

SHODHKAVERI: GLOBAL ACADEMIC PRACTICES OF MULTIDISCIPLINARY RESEARCH AND DEVELOPMENT



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www.multispectrum.org

Edition: First

Year: June, 2024

ISBN: 978-81-973085-4-3

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© **Publisher**

Publisher



(International Publisher)

Kanyakumari, Tamilnadu, India.

Phone: +91 6384730258

E-Mail: editor@multispectrum.org

www.multispectrum.org

PERFACE

In the ever-evolving landscape of academia, the pursuit of knowledge transcends traditional disciplinary boundaries. As the world becomes increasingly interconnected, the need for multidisciplinary research and development has never been more crucial. This book, "Global Academic Practices of Multidisciplinary Research and Development," delves into the intricate tapestry of scholarly endeavors that span across various disciplines and geographical boundaries. Within these pages, readers will embark on a journey that illuminates the diverse array of approaches, methodologies, and collaborations shaping the landscape of contemporary research and development. From the corridors of prestigious universities to the bustling laboratories of innovative startups, this book offers a panoramic view of the dynamic interplay between different fields of study.

Through a series of insightful essays, case studies, and expert analyses, this book showcases the transformative power of multidisciplinary research in addressing complex global challenges. Whether exploring the intersection of technology and healthcare, the nexus of environmental science and policy, or the synergy between arts and engineering, each chapter offers a unique perspective on the multifaceted nature of academic inquiry. Moreover, this book serves as a testament to the collaborative spirit that drives progress in the academic community. By fostering cross-disciplinary dialogue and fostering a culture of innovation, scholars and practitioners around the world are breaking down silos and forging new paths towards discovery and advancement. As editors of this volume, we are honored to present a compilation that reflects the rich tapestry of global academic practices in multidisciplinary research and development. It is our hope that this book will inspire readers to embrace the limitless possibilities that emerge at the intersection of diverse fields, and to embark on their own journeys of exploration and discovery in the pursuit of knowledge.

Editors

ABOUT THE EDITORS



Dr. E. Joseph Rubert, Professor and Head, Department of Management Studies, Arunachala College of Engineering for Women, Manavilai, Kanyakumari District, Tamilnadu,, has more than 13 years of Teaching and Research experiences and 6 years of industrial Experience. He has successfully completed PhD in Management Studies from Noorul Islam University, Kumarkovil. He is the Guest Editor of UGC CARE Listed and Scopus Journals. He has published 45 research articles in various reputed journals including UGC Care, Scopus, Peer Refereed and Conference Proceedings. He is the Editor of 33 ISBN Edited books and has presented more than 23 papers in various National and International Conferences including International Conference conducted by IIT, Chennai. He guided 1 Ph.D Research Scholars in Manonmaniam Sundaranar University, Tirunelveli. He has organized 8 National, International Conference, 50 Seminars, Workshops and Business Conclaves. He is a Doctorate Committee member of Department of Management Studies, Manonmaniam Sundaranar University and Nesamoney Memorial Christian College. He is Member of Board of Studies in St.Xavier's College (Autonomous) Tirunelveli. He was the convener of different academic programmes and coordinators of various academic committees.

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**Visualizing Connectivity: Harnessing the Power of Network
Virtualization for Dynamic Communication**

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Abstract

In the realm of visual communication, network virtualization stands as a game-changing paradigm, offering transformative solutions that redefine the landscape of content delivery and interaction. This chapter delves into the profound impact of network virtualization on visual communication, exploring its capacity to optimize efficiency, scalability, and security. From cloud-based collaboration platforms to augmented reality environments, network virtualization enables organizations to deliver seamless and immersive visual experiences to users worldwide. By consolidating resources, enhancing flexibility, and implementing secure protocols, network virtualization unlocks new possibilities for dynamic adaptation and reliable content delivery. However, as we embrace the potential of networked visual experiences, it becomes crucial to prioritize responsible and ethical development, ensuring user privacy, security, and data ethics are upheld. This chapter emphasizes the need for a holistic approach to shaping the future of networked visual communication, one that combines technical innovation with ethical considerations to create a more inclusive, secure, and empowering digital environment.

Keywords: Network Virtualization, Visual Communication, Efficiency, Scalability, Security, Ethical Development

Introduction

Communication technology is in a perpetual state of evolution, continually shaping and reshaping how we connect and interact with one another. In

this rapidly changing landscape, visual communication has emerged as a powerful medium, transcending linguistic barriers and conveying complex ideas with clarity and impact. As we navigate this dynamic environment, the concept of network virtualization emerges as a pivotal force in unlocking new frontiers in visual communication(**Ryan, and L., 2016**).

The rise of visual communication is evident in our daily lives, from sharing photos and videos on social media to engaging in video calls with loved ones across the globe. Visual content has a unique ability to captivate and engage audiences, delivering information in a format that is easily digestible and memorable. Whether it's a captivating image, an informative infographic, or an immersive virtual reality experience, visual communication has become an integral part of how we express ourselves and exchange ideas in the digital age(**Adami, et. al., 2016**).

At the heart of this visual revolution lies the concept of network virtualization—a technology that holds the promise of transforming the way we communicate visually. Network virtualization abstracts network resources from physical infrastructure, allowing for greater flexibility, efficiency, and security in the transmission of visual content. By decoupling network services from the underlying hardware, network virtualization enables the dynamic allocation and optimization of resources based on the specific needs of users and applications(**Mijumbi, et. al., 2015**).

In essence, network virtualization enables the creation of virtual networks within a shared physical infrastructure, much like building virtual highways on top of existing roads. This abstraction of network resources paves the way for a more agile and responsive communication infrastructure, capable of adapting swiftly to changing demands and scaling seamlessly to accommodate growing audiences(**Castells, and M., 2013**).

However, the impact of network virtualization extends far beyond technical considerations. It has the potential to revolutionize the way we connect and communicate on a global scale. In underserved regions or disaster-stricken areas, network virtualization can facilitate the rapid deployment of virtualized network infrastructure, providing vital

connectivity when it's needed most. It can also democratize access to advanced visual communication tools, empowering individuals and communities to share their stories and ideas with the world(**Chowdhury, et. al., 2010**).

As we delve deeper into the world of network virtualization, we'll explore its applications across a diverse range of industries and domains. From cloud computing to data centers to industrial automation, network virtualization is reshaping the way we design, deploy, and manage visual communication networks. We'll examine real-world examples of how organizations are leveraging network virtualization to enhance collaboration, streamline operations, and deliver richer, more immersive visual experiences to their audiences.

But perhaps most importantly, we'll consider the future implications of network virtualization in shaping the way we communicate visually. As technology continues to evolve at a rapid pace, the possibilities for innovation and disruption are endless. From integrating with emerging technologies like artificial intelligence and augmented reality to addressing privacy and security concerns, network virtualization opens up a world of possibilities for the future of visual communication.

By harnessing the power of network virtualization, we have the opportunity to create richer, more immersive visual experiences that transcend geographical boundaries and cultural barriers. As we embark on this journey of exploration and discovery, let us embrace the transformative potential of network virtualization and envision a future where visual communication knows no limits.

Defining Visual Communication and its Significance in Modern Society:

Visual communication is the transmission of information and ideas through visual aids such as images, graphics, videos, and animations. It plays a crucial role in modern society, serving as a powerful tool for conveying complex concepts, emotions, and narratives clearly and compellingly(**Kaushik, A., and Tomar, V., 2024**).

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In today's fast-paced world, where attention spans are short and information overload is prevalent, visual communication has become more important than ever. It allows us to cut through the noise and capture people's attention in an increasingly crowded digital landscape. Whether it's a captivating image on social media, an informative info graphic on a website, or a visually stunning advertisement on a billboard, visual communication can engage audiences and leave a lasting impression(**Kaushik, A., and Tomar, V., 2023**).

Beyond its ability to grab attention, visual communication also facilitates comprehension and retention of information. Studies have shown that visual aids can enhance learning and memory by making complex ideas more accessible and digestible. By presenting information in a visually appealing format, visual communication enables us to convey messages more effectively and ensure they resonate with our target audience(**Josephson, et. al., 2020**).

Moreover, visual communication transcends linguistic and cultural barriers, making it a universal language that can be understood by people from diverse backgrounds and walks of life. Whether it's a picture, a symbol, or an icon, visual elements have the power to convey meaning in a way that words alone cannot. This makes visual communication an invaluable tool for fostering cross-cultural understanding and promoting inclusivity in an increasingly globalized world(**Worth, and S., 2016**).

In addition to its role in everyday communication, visual communication plays a significant role in various professional fields and industries. From advertising and marketing to journalism and design, visual communication is instrumental in shaping how we perceive and interact with the world around us. It allows businesses to effectively communicate their brand identity and values, journalists to tell compelling stories, and designers to create impactful experiences that resonate with audiences(**Holsanova, and J., 2012**).

Introducing the Concept of Network Virtualization as A Transformative Tool in Enhancing Visual Communication:

Introducing the concept of network virtualization as a transformative tool in enhancing visual communication opens up a world of possibilities

where the seamless transmission of visual content becomes not just efficient but also dynamic and adaptable to evolving needs. Network virtualization, in its essence, abstracts the complexities of physical network infrastructure, paving the way for a more agile and responsive communication environment(Cai, et. al., 2022).

Imagine a scenario where a designer in one part of the world collaborates in real-time with colleagues scattered across different continents, seamlessly sharing high-resolution images and videos without the constraints of geographical boundaries. This is the power of network virtualization in visual communication – it transcends the limitations of traditional networks, enabling fluid collaboration and creativity on a global scale.

By decoupling network services from the underlying hardware, network virtualization allows for the efficient allocation and optimization of resources based on the specific demands of visual communication. This means that bandwidth can be dynamically allocated to support high-definition video streaming, latency can be minimized to ensure real-time interaction in virtual environments, and security protocols can be tailored to safeguard sensitive visual content(Ramakrishnan, et. al., 2020).

Moreover, network virtualization fosters innovation by providing a flexible and scalable infrastructure for experimenting with emerging technologies such as augmented reality (AR) and virtual reality (VR). These immersive technologies rely heavily on fast and reliable network connections to deliver rich visual experiences, and network virtualization ensures that the underlying infrastructure can support their demands without compromise(Blenk, et. al., 2015).

In a world where visual content is king, network virtualization emerges as a game-changer, enabling organizations to deliver richer, more engaging visual experiences to their audiences. Whether it's streaming high-definition videos, hosting virtual events, or collaborating in virtual design studios, network virtualization provides the foundation for a new era of visual communication that is not just efficient and reliable but also innovative and transformative.

Understanding Network Virtualization

Network virtualization is a transformative approach to networking that involves abstracting and decoupling network resources from the underlying physical infrastructure. At its core, network virtualization aims to create virtualized instances of networks within a shared physical infrastructure, allowing for greater flexibility, efficiency, and scalability in the allocation and management of network resources(Liang, et. al., 2014). Fundamentally, network virtualization involves the creation of virtual networks that operate independently of the physical hardware. This means that network functions such as routing, switching, and security are abstracted from the physical devices and implemented in software, enabling them to be dynamically allocated and configured based on the specific requirements of users and applications(Bari, et. al., 2012).

In practical terms, network virtualization allows multiple virtual networks to coexist within the same physical infrastructure, each with its own set of policies, configurations, and security measures. This enables organizations to optimize the use of their network resources, reduce operational costs, and adapt more quickly to changing business needs.

Key Components of Network Virtualization:(Wang, et. al., 2012)

- **Virtualization Layer:** This layer abstracts network resources from the underlying physical infrastructure, creating virtual instances of networks that can be dynamically provisioned and managed.
- **Hypervisor or Network Virtualization Software:** The hypervisor or network virtualization software is responsible for managing and orchestrating the virtualized network resources. It enables the creation, configuration, and monitoring of virtual networks, as well as the allocation of resources based on demand.
- **Virtual Switches and Routers:** Virtual switches and routers replicate the functionality of their physical counterparts in software, allowing for the routing and switching of traffic within virtual networks.
- **Overlay Networks:** Overlay networks provide a mechanism for encapsulating and transporting traffic between virtual network endpoints over a physical network infrastructure. This enables communication

between virtual networks that may be geographically dispersed or hosted on different physical devices.

External vs. Internal Virtualization: A Deeper Dive into the Technical Aspects:

Network virtualization encompasses two key realms: external virtualization and internal virtualization, each offering distinct approaches and benefits in optimizing network infrastructure and enhancing communication capabilities (Pearce et al., 2013).

A. External Virtualization:

External virtualization involves the amalgamation of multiple physical networks or network segments into a unified virtual entity. This approach enables the creation of a single, cohesive network abstraction that spans across disparate physical infrastructure, allowing for streamlined management and efficient resource utilization (Pearce et al., 2013).

- **Unified Network Abstraction:** External virtualization abstracts multiple physical networks or network segments into a single, unified virtual entity. This abstraction simplifies network management by providing a cohesive view of the entire network infrastructure, regardless of its underlying complexity.
- **Interconnection of Network Segments:** External virtualization facilitates seamless communication between disparate network segments by creating a common virtual overlay. This enables data to traverse between different segments of the network without the need for complex routing configurations or physical connections.
- **Resource Pooling and Sharing:** By consolidating multiple physical networks into a single virtual entity, external virtualization enables efficient resource pooling and sharing. This allows organizations to optimize the use of network resources and allocate bandwidth dynamically based on changing demand.
- **Scalability and Flexibility:** External virtualization provides scalability and flexibility in network design and deployment. Organizations can easily add or remove virtualized network segments as needed, allowing for rapid expansion or contraction of network infrastructure in response to evolving business requirements.

- **Improved Security and Isolation:** External virtualization enhances security and isolation by segmenting different parts of the network into distinct virtual overlays. This isolation helps prevent unauthorized access and contains potential security breaches, ensuring the integrity and confidentiality of sensitive data.

B.Internal Virtualization:

Internal virtualization, on the other hand, focuses on providing network-like functionality to software containers or virtual machines (VMs) within a single network server or data center. This approach enables the creation of isolated virtual networks for different applications or tenants, enhancing security and resource management within a shared infrastructure(Pearceet et. al., 2013).

- **Isolation of Virtual Networks:** Internal virtualization isolates virtual networks within a single physical server or data center, providing dedicated network environments for individual applications or tenants. This isolation ensures that each application operates independently without interference from others.
- **Software-defined networking (SDN) Principles:** Internal virtualization often leverages SDN principles to dynamically configure and manage virtual network resources. SDN enables centralized control and programmable network policies, allowing for efficient traffic routing and quality of service (QoS) enforcement.
- **Efficient Resource Utilization:** By virtualizing network resources at the server level, internal virtualization optimizes hardware utilization within data centers. This results in cost savings and improved performance as resources are allocated more efficiently to meet the demands of virtualized applications.
- **Enhanced Performance and Agility:** Internal virtualization enables faster deployment and provisioning of network resources, leading to enhanced performance and agility in application delivery. Virtualized networks can adapt quickly to changing workloads and traffic patterns, ensuring optimal performance under varying conditions.
- **Integration with Containerized Environments:** Internal virtualization seamlessly integrates with containerized environments, allowing for the creation of isolated network namespaces for individual containers. This

enables efficient communication between containers while maintaining network isolation and security

**Intersection of Network Virtualization with Visual Communication:
(Shen, et. al., 2021)**

- **Optimized Content Delivery:** Network virtualization enhances visual communication by optimizing content delivery. By abstracting network resources, virtualization enables dynamic allocation of bandwidth and resources, ensuring smooth and efficient transmission of visual content. This translates to faster loading times, higher-resolution images, and seamless streaming experiences for users.
- **Global Collaboration:** Network virtualization facilitates global collaboration in visual communication. Virtualized networks allow distributed teams to collaborate in real-time, sharing and editing visual content regardless of geographical location. This fosters creativity and innovation by enabling seamless collaboration among designers, artists, and content creators around the world.
- **Enhanced Multimedia Experiences:** Network virtualization enriches multimedia experiences by providing a robust and scalable infrastructure for delivering rich visual content. Whether it's streaming high-definition videos, hosting virtual events, or powering immersive virtual reality experiences, virtualized networks ensure that multimedia content is delivered reliably and efficiently to users.
- **Secure Data Transmission:** Network virtualization enhances the security of visual communication by providing isolated virtual networks and encrypted communication channels. This protects sensitive visual data from unauthorized access or interception, ensuring the privacy and integrity of visual content transmitted over the network.
- **Adaptive Content Distribution:** Network virtualization enables adaptive content distribution in visual communication. Virtualized networks can dynamically adjust bandwidth allocation and routing paths based on network conditions, ensuring that visual content is delivered optimally to users regardless of their location or device. This results in a seamless and consistent viewing experience across different devices and network environments.

Impact of Network Virtualization (Wang, et. al., 2010)

Network virtualization revolutionizes visual communication by consolidating resources, leading to improved efficiency in content delivery. By abstracting network resources from physical infrastructure, virtualization allows for the consolidation of diverse networks into a unified virtual entity. This consolidation streamlines network management processes, reducing the complexity and overhead associated with managing multiple physical networks.

With resource consolidation, organizations can optimize the use of network resources, leading to improved performance and reliability in visual communication. Bandwidth, for instance, can be dynamically allocated and reallocated based on demand, ensuring that visual content is delivered efficiently and without delays. This means smoother streaming experiences, faster download speeds, and quicker access to visual content for users.

Moreover, resource consolidation enables organizations to make better use of their existing infrastructure, leading to cost savings and improved return on investment (ROI). By eliminating the need for redundant hardware and streamlining network operations, virtualization allows organizations to do more with less, maximizing the efficiency and scalability of their visual communication infrastructure.

Elevated Flexibility for Dynamic Adaptation in Visual Content Delivery:

Network virtualization introduces a new level of flexibility in visual content delivery, enabling dynamic adaptation to changing demands and network conditions. With virtualized networks, organizations have the agility to adjust their content delivery strategies in real-time, ensuring optimal performance and user experience(Yaquoob, et. al., 2020).

One way network virtualization enhances flexibility is through dynamic resource allocation. Virtualized networks allow for on-the-fly adjustments to bandwidth allocation and routing paths based on changing traffic patterns and network congestion. This means that during peak usage periods, resources can be allocated to critical visual content delivery

channels, ensuring that users receive high-quality content without delays or interruptions(Corbillon, et. al., 2017).

Additionally, network virtualization enables organizations to deploy content delivery networks (CDNs) that are more responsive and adaptable to user demands. Virtualized CDN nodes can be dynamically provisioned and scaled based on geographic location, user demand, and content popularity, ensuring that visual content is delivered from the closest and most efficient source(Christodoulou, et. al., 2017).

Furthermore, virtualization empowers organizations to experiment with new content delivery technologies and approaches without the need for extensive hardware upgrades or infrastructure changes. Virtualized networks provide a flexible platform for implementing content delivery optimizations such as edge computing, caching, and content pre-fetching, leading to improved performance and responsiveness in visual content delivery.

Strengthened Security Measures for Safeguarding Visual Data Transmission:(Xing, and P., 2023)

- **Isolation of Virtual Networks:** Network virtualization enables the creation of isolated virtual networks, providing a secure environment for visual data transmission. Each virtual network operates independently, reducing the risk of unauthorized access or data breaches.
- **Encrypted Communication Channels:** Virtualized networks support encrypted communication channels, ensuring that visual data transmitted over the network is protected from interception or eavesdropping. Encryption protocols such as SSL/TLS are commonly used to secure visual data transmission, safeguarding the privacy and integrity of sensitive content.
- **Access Control and Authentication:** Network virtualization allows organizations to implement access control and authentication mechanisms to restrict access to visual content based on user credentials and permissions. Role-based access control (RBAC) and multi-factor authentication (MFA) can be enforced to ensure that only authorized users have access to visual data.

- **Intrusion Detection and Prevention:** Virtualized networks can be equipped with intrusion detection and prevention systems (IDPS) to monitor network traffic for suspicious activity and block potential threats in real-time. IDPS solutions help organizations detect and mitigate security breaches, protecting visual data from malicious attacks.
- **Compliance and Regulatory Requirements:** Network virtualization enables organizations to comply with industry regulations and data protection laws by implementing security measures such as data encryption, access controls, and audit trails. By adhering to regulatory requirements, organizations can ensure the confidentiality, integrity, and availability of visual data transmitted over virtualized networks.

Practical Applications in Visual Communication

Cloud-based Visual Collaboration Platforms: (Bekele, and M. K., 2021)

- **Virtual Meeting Spaces:** Cloud-based visual collaboration platforms provide virtual meeting spaces where users can collaborate in real-time, sharing and editing visual content such as documents, presentations, and images. These platforms leverage network virtualization to optimize network resources for seamless interaction, ensuring smooth video conferencing and screen-sharing experiences.
- **Scalable Infrastructure:** Cloud-based visual collaboration platforms leverage virtualized infrastructure to scale resources dynamically based on user demand. Virtualized servers and networks enable these platforms to accommodate fluctuating usage patterns and peak loads, ensuring consistent performance and reliability for users.
- **Global Accessibility:** Network virtualization enables cloud-based visual collaboration platforms to offer global accessibility, allowing users to connect from anywhere in the world. Virtualized networks provide low-latency connections and optimized routing paths, ensuring that users can collaborate effectively regardless of their geographical location.
- **Security and Compliance:** Cloud-based visual collaboration platforms prioritize security and compliance by implementing robust security measures such as encryption, access controls, and audit trails. Virtualized

networks isolate user data and communications, protecting sensitive visual content from unauthorized access or interception.

- **Integration with Productivity Tools:** Cloud-based visual collaboration platforms seamlessly integrate with productivity tools such as document editors, project management software, and messaging apps. Virtualized networks facilitate data exchange and interoperability between different applications, enabling users to streamline their workflows and enhance productivity.

Virtualized Broadcasting Networks: (Montalban, et. al., 2021)

- **Dynamic Scaling of Resources:** Virtualized broadcasting networks leverage network virtualization to dynamically scale resources based on demand. This enables broadcasters to efficiently allocate bandwidth and computing resources to accommodate peak viewership periods, ensuring a seamless viewing experience for audiences.
- **Redundancy and Failover:** Virtualized broadcasting networks enhance reliability through redundancy and failover mechanisms. By replicating critical network components and services across multiple virtual instances, broadcasters can mitigate the impact of hardware failures or network outages, ensuring uninterrupted media distribution.
- **Geographic Distribution:** Network virtualization enables virtualized broadcasting networks to distribute media content geographically, minimizing latency and improving performance for viewers in different regions. Virtualized content delivery networks (CDNs) cache and distribute media content closer to end-users, reducing the distance data needs to travel and optimizing network throughput.
- **Adaptive Bitrate Streaming:** Virtualized broadcasting networks support adaptive bitrate streaming, allowing broadcasters to deliver media content in multiple quality levels to accommodate varying network conditions and device capabilities. This ensures a consistent viewing experience for users across different devices and network environments, regardless of fluctuations in bandwidth or connectivity.
- **Security and Content Protection:** Virtualized broadcasting networks prioritize security and content protection through encryption, access controls, and digital rights management (DRM) mechanisms. Virtualized

networks isolate media streams and implement encryption protocols to prevent unauthorized access or piracy, safeguarding the integrity and confidentiality of media content.

Augmented reality (AR) and virtual reality (VR) environments:(Al-Ansi, et. al., 2023)

- **Low-Latency Communication:** Network virtualization ensures low-latency communication in AR and VR environments, facilitating real-time interaction and collaboration among users. Virtualized networks optimize routing paths and minimize packet loss, providing a seamless and immersive experience for users engaged in AR and VR applications.
- **Scalable Infrastructure:** AR and VR applications require scalable infrastructure to support the high bandwidth and processing requirements of immersive visual experiences. Network virtualization enables the dynamic allocation of resources, allowing AR and VR platforms to scale infrastructure up or down based on user demand, ensuring consistent performance and reliability.
- **Global Distribution:** Network virtualization enables global distribution of AR and VR content, allowing users to access immersive experiences from anywhere in the world. Virtualized content delivery networks (CDNs) cache and distribute AR and VR content closer to end-users, reducing latency and optimizing network throughput for a seamless viewing experience.
- **Collaborative Environments:** AR and VR environments leverage network virtualization to create collaborative spaces where users can interact and engage with visual content in real-time. Virtualized networks enable multi-user synchronization and communication, allowing users to collaborate on projects, attend virtual events, and share immersive experiences regardless of their geographical location.
- **Security and Privacy:** Network virtualization enhances security and privacy in AR and VR environments through encryption, access controls, and authentication mechanisms. Virtualized networks isolate user data and communications, protecting sensitive visual content from unauthorized access or interception, and ensuring the confidentiality and integrity of AR and VR experiences.

Future Perspectives and Innovations

AI-driven Image Processing and Analysis: (Krauze, et. al., 2022)

- **AI-Powered Image Enhancement:** Network virtualization integrates with emerging visual technologies, such as artificial intelligence (AI), to enable AI-driven image processing and enhancement. Virtualized networks provide the scalable infrastructure needed to support computationally intensive AI algorithms, allowing for real-time image enhancement, denoising, and restoration.
- **Smart Content Delivery:** Network virtualization leverages AI-driven image analysis to optimize content delivery based on user preferences and behavior. Virtualized networks utilize AI algorithms to analyze user interactions with visual content, dynamically adjusting compression ratios, encoding formats, and delivery methods to deliver personalized and engaging visual experiences.
- **Content Recognition and Tagging:** Virtualized networks enable AI-powered content recognition and tagging, allowing for automated classification and categorization of visual content. AI algorithms analyze images and videos in real-time, identifying objects, scenes, and context to enhance the search ability and discoverability of visual assets across distributed networks.
- **Real-Time Object Detection and Tracking:** Network virtualization enables real-time object detection and tracking in visual communication applications. Virtualized networks leverage AI algorithms to detect and track objects within live video streams, enabling immersive augmented reality (AR) experiences, interactive gaming, and dynamic content overlays.
- **Predictive Analytics and Insights:** Virtualized networks harness AI-driven image analysis to generate predictive analytics and insights from visual data. AI algorithms analyze patterns and trends within visual content, extracting valuable insights into user behavior, sentiment, and preferences, enabling organizations to make data-driven decisions and optimize visual communication strategies.

Implementing Security & Privacy Protocols for Visual Data Transmission: (Fathima, et. al., 2023)

- **End-to-end Encryption:** Future advancements in network virtualization will prioritize the implementation of end-to-end encryption protocols for visual data transmission. Virtualized networks will utilize encryption techniques such as SSL/TLS to secure communication channels and protect visual data from unauthorized access or interception.
- **Secure Multiparty Computation:** Virtualized networks will leverage secure multiparty computation (SMPC) techniques to enable collaborative visual data processing while preserving privacy. SMPC protocols allow multiple parties to jointly analyze encrypted visual data without revealing sensitive information, ensuring privacy and confidentiality in collaborative environments.
- **Homomorphic Encryption:** Future innovations in network virtualization will explore the use of homomorphic encryption for visual data transmission. Homomorphic encryption enables computations to be performed on encrypted data without decrypting it, providing a high level of security and privacy for visual content transmitted over virtualized networks.
- **Zero-Knowledge Proofs:** Virtualized networks will adopt zero-knowledge proof (ZKP) protocols to enhance privacy in visual data transmission. ZKP techniques allow one party to prove the validity of a statement without revealing any information beyond the validity of the statement itself, enabling verifiable and privacy-preserving interactions in visual communication.
- **Blockchain-Based Solutions:** Future developments in network virtualization will integrate blockchain technology to enhance security and privacy in visual data transmission. Blockchain-based solutions provide immutable records of visual data transactions, ensuring data integrity and transparency while preserving privacy through decentralized and cryptographic mechanisms.

Advancements in Network Virtualization Technology: (Rathore, et. al., 2024)

- **Software-defined networking (SDN) Integration:** Advancements in network virtualization technology will involve deeper integration with

software-defined networking (SDN) principles. SDN enables centralized control and programmable network policies, allowing for more efficient traffic routing, QoS management, and network optimization in visual communication networks.

- **Network Function Virtualization (NFV) Evolution:** Future advancements will see the evolution of network function virtualization (NFV) techniques to enhance the efficiency and reliability of visual communication networks. NFV enables the virtualization of network functions such as firewalls, load balancers, and content delivery systems, leading to improved scalability, flexibility, and performance.
- **Edge Computing Integration:** Network virtualization technology will increasingly integrate with edge computing infrastructure to support low-latency visual communication applications. Edge computing brings computation and storage closer to end-users, reducing latency and improving responsiveness in real-time visual communication scenarios such as video conferencing, AR/VR, and live streaming.
- **Containerization and Microservices Architecture:** Advancements in network virtualization will leverage containerization and microservices architecture to enhance the scalability and reliability of visual communication networks. Containerized environments enable rapid deployment and scaling of network services, while microservices architecture promotes modularity, fault isolation, and resiliency in distributed network environments.
- **AI-driven Network Optimization:** Future innovations will involve the use of artificial intelligence (AI) and machine learning (ML) algorithms to optimize network performance and reliability in visual communication networks. AI-driven network optimization techniques analyze network traffic patterns, predict potential bottlenecks, and dynamically adjust network configurations to ensure optimal performance and reliability for visual content delivery.

Conclusion

In conclusion, network virtualization emerges as a transformative force in visual communication, revolutionizing the way we create, share, and interact with visual content. Throughout this exploration, we have

witnessed the profound impact of network virtualization in enhancing efficiency, scalability, and reliability in visual communication networks.

Recapitulating the transformative potential of network virtualization, we have seen how it enables optimized content delivery, dynamic adaptation, and strengthened security measures in visual communication. From cloud-based collaboration platforms to augmented reality environments, network virtualization empowers organizations to deliver immersive visual experiences to users worldwide, while maximizing the efficiency and scalability of network resources.

However, as we look towards the future of networked visual experiences, it is imperative to emphasize the need for responsible and ethical development. While network virtualization offers unprecedented opportunities for innovation and growth, it also brings new challenges and considerations regarding privacy, security, and data ethics.

Therefore, as we continue to shape the future of networked visual experiences, we must prioritize responsible and ethical development practices. This entails implementing secure protocols for visual data transmission, safeguarding user privacy, and ensuring transparency and accountability in network operations.

By embracing responsible and ethical development principles, we can harness the transformative potential of network virtualization to create a future where visual communication is not only efficient and reliable but also inclusive, secure, and empowering for all. Together, let us embark on this journey towards a brighter and more connected future of visual communication.

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**Challenges and Opportunities in Human Resource Management:
Navigating Global Trends for Competitive Advantage**

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Abstract

In today's dynamic business environment, human resource management (HRM) plays a pivotal role in ensuring organizational success and maintaining a competitive edge. This article delves into the complexities of HRM, exploring global trends, methods, challenges, and opportunities in the field. However, these challenges also present opportunities for HR to leverage technology, embrace diversity and inclusion, develop agile learning structures, and cultivate a strong employer brand. By strategically navigating these trends, HR can attract, retain, and develop top talent, ultimately leading to a sustainable competitive advantage for organizations. By navigating these dynamics effectively, organizations can leverage HRM practices to gain a competitive advantage in the ever-evolving business environment.

Keywords: Business Environment, Challenges, Opportunities, Technology, Strategy

Introduction:

Human Resource Management plays a pivotal role in shaping organizational success by effectively managing the workforce and aligning human capital strategies with business objectives. In today's dynamic and interconnected world, HRM faces unprecedented challenges and opportunities arising from global trends such as technological advancements, demographic shifts, and changing employee expectations. This article examines the key global trends impacting HRM and explores strategies for navigating these trends to achieve competitive advantage.

Human resource management is a critical function within organizations, responsible for attracting, developing, and retaining talent, as well as fostering a positive work culture and ensuring compliance with

legal and ethical standards. With globalization breaking down geographical barriers and technological advancements reshaping the way we work, HRM practices are evolving to meet the demands of an increasingly interconnected world.

The Human resource sector has undergone significant innovative changes in the past few years. Technological advancement and the way of working have collaborated to shape the world of human resources in many organizations. Managers and HR professionals should be aware of the Current Trends in Human Resource Management and adapt them quickly to ensure the company is at the forefront of innovation. As a result, it helps a business to be in line with upcoming changes and embrace new technology quickly.

In recent years, the landscape of human resource management (HRM) has undergone significant transformation due to globalization, technological advancements, demographic shifts, and changing workplace dynamics. As organizations strive to remain competitive in this rapidly evolving environment, HRM professionals are facing a myriad of challenges and opportunities.

