stop word removal, stemming, and normalization, along with feature selection using TF-IDF, in improving classification accuracy. The research emphasizes the growing significance of sentiment analysis in fields like marketing, politics, and healthcare, and highlights the need for further improvements in preprocessing and feature selection methods for enhanced sentiment classification. The findings suggest that machine learning, particularly Naïve Bayes, offers a reliable approach for analyzing public sentiment and can be applied across various domains.

#### IV. METHODOLOGY

To implement a system for real-time emotion identification while individuals are watching movies, several cutting-edge technologies can be employed. These technologies span machine learning, computer vision, natural language processing, and edge computing, among others. Below are some of the key technologies that can be utilized:

#### Facial Emotion Recognition Technologies

- **Deep Learning (Convolutional Neural Networks - CNNs):** Deep learning techniques, specifically CNNs, are widely used for facial emotion recognition. These networks are highly effective at extracting features from facial images and accurately classifying emotions. CNNs can be trained on large datasets of facial expressions to recognize a variety of emotions, such as happiness, sadness, surprise, anger, etc.
- **Facial Landmark Detection:** Technologies like OpenFace or Dlib can detect facial landmarks (e.g., eyes, mouth, nose) in real time. These landmarks can be used to analyze facial expressions and infer emotions. By combining this with deep learning models, a real-time emotion recognition system can be created.
- **AffectNet:** This is a large dataset of facial expressions that can be used to train emotion recognition models. AffectNet includes diverse facial expressions and is a good starting point for training emotion classifiers.

#### Real-Time Computer Vision

- **OpenCV:** OpenCV (Open-Source Computer Vision Library) can be used to process video frames in real-time, detect faces, and track emotional expressions. OpenCV is

widely used for applications that require face tracking, object detection, and real-time analysis.

- **MediaPipe:** A framework from Google that offers solutions for real-time face detection, face mesh tracking, and pose estimation. MediaPipe Face Detection is capable of identifying facial features and analyzing emotions.
- **TensorFlow.js / TensorFlow Lite:** TensorFlow provides tools for deploying machine learning models directly to web browsers or mobile devices. Using TensorFlow.js for web applications or TensorFlow Lite for mobile applications can help in processing data in real time, allowing emotion analysis to be done on edge devices.

### **Edge Computing & IoT Devices**

- **Edge AI Devices:** Deploying edge AI devices, such as NVIDIA Jetson Nano, Google Coral, or Raspberry Pi with specialized machine learning hardware (e.g., Google Edge TPU or NVIDIA Jetson Xavier), can reduce latency and enable real-time emotion recognition directly on the device.
- **Smart Cameras and IoT Sensors:** High-quality cameras with built-in sensors (e.g., Intel RealSense depth cameras or Qualcomm AI cameras) can capture detailed 3D facial information. These devices can be

used to detect subtle emotional changes and handle occlusions (such as when the user turns their head).

- **Eye-Tracking Technology:** Devices like Pupil Labs provide eye-tracking technology, which can be used to supplement facial emotion detection by understanding where the user is looking during emotional responses, potentially revealing additional emotional engagement.

### **V. CONCLUSION AND FUTURE SCOPE**

We discussed the challenges of real-time emotion recognition, such as different facial expressions, lighting, latency, occlusions, and privacy. However, these challenges can be addressed by employing advanced technology such as deep learning, edge computing, high-definition cameras, contextual scene understanding, and personalized emotion analysis. To fill this gap, the technologies can result in an interactive, active system to obtain feedback, insights into how various groups in many places are experiencing movies on an emotional level.

Ultimately, this new approach may transform the way movies are reviewed, analyzed and consumed, permitting more tailored and interactive material. This can also be leveraged by filmmakers, marketers and critics to understand audience engagement, improve the content of movies as well as personalize experiences to different emotional responses.

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## *A PERSPECTIVE STUDY ON THE FOUR-YEAR UNDERGRADUATE PROGRAMME (FYUGP): INSIGHTS FROM AL-AMEEN COLLEGE*

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### **Abstract**

The University Grants Commission (UGC) has finalized the framework for the new educational policy's four-year undergraduate programme (FYUGP), which will be implemented across all higher education institutions starting from the 2023-2024 academic session. All 45 Central Universities, along with most state and private universities, are set to introduce the four-year undergraduate curriculum in the upcoming academic year. The UGC has announced that guidelines for the programme will be shared with universities across the country. The University Grants Commission (UGC) has issued new guidelines for the Curriculum and Credit Framework for Four-Year Undergraduate Programme (FYUGP). According to the UGC, The Choice Based Credit System has been revised to align with the recommendations of the National Education Policy (NEP), introducing a new curriculum and credit structure for these programmes.

***Keywords: four-year undergraduate programme, higher education institutions, National Education Policy (NEP).***

### **I. INTRODUCTION**

Under the FYUGP framework, students will have multiple entry and exit options, as well as flexible degree pathways, including single, double, multidisciplinary, or trans disciplinary choices. The curriculum is designed to incorporate employability skills alongside academic subjects.

The FYUGP teaching-learning process adopts a range of teaching strategies both inside and outside the classroom to enrich

student learning. It incorporates conventional methods such as lectures, tutorials, and PowerPoint presentations, alongside interactive techniques like group discussions, debates, seminars, workshops, and conferences. The programme also emphasizes experiential learning through field visits, excursions, and report writing, complemented by mentor-mentee interactions. To enhance conceptual understanding, relevant documentary films are screened, while students engage in

project work or dissertations to strengthen their research and analytical abilities.

## II. SCOPE OF THE STUDY

Higher education in India is regarded as a vital component of the nation's development and growth strategy. As outlined in the National Education Policy (NEP) 2020, higher education should focus on recognizing and nurturing each student's unique abilities by educating teachers and parents about the importance of promoting holistic development in both academic and extracurricular areas. It should also offer flexibility, enabling students to choose their learning pathways and programs, ultimately allowing them to make life decisions aligned with their skills and interests. This study seeks to assess public awareness of the program.

## III. OBJECTIVES OF THE STUDY

- To evaluate the perceptions and attitudes of stakeholders towards the potential benefits and challenges of implementing the FYUGP
- To provide recommendations for improving awareness and acceptance of the FYUGP based on the findings of the study.

## IV. METHODOLOGY OF THE STUDY

Descriptive and exploratory, aiming to explore the viewpoints and provide insights into the implementation and effects of the Four-Year Undergraduate Programme (FYUGP) at Al-Ameen College. The

population of the study consists of 350 first year students in Al-Ameen College. For this purpose, a sample of 55 students has been selected by using convenience method And both primary and secondary data were used for the study. Primary data were collected using questionnaire and secondary data were collected using journals and websites.

## Tools For Data Collection:

- **Percentage analysis:-** It refers to a certain type of rate in which percentages are used to compare two or more sets of data. The relationship between the series is determined using a percentage.
- **Surveys and Questionnaires:-** Online survey platforms (e.g., Survey Monkey, Google Forms) to collect quantitative data by using the method of Descriptive statistics, cross-tabulation, and frequency analysis.

## V. LIMITATIONS OF THE STUDY

**At Low Public Awareness:** Limited understanding of the FYUGP's objectives and structure among stakeholders, particularly in rural and underserved regions, may result in incomplete perspectives.

**Implementation Challenges:** Issues such as inadequate resources, lack of trained faculty and insufficient infrastructure may not be fully addressed, affecting the study's depth.

**Insufficient Data:** A scarcity of comprehensive and reliable data on the programmer's implementation and results may limit the scope of analysis.

## VI. REVIEW OF LITERATURE

1. Sharma (2023) Research reveals that students exhibit varying levels of familiarity with FYUGP's structure and goals. Some students appreciate its focus on skill enhancement and flexibility, while others are unclear about its long-term benefits and implementation details
2. Gupta and Singh (2023) The interdisciplinary structure of FYUGP, which incorporates core subjects, major and minor courses, has been met with a largely positive response. However, there are concerns about the workload and whether the infrastructure can adequately support the program. The study reported that 68% of students appreciated the ability to take courses across disciplines, although 45% were concerned about managing their course plans.
3. Rajan (2022) The program's multiple exit options, which allow students to obtain certificates, diplomas, or degrees based on the duration of their study, are considered a novel feature. While students appreciate this flexibility, concerns persist about societal views on leaving the program early.

## VII. FINDINGS

At The study on students' perceptions of the Four-Year Undergraduate Program (FYUGP) yielded the following major findings:

### Awareness and Understanding:

60% of students reported having a fair understanding of FYUGP. No students reported being completely unaware of the program. 74% of students first learned about FYUGP through their educational institutions.

74% of students indicated they understand the difference between FYUGP and the traditional three-year degree.

### Academic Flexibility and Skill Development:

80% of students believe that the option to choose major and minor subjects increases academic flexibility. 76% feel that FYUGP enhances practical learning and promotes industry-relevant skills.

### Employability and Higher Education Opportunities:

67% of students believe that FYUGP better prepares them for employment. 82% think that FYUGP positively impacts opportunities for international higher education.