Statement of the Problem:

While Human Resource Management is essential for organizational success, it also faces numerous challenges in the face of evolving global trends. Issues such as talent shortages, skills gaps, technological disruptions, demographic changes, and cultural diversity present significant hurdles for HRM professionals. This study seeks to address these challenges and identify opportunities for organizations to enhance their HRM practices and gain a competitive edge in the global marketplace.

Objectives of the Study:

1. To analyze global trends shaping the field of Human Resource Management.
2. To explore methods and approaches used in HRM to address challenges and leverage opportunities.
3. To assess the scope of HRM practices in optimizing organizational performance and competitiveness.

4. To identify the key challenges faced by HRM professionals in the current global landscape.
5. To highlight opportunities for innovation and growth within the realm of HRM.

Scope of the Study:

This study focuses on the challenges and opportunities in Human Resource Management within the context of global trends. It encompasses various aspects of HRM, including talent acquisition, retention, training and development, diversity and inclusion, employee engagement, and strategic workforce planning. Additionally, the study examines how HRM practices differ across industries and regions, highlighting best practices for achieving competitive advantage.

Global Trends in HRM:

- 1. Technological Advancements:** The integration of technology in HRM processes, such as automation, artificial intelligence, and data analytics, is reshaping traditional HR practices and enhancing efficiency and decision-making.
- 2. Demographic Shifts:** Aging populations, generational diversity, and workforce globalization are influencing talent acquisition strategies, succession planning, and employee engagement initiatives.
- 3. Remote Work and Flexible Arrangements:** The rise of remote work and flexible work arrangements necessitates new approaches to performance management, communication, and collaboration.
- 4. Skills Shortages and Talent Mobility:** The war for talent intensifies as organizations compete for skilled professionals amidst talent shortages and increasing demand for specialized skills.
- 5. Diversity, Equity, and Inclusion (DEI):** Embracing diversity, equity, and inclusion in the workplace is not only a moral imperative but also a strategic advantage for organizations aiming to foster innovation, creativity, and employee engagement.
- 6. Gig Economy and Contingent Workforce:** The prevalence of gig workers and contingent workforce models requires HRM to adapt policies and practices to effectively manage non-traditional employment relationships.

Methods:

Emphasis on Employee Experience:

In today's digital age, organizations are placing greater emphasis on enhancing the employee experience to attract, engage, and retain top talent. This involves creating a conducive work environment, offering opportunities for growth and development, and prioritizing employee well-being and work-life balance.

Adoption of HR Analytics:

The proliferation of data analytics tools has revolutionized HRM practices, enabling organizations to make data-driven decisions regarding recruitment, performance management, training, and retention. HR analytics helps in identifying trends, predicting future workforce needs, and optimizing HR processes for greater efficiency and effectiveness.

Remote Work and Virtual Collaboration:

The COVID-19 pandemic accelerated the adoption of remote work and virtual collaboration, challenging traditional notions of workplace dynamics. HRM professionals are tasked with managing geographically dispersed teams, ensuring effective communication, and fostering a sense of belonging and cohesion among remote workers.

Diversity, Equity, and Inclusion (DEI) Initiatives:

Organizations are increasingly recognizing the importance of diversity, equity, and inclusion in fostering innovation, creativity, and organizational performance. HRM plays a pivotal role in implementing DEI initiatives, promoting a culture of belonging, and addressing systemic barriers to inclusion.

Agile HRM Practices:

Agile methodologies, originally developed in the field of software development, are being applied to HRM practices to enhance flexibility, responsiveness, and adaptability. Agile HRM involves iterative processes, cross-functional collaboration, and a focus on delivering value to both internal and external stakeholders.

Work and Wellness

As the trend shifted to employee-centric strategies, the personal well-being of employees caught the limelight.

According to Gartner's 2020 Reimagine HR Employee Survey, there is a 23% increase in the number of employees reporting better mental health when employers develop deeper relationships. Also, employers who provided holistic support witnessed a 21% increase in productivity, high performers. Thus, building deeper connections eventually leads to increased employee satisfaction and productivity. The HR professionals need to motivate employers towards the same as the focus on mental health and its connection with productivity is apparent.

Administering Progressive Benefits

The idea of a job rings a different bell in today's young minds. They seek an open work culture with accommodating mentors, opportunities to innovate, flexible working hours, etc. They also expect progressive benefits such as more family time, the option to choose remote working, extended vacation time, paternity leaves, etc. Inclusion of progressive work culture has become a necessity, and the focus must lie on integrating it in a way that is beneficial to both the employer and the employees.

Empowering Employees

Employees are no longer liabilities, but resources that employers can invest time and money in. This "employee is an asset" mindset must be adhered to, by companies to seek the full potential of the talent pool. The HR teams must look into empowering them with skills that improve career development. Professional courses and approaches to updating their technical knowledge add value to the individual and empower them to face future challenges.

Globalized Talent Pool

Another global HR strategy that became trending in 2021 is the globalization of talent acquisition. Previously, the geographic location and consent to relocate was an essential aspect of hiring.

This took a major step back during remote working. Globalization enabled cross-border recruitment to unfold a vast array of talent pools to choose from. After all, hiring the top talents has always been HR's top priority.

Diversity

Globalization of the talent pool enabled diversity. A wider array of people can be included irrespective of their country, race, or language.

Inclusion

Another major trend in global HR is the inclusion of contractors or part-time employees. The previous annotation of preferring only full-time employees was erased due to remote working and globalization.

However, care must be taken to manage distinct policies and maintain separate contracts and other norms for both types of employees.

Cross Border Compliance

The inclusion of global teams is easier said than done. There are several local laws and compliances in place that differ from one country to the other. We must be well aware of and abide by them to set up a functioning team. The entire process can be streamlined and managed with EOR (Employer of Record) tools such as Multiplier.

People Analytics

Data is the new oil, an untapped valuable asset. The practice of transforming HR data into actionable insights unleashes the potential to make more strategic and informed decisions.

AI in HR

The next global HR trend is the use of AI in HR. With AI being integrated into our everyday tasks, this comes as no surprise.

AI-driven process and decision automation speed up HR tasks while improving the quality. Optimization of the human-automation combination is bound to transform the future of the HR domain.

Cloud-based HR Tools

HR tools have made life easier in the remote world, for both employers and employees. The use of PEO (Professional Employer Organization) tools for the virtual onboarding of new employees has served companies to a greater extent, especially during global hiring. They declutter the entire process thereby, simplifying it.

LATEST HR MANAGEMENT TRENDS

1. Shift to employee's experience

Due to a technology change, most businesses are shifting from employee engagement to employee experiences. This is done through an easy implementation of the HR process, improving employee's careers, and a productive office atmosphere.

2. Data security

Human resource automation allows you to use software that can back up important data to cloud services thus protecting critical company data. It also reduces errors that may occur during manual processes. These are the Current Trends in Human Resource Management.

3. Mobile Access

This is where employees across all divisions and sectors access different applications via mobile apps. HR applications in a given company can now be accessed through mobile thus making work easier.

4. HR innovations

A new pace is being set based on, for example, new learning methods, new methods to reduce biases, innovative recruit approaches, training, and advanced performance management.

5. Migration to Cloud

A Cloud-based HR is being embraced by most business today because it is making work easier and one can perform HR functions wherever they want at anytime

6. Rise of Intelligent Self – service tools

The existence of intelligent self –service tools has helped the HR department to conduct time-tracking, training, and reporting easily.

7. Intelligent Apps and Analytics

HR applications are changing the nature and structure of the workplace. Similarly, they are enabling work-performance analysis, tracking and assessments, internal management, and attracting talents and enterprise management for improved better decision-making.

Challenges and Opportunities:

1. Talent Acquisition and Retention: Competition for skilled talent poses challenges for recruitment, while effective retention strategies can drive employee engagement and reduce turnover costs.

2. Skills Development and Training: Bridging skills gaps and fostering a culture of continuous learning are critical for maintaining a competitive workforce.

3. Technology Integration: Adopting and leveraging HR technologies requires investment, training, and change management to realize their full potential.

4. Diversity and Inclusion: Overcoming biases, promoting inclusivity, and creating a diverse workforce can lead to innovation and better decision-making.

5. Remote Work Challenges: Managing remote teams effectively, maintaining communication and collaboration, and addressing work-life balance issues are key challenges in remote work environments.

6. Data Privacy and Security: Ensuring compliance with data protection regulations and safeguarding employee data privacy are essential considerations in HRM practices.

CHANGES REQUIRED TO OVERCOME THE CHALLENGES AND OPPORTUNITIES

Achieving competitive success through people requires a fundamental change in how managers think about their employees and how they view the working relationship.

Employment Security

Employment security is a critical element of a high-performance work arrangement. The security of employment signals a longstanding commitment to its workforce.

Employees will develop new ideas when their jobs are secured because they know that introducing the new system will not affect their employment stability. They will welcome the change.

Selective Recruiting

Organizations serious about making a profit through people will expend the efforts needed to recruit the right people in the first place.

High and Lucrative Wages

An organization can attract and retain qualified candidates if it pays a high and lucrative pay package.

Higher wages tend to attract more outstanding applicants, permitting the organization to be more selective in finding people who will be committed to the organization.

Incentive Pay

The pay system should be based on the performance or productivity of employees.

SHODHKAVERI: GLOBAL ACADEMIC PRACTICES OF MULTIDISCIPLINARY RESEARCH AND DEVELOPMENT

Paying for skills acquisition encourages people to learn different jobs and become more flexible. There is a tendency to overuse money to solve organizational problems.

Employee Ownership

Organizations should make an employee a mini-employer. A stock ownership plan can do this. This may increase their sense of ownership.

Employee ownership reduces conflict between labor and capital.

Employee ownership puts stock in the hands of people.

Employee Empowerment and Participation

Empowerment indicates many things to many experts. It refers to mutual influence, creative power distribution, and shared responsibility. It is a democratic and long-lasting process.

Participation increases both satisfaction and employee productivity. Managers should encourage the decentralization of decision-making.

Information Sharing

To be a source of competitive advantage, people must have the information necessary to do what is required to be successful.

Information sharing is an essential element of high-performance work systems. The sharing of information on issues like budget, strategy, and financial performance conveys to an organization's people that they are trusted.

Training and Development of Skills

Training is an essential component of high-performance work systems because these systems rely on front-line employees' skill and initiative to identify and resolve problems, initiate change in work methods, and take responsibility for quality.

Treat People with Respect and Dignity

Dignity is a term used in moral, ethical, legal, and political discussions to signify that human being has an innate right to be valued and receive ethical treatment.

Wage Compression

Pay differential among the levels of management should be lower. Wage compression between senior managers and employees will reduce status differences and develop a sense of common fate.

Promotion from Within

It is of vital importance to encourage employee promotion from within the organization. This practice may boost employee morale. It encourages training and skill development because the availability of promotion opportunities within the firm binds workers to employers and vice versa.

Conclusion:

Navigating global trends in Human Resource Management presents both challenges and opportunities for organizations seeking to gain a competitive advantage. By embracing technological advancements, fostering diversity and inclusion, and prioritizing employee development and well-being, organizations can optimize their HRM practices to attract, retain, and engage top talent. Strategic alignment between HRM initiatives and business objectives is paramount for achieving sustainable growth and success in the dynamic global marketplace.

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**Exploring Data in R: Unveiling dplyr and ggplot2 libraries for the
analysis of a simple dataset**

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Introduction

R has become a very useful tool in data science and statistical analysis, with many libraries and packages available to help with different tasks. Among them, **ggplot2** and **dplyr** stand out as essential tools for data wrangling, data visualization and manipulation, respectively. These two libraries work together to give researchers and analysts a strong framework for efficiently analysing, manipulating, and presenting data. This research project aims to explore the capabilities of ggplot2 and dplyr by analysing a basic dataset and discovering their potential. This study intends to demonstrate the smooth integration of both tools in the data analysis pipeline by utilizing the features of ggplot2, which is well-known for its versatility in making aesthetically pleasing plots, and dplyr, which offers a consistent syntax for data manipulation. Before covering these libraries, an overview of R is provided.

Overview of R

R was first developed in the early 1990s, and its first stable version (1.0.0) was made available in 2000. At the University of Auckland in New Zealand, Ross Ihaka and Robert Gentleman designed R originally. Since then, statisticians, academics, and developers from all over the world have contributed to the ongoing development and improvement of R.

Although it is not directly descended from S, R is greatly impacted by it. John Chambers and his associates at Bell Laboratories worked on developing the S language during the 1970s and 1980s. In terms of functionality, data structures, and syntax, R and S are very comparable. R might be seen as a re-implementation of the fundamental concepts and principles of the S language, even if it is not a direct descendent of S.

Although though R and S are two different languages, R borrows a lot from the ideas and design philosophies of S, so users who are familiar with S will find R easy to switch between.

Overview of dplyr& ggplot2

Dplyr:

A robust R package called dplyr was created to make data manipulation procedures more efficient. Dplyr, created by Hadley Wickham, is a logical collection of functions that let users easily and effectively do basic data manipulation tasks. Key attributes and capabilities of dplyr comprise:

- *Consistent syntax*: Dplyr presents a straightforward and simple-to-understand consistent syntax for data manipulation. The verbs in this grammar align with typical data manipulation operations, like filtering, choosing, modifying, summarizing, and organizing data.
- *Data Frames*: One of the main data structures in R, data frames, are designed to integrate flawlessly with dplyr. It simplifies complex procedures by enabling users to handle data frames with an expressive and basic vocabulary.
- *Piping*: The pipe operator (`%>%`) from the magrittr package is easily integrated with dplyr. This improves the readability and maintainability of code by enabling users to tie together various data manipulation methods in a clear and succinct manner.
- *Efficiency*: Dplyr is a performance-optimized tool that excels at handling big datasets. Dplyr uses effective algorithms and lazy evaluation in the background to reduce memory consumption and increase processing performance.
- *Database Integration*: Dplyr offers functions that allow one to work with remote data sources, including databases, using a syntax identical to that of local data frames. As a result, users may easily interact with data kept in external databases without switching between programs or languages.

ggplot2:

A popular R program for designing sophisticated and adaptable data visualizations is ggplot2. ggplot2, created by Hadley Wickham, is predicated on the grammar of graphics, a theoretical framework for comprehending and producing visuals. ggplot2's main attributes and tenets include:

- *Grammar of Graphics:* ggplot2 adheres to the grammar of graphics, which divides the process of making a plot into many elements, including scales, geometries, data, and aesthetics. With the help of this conceptual framework, users can combine straightforward building elements to produce sophisticated visualizations.
- *Layered Method:* To create plots, ggplot2 employs a layered method in which various plot elements (such as data points, lines, and labels) are inserted as distinct layers. This makes it simple to add, remove, and alter layers, as well as change the order in which they are added or removed, from plots.
- *Aesthetic Mapping:* With ggplot2, users can associate plot aesthetic elements like color, shape, size, and location with variables in the data. This allows users to produce visualizations, like grouping or highlighting distinct groups, that communicate additional information beyond the raw data.
- *Flexible Geometries:* A variety of geometries, or geoms, such as points, lines, bars, histograms, boxplots, and more, are available for data visualization with ggplot2. Users are able to select the right geom for their data and alter its design to fit their preferences.
- *Themes and Customization:* There are several choices available in ggplot2 to customize the look of plots, such as themes, scales, labels, and annotations. Plots can be readily altered by users to accommodate their tastes or the needs of their target audience.

- *Faceting* : A feature of ggplot2 that lets users make different plots (called facets) depending on subsets of the data. This is especially helpful when comparing groups within the data or investigating correlations between variables.

Importing, processing and Visualising data

Here the data explored is based on a Shoe Store having two brands – Nike and Adidas. Each of these having date and quantity sold for the month of Sep 2023 shown in the Figure 1. It will demonstrate how to import this data and perform a number of meaningful data manipulation processing.

Package	Functions	Description
dplyr	filter()	Select rows that meet specified conditions.
dplyr	select()	Select columns by name.
dplyr	mutate()	Create new columns or modify existing ones.
dplyr	arrange()	Arrange rows by variables.
dplyr	group_by()	Group data by one or more variables.
dplyr	summarize()	Summarize data into a single row.
dplyr	join()	Merge datasets based on a common variable.

Table 1: Summary of useful functions of dplyr

Here is the preview of the dataset which discuss about sales of branded shoes:

```
      date    brand sold_qty
1 01/09/23   Nike      24
2 01/09/23 Adidas      14
3 02/09/23   Nike      21
4 02/09/23 Adidas      12
5 03/09/23   Nike      18
6 03/09/23 Adidas      11
```

Package	Functions	Description
ggplot2	ggplot()	Initialize a ggplot object
ggplot2	aes()	Define aesthetic mappings (e.g., x, y, color) within ggplot()
ggplot2	geom_point()	Add points to a plot
ggplot2	geom_line()	Add lines to a plot
ggplot2	geom_bar()	Create bar charts
ggplot2	geom_boxplot	Create boxplots.
ggplot2	theme()	Customize the appearance of the plot.

Table 2: Summary of useful functions of ggplot2

First step is to load required libraries that are needed for data analysis task.

library(dplyr)

library(ggplot2)

After this, dataset is imported in console. There are two ways to import – by using `read_csv()` (from the library *readr*), is used to read in the rectangular data from the comma-separated file, and copy this data into the tibble data structure. Another way is by using the direct option of importing data from different sources like excel, SQL, SPSS, SAS etc.

Now we have to define the imported dataset into a new data frame `Shoe_Sales` for efficient data processing. After that used the `head()` function to preview the data as shown above. Then `summary()` function is used to find out if any **NA** values or outliers are present or not.

```
Shoe_Sales<-shoe_sales  
head(Shoe_Sales)  
summary(Shoe_Sales)
```

```
      date      brand      sold_qty  
Length:60      Length:60      Min.   :  7.00  
Class :character Class :character 1st Qu.: 12.25  
Mode  :character Mode  :character Median : 16.00  
                                Mean  : 27.48  
                                3rd Qu.: 19.75  
                                Max.   :689.00  
                                NA's   :2
```

Figure 2: Output of summary()

When using summary (Shoe_Sales), above output is displayed and the overall structure of the data is displayed. It can identify that outlier which might be present in the data because the max sold qty is 689 but 3rd quartile showing sold quantity (qty) as 19.75, which doesn't make any sense. There are also 2 NA values we have to treat this outlier and NA values otherwise it will be difficult to generate insights and might get wrong interpretation. We have to use filter() function in dplyr library to find quantity sold more than 19.75 which is 3rd quartile or 75 % of the sold quantity falls below 19.75 and outlier is in the top quartile or top 25%. So, it can be seen in the below Output that outlier is 689 which is of brand Adidas.

```
df1<-Shoe_Sales %>% filter(sold_qty>19.75)  
df1
```

Following output is displayed after performing the above operation.

	date	brand	sold_qty
1	01/09/23	Nike	24
2	02/09/23	Nike	21
3	04/09/23	Nike	22
4	05/09/23	Nike	20
5	06/09/23	Nike	23
6	09/09/23	Nike	25
7	11/09/23	Nike	23
8	12/09/23	Adidas	689
9	9/14/2023	Nike	22
10	9/16/2023	Nike	21
11	9/20/2023	Nike	24
12	9/21/2023	Nike	24
13	9/23/2023	Nike	20
14	9/27/2023	Nike	22
15	9/28/2023	Nike	21

Figure 3: Output of df1

Now using filter() command again on the data on the basis of Nike to check if Nike is having NA values or not.

```
nike<-Shoe_Sales %>% filter(brand== “Nike”)  
nike
```

From the previous operation we got the following output-

	date	brand	sold_qty
1	01/09/23	Nike	24
2	02/09/23	Nike	21
3	03/09/23	Nike	18
4	04/09/23	Nike	22
5	05/09/23	Nike	20
6	06/09/23	Nike	23
7	07/09/23	Nike	19
8	08/09/23	Nike	17
9	09/09/23	Nike	25
10	10/09/23	Nike	14
11	11/09/23	Nike	23
12	12/09/23	Nike	19
13	9/13/2023	Nike	16
14	9/14/2023	Nike	22
15	9/15/2023	Nike	17
16	9/16/2023	Nike	21
17	9/17/2023	Nike	NA
18	9/18/2023	Nike	18
19	9/19/2023	Nike	15
20	9/20/2023	Nike	24
21	9/21/2023	Nike	24
22	9/22/2023	Nike	16
23	9/23/2023	Nike	20
24	9/24/2023	Nike	15
25	9/25/2023	Nike	NA
26	9/26/2023	Nike	19
27	9/27/2023	Nike	22
28	9/28/2023	Nike	21
29	9/29/2023	Nike	17
30	9/30/2023	Nike	18

Figure 4: Output of nike

Now using again the summary() function to get the overall structure of the data filtered on the basis of Nike. From the below output it is interpreted that average or mean quantity sold is 19.64 and the range of daily quantity sold is 14 – 25.

date	brand	sold_qty
Length: 30	Length: 30	Min. :14.00
Class :character	Class :character	1st Qu.:17.00
Mode :character	Mode :character	Median :19.50
		Mean :19.64
		3rd Qu.:22.00
		Max. :25.00
		NA's :2

Figure 5: Output of summary()

Now, to retrieve the rows having NA values the function **is.na()** is used from the library that has been loaded earlier. It is used to find NA values.

```
nike[is.na(nike$sold_qty),]
```

We get the following output by performing the previous operation:

	date	brand	sold_qty
17	9/17/2023	Nike	NA
25	9/25/2023	Nike	NA

In above case, NA values can be replaced with obtained mean. The function can be used called as **mutate()** function to replace the NA values with in an if-else condition. In this, if sold_qty is having NA values, it will replace it by mean .i.e. 20, otherwise default value will be printed.

```
Nike1<-nike %>%
```

```
mutate(sold_qty=ifelse(is.na(sold_qty),20,sold_qty))
```

```
Nike1[c(17,25),]
```

We get the following output:

	date	brand	sold_qty
17	9/17/2023	Nike	20
25	9/25/2023	Nike	20

Same process of filtering the data is repeated using “Adidas” and it displays the following output:

```
Adidas<-Shoe_Sales %<% filter(brand== “Adidas”)
```

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	date	brand	sold_qty
1	01/09/23	Adidas	14
2	02/09/23	Adidas	12
3	03/09/23	Adidas	11
4	04/09/23	Adidas	13
5	05/09/23	Adidas	10
6	06/09/23	Adidas	15
7	07/09/23	Adidas	16
8	08/09/23	Adidas	8
9	09/09/23	Adidas	17
10	10/09/23	Adidas	7
11	11/09/23	Adidas	9
12	12/09/23	Adidas	689
13	9/13/2023	Adidas	11
14	9/14/2023	Adidas	13
15	9/15/2023	Adidas	10
16	9/16/2023	Adidas	14
17	9/17/2023	Adidas	8
18	9/18/2023	Adidas	15
19	9/19/2023	Adidas	7
20	9/20/2023	Adidas	19
21	9/21/2023	Adidas	18
22	9/22/2023	Adidas	12
23	9/23/2023	Adidas	11
24	9/24/2023	Adidas	14
25	9/25/2023	Adidas	10
26	9/26/2023	Adidas	9
27	9/27/2023	Adidas	13
28	9/28/2023	Adidas	15
29	9/29/2023	Adidas	8
30	9/30/2023	Adidas	16

Figure 6: Output of Adidas

From the above output it is observed that there is an outlier, i.e. sold_qty of 689 of Adidas on date 12/09/23.

Now, after using the **summary ()** function again to see the overall structure of data filtered on the basis of Adidas and we get the following output:

date	brand	sold_qty
Length:30	Length:30	Min. : 7.0
Class :character	Class :character	1st Qu.: 10.0
Mode :character	Mode :character	Median : 12.5
		Mean : 34.8
		3rd Qu.: 15.0
		Max. : 689.0

From the above output it is interpreted that average quantity sold is 35 approx. Daily quantity sold(Qty Sold) range cannot be identified because

of the outlier. To confirm the outlier, **quantile()** function is used to find the 'Qty Sold' above 95% or in other words 95% of 'Qty Sold' is below 18.55. The output is shown below:

Quantile (Adidas\$sold_qty,0.95)

95%
18.55

Next, data is filter where sold_qty is more than 18.55. It will display the outlier which is 689.

Adidas%>% filter(sold_qty>18.55)

	date	brand	sold_qty
1	12/09/23	Adidas	689
2	9/20/2023	Adidas	19

So next, outlier value will be replaced by with median value of 12(approx.). It is always recommended to replace outliers with median values not mean.

Adidas[Adidas\$sold_qty==689, "sold_qty"]<-12

Adidas %>% filter(date=="12/09/23")

	date	brand	sold_qty
1	12/09/23	Adidas	12

At last, both above data frame is merged the two processed data frame of Adidas and Nike by using the **merge()** function where **all= FALSE** means inner join on the basis of **by='date'**. It will be assigned a new name as data frame called **merged_df**.

merged_df<- merge(Adidas,Nike1, by = 'date', all = FALSE)

merged_df

	date	brand.x	sold_qty.x	brand.y	sold_qty.y
1	01/09/23	Adidas	14	Nike	24
2	02/09/23	Adidas	12	Nike	21
3	03/09/23	Adidas	11	Nike	18
4	04/09/23	Adidas	13	Nike	22
5	05/09/23	Adidas	10	Nike	20
6	06/09/23	Adidas	15	Nike	23
7	07/09/23	Adidas	16	Nike	19
8	08/09/23	Adidas	8	Nike	17
9	09/09/23	Adidas	17	Nike	25
10	10/09/23	Adidas	7	Nike	14
11	11/09/23	Adidas	9	Nike	23
12	12/09/23	Adidas	12	Nike	19
13	9/13/2023	Adidas	11	Nike	16
14	9/14/2023	Adidas	13	Nike	22
15	9/15/2023	Adidas	10	Nike	17
16	9/16/2023	Adidas	14	Nike	21
17	9/17/2023	Adidas	8	Nike	20
18	9/18/2023	Adidas	15	Nike	18
19	9/19/2023	Adidas	7	Nike	15
20	9/20/2023	Adidas	19	Nike	24
21	9/21/2023	Adidas	18	Nike	24
22	9/22/2023	Adidas	12	Nike	16
23	9/23/2023	Adidas	11	Nike	20
24	9/24/2023	Adidas	14	Nike	15
25	9/25/2023	Adidas	10	Nike	20
26	9/26/2023	Adidas	9	Nike	19
27	9/27/2023	Adidas	13	Nike	22
28	9/28/2023	Adidas	15	Nike	21
29	9/29/2023	Adidas	8	Nike	17
30	9/30/2023	Adidas	16	Nike	18

Figure 7: Output of merged data

Now a plot is made based on a line chart to analyse the Adidas and Nike performance over time but before that data has to be arranged by 'dates' and ordered by dates. For that we have to use the **arrange()** function and **order()** function and store it in **Sorted_Shoe1**.

```
Sorted_shoe<-arrange(merged_df,merged_df$date)
Sorted_shoe1<-Sorted_shoe[order(Sorted_Shoe$date),]
```

The line chart is created using **ggplot** for analysing the performance of Adidas vs Nike over time in the Month of Sep 2023.

```
ggplot(data = Sorted_Shoe1, aes(x = Sorted_Shoe1$date, color =  
"Adidas",)) +  
geom_line(aes(y = Sorted_Shoe1$sold_qty.x, group = 1)) +  
geom_line(data = Sorted_Shoe1, aes(x = Sorted_Shoe1$date, y =  
Sorted_Shoe1$sold_qty.y, color = "Nike", group= 1)) +  
labs(title = " Adidas Vs Nike Performance Overtime",  
x = "Date",  
y = "Sold Quantity")+  
theme(axis.text.x = element_text(angle = 45, hjust = 1))
```

Above command can be explained as following steps:

1. **ggplot(data = Sorted_Shoe1, aes(x = Sorted_Shoe1\$date, color = "Adidas"))**: This initializes a ggplot object with your data, Sorted_Shoe1. The x-axis (x) is mapped to the date column of Sorted_Shoe1. The color aesthetic (color) is set to "Adidas". However, note that in ggplot2, if you want to map colors to different categories, you should use a variable name instead of a string. In this case, "Adidas" is treated as a constant, and all points will have the same color.
2. **geom_line(aes(y = Sorted_Shoe1\$sold_qty.x, group = 1))**: This adds a line layer to the plot for Adidas. It maps the y-axis (y) to the sold_qty.x column of Sorted_Shoe1. The group = 1 parameter ensures that all points are treated as belonging to the same group, resulting in a continuous line.
3. **geom_line(data = Sorted_Shoe1, aes(x = Sorted_Shoe1\$date, y = Sorted_Shoe1\$sold_qty.y, color = "Nike", group= 1))**: This adds another line layer to the plot, this time for Nike data. It specifies the x-axis (x) as Sorted_Shoe1\$date and the y-axis (y) as Sorted_Shoe1\$sold_qty.y. The color aesthetic is set to "Nike", but similarly to the previous line, it should ideally be a variable name representing different categories. The group = 1 parameter ensures all points are treated as belonging to the same group.
4. **labs(title = " Adidas Vs Nike Performance Overtime", x = "Date", y = "Sold Quantity")**: This sets the title of the plot and labels for the x-axis and y-axis.

5. **theme(axis.text.x = element_text(angle = 45, hjust = 1))**: This modifies the appearance of the x-axis labels. It rotates the labels by 45 degrees (angle = 45) and adjusts their horizontal alignment to be right-justified (hjust = 1), making them more readable when they might overlap.

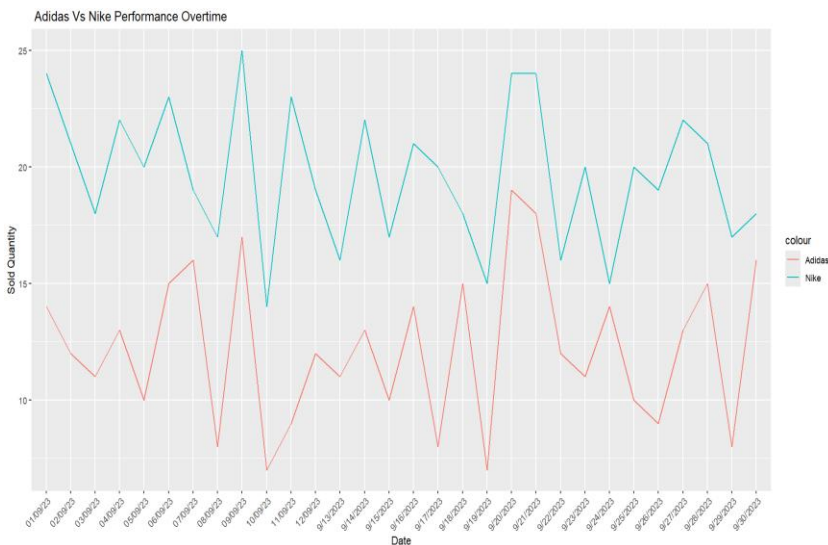


Figure 8: Output of ggplot command of line char

Conclusion

This study shows a basic illustration for how to import, clean, and preprocess data related to dplyr library in R software. This involves tasks like handling missing values and transforming data into a suitable format for analysis. R offers numerous packages for statistical analysis. R provides powerful tools like ggplot2 for creating visually appealing and informative plots. It also depicts how to visualize data trends over time and create aesthetics line chart to explore data.

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SOCIAL FINANCE AND SOCIAL STOCK EXCHANGES

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ABSTRACT

Social finance is considered to be the mainstream problem in India for goods and services which targets the underprivileged and poorer sections of the society. SSEs offer a platform where investors can support organizations committed to positive social and environmental outcomes. Honourable finance Minister Smt, Nirmala Sitharaman as part of budget speech for FY 2019-20 proposed the idea of an electronic fund raising platform "Social Stock Exchange" under the regulatory ambit of SEBI for listing social enterprise and voluntary organizations working for the realization of a social welfare objective so that they can raise capital as equity or as units of mutual fund. The fund channeling capability of social stock exchanges for the purpose of social upliftment of society will clearly be a game changer for those who have fire to do something for the society but lack resources. The proposal has attracted much attention, and social entrepreneurs, among others, have said that the move can have a revolutionary effect on how they tap investors for capital. .Recently the National Stock Exchange of India, received in principle approval from securities exchange board of India to set up a Social Stock Exchange(SSE)as a separate segment.. Under the new rules, SSE will be a separate segment of the existing stock exchanges.

Keywords: Social Finance ,Social entrepreneurs, Impact Investment, SEBI, SSE, Funds, Stock Exchange

ROLE OF SOCIAL STOCK EXCHANGE

INTRODUCTION

Social Stock Exchange (SSE) helps social enterprises raise finances from the public through the stock exchange medium. It aims to provide an alternative fund-raising instrument. In simpler words, SSE is a medium between social enterprises and fund providers. There is much potential for SSE's in India as there are 31 lakh NPOs, which is more than the number

of schools and 250 times the number of government hospitals. This means that there is one NPO for 400 Indians. As per the draft of the SEBI report, a Social Stock Exchange may be helpful in rebuilding the livelihoods of people who are affected during the COVID-19 epidemic. According to exports SSEs will aim at unlocking large pools of social capital and encourage a mixed fiscal structure, so that conventional capital can partner with social capital to meet the serious challenges of COVID-19.

Social stock exchange is a platform on which social enterprises, volunteer groups and welfare organizations will be listed so that they can raise capital. The proposal has attracted much attention, and social entrepreneurs, among others, have said that the move can have a revolutionary effect on how they tap investors for capital. With social finance, impact investors put their capital behind enterprises that profitably cater to underserved populations by expanding access to critical goods and services, such as healthcare, affordable housing, credit, and quality employment etc. SSE is a unified platform that can bring in greater transparency for nonprofits, and help both individuals and the corporate sector evaluate organizations they would like to give money to. Such a platform can help with both discoveries of organizations and in impact evaluation, which is otherwise expensive.

This is a revolutionary conception to give an avenue to these organizations, so that they can approach and tap the reservoir of investors for capital. We all are aware that one of the main concerns of the society has been to remove poverty and transfer the benefits of economic growth to the last person in the line. Social finance makes a compelling promise: to make the world a better place by harnessing the power of the market to address pressing global social challenges—to do well financially by doing social good. In order to fulfill this promise, however, social finance or impact investing must strike a delicate balance between two historically opposed imperatives: profit and social benefit. And when this balance tips in favor of profitability, social finance can end up harming the very people whose lives it seeks to improve. However, before one can understand what a Social Stock Exchange is, two terms —social enterprises and impact investment — need to be understood.

A. Social Enterprise:

A social enterprise is a revenue-generating business, but with a difference — its primary objective is to achieve a social objective. While pursuing social goals, the social enterprise does not do away with profit because it ensures the sustainability of the entity. The thrust and focus is that the profit these entities generate is not used for payouts to investors, but reinvested into their social programs. Profit, which makes social enterprises sustainable, differentiates them from charities. Charities also have a social mission, but they are fully dependent on donations.

B. Impact Investment

As the term suggests, impact investment is the investment made into businesses with the aim to make a noticeable social, economic and environmental impact.. Impact investments are investments made into companies, organizations and funds with the intention to generate social and environmental impact alongside a financial return. Impact investments can be made in both emerging and developed markets, and target a range of returns from below market to market rate, depending on the circumstances. Broadly speaking, Investments made with an aim to make quantifiable social, economic and environmental impression and also generating profit and publicity. Currently, impact Investment sector is growing in India which means that investments will also increase.

ACTIVITIES PERMISSIBLE FOR A SOCIAL BUSINESS :

Social businesses should work to eliminate hunger, poverty, malnutrition, and inequality, as well as promote health care (including mental health) and sanitation, and provide safe drinking water. They try to build sustainable and resilient cities, slum area development, affordable housing, and other interventions are needed. To promote rural and urban poor livelihoods, particularly increasing the income of small and marginal farmers and non-farm workers. Environmental sustainability, climate change mitigation, and adaptation, and forest and wildlife conservation are all priorities. Gender equality, women's empowerment, and LGBTQIA+ groups are all promoted. Education, employability, and livelihoods are all promoted.

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OBJECTIVES OF SSE

- It is a platform regulated by SEBI that brings together social enterprise and donors
- It facilitate growth and funding of social enterprises
- It's a mechanism that ensures robust standards of social impact and financial reporting

KEY FEATURES OF SSE

- **MISSION ALIGNMENT**-SSEs make it clear that organizations should have a clear social or environmental mission embedded in their business model
- **IMPACT MEASUREMENT AND REPORTING**-Transparency and accountability is the key element of SSEs.
- **INVESTOR ENGAGEMENT**-SSEs tries to engage a diverse range of investors, including individual investors, institutional investors, philanthropic foundations, and impact-focused funds.
- **REGULATORY FRAMEWORK**-SSE typically involves developing a regulatory framework that governs the listing, trading, and reporting requirements for participating organizations.
- **MARKET INFRASTRUCTURE** -SSEs provide the necessary infrastructure for organizations to raise capital through various financial instruments, such as shares, bonds, or other securities specifically designed for impact investing.

NEED OF SOCIAL STOCK EXCHANGE

- **Impact Investing**-SEs can provide a platform for impact investors who want to support companies that prioritize social and environmental objectives alongside financial returns
- **Transparency and Accountability**- This transparency can build trust among investors and stakeholders and drive greater corporate responsibility.
- **Access to Capital**-For social enterprises and organizations focused on creating positive social impact, accessing capital can be challenging.
- **Brand Differentiation**- Listing on a social stock exchange can serve as a badge of credibility for companies committed to social

and environmental stewardship. It can differentiate them from traditional businesses and attract consumers, investors, and employees who value ethical and sustainable practices.

IMPORTANCE OF SOCIAL STOCK EXCHANGE

- To solve the fund crunch faced by social enterprises
- To meet the investment demand in human development sector
- To create Transparency and accountability
- To produce Synergy between investor and investee in social aims

Social enterprise examples

- Fifteen is the name of several restaurants founded in 2004 by Jamie Oliver, a well-known British chef. These restaurants employ disadvantaged youth, including those with drug or alcohol problems, the unemployed and the homeless, ultimately training them to become chefs.
- An example of a social enterprise is Bangalore-based SELCO. This is an entity involved in the 'delivery of last mile sustainable energy solutions'. SELCO says, it "has maintained modest profits in the last eight years with growth rates at an annual average of 20 per cent.

It has reinvested its profits back into the company". SELCO views energy access as an underlying precondition to facilitate progress related to health, education, livelihoods, financial inclusion and so on leading to overall improvement in quality of life. TOM'S SHOES-Known for its "One for One" model, TOMS donates a pair of shoes to a child in need for every pair purchased. Fair Trade USA-This organization certifies products that meet certain social, environmental, and economic standards, ensuring fair wages and working conditions for producers in developing countries. Grameen Bank- founded by Muhammad Yunus, Grameen Bank provides microfinance loans to empower low-income individuals, particularly women, in Bangladesh and other countries. Body Shop-Known for its ethical and environmentally friendly beauty products, The Body Shop advocates against animal testing and sources ingredients from fair trade suppliers.

Status of Social Stock Exchange in India

A technical group on Social Stock Exchanges was established by SEBI in September 2020, under the chairmanship of Harsh Bhanwala, the former head of NABARD. The technical committee recommended the following:

- Political and religious organizations, as well as trade associations and corporate foundations, should not be authorised to raise funds through SSEs.
- For-Profit Enterprises (FPEs) and Non-Profit Organisations (NPOs) will be allowed to access the SSE if they can demonstrate that their major goals are social intent and impact.
- Entities included on SSE will be required to provide an annual social impact report that includes "strategic intent and planning, approach, and effect scorecard."
- Non-governmental organizations, Section 8 businesses, trusts, and societies are common structures for NPOs. Private limited firms, partnerships, and sole proprietorships are all examples of FPGAs.

HOW TO RAISE FUNDS FOR SSE

It is mandatory for a Not-for-profit organization to register with Social Stock Exchange before it raises funds through Social Stock Exchange. Only Indian entities can register in Social Stock Exchange. A Not-for-Profit organization after registering with Social Stock Exchange may raise funds on Social Stock Exchange through issue of zero coupon bonds, donations through mutual fund schemes, any other means SEBI may specify in future.

CURRENT CHALLENGES OF SSE IN INDIA :

The first thing the government needs to decide is how to differentiate between asocial enterprise and a normal enterprise to educate, train and create awareness about SSE. Many still think that three years is “the make or break” line for any new business and social businesses are especially vulnerable to failure due to lack of resources and uncontrollable environments governments should help in creating social finance markets, and then support them with the right mix of policy and legislative tools. For example, there are still legal restrictions preventing fund managers from investing in social finance in many countries

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Investors—whether local governments, philanthropic organizations, or foundations—need to provide more seed funding to understand and gauge the necessary drivers for impact investment, and boost the organizational capacity of the social sector. Some more challenges faced are absence of a legal criteria to differentiate between a social enterprise and a normal enterprise, Misuse or diversion of funds, lack of proper framework for social impact assessment, Lack of resources with NGOs so as to maintain their financial records.

Conclusion

Social Stock Exchange being a new concept in India could serve private and non-profit sector providers by channeling capital. Social Stock Exchanges (SSEs) in India were still in the developmental phase. The Securities and Exchange Board of India (SEBI), the regulatory body overseeing securities markets in India, had proposed the concept of SSEs as a means to facilitate fundraising by social enterprises and organizations working for social welfare causes. SSEs represent an innovative approach to mobilizing capital for social and environmental good, offering a platform for investors to contribute to positive change while seeking financial returns. As the field of impact investing continues to evolve, SSEs are poised to play a crucial role in shaping the future of finance towards greater sustainability and social equity. It serves as a platform to raise funds by social enterprises engaged in creating a positive social impact. Setting up of a Social Stock Exchange is a win-win situation for both people and society, if duly enforced. While investors would get a better and more potent opportunity to extend a helping hand towards ever changing requirements of society such as health and care for elderly, this will also improve the system for people. SSE is beneficial for the social enterprises, government, and for Indian economy as a whole.

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SHODHKAVERI: GLOBAL ACADEMIC PRACTICES OF MULTIDISCIPLINARY RESEARCH AND DEVELOPMENT

AN EMPIRICAL STUDY OF THE SCENARIO ON FAST-FOOD INDUSTRY IN INDIA

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ABSTRACT

Indian society's traditional economic landscape was different from what it is today. The majority of Indian consumers strongly preferred food that was prepared at home. In contrast, Indian society's perspective is fast shifting as a result of the contemporary culture of eating out. Currently, a lot of fast-food chains have made their mark in India thanks to the country's fast-paced culture, hectic schedules, competitive environment, rising number of working women, idea of the nuclear family, etc. Thanks to favorable demographics, shifting consumer preferences, and more disposable money, the fast-food industry in India is expanding rapidly. The increasing number of individuals choosing to dine out is giving numerous international firms fantastic chances. Fast food consumption is thought to be increasing in tandem with urbanization, indicating that modernization of the Indian food business is imminent. This study aims to explore and comprehend the fast-food industry's general situation in India.

INTRODUCTION

India is a diverse nation. Not only is food viewed as a source of nourishment in this place, but it also works in tandem with local customs and traditions. In India, regional variations occur in the flavors and tastes of food preparation. In India, people tended to favor home-cooked meals when they were younger. However, as urbanization occurs, it appears that this situation is entirely shifting. The idea of fast food has been popular for a while now. All family members must work in order to make ends meet in

our fast-paced world where costs are rising every day. In order to make a living, many people also frequently relocate far from their families to another area. This type of fast-paced lifestyle allows for the consumption of simply prepared, swiftly served meals that we refer to as fast-food. This fast cuisine is not only delicious when it's freshly prepared, but it also tastes good. The fast-food sector in India is growing daily, which brings with it both advancements and certain downsides.

Fast food has been a popular concept for some time now. Every family member needs to work to make ends meet in our fast-paced, ever-expanding world. Many people also regularly move far from their relatives to another area in order to earn a living. Fast-food is defined as simply prepared meals that are supplied quickly to consumers who lead fast-paced lives. When freshly made, this fast food is not only tasty, but it also looks good. India's fast-food industry is expanding constantly, bringing with it both benefits and drawbacks.

History of fast-food industry

In the 1940s, Southern California was the first to envision the fast-food sector. It had a significant effect on eating customs not only in Asian but also in American nations. The American fascination with cars, the construction of a significant new highway system, the growth of suburban areas, etc., are some of the elements that contributed to the emergence of the fast-food culture. The American tradition of eating out has also been greatly influenced by the Asian countries. It was noted that Asian nations have a very high demand for fast meals. In these nations, ready-to-eat food was becoming increasingly popular in tandem with urbanization. Noodles were the popular fast food item in East Asian cities; falafel and flatbread were popular in the Middle East; and roadside vendors in West African French-speaking countries served brochettes, or char-grilled meat sticks.

OBJECTIVES OF THE STUDY

More specifically the study makes an earnest attempt by having the following as its objectives:

1. To bring out the trends of the fast food industry in India
2. To study the reasons behind the arrival of the fast food industry in India
3. To explore the challenges and effects of the fast food industry in India

REVIEWS OF LITERATURE

(Y Prabhavathi, 2014), Fast food industry one of the most growing industry in the world, the rising number of nuclear families, economic growth and rise in income of people, change in taste & preference, busy lifestyle and globalization has helped fast food to gain popularity in India. The finding of the research by conducting a survey concluded that there is absence of healthy menu, slow delivery time, no new variety in fast food were the problems perceived by the consumers of fast food chains.

(Anita Goyal, 2007), tries to evaluate significance of different variables influencing the decision of fast food chains of young Indian consumers. The findings were that youth in India are passionate for visiting fast food chains for fun and change, but they prefer homemade food more. They consider it as healthier, taste and quality, ambience and hygiene.

According to (Neeti Kasliwal, 2008), the marketing and branding initiatives taken by McDonald's in India to promote its sales is customizing their menu according to the taste of Indians. quick service restaurant experience supported by principles and core Val (M.S. Anitharaj, 2018), says that Indian economy is an economy with most of the consumers being to have preference towards home cooked foods. This created a major challenge for the global fast food giants like McDonalds, KFC, etc to establish their place in Indian Market. In recent years, Indian fast food industry is going through many changes, effecting a number of underlying progress. The most important was the quality and variety of services which have fastened and expanded the scope of fast food restaurants.

(Annie.S. Priyadharsini, 2014), In the recent years one of the major problem faced by fast food industries is consumer behaviour . The study consumer behaviour includes not only why consumers take decisions to buy goods and services but also all the behaviours that consumers display in searching for, purchasing ,using, evaluating and disposing of products and services that they expect will satisfy their needs.. It is very important that every industry should have the knowledge of consumers needs wants ,attitude and beliefs because these areas will help firms to improvise their marketing strategies by understanding issues such as how the consumers

think feel and comprehend and select various competing brands ,how they are influenced by their environment .

(Tandon, 2016) found that in recent years the number of American or multinational food chains targeting India have risen, these restaurants are serving burger, pizza, etc. Country's largest pizza chain, Domino's Pizza, has registered low SSSG over the past three years and has pumped up advertising expenses in 2015 to beat competition from non-pizza companies. There are three reasons for this slowing growth: first, consumers are really not eating out as much as it was projected they would a decade ago. Second, younger and urban consumers in India are spending on more sophisticated fare offered by restaurants and cafes in top metros. Third, health concerns are weaning people off fast-food. On the other hand, urban Indians, with more disposable income than the previous generation, are choosing to spend their money on gourmet options. Mexican, Japanese, and Vietnamese cuisines today find spots at malls, high-streets, food-trucks, and food festivals. Younger and more sophisticated, Indians are now finding their grub at newer places. The competition will not decline it will only increase and brands have to come up with new ways to attract customers.

(Yerunkar, 2016) says that quick service restaurant is expected to grow in high rate to reach \$4.13 billion by 2020. The fastest growing segment of the organized food service industry is estimated to grow at 18% according to CAGR of next four years. According to analysts, foreign quick service restaurants (QSRs) operators are likely to face challenges in India in terms of localizing their menus in addition to competition from roadside vendors on price margins. The \$50- food service industry in the country is currently dominated by the unorganized sector and while this is not likely to change in the near future, there will be a steady decline in the share of unorganized food sector over the next four to five years, noted the research firm.

The QSRs market in the country currently stands at a mere \$2.13 billion. the QSR market has seen a huge slowdown with companies such as Pizza Hut, Costa Coffee, Barista, KFC, and Mc Donald's downsizing their operations in recent months. The target consumer of QSR segment is majorly the youth. the shift in consumer preferences to increasingly eating

out, and greater hygiene consciousness are some of the factors contributing to the rise of QSRs in the Indian market. Digital, too, is contributing to a new breed of consumers with an increasing demand for gourmet and specialized food. That's why Zomato, Swiggy, Food panda are growing rapidly. As per other studies, from many years India have been a market for snacks-to-go by street vendors, either fast food is not modern for Indians or western transformation. Many multinational food chains are entering Indian markets and many are not performing very well.

For Indians variety of foods were not a new thing from north to south or east the taste & preference change from within a region. The finding of report, (Rise of the Restaurant Industry in India) says that India loves food, the taste of every dish's changes from region to region, Indians have never been very big on eating out. There were nearly 22 lakh hotel and restaurant establishments in India in 2002. The food service or restaurant industry was worth a whopping Rs. 43,000 crores in 2010 and growing at a healthy rate of 15-20 percent annually. The growth of the restaurant industry coincided with the growth of the great Indian middle class, which was the by-product of liberalization.

RESEARCH METHODOLOGY

In order to gather information for this study about the fast food industry challenges and effects in India, secondary data were used. This research is based on secondary sources of data, which include Articles , Journals and Books.

ANALYSIS AND INTERPRETATION

TRENDS IN INDIA:

In India, fast food is one of the food categories with the fastest growth. The poll claims that the fast food business in India is generating enormous sales and is rising by 40% annually. India has emerged as one of the major growth hubs for international fast food companies because of its size, population, and access to raw materials.

Major global fast food players and its size

- Mc Donald's – 300 outlets and according to the plan it can 500 by the year 2020.

- Dominoes – in 2008 there were 227 outlets in Indian and by the year 2017 the number of outlets has increased to 1126.
- Pizza hut – 360 outlets currently in India and according to the plan the number can go to 700 by the year 2020.
- Subways – there are currently 600 outlets over all India which might even increase by 2020.

Based on statistical data, the fast food business in India ranks 10th in terms of per capita spending on fast food, accounting for 2.1% of total yearly spending. It is projected that the Indian fast food industry will develop at a rate of 18% by 2020, with an emphasis on changing consumer behavior and demographic reasons. By 2020, the Indian fast food market is projected to be valued at US \$27.57 billion. The organized fast-food business in India is expected to witness a 27% growth in fast food casual dining outlets by 2019–20. India ranks third among nations with respect to the purchasing power of individuals between the ages of 25 and 49, per the poll. Additionally, 400 commercial centers, fast food restaurants, multiplexes, and other establishments are either under development or in the planning stages. Different market categories are being targeted in the Indian fast-food industry. It tries to serve every market segment based on factors like age, sex, economic group, family, area, and so on rather than just one.

Since children are typically accompanied by their parents, fast food brands present a variety of items to attract children, who are seen to be the primary consumer base in India. This indirectly targets the parents of the children. In contrast to previous times, people in India increasingly prefer to eat out because food is perishable and advancements in technology, particularly in the food business, are crucial. Rapid advancements in fast food technology have been noted in India. Because there are so many different fast-food brands and locations, customers are frequently seen switching between brands, which reduces their sense of loyalty to one particular brand.

THE REASONS FOR ARRIVAL OF FAST-FOOD INDUSTRY IN INDIA: In contrast to the past, men and women today commute to work in equal measure. Every member of the family needs to be employed because

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of rising costs and the desire to upgrade lifestyle. In these situations, fast food serves as a convenient escape due to hectic schedules.

- The modern generation of women does not wish to adhere to the traditional gender responsibilities of childrearing and cooking. Thus, the modernization leads to a rise in the fast food industry's consumption.
- Nowadays, customers don't want to invest their time or energy in cooking. They are becoming more sophisticated as a result of increasing their confidence in the fast-food brands that are accessible in the market. Both men and women are equally focused on their careers in the current environment. As a result, there is double the income, which raises spending capacity and, in turn, leads to a greater scale increase in the consumption of ready-to-eat food.
- There are not enough days in the current circumstances for work. People therefore want to spend their free time on amusement and relaxation after a long day at work. Many of them choose to eat fast food instead of cooking because they are too busy with leisure activities or lack the resources to cook.
- Being the second-largest country with a large population, India has attracted a large number of global firms to its market. The liberalization of Indian markets in 1991 also made it easier for numerous multinational corporations (MNCs) to enter the country, since many tariff and non-tariff obstacles from Indian borders have been eliminated or significantly reduced.

CHALLENGES FACED BY FAST-FOOD INDUSTRY IN INDIA

- Many multinational corporations (MNCs) enter the Indian market with the intention of building their brand and so raising public and government expectations for higher employment rates, GDPs, and GNPs. However, in practice, neither employment rates nor GDPs or GNPs rise because all profits are returned to the MNCs' home countries.

- Because of the social and cultural ramifications, there are some foods that are off limits. The majority of Indians are prohibited from consuming foods like beef and alcohol.
- Ahimsa adherents in some groups also abstain from eating non-vegetarian cuisine, and others refrain from consuming foods that include onions or garlic. These actions all put up obstacles in the way of fast food companies entering the Indian market. Thus, the fast-food industry in India faces difficulties related to social and cultural ramifications.
- Not utilizing glassware, metal ware, or linen napkins when serving quick food presents another difficulty. The usage of biodegradable items is stressed since paper napkins, cups, polyurethane containers, and plates are typically used to serve fast food and are frequently thrown in the trash rather than recycled.
- The fast food business faces challenges due to the high cost of biodegradable materials, despite the Indian government enforcing tight restrictions regulating their use. Moreover, fulfilling the harmony between cultural expectations and businesses' financial goals is a major obstacle for the fast-food sector.

EFFECTS OF FAST FOOD ON HEALTH

Fast food has many health risks for the person eating it, in addition to its taste and convenience. Despite generating billions of dollars in income, the fast-food industry negatively impacts people's ability to eat a healthy, balanced diet because of its flavors and nutritional value. Eating such fast-food increases obesity and causes one to become overweight, which raises the risk of developing ailments like diabetes, high blood pressure, heart disease, etc. Fast food consumption has an impact on people's emotional and physical health, contributing to conditions like depression, exhaustion, and high blood pressure.

SUGGESTION

The fast-food sector must take responsibility for the health risks associated with its consumption. They ought to make the necessary adjustments and work to enhance both the flavor and nutritional content of their products.

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The greater the nutritional worth of their food items, the more they will benefit society and the general public's health.

CONCLUSION

Fast food will continue to grow in India as the country moves toward industrialization. The fast food industry advances as a result of changes in the nation's standard of living. The emergence of this industry in India can be attributed to a number of factors, including the number of men and women working simultaneously, the rise in single-parent households, the distance between work and school, the short lunch break, etc. As with everything, there are advantages and disadvantages. The fast-food industry in India is undoubtedly expanding, which is good for the country's economy. Human health is being adversely affected, leading to major health issues.

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Hypothesis: One topic, one thought, one idea

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Abstract

Hypothesis is a kind of thought which comes to mind in some way, or the other or we can also call it thinking. This paper is based on that, however, importance has also been given to the field of research because when the name of hypothesis comes If so, the research remains implicit in it. The types and characteristics of hypothesis are known for all types in this paper. Some elements of hypothesis research are also presented in this paper. The types or forms of hypothesis are also shown with some examples. Whatever researcher works because of the hypothesis has been told. Through this paper, only some information about the hypothesis has been given because knowing or explaining the hypothesis completely can be very detailed, hence only some aspects of the hypothesis have been focused on. These are given because it is not possible to mention the research and the elements related to the research completely, hence some questions related to how the hypothesis should be, how it should be made, how it should be arrived at, the research hypothesis has also been mentioned in it because without research, the hypothesis cannot be explained completely. Therefore, research hypothesis is described as different from the type of hypothesis.

Key: - hypothesis, research, variable, thinking, idea

Introduction

Hypothesis is an imagination which in a way is focused on an idea. Hypothesis means beyond imagination, whenever any research has been done, it has been done on the basis of hypothesis only. When we write something, then feelings come in our mind, with the help of that we can understand a lot. Let's write something. Explaining an event and putting forward those ideas or collecting and presenting seemingly different suggestions but having logic in it and proving it is called a logical suggestion, hypothesis. According to the rules of scientific method, it is necessary that any hypothesis must be proved.

If we want to understand the hypothesis then it can also be understood in this way, when we do Doctor of Philosophy then we have to choose a topic of research and we choose a topic for ourselves, suppose we want to do a degree in Library Science, if the research is “At present in India If it is taken from the name of "condition of libraries in India", then it is also a kind of hypothesis which we will have to prove and write on it on the basis of facts.

A hypothesis is an assumption made based on some evidence.

Literature reviews

Many academicians have given their views about the hypothesis in the past. If we talk about it, James Lovelock had also told about it in his 'Gaia As Seen Through The Atmosphere' of the year 1972. Now in the year 2016 also, Patanjali Mishra University Of Allahabad, an article has also been presented by Dr. Preeti Bora, Home Science, Uttarakhand Open University has also given information about this in its article Research Methodology and Statistics (2019) Methodology of Research in Education (2007) Sidhu Kulbir Singh Sterling Book The hypothesis has also been explained in Educational Research and Statistics (2005) Agra Rampal Singh has also presented the hypothesis with his examples Srivastava D, N (2006) The hypothesis has also been explained in his book Psychological Research and Measurement Michael Noonan (2023)) and Yuanxin (Amy) Yang Alcocer have also clarified the concept of hypothesis testing in their article. Definition, steps and examples. On this basis, it seems that the history of hypothesis is very old, hypothesis has been there in every era, whether it is today or not. Be it an era or an ancient era, the concepts have been there all the time.

Objectives of the study:-

The objectives of this study mentioned here:-

- 1. Understanding the hypothesis**
- 2. Create a hypothesis**
- 3. What is the definition of hypothesis?**
- 4. What is hypothesis used for?**

5. What are the types of hypothesis

6. What is the need for hypothesis?

7. Place of hypothesis in research field

Features of hypothesis:-

1. Hypothesis must always be presented with confidence
2. If the hypothesis is a correlation hypothesis, it must establish a relationship between the variables.
3. It is necessary to base the hypothesis on testing because its credibility can be understood only in research. It is very important to test it to live up to the trust.
4. The way of explaining the hypothesis should be simple because whenever it is explained, its explanation should be so simple that it becomes easily clear.

Functions of hypothesis:-

Imagination can make even the seemingly impossible work possible.

When you do any investigation then it does the work of getting it started.

Hypotheses serve as guidelines for verifying observations.

It simplifies inquiries.

Types of hypothesis

1 Simple hypothesis

This is a situation between a dependent variable and an independent variable. In which we see how dependent one thing is on another thing. For example - if you eat more amount of food, your weight will increase rapidly. Here, Eating more is the independent variable, while gaining weight rapidly is the dependent variable

.2 Complex hypothesis

It describes the situation of two or more dependent variables and two or more independent variables. Waking up early in the morning and going for a walk and taking bath every day helps in maintaining weight and keeping the mind engaged in work.

3 Directional hypothesis

It shows how much intellectual capacity a researcher has and how much capacity he has for any result and the relationship between the variables can be ascertained. For example, a sixty year old person is consuming less food as compared to an eighteen year old youth, due to which the energy level is less in the sixty year old person, hence the effect is being observed from this hypothesis.

4 Non-directional hypothesis

Its detection is very rare because it is not necessary to get better results because it is difficult to find the position of the variables. For example, elephants and dogs are companions of each other.

5 Null hypothesis

This is a hypothesis that depends only on the coincidence, in this no relationship is being shown between the dependent variable and the dependent variable, like for example H_0 is shown that the new advertisement will not be that effective.

6 Associative hypothesis

In associative hypothesis, if one variable changes its state, then the state of the other variable will also change. For example, increasing weight will weaken the ability to run.

7. Causal hypothesis:

Causal hypotheses are formed when one variable causes another variable.

Example: “Sleeping for a long time reduces energy efficiency”

8. Statistical hypothesis

A statistical hypothesis is based on statistical inference that is used to determine whether data sufficiently support a particular hypothesis. They are based only on probability.

Example: The sick person rate in India is 56%.

Research hypothesis: When writing your research, the first question that comes first is "What is the hypothesis?" What will be the research hypothesis? "I want to write a good research hypothesis A research hypothesis is an idea in which many tests have to be done. To do any research, it has to be proved in a way. In this, observation is also important because research is necessary for any subject and research is done in different fields, but all the research It is very important to choose the subjects to study, only then we can observe.

A study begins with a research question. A researcher creates a background for this, this background is the basis of information, after this the researcher observes and takes all the data and only after observing it draws conclusions. He sees whether the conclusions are according to the original hypothesis or not.

What needs to be done for a good research hypothesis

1. First of all we have to look at the research questions
2. Literature review also has to be done. What is the literature based on?
3. Research is based on the question. To get a good conclusion, many methods have to be adopted. Many observations also have to be made so that the authenticity of the results can be properly checked and tested.
- 4 Null hypothesis is a statement that no relationship can be seen between variables.
5. Like we are studying a population and after observation, clear results have to be presented.
- 6 To test the hypothesis, appropriate research methods have to be observed, which also includes survey.

The research hypothesis is also rejected, hence continuous efforts should be made to make it better.

When you write a research hypothesis, you use an "if-then" statement that states a relationship between two or more variables. We know well the characteristics of a good hypothesis, the independent variable and the dependent variable as well as the way you are studying. But a good hypothesis depends on the findings, this is the main thing.

Importance of testable hypothesis:-

If there is any research in which it is difficult to draw conclusions because when the researcher gets a good hypothesis to test, then the variables included in it help in understanding it. A testable hypothesis helps the researcher to get accurate results.

Testable hypotheses collect data to prove the conclusions and help the researcher to learn about them. Research questions are based on the problem and help to drive the study. It all depends on ideas.

To collect data by the researcher, to reach a specific investigation, to prove the hypothesis and a hypothesis which is rejected, the test of which is not getting importance, even on the basis of statistics, no results are found. There are also such hypotheses in which The evidence is not found to be correct and is not favorable.

A testable hypothesis must be specific and understandable and must show a relationship between variables that can be derived from the data.

- A hypothesis can lead to a result by establishing a relationship between variables.
- It is important to know the hypothesis in which relationships can be made and results can be derived.
- You must collect the necessary data within your study.

It becomes possible for other researchers to conduct studies using similar methods and variables and statistical analysis is required.

- Helps to enable hypothesis through collection of data

If your data supports your research hypothesis, you will need to transform it into a new form. You should maintain your data carefully and identify inconsistencies in it by knowing your research question, and keep checking the results in it. You should give the results only after looking at the data so that the results are in accordance with the way the research has been designed. The researcher has only limited facts with him through which he can reach the result. If the hypothesis is of such a type that it is testable, some hypothesis is not in accordance with it, then the researcher makes it valid by changing some requirements in it. While choosing the

hypothesis, many ideas come to his mind, and then he has to see which hypothesis can become correct and clear to the researcher.

Characteristics of a good hypothesis

- All the information given should be written correctly.
- No unnecessary data or ideas should be included
- Variables are clearly explained
- Be testable so that it can be proven
- Have research designs that are ethical
- The research problem must be understood
- Literature search has been done
- To get some new information

Elements of research hypothesis:-

Elements required for a good research design

1. Testable: A research hypothesis must be able to be tested by observational methods.
2. Specific: The relationship between variables should be clear.
3. Based on prior knowledge: A research hypothesis should be based on existing knowledge in the field and previous knowledge that has led to successful research in the past.
4. Falsifiable: A research hypothesis should be such that it can be successful through testing. Therefore, even if there is something false in it, it should be accepted.
5. Clear and concise: A research hypothesis should lead to a conclusion in a clear and concise manner.
6. Logical: A research hypothesis should be logical and related to the current knowledge of the topic.
7. Relevant: A research hypothesis should be relevant to the research question and objectives.