### Challenges and Concerns:

49% of students expressed concern regarding the financial burden associated with an additional year of study. 46% of students prefer the traditional three-year degree over the four-year program.

#### **Institutional Preparedness:**

58% of students believe that universities have adequately planned for the implementation of FYUGP, although further improvements are necessary.

### **VIII. CONCLUSION**

The Four-Year Undergraduate Programme (FYUGP) introduces a significant change in India's higher education landscape, aiming to enhance academic flexibility, skill development, and global recognition. Although students acknowledge the benefits of interdisciplinary learning and improved employability, concerns remain regarding financial constraints, increased academic

workload, and societal acceptance of flexible exit points. To ensure successful implementation, institutions must prioritize raising awareness, strengthening faculty capabilities, and providing financial support where necessary. With proper execution, FYUGP has the potential to elevate the quality of higher education and better prepare students for their professional careers.

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## *REIMAGINING GENDER, RECLAIMING NATURE: GENDER AND SOCIAL CHANGE IN ROKEYA SAKHAWAT HOSSAIN'S SULTANA'S DREAM*

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### **Abstract**

The juncture of gender, social transformation, and environmental justice has always remained a critical site of academic inquiry. Women's contribution in accomplishing progressive societal transformation and encouraging sustainable global goals has gathered momentous academic consideration, particularly concerning guidance, instruction, and universal reform. Despite organizational barriers, gendered labour market dissection, male-controlled socio-political frameworks, and epistemological segregations, women continue to act as agents of transformative change. Rokeya Sakhawat Hossain's *Sultana's Dream* (1905) is the subject of scholarly analysis in this article, exploring the changing discussions on gender roles in power structures. The novella gained recent global attention when UNESCO inscribed the novella to its Memory of the World Regional Register in May 2024 to narrate how it inspired an all-women's expedition to the Himalayas. By engaging feminist, postcolonial, and ecofeminist hypothetical frameworks, this study examines the mechanisms through which *Sultana's Dream* disrupts patriarchal conventions and reimagines gendered intervention within an alternative socio-technological landscape.

***Keywords: Postcolonial Feminism, Feminist utopia, Gender and Social Transformation***

The juncture of gender, social transformation, and environmental justice has always remained a critical site of academic inquiry. Women's contribution in accomplishing progressive societal transformation and encouraging sustainable global goals has gathered momentous academic consideration, particularly concerning guidance, instruction, and universal reform. Despite organizational barriers, gendered labour market dissection, male-controlled socio-political frameworks, and epistemological segregations, women

continue to act as agents of transformative change. Rokeya Sakhawat Hossain's *Sultana's Dream* (1905) is the subject of scholarly analysis in this article, exploring the changing discussions on gender roles in power structures. The novella gained recent attention when UNESCO inscribed the novella to its Memory of the World regional register in May 2024 to narrate how it inspired an all women's expedition to the Himalayas. By engaging feminist, postcolonial, and ecofeminist hypothetical frameworks, this study examines the mechanisms through which *Sultana's Dream*

disrupts patriarchal conventions and reimagines gendered intervention within an alternative socio-technological landscape.

Rokeya Sakhawat Hossain (1880–1932), a pioneering feminist intellectual and social reformer in colonial Bengal, contested dominant patriarchal narratives by advocating for women's education and self-determination. Through her writing, teaching and activism, Hossain strived to fight against 'systems of gendered oppression' built upon both indigenous patriarchal traditions and colonial epistemic violence. Her novella *Sultana's Dream* operates as a counter-discursive feminist intervention, engaging in a subversive dialogue with the sociocultural constraints of early 20th-century South Asia. Through speculative fiction, Hossain constructs a reversed gender order wherein women wield political, technological, and intellectual authority, thus foregrounding the emancipatory potential of female autonomy.

Hossain's formative years in a conservative, aristocratic Bengali Muslim household shaped her critical engagement with gender politics. Hossain was a pioneering feminist and social reformer who advocated for women's education and rights in colonial Bengal. Her 1905 utopian novella, *Sultana's Dream*, rises above its historical background to offer a potent study of the interconnectedness of gender, environment, and social justice, particularly relevant within the framework of colonial India. The novella reflects her engagement with contemporary debates on gender and social reform, offering a sharp critique of the gendered limitations imposed on women in early 20th-century South Asia while

simultaneously proposing a futuristic society where women harness science and rationality for the greater good. In a way that is in line with the utopian feminist tradition, it envisions an alternative to male-dominated social structures. Raised in an environment where women were strictly confined within purdah and formalities were formal, Rokeya was born into a conservative, upper-class Bengali Muslim family in Pairabondh, Rangpur in 1880. However, her elder brother, Ibrahim Saber, and sister, Karimunnessa, secretly taught her Bangla and English, instilling in her a love for learning. When she was sixteen, she married Khan Bahadur Syed Sakhawat Hossain, a progressive deputy magistrate in Bihar, who supported her education and encouraged her to write. Rokeya developed her writing skills under his guidance, and started publishing as a rebel in the fight for women's rights (Hossain 79). Though denied formal education under the purdah system, she learned to read and write in secret under her progressive siblings. Her marriage to Syed Sakhawat Hossain, provided a rare platform for intellectual development, enabling her to write prolifically and establish the Sakhawat Memorial Girls' School. These biographical details contextualize the radical vision embedded in *Sultana's Dream*, wherein Hossain projects an alternative epistemology that subverts patriarchal and colonial hierarchies. She was a self-educated woman who dedicated her life advocating for female education and independence. She worked for the liberation of women through education, enabling their escape from social stigma and prejudice. Rokeya tirelessly worked to awaken

women's self-awareness despite the conservative norms of her time, which denied them access to education,. She tried to teach that women themselves had to realize their degraded position in order to make change. For women's education and social progress ,she established the Sakhawat Memorial Girls' School and the Anjuman-e-Khawatin-e-Islam. Through her works and social engagement ,she tried to expose the suffering of women in a patriarchal society and highlighted the importance of education in reclaiming their rightful place.

The literary works of Rokeya offered a dual perspective—on one hand, she disapproved the biases of a the society that kept women away from their rights; on the other, she talked a world where women were treated like or better than men in terms of intelligence, knowledge, and attainments. In her essay *Istrijatir Abanati* (Women's Downfall), she found that the roots of female suppression, to lack of opportunities and years of dependency on men. She was against the customs like *purdah* and the fascination for ornaments , which she depicted as images women's enslavement. She urged women to rise, stand up, and assert their entitlements in the society In her autobiography *Subeh Sadek* (The Dawn). Rokeyaknew that the struggle for women's liberation would not be easy, but she advised women to fight for their rights.she urged the women to take the initiative themselves as no one else would truly work for their liberation. She came up with a passionate message: "Let's educate the girls and leave them in the workplace; they will earn their way." Through her relentless activism and

fearless writings, Rokeya pioneered the movement for women's education and empowerment, thus enabling the women to make an impact, creating a memorable legacy in South Asian feminist history.

In *Sultana's Dream*, Rokeya Sakhawat Hossain picturises a utopian future that offers an alternative vision of reversing gender roles, leading women to live in a society which is technologically advanced and peaceful. Sultana,the narrator , who observes *purdah*, is transported to *Ladyland*, a city-state where women rule the society and men are confined within the security of the home, mirroring the traditional isolation forced on women. When she hesitates to step outside, Sultana is reassured that she has nothing to fear, as *Ladyland* has abolished violence, embraced green technologies, and fostered a society based on love and truth rather than fear and oppression. Rokeya challenges patriarchy and imagines a world where women's intelligence and leadership create a harmonious and progressive society by this satirical reversal. The story portrays *Ladyland*, where women embrace science and reason to creating a peaceful, egalitarian society, a visionary feminist utopia. They presents a world enriched with solar technology, beautified flower-paved streets, and a relaxed two-hour workday, utilizing themes of gender equality and scientific progress. This utopian fantasy visualize a land ruled by women through ecological sustainability ,scientific innovation and political pacifism .The men of *Ladyland* are seen to endure confinement in domestic environment—ironically a reversal of the *purdah* system.Sultana, the protagonist who

initially found it difficult to venture into public spaces where she had been brought up, eventually comprehends that the land where she was taken now, Ladyland, represents a sociopolitical structure without any form of patriarchal oppression or coercion. The ruler of the land, the Queen, a polymath and scholar, eradicates war with her scientific knowledge, using solar energy and sustainable agriculture as the foundation of national prosperity.

Hossain's portrayal of a society that is technologically progressive, which subverts colonialist and patriarchal narratives that historically marginalized women as incompetent of intellectual and political management.

"Our virtuous Queen is a great scholar. She has published many books. When she was young, she continued her studies even after her marriage."

Liberal feminism encourages gender equivalence through legal and educational modification, with Hossain's emphasis on women's education being seen as a transformative inspiration. In "Sultana's Dream," the protagonist, Sultana, is transported to an alternate reality where women have utilized knowledge and education to alter the progression of history. Hossain writes, "The women of this country are not like the Bengali women. In our land, no woman is confined within the four walls of the house" (Hossain, 1905). This dream of an educated and empowered female public mirrors the standards of liberal feminism.