8. Feasible: A research hypothesis must be practical within the scope of the study.

9. Represents the population: A research hypothesis must also represent the sample being studied.

10. Simple: A good research hypothesis should be written in such a way that it is easy to understand.

Conclusion

After knowing about the hypothesis, it becomes clear that it is related to the research. Any research that is being done is based on some hypothesis only. Literature review can be considered related to this only, whenever any research is done. When a study is done then its conclusion is most focused on the samples or data. Whenever a researcher will report or present his hypothesis, it has to be explained in detail which should be simple and clear from the beginning to the end because the hypothesis can be accepted or Rejection can be presented in both the ways. In this way, the result also has to be kept an eye on. In this hypothesis, the elements must be kept in mind so that its result can be controlled, in which those variables also remain. This has to be seen. Those that can be controlled and those that cannot be controlled.

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INCORPORATE OF COMPANY

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A company is called as an ‘Incorporated Company’ when its name has been registered under the Companies Act and when it has obtained a Certificate of Incorporation from the Registrar of Companies. Before the Incorporation a number of preliminary works should have to be done by its promoters. From the date of Incorporation the company enjoys its legal entity, uses its common seal, enters into contract, etc., The certificate of Incorporation of a company is a conclusive proof that all the legal formalities of the Act have been duly complied with.

Effect of Incorporation

- 1.The company becomes an artificial person and commences its life from the date as mentioned in the Certificate of Incorporation.
- 2.It enables the company to enter into contracts with its members and outsiders
- 3.The company can sue and be sued in its corporate name.
4. The company is capable of owning, enjoying and disposing of property in its own name

5.No member can himself to be owner of the company's property during its existence or on its winding up.

6.The company has perpetual succession and remains in existence, until it is dissolved by liquidation. That is, the company never dies.

Procedure of Incorporation

Incorporation requires the following steps:

I. Application for approval of Name:

The promoters and subscribers of the Memorandum o may adopt any name. The name does not resemble the name of any other existing registered companies. An application is to be submitted to the Department of Company Law Administration, Government of India. It must be submitted through the Registrar of Companies of the State where the company is expected to be registered.

II. Filing of Documents:

The promoters should prepare and file with the Registrar the following documents:

- (i) The Memorandum of Association:
It is the charter of the company. It must be printed, It must be signed by atleast 7 persons in the case of public company and at least 2 persons in the case of private company.
- (ii) The Articles of Association, if any, It contains the rules and regulations for the internal management of the company.
- (iii) If the authorized capital exceeds Rs.50 lakhs, prior approval of the controller of capital issues has to be obtained and the same must be filed with Registrar.
- (iv) A list of person who have agreed to act as Directors.
- (v) A written consent of directors to act as such.
- (vi) An underwriting given by the directors in writing to take up and pay for their qualification shares.
- (vii) A statutory declaration stating that all the legal formalities of the Act have been duly complied with. The declaration must be certified and signed by any one of the following persons.
 - a. An advocate of the supreme court or of a High Court.

- b. An attorney or pleader who is entitled to appear before a High Court.
- c. A chartered Accountant practicing in India and engaged in the formation of a company.
- d. A person whose name is incorporated in the Articles as a director or manager or secretary of the company.

All these documents together with the prescribed fee have to be sent to the Registrar for Registration.

The Registrar shall then scrutinize all the documents. If he is satisfied, he retains all the documents and incorporates the particulars of the company in his Register. Then he issues the 'Certificate of Incorporation' to the company. From the date of Incorporation, the life of a company is said to be commenced.

A private company can commence business immediately on receipt of the certificate of Incorporation. But a public limited company shall have to obtain another certificate namely 'Certificate of Commencement of Business' before commencing its business.

Duties of Secretary at the Promotion State:

The 'Pro Term 'Secretary' is to help the promoters at the time of promotion and Incorporation of a company. He is also called as Secretary for the Time being". He may or may not be appointed as a regular secretary. He has to assist the promoters on matters relating to (a) Discovery, (b) Investigation (c) Capital estimation and (d) Incorporation. The following are his duties at the state of promotion:

- (i) To help the promoters while investigating their proposed business proposition.
- (ii) To convene and conduct the preliminary meetings of the promoters and record the proceedings in the minutes book
- (iii) To help promoters in the preparation of documents essential for registration.

- (iv) To see whether the documents are adequately stamped and duly signed as per the requirements of the companies Act.

Duties at the State of Incorporation:

- (i) Send an application along with all the requisite documents to the Registrar for the Registration.
- (ii) To see whether all the statutory requirements regarding registration have been duly compiled with and
- (iii) To collect the Certificate of Incorporation from the Registrar.

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**MANAGERIAL SKILLS AND STRATEGIES IN WOMEN-LED
MICRO-ENTERPRISES IN KANYAKUMARI DISTRICT,
TAMILNADU**

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Abstract

Managers infuse life into businesses, driving their operations and growth. This study examines the management skills of minority business owners who are often under-represented and marginalized. Unlike large corporations with rigid, formalized practices, micro-enterprises tend to operate based on the individual preferences and personal priorities of their owners. The study reveals that managing a micro-enterprise involves much more than traditional business administration techniques. It encompasses a unique blend of personal values, community ties, and adaptive strategies that reflect the distinct experiences and challenges faced by these minority entrepreneurs. This broader understanding highlights the dynamic and personalized nature of management within small, minority-owned businesses.

Key words: Management competence, micro-enterprises, owner-managed firms

Introduction

The profound importance of corporate culture has made managerial competence a crucial factor for organizational success. Managerial competence involves the capability of management to effectively steer a company towards achieving its objectives. Peter Drucker (1955; 2002)

highlighted the pivotal role of managerial competence, noting that it must be paired with professional integrity and performance efficiency for true effectiveness. In large, multi-billion-dollar corporations, management and ownership are usually distinct and separate. However, in micro-enterprises, these roles are intricately linked, with owner-managers blending their personal management styles into the daily operations. These practices often become informal routines rather than formalized corporate policies.

This research focuses on the management competence of self-trained women owner-managers of micro-enterprises in a semi-urban region of South India. Although the terms "manager" and "entrepreneur" have distinct meanings, they are used interchangeably in this study to reflect the dual roles these women often occupy. The businesses examined are located in and around a town and encompass a diverse range of economic activities. The study area has a high concentration of women-run enterprises, primarily single-women operations, and tiny or home-based businesses. This prevalence is largely due to the accessible seed funding and the scarcity of other economically productive opportunities for women in the region.

Despite the extensive literature on gender issues related to employment, women entrepreneurship, and micro-enterprises, there is a noticeable gap in research focusing specifically on the management aspects of women-owned micro-enterprises. This study aims to bridge this gap by delving into the distinctive management practices and competencies of these women owner-managers. In large corporations, the separation of ownership and management allows for specialized managerial roles, with clearly defined policies and procedures. Conversely, in micro-enterprises, the owner-managers must juggle multiple roles, often relying on their intuition and personal judgment to make decisions. This results in a management style that is highly adaptive but less structured compared to the formalized systems found in larger businesses.

The owner-managers of micro-enterprises, particularly women in semi-urban South India, face unique challenges and opportunities. These women often start their businesses out of necessity, driven by the need for financial independence and the lack of alternative employment options. Their management practices are shaped by their personal experiences and

the socio-economic environment in which they operate. This often means that their approach to management is pragmatic and flexible, designed to meet the immediate needs of their business.

This study reveals that the management competence of these women is not just about formal business knowledge, but also about resilience, creativity, and the ability to navigate complex social and economic landscapes. Their businesses may not adhere to conventional management theories, but they thrive on the ingenuity and determination of their owners.

Furthermore, the study underscores the importance of providing targeted support to women entrepreneurs in micro-enterprises. This includes access to training programs that enhance their management skills, as well as financial and policy support to help them grow their businesses. Recognizing the significant contributions of these women to the local economy, the study advocates for measures that address the unique challenges they face and foster an enabling environment for their enterprises to flourish.

Methodology

The current study was carried out in Kanyakumari District, Tamil Nadu, South India. The primary data for this research was collected through a survey method. A comprehensive multiple-choice, closed-ended questionnaire was developed to obtain information from the participants. The survey targeted women-operated micro-enterprises, each employing at least one but no more than five paid workers. Field investigators personally administered the questionnaires on-site to the identified owner-managers, who were selected through an inspection process. A total of 125 respondents were surveyed. The personal administration of the questionnaires allowed for immediate correction of any potential issues, ensuring a 100 percent response rate. The survey collected basic demographic information such as age, education level, and field experience, as well as organizational data related to the micro-enterprises. This included information about the nature of the business, material assets, annual turnover, and earnings.

To evaluate the managerial competence of the women owner-managers, the researchers utilized eight managerial functions identified by Economy and Nelson (2005). These functions include planning, organizing, leading,

controlling (traditional), energizing, empowering, supporting, and communicating. The questionnaire included 29 statements related to these eight functions, asking respondents to indicate their level of agreement, disagreement, or neutrality. The responses were numerically coded and analyzed using the Likert scale. The combined mean of each group of responses was calculated to determine the significance or importance of each function. In addition to calculating the competence scores, a competence index was created to understand the relative significance of each function among the group.

This thorough approach allowed the study to gather detailed insights into the managerial skills and strategies employed by women owner-managers in micro-enterprises. The findings provide a nuanced understanding of how these women navigate their roles and highlight the key areas of competence that contribute to their business success. By focusing on these eight managerial functions, the study offers a robust framework for assessing and enhancing managerial competence in similar contexts.

Results and Discussion

Personal Profile

To gain insight into the age, education level, and years of experience of the women entrepreneurs involved in the study, their personal profiles were collected. The age distribution of the respondents indicates that more than half are in the upper age range. The average age is 36.72 years, with a standard deviation of 12.75, suggesting that about 68% of the respondents fall between the ages of 24 and 48. Table 1 demonstrates that these entrepreneurs are relatively well-educated, with nearly 50% having attained a university education. The professional category includes diploma holders, technical graduates, and other professional degree holders.

The experience profile reveals that the majority of these entrepreneurs have less than 10 years of experience, with a smaller proportion being highly experienced. Cross-tabulation analysis shows a higher concentration of experienced businesswomen in the younger age category compared to the older age category (refer to Table 2). The average experience is 7.64 years, with a standard deviation of 5.51, indicating significant variability. The study found that experienced individuals do not

tend to remain in business as they age. Informal discussions during the field survey revealed that many women start small firms in their prime years driven by enthusiasm, a desire for financial independence, and a sense of pride. However, they often leave the business due to reasons such as family obligations, business setbacks, and difficulties adapting to adverse conditions, leading to a loss of seasoned management in micro-enterprises.

Organizational Profile

The organizational profile includes variables such as the nature of the business, the value of total physical assets, approximate annual turnover, and profits (refer to Table 3). The study covered manufacturing, trading, and service micro-enterprises with fewer than five paid workers. The asset position of these firms was examined to understand the available infrastructure, including furniture, vehicles, equipment, and leasehold property, but excluding the lease value of owned buildings or land. The data shows that over one-fourth of the entrepreneurs possess assets valued between Rs. 400,000 and Rs. 600,000 (Rs. 1 = USD 0.022222). The mean asset value is Rs. 607,200, with a standard deviation of Rs. 334,610. A normal distribution curve indicates a higher concentration of assets on the lower side.

Examining the annual turnover is crucial for understanding the business performance. The study found that nearly one-third of the firms have an annual turnover of less than ₹ 300,000. A normal distribution curve shows a leftward skew, indicating a heavy concentration at lower turnover levels. Turnover alone does not determine a firm's viability; profits are also essential. Therefore, the study estimated approximate annual earnings (refer to Table 3). The data on earnings reflect the turnover trends, with the mean annual profit estimated at 72,360 and a standard deviation of 45,881.

Management Competence

This study views management competence as an essential qualitative trait with a significant impact on organizational performance. Despite lacking familiarity with total quality management intricacies, a buzzword in modern management, the everyday management practices of these self-taught managers are expected to fulfill the same functions as those in large corporate houses. Management, as highlighted by Drucker (2002), is

indispensable for any institution, regardless of size or structure. Administrative capacity and entrepreneurial spirit, as Drucker (2002) articulates, constitute the two dimensions of management. Self-owned enterprises must balance these dimensions, with administrative focus on routine affairs and entrepreneurship driving initiatives to catalyze changes in the business. Entrepreneurship entails relentless pursuit of identifying market opportunities and unmet needs (Weihrish et al., 2008). The essence of entrepreneurship lies in the readiness to seize opportunity (Stevenson and Jarillo, 1990). Neither stock nor access to resources can impede the drive to become an entrepreneur. However, this study primarily focuses on the administrative dimension of management. Pansiri and Temtime (2008) assert that access to finance alone does not suffice; it is equally vital how small enterprises manage their resources and navigate market complexities and changes. Management competence is considered pivotal for organizational excellence, as poor management is frequently cited as a cause of business failure (Pansiri and Temtime, 2008).

As part of this study, a total of 29 statements were formulated to gauge agreement and disagreement on a five-point scale. These statements were crafted to encompass the eight functions of contemporary managers, a concept supported by various researchers (Burton and Thakur, 1995; Stoner et al., 1995; Griffin, 1999; Pansiri and Temtime, 2008; Weihrish et al., 2008). It is pertinent to provide a concise discussion on the components of managerial functions and their implications explored in the study.

Let's commence with the paramountcy of management, namely planning. The planning function provides a roadmap to navigate the tumultuous terrain of business. According to Burton and Thakur (1995), the failure to plan may lead to missed lucrative market opportunities. Thus, it was investigated whether planning is an inherent aspect of business operations, whether entrepreneurs initiated ventures aligned with their knowledge and skills, and the prospects of the business. The Japanese model of just-in-time management may prove ineffective on numerous occasions. Through planning, organizations establish goals, determine resource sources, and schedule procurement and production. Consequently, having a plan becomes a hallmark of organizational success. Regardless of organizational size, planning is an indispensable prerequisite.

Organizing is essential subsequent to planning. Weihrish et al. (2008) posit that organizing entails establishing intentional role structures within an organization. The organizing capacity of participants was explored through their ability to engage committed individuals, mobilize capital, select suitable locations, and access inputs. These decisions are crucial in providing a competitive edge to business operations. Organizing serves as the initial step to implement business plans. Efficient resource allocation is pivotal for operational efficiency. Given the inherent change and uncertainty in business, failure to organize exacerbates seemingly chaotic situations (Burton and Thakur, 1995).

Leadership is deemed the most crucial element for successful management (Nelson and Economy, 2005). The merits of inspiring leadership facilitate the cultivation of cordial relationships and command over individuals, enabling the accomplishment of extraordinary feats. The success of leadership is gauged by the willingness of individuals to follow and seek guidance. The gender dimension of women managers enhances the intimacy of interpersonal relationships.

Controlling serves as a vital mechanism to imbue organizational performance with a directional framework. It involves the measurement and correction of performance to ensure the accomplishment of enterprise objectives and plans (Koontz and Weirish, 2003). Setting benchmarks for every operation, managing resources frugally, conducting periodic reviews, and taking corrective, preventive, or promotional actions are integral components of management control. An appropriate controlling process provides insights and guidelines for future actions.

While traditional functions remain essential, they are insufficient to manage modern businesses comprehensively. Nelson and Economy (2005) observe that while classic functions retain validity, they do not encompass the entirety of modern workplace dynamics. Managers and workers are entering a new partnership paradigm, necessitating additional roles in the management process. Failure to accommodate these roles may lead to systemic incompatibilities, resulting in failures and breakdowns. The additional functions identified by Nelson and Economy (2005) are prerequisites to align with the people dimension of organizations, propelling them toward a virtuous cycle of success (Lawler III, 2003).

The current study aimed to explore the competency of women managers in micro-enterprises. Consistent inspiration and persuasion are essential to motivate employees to realize their full potential. Empowering subordinates to shoulder responsibilities fosters a sense of ownership and belongingness. Employee commitment is evident through their initiatives and engagement in work, even without constant supervision. Sharing organizational responsibilities nurtures employees' confidence, fostering creativity and commitment. Empowering employees cultivates an environment conducive to intrapreneurship, as defined by Stoner et al. (1995), as the practice of initiating and developing new business ventures within an existing organization.

Employees seek continuous support from their superiors, and a mutually supportive environment is characteristic of successful organizations. Employees should feel free to express their opinions, concerns, and disagreements without fear of retaliation. Effective communication, both internally and externally, is indispensable, as highlighted by Nelson and Economy (2005). Communication lubricates the organizational wheels, facilitating informed decision-making and adaptation to changing environments. Organizations with well-established communication channels are better equipped to anticipate market needs and constantly improve using available information. Information resources, comprising usable data, are vital for making effective decisions (Griffin, 1999). Communication stands as the linchpin determining the effectiveness of all other functions, while distortions in communication may hinder the efficacy of managerial processes.

The Likert scale was utilized to assess the statements designed to gauge the managerial competence of women-owned enterprises. The averages of these scores were calculated to gauge the level of management competence within the target group. A higher numerical value indicates greater managerial competence, while a lower value suggests otherwise (see table 4). Additionally, a competence index was formulated and provided alongside the scores of the respective items. This index was calculated as a proportion of the overall management competence score.

The findings indicate that, with the exception of managerial functions such as energizing and communication, the majority of managerial responsibilities exhibit consistently high competence scores.

Communication emerges as the most proficient function, while energizing shows the lowest competence. It is natural for communication to excel in environments with fewer hierarchical layers, as this fosters intimacy and productivity. Micro-enterprises, with their limited hierarchy, facilitate enhanced personal communication, a trait particularly advantageous for women who tend to excel in relational dynamics (Anderson, 2006). These findings align with existing research emphasizing women's innate communication skills.

The lower score in energizing could stem from limited exposure to management theories emphasizing motivation on a larger scale. Compared to traditional management functions, the respondents consistently scored well, as reflected in the competence index. Overall, the estimated competence level surpasses the average, underscoring the proficiency of women-owned micro-enterprises in managing various functions effectively.

The involvement of family members significantly influences the operation of micro-enterprises. However, the results indicate that only 59 percent of the micro-enterprises included in the study receive such support from family members. When owner-managers must handle every aspect of the business due to insufficient help from family members, their managerial competence is likely to decline. This finding resonates with the concept of "fire-fighting" discussed by Pansiri and Temtime (2008). In the absence of essential family support, entrepreneurs are compelled to hire more paid workers. The researchers acknowledge the importance of employment opportunities for potential workers. This study specifically focused on firms with at least one paid worker. The employment potential within the target firms reveals that approximately 60 percent have one paid employee, while around 11 percent accommodate more than three paid workers.

Conclusion

The pursuit of a successful business venture is a universal aspiration. Ultimately, it is not the nature of the business itself that determines success, but rather the manner in which it is managed – governance is paramount. Management serves as the guiding force, providing direction and vitality to the business enterprise. This study reveals that despite the

women entrepreneurs' relatively lower levels of education and lack of formal management training, their perceptions of management are satisfactory. Their competence, though acquired informally, is nonetheless effective.

The findings of this study align with Peters and Waterman's observation in 1984 regarding the similarities between micro-enterprises and excellent enterprises. These women-owned micro-enterprises seamlessly integrate management and entrepreneurship, demonstrating resilience and adaptability in navigating the complexities of business operations.

Informal management practices within these organizations foster intimacy, strengthen psychological bonds, stimulate creativity, and enhance communication effectiveness. Such organizational structures afford individuals the autonomy necessary for innovation and growth. Peters and Waterman (1985) underscored autonomy and entrepreneurship as defining characteristics of small enterprises, traits which are evident in the micro-enterprises studied.

Moreover, this study echoes Drucker's assertion that the skills, competence, and experience of management are not easily transferable. Small enterprises demand highly competent individuals who are deeply committed to their work, driven by a sense of purpose, and willing to invest significant time and effort.

In conclusion, the women-owned micro-enterprises examined in this study exemplify the fusion of management and entrepreneurship. Their success underscores the importance of effective management practices, even in the absence of formal training, and highlights the resilience and adaptability of small-scale enterprises in today's dynamic business landscape.

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INNOVATION AND RESOURCE MOBILIZATION IN ENTREPRENEURIAL ECOSYSTEMS

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Abstracts

Innovation and resource mobilization are critical components of successful entrepreneurial ecosystems. This research consist of the comparative analysis of developed and developing countries and examines how these elements are managed and utilized in developed versus developing countries. Through case studies and data analysis, the study investigates the sources of innovation, availability of resources (financial, human, and technological), and the mechanisms for resource mobilization. The comparative analysis highlights the disparities and similarities in innovation practices and resource utilization, offering practical solutions for enhancing entrepreneurial ecosystems across different economic landscapes.

Key Words: Innovation, Resource Mobilization, Entrepreneurial Ecosystems, Developed Countries, Developing Countries.

Introduction

Innovation and resource mobilization are pivotal elements that drive the success and sustainability of entrepreneurial ecosystems. These ecosystems are intricate networks that include various components such as access to finance, human capital, technological infrastructure, and supportive regulatory frameworks. Understanding how these elements operate differently in developed and developing countries is crucial for fostering a global entrepreneurial environment that promotes innovation and sustainable economic growth. This research consist of the comparative analysis of developed and developing countries and examines how these

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elements are managed and utilized in developed versus developing countries. Entrepreneurial ecosystems in developed countries often benefit from well-established financial systems, advanced technological infrastructure, and robust educational institutions. These components create an environment conducive to innovation, with ample access to venture capital, sophisticated markets, and a culture that encourages risk-taking and creativity. In these countries, government policies frequently support innovation through funding initiatives, tax incentives, and grants aimed at promoting research and development activities. The synergy between academia, industry, and government fosters a collaborative atmosphere that drives cutting-edge research and commercialization.

In contrast, developing countries face numerous challenges that hinder the growth of their entrepreneurial ecosystems. Limited access to finance, inadequate technological infrastructure, and insufficient support systems are significant barriers. Traditional banking systems may be underdeveloped, and there is often a scarcity of venture capital and angel investors. Educational systems may lack the resources needed to produce a highly skilled workforce, and brain drain exacerbates this issue by driving talented individuals to seek opportunities abroad. Despite these challenges, developing countries often exhibit remarkable ingenuity and adaptability, with grassroots innovation emerging as a key driver. Informal networks and alternative financing mechanisms, such as microfinance and mobile money, play crucial roles in resource mobilization.

This research aims to explore and compare the sources and drivers of innovation, the availability and utilization of resources, and the mechanisms for resource mobilization in the entrepreneurial ecosystems of developed and developing countries. By conducting case studies and data analysis, the study will highlight the disparities and similarities in innovation practices and resource utilization, providing a comprehensive understanding of the unique challenges and opportunities in these distinct economic contexts.

The study's objectives are to identify the primary sources of innovation, evaluate the key drivers that stimulate innovative activities, assess the availability of financial, human, and technological resources, and compare the effectiveness of resource mobilization mechanisms. Additionally, the research will identify best practices for fostering innovation and resource

mobilization and develop practical recommendations for policymakers, entrepreneurs, and stakeholders.

Ultimately, this comparative analysis will offer actionable insights for enhancing entrepreneurial ecosystems across different economic landscapes. By understanding the unique strengths and challenges of both developed and developing countries, stakeholders can implement strategies that support innovation, drive economic growth, and promote sustainable entrepreneurial activities worldwide. This study contributes to the global discourse on entrepreneurial development by providing a nuanced perspective on the interplay between innovation and resource mobilization in diverse economic contexts.

Objectives of the Study

- (i) To explore the sources and drivers of innovation in entrepreneurial ecosystems of developed and developing countries.
- (ii) To assess the availability and utilization of financial, human, and technological resources in these ecosystems.
- (iii) To compare mechanisms for resource mobilization and their effectiveness in supporting entrepreneurship.
- (iv) To identify best practices for fostering innovation and resource mobilization in diverse economic contexts.

Background of the Study

Entrepreneurial ecosystems are complex and dynamic environments that facilitate the growth and sustainability of new ventures. These ecosystems comprise various components, including access to finance, human capital, technological infrastructure, and supportive regulatory frameworks. Innovation and resource mobilization are particularly critical as they drive entrepreneurial activities and enable startups to scale and succeed.

In developed countries, well-established financial systems, advanced technological infrastructure, and robust educational institutions create conducive environments for innovation. These countries typically have better access to venture capital, sophisticated markets, and a culture that encourages risk-taking and innovation. Conversely, developing countries often face challenges such as limited access to finance, inadequate

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technological infrastructure, and insufficient support systems, which can hinder entrepreneurial activities. Understanding how innovation and resource mobilization are managed and utilized differently in developed versus developing countries is crucial. This comparative analysis will shed light on the unique challenges and opportunities in these distinct economic settings and provide actionable insights for enhancing entrepreneurial ecosystems worldwide.

Scope of the Study

The scope of this study includes a wide-ranging examination of entrepreneurial ecosystems in both developed and developing countries, focusing specifically on Identification of primary sources of innovation (e.g., academic research, corporate R&D, start-up incubators). Analysis of the key drivers that stimulate innovative activities (e.g., government policies, market demands, cultural factors). Evaluation of financial resources, including venture capital, angel investment, and government grants. Assessment of human resources, including availability of skilled labor, education, and training programs. Analysis of technological resources, such as infrastructure, access to digital tools, and support for technological development. Examination of how resources are mobilized and allocated within entrepreneurial ecosystems. Comparison of the effectiveness of different resource mobilization mechanisms in supporting entrepreneurial ventures. Identification of best practices in fostering innovation and resource mobilization. Development of practical recommendations for policy makers, entrepreneurs, and stakeholders to enhance entrepreneurial ecosystems.

Review of Literature

Acs, Z.J., Autio, E., & Szerb, L. (2014): This study provides a global perspective on the measurement of entrepreneurial ecosystems, highlighting the importance of innovation and resource availability as key components of entrepreneurial success.

Porter, M.E. (1990): Porter's work on the competitive advantage of nations underscores the role of innovation and the importance of a supportive environment for entrepreneurial activities.

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Beck, T., Demircug-Kunt, A., & Levine, R. (2005): This research explores the impact of financial development on entrepreneurship, emphasizing the disparity in access to financial resources between developed and developing countries.

Ayyagari, M., Demircug-Kunt, A., & Maksimovic, V. (2011): The authors analyze the role of small and medium-sized enterprises (SMEs) in economic development, highlighting challenges in resource mobilization in developing economies.

Isenberg, D.J. (2010): Isenberg's framework for developing entrepreneurial ecosystems outlines the importance of various mechanisms for resource mobilization, including financial support, human capital development, and policy frameworks.

Acs, Z.J., Szerb, L., & Lloyd, A. (2017): This research presents the Global Entrepreneurship Index, which benchmarks the performance of entrepreneurial ecosystems globally, offering insights into the differences between developed and developing countries.

Analysis and Interpretation

Innovation

In developed countries, innovation often stems from a combination of well-established academic institutions, robust corporate research and development (R&D) departments, and a vibrant start-up culture. Universities and research institutions play a critical role in advancing new technologies and fostering innovative ideas. These institutions often collaborate with industry partners, creating a synergy that drives cutting-edge research and commercialization. Additionally, the presence of strong intellectual property rights (IPR) protection encourages innovation by ensuring that inventors can benefit from their creations. Government policies in developed countries frequently support innovation through funding initiatives, tax incentives, and grants aimed at promoting research and development activities.

In developing countries, the sources of innovation are more diverse and often stem from necessity. Grassroots innovation, where individuals or small groups create solutions to local problems, is common. While formal R&D activities are less prevalent due to limited resources, there is a

significant amount of informal innovation driven by practical needs and resource constraints. The lack of strong IPR protection in many developing countries can both hinder and stimulate innovation. While it may dissuade formal R&D investment, it also encourages a culture of open innovation and collaboration. Government policies in developing countries may not be as supportive, but international aid and development programs often step in to fill this gap, providing funding and expertise to foster innovation.

Financial Resources:

Developed Countries: Access to financial resources in developed countries is generally abundant. Venture capital (VC), angel investors, and established financial institutions provide a steady stream of funding for new ventures. Additionally, government grants and subsidies further support entrepreneurial activities. Financial markets in developed countries are also more mature, offering various instruments like initial public offerings (IPOs) and crowd funding platforms that entrepreneurs can leverage.

Developing Countries: In contrast, entrepreneurs in developing countries often struggle to access adequate financial resources. Traditional banking systems may be underdeveloped, and there is a scarcity of venture capital and angel investors. Microfinance institutions and non-governmental organizations (NGOs) often fill this gap, providing small-scale funding. However, these sources are typically insufficient for large-scale innovation projects.

Human Resources:

Developed Countries: The availability of skilled human capital is a significant advantage for developed countries. High-quality education systems produce a steady stream of talented individuals equipped with the skills needed for innovative activities. Furthermore, there is a strong emphasis on continuous professional development and lifelong learning, ensuring that the workforce remains competitive.

Developing Countries: The situation in developing countries is more challenging. Educational systems may be underfunded and lack the resources to provide high-quality education. As a result, there is often a

shortage of skilled workers. Brain drain, where talented individuals move to developed countries for better opportunities, exacerbates this problem. Nonetheless, local talent often displays remarkable ingenuity and adaptability, driven by necessity and a strong entrepreneurial spirit.

Technological Resources:

Developed Countries: Technological infrastructure in developed countries is advanced, providing a solid foundation for innovation. High-speed internet, cutting-edge research facilities, and widespread access to digital tools and technologies enable entrepreneurs to develop and scale their ideas rapidly.

Developing Countries: Technological infrastructure in developing countries can be a significant barrier to innovation. Limited access to high-speed internet, outdated equipment, and insufficient technical support hinder the development and implementation of new technologies. However, mobile technology penetration is often high, leading to innovative solutions in mobile banking, healthcare, and other sectors.

Mechanisms for Resource Mobilization

Developed Countries: In developed countries, resource mobilization mechanisms are well-established and efficient. Entrepreneurs can access a variety of funding sources, including venture capital, private equity, and government grants. There are also numerous incubators, accelerators, and innovation hubs that provide not only funding but also mentorship, networking opportunities, and other forms of support. Public-private partnerships (PPPs) are another effective mechanism in developed countries. These collaborations leverage the strengths of both sectors, combining public resources and private sector efficiency to support entrepreneurial activities.

Developing Countries: Resource mobilization in developing countries is often more fragmented and challenging. Traditional financial institutions may be reluctant to lend to startups due to perceived risks. As a result, entrepreneurs often rely on informal networks, such as family and friends, for initial funding. NGOs and international development agencies play a crucial role by providing microloans, grants, and capacity-building programs.

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Innovative mechanisms such as mobile money and community-based savings groups have also emerged as important tools for resource mobilization in developing countries. These mechanisms allow entrepreneurs to access small amounts of capital and build credit histories, paving the way for future funding opportunities.

Best Practices for Fostering Innovation and Resource Mobilization

Developed Countries: Strong Educational Systems: Continual investment in education and vocational training ensures a steady pipeline of skilled workers. A well-developed financial sector, including venture capital and angel investment networks, supports entrepreneurial activities. Partnerships between universities, corporations, and startups foster a culture of collaboration and innovation. Policies that provide tax incentives, grants, and regulatory support encourage innovation and entrepreneurship.

Developing Countries: Encouraging and supporting grassroots innovation can address local needs and foster entrepreneurial spirit. Expanding access to microfinance, mobile money, and community-based funding solutions can help overcome financial barriers. Investing in education and training programs to develop local talent is crucial. Leveraging international aid and development programs can provide the necessary resources and expertise to support local innovation.

Conclusion

The comparative analysis of entrepreneurial ecosystems in developed and developing countries illustrates significant disparities in innovation practices and resource mobilization. Developed countries benefit from established financial systems, advanced technological infrastructure, and robust support mechanisms, which collectively foster a conducive environment for entrepreneurial activities. Strong educational systems, intellectual property rights, and collaborative innovation further enhance their innovation capabilities. Conversely, developing countries face numerous challenges, including limited access to finance, inadequate technological infrastructure, and a shortage of skilled human capital. Despite these barriers, entrepreneurs in these regions often demonstrate remarkable ingenuity and adaptability. Grassroots innovation and alternative financing mechanisms such as microfinance and mobile money

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are prevalent, highlighting the unique strengths of these ecosystems. Both contexts offer valuable insights for enhancing entrepreneurial ecosystems globally. Developed countries can continue to leverage their advanced infrastructure and financial resources to support high-level innovation, while developing countries can harness grassroots innovation and alternative resource mobilization strategies to address local needs and foster entrepreneurial growth.