Mary Wollstonecraft's seminal treatise, "A Vindication of the Rights of Woman," similarly contends that women's suppression

stems not from innate inferiority but from systemic educational denial. Wollstonecraft argues, "I do not wish [women] to have power over men; but over themselves" (Wollstonecraft 74). This critique is echoed in Hossain's vision of knowledge as a vehicle for gender emancipation.

Hossain's observation on knowledge as a way to attain gender equality is in line with her criticism. The women of Ladyland have accomplished remarkable progressions in science and technology, utilising the transformative power of education. Hossain explains,

"Men, who do or at least are capable of doing no end of mischief, are taught from their infancy that they are lords of all creation. Poor women! Their lot is, alas, to weep and serve and cook and never set foot in the open air" (Hossain, 1905). This echoes the liberal feminist outlook that education and intellectual empowerment are vital to dismantling patriarchal structures. Judith Butler's theory of gender performativity, which states that gender identity is not inherent but socially constructed through repeated actions, can be identified in Sultana's Dream to discover the flexibility of gender roles in Ladyland. Butler claims that gender is not a stable essence but rather something that is endorsed through behaviour, discourse, and social norms. In Ladyland, the women's roles and individualities are redefined by their actions and societal structures that are not moulded by patriarchal norms. When men are absent, women attain the ability to engage in pioneering gendered lifestyles where leadership, intelligence, and innovation are not attributed to men but are

inherent to all women. The intersection of gender, technology, and feminist theory in Sultana's Dream can be understood through the rich framework Donna Haraway's work, particularly her Cyborg Manifesto. Here the cyborg is proposed to transcend the boundaries between human and machine, nature and culture, and male and female thus challenging the traditional ideas of gender and biology. Haraway's cyborg ideal can be related to the women's technological advances and their harmonious coexistence with nature in Ladyland where they are not confined by traditional gender roles or limited by the biological constraints often imposed upon women in patriarchal societies. They have harnessed technology to enhance their lives and the environment, signifying that the future of feminism is intertwined with technological progress.

The dichotomy that has historically separated the natural from the artificial, the biological from the technological is also challenged by Haraway's cyborg. Rather than being in charge, Ladyland's women use technology to interact with nature. Ladyland's inventions include flying cars and weather manipulation, which serve not to dominate nature, but to live in harmony with it, which reflects Haraway's argument that technology should be understood as a tool for transformation rather than oppression. Rather than exploiting the environment or each other, Ladyland's female members utilize technology to promote fairness and sustainability. "Haraway's theory, when applied to Sultana's Dream, allows us to see the novel as not just a feminist text but as a vision for a future

where technology and nature coexist in mutually beneficial ways.

Furthermore, the women in Ladyland are not biological; they are actions, intellect, and contributions to society that make them relevant, much like Haraway's cyborg. This transformation of gender norms and the integration of technology into everyday life in Ladyland exemplify how Hossain's vision aligns with Haraway's feminist posthumanism, offering a critique of both patriarchy and essentialist ideas of gender.

Radical feminism, which interrogates patriarchal power structures at their core, aligns with Sultana's Dream's thematic reversal of gender hierarchies. The confinement of men within domestic spaces in Ladyland serves as a strategic deconstruction of patriarchal logics, compelling male readers to confront the oppressive realities that women endured under the purdah system. Postcolonial theory provides an essential framework for comprehending the historical structure of power, knowledge, and identity inherited from colonialism, including the purdah system. The East is viewed as inferior, irrational, and incapable of self-rule in colonial discourse according to Edward Said's Orientalism (Said 3). Hossain's Sultana's Dream subverts this colonial logic. Instead, women govern through scientific advancements and ecological wisdom, directly challenging colonial narratives of civilizational superiority. By portraying Ladyland as a self-sufficient, technologically advanced community that doesn't conform to Western standards of progress, Hossain defies the colonial thinking in Sultana's Dream.

Similarly, Gayatri Chakravorty Spivak's seminal essay *Can the Subaltern Speak?* discusses how colonial and patriarchal structures silence colonized women (Spivak 287). Hossain's novella serves as a creative counter-discourse towards this absence, providing a hypothetical space where women's activity is not only restored but raised to a position of absolute power.

The Queen of Ladyland, as a figure of intellectual and political power, embodies a radical restructuring of gendered subjectivity that resists both colonial and indigenous patriarchies. Homi Bhabha's concept of hybridity, articulated in *The Location of Culture*, further sets us to think and illuminates *Sultana's Dream's* subversive potential. Bhabha argues that colonial subjects do not merely imitate Western modernity but set a model hybrid identities that challenge binary antagonisms between colonizer and colonized (Bhabha 112). Hossain's utopia imagines a society that neither wholly discards modern technology nor surrenders to colonial models of progress. Instead, *Ladyland* presents an indigenous substitute to both Western and patriarchal paradigms, merging methodical advancement with a principle of upkeep and sustainability. By changing gender roles and positioning women as architects of a peaceful, technologically advanced society, *Sultana's Dream* contests the dual dominations of colonialism and patriarchy. Hossain's vision anticipates contemporary postcolonial feminist reviews, asserting that true liberation must pull apart both imperial and gendered structures of authority.

The critique of *Purdah*, a religious exercise that restricts women's partaking in

public life, is central to the novel's postcolonial analysis. *Purdah* can be seen as a colonial inheritance, as it was strengthened by both colonial and religious patriarchal systems. In *Sultana's Dream*, the women's liberation from such restraining practices is emblematic of the broader decolonization of gender and society. The novel envisions a world where women are not bound by means of colonial and patriarchal constructions but instead lead and form a world based on shared effort and rational competence.

Hossain's analysis of colonialism also encompasses to how colonialism created orders that positioned Western, male-centered societies as superior to the cultures they colonized. In *Ladyland*, the women have rejected such imperialist philosophies. They manage their world without the obligation of external commendation or power, signifying that the future of postcolonial cultures could encompass a negation of both colonization and male-controlled domination. Moreover, Hossain's design of *Ladyland* as a place of scientific and social progress contests colonial accounts that characterize colonized nations, as static or backward. In *Ladyland*, women have a proficient level of technological superiority and communal harmony that exceeds the patriarchal, colonial constructions that rule the real world. Thus a substitute model of progress is offered, one that is rooted in gender equivalence, cooperation, and respect for nature, rather than exploitation and competition.

Ecofeminism, which speaks the interlinkages between gender subjugation and environmental exploitation, provides a

persuasive framework for analysing Sultana's Dream's ecological dream. In Ladyland, ecological sustainability is complemented by technological innovation as against the colonialist-masculinist-industrialist paradigm of exploitative expansion. The ethos of preservation, with solar energy and botanical innovations displacing militarized industrialization serves as the governing stand for the Lady land.

The contemporary ecofeminist analyses of capitalist environmental dilapidation is replicated in Hossain's "Sultana's Dream". Vandana Shiva and Maria Mies contend that women's traditional information systems offer sustainable replacements to manipulative capitalist models. Hossain's description anticipates this argument by raising a feminist ecological utopia that reimagines science as an instrument of symbiosis rather than power.

'While the women were engaged in scientific research, the men of this country were busy increasing their military power. When they came to know that the female universities were able to draw water from the atmosphere and collect heat from the sun, they only laughed at the members of the universities and called the whole thing "a sentimental nightmare"!'

Shiva and Mies, in their work "Ecofeminism," highlight the unfavourable impact of capitalist expansion on both women and nature, highlighting the need for sustainable practices rooted in traditional knowledge. They opine, "Women's work and knowledge are central to the preservation of the biosphere" (Shiva and Mies 38). This outlook resonates with

Hossain's illustration of Ladyland, where women employ green technology and reasonable practices.

Hossain's narrative portrays Ladyland as a society where science is used to boost harmony with nature. She inscribes, "We had no coal, nor did we employ any fuel. Every one of our buildings was lighted with solar heat" (Hossain 1905). This vision diverges sharply from the exploitative industrial practices criticized by ecofeminists like Shiva and Mies.

In Ladyland, ecofeminist utopia is visible utilising the importance of solar energy and feasible agriculture. Shiva and Mies says that capitalist models interprets nature as a resource to be exploited, whereas traditional knowledge systems, often maintained by women, understand nature as a partner in synergy. Hossain resonances this sentiment, describing how Ladyland's women "gather honey, but do not kill the bees" (Hossain 1905), indicating a non- exploitative rapport with nature. By presenting a society where women govern through science and cooperation, Hossain's

"Sultana's Dream" reinforces ecofeminist ideals. The alternatives to capitalist exploitation is very well identified in the narrative which suggests reimagining of technological agency and the integration of traditional knowledge systems. The unending feminist accounts of public-private contradictions that constrain women's agency resonates with the questions of the gendered politics. Thus Ladyland's environmental morals and technological advancements offered a visionary prototype for the contemporary deliberations on sustainable development

and gender comprehensive governance .The text not only historicizes gendered suppression but also offers a hypothetical map-making of feminist futurity—an intellectual endeavour that remains authoritative in the 21st century. The extrapolation of Butler’s, Haraway’s, and postcolonial theories collectively illumine the complex interplay between gender, power, technology, and colonial histories in *Sultana’s Dream*. The traditional notions of gender as an inherent or essential feature, is challenged in the novel thus suggesting instead that gender is performative and shaped by the existing social and cultural erections. Also the the postcolonial theory underscores the interpretation of the novel that questions the colonial inheritances and patriarchal oppression .the women of ladyland ,who are not restricted by the confines of the partriarchal expectations performs empowered gender roles proposes a future where women and colonized people can create a more just and unbiased society, free from the ladders of both gender and empire. Thus the future envisioned in the novel can be combined with the feminist ideals with the tecnological modernization ,religious modification and postcolonial liberation. Hossain uses Ladyland as a platform to evaluate patriarchal power structures and colonial histories while encouraging for a reimagining of the future that is deep-rooted in gender equality, intellectual empowerment, and social collaboration. Through these frameworks, by drawing on Butler’s, Haraway’s, and postcolonial theories, "*Sultana’s Dream*" becomes a visionary text that not only critiques the present but also offers a

influential, transformative dream for a more just and impartial world.

Ecofeminism contends that the patriarchal social order overpowers both women and nature, observing them as submissive, utilizable possessions. "*Sultana’s Dream*" interrupts this narrative by bestowing Ladyland, where women rule through science and collaboration rather than power and conflict. In contrast, men—usually associated with mechanization and environmental degradation—are curbed indoors, disrupting the patriarchal order. Hossain pens, “Men, who do or at least are capable of doing no end of mischief, are taught from their infancy that they are lords of all creation” (Hossain, 1905).

Hossain’s narrative emphasizes, “We do not want to have any war in Ladyland, no plunder, no poverty” (Hossain, 1905).

Ecocriticism observes how literature characterizes nature and human relationships with the environment. *Sultana’s Dream* contests the traditional, male-dominated scientific model by depicting women as the designers of green progressions. Instead of captivating advantage of nature for personal benefit, they link technology for shared welfare. Thus, the utopian dream examines the anthropocentric and patriarchal tendencies of industrialization, which prioritize economic growth over natural and social well-being. Moreover, Ladyland’s two-hour workday reflects an ecocritical critique of capitalism’s untenable demands on both people and the planet. It offers a substitute economic model where labour is not determined by endless production and consumption. The novella thus preludes contemporary deliberations on degrowth and

sustainable living. It presents an ecofeminist dream that interweaves women's liberty with environmental stewardship. By replacing patriarchal dominion with supportive, justifiable governance, Ladyland embodies an ideal where nature and women are no longer subjugated but empowered.

Rokeya Sakhawat Hossain's work develops as a radical feminist and postcolonial arbitration that challenges the epistemological and material rudiments of patriarchal and colonial modernism. Through its utopian transposal of gender roles, the novella strike at the foundations of prescriptive origins of power, science, and governance, propositioning an alternative paradigm rooted in feminist wisdom and environmental harmony. By generating feminist, postcolonial, and ecofeminist critiques, Sultana's Dream surpasses its historical milieu to offer an outline for reimagining gendered intervention in the modern-day world.

The text can be identified as a rich source that encompasses both a critical article of early feminist speculative fiction and a transformative vision of a just and sustainable future.

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## *ROLE OF CSR IN BUSINESS PERFORMANCE-A SPECIAL REFERENCE TO SELECTED LISTED COMPANIES IN KERALA*

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### **Abstract**

Companies today are increasingly focused on protecting the interests of stakeholders through improved social performance. There is a growing compulsion for these companies to report their socially responsible activities and practices in order to gain public support. In Kerala, some organizations have taken the initiative to publish reports on their social activities on their websites. Such initiatives can enhance a company's performance in the market. This study investigates the relationship between Corporate Social Responsibility (CSR) and the financial performance of companies based in Kerala. A multiple regression and correlation analysis approach has been employed to examine the association between CSR initiatives and financial outcomes. The results indicate a positive association between CSR activities and sales performance among Kerala-based companies. Moreover, financially progressive companies are more inclined to invest in CSR efforts. It is concluded that the trend of CSR adoption is likely to grow, with more companies in Kerala expected to engage in socially responsible practices.

***Keywords:* stakeholders, corporate social responsibility, financial performance, Kerala, CSR initiatives.**

### **I. INTRODUCTION**

Corporate Social Responsibility (CSR) is a broad business concept that involves conducting business ethically while contributing to social, economic, and environmental development. It emphasizes the importance of respecting human rights and ensuring the welfare of society alongside the pursuit of profit.

While the primary objective of most businesses is to generate profit, companies are increasingly expected to operate in ways that benefit the broader community.

Understanding how CSR spending, initiatives, and publicity impact a company's financial performance is crucial. Several studies have explored the relationship between CSR and firm performance, revealing a connection between the two variables. However, the direct link between CSR activities and financial outcomes often appears inconsistent or inconclusive.

CSR implementation varies widely across companies depending on several factors. Most existing research focuses on a direct relationship between CSR and financial

performance, but this relationship can sometimes seem unreliable or overstated.

This study aims to examine the relationship between corporate social responsibility and the financial performance of listed companies in Kerala. Data was collected from Kerala-based companies listed on the Bombay Stock Exchange (BSE). Statistical tools such as correlation and regression analysis, along with hypothesis testing, were used to explore the relationship between CSR practices and financial outcomes.

The results indicate a significant association between CSR and financial performance. The findings suggest that CSR positively influences financial results by enhancing the company's reputation among stakeholders and reducing operational costs. This research highlights the value of CSR and provides insights for management to better understand its importance in achieving sustainable business success.

## II. REVIEW OF LITERATURE

According to Margolis and Walsh (2003), a positive relationship between CSR and financial performance exists, especially in firms that integrate CSR into their core operations. In contrast, Friedman (1970) famously argued that the only social responsibility of business is to increase its profits, suggesting a potential conflict between CSR and shareholder wealth maximization.

In the Indian context, Nandini et al. (2020) found that CSR positively influences the

financial performance of companies listed on the BSE. The implementation of the Companies Act 2013, which mandates CSR spending for certain firms, has led to a measurable increase in CSR activities.

Mishra and Suar (2010) investigated Indian manufacturing firms and found that CSR activities directed toward primary stakeholders (customers, employees, investors) significantly impacted firm performance.

KPMG India (2022) reports that CSR compliance in India has increased substantially post-2014. However, the effectiveness and strategic alignment of CSR initiatives remain a concern, especially among smaller listed firms.

## III. RESEARCH METHODOLOGY

This study investigates the relationship between Corporate Social Responsibility (CSR) activities and the financial performance of listed companies in Kerala. The analysis focuses on companies across all sectors over a three-year period, from 2017–18 to 2019–20.

### Data Collection

- **Financial Data:** Sales and profit figures of listed companies in Kerala were collected for the years 2017–18, 2018–19, and 2019–20.
- **CSR Ratings:** CSR performance ratings for the same period were obtained from reliable sources, namely:

- CSR.gov.in
- Karmayog.org

These platforms provide CSR ratings and reports based on company disclosures and other verified data sources.

### Analytical Tools and Techniques

- **Statistical Software:** SPSS was used to perform the data analysis.
- **Regression Analysis:** Conducted to examine the potential impact of CSR activities on the financial performance of the companies.
- **Correlation Analysis:** Used to determine the strength and direction of the relationship between CSR ratings and financial performance indicators (sales and profit).
- **Hypothesis Testing:** Carried out using correlation analysis to test whether a statistically significant relationship exists between CSR engagement and financial outcomes.

### IV. OBJECTIVE

The main objective of the analysis is to evaluate whether CSR activities have a measurable influence on the financial performance of companies in Kerala, and to identify if a positive, negative, or neutral relationship exists between the two.

### V. ANALYSIS AND INTERPRETATION OF RESULTS

#### Correlation Matrix of Listed Companies in Kerala

CSR and Financial Performance Relationships (Positive=Green, Negative=Red)

Company	CSR → Sales (Next)	CSR → Profit (Next)	Sales → CSR (Next)	Profit → CSR (Next)
Muthoot Finance	1	1	1	1
Manappuram Finance	1	1	1	1
Apollo Tyres	0	1	0	1
KSE	1	1	1	0
Muthoot Capital	1	1	1	1
V-Guard	1	1	1	1
Geojit	1	1	1	0
Kitex	0	0	0	1
SIB	0	0	0	0
Federal Bank	1	1	1	0

#### Interpretation

- Most listed companies in Kerala show a positive relationship between CSR spending and financial performance.
- Companies with higher current-year sales and profits tend to spend more on CSR in the following year.
- Increased CSR investment appears to enhance brand/market image, which in turn boosts future sales and profits.
- This trend suggests that growth-oriented companies invest in CSR not only for compliance but also as a strategic tool to strengthen stakeholder relationships and long-term financial outcomes.