Suggestions

For Developed Countries: Continue to foster partnerships between academia, industry, and government to drive cutting-edge research and commercialization. Increase funding and support for startups through incubators, accelerators, and innovation hubs. Ensure that government policies remain supportive of innovation through tax incentives, grants, and regulatory frameworks. Invest in lifelong learning and professional development programs to maintain a competitive and skilled workforce.

For Developing Countries: Invest in education and vocational training to develop a skilled workforce and reduce brain drain. Support grassroots innovation through local initiatives and by providing necessary resources and infrastructure. Enhance access to microfinance, mobile money, and community-based funding solutions to overcome financial barriers. Leverage international aid and development programs to gain resources and expertise needed for local innovation. Invest in upgrading technological infrastructure to support digital entrepreneurship and innovative solutions in various sectors.

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**The Man Making Message of Vivekananda for the use of College
Students: A Book Review**

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I recently came across the book entitled “The Man Making of Vivekananda for the use of College Students” from an old book shop in Madurai. Written in simple and lucid language, the book was published by Ramakrishna Mission. The title itself is impressive as it relates to the “Character building or Man Making”, the most important trait which is a pre requisite to develop one’s personality. This book is meant for all youngsters and college students who wish to imbibe the noble qualities of a great saint like Swami Vivekananda, whose life and teachings form a role model for all and learners across the globe. However, the main motif of publishing this book seems to teach the younger generation about the importance of Hinduism which is rated above all religions and sects, and the key role played by Hinduism in shaping the young minds through inculcating the noble virtues like love, truth, compassion, brotherhood and above all to aim at establishing the thesis that the ultimate goal of Hinduism in particular is self-realisation which leads to God realisation or salvation.

The book is divided into various chapters. Much of importance has been given to the basic principles of Hinduism – Gnana, Karma and Bakthiyogas which are the important force to realise God is one self and finally to merge with God Almighty, which is liberation of soul. However, the book basically covers the fundamental tenets of Hinduism, apart from dealing with other issues like education and women empowerment which form the supporting dogmas that Vivekananda has chosen to strengthen his concept of character building or Man Making.

What really impresses the reader most is the primary motif in writing this book – to morally instruct and guide the younger generation

towards the goal – to mould their character through imbibing the noble virtues like love, truth, compassion and brotherhood which would be aptly supplemented through education. Hence Vivekananda declares firmly that education is not just collection of facts but assimilating varied ideas from different sources and to fuse them with practical knowledge. Vivekananda firmly believes that no education is fruitful unless it enriches the body, mind and soul of the learners. Though an ardent disciple of Sri Ramakrishna Paramahansa, Vivekananda not only possessed scientific approach while discussing the complexity of a serious topic like Vedanta or Bakthi Yoga. Vivekananda does not foolishly advocate the concept of reading Bhagavat Gita for the learners, but rationally instructs them to strengthen their bodies too.

Vivekananda uses life experiences to teach difficult topics like Bakthi or Gnana Yoga using simple language, proverbs and interesting stories taken from great epics like The Ramayana and The Mahabharata, Swami Vivekananda makes his preachings glitter like gold and ever meaningful to learners. The book shines as a guiding star for all youngsters who wish to become successful citizen of future India. The book deals with the important topic – “Man Making or Character building”. Ideas pertaining to this burning issue known as “personality development” stem from Swami Vivekananda’s concept of religion, duty and love. The saffron clad saint who had broad shoulders and shining eyes has been a constant source of inspiration to all monks alike. To call Swami Vivekananda, a monk itself is not valid as he transcends the boundaries of a monk, and raises above the general concepts which govern a monk or his way of life. Swami Vivekananda is more than a monk, but a great spiritual leader who is the torch bearer of Hinduism.

I strongly recommend this book to all college students as it contains most valuable ideas related to ‘character-building’. In short it is a must-read book as it is a rich pertaining to development of personality. Vivekananda has distinguished himself as an excellent orator, writer and an eminent philosopher. Though he lived for a short span of time, he was instrumental in spreading Hinduism across the globe. The book in the beginning chapters carries a short version of his most famous “Chicago

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address” that he delivered in the U.S.A at the parliament of religions. His speech itself is a classic example to show how an orator ought to organize his speech, how to captivate the audience through sparking ideas which ignited the American audience in particular, and above all his simplicity of speech, style and diction which ultimately crown his character and inspire us to reach his level of excellence.

Ethical Challenges in the Study of Media

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Abstract

An ethical challenge is a problem in the process of decision-making between two possible but unacceptable choices or options from an ethical point of view. Ethical challenges are primarily concerned with what is right and what is wrong. It also focuses on what is good and what is bad. Along with these, ethical challenges emphasizes on how we use that information in order to decide our actions in the real-life world. Again, media is the channel of communication through which any form of information can reach the people and influence them in some way or the other. This article tries to show the different kinds of ethical challenges that can largely be found in media. These challenges provide many hurdles in the proper communication process of the media. In order to mitigate the ethical challenges in the media, it is very much essential to find out optimal solutions as much as possible.

Keywords: Communication, ethical, information, media.

The word –‘ethics’- has been derived from the Greek word ‘ethos’ which means character or conduct. Ethics can be defined as the philosophical study of morality. It is the analysis of human actions from the perspective of good and evil or of morally correct and morally wrong. It can also be considered as the general study of goodness, right action, applied ethics, meta-ethics, moral psychology and metaphysics of moral responsibility. In simple words, ethics means the general study of goodness and right action. Ethics is also known as moral philosophy. Ethics can be both theoretical as well as practical. It can be considered as theoretical as it provides the fundamental principles upon which moral judgements are arrived at. Again, it can be considered as practical as it is concerned about an end to be gained and the means of attaining it. In today’s contemporary world, the importance of ethics is felt at almost every sphere of human living. In an ethical challenge, a problem or situation arises in which a

person is required to choose between two options, where both the options are morally wrong. Ethical challenges are extremely complicated challenges that are not easy to be solved.

In the everyday lives of the people, media plays a significant role because it is highly responsible for educating them and also enables them to trace the day-to-day happenings and news of the world-both locally as well as globally. Media can be considered as a suitable best for the people, where they can get information and knowledge of the happenings worldwide and down the street. People can develop their own opinions and perspectives by analysing and synthesizing the information they receive. They are also able to respect the opinions of the people who differs and don't agree with them. In the field of education, media plays a key role as it helps the children and youth to develop their critical thinking and logical reasoning by teaching them to consider more than one perspective. The media is like a watchdog for investigating and reporting on the actions of the government, especially in today's world. In the field of communication, media can be considered as the outlets or tools that are used to store and deliver content including the semantic information or the subject matter of which the media contains. The term –'media'- generally refers to the components of the mass media communications industry which includes- the print media, the news media, the digital media, publishing, photography, broadcasting (both television and radio), advertisement, and lastly, cinema.

As mentioned in the 1996 edition of the Webster's New Universal Unabridged Dictionary, the word – 'ethical'- means "pertaining to, or dealing with morals or the principles of morality; pertaining to right and wrong in conduct; secondly, being in accordance with rules or standards for right conduct or practice, particularly the standards of a profession that should be: good moral, upright, honest, righteous, virtuous." Again in Roget's 21st Century Thesaurus in dictionary form, the 1999 edition, the word –'ethical'- stands for being "clean, conscientious, correct, decent, elevated, equitable, fair, good, high-principled, honest, honourable, humane, just, kosher, moralistic, noble, straight, respectable, right, right-minded, square, true blue, upright, upstanding, virtuous."Next, the online

dictionary.com defines the meaning of –‘ethical’- as “pertaining to or dealing with morals or the principles of morality; pertaining to right and wrong in conduct; or, according to standards for right conduct or practice, especially the profession.”

Ethical challenges call into question the ethics of a person or organisation with regards to the concept of right or wrong varying with time, place, and situation. These challenges evolve over a period of time and they cannot be applied uniformly for they are the relative concepts. Ethical challenge is consisted of any story, event or happening that is not completely truthful or has been obtained through wrongful ways or not ‘according to standards for right conduct’ of media. If any news medium focuses negatively or adversely on a specific aspect of a news story, without any valid, meaningful or justified reason on a person, an institution, an organisation or a business firm in order to deliberately hurt their image, that can be termed as unethical.

The various ethical challenges that can be largely noticed in media are as follows:

- **Bias and Subjectivity:** Often the news reports are reported in a particular style and are biased in a manner which has led to the suspicion of the intention and objective of the news media. It is noticed that the reporters always get personally involved in doing their stories about some noted politicians against whom cases of alleged corruption, murder, mockery etc. have been registered in the courts. In a similar way, there are many criminal-politicians, seasoned criminals, and gangsters about whom media persons often get to know intimately, and show their interests in several national as well as international scandals. Such personal knowledge gathered when court hearings are in progress and this leads them to become biased against them. Therefore, there are highly chanced of their reports getting coloured with their personal knowledge of such dishonest deeds of the persons and this leads to bias and subjectivity in reporting.
- **Paid News:** In the words of the Press Council of India (PCI), “paid news is any news or analysis appearing in print or electronic media

for consideration in cash or kind”. In India, the trend of paid news is on the rise as several print and broadcast media organisations publish some favourable news stories in exchange for money. Such news stories are sponsored by the political parties, politicians, ministers, organisations, celebrities, businessmen, and so on and so forth. The Press Council of India (PCI) has even asked the government to stop giving advertisements of the newspapers found guilty of paid news.

- **News Source Confidentiality:** The journalists frequently report based on information from confidential sources and sensitive documents in order to write in-depth stories and doing investigative report analysis. In the past, there have been many prominent cases where the reporters have published some articles and reports based on the confidential sources and they even quoted from secret papers and the official documents of the government which has resulted in the ousting of the governments, overthrowing of the regimes, arresting of the ministers and VIP persons. Serious ethical concerns have often been expressed where reporters covered some special stories based on the information concerning the personal conduct of an individual in private life.
- **Conflict of Interests:** The conflict of interest occurs when the obligations or interests of a media person clash with his or her duty as a journalist. In today’s world, almost all news media organisations survive on the strength of advertising revenue. There are several advertisers, both multi-national corporations and domestic, who provide heavy and regular ads to the popular news media outlets to seek their editorial support and favourable comment about their business interests. Again, there can also be some occasions when a reporter’s personal views may conflict with the politician or the party that he or she is reporting. It is very much common that some reporters or correspondents are innately devoted to certain political ideologies or political parties, and these might be reflected in their stories. Under such circumstances, an independent-minded reporter while writing the news in an objective manner, could hurt his or her own or the political agenda

of the organisation. Hence, conflict of interest plays a serious role in plaguing the news media today.

- **Sting Operations:** Last but not the least, the issues related to the sting operations have involved several deep and all-pervasive ethical concerns, which are also known as under-cover reporting. It is due to the reporter's penchant for scoops and covering up of exclusive stories using sting operations, they get into innumerable traps. In doing so, many triumphs with pride and glory, while some others err and get dropped by the wayside and they even become victims of many unethical allures for the sake of outpacing and beating their rivals, contemporaries, or competitors.

The media persons should always try to – emulate global reporting practices and standards, redefine coverage of international events, watch globally accepted journalists' code of ethics, global initiative to defend and enhance free and responsible news media, etc. By doing so, the global media ethics can act as global agents in serving the citizens of the world and promoting non-parochial understandings. In order to effectuate the rising scales and standards of speed, accuracy, and fairness, the news media frequently face several tough situations and requirements. Again, the reporters or correspondents should have to rise to the demands of any occasion and race against time in order to meet the unearthly deadlines and cope with limited feedback from the sources of the news. Recently, many mass media establishments and organisations have drawn up their own codes for the journalists. In the Indian context, the journalists' organisations such as the Indian Federation of Working Journalists and National Union of Journalists (India) have their codes for journalists. Ethical challenges in media have become increasingly complex as media organizations navigate the demands of objectivity, sensitivity, and societal impact. The media landscape continues to evolve and hence, addressing the ethical challenges is essential to preserve the credibility and integrity of journalism in the digital era of post-modernization. These ethical challenges are complex and multifaceted. Thus, it is the prime responsibility of the media professionals to make correct choices in their conduct and decision-making in day-to-day practice, so that they can

perform their duties without any fear or favour and also with a clear conscience.

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**Sustainable Development Goals (SDGs) and Economic Growth in
India: A Multidisciplinary Assessment**

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Abstract

India is currently at a crucial point in its path of development when it must carefully manage the need for economic growth while also working towards achieving the sustainable development goals (SDGs) outlined by the United Nations. This interdisciplinary evaluation examines the complex correlation between Sustainable Development Goals (SDGs) and economic expansion in the Indian context, utilizing knowledge from the fields of economics, environmental science, sociology, and policy studies. This study critically analyzes the influence of economic policies on the attainment of Sustainable Development Goals (SDGs) in India by thoroughly examining relevant literature, empirical evidence, and case studies. This study examines the impact of technological innovation, institutional frameworks, and social dynamics on a country's progress towards sustainable development goals, while also addressing the problems presented by rapid economic growth. Moreover, this study rigorously examines the impact of inclusive growth policies on fostering social fairness and alleviating poverty, taking into account the distinctive socio-economic conditions of India. The text also examines the possible compromises and collaborations between economic growth and sustainable development, emphasizing the necessity for comprehensive strategies that harmonize economic prosperity with environmental sustainability and social inclusion.

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This study intends to give significant insights to policymakers, researchers, and practitioners engaged in India's sustainable development goal by presenting a comprehensive view of the connection between SDGs and economic growth. This highlights the significance of comprehensive strategies that tackle the interrelated issues of reducing poverty, conserving the environment, and promoting inclusive economic growth in order to promote a more sustainable and fair future for all Indian citizens.

Keywords: Sustainable Development Goals, Economic Growth, India, Multidisciplinary Assessment, Policy, Social Equity, Environmental Sustainability

Introduction

India, being one of the rapidly expanding economies globally, is currently at a crucial point in its development path. This age is defined by the simultaneous efforts to achieve economic growth and fulfil the Sustainable Development Goals (SDGs) established by the United Nations. The SDGs offer a comprehensive strategy to address global challenges, encompassing the eradication of poverty, the advancement of environmental sustainability, and the promotion of social equity (United Nations, 2015). This comprehensive review aims to analyze the intricate correlation between Sustainable Development Goals (SDGs) and economic growth in the context of India.

India has had remarkable economic progress in the past few decades, which has resulted in the upliftment of millions of people from poverty and established the country as a prominent participant in the global economy (World Bank, 2020). Nevertheless, in addition to its expansion, India confronts significant obstacles such as enduring poverty, ecological deterioration, and social inequalities. The SDGs provide a comprehensive framework to tackle these challenges, with an emphasis on encouraging inclusive and sustainable development that guarantees the inclusion of all individuals (United Nations, 2015).

The objective of this study is to comprehensively analyze the relationship between Sustainable Development Goals (SDGs) and economic growth in

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India. It will draw insights from various disciplines like economics, environmental science, sociology, and policy studies. Using a variety of perspectives and approaches, the goal is to understand and address the challenges and compromises involved in achieving both economic growth and sustainable development goals.

Key considerations include the impact of economic policies on the attainment of Sustainable Development Goals (SDGs) in India, the role of technological innovation in advancing sustainable development, and the efficacy of social policies in fostering inclusive growth. Furthermore, the study will comprehensively analyze India's unique socio-economic and environmental issues and assess potential strategies for harmonizing economic progress with the attainment of Sustainable Development Goals (SDGs).

The aim of this study is to offer a comprehensive understanding of the substantial convergence of several disciplines. The aim is to offer valuable insights for policymakers, scholars, and practitioners engaged in India's sustainable development agenda. This underscores the significance of integrating approaches that advance both economic progress and environmental preservation, while also guaranteeing social integration, in order to attain an equitable and enduring future for all residents of India.

This study will comprehensively analyze the current body of literature, empirical data, and case studies to provide insight into the complex correlation between Sustainable Development Goals (SDGs) and economic growth in India. The aim is to enhance a sophisticated comprehension of this intricate and pressing matter.

Review of the Literature

The convergence of Sustainable Development Goals (SDGs) and economic growth in India has been the subject of substantial academic investigation across multiple fields of study. This review consolidates significant discoveries from the literature to offer insights into the complex correlation between Sustainable Development Goals (SDGs) and economic progress in the Indian context.

A prominent and recurring theme in literature is the influence of economic policies on the progress of Sustainable Development Goals (SDGs) in India. Chakraborty and Saha (2020) highlight the significance of maintaining macroeconomic stability and implementing structural changes to promote sustainable economic growth and alleviate poverty. Kumar and Sen (2018) emphasize the importance of fiscal policies in tackling socioeconomic inequality and fostering inclusive growth. These studies emphasize the importance of aligning policies and strategies between economic plans and Sustainable Development Goal (SDG) targets in order to achieve the best possible developmental results.

Technological innovation is identified as a crucial aspect that contributes to sustainable development and economic prosperity in India. Khatua et al. (2019) analyze how digital technologies improve productivity and efficiency in many sectors, leading to job growth and economic empowerment. In addition, Gupta et al. (2020) explore the capacity of renewable energy technologies to advance environmental sustainability and energy security, as well as foster economic growth. These findings highlight the significant impact that technology advances can have on advancing economic and sustainability goals.

Social considerations are crucial in influencing India's progress towards achieving the Sustainable Development Goals (SDGs), alongside economic policies and technical improvements. Dasgupta and Dey (2017) examine the connections between gender equality and economic growth, emphasizing the significance of empowering women and advocating for policies that include both genders in order to achieve sustainable development. Rajan et al. (2019) analyze the socioeconomic factors that influence health and their impact on promoting equal economic growth. They highlight the importance of comprehensive strategies that tackle both health disparities and economic inequality.

The literature highlights environmental sustainability as a significant topic, with scientists stressing the importance of incorporating environmental factors into economic policies and development methods. Bhattacharyya and Kojima (2019) analyze the difficulties and possibilities

associated with shifting towards a low-carbon economy in India, highlighting the significance of investing in clean energy and developing infrastructure that can withstand climate change. In addition, Roy and Nath (2018) emphasize the significance of sustainable agriculture techniques in advancing food security, reducing poverty, and fostering rural development.

The economic policies of India have a substantial impact on the country's progress in achieving the Sustainable Development Goals (SDGs). Economic policies consist of several measures, such as fiscal, monetary, trade, and industrial policies. These measures have an impact on the overall economic conditions and determine how resources are allocated towards achieving sustainable development goals.

In their study, Chakraborty and Saha (2020) utilized a dynamic computable general equilibrium (CGE) methodology to evaluate how macroeconomic policies affect poverty reduction and sustainable development in India. Their research indicates that policies focused on increasing overall economic stability, improving productivity, and encouraging structural reforms have beneficial impacts on reducing poverty and attaining Sustainable Development Goals (SDGs). Kumar and Sen (2018) examined the redistributive consequences of fiscal policy in India by utilizing data from the National Sample Survey (NSS). Research has shown that specific fiscal measures, such as social welfare programmes and progressive taxes, are essential in decreasing economic inequality and fostering inclusive development. These measures also contribute to the achievement of Sustainable Development Goals (SDGs).

In addition, Dasgupta and Dey (2017) examined the correlation between gender equality, health outcomes, and economic growth in India. Their research uncovered that implementing gender-inclusive policies, such as granting women access to education and healthcare, not only enhances social indicators but also generates beneficial ripple effects on economic growth and human development. These policies are in line with various Sustainable Development Goals (SDGs), including gender equality (SDG 5) and good health and well-being (SDG 3).

Rajan et al. (2019) investigated the influence of health-related policies on inclusive growth in India. Their analysis revealed that investments in healthcare infrastructure, preventive healthcare measures, and social health insurance programmes help to decrease health disparities and improve productivity. Consequently, this fosters equitable economic growth and assists in achieving the Sustainable Development Goals (SDGs) related to health and well-being (SDG 3).

These studies emphasize the crucial impact of economic policies on India's advancement towards attaining the Sustainable Development Goals (SDGs). Well-crafted economic policies that focus on supporting macroeconomic stability, decreasing poverty and inequality, investing in human capital, and fostering inclusive growth can effectively contribute to sustainable development outcomes and facilitate the achievement of the Sustainable Development Goals (SDGs) in India.

Statement of the Problem

India stands at a critical juncture in its development trajectory, facing the dual imperative of achieving sustained economic growth while simultaneously addressing the Sustainable Development Goals (SDGs) set forth by the United Nations. Despite the nation's economic success, which has led to the improvement of living conditions for many and established it as a strong global economy, there are still ongoing issues that need to be addressed, including poverty, inequality, environmental degradation, and social isolation. The Sustainable Development Goals (SDGs) offer a comprehensive framework to tackle these difficulties and foster equitable and sustainable development. However, the complex interplay between economic growth and the attainment of SDGs in the Indian context remains poorly understood and requires multidisciplinary assessment.

The problem statement for this multidisciplinary assessment is to critically examine the relationship between SDGs and economic growth in India and identify key challenges, opportunities, and pathways for aligning economic policies and development strategies with sustainable

development objectives. Specifically, the assessment seeks to address the following questions:

How do economic policies and strategies impact the achievement of SDGs in India?

What is the role of technological innovation in fostering sustainable development and economic growth?

What are the social determinants and implications of economic growth for inclusive development and social equity?

How can environmental sustainability be integrated into economic policies and development strategies to promote sustainable growth?

What are the potential trade-offs and synergies between economic growth and the attainment of SDGs in India?

By addressing these questions through a multidisciplinary lens encompassing economics, environmental science, sociology, and policy studies, this assessment aims to provide valuable insights for policymakers, researchers, and practitioners engaged in India's sustainable development agenda. It seeks to inform evidence-based decision-making and contribute to the formulation of integrated approaches that balance economic prosperity with environmental sustainability, social inclusion, and the realization of SDGs for all citizens of India.

Significance of the Study

The multidisciplinary assessment of Sustainable Development Goals (SDGs) and economic growth in India holds significant importance for several reasons. The multidisciplinary assessment of SDGs and economic growth in India has far-reaching significance for policymaking, strategic planning, academic research, capacity building, and global sustainable development efforts. By shedding light on the complex dynamics at play, this study can pave the way for more inclusive, equitable, and sustainable development pathways in India and beyond.

Objective of the Study

To analyse the impact of economic policies on the achievement of SDGs in India.

To evaluate the role of technological innovation in fostering sustainable development and economic growth.

To assess the integration of environmental sustainability into economic policies and development strategies.

To identify potential trade-offs and synergies between economic growth and the attainment of SDGs.

Research Methodology

The methodology for assessing the relationship between Sustainable Development Goals (SDGs) and economic growth in India involves a multidisciplinary approach, integrating descriptive analysis. This comprehensive methodology encompasses data collection from various domains including economics, environmental science, social sciences, and public policy. Conduct an extensive review of existing literature on SDGs, economic growth, and their inter linkages. This will provide a theoretical foundation and identify gaps in current research. Gather quantitative data from reliable sources such as government reports, international databases (e.g., World Bank, United Nations), and academic studies. Specific indicators for each of the 17 SDGs as defined by the United Nations, focusing on those most relevant to economic growth (e.g., SDG 1: No Poverty, SDG 8: Decent Work and Economic Growth, SDG 9: Industry, Innovation, and Infrastructure).

Result and Discussion

Examining the influence of economic policies on the attainment of Sustainable Development Goals (SDGs) in India is a complex undertaking. India's economic policies directly influence various aspects of development, including poverty alleviation, gender equality, education,

healthcare, infrastructure development, and environmental sustainability, all of which are key components of the SDGs.

IMPACT OF ECONOMIC POLICIES ON THE ACHIEVEMENT OF SDGS IN INDIA

Poverty Alleviation (SDG 1): Economic policies that promote inclusive growth, such as targeted poverty alleviation programs, rural development initiatives, and employment generation schemes, play a crucial role in reducing poverty levels in India.

Education (SDG 4): Education is essential for sustainable development. Economic policies that prioritize investment in education infrastructure, teacher training, and educational access for marginalized communities contribute to progress towards SDG 4.

Healthcare (SDG 3): Access to affordable healthcare is critical for improving public health outcomes. Economic policies that focus on expanding healthcare infrastructure, providing health insurance, and promoting preventive healthcare measures contribute to achieving SDG 3 targets.

Gender Equality (SDG 5): Economic policies that promote women's participation in the workforce, provide access to finance and entrepreneurship opportunities for women, and address gender-based discrimination contribute to progress towards SDG 5.

Infrastructure Development (SDG 9): Infrastructure development is essential for economic growth and sustainable development. Policies that prioritize investments in transportation, energy, water, and sanitation infrastructure contribute to achieving SDG 9.

Environmental Sustainability (SDG 13, 14, 15): Economic policies need to be aligned with environmental sustainability goals. Measures such as promoting renewable energy, sustainable agriculture practices, and conservation of natural resources contribute to progress towards SDGs

related to climate action (SDG 13) and environmental conservation (SDG 14 and 15).

Decent Work and Economic Growth (SDG 8): Economic policies that promote job creation, entrepreneurship, and inclusive economic growth contribute to achieving SDG 8 targets.

Partnerships for the Goals (SDG 17): Collaboration between government, private sector, civil society, and international organizations is crucial for achieving the SDGs. Economic policies that foster such partnerships and encourage sustainable business practices contribute to progress towards SDG 17.

ROLE OF TECHNOLOGICAL INNOVATION IN FOSTERING SUSTAINABLE DEVELOPMENT AND ECONOMIC GROWTH

Productivity and Efficiency: Technological innovations such as automation, artificial intelligence, and advanced manufacturing processes improve productivity by streamlining production processes, reducing costs, and enhancing the quality of goods and services. This leads to increased economic output without proportionately increasing resource consumption, thus promoting sustainable development.

Resource Efficiency and Conservation: Innovation enables the development of cleaner and more efficient technologies for energy generation, transportation, and resource utilization. Renewable energy technologies such as solar and wind power, in addition to developments in energy storage and smart grid systems, can decrease carbon emissions and alleviate climate change while fostering economic growth.

Inclusive Development: Technology can bridge the gap between different socioeconomic groups by providing access to information, education, healthcare, and financial services. For instance, mobile technology and digital platforms facilitate financial inclusion, enabling underserved populations to participate in the formal economy and access essential services, thereby reducing poverty and inequality.

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Environmental Sustainability: Clean energy, sustainable agriculture, waste management, and water purification are examples of green technology innovations that support environmental sustainability by lowering pollution, preserving natural resources, and advancing the ideas of the circular economy. These innovations not only mitigate environmental degradation but also create new economic opportunities and industries.

Healthcare and Education: Technological advancements in healthcare, including telemedicine, wearable devices, and digital health records, improve access to quality healthcare services and promote preventive care, leading to better health outcomes and increased productivity. Similarly, educational technologies like e-learning platforms, virtual classrooms, and digital libraries enhance access to education and skill development, empowering individuals and fostering human capital development, which is essential for long-term economic growth.

Global Challenges: In order to address urgent global issues including climate change, food security, access to clean water, and public health concerns, technological innovation is essential. Innovative responses to these problems are developed through cross-sector cooperation and research and development investments, which open up new markets and economic opportunities and advance sustainable development objectives.

Policy and Regulatory Frameworks: Robust rules and regulatory frameworks are crucial for leveraging the advantages of technological innovation while minimising potential risks and adverse consequences. Governments have a vital role in stimulating innovation by investing in research and development, creating a favourable economic climate, safeguarding intellectual property rights, and guaranteeing fair access to technology.

INTEGRATION OF ENVIRONMENTAL SUSTAINABILITY INTO ECONOMIC POLICIES AND DEVELOPMENT STRATEGIES

Education: Education is a critical social determinant that influences both economic growth and inclusive development. Access to quality education

not only empowers individuals with skills and knowledge but also enhances productivity and innovation, thereby contributing to economic growth. However, disparities in educational access and quality can perpetuate inequalities, hindering inclusive development. Investing in education, particularly for marginalized groups, is essential for fostering inclusive growth.

Healthcare: Access to healthcare services and health outcomes are closely linked to economic growth and inclusive development. Economic growth can lead to improvements in healthcare infrastructure, medical technologies, and public health programs, resulting in better health outcomes for the population. Conversely, poor health can impede economic productivity and perpetuate poverty. Ensuring universal healthcare coverage and addressing social determinants of health, such as income inequality and access to clean water and sanitation, are crucial for promoting inclusive development.

Income Inequality: If the benefits of economic progress are disproportionately obtained by the wealthy and the poor are neglected, income inequality can worsen. Elevated levels of income disparity can impede upward social mobility, sustain poverty, and erode social cohesiveness. Measures that support fair allocation of income, such as progressive taxation, social safety nets, and inclusive economic possibilities, are crucial for ensuring that the advantages of economic growth are distributed more evenly throughout society.

Gender Equality: Gender inequality remains a significant barrier to inclusive development. Economic growth alone does not guarantee gender equality, as women often face structural barriers and discrimination in accessing education, employment, and economic opportunities. Promoting gender equality through measures such as equal pay for equal work, eliminating gender-based violence, and increasing women's representation in decision-making roles is crucial for realizing the full potential of economic growth and fostering inclusive development.

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Social Protection: Social protection programs, including social assistance, unemployment benefits, and pension schemes, play a vital role in mitigating the adverse effects of economic shocks and promoting inclusive development. Access to social protection ensures that vulnerable groups, such as the unemployed, elderly, and persons with disabilities, are not left behind during periods of economic growth. Strengthening social protection systems and expanding coverage to marginalized populations are essential for building resilient and inclusive societies.

Labor Market Dynamics: Labor market policies and regulations significantly influence the extent to which economic growth translates into inclusive development. Policies that promote decent work, labor rights, and social dialogue contribute to creating more inclusive labor markets where workers have access to fair wages, job security, and opportunities for advancement. Furthermore, allocating resources towards the improvement of skills, vocational training, and lifelong learning initiatives can increase the chances of finding employment and guarantee that individuals are able to engage in and reap the rewards of economic expansion.

Social Cohesion and Governance: Inclusive development requires strong social cohesion and effective governance mechanisms that foster trust, cooperation, and participation among diverse groups within society. Addressing social exclusion, marginalization, and discrimination is essential for building inclusive societies where all individuals have a voice in decision-making processes and can contribute to and benefit from economic growth.

POTENTIAL TRADE-OFFS AND SYNERGIES BETWEEN ECONOMIC GROWTH AND THE ATTAINMENT OF SDGS

Policy Frameworks: Many countries have established policy frameworks aimed at integrating environmental sustainability into economic development. This includes setting targets for reducing greenhouse gas emissions, promoting renewable energy adoption, implementing pollution control measures, and conserving natural resources. Assessing the

effectiveness of these policies requires evaluating their coherence, comprehensiveness, enforcement mechanisms, and alignment with international commitments such as the Paris Agreement on climate change and the Sustainable Development Goals.

Regulatory Measures: Regulatory measures play a crucial role in ensuring that economic activities are conducted in an environmentally sustainable manner. This includes setting standards for air and water quality, regulating emissions from industries, establishing protected areas for biodiversity conservation, and implementing environmental impact assessment processes for development projects. Assessing the effectiveness of regulatory measures involves evaluating their stringency, enforcement capacity, compliance levels, and ability to address emerging environmental challenges.

Market Mechanisms: Market-based instruments such as carbon pricing, emissions trading schemes, and green procurement policies can incentivize businesses to adopt environmentally sustainable practices. Assessing the integration of market mechanisms into economic policies requires evaluating their design, effectiveness in internalizing environmental costs, impact on innovation and investment in clean technologies, and distributional effects on different stakeholders.

Investment and Financing: Redirecting investment and financing towards environmentally sustainable projects and initiatives is essential for achieving sustainable development goals. This includes mobilizing public and private capital for renewable energy projects, sustainable infrastructure development, and conservation initiatives. Assessing the integration of environmental sustainability into investment and financing involves evaluating the availability of green finance instruments, the alignment of investment portfolios with environmental objectives, and the effectiveness of incentive mechanisms for sustainable investments.

Innovation and Technology: Promoting innovation and technology development is critical for advancing environmental sustainability goals. This includes investing in research and development of clean technologies,

promoting technology transfer to developing countries, and fostering collaboration between governments, academia, and the private sector. Assessing the integration of innovation and technology into economic policies involves evaluating the level of investment in green innovation, the diffusion of clean technologies, and the impact of technological advancements on environmental performance.

Stakeholder Engagement: In order to successfully incorporate environmental sustainability into economic strategies, it is crucial to actively include and include many stakeholders such as government agencies, enterprises, civil society organisations, and local communities. Evaluating stakeholder engagement entails assessing the inclusivity of decision-making processes, the transparency of information dissemination, and the responsiveness of policies to stakeholder inputs and concerns.