### VI. KEY FINDINGS

- **CSR Expenditure (Current Year) vs Sales (Next Year):**
  - Positive correlation in 7 companies
  - (Muthoot Finance, Manappuram Finance, KSE, Muthoot Capital, V-Guard, Geojit, Federal Bank)

- **CSR Expenditure (Current Year) vs Profit (Next Year):**
  - Positive correlation in 8 companies
  - (Muthoot Finance, Manappuram Finance, Apollo Tyres, KSE, V-Guard, Geojit, Federal Bank)
- **Sales (Current Year) vs CSR Expenditure (Next Year):**
  - Positive correlation in 7 companies
  - (Muthoot Finance, Manappuram Finance, KSE, Muthoot Capital, V-Guard, Geojit, Federal Bank)
- **Profit (Current Year) vs CSR Expenditure (Next Year):**
  - Positive correlation in 6 companies
  - (Muthoot Finance, Manappuram Finance, Apollo Tyres, Muthoot Capital, V-Guard, Kitex)

## VII. SUMMARY

This study examined the link between CSR spending and financial performance of listed companies in Kerala using data from 2017–18 to 2019–20. The findings show that CSR expenditure leads to higher sales in the following year, likely due to improved brand

image. However, it does not significantly impact profits. Additionally, companies with higher sales and profits tend to spend more on CSR in the subsequent year.

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## जसिंता केरकेट्टा की कहानी 'रेशमा' में चित्रित नारी का त्रासद जीवन

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### सारांश

सदियों से हर जमाने में हर एक देश में स्त्रियों के उद्धार के लिए आंदोलन होते आ रहे हैं। इन आंदोलनों से स्त्रियों की जिंदगी में काफी बदलाव भी आया है। लेकिन भारत में हम देखते हैं कि आए दिन स्त्रियों के प्रति अत्याचार बढ़ रहा है। लेकिन सामूहिक बलात्कार जैसे हीन, निकृष्ट कुकर्म बहु संख्या में हो रहे हैं। यद्यपि हम चांद तक पहुंचे हैं, सूर्य को अभी छूने वाले हैं स्त्रियों के प्रति जो मानसिकता है उसमें काफी बदलाव नहीं आया है। आजकल समाचार पत्रों में जो खबरें आती हैं वह हमें भयभीत करने वाली हैं।

एक साल की बच्ची से लेकर साठ होते बूढ़ी स्त्री तक पुरुष के यौन शोषण से मुक्त नहीं है। हम दावा करते हैं कि शिक्षा का स्तर बढ़ रहा है, तकनीकी के मामलों में हम दुनिया में अब्बल बनते आ रहे हैं, दुनिया के देशों में भारत योग और आत्मसंयम के लिए प्रसिद्ध है, लेकिन स्त्री के प्रति भारतीयों की नजरिया में बदलाव नहीं आया है। झारखंड की प्रसिद्ध आदिवासी लेखिका जसिंता केरकेट्टा की कहानी 'रेशमा' ये सब बातें हमारे दिमाग में टूंस देती है। अपनी कहानी द्वारा जसिंता केरकेट्टा हमारे आगे एक ग्रामीण लड़की की दर्दनाक जिंदगी सामने रखती हैं। एक हंसमुख लड़की की जिंदगी क्यों इतनी त्रासद बन गई इस पर हमें सोचना है। स्त्री अब भी एक देह मात्र रह गयी है। उसका अपना अस्तित्व और व्यक्तित्व नहीं है। हमेशा पुरुष के कदमों के नीचे, दम घुटती जिंदगी जीना पडता है। पुरुष वर्चस्वादी समाज में स्त्री दोगम दर्जा का अधिकारी है। घर की चहारदीवारी में पडी रहकर सारा काम निभानेवाली स्त्री के लिये विश्राम करने के लिये भी एक कमरा नहीं है। नियम हमेशा स्त्री और पुरुष के लिये अलग है। रेशमा कहानी इस अन्याय की ओर हमारा ध्यान आकर्षित करती है।

**बीज शब्द :** जसिंता केरकेट्टा, नारी शोषण, घरेलू हिंसा, स्वत्व बोध, शिक्षा, अस्मिता, पहचान.

### I. भूमिका

हर मार्च 8 महिलाओं पर सोचने का अतिरिक्त अवसर देता है। इस वर्ष महिला दिवस आचरण में भारत की महिलाओं के लिए खुशी की एक बात भी है कि महिला आरक्षण बिल पास हो गया है। इस बिल के मुताबिक लोक सभा और राज्यसभा दोनों में महिलाओं के लिए एक तिहाई सीट यानी 33 प्रतिशत सीटें आरक्षित है। यह दूसरी बात है कि इस वर्ष के चुनाव में यह लागू नहीं होगा। जनगणना और मण्डल पुनर्निर्णय के बाद ही यह प्रावर्तिक होगा। फिर भी यह महत्वपूर्ण बात है कि

1996 से लेकर महिला आरक्षण की बात हो रही थी और अब ही वह सार्थक हो गई है। इस विधेयक के निर्माण में यही बात जाहिर होती है कि समाज के निर्माण में महिलाओं की भागीदारी की महता को देश भर में स्वीकारने लगा है। महिला आरक्षण बिल सिर्फ एक संवैधानिक प्रावधान नहीं है। यह पूरे राष्ट्र की अस्मिता का प्रश्न है। विकसित राष्ट्र की पहचान का मसला है। किसी भी समाज के विकास का आकलन वहां के स्त्री समाज की नियति के आधार पर हो सकता है।

स्त्री शिक्षा का स्तर और साक्षरता, महिला स्वास्थ्य, उनकी रोजगार की स्थिति तथा समाज में निर्णय लेने और नीति निर्धारण में उसकी भागीदारी का स्तर आदि सामाजिक प्रगति के सूचकांक हैं। भारत जैसे पितृसत्तात्मक विचारधारा रखने वाले देश में स्त्रियों के आरक्षण की सख्त जरूरत है। हमें इस बात पर गर्व है कि भारत की प्रथम नागरिक एक वनिता है। भारत की पहली प्रधानमंत्री एक वनिता थी जिनका नाम आज भी हमारे जुबान पर एक दृढ़ व्यक्तित्व वाली महिला के रूप में कायम है। भारत की अबकी वित्त मंत्री एक वनिता है। खेल - कूद, विज्ञान, मनोरंजन, व्यापार आदि क्षेत्रों में भी भारत की महिलाएं विजय पताका फहरा रही हैं। अब अधिकांश महिलाएं छोटे-बड़े कामों के लिए घर की चार दीवारी से बाहर निकालने लगी हैं। यह सब गर्व करने वाली बातें हैं। लेकिन इसके साथ ही साथ रोज अखबारों में ऐसी खबरें भी आती हैं जो हमारे तन और मांस को व्यथित करती हैं। 2 बरस की बच्ची से लेकर 70 बरस की बूढ़ी तक का बलात्कार किया जा रहा है।

दहेज के नाम पर हो रही स्त्रियों की आत्महत्या और हत्याओं की संख्या दिन-ब-दिन बढ़ती जा रही है। खेलकूद में हो रहे शोषण की खबरें आती ही रहती हैं। अशिक्षित, गंवार, दलित और आदिवासी लोगों का शोषण जोरों पर है। आदिवासी स्त्री दोहरी पीड़ा झेल रही है - एक आदिवासी होने की और दूसरी स्त्री होने की।

एक और विकास, तकनीकी, विज्ञान आदि के शिखर पर खड़ा देश दूसरी ओर स्त्रियों के प्रति हो रहे अतिक्रमण के नाम पर सर झुकाए खड़ा है। इन स्त्रियों पर हो रहे अन्याय और अतिक्रमण का चित्रण जसिंता केरकेट्टा अपनी कहानी 'रेशमा' में करती है।

## II. कहानी समीक्षा

जसिंता केरकेट्टा आदिवासी युवा लेखिका है जिसका जन्म झारखंड में हुआ था। वह सामाजिक कार्यकर्ता है जो आदिवासियों के सुधार और उधर के लिए काम कर रही है। 'रेशमा' कहानी वागर्थ में 2023 अप्रैल में छपी थी।

भारत की दलित और आदिवासी जनता सुविधाओं से वंचित है। मुख्य धारा के लोगों द्वारा आस्वादित अधिकारों से मीलों दूर जी रहे वे लोग अपने अधिकारों के लिए लड़ रहे हैं। 'रेशमा' में जसिंता 16 साल की एक आदिवासी लड़की की कहानी बता रही है। आत्मकथा शैली में यह कहानी लिखी गई है। रेशमा नाम की लड़की की लाश एक पेड़ पर टंगी हुई है। और रेशमा की आत्मा अपनी देह से उतरकर उसकी पिछली कहानी याद कर रही है और अबकी हालत पर सोच रही है। उसके सोच में गांव और शहर की स्त्रियों की जिंदगी से संबंधित कई सवाल उभर आते हैं। यह कहानी स्त्रियों पर हो रहे अतिक्रमणों पर सोचने को हमें बाध्य करती है।

रेशमा झारखंड के एक आदिवासी गोत्र की आठवीं दर्जे में पढ़ने वाली एक लड़की है जो धान कूटने के बाद स्कूल जाती है। और स्कूल से वापस आकर भी धान कूटकर, भूसे से भरा चावल साफ करती, भात रींध करती थी। मेहनती किसान परिवार की मेहनती लड़की। बड़ी चुलबुली। गांव में वही एक लड़की थी जिसका रंग श्वेत था। सब लोग उसकी मांस से कहा करते थे कि उसकी लड़की सुंदर है। यही अभिमान था रेशमा को। मांस चाहती थी कि उसकी बेटी अच्छी तरह पढे और किसी बड़ी नौकरी में लग जाए। वही रेशमा की भी चाह थी।

तभी वहां उसके चाचा का बेटा सोमरा आता है। वह काम के नाम पर गुजरात के शहर में था और शहर से वापस आने पर उसका नाम समर

हो गया। वह गांव की सुंदर लड़की की छेड़खानी करने लगता है। वह भी धान कूटने के लिए आता है। और कुछ ही दिनों में रेशमा को अपने वश में कर लेता है। रेशमा अपने इस प्रेम संबंध के बारे में कई बार सोचती हैं। वह सोचती है कि चाचा का बेटा है। रिश्ते में भाई बहन है। उसके गोत्र में प्रेम, प्रेम विवाह, विवाह से पहले बच्चा होना, शारीरिक संबंध होना इन सब का कोई मनाही नहीं है। गांव में यह सब तो सहज बातें हैं। लेकिन एक ही गांव के एक ही गोत्र के बीच के संबंध को वे समर्थन नहीं करते। यदि रिश्तेदार हो तो कभी नहीं।

रेशमा के संदेह को सोमरा एकाएक टाल देता है यह कहकर कि शादी के बाद हम किसी शहर जाकर बसेंगे तो वहां के लोग थोड़े ही जानते हैं कि हम रिश्ते में भाई- बहन हैं। दोनों के बीच शारीरिक संबंध होता है और रेशमा गर्भिणी बन जाती है। सोमरा से कहा तो उसने कहा कि किसी से मत कहना। मां ने पूछा कि कौन इसका उत्तरदाई है तो रेशमा ने कुछ नहीं कहा। और एक दिन रात को सोमरा आकर रेशमा से बाहर आने को कहता है। और राउरकेला जाने की बात कहता है। और साथ में कपड़ा भी लेने को कहता है। रेशमा जब बाहर निकलती है तो देखती है कि चार लड़के और वहां खड़े हैं तो वे क्यों आए हैं यह पूछने पर सोमवार ने कहा कि हम लोग दूर जाते हैं न? कोई काम आ जाए तो ये मदद आएंगे। अपने गांव को छोड़कर जाते वक्त रेशमा के मन में यही प्रतीक्षा है कि राउरकेला जाकर उसका गर्भपात होगा और वापस आकर मां की इच्छा के अनुसार खूब पढ़ेगी और नौकरी भी पाएगी। जब गाड़ी बिसरा स्टेशन पर पहुंची तो वे पांच लड़के उतरते हैं और रेशमा से उतरने के लिए कहते हैं। रेशमा ने सोचा कि गाड़ी तो स्टेशन पर पहुंची नहीं है। हवा में थोड़ी देर आराम करने के लिए होगी यह सोचकर रेशमा

बाहर निकलती है। तो कोई आकर उसके मुंह बंद करके उसको खींच कर घसीटकर पेड़ के नीचे ले गया। उसको पता चलता है कि उसके प्रेमी ने ही उसको घसीट लिया था और एक-एक करके पांचों ने उसके साथ क्रूर बलात्कार किया। रेशमा उन लड़कों को पहचानती है। वे सब तो उसके सगे संबंधी हैं। वही लड़के जो उसके ही इलाके में घुमा फिरा करते थे। उसकी चीख किसी ने नहीं सुनी। क्योंकि गाड़ी चल रही थी और उसके बाद रेशमा की लाश को वहां पेड़ पर टांग दिया गया। रेशमा की लाश से आत्मा उतरती है और सोच रही है कि रेशमा और चाचा के बेटे के बीच शादी हो सकता था। लेकिन उसने ऐसा क्यों किया। पेड़ पर टंगी हुई रेशमा कुछ सवाल और सोच हमारे सामने रखती है जिन पर हमें, जो सभ्य होने का दावा करते हैं, जो शिक्षित होने का दर्प रखते हैं, जो आधुनिक होने का गर्व दिखाते हैं, उनका उत्तर देने के लिए बाध्य है।

अपने मांस को खाने के लिए आए चील और कौवे को देखकर वह पूछ रही है कि “आदमी और इनमें क्या फर्क है यह भी इंसानी देह को मांस का टुकड़ा समझते हैं। पर ये चील - कौवे - गिद्ध आदमी से बेहतर है। ये जिंदा इंसान के नाम को लोथड़ा नहीं समझते। ये किसी की रूह का गला नहीं घोंटते। किसी का बलात्कार नहीं करते। और उसे पेड़ पर इस तरह नहीं टांग जाते। स्त्री को इंसान समझना और खुद भी इंसान हो जाना तो दूर की बात है आदमी को इनकी तरह होने में भी बहुत वक्त लगेगा।” उसके मन में यह भी सवाल उठता है कि आदमी उजाले में क्या होता है और अंधेरे में क्या? और अपने ही लोगों द्वारा सामूहिक बलात्कार की घटना गांव में यह पहली ही थी। समाज और गांव का बदला क्या इस तरह है?

रेशमा की मृत्यु की खबर चारों ओर फैल जाती हैं। अखबारों में तस्वीर छप जाती है और रेशमा ने सोचा कि घर में यह जानकर बहुत कोहरा मच जाएगा। घर वाले मिलकर बलात्कारियों को सजा दिला कर ही रहेंगे। लेकिन रेशमा ने देखा कि ऐसा कुछ नहीं हुआ। बाबा बहुत रोया और खुद को कोसा कि उनकी गलती से रेशमा का यह हाल हुआ। मां बुरी तरह रोई। दिनों तक कुछ खाया पिया भी नहीं। भाई भी बहुत दुखी थे। पूरा घर श्मशान की तरह हो गया। एक बात रेशमा को अच्छी नहीं लगी कि सब लोग दुखी जरूर थे। पर हर कोई इस बात को दबा देना चाहता था। बाबा ने यह भी कहा कि जो चला गया तो चला गया। लड़की ही अपनी ठीक नहीं थी तो कोई क्या कर सकता है? रेशमा को अपनी मां की हालत पर तरस आती है। वह इस यथार्थ से अवगत हो जाती है कि लड़की के लिए रोने और सहने के लिए उसकी मां ही होगी। स्त्री की व्यथा एक स्त्री ही समझ सकती है।

“मां मुझे न्याय दिलाने के लिए लड़ना चाहती थी। बलात्कारियों को सजा दिलाना चाहती थी। लेकिन उसे याद आया कि इस घर में उसकी खुद की कोई कीमत नहीं। घर पति का, खेत पति का, संपत्ति पति की, शक्ति पति की, निर्णय पति का और बेटी का बलात्कारी भी तो पति के भाई का लड़का और उसी की मित्र मंडली। इस घर में, इस खेत में वह आजीवन खटने के लिए तो है। लेकिन कोई निर्णय लेने, हक मांगने, न्याय चाहने और अन्याय के खिलाफ कुछ बोल सकने के लिए नहीं है।”<sup>2</sup>

रेशमा देखती है कि गांव में इस बात को लेकर कोई पंचायत भी नहीं हुए। सब कह रहे थे कि लड़की अच्छी नहीं है तो क्या करें। गांव का और घर की इज्जत रखने के लिए चुप रहना ही अच्छा है। सोमरा उस घटना के बाद फरार था।

लेकिन वह रात में कभी-कभी गांव आता रहता था। दोस्तों और परिवार मिलकर प्रभात में वह गायब होता। बाकी लड़के भी उसी प्रकार ही आते जाते रहते थे। लोग उस घटना को भूल गए। और इस प्रकार सब चुप रहकर रेशमा के घर और गांव की इज्जत बचाए रखा।

कहानी इस प्रकार समाप्त होती है कि “ट्रेन अभी चलती है उस तरह। बिसरा स्टेशन से होकर गुजरती है। वह पेड़ अब भी इस तरह खड़ा है। मेरे सगे-संबंधी अक्सर इस ट्रेन से राउरकेला जाते हैं। सब किसी बुरे सपने की तरह मुझे भूल चुके हैं। पर मैं आज भी उसी पेड़ पर टंगी हुई हूँ। देह तो दफन हो गई। पर रूह का क्या? अब भी वही है। उसी बिसरा स्टेशन पर न्याय का इंतजार करते हुए। अपनी मुक्ति की राह देखते हुए।”<sup>3</sup>

कहानी के अंत में रेशमा द्वारा पूछा गया प्रश्न हम पाठक गण की ओर है। हम कैसे इस अन्याय को न्याय में बदलेंगे? कैसे स्त्री को मुक्ति की राह दिखाएंगे? रेशमा अपने लिए मात्र यह प्रश्न पूछ नहीं रही है, बलात्कार की क्रूर यातना को सहनेवाली सभी लड़कियों के लिए है। स्त्री को मात्र भोग्य वस्तु मानकर अपने पौरुष का पराक्रम दिखानेवाले पुरुषों को अपराधी मानने के लिए समाज तब तक तैयार नहीं होता जब तक उसके खिलाफ कोई कानूनी जांच-पड़ताल नहीं आए। स्त्री से चुप रहने के लिए कहते हैं। यदि वह खुलकर बताएगी तो घर – परिवार की इज्जत मिट्टी में मिल जाएगी। यदि कोई लड़की इसका खुलासा करती है तो उसके वीरुध अफवाहें फैलने लगती हैं। अदालत में भी उससे ऐसे सवाल पूछे जाते हैं कि उसको लगता है कि उसका कई बार बलात्कार हो रहा है। जसिंता हमारे सामने कई सवाल रखती है। जैसे-

१. एक ही गलती के लिए स्त्री और पुरुष के साथ भिन्न-भिन्न व्यवहार क्यों?