Monitoring and Evaluation: Monitoring and evaluating the implementation of environmental policies and development strategies are essential for assessing progress towards sustainability goals and identifying areas for improvement. This includes tracking environmental indicators, conducting environmental impact assessments, and evaluating the effectiveness of policy interventions. Assessing monitoring and evaluation mechanisms involves evaluating their robustness, reliability, and ability to inform evidence-based decision-making.

Trade-offs:

a. Environmental Degradation: Economic growth driven by resource-intensive industries, such as manufacturing and mining, can lead to environmental degradation, including deforestation, pollution, and habitat destruction (SDGs 13, 14, 15). While economic growth may increase GDP and create jobs in the short term, it can undermine environmental sustainability and compromise long-term well-being.

b. Income Inequality: If the wealthiest disproportionately gain from economic growth while marginalised populations are left behind, it can worsen income inequality (SDG 10). In the absence of specific measures to tackle income inequalities, economic expansion has the potential to

exacerbate the disparity between the wealthy and the impoverished, resulting in social unrest and instability.

c. Social Disparities: Economic growth may not necessarily translate into improvements in social indicators such as education, healthcare, and gender equality (SDGs 3, 4, 5). Inadequate access to quality education, healthcare, and social services can perpetuate social inequalities, particularly for marginalized communities, despite overall economic progress.

d. Natural Resource Depletion: Unsustainable exploitation of natural resources to fuel economic growth can deplete finite resources and compromise future generations' ability to meet their needs (SDG 12). Excessive utilisation of water, land, and minerals in the absence of effective control can result in the exhaustion of resources and impede the achievement of long-term sustainable development.

Synergies:

a. Poverty Alleviation: Economic growth can contribute to poverty alleviation by creating employment opportunities, increasing income levels, and improving living standards (SDG 1). Sustainable economic growth that prioritizes inclusive development can help lift people out of poverty and improve their overall well-being.

b. Infrastructure Development: Investments in infrastructure, such as transportation, energy, and sanitation, can support economic growth while enhancing access to essential services and promoting sustainable development (SDGs 7, 9). Well-planned infrastructure projects can improve connectivity, facilitate trade, and stimulate economic activity while minimizing environmental impacts.

c. Innovation and Technology: The utilisation of innovation and technological breakthroughs in the economy can result in sustainable solutions to tackle global concerns, including climate change, food security, and healthcare (as outlined in Sustainable Development Goals 2, 7, and 13). Investing in clean energy, green technologies, and digital

innovation has the potential to create new economic opportunities while also supporting environmental sustainability.

d. Green Economy Transition: Transitioning towards a green economy, characterized by sustainable consumption and production patterns, can create new economic opportunities while addressing environmental challenges (SDGs 8, 12). Promoting renewable energy, eco-friendly agriculture, and circular economy practices can drive economic growth while reducing ecological footprint and promoting sustainable development.

Conclusion

The Sustainable Development Goals (SDGs) represent a comprehensive framework for addressing the world's most pressing challenges, encompassing economic, social, and environmental dimensions. In the context of India, achieving these goals requires a multidisciplinary assessment that considers the complex interplay between economic growth, social development, and environmental sustainability. India's pursuit of economic growth presents both opportunities and challenges for SDG attainment. Although economic growth has successfully alleviated poverty and driven technical progress, it has also resulted in environmental deterioration, income disparity, and social inequalities. Therefore, a nuanced understanding of the trade-offs and synergies between economic growth and SDGs is essential for guiding policy interventions and development strategies.

A multidisciplinary approach to SDG implementation in India involves integrating economic, social, and environmental considerations into policymaking processes, fostering cross-sectoral collaboration, and promoting inclusive and sustainable development. This requires aligning economic policies with the principles of sustainability, investing in human capital development, enhancing social protection mechanisms, and transitioning towards a green economy. Furthermore, leveraging innovation, technology, and partnerships can unlock new pathways for sustainable development, driving economic growth while advancing SDG

objectives. Strengthening governance mechanisms, ensuring policy coherence, and promoting stakeholder engagement are critical for navigating the complexities of sustainable development in India. In essence, achieving the SDGs requires a holistic and integrated approach that prioritizes people, planet, and prosperity. By embracing sustainable development principles and fostering inclusive growth, India can pave the way towards a more equitable, resilient, and prosperous future for all its citizens.

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**A STUDY ON-THE IMPACT OF INTERNAL ASSESSMENT ON
MAKING LEARNING EFFECTIVE WITH REFERENCE TO
UNDER GRADUATE STUDENTS OF EDUCATION
DEPARTMENT OF COTTON UNIVERSITY- GUWAHATI
(ASSAM).**

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INTRODUCTION

Introduction of the study:

During the last two decades the higher education system has been facing different type of challenges / problems in its management. On one side, increasing growth in the social demand for higher education, quantitative extension, decrease or stagnation in the allocation of finance resources, and increase in the demand of responsibility, accountability and transparency in the academic affairs. On the other hand, quality maintenance, improvement and assurance. So that this forced the academic management to evaluate the performance and assurance.

To maintain quality of educational system the main/ core is education itself, to maintain the quality of education, the teacher- student relation must be kept intact with full of knowledge, communication and assessment. The procedure of assessment can be classified as internal assessment and external assessment.

Some of the general Characteristics of internal assessment

- This process does not involve any outside person
- Should be continuous and made by subject teacher, it does not replace exam.
- It uses suitable evaluation tools and techniques.
- Fix proportion of marks according to hours of instructions.
- Used as feedback to improve teaching.

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- Internal assessment should be comprehensive evaluating all the aspects of student's growth. Example- academic achievement, personality traits etc.

Basic principles of internal assessment

- Students should know their internal assessment marks before their final exams.
- Give opportunity to students to improve their internal assessment grade by additional tests, assignments etc.
- Results must be studied statistically.
- Improve a number of components.
- Internal assessment should be kept separately.
- Internal assessment should be objective, unbiased and based on all the records of unit test, practical tests, homework, class work, observational scales and inventories, participation in group project etc.

Internal assessment includes the teachers and professors within the educational institution to take the assessment of the students to keep their improvement on record. Internal assessment helps to reduce the burden and stress/ tension of the students regarding the final evaluation. In addition, it helps to build up a link between the teacher and the student, it helps the teacher to get data related to the students' performance, it also provides an opportunity to the teacher to evaluate the students' performance and moreover, it provides the students the opportunity for continuous learning.

The types of Internal Assessment are- Formative evaluation and summative evaluation. Formative evaluations are the feedback arrangements procedure, it enables the curriculum planners make adjustment and improvement at every stage of the curriculum implementation. Summative evaluation comes at the end of the plan and deals with the total curriculum plan. The evaluation becomes feedback and helps the curriculum planners to decide whether to keep, modify or eliminate the curriculum with another group of the student population.

Internal assessment is an integral part of the higher education system and plays a significant role in evaluating a student's progress and academic performance. Here are some of the key reasons why internal assessment is important in higher education:

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Measuring Progress: Internal assessment helps educators to monitor and measure the progress of students throughout their course of study. This allows for a more comprehensive evaluation of a student's academic performance and helps identify areas where they may need additional support.

Promoting Active Learning: Internal assessment encourages students to take an active role in their education and engage with the material in a meaningful way. By requiring students to complete assignments, quizzes, and other forms of assessment, educators can encourage students to think critically and apply their knowledge in practical situations.

Encouraging Self-Reflection: Internal assessment provides students with opportunities to reflect on their learning and identify areas where they need to improve. This helps students to take ownership of their education and develop a deeper understanding of their strengths and weaknesses.

Enhancing Accountability: Internal assessment promotes accountability among students by requiring them to complete assignments and meet deadlines. This helps students to develop time-management skills and work ethic, which are important skills that will serve them well beyond their academic careers.

Providing Feedback: Internal assessment provides students with valuable feedback on their performance, which can help them to identify areas where they need to improve and make changes to their study habits. This can ultimately lead to better academic performance and a more successful academic career.

Overall, internal assessment is an essential component of higher education that helps to promote active learning, accountability, and academic success.

Internal assessment/ evaluation focuses on the internal accountability of the materials for example- theoretical assumptions of the materials, the predetermined objectives and the extent to which it has been achieved, justification of the language selected and grading the design of the activities and the task.

Here we are going to introduce the theoretical and practical principles of internal assessment of higher education level (under graduate level). This

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paper attempts to present the application of the internal assessment for quality improvement of the students and the teacher-taught relationship.

Statement of the study:

The study is entitled as “A study on the Impact of Internal Assessment on making learning effective with reference to Under graduate students of Education department of Cotton University- Guwahati (Assam)”

Need of the study:

The internal assessment gives credit to the final assessment. Also, it reduces the burden related to the final examination. For example, if a student has performed well in an assessment/ test, they do not need to take much pressure of the final examinations. Moreover, such periodic assessments act as a link that provides data related to students' performance. It allows students to learn continuously.

The internal assessment compels the students to be regular in their studies and other activities. Some of them feel that this system is subjective. In short, the internal assessment brings certain changes in hard work of the student. Internal assessment evaluates the students' actual performance and reduces examination fear, diagnoses the deficiencies and gives remedy to them. Internal assessment provides a continuous systematic evaluation rather than a terminal evaluation which has so many defects in the present condition. Internal assessment is done on the basis of the student's overall performance.

Internal assessment provides continuous systematic evaluation as well as motivation to study systematically. It also provides the knowledge of progress periodically. Internal assessment improves the students' performance through different types of assignments such as internal test, seminars and practical. The need of the study includes its objectives such as to study the positive effect of internal assessment on gaining good marks according to the students, to study the psychological impact of internal assessment on students and; to study the relationship between the teacher and taught.

So, in the present study the investigator attempts to measure the attitude of college students towards internal assessment.

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Objectives of the study.

- a) To study the positive effects of internal assessment as viewing by the students on gaining good grades.
- b) To study the psychological impact of internal assessment on students.
- c) To study whether internal assessment can aid in the development of teacher-student relationship.

Operational definition of the term:

Impact- Impact refers to the effect or influence that something has on a particular situation, system, person, group, or society as a whole. It can be positive or negative and can be seen in various areas such as social, economic, environmental, and political.

Education- Education is the process of facilitating learning, or the acquisition of knowledge, skill, values, beliefs and habits.

Internal assessment- Internal assessment refers to the process of evaluating an organization's own performance, resources, strengths, and weaknesses.

Delimitations of the study.

- I. The project is delimited to only under graduate students of Cotton University, it is not applicable to Higher Secondary or Post Graduate students.
- II. The study has been done on students of Education department of Cotton University.
- III. The study has been conducted on 30 students.
- IV. This study produces result on the overt attitude of the students towards internal assessment and not the covert behaviour.

Description of the area:

The university from where the investigator collected data for the present study is Cotton University. Cotton University (formerly known as Cotton College) is a Public State University located in Guwahati (Panbazar, Guwahati campus is spread over 12.04 Acre of land on the south bank of mighty river Bhrahmaputra), Assam, India. Formerly known

as Cotton College, the institute was established in 1901 by Sir Henry Stedman Cotton, the Chief Commissioner of the erstwhile British province of Assam.

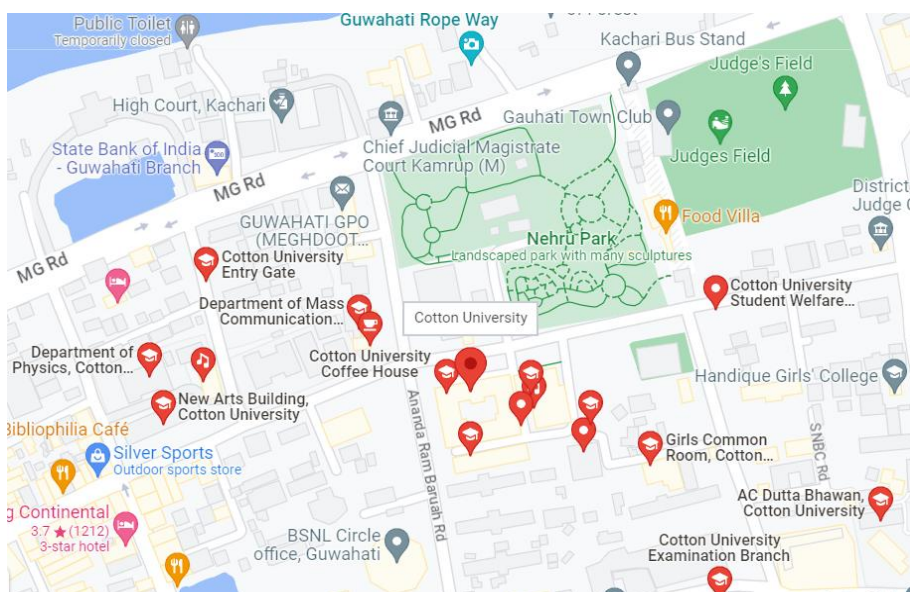
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Figure 2- Campus: Cotton University

REVIEW OF RELATED LITERATURE.

A survey of related studies was undertaken by the investigator to get an insight into the work that has been already in the field of this investigation and also get suggestions regarding the ways and means for the collection of relevant data and interpretations of result.

- I. Das, Monoranjan (1976) studied about the importance of practical education laid on the new educational system of Assam. He said that, a man is generally called as the manifestation of the body, mind and spirit. All round development of these constituents makes a perfect man. Practical education can develop students physical, mental and spiritual potentialities.
- II. Sharma,D.(1994) conducted an experimental study by organizing activities like brainstorming, problem solving, quiz and project work in a science teaching class. The main objective of the study was to assess the effect of special climate on creative thinking of children in particular through enrichment activities running across a wide the investigation, the students of the experimental group should significantly gain with respect to verbal fluency, verbal flexibility, verbal originality and non-verbal creative thinking. In what ways can these activities be grouped together so as to get the maximum advantage in the classroom.
- III. Shepard, L. A. (2000) studied "The Role of Assessment in a Learning Culture," Lorrie A. Shepard explores the importance of assessment in promoting a culture of learning within educational systems. Shepard emphasizes the need for assessment practices that align with learning goals and support students' growth. The article distinguishes between formative and summative assessment, highlighting their respective roles in providing feedback during the learning process and evaluating overall achievement. Shepard argues for a balanced approach to assessment that focuses not only on evaluation but also on using assessments as tools to improve instruction and enhance student learning. The article addresses challenges in implementing effective assessment practices and suggests alternative approaches that foster higher-order thinking and real-world application of knowledge. Shepard emphasizes the value of assessment in informing instructional decisions and promoting a culture of continuous learning.

- IV. Rathna, S. Selva and Daniel, Y. (2016), conducted research on the “Attitude of college students towards Internal assessment”. The aim of the study was to find out the attitude of college students towards internal assessment. The survey method was used for the study. The sample consisted of 300 college students from 10 arts and science college in Tirunelveli district, giving importance to gender, status of college. For the study the investigator used internal assessment scale constructed by Parikh. The tool contains 40 statements. From the study it was found that the arts and science students have average level of attitude towards internal assessment. The recommendation given by the investigator may be very helpful for improving the attitude of the college students towards internal assessment.
- V. Ahad, Farhana and Nowrun, Nida (2019) Conducted research to explore whether performance in the continuous internal assessment, correlates with the final summative assessment, correlates with the final summative assessment in first year medical students in the subjects of Physiology for last three years. This study was conducted over a period of six month at SKIMS medical college, Srinagar. It was an observational record-based study on 280 students who took a thorough internal assessment and final examination. The internal assessment marks showed a positive correlation with marks obtained in final assessment or final university exams in all three batches, which is statistically highly significant ($p < 0.01$).
- VI. Reddy, Yella, B. (2019) conducted a study on Internal assessment of Post Graduate students with management and gender. To study the impact of management and gender on the internal assessment of Post Graduate students. The internal assessment test was developed by Shyam Pratap Kumar, K (1986) adopted from Ramadevi K. (2018). The tool was highly reliable for the investigation. The total has 53 items. The result shows, there is a significant influence of management and gender at 0.01 level of significance on the internal assessment of Post Graduate students.
- VII. Akhtar, U; Hassan, U; Tausuf, A; Arshad, S; Sabir, S and Aslam, A (2021) Conducted a research to evaluate the role of Internal Assessment as a predictor of academic assessment in the subject of anatomy. This study included 297 Under Graduate medical

students of 1st Year MBBS from academic sessions 2017-2018 & 2018-2019. The result showed there was a linear correlation between Internal assessment scores and 1st professional examination scores and it was found to be statistically significant ($r^2=0.635$, $p=0.000$) in the subject of Anatomy. By modifying internal assessment with proper remedial measures can not only promote learning but can also improve performance of students in the end of session summative assessment.

RESEARCH METHODOLOGY

Methodology used in the study:

Methodology in research refers to the overall approach or plan of action that a researcher employs to conduct a study. It involves the systematic and rigorous collection, analysis, and interpretation of data to answer a research question or test a hypothesis.

The methodology used in a research study can vary depending on the nature of the research question, the type of data that needs to be collected, and the resources available to the researcher. However, there are some common elements that are present in most research methodologies. These include:

Research design: This refers to the overall plan of action for the study, including the type of study (e.g., experimental, observational, survey), the sampling strategy, and the data collection methods.

Data collection: This involves the collection of data from the participants or the environment being studied. Data collection methods can include surveys, interviews, observation, experiments, and secondary data sources.

Data analysis: This involves the use of statistical or other analytical techniques to make sense of the data collected. This can include descriptive statistics, inferential statistics, or qualitative analysis.

Interpretation of results: This involves making sense of the findings of the study and drawing conclusions based on the data collected. **Ethical considerations:** This involves ensuring that the study is conducted in an ethical and responsible manner, including protecting the rights and privacy of participants and obtaining informed consent.

Overall, a well-designed methodology is crucial for conducting rigorous and credible research, and it is important for researchers to carefully consider the most appropriate methodology for their particular research question and data.

In this study descriptive survey method was used. Descriptive research is defined as a research method that describes the characteristics of the population or phenomenon studied. This methodology focuses more on the ‘what’ of the research subject than the ‘why’ of the research subject. Descriptive research aims to accurately and systematically describes a population, situation or phenomenon. Its goal is to collect factual evidences and information that give your reader a comprehensive perception of the subject.

Population of the study:

In research, population refers to the entire group of individuals, objects, or events that share a common characteristic and are of interest to the researcher. It can be large or small and can be defined in different ways, such as all the students in a school or university, all the employees of a company, or all the residents of a city or country. Defining the population is important as it determines the sample of individuals that will be selected to participate in the study. By selecting a representative sample from the population, researchers can draw conclusions that are applicable to the larger population with greater confidence.

In this study, the whole group of Under graduate students of Education department of Cotton University are taken as the population of the study.

Sample of the study:

In research, a sample is a subset of the population that is selected for study. It is not feasible or practical to study the entire population, so researchers choose a smaller group of individuals that is representative of the population being studied. The selection of a sample is important as it determines the generalizability of the study's findings. A sample that is representative of the population will allow researchers to draw conclusions that can be generalized to the larger population with greater confidence.

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As a sample 30 under graduate students of education department have been selected randomly for this study.

Tools of the study:

Tools in research methodology refer to instruments or methods used to collect data or information. They can be physical or abstract, such as questionnaires, surveys, interviews, observation checklists, psychometric scales, coding schemes, and statistical software programs. Careful selection and use of appropriate tools is important to ensure the validity, reliability, and ethical considerations of the research.

In this study questionnaire survey method was used. The questionnaire method is defined as a research technique used to gather data from a sample of individuals using a standardized set of questions. It is a popular method in social science research as it is relatively easy to administer and can be used to collect a large amount of data quickly and efficiently.

Questionnaires can be delivered in a variety of formats, including paper-and-pencil, online, by phone, or in-person interviews. The questions can be open-ended, closed-ended, or a combination of both, and can be designed to gather information on a wide range of topics, such as attitudes, beliefs, behaviours, experiences, and demographics.

In this study questionnaire have been prepared for the under graduate students. There are 12 statements in the questionnaire. There are two options for each statement.

ANALYSIS AND INTERPRETATION OF DATA.

Analysis and interpretation of data:

Analysis and interpretation of data in research refer to the process of examining and making sense of the data collected during a study. This involves systematically reviewing, organizing, and summarizing the data using statistical and qualitative methods. The purpose of this process is to draw meaningful conclusions from the data and to answer the research questions or hypotheses.

During the analysis phase, the data is cleaned, transformed, and analyzed using appropriate statistical and analytical tools. The data may be

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examined using descriptive statistics to summarize the key characteristics of the sample, or inferential statistics to make inferences about the population.

The interpretation phase involves examining the results of the analysis to identify patterns, trends, and relationships in the data. This may involve comparing the findings to previous research or established theories to draw conclusions and make recommendations.

Both analysis and interpretation of data are critical steps in the research process, as they allow researchers to draw valid and reliable conclusions from their study. It is important for researchers to use appropriate methods and tools to ensure the accuracy and rigor of their findings.

The data gathered was carefully analysed with the help of tables. The analysis and interpretation of data in the light of the objectives set forth for the investigation and discuss as follows:

Analysis and Interpretation of Objective No. 1

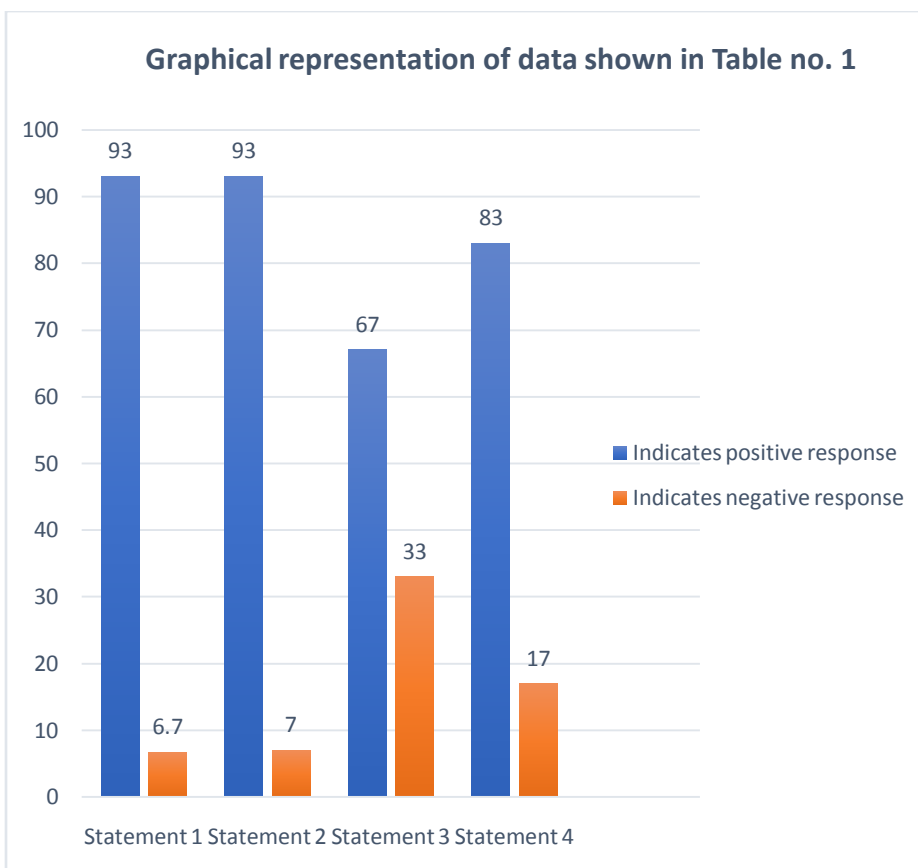
Objective No.1: To study the positive effects of internal assessment as viewing by the students on gaining good grades.

TABLE NO. 1

<u>Questions</u>	<u>Response</u>		<u>Percentage</u>	
	<u>Yes</u>	<u>No</u>	<u>Yes</u>	<u>No</u>
1.Are feedback given by teacher after each Internal Assessment helpful?	28	2	93%	7%
2.Are Internal Assessment helpful for the preparation of end semester examination?	28	2	93%	7%

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3.Does Internal Assessment helps in managing stress by decreasing the load before end semester examination?	20	10	67%	33%
4.Does Internal Assessment makes students aware of their weakness and strength?	25	5	83%	17%



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Interpretation:

- 93% under graduate students agree that feedbacks given by teachers after each internal assessment is helpful, while 7% students disagree that feedbacks of the teachers are helpful.
- 93% under graduate students agree that internal assessments are helpful for the preparation of end semester examinations, whereas 7% students disagree that internal assessment helps in the preparation of the end semester examinations.
- 67% under graduate students agree that internal assessment helps in managing stress by decreasing the load before end semester examination, whereas 33% students disagree that internal assessment helps in managing stress by decreasing the load before end semester examination.
- 83% under graduate students agree that internal assessment makes students aware of their weakness and strength, whereas 17% under graduate students disagree that internal assessment makes students aware of their weakness and strength.

Analysis and Interpretation of Objective No. 2

Objective No.2

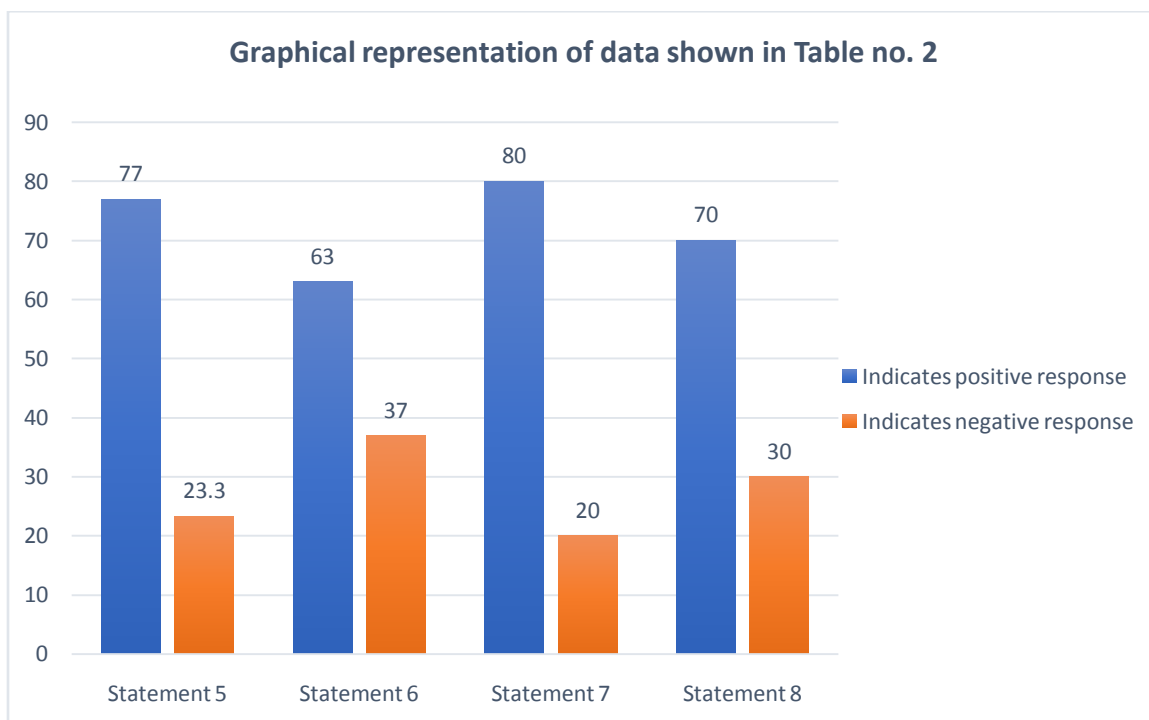
To study the psychological impact of internal assessment on students.

TABLE NO. 2

<u>Questions</u>	<u>Response</u>		<u>Percentage</u>	
	<u>Yes</u>	<u>No</u>	<u>Yes</u>	<u>No</u>
5. Do Internal Assessment help you to improve your attention in your studies?	23	7	77%	23%

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6. Does Internal Assessment increases stress and burden on the students?	19	11	63%	37%
7. Does Internal Assessment creates competition among the students for getting more marks/ scores in the end semester examination?	24	6	80%	20%
8. Does Internal Assessment increases mental fatigue among students?	21	9	70%	30%



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Interpretation:

- 77% under graduate students agree that internal assessment helps to improve their attention studies, whereas 23% under graduate students disagree that internal assessment helps to improve their attention in studies.
- 63% under graduate students agree that internal assessment increases stress and burden on the students, whereas 37% disagrees that internal assessment increases stress and burden on the students.
- 80% under graduate students agree that internal assessment creates competition among the students for getting more marks/ scores in the end semester examination, whereas 20% disagrees that internal assessment creates competition among the students for getting more marks/ scores in the end semester examination.
- 70% under graduate students agree that internal assessment increases mental fatigue among students, whereas 30% disagrees that internal assessment increases mental fatigue among students.

Analysis and Interpretation of Objective No. 3

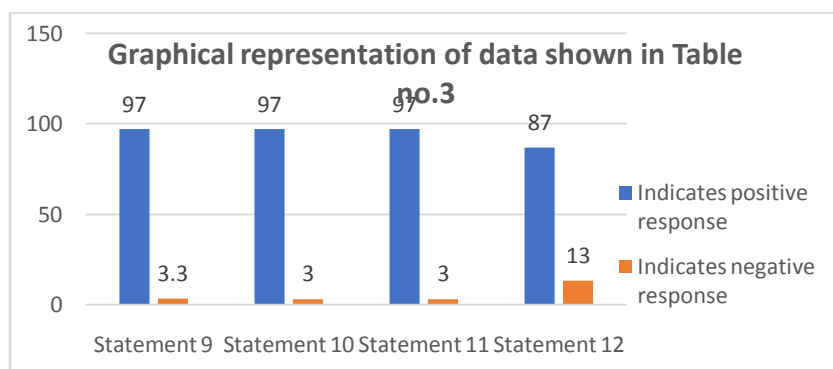
Objective No.3: To study whether internal assessment can aid in the development of teacher-student relationship.

TABLE NO. 3

<u>Questions</u>	<u>Response</u>		<u>Percentage</u>	
	<u>Yes</u>	<u>No</u>	<u>Yes</u>	<u>No</u>
9. Does Internal Assessment helps in improving the teacher-taught relationship by increasing classroom communication between teacher-taught?	29	1	97%	3%

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10. Do you think remedial classes after Internal Assessment develops good teacher student relationship?	29	1	97%	3%
11. Do you think by conducting Internal Assessment teachers can better understand the requirements of each student, which enhances the teacher-students relationship?	29	1	97%	3%
12. Do you think Internal Assessment can help students to communicate better about their personal and academic problems to their teachers?	26	4	87%	13%



Interpretation:

- 97% under graduate students agree that internal assessment helps in improving the teacher- taught relationship by increasing classroom communication between teacher-taught, whereas 3% disagrees that internal assessment helps in improving the teacher- taught relationship by increasing classroom communication between teacher-taught.
- 97% under graduate students agree that remedial classes after internal assessment develops good teacher student relationship, whereas, 3% disagrees that remedial classes after internal assessment develops good teacher student relationship.
- 97% under graduate students agree that by conducting internal assessment, teachers can better understand the requirements of each student, which enhances the teacher-students relationship, whereas 3% disagrees that by conducting internal assessment teachers can better understand the requirements of each student, which enhances the teacher-students relationship.
- 87% under graduate students agree that internal assessment can help students to communicate better about their personal and academic problems to their teachers, whereas 13% disagrees that internal assessment can help students to communicate better about their personal and academic problems to their teachers.

FINDINGS OF THE STUDY.

Objective wise findings of the study are:

1. Findings related to the study of positive effects of internal assessment as viewing by the students on gaining good grades.

- From the analysis and interpretation of the data it has been observed that most of the under graduate students of Education department, Cotton University agrees that feedbacks given by teachers after internal assessment are helpful.

- It has been observed that internal assessment helps in preparation of the end semester examination of most of the students.
- It has also been observed that Internal assessment helps students in managing their stress regarding their studies by decreasing load before end semester examination, whereas 33% disagrees that internal assessment can help in managing stress of the students.
- Internal assessment helps most of the students to recognise their strengths and weaknesses in the subject matters.

2. *Findings related to the study of the psychological impact of internal assessment on students.*

- From the analysis and interpretation of the data it has been observed that most of the under graduate students of Education department, Cotton University agrees that internal assessment helps to improve their attention studies.
- It has been observed, most of the students agreed that continuous internal assessment increases stress and burden of the students, whereas 37% students disagrees that internal assessment increases burden.
- Through the analysis of the data, it has been observed that internal assessment creates competition among the students for getting more marks/ scores in the end semester examination.
- It has also been observed, most of the students agreed that internal assessment increases mental fatigue among student, whereas 30% disagreed that internal assessment increases mental fatigue.

3. *Findings related to the study of whether internal assessment can aid in the development of teacher-student relationship.*

- From the analysis and interpretation of the data it has been observed that majority of the under graduate students of Education department, Cotton University agrees that internal assessment helps in improving the teacher- taught relationship by increasing classroom communication between teacher-taught.

- It has been observed, most of the students agreed that remedial classes after internal assessment develops good teacher student relationship.
- Majority of students have agreed that by conducting internal assessment, teachers can better understand the requirements of each student.
- It has also been observed that, most of the students agreed that internal assessment can help students to communicate better about their personal and academic problems to their teachers, whereas 13% disagrees that internal assessment can help students to communicate better about their personal and academic problems to their teachers.

SUGGESTIONS.

After conducting the study on the students of education department of Cotton University we could observe that internal assessment in higher education is necessary to evaluate a student's learning progress and understanding of the subject matter. It also helps to identify areas of strength and weakness, provides feedback for improvement, and prepares students for external examinations and future careers. Moreover, it encourages self-directed learning and promotes accountability among students.

Here are a few suggestions to improve internal assessment in higher education:

1. Use a variety of assessment methods: Employ different types of assessments such as quizzes, essays, projects, presentations, and exams to evaluate students' knowledge and skills, it helps to develop critical thinking and reflective level of thinking of the students.
2. Provide timely feedback: Offer constructive feedback to students on their performance to help them improve and learn from their mistakes. It also provide exposure to the teacher's perspective and helps the teacher communicate with each and every student personally.
3. Ensure assessment validity and reliability: Use clear criteria and rubrics for grading to ensure consistent and fair assessment practices.

4. Involve students in the assessment process: Encourage students to participate in self-assessment and peer evaluation to develop their critical thinking and evaluation skills. Also encourages healthy competition among the students and helps to get motivation from each other.
5. Train and support faculty members: Provide training and resources to faculty members to improve their assessment techniques and help them understand the importance of assessment in enhancing students' scope of learning and not just scoring marks.
6. Review and revise assessment practices: Regularly review and revise assessment practices to ensure they are up-to-date and aligned with the learning outcomes of the course or program.

CONCLUSION.

Internal assessment is a valuable tool that can significantly enhance the teaching-learning process for undergraduate students. It helps instructors to align their teaching strategies with the desired learning outcomes and understand each student's learning needs. This personalized approach to learning can result in a more effective teaching-learning process. Furthermore, internal assessment provides students with immediate feedback on their performance, which can motivate them to take responsibility for their own learning and become more engaged in the learning process. This can result in increased motivation and better academic outcomes.

Additionally, internal assessment helps to ensure the quality of the teaching-learning process by providing instructors with valuable information about their teaching effectiveness and student learning outcomes. This information can be used to improve the quality of the teaching-learning process and ensure that students are achieving the desired learning outcomes. In summary, internal assessment is a valuable tool that can help to improve the teaching-learning process by providing personalized learning experiences, immediate feedback, improving motivation, and ensuring quality assurance.

In conclusion, the study on the positive effects of internal assessment, as viewed by students, sheds light on several key findings. The majority of undergraduate students in the Education department at Cotton University found internal assessment to have beneficial effects on their academic performance and overall learning experience.

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Firstly, students recognized the value of feedback provided by teachers after internal assessments, considering it helpful in their learning and preparation for end-semester examinations. Internal assessments were seen as a tool that aided students in identifying their strengths and weaknesses in the subject matter, allowing them to focus on areas that needed improvement.

Secondly, the psychological impact of internal assessment was a topic of interest. While some students acknowledged that internal assessment helped improve their attention to studies, others expressed concerns about increased stress and burden associated with continuous internal assessments. The competitive nature of internal assessments was also acknowledged, with students striving to achieve higher marks. However, there were differing opinions regarding the extent to which internal assessment contributed to mental fatigue among students.

Lastly, the study examined the role of internal assessment in fostering a positive teacher-student relationship. Students highlighted the importance of classroom communication and the benefits of remedial classes after internal assessments in enhancing this relationship. Internal assessments were seen as a means for teachers to better understand individual student requirements and for students to communicate their personal and academic concerns to their teachers.

These findings emphasize the multifaceted impact of internal assessment on students' academic performance, psychological well-being, and teacher-student relationships. The study provides valuable insights into the perceptions of undergraduate students at Cotton University and highlights areas where internal assessment practices can be further refined and optimized to promote positive learning outcomes and student-teacher interactions.

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**Corporate Social Responsibility in Digital Era: Navigating Ethical
Challenge**

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Abstract

Ethics is the branch of knowledge that deals with moral Principles. It contains the standards of behaviour what our society accepts simply to put; ethics involves learning what is right of wrong. What is right is ethical and what is wrong is unethical. The words ‘proper’ ‘Fair’ ‘Just’ are also used in place of ‘Ethical’ Social responsibility is an ethical theory that an entity be it an organization or individual who has an obligation to act to benefit at large. Social responsibility is a duty where every individual and an organization have to perform, so as to maintain balances between the economy and the eco system, being socially responsible means that people and organization must behave ethically and sensitively towards social, cultural, economical and environmental issues. This paper navigates through the evolution, types, legal provisions necessity, benefits of Corporate Social Responsibility (CSR) and ethical challenges faced in digital Era

Key words

(Ethics, Organization, corporate social Responsibility digital)

INTRODUCTION

Corporate Social responsibility is an ethical theory that an organization has an obligation to act for the benefit of society at large to maintain the balance between economy and eco system. The CSR has been defined by **Lord Holmes and Richard watts** in the **World Business Council for sustainable development Publication**

‘Making Good Business Sense’ “The communing commitment by business to balance ethically and contribute to economic development while improving the availability of life of the work force and their families as well as local community and society at large.”

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CSR is one of the new management strategies where companies try to create a positive impact on society while doing business. Every company has the different CSR policy though the main motive is the same. Social responsibility relates to helping the society to upgrade and develop. This would include support to sports, local products and skills, health care, literacy campaign, water conservations, soil enrichment and so on..None of these activities related to the main business of the company. In the present digital era companies are facing challenges while adopting CSR policies.

OBJECTIVES OF THE STUDY

1. To understand the need of corporate social responsibility in the digital era
2. To study the different challenges on CSR faced by the organization

RESEARCH METHODOLOGY

Research is based on secondary data hence exploratory in nature. The secondary data and information have been analysed for preparing the paper extensively. The information has been collected from different scholars and researchers, publications, e-books, Articles published in different journals, periodicals, and websites.

EVOLUTION OF CSR

CSR has a legacy extending beyond thousand years, where the roots can be found in the ancient Indian thought. In India known for its deep-rooted ethical traditions, its steps can be found in the great epic **Mahabharata.Vidura** who was the minister, guide and brother in law of **Druetrastra**, the king of **Hatinapura** advised him on the spiritual Philosophy of life which is popularly known as **Vidura Niti- Value based Management** for the sound functioning of organization and welfare of the society.

Vidura Niti comprises of a small section of eight chapters known as **Udyog Parva** which is a part of great epic Mahabharata in which it talks about

- The Administration system which should be conducted in just and right way
- Ethical issues and value based management

The concept of present CSR has originated in the late 1800s when the rise of philanthropy coincided with the growing apprehensions about the declining state of working conditions. Business magnates began contributing to community causes, initiating a shift towards responsible corporate practices. However, it wasn't until 1953 that the term "Corporate Social Responsibility" was coined by economist **Howard Bowen** in his book "**Social Responsibilities of a Businessman.**" Bowen Highlighted upon the impact of corporations on society, asserting that businesses have an obligation to pursue policies beneficial to common good.

The development of CSR underwent a notable transformation after 1960s when academicians broadened its scope to address emerging social issues. Globalisation in the 1990s marked a pivotal moment, expanding the scope of CSR and laying the foundation for its Contemporary understanding such as **Agenda 21, The United Nations framework convention on climate change and Kyoto protocol**, promoted multinational companies to consider their global impact. The rhetoric of CSR shifted from minimizing local harm to addressing global issues

The present stage of CSR in India is, commencing in the 1980s, marked a significant and transformative change. In India As per the provision of **Section 135 of the Companies Act**

2013 and the Companies (Corporate Social Responsibility Policy) Rules 2014 has made it mandatory for certain companies to follow CSR guidelines and to form a CSR committee mandatorily.

It is important to note that CSR provisions aim to encourage companies to contribute to social and environmental causes. Non compliance with CSR obligations may result in penalties, and companies are expected to ensure proper implementation and reporting their CSR activities in accordance with Law.

TYPES OF CSR ACTIVITIES

CSR is not a singular, uniform set of activities; rather it comprises a range of practices that an organization can adopt. The four main types of CSR are

1. Environmental responsibility
2. Ethical Responsibility
3. Philanthropic responsibly
4. Economic Responsibility.

CSR IN DIGITAL ERA

The increasing relevance and use of social media for communicating CSR initiatives is linked to the trade off between CSR communications credibility and its controllability. Social media are natural platforms for dialogue that are being used increasingly intensively by corporations for the purpose of debating CSR issues.

CHALLENGES IN CSR

Companies face many challenges as regards to its CSR activities in this digital Era. Specifically with regarding to communication of CSR activities the more controllable the communicator is the less credible she or he (Du et al. 2010). In digital environment, stake holders work as critical actors who show scepticism towards corporate source in CSR communications, as the latter are perceived to be self interested. (Du et al 2010) From the stake holder perspective a company could manipulate the content message addressed to them.

Other challenges a company can face is

- Lack of clear frame work: companies face challenge because there is no well defined frame work for implementing and assessing CSR activities
- Lack of transparency and Accountability: A considerable number of Companies fail to maintain transparency and clear communication

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- Balancing short term Economic considerations: Achieving balance between economic considerations and long term CSR goals is a biggest challenge in this digital Era

REMEDIES FOR NAVIGATING CSR CHALLENGES

Several strategic solutions can be explored to navigate and effectively integrate CSR into their operations. These solutions are pivotal in addressing the complexities that often accompany CSR initiatives.

- Clarity in CSR definition: Developing a precise and comprehensive definition of CSR is very important
- Standardized reporting and disclosures: it is very important to standardize :reporting system to ensure transparency and accountability
- Collaborative guidelines and regulations: business entity should develop clear guidelines and regulations.
- Investment in Research and development: this helps to seek cost effective and efficient ways to implement CSR activities

CONCLUSION

CSR initiatives are designed to address social, environmental and economic concerns, contributing to positive change in society. These initiatives when thoughtfully implemented, can have a significant impact on various aspects of community well being on the other hand CSR offers a wide range of benefits for companies that extend beyond financial gains. Participating in CSR activities has the potential to improve a company's standing, cultivate more robust connections with stake holders, and contribute to enduring sustainability.

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**Performance Analysis of Power Allocation Strategy in 6G CellFree
Communication**

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ABSTRACT

To perform and analyses the Power Allocation strategy in 6G Cell Free Communication network using fair and fixed NOMA PA policies. UD CF-mMIMO is introduced to overcome the obstacles, enhance wireless transmission efficiency, and offer improved coverage. By sharing the same time and frequency resources, NOMA provides service to a large number of customers and delivers high device performance, high efficiency, increased coverage, low latency and huge networking. Comparing with overall performance the Fair PA in AWGN channel reduces the BER. Further, Reinforcement Learning (RL) algorithm may be made available in the future to optimize resource allocation within cell free network. Based on users demands and network conditions to minimize interference, BER and enhance network efficiency.

KEY WORDS: NOMO, Power Allocation, 6G CF communication, UD CF-mMIMO, SIC, Superposition Coding.

INTRODUCTION

Power Allocation strategies play a vital role in 6G, with its performance, efficiency, and reliability of networks. The most important technologies that will be the driving force for 6G are the Tera-Hertz (THz) band, Artificial Intelligence (AI)/ Machine Learning (ML), optical wireless communication, 3D networking, unmanned aerial vehicles, and wireless power transfer. The transition from traditional cellular architectures to cell free communication in 6G shows the sustainability and environmental responsibility of future wireless networks, supporting

with global efforts to promote Energy Efficiency in the telecommunication industries. The term NOMA is involved because of its intercell multiuser and multiplexing schemes which provides less power for allocating the User Equipment located near the access point and more power allocated for far user.

The transition from traditional cellular architectures to cell free communication in 6G shows the sustainability and environmental responsibility of future wireless networks, supporting global efforts to promote energy efficiency in the telecommunication industries. CF-mMIMO can perhaps lessen the considerable pathloss variances and performance problems with cell edges that come with traditional networks. Even though CF-mMIMO has many advantages,

using a distributed antenna array in CF-mMIMO systems has the potential to significantly raise power consumption and total energy emissions in wireless communication systems. Consequently, the analysis of power allocation approach introduces UD CF-mMIMO.

RELEATED WORKS

Recently, there has been a notable increase in the amount of research interest in the need to reduce the carbon footprint of the world and deal with interference problems related to wireless communication networks. Numerous cutting-edge methods for green networking, maximising energy efficiency (EE) through schemes, detecting and mitigating interference, and managing connectivity have been put forth by Cucho Padin G et al (2019). The schemes are designed to facilitate efficient wireless networks to meet the growing traffic demand and guarantee the continuous evolution of wireless systems. Specifically, Tang et al (2020) characterized the EE of simultaneous wireless information and power transfer (SWIPT)-aided nonorthogonal multiple access networks. Alageli et al. (2020) went one step beyond and probed the unique pairing of CF-mMIMO with SWIPT for energy-efficient mobile communication networks.

A clever switch on/off method was presented by Gracia-Morales et al. (2020) to reduce the carbon footprint that cellular network equipment leaves behind worldwide. The network capacity, energy efficiency, and

design limitations of the UD infrastructure were described by Ahmed et al. (2020). Similarly, precoding approaches were suggested by Dai and Yu (2016) as a way to enhance CF-mIMO's EE performance. In order to tackle a multi-objective total EE maximisation challenge, Nguyen et al. (2017) introduced a novel closed-form algorithm with a zero-forcing precoder and examined the uplink EE of CF-mMIMO. Hamdi and Qaraqe (2020) examined the viability of integrating energy harvesting and energy exchange capabilities into CF-mMIMO networks in a related study.

PROPOSED METHOD

CONVENTIONAL TDD BASED CELL FREE MASSIVE MIMO

It consists of large number of APs that serve a much smaller number of users on the simultaneous frequency. Visualise a large MIMO network without cells, made up of L dispersed APs with N antennas apiece, able to service K users with single antennas. Every AP is linked to a CPU. The channel between the l^{th} AP and the k^{th} user is assumed to be constant in each coherence time τ_c . The channel h_{kl} is speculated to be a correlated Rayleigh fading distribution,

$$h_{kl} \approx \text{NC}(0, R_{kl})$$

where, N denotes the antennas in each AP and $R_{kl} \in \mathbb{C}^{N \times N}$ denotes the spatial correlation matrix, composed of small scale and large-scale fading.

SUCCESSIVE INTERFERENCE CANCELATION (SIC) IN NOMA

The prospect of NOMA based on applying Superposition Coding (SC) at the transmitter and SIC at the receiver, as below, to transmit the data, each user sends an independent pilot sequence at the same time slot for channel estimation. At the transmitter side, all the separate user's sequences are superimposed into a single signal. At the receiver side, each user uses SIC to decode and receive their signal, since all users receive the same superimposed signal holding data. This process is performed iteratively until the weakest user receives their own clean signal.

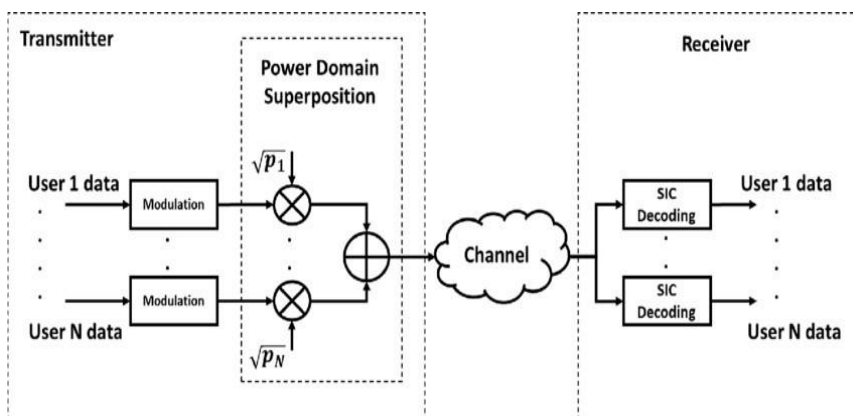


Figure 2: Block diagram of conventional NOMA system

Derivation of Power Allocation coefficients α_n and α_f

The power allocation coefficients for dynamic power allocation scheme, fair PA is given as.

$$\alpha_f = \min \left(1, \frac{e(|h_f|^2 P + \sigma^2)}{|h_n|^2} \right)$$

Once α_f is computed using the above equation, we can easily calculate α_n as,

$$\alpha_n = 1 - \alpha_f \quad (6)$$

$$R_n = \log_2 \left(1 + \frac{|h_n|^2 P \alpha_n}{\sigma^2} \right) \quad (8)$$

where,

α_n, α_f - power allocation coefficient for near and far user
 h_n, h_f - Rayleigh fading coefficient for near and far user
 P - Total transmit power
 σ^2 - Noise power

R_n is obtained after removing the interference from far user transmission by successive interference cancellation (SIC).

RESULTS

PERFORMANCE COMPARISON OF FIXED PA AND FAIR PA

Target rate (R^*) of fair PA and fixed PA

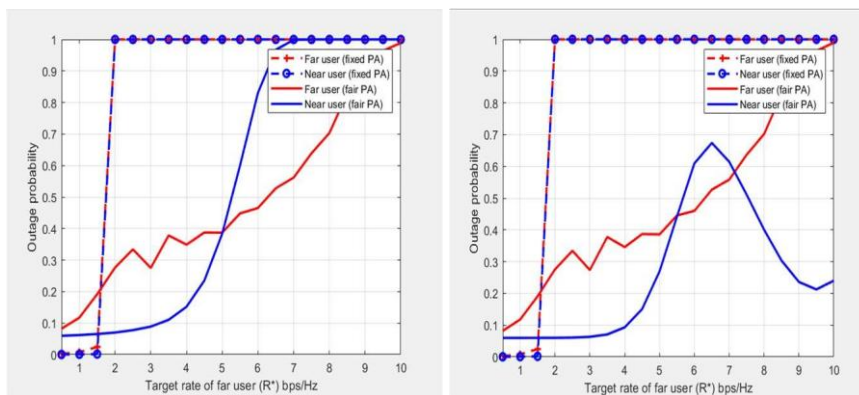


Figure 2 Target rate (R^*) of fair PA and fixed PA (a) $R^* = 0$ to 6.5 bps/Hz
(b) $R^* > 6.5$ bps/Hz

Sum rate and outage probability of fair PA and fixed PA

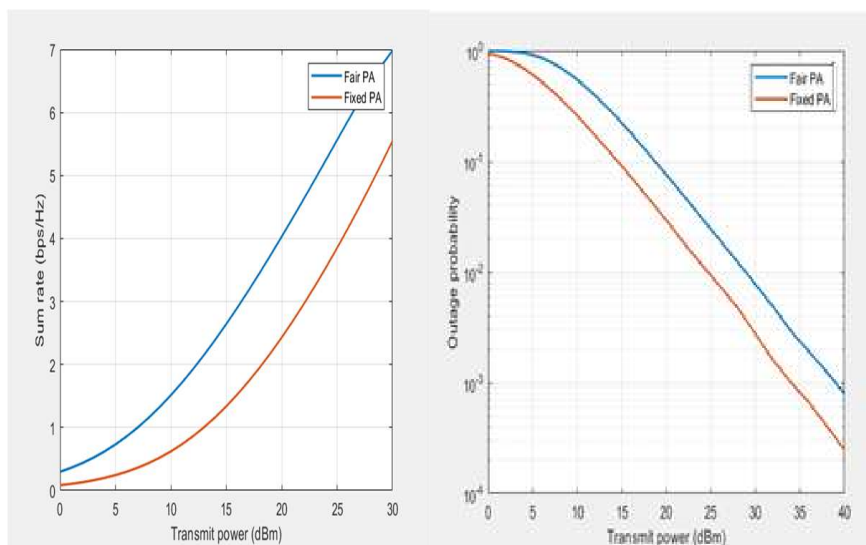
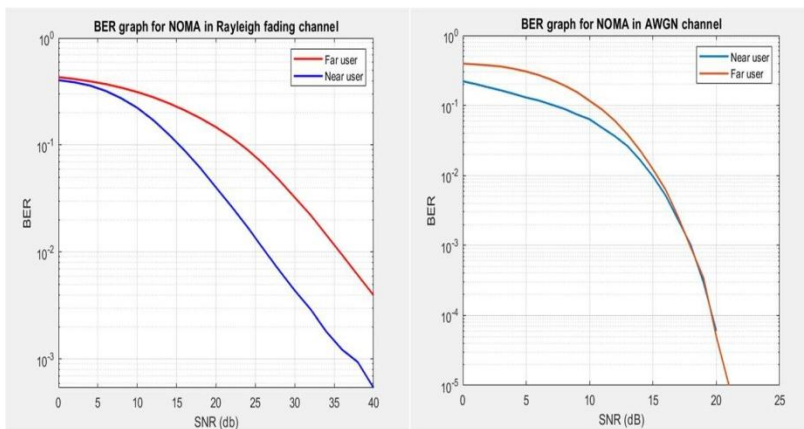


Figure 3 Sum rate and outage probability of
fair PA and fixed PA

SNR Vs BER for AWGN and Rayleigh Fading channel



**Figure 4 SNR Vs BER for AWGN and Rayleigh
Fading channel**

CONCLUSION

This work provides an extensive overview of the concepts and techniques proposed for energy efficient power control in UD CF-mMIMO systems. In this analysis, NOMA scheme for fixed and fair power allocation policies with far and near users, are compared and its parameters is analysed in terms of outage probability, sum rate and error rate. When target rate lies in the range of 0 to 6.5 bps/Hz, the far users are favoured by allocating more power, at the cost of sacrificing the performance of near users. But beyond 6.5 bps/Hz, any value of far user coefficients may not fully satisfy target rate. The near user with 0.35dB and far user with 0.65dB achieve maximum outage probability. When SNR = 15dB the BER of near user is at 10^{-1} and 10^{-2} for Rayleigh and AWGN channel respectively. Comparing with overall performance the Fair PA along with AWGN channel reduces the BER. In future, Reinforcement Learning algorithm can be incorporated for resource allocation in Fair PA cell free network to optimize the user based on their demands and network conditions to minimize interference, BER and enhance network efficiency.

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**Aligning Vocational Education with the vision of NEP 2020:
Opportunities, Challenges and Strategies for Implementation**

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Abstract

Vocational education refers to training programs that focus on practical applications and hands on experience, aiming to equip individuals with specific skills and knowledge required for particular trades or professions. Defined as skills-based education, it is crucial for every country to establish a robust vocational system as it contributes to economic growth. In India, the education system acknowledges the importance of vocational training. In this regard, the National Education Policy (NEP) 2020 marks a paradigm shift in the country's education system, emphasizing the integration of vocational education into mainstream education system to foster skill development and enhance employability. This research article explores the opportunities and challenges inherent in aligning vocational education with the NEP 2020 vision and provides practical steps for successful implementation. By analyzing the policy's objectives, potential benefits, and the current vocational educational landscape, this article aims to offer insights into creating a more skill-oriented educational framework that better prepares students for future employment and supports holistic development.

Keywords:

Vocational education, NEP 2020, practical skills, opportunities, challenges, strategies

Introduction:

Vocational education, also referred to as skill-based education, stands as a pragmatic alternative to traditional academic learning. While conventional education prioritizes theoretical knowledge, vocational education focuses on imparting practical skills and expertise tailored to specific workforce requirements. Through hands-on training and real-world applications, vocational education prepares individuals for

immediate integration into the workforce and plays a crucial role in today's society by bridging the gap between theoretical knowledge and practical skills.

In India, vocational education has long been sidelined in favor of traditional academic streams and it has often been perceived as secondary option. However, the National Educational Policy (NEP) 2020, introduced by the Government of India, represents a transformative framework for the Indian educational landscape. Emphasizing a multidisciplinary approach to education, NEP 2020 highlights the importance of practical skills and real world applications. It advocates for the alignment of vocational education with mainstream education system, promoting lifelong learning and enhancing employability across diverse sectors. In order to achieving this goal, the NEP 2020 of India proposes that at least 50% of learners in schools and higher education institutions should have exposure to vocational education by the year 2025. This article aims to explore the opportunities and challenges associated with this alignment. It'll analyze the current state of vocational training in India, assess the readiness of educational intuitions and industries to embrace this change, and provide recommendations for effective implementation.

Objectives:

- To identify the potential benefits and growth opportunities presented by NEP 2020 for enhancing vocational education
- To identify and address the challenges in implementing vocational education under NEP 2020 and suggest strategies for effective implementation.

Methodology:

This study article is descriptive in nature and uses information from secondary sources like books, articles, journals, web pages, and other available sources from the internet along with the draft of NEP 2020 to examine and present a comprehensive analysis of vocational education and its alignment with NEP 2020.

Need of vocational education:

Vocational education is crucial for providing individuals with practical skills and knowledge needed for specific trades and carriers, effectively bridging the gap between education and employment. It

prepares individual for self employment by equipping them with specific skills, knowledge and confidence and practical experience. It enhances employability, supports economic growth, and caters to diverse industry needs. Additionally, vocational education promotes personal development and job satisfaction, offering pathways for carrier advancement and lifelong learning. Mahatma Gandhi emphasized the importance of vocational education through his concept of Basic Education (Nai Talim) which integrated productive work with learning. Gandhiji believed this approach would foster self-reliance, dignity of labor and holistic development. The Mudaliar commission (1952-53) and the Kothari commission (1964-66) also highlighted the need for vocational education, recommending the vocationalization of secondary education to address unemployment and make education more relevant to economic demands. The commission's recommendations aimed to diversify the curriculum to include vocational courses, thereby preparing students for the workforce and promoting national development. In addition to them, The National Policy on Education (1986) also recommended the vocationalization of education by introducing Socially Productive Work (SUPW) as a separate subject in secondary classes and vocational degree courses at higher education level. Since 1988, the centrally Sponsored Scheme of Vocationalization of Secondary Education at the +2 level has been implemented. Furthermore, the current National Education Policy (NEP), 2020 places special emphasis on vocational education. Therefore, it is evident that vocational education is of great importance today, as it promotes practical skills and enhances employability.

Overview of NEP 2020 and Its emphasis on vocational education:

The National Education Policy (NEP) 2020 is the first education policy on the 21st century and replaces the thirty-four year old National Policy on Education (NPE), 1986. It is a comprehensive framework aimed at guiding the development of education in India, from early childhood through higher education and it proposes significant reforms in the education system. It was drafted by a committee chaired by Dr. K. Kasturirangan and was submitted in 31st May 2019. The policy was officially approved and released by the Government of India in 29th July 2020. Built on the foundational pillars of Access, Equity, Quality,

Affordability and Accountability, this policy is aligned to the 2030 Agenda for Sustainable Development and aims to transform India into a vibrant knowledge society and global knowledge superpower by making both school and college education more holistic, flexible, multidisciplinary suited to 21st century needs and aimed at bringing out the unique capabilities of each student. It mainly focuses on making education accessible, equitable and inclusive. The policy aims to make education more learner centric, fostering critical thinking, creativity and problem solving skills. It places a strong emphasis on reducing the rigid boundaries between streams in education, encouraging a multidisciplinary approach that allows students to choose subjects based on their interests and aptitudes.

The policy places significant emphasis on vocational education, recognizing its crucial role in preparing student for the workforce and ensuring the economic development of the country. The policy aims to integrate vocational education into mainstream education at all levels, allowing students to explore and develop skills in different fields from a young age, thus broadening their carrier prospect and contributing to a skilled and capable workforce. Emphasizing Foundation literacy and Numeracy (FLN) in the early years, the policy seeks to ensure holistic development by integrating vocational courses and coding from as early as the sixth grade. The policy outlined that by 2025, at least 50% of learners should have exposure to vocational education through school and higher education. This will be facilitated by establishing collaboration between schools, higher education institutions and industry partners. The policy also suggested that internships will be provided to students starting from class 6 onwards which emphasizes experiential learning and practical exposure including hands-on training and internships. For school students starting from class six, NEP 2020 mandates ten days of bagless periods each year for internships with local vocational experts, providing early exposure to trades and practical skills. Similarly for higher education students, all undergraduate programs much include internships with local industries and professionals to enhance employability and bridge the gap between theory and real-world applications. Therefore, by emphasizing vocational education, NEP 2020 aims to address skill gaps, reduce

unemployment and create a workforce that is better equipped for the demands of the 21st century economy.

Opportunities in aligning vocational education with the vision of NEP 2020:

Aligning vocational education with the vision of NEP 2020 presents a range of opportunities. Here are some of them-

- Early integration and skill development: NEP 2020 proposes introducing vocational education from grade six onwards, with a focus on coding and internships. This early exposure can help students develop practical skills and identify their interest and aptitudes at a young age, fostering a culture of hands-on learning and innovation.
- Holistic and multidisciplinary approach: The policy promotes a holistic education system where vocational training is seamlessly integrated with academic learning, which can produce well-rounded individual who posses both theoretical knowledge and practical skills.
- Flexibility and lifelong learning: The policy emphasizes flexible learning pathways, enabling students to transition between vocational and academic streams. This flexibility supports lifelong learning and continuous skill enhancement.
- Enhanced employability: Aligning vocational education with NEP 2020 can significantly enhance the employability of students by equipping them with industry-relevant skills.
- Industry-academia collaboration: The policy encourages collaboration between educational institutions and industries, facilitating real-world training and exposure for students.
- Innovation and entrepreneurship: Vocational education aligned with NEP 2020 can foster innovation and entrepreneurship, encouraging students to create their own opportunities and contribute to economic growth.
- Inclusive education: NEP 2020 focuses on vocational education provides opportunities for all students, including those from marginalized sections of society, to gain skills and enhance their employability.

- Global competitiveness: Aligning vocational education with international standards can make Indian students more competitive in the global job market.

Challenges in aligning vocational education with NEP 2020's vision:

Successfully integrating vocational education with the vision outlined in NEP 2020 can indeed face several challenges. Some of these challenges include-

- Infrastructure and resource constraints: The current educational infrastructure may not be adequately equipped to handle the integration of vocational education. Many institutions lack the necessary facilities and equipment for practical training.
- Societal perceptions: Vocational education often suffers from a stigma, being perceived as less prestigious compared to traditional academic education.
- Lack of experienced and qualified teachers: There is lack of experienced and qualified teachers to train students on vocational skills. It is seen that teachers having knowledge of general education and vocational education combined are not available.
- Lack of funding and resources: Implementing vocational education programs requires significant investment in terms of training facilities, equipment and skilled instruction, which may cause a financial challenge.
- Issue of quality assurance: Ensuring the quality of vocational education delivery and assessment poses a significant challenge, particularly in maintaining standards across diverse regions.

Strategies for implementation:

To successfully align vocational education with the NEP 2020, a multifaceted approach is necessary. The following strategies can facilitate effective implementation-

- Infrastructure development: Investing in the development of the infrastructures and resources is essential. Because adequate infrastructure ensures that student have access to the necessary facilities and resources to acquire practical skills and hands-on experiences.

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- Awareness campaigns: Conducting awareness campaigns to change societal attitudes and perceptions towards vocational education by highlighting the Importance and potential of vocational courses in providing sustainable livelihoods can help in promoting its value and importance. A favorable attitude towards manual work should be created among the people.
- Teacher training and capacity building: Conduct comprehensive training programs for vocational educators to enhance their pedagogical skills, subject knowledge and industry relevance.
- Incentives and recognition: Provide incentives such as scholarships, grants and awards to students to pursue vocational education.
- Career counseling and guidance: Offers comprehensive career counseling services to help students make informed decisions about vocational pathways including course selection, job opportunities, skill development etc.
- Policy support and coordination: Ensures coherence and coordination among government agencies, educational institutions, industry bodies and civil society organizations in vocational education and develop supportive policies, funding mechanisms and regulatory frameworks to sustainably grow vocational education in line with NEP 2020 objectives.