२. लड़की की इज्जत पर ही क्या गांव और परिवार की इज्जत खड़ी है?

३. घर परिवार में स्त्री की क्या हैसियत है? पूरे परिवार के लिए हमेशा काम करती रहने वाली स्त्री के लिए उस घर में विश्राम के लिए भी एक जगह नहीं है। खुले वातावरण में खुला होकर उसे सोना पड़ता है। इसलिए गहरी नींद भी उसे कभी नहीं मिलती। अपनी मां के बारे में सोच कर रेशमा रहती है कि मां जैसी स्त्रियां जिंदगी में एक ही बार गहरी नींद सोती हैं, मृत्यु शय्या में। वर्जीनिया वुल्फ ने बरसों पहले अपनी पुस्तक 'ऑफ वंस ओन रूम' कहा था कि स्त्री को अपना एक कमरा होना चाहिए।

४. घरेलू बलात्कार से स्त्री की मुक्ति कब होगी? रेशमा कहानी में रेशमा याद करती है कि उसकी मां यह कहा करती थी कि अच्छी तरह पढ़ना है और नौकरी पाना है। मां ने ऐसा क्यों कहा था यह रेशमा जानती है। मां भी अच्छी तरह पढ़ने वाली थी। जब वह आठवीं क्लास में हुई तो उसकी शादी हो गई। मां बताती थी कि वह शादी करना नहीं चाहती थी। लेकिन बाबा ही पीछे पड़ गए थे। अगर शादी नहीं हुई तो मर जाने का की धमकी भी उसने दी थी। और शादी के बाद मां की पढाई छूट गई। कच्ची उम्र में ही एक लड़के को जन्म दिया। और बच्चे बार-बार हुए। और दूसरे बच्चे के बाद ही बाबा दारू पीकर आने लगा और मां को पीटने लगा। यह सच जानकर भी मां चुप रही कि उसके पति को अन्य स्त्रियों के साथ संबंध है। अपने बच्चों को लेकर वह कहीं ओर भाग जाना चाहती थी। एक बार वह गई भी। लेकिन सगे-संबंधियों ने उसे समझाया कि विवाहित लड़की का

घर कहां होता है पति का घर ही उसका घर है। और मां मन मसोस कर वापस चली आई और इस आदमी के साथ जीती रही जो दिन रात उसे पर हाथ चलाता था। उसका क्रूर बलात्कार करता था। रेशमा सोचती है कि मां घर के भीतर और वह घर के बाहर बलात्कार के शिकार हुई।

'स्त्रियों का ईश्वर' शीर्षक अपनी कविता में जसिंता केरकेट्टा ईश्वर के ही अस्तित्व पर प्रश्न चिन्ह लगाती है जो पुरुषों और स्त्रियों के साथ भिन्न-भिन्न व्यवहार करता है। कविता में वह कहती है कि -

पिता और भाई के हिंसा से

बचने के लिए मैं ने बचपन में ही

मां के ईश्वर को कसकर पकड़ लिया

मैं बड़ी होने लगी

और मां बूढ़ी होने लगी

हम दोनों के पास अब भी वही ईश्वर था

मां की मेहनत का हिस्सा

अब भी भाई छीन ले जाता

और शाम होते ही पिता

पीकर उस पर चिल्लाते

वे कभी नहीं बदले

ना मां के दिन कभी सुधरे

मैंने ऐसी ईश्वर को विदा किया

और खुद से पूछा

सबके हिस्से का ईश्वर

स्त्री के हिस्से में क्यों आ जाता है

क्यों उसके पास सबसे ज्यादा ईश्वर है

और उनमें से एक भी काम का नहीं

वह जीवन भर सबको नियमित पूजती है  
फिर पूजे जाने और हिंसा सहने के लिए  
ताउम्र बुत बनकर क्यों खड़ी रहती है?4  
स्त्री पर हो रहे घरेलू हिंसा का परिचायक है ये  
पंक्तियां।

घरेलू हिंसा पर वर्जिनिया वूल्फ का कथन  
है सोचती हूं कि किसी ऐसे घर के बाहर फंस जाना  
,जिसके दरवाजे पर बाहर से ताला लगा हो,  
कितनी दुखद स्थिति होती है।परंतु मुझे यह  
सोचकर और भी डर लगता है कि किसी ऐसे घर के  
अंदर फंस जाना जिसके दरवाजे पर बाहर से ताला  
लगा हो, यह भी उससे भी बदतर स्थिति है।

५. अपनी प्रेमिका लड़की का बलात्कार करने के  
लिए दूसरे पुरुषों को अनुमति देनेवाले पुरुष की  
मानसिकता क्या है ? असल में वह प्रेम नहीं है।  
उसके लिए वह एक वस्तु मात्र है।

### III. निष्कर्ष

जसिंता ने आदिवासी लड़की और स्त्री की बात  
इसमें कहा है। लेकिन इस में उठाई गयी समस्याएं  
सब स्त्रियों पर लागू हैं। इन यंत्रणाओं और पीड़ाओं  
से बचने के लिए स्त्री क्या कर सकती है? अपने  
आपको बचाना है और दूसरी स्त्रियों को मुक्ति की  
राह दिखाना है।

अगर गंभीरतापूर्वक इस बात पर विचार  
करें तो यही बात महत्वपूर्ण लगता है कि स्त्री  
शिक्षित हो जाए। जब तक शिक्षित होकर अपने  
पैरों पर खड़ी नहीं होती तब तक किसी प्यार-व्यार  
के चक्कर में नहीं पड़े। अपने आप से प्यार करें।  
अपने पर गर्व करें। अपनी अस्मिता को खूब  
पहचानें। किसी पुरुष द्वारा अपनी स्तुति सुनने के

इंतज़ार में मत रहेम। अपना शरीर किसी की भोग  
लिप्सा की पूर्ति के लिए नहीं, यही मानिए। नोबेल  
पुरस्कार जेता टोनी मॉरिसन अपने 'जाज़'शीर्षक  
उपन्यास में कहा था “ don't ever think I fell  
for you or fell over you! I didn't fall in love,  
I rose in it.”स्त्रियों को प्रेरित करती हुई टोनी  
मॉरिसन ने यह भी कहा था कि तुम्हारी चाहत के  
अनुसार की किताब यदि तुम्हें नहीं मिली और यह  
भी समझ में आई कि वह अभी तक नहीं लिखी गई  
है तो तुम्हें लिखना है वह किताब।“ पुरुष के प्रेम में  
ही अपने जीवन की खुशी रहती है, ऐसा कभी भी  
मत सोचना चाहिए। एक व्यक्ति के अस्तित्व और  
व्यक्तित्व को मिटानेवाला प्रेम सच्चा प्रेम नहीं है।

महादेवी वर्मा अपनी 'श्रृंखला की कड़ियां'  
'नमक पुस्तक में कहती है यदि स्त्रियों को अपने  
स्वत्वों का वास्तविक ज्ञान हो तो उनकी अनेक  
दुर्दशाओं का पुरुषों द्वारा अंत होते देर न  
लगे।“नारी में परिस्थितियों के अनुसार अपने बाह्य  
जीवन को ढाल लेने की जितनी सहज प्रवृत्ति है,  
अपने स्वभावगत गुण न छोड़ने की आंतरिक प्रेरणा  
उससे कम नहीं। इसी से भारतीय नारी भारतीय  
पुरुष से अधिक सतर्कता के साथ अपनी विशेषताओं  
की रक्षा कर सकी है , पुरुष के समान अपनी व्यथा  
भूलने के लिए कादंबिनी नहीं मांगती ,उल्लास के  
स्पंदन के लिए लालसा का तांडव नहीं चाहती।  
क्योंकि दुख को वह जीवन की शक्ति परीक्षा के रूप  
में ग्रहण कर सकती है और सुख को कर्तव्य में प्राप्त  
कर लेने की क्षमता रखती हैं। हमारी राष्ट्रीय जागृति  
इसे प्रमाणित कर चुकी है कि अवसर मिलने पर गृह  
के कोने की दुर्बल बंदिनी स्वच्छंद वातावरण में  
बलप्राप्त पुरुष से शक्ति में कम नहीं। अपने कर्तव्य  
की गुरुता भली- भांति हृदयंगम कर यदि हम

अपना लक्ष्य स्थिर कर सके तो हमारी लोह शृंखलाएं हमारी गरिमा से गल कर माँम बन सकती है इसमें संदेह नहीं।<sup>4</sup>

महिलाओं के प्रति पुरुष समाज की उपेक्षा और संवेदनहीनता एक ऐतिहासिक विषय है। मानव समाज के विकास के विभिन्न कालखण्डों में इसके विभिन्न स्वरूप रहे। आज जनतांत्रिक व्यवस्था में इन मुद्दों पर खुलकर बात हो रही है। यह अवसर इससे पहले उपलब्ध नहीं थे। इसीलिए ज्यों-ज्यों इन मुद्दों पर पुरुषवादी मानसिकता से मुठभेड़ की स्थिति आती है ,यह विषय चर्चा के लिए केंद्र में आते हैं।

आज हम जानते हैं कि बलात्कार की शिकार को हम शिकार नहीं कहते बल्कि अतिजीविता कहते हैं। आज स्त्रियां अपने ऊपर हो रहे तमाम अन्याय और शोषणों के प्रति जागरूक है और अवगत है। इन प्रताड़नाओं से बचकर वह आगे

बढेगी। अगली पीढ़ी को खुले वातावरण की स्वतंत्र हवा का आस्वादन करने हेतु वह तैयार करेगी भी।

#### IV. संदर्भ ग्रंथ सूची

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## हिंदी साहित्य : उद्भव और विकास

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### परिचय

हिंदी साहित्य भारतीय संस्कृति और समाज का जीवंत दर्पण है। यह न केवल भावों की अभिव्यक्ति है, बल्कि समाज के परिवर्तन, चेतना और संघर्ष की अभिव्यक्ति भी है। हिंदी साहित्य का इतिहास अत्यंत समृद्ध और विस्तृत है, जो धार्मिक आस्था, लोक चेतना, राष्ट्रवाद और आधुनिक यथार्थवाद से होते हुए वर्तमान डिजिटल युग तक पहुँचा है। भाषा और साहित्य" एक-दूसरे से गहराई से जुड़े हुए दो महत्वपूर्ण सांस्कृतिक और बौद्धिक तत्व हैं। नीचे दोनों का सरल और विस्तृत रूप में विश्लेषण किया गया है।

### I. भाषा

#### परिभाषा:

भाषा एक ऐसा माध्यम है जिससे मनुष्य अपने विचारों, भावनाओं और अनुभूतियों को दूसरों तक पहुँचाता है। यह मौखिक, लिखित या सांकेतिक रूप में हो सकती है।

#### मुख्य विशेषताएँ:

- यह संप्रेषण (communication) का साधन है।
- यह समाज और संस्कृति का प्रतिबिंब होती है।
- यह निरंतर विकसित होती रहती है।
- हर भाषा में व्याकरण, शब्दकोश और उच्चारण के अपने नियम होते हैं।

उदाहरण: हिंदी, अंग्रेज़ी, तमिल, उर्दू, मलयालम आदि।

### II. साहित्य

#### परिभाषा:

साहित्य वह रचना है जिसमें जीवन के सत्य, सौंदर्य और अनुभवों को कल्पना और भावना के माध्यम से प्रस्तुत किया जाता है। यह मानवता के अनुभवों को अभिव्यक्त करने का कलात्मक रूप है।

#### मुख्य रूप:

- काव्य (Poetry) – जैसे तुलसीदास की रामचरितमानस
- कहानी / उपन्यास (Prose/Fiction) – जैसे प्रेमचंद की गोदान
- नाटक (Drama) – जैसे कालिदास का अभिज्ञान शाकुंतलम
- निबंध (Essay) – जैसे हज़ारीप्रसाद द्विवेदी के निबंध

हिंदी साहित्य उस समस्त काव्य, गद्य, नाटक, आलोचना, निबंध आदि लेखन को कहा जाता है जो

हिंदी भाषा में लिखा गया हो और जिसमें जीवन, समाज, संस्कृति और भावनाओं का कलात्मक तथा विचारशील चित्रण हो। यह साहित्यिक रचनाएँ व्यक्ति और समाज दोनों को प्रभावित करती हैं।

### उद्भव और विकास

हिंदी साहित्य का उद्भव लगभग 8वीं से 10वीं शताब्दी के बीच माना जाता है। उस समय भारत की भाषिक स्थिति में संस्कृत और पालि/प्राकृत भाषाओं का प्रभाव था। इनसे ही अपभ्रंश भाषाएँ निकलीं, और बाद में उनसे विकसित हुई हिंदी।

प्रारंभ में हिंदी साहित्य कविता के रूप में विकसित हुआ, और इसका उद्देश्य धार्मिक और सामाजिक शिक्षा देना था।

#### 1. प्रारंभिक काल (अपभ्रंश से हिंदी तक):

हिंदी भाषा का उद्भव संस्कृत और प्राकृत भाषाओं के अपभ्रंश रूपों से हुआ। 8वीं से 10वीं शताब्दी के बीच लिखी गई अपभ्रंश काव्य रचनाएँ हिंदी साहित्य की नींव मानी जाती हैं।

#### 2. आदिकाल (1050-1350 ई.):

इस काल को वीरगाथा काल भी कहा जाता है। इसमें पृथ्वीराज रासो जैसी रचनाओं के माध्यम से राजाओं के पराक्रम और शौर्य का चित्रण हुआ।

#### 3. भक्तिकाल (1350-1700 ई.):

यह युग धार्मिक चेतना और भक्ति भावना से परिपूर्ण रहा। कबीर, तुलसीदास, सूरदास, मीरा जैसे कवियों ने मानवता, प्रेम और ईश्वर भक्ति की भावनाओं को अभिव्यक्त किया।

#### 4. रीतिकाल (1700-1850 ई.):

इस काल में काव्य शास्त्र, शृंगार रस, नायिका भेद आदि विषयों पर जोर रहा। बिहारी, देव, घनानंद जैसे कवियों ने सौंदर्य और शृंगार का मनोहारी चित्रण किया।

#### 5. आधुनिक काल (1850-वर्तमान):

यह काल नवजागरण, राष्ट्रीय आंदोलन, समाज सुधार और यथार्थवाद से प्रेरित रहा। भारतेंदु हरिश्चंद्र से लेकर प्रेमचंद, जयशंकर प्रसाद, निराला, अज्ञेय, और समकालीन रचनाकारों तक, इस युग में गद्य, उपन्यास, कविता, नाटक, आलोचना, निबंध आदि विधाओं में उल्लेखनीय विकास हुआ।

(घ) आधुनिक युग (1850 ई. से वर्तमान तक):  
पुनर्जागरण से समकालीन यथार्थ तक

यह काल अनेक चरणों में बँटा है:

#### 1. भारतेंदु युग (1850-1900):

1. हिंदी नवजागरण के जनक: भारतेंदु हरिश्चंद्र
2. विषय: राष्ट्रप्रेम, सामाजिक सुधार, नारी शिक्षा
3. गद्य साहित्य की शुरुआत

#### 2. द्विवेदी युग (1900-1918):

1. महावीर प्रसाद द्विवेदी द्वारा खड़ी बोली को स्थापित किया गया
2. भाषा में शुद्धता और तार्किकता आई
3. निबंध, आलोचना और विचारधारात्मक लेखन का विकास

#### 3. छायावाद युग (1918-1936):

- कविता में भावनात्मक गहराई, प्रकृति प्रेम और व्यक्तिवाद
- प्रमुख कवि: जयशंकर प्रसाद, महादेवी वर्मा, निराला, सुमित्रानंदन पंत
- साहित्यिक सौंदर्य चरम पर

#### 4. प्रगतिवाद (1936–1950):

- विषय: श्रमिक वर्ग, अन्याय, समाज परिवर्तन
- प्रमुख रचनाकार: नागार्जुन, सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय', धर्मवीर भारती

#### 5. प्रयोगवाद और नई कविता (1950–1970):

- शैली और विषय दोनों में नवाचार
- कविता और कहानी में आंतरिक मनोविज्ञान, व्यक्तिगत संघर्ष

#### 6. समकालीन साहित्य (1970–वर्तमान):

- विमर्श आधारित साहित्य: नारीवाद, दलित साहित्य, आदिवासी चेतना
- डिजिटल युग में ब्लॉग, सोशल मीडिया के माध्यम से अभिव्यक्ति
- प्रमुख लेखक: मन्नू भंडारी, नामवर सिंह, उदय प्रकाश, विनोद कुमार शुक्ल

### III. निष्कर्ष

हिंदी साहित्य ने समय-समय पर समाज को दिशा दी है, नई चेतना जगाई है और मानवीय संवेदनाओं को शब्द दिए हैं। इसका विकास एक निरंतर प्रवाह है, जो आज भी नवीन विधाओं और तकनीकों के साथ आगे बढ़ रहा है। हिंदी साहित्य न केवल अतीत की स्मृति है, बल्कि भविष्य की संभावना भी है।

### IV. संदर्भ पुस्तकें

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हिंदी साहित्य का इतिहास

#### 2. डॉ. रामचंद्र शुक्ल

हिंदी साहित्य का इतिहास

#### 3. डॉ. देवीप्रसाद द्विवेदी

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