Conclusion:

Aligning vocational education with NEP 2020 presents a transformative opportunity to reshape India's educational landscape and bridge the skills gap in the workforce. The policy's emphasis on experiential learning, flexibility and holistic development provides a robust foundation for integrating vocational training into mainstream education system. However significant challenges such as overcoming societal biases, ensuring curriculum relevance, building infrastructure and enhancing teacher capacity much be addressed. So successfully implement the vision of NEP 2020, a multifaceted approach is essential, including advocacy, standardized curricula, technology integration and collaboration among government agencies and educational institutions is crucial, along with the development of supportive policies and funding mechanism. By

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creating a robust vocational educational system and realizing the NEP 2020's vision, India can lead to a skilled, adaptable and future-ready workforce, significantly contributing to the socio-economic development of the nation and innovation.

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**Contribution of the State Universities in Assam to Shodhganga: A
*Reservoir of Indian Theses***

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Abstract

The purpose of this study is to enumerate the contribution made by the government universities in Assam to Shodhganga, an open-access repository. There are in total 18 State Universities and 2 Central Universities in Assam as listed in UGC website of which 11 are sharing their research papers to Shodhganga. This paper is a thorough study of the contributions made by these government universities in Assam, organized together by year. Data was obtained by year and university for this survey, which exclusively covered public universities. Required data for the study were collected from the Shodhganga website up till January 16, 2024, and analyzed with standard percentages, presented in tables and figures. The study shows that as of January 16, 2024, 10,579 theses have been added to the Shodhganga repository by these universities combined. With 59.25% (6,266) of theses submitted, Gauhati University (GU) is leading the way and holds the highest ranking among the participating institutions. Assam University (AU) is in second place with 20.94% (2,216) theses, closely followed by Dibrugarh University (DU) in third place with 8.63% (914) theses. Over the last ten years, the top five universities of Assam have submitted a maximum of 604 theses. This record was set in 2017, followed by 578 in 2021 and 560 in 2019.

Keywords: ETD, Shodhganga, Open access repositories, Institutional repositories, Assam

Introduction

In a research process these, dissertations etc. serve as valuable origin of information and sometimes are the only source information. For this, their visibility and accessibility are very important. When these fail to make their way into various publications channels for different reasons, their

visibility and accessibility become limited and this leads to poor quality, duplication and repetition of research work. This issue has been solved after the emergence of Information Technology. The concept of libraries also has undergone a revolution due to the widespread use of information technology in recording, storing, and distributing information in digital form. Every single library gradually transitions to this phase in order to satisfy the demands placed upon it. Additionally, a new idea called "Institutional Repository (IR)" is established in order to satisfy user requests. An institution's digital repository for intellectual works, especially those from research institutes, is called an IR. Colleges and universities in India are creating institutional repositories of their own to house their students and researcher's theses and dissertations as ETDs, which are the digitized form of the print theses and dissertations, publicly accessible and retrievable by anybody across the world. Because of the many advantages that electronic theses and dissertations (ETDs) offer over traditional print formats, the University Grants Commission (UGC) in India took the initiative to create common repositories specifically for the gathering of theses, leading to the establishment of the Shodhganga repository (Saikia & Das, 2014).

What is Shodhganga?

Shodhganga is common open access digital repository which is the result of the UGC's notification (Minimum Standards & Procedure for Award of M.Phil./ Ph.D Degree, Regulation, 2009 Amendment made on 2016) dated May 5, 2016, which requires university researchers to submit their research outputs in electronic format. Enabling open access to Indian theses and dissertations for the global academic community is its main purpose (Shodhganga: A Reservoir of Indian Theses @ INFLIBNET, 2024). In compliance with the rules and regulation, the INFLIBNET Center is tasked with hosting, maintaining, and providing access to "Shodhganga" for all institutions and universities. Shodhganga uses DSpace; the open source digital repository software, developed by MIT (Massachusetts Institute of Technology) in partnership between Hewlett-Packard (HP) and it supports "Open Archives Initiative's Protocol for Metadata Harvesting" (OAI-PMH) and uses a qualified version of the Dublin Core schema for its metadata. Research scientists can submit their

Ph.D. theses on Shodhganga and making them openly accessible to the entire academic community. Researchers' submitted ETDs (Electronic Theses and Dissertations) can be indexed, stored, shared, and preserved by the repository(*Shodhganga : A Reservoir of Indian Theses @ INFLIBNET*, 2024)

Why Universities join Shodhganga?

Degree-awarding institutions are required by UGC Regulations (2016) to provide provisional certificates and upload electronic copies of Ph.D. theses to INFLIBNET for accessibility.

Universities that agree to electronically submit their theses and sign memorandums with INFLIBNET may be eligible to receive funding for digitizing their thesis backup files. It is anticipated that the amount of electronic theses and dissertations (ETDs) would increase in the future, impacting grant awarding organizations' and accreditation authorities' decisions. Although plagiarism is a serious issue, the enhanced visibility of the open access repositories is meant to discourage plagiarism. Appropriate software techniques exist for detecting plagiarism, and open access repositories might encourage cooperation between Indian academic institutions and international organizations. Having several theses in one repository makes it possible for the INFLIBNET Centre to use technology and data mining tools to provide alerts and analytical services. Shodhganga Membership is not for Colleges (*Shodhganga : A Reservoir of Indian Theses @ INFLIBNET*, 2024.).

Review of Literature

Saikia and Das, (2014) in the article 'Shodhganga Repository: A Comparative Study with Special Reference to the Universities of Assam' provides a comprehensive overview of India's ETD repositories, fundamental information regarding the Shodhganga repository and the status of all universities of Assam registered in Shodhganga.

Jhamb and Samim, (2017) in the article 'Contribution to Open Access Repository by the Central Universities of India: A Case Study of Shodhganga' gives the overview of the research inputs made by the central universities of India to Shodhganga.

Kalita, (2021) in the article 'Electronic Thesis and Dissertations (ETDs) Contribution to Shodhganga by the Universities of Assam: A Study' states

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Eleven universities in Assam, comprising private, state, and central institutions, have an agreement with Shodhganga and have contributed theses to it. However, it is also noted that Shodhganga has not benefited enough from the theses of a small number of universities. To ensure the success of this project, the university administration and library experts must take the necessary steps and contribute theses to Shodhganga.

Pathak, (2023) in the article 'Role of ETD Repository in the University Libraries of Assam' states that role of ETDs as a source of knowledge and information and how Shodhganga initiative is helping the ETDs to get visibility and prevention of plagiarism. The article highlights the function and advantages that the State University libraries in Assam have seen firsthand as a result of the ETDs. The broad use and accessibility of ETDs demonstrates their obvious advantages for the academic community.

Objective

- To determine the overall quantity of theses and dissertations submitted by the public universities in Assam which have signed memorandums of understanding (MoU) with INFLIBNET.
- To evaluate and order the top five public universities in Assam on the basis of the number of theses contributed by them to Shodhganga.
- To evaluate the year wise contribution from last ten years of these top five public universities of Assam to Shodhganga.

Methodology

A thorough analysis of the Shodhganga repository was done in order to achieve the objectives mentioned above. This survey only included public universities, and data was gathered by year and university wise. Required information were gathered from the Shodhganga up until January 16, 2024, and it was examined using conventional percentages and displayed as tables and figures. Top 5 out of the 20 public Universities were selected for the study.

ETD Contribution of Government Universities from Assam to Shodhganga

Till January 25, 2023, UGC lists 460 state and 56 central universities in India. Assam is home to 18 of the 460 state universities and 2 of the 56 central universities(*University List Ugc 2023 - Google Search*, 2023). In

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order for universities to take part in the Shodhganga initiative, they must have to sign an agreement with INFLIBNET. INFLIBNET Center would advise UGC to provide grants designated for the Shodhganga project during the XI Plan Period based on the agreement. 756 universities of India have signed the MoU with INFLIBNET.

Table 1 University That Have Signed MoU With INFLIBNET

Name of Universities	MoU Signed Year
Assam Agricultural University(AAU)	2020
Assam Rajiv Gandhi University of Cooperative Management (ARGUCOM)	2020
Assam Science & Technology University (ASTU)	2019
Assam University (AU)	2013
Bodoland University (BUNIV)	2015
Cotton University (CU)	2018
Dibrugarh University (DU)	2015
Gauhati University (GU)	2011
Krishna Kanta Handiqui State Open University (KKHSOU)	2011
National Law University and Judicial Academy (NLUJA)	2019
Tezpur University (TU)	2013

From Table 1 it is seen that out of the 20 Universities in Assam (state and central), only 55% (11) have signed the MoU with INFLIBNET center in order to participate in the Shodhganga Project.

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Table 2 Overall Contributions by the Public Universities in Assam

Name of Universities	Contribution	
	Number of theses submitted	Percentage
Assam Agricultural University(AAU)	151	1.42%
Assan University	2216	20.94%
Assam Rajiv Gandhi University of Co-operative Management (ARGUCOM)	2	0.01%
Assam Science & Technology University (ASTU)	2	0.01%
Bodoland University (BUNIV)	99	0.93%
Cotton Univeristy (CU)	17	0.16%
Dibrugarh University (DU)	914	8.63%
Gauhati University (GU)	6266	59.25%
Krishna Kanta Handiqui State Open University (KKHSOU)	30	0.28%
National Law University and Judicial Academy (NLUJA)	9	0.08%
Tezpur University (TU)	873	8.25%
Total number of theses	10579	

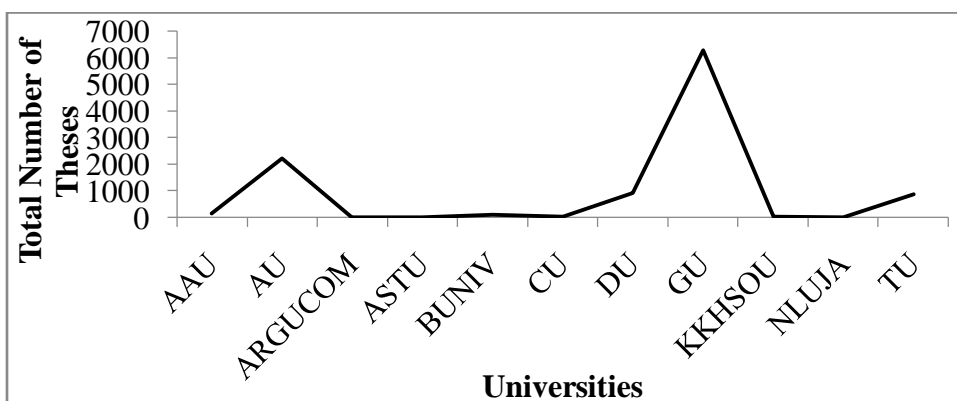


Fig. 1 Overall Quantity of Theses Submitted By the 11 Public Universities in Assam

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From Table 2 and Fig. 1, it is seen that Gauhati University (GU) is ranked as first as it has submitted the maximum theses 6266 (59.25%) as of today followed by Assam University (AU) as second whose contribution is 2216 (20.94%), Dibrugarh University (DU) as third with contribution of 914 (8.63%) theses, Tezpur University (TU) as fourth with contribution of 873 (8.25%) theses and Assam Agricultural University(AAU) in the fifth position by contributing 151 (1.42%) theses till now.

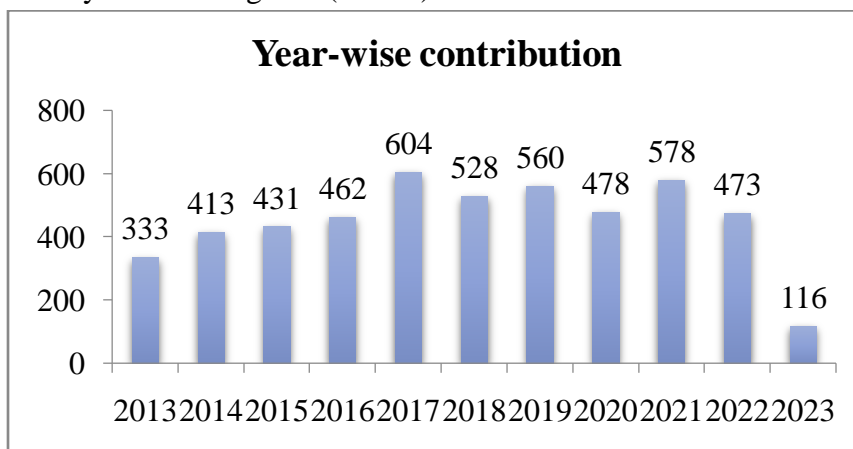


Fig. 2 Year wise Contribution of the Top 5 Contributing Public Universities of Assam

Table 3 Year Wise Contribution From 2013-2023 by the Top 5 Contributing Universities

University		GU	AU	DU	TU	AAU	Total
Year	2013	87	168	19	53	6	333
	2014	63	224	67	59	0	413
	2015	125	174	83	49	0	431
	2016	172	187	71	32	0	462
	2017	329	157	75	41	2	604
	2018	200	141	136	50	1	528
	2019	100	197	119	117	27	560
	2020	216	102	95	56	9	478
	2021	196	160	98	64	60	578
	2022	170	88	81	89	45	473
	2023	45	13	4	53	1	116
Total		1703	1611	848	663	151	4976

Fig. 2 and Table 3 shows that in the last ten years, the highest quantity of theses submitted (604) by the top 5 contributing universities from Assam was in the year 2017 with the highest contribution from Gauhati University (329). The second highest contribution (578) theses was made in the year 2021. The most contributing among these top 5 universities in the 2021 was too the Gauhati University (196). The third highest number of contribution by these universities (560) and was made in the year 2019 with the maximum contribution from Assam University (197).

Results

Just 11 out of the 20 universities in Assam (both state and central) have signed the memorandum of understanding with the INFLIBNET center in order to take part in the Shodhganga project. Up to January 16, 2024, these 11 public universities in Assam have contributed a total of 10579 to the Shodhganga repository.

With 6266 (59.25%) theses submitted as of today, out of these 11 public universities, Gauhati University (GU) is ranked first. Assam University (AU) is in second place with 2216 (20.94%) theses submitted. Dibrugarh University (DU) is in third place with 914 (8.63%) theses submitted, Tezpur University (TU) is in fourth place with 873 (8.25%) theses submitted, and Assam Agricultural University (AAU) is in fifth place with 151 (1.42%) theses submitted so far.

In the past ten years the maximum quantity of theses submitted (604) by these top five most contributing universities from Assam was in the 2017, followed by in 2021 (578) and then in 2019 (560). In 2017 and 2021, Gauhati University had contributed the maximum by submitting 329 and 196 theses respectively. In 2018 it was Assam University by submitting 197 theses to Shodhganga.

Conclusion

Shodhganga project in Assam has garnered participation from 11 out of the 20 universities, both state and central. As of January 16, 2024, these universities have collectively contributed 10,579 theses to the Shodhganga repository. Gauhati University (GU) stands at the forefront, submitting 59.25% (6,266) of theses, securing the top rank among the contributing institutions. Following closely, Assam University (AU) holds the second

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position with 20.94% (2,216) theses, while Dibrugarh University (DU) secures the third spot with 8.63% (914) theses. Tezpur University (TU) and Assam Agricultural University (AAU) occupy the fourth and fifth positions, contributing 8.25% (873) and 1.42% (151) theses, respectively. Analyzing the past decade, the peak in thesis submissions occurred in 2017, with 604 submissions, followed by 2021 (578) and 2019 (560). Gauhati University consistently excelled in 2017 and 2021, contributing 329 and 196 theses, respectively, while in 2018, Assam University took the lead with 197 submissions. This data reflects the evolving research landscape in Assam, showcasing the significant academic contributions made by these institutions to the Shodhganga project over the years.

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Exploring Gender Discrimination in Devakaruni's *Palace of Illusions*

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Abstract

In the Indian epics such as the Ramayana and Mahabharata, women were consistently portrayed as inferior beings, devoid of agency and unable to pursue their own desires. Their lives were marked by enduring cruelty and oppression. Men, on the other hand, held unquestionable dominance, wielding authority over their wives and daughters, dictating their actions and decisions. This patriarchal control extended beyond mere influence; it encompassed the power to dictate the very course of women's lives. Throughout history, women found themselves subjected to the whims and dictates of male authority figures, often with little recourse or autonomy. In Chitra Banerjee Devakaruni's "Place of Illusions," these injustices and pains faced by women are vividly depicted. Through her narrative, Devakaruni sheds light on the myriad ways in which women have been marginalized and subjugated throughout time. However, amidst this bleak reality, she also highlights the transformative power of feminism. By advocating for gender equality and challenging entrenched societal norms, feminism emerges as a potent force for change, offering hope for a future where women can assert their rights and reclaim their agency. The paper deals with the suppression of women and their discrimination in the society.

Keywords: Domination, discrimination, struggles, power and identity.

Introduction

Chitra Banerjee Devakaruni, a poet and author of Indian descent, is celebrated for her diverse literary contributions spanning various genres such as historical fiction, fantasy, magical realism, and mythology. Her works cater to both children and adults alike. Renowned for her exploration of Indian mythology, Devakaruni delves into the roles of female characters in novels like "Kunti," "Gandhari," "Sikhandi," and

"Bhanumati." In her novel "The Palace of Illusions," she intricately examines the struggles and challenges faced by women through the lens of the primary female character, Panchali. Through Panchali's story, Devakaruni sheds light on the hardships and tribulations endured by women in society.

In the tale, Panchali emerges as the central figure, her journey fraught with hardship from the very beginning, symbolized by her harrowing birth where she and her twin brother are forcefully separated by flames, casting her into the world as Draupadi, daughter of Drupad, burdened with the stigma of being deemed unwanted. Her formative years are imbued with profound suffering, setting the stage for the trials that lie ahead. As prophesied by the sage Vyasa, Panchali's life unfolds with grand predictions of extraordinary power and a fate entwined with five husbands, destined to be both a beacon of strength and the catalyst for the kingdom's eventual downfall. Throughout her tumultuous journey, it is Lord Krishna who becomes her unwavering source of solace and guidance, navigating her through the turbulent currents of fate.

Despite her affections for Karna, Panchali finds herself entangled in circumstances beyond her control, compelled into an archery contest where Arjuna claims her as his spouse, a decision made not by choice but by the whims of fate. Further tribulations arise when Kunti, Arjuna's mother, decrees her marriage to all five Pandava brothers, a decision made in the name of familial unity but one that subjects Panchali to relentless societal scrutiny and discrimination. Panchali's dignity is brutally assaulted by Duryodhana, who publicly strips her of her garments, an egregious act of gender-based violence and degradation. Yet, in her moment of utmost vulnerability, divine intervention from Lord Krishna serves as her shield, safeguarding her modesty and symbolizing a resolute defense against the pervasive forces of oppression.

As the narrative unfolds, the construction of the Palace of Illusions by the Pandavas stands as a testament to their love for Panchali. However, their joy is short-lived as the Kauravas, consumed by envy and prejudice, conspire to seize control, perpetuating a cycle of discrimination and

injustice that pervades their lives. The story continues to unfold with Panchali and her husband enduring exile and persecution, their plight serving as a stark reminder of the systemic biases and injustices deeply ingrained within society, perpetuating a cycle of discrimination and marginalization.

Conclusion

In the final reckoning, both Karna and Panchali's spouses meet their demise on the battlefield, and eventually, Panchali herself passes away, reuniting with Karna in paradise. This epic saga serves as a powerful testament to the resilience and strength of women, showcasing their identity and inherent power amidst adversity. Through the narrative, the author imparts valuable wisdom on how to navigate through challenging circumstances and overcome obstacles. The fleeting nature of love, likened to lightning that strikes and fades away, underscores the impermanence of human emotions and experiences. As a female author, she sheds light on the realities of women's lives, imparting a poignant feminist lesson. Her narrative encourages readers to remain composed in the face of discomfort and to rise above the most daunting of challenges. This lesson has personally resonated with me, inspiring a sense of resilience and the ability to transcend adversities with grace.

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**PSYCHOLOGICAL APPROACH ON MEN WITH ERECTILE DYS
FUNCTION**

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ABSTRACT

Erectile dysfunction (ED) is a prevalent condition characterized by the inability to achieve or maintain an erection sufficient for satisfactory sexual performance. It affects men across various age groups, with increased incidence in older males. ED can result from physical causes such as cardiovascular disease, diabetes, and hormonal imbalances, as well as psychological factors like stress, anxiety, and depression. Diagnosis typically involves a combination of medical history, physical examination, and specific tests. Treatment strategies include lifestyle modifications, pharmacotherapy, psychological counseling, and surgical interventions, aiming to improve both physical and psychological aspects of sexual health.

INTRODUCTION

Erectile dysfunction (ED) is the inability to achieve or maintain an erection sufficient for satisfactory sexual performance. It is a common condition affecting men, particularly with increasing age. While occasional difficulty with erections is not uncommon, persistent ED can

cause stress, impact self-confidence, and contribute to relationship problems.

CAUSES OF ERECTILE DYSFUNCTION

Physical Causes: Cardiovascular disease, diabetes, hypertension, obesity, hormonal imbalances, and certain medication

Psychological Causes: Stress, anxiety, depression, and relationship issues.

SYMPTOMS:

- Trouble getting an erection.
- Difficulty maintaining an erection during sexual activities.
- Reduced interest in sex.

DIAGNOSIS:

- Medical and sexual history.
- Physical examination.
- Blood tests.
- Other tests to evaluate blood flow and nerve function.

TREATMENT OPTIONS:

1. Lifestyle Changes: Improving diet, exercising, quitting smoking, and reducing alcohol intake.

2. Medications: Phosphodiesterase inhibitors (like sildenafil), hormone therapy.

3. Therapy: Psychological counseling, cognitive-behavioral therapy (CBT), and sex therapy.

4. Devices: Vacuum erection devices, penile implants.

5. Surgery: Vascular surgery in specific cases.

PSYCHOLOGICAL APPROACH AND COUNSELING

Counseling for men with erectile dysfunction (ED) typically involves a combination of psychological therapies aimed at addressing the mental and emotional factors contributing to the condition. Here are some common counseling approaches:

Cognitive Behavioural Therapy (CBT)

Focus: Identifying and changing negative thought patterns and behaviors.

Goal: Reduce anxiety, improve self-esteem, and enhance sexual function.

Sex Therapy

Focus: Addressing sexual performance anxiety and improving communication with partners.

Goal: Foster a healthy sexual relationship and reduce stress related to sexual performance.

Mindfulness-Based Therapy

Focus: Reducing stress and enhancing relaxation through mindfulness techniques.

Goal: Improve overall mental well-being, which can positively impact sexual function.

Relationship Counselling

Focus: Helping couples manage the emotional and relational aspects of ED.

Goal: Strengthen the relationship and reduce the impact of ED on the couple's intimacy.

Addressing Underlying Psychological Issues

Focus: Treating conditions like depression, anxiety, or past trauma that may contribute to ED.

Goal: Improve overall mental health, thereby enhancing sexual function.

STEPS IN COUNSELING

1. Assessment: Understanding the psychological and emotional factors contributing to ED.

2. Goal Setting: Defining clear, achievable goals for therapy.

3. Interventions: Implementing therapeutic techniques to address the identified issues.

4. Follow-Up: Monitoring progress and making adjustments as needed.

Counselling can be highly effective in managing ED, especially when combined with medical treatments and lifestyle changes. It helps men regain confidence, reduce anxiety, and improve their sexual and overall well-being.

HEALTHY DIET FOR MEN WITH ERECTILE DYSFUNCTION



A healthy diet can significantly improve erectile dysfunction (ED) in men. Here are some dietary recommendations:

- 1.Fruits and Vegetables:** Rich in antioxidants, vitamins, and minerals which improve blood flow and overall vascular health. Focus on berries, citrus fruits, and leafy greens.
- 2. Whole Grains:** Whole wheat, oats, and brown rice are beneficial for heart health, which is linked to erectile function.
- 3.Lean Proteins:** Include fish, chicken, turkey, and plant-based proteins like beans and lentils.
- 4. Healthy Fats:** Nuts, seeds, avocados, and olive oil can help reduce inflammation and improve heart health.
- 5. Limit Processed Foods and Sugars:** These can lead to weight gain and cardiovascular problems, worsening ED.

SAMPLE DIET PLAN

Breakfast: Oatmeal topped with berries and a handful of nuts.

Lunch: Grilled chicken salad with mixed greens, tomatoes, cucumbers, and olive oil dressing.

Snack: An apple with a spoonful of almond butter.

Dinner: Baked salmon with quinoa and steamed broccoli.

Hydration: Drink plenty of water and limit alcohol intake.

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**ENHANCING VALUE ADDITION ON RAMBUTAN: A
REVIEW**

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ABSTRACT

Rambutan (*Nephelium lappaceum* L.) is a tropical fruit native to Southeast Asia, renowned for its unique appearance, juicy flesh, and sweet flavor. In recent years, there has been growing interest in maximizing its value through various processing techniques and value-added products. This review aims to provide an overview of the current methods and strategies employed to enhance the value addition of rambutan. The review begins by exploring the nutritional composition and medicinal properties of rambutan, highlighting its rich content of vitamins, minerals, and antioxidants, which contribute to its potential health benefits. Subsequently, it delves into the diverse processing techniques utilized to extend the shelf life of rambutan and transform it into value-added products, such as jams, jellies, juices, and concentrates. These processing methods not only enhance the convenience and accessibility of rambutan but also offer opportunities for economic diversification and waste reduction in rambutan-producing regions. Furthermore, the review examines the market trends and consumer preferences driving the demand for rambutan-based products, emphasizing the importance of product

innovation and marketing strategies in capturing niche markets and maximizing profitability. Additionally, it discusses the challenges and constraints associated with rambutan processing, including issues related to postharvest handling, quality control, and market access, and proposes potential solutions and future research directions to address these challenges.

INTRODUCTION

Rambutan (*Nephelium lappaceum* L.) is a tropical fruit native to Southeast Asia, characterized by its distinctive appearance, succulent flesh, and sweet flavor. Belonging to the Sapindaceae family, rambutan trees thrive in warm, humid climates and are cultivated primarily in regions such as Malaysia, Indonesia, Thailand, the Philippines, and other parts of tropical Asia. The name "rambutan" originates from the Malay word "rambut," which means "hair," referring to the spiky, hair-like extensions covering the fruit's skin. Rambutan is often compared to lychee and longan due to its similar appearance and taste, but it possesses its own unique characteristics and nutritional profile.



Externally, rambutan fruits are round or oval in shape, typically measuring about 3 to 6 centimeters in diameter. The skin is covered with soft, pliable spines or hairs, which vary in color from green to yellow, red, or orange, depending on the variety and ripeness. Once peeled, the translucent, juicy flesh of the rambutan reveals a single seed or pit, which is not typically consumed.

Rambutan is prized not only for its refreshing taste but also for its nutritional benefits. It is rich in vitamin C, fiber, antioxidants, and minerals such as potassium, calcium, and iron. These nutrients contribute to overall health and well-being, supporting immune function, digestion, and skin health. In addition to being enjoyed fresh as a snack or dessert, rambutan is also used in various culinary applications and processed into value-added products such as jams, jellies, juices, and preserves. Its versatility and unique flavor make it a popular ingredient in tropical fruit salads, cocktails, and desserts.

Beyond its culinary uses, rambutan holds cultural significance in many Southeast Asian countries, where it is often featured in traditional festivals, ceremonies, and rituals. Its abundance during the fruiting season symbolizes prosperity, abundance, and good fortune. As global demand for exotic fruits continues to rise, rambutan has garnered attention in international markets, spurring increased cultivation and trade. With its appealing taste, nutritional benefits, and diverse culinary applications, rambutan remains a beloved tropical fruit cherished by both locals and enthusiasts worldwide.

MEDICINAL USES OF RAMBUTAN

Rambutan fruit, aside from being a delicious tropical treat, also offers several potential health benefits due to its rich nutritional profile and bioactive compounds. While scientific research on the medicinal uses of rambutan is still limited compared to more extensively studied fruits, such as berries or citrus fruits, there are some emerging findings and traditional uses worth noting. Here are some potential medicinal uses of rambutan fruit:

1.Antioxidant Properties: Rambutan is rich in antioxidants, including vitamin C and a variety of polyphenols such as flavonoids and phenolic acids. These antioxidants help neutralize harmful free radicals in the body, reducing oxidative stress and inflammation, which are linked to various chronic diseases, including cardiovascular diseases, cancer, and neurodegenerative disorders.

2.Immune Support: The high vitamin C content in rambutan fruit can support immune function by stimulating the production of white blood cells and enhancing the body's ability to fight infections. Consuming

rambutan regularly may help strengthen the immune system and reduce the risk of common illnesses such as colds and flu.

3. Digestive Health: Rambutan contains dietary fiber, which aids in digestion and promotes regular bowel movements. Fiber helps prevent constipation, regulates blood sugar levels, and supports gut health by promoting the growth of beneficial bacteria in the digestive tract.

4. Cardiovascular Health: Some studies suggest that the bioactive compounds found in rambutan, particularly flavonoids, may have cardio-protective effects by reducing the risk of heart disease. These compounds help lower blood pressure, improve blood flow, and reduce inflammation, all of which contribute to better cardiovascular health.

5. Anti-inflammatory Effects: Certain compounds in rambutan, such as gallic acid and ellagic acid, exhibit anti-inflammatory properties. These compounds may help alleviate inflammation in the body, which is associated with various chronic conditions, including arthritis, asthma, and inflammatory bowel disease.

6. Skin Health: The vitamin C content in rambutan is beneficial for skin health, as it promotes collagen synthesis, which helps maintain skin elasticity and prevent premature aging. Additionally, antioxidants in rambutan may protect the skin from damage caused by UV radiation and environmental pollutants.

7. Traditional Uses: In traditional medicine practices in Southeast Asia, various parts of the rambutan tree, including the fruit, leaves, barks, and roots, have been used to treat ailments such as dysentery, fever, and diarrhea. However, more research is needed to validate these traditional uses and explore their potential therapeutic effects.

CULINARY USES OF RAMBUTAN

Rambutan fruit's sweet and juicy flesh makes it a versatile ingredient in various culinary creations. Here are some popular culinary uses of rambutan fruit:

1. Fresh Consumption: The simplest and perhaps most enjoyable way to enjoy rambutan is by eating it fresh. Simply peel away the spiky skin to reveal the translucent, juicy flesh inside. Rambutan's sweet flavor and refreshing texture make it a delightful snack or addition to fruit salads.

2. Fruit Salads: Rambutan adds a burst of sweetness and tropical flair to fruit salads. Its vibrant color and unique appearance make it an eye-

catching addition to mixed fruit salads, providing a refreshing contrast to other fruits like pineapple, mango, and papaya.

3. Desserts: Rambutan can be used to create a variety of desserts, including sorbets, ice creams, and fruit tarts. Its natural sweetness and subtle floral notes pair well with creamy desserts like custards and puddings, adding a refreshing twist to classic recipes.

4. Beverages: Rambutan can be juiced or blended to make refreshing beverages, such as smoothies, cocktails, and fruit punches. Combine rambutan juice with other tropical fruits like pineapple, coconut, and lime for a delicious and hydrating drink.

5. Preserves and Jams: Rambutan's high pectin content makes it suitable for making preserves, jams, and jellies. Cooked rambutan preserves can be spread on toast, biscuits, or scones for a tropical twist on traditional breakfast fare.

6. Chutneys and Salsas: Rambutan can be incorporated into savory dishes by using it to make chutneys, salsas, or relishes. Combine diced rambutan with onions, cilantro, lime juice, and chili peppers to create a flavorful topping for grilled meats, fish, or tacos.

7. Asian Cuisine: Rambutan is a common ingredient in various Southeast Asian dishes, particularly in Thai and Malaysian cuisine. It is often used in salads, curries, and stir-fries, adding sweetness and texture to savory dishes.

8. Candied Rambutan: Rambutan can be candied by simmering it in a simple syrup until translucent and then drying it. Candied rambutan makes a delicious and visually appealing garnish for cakes, pastries, and desserts.

9. Infusions and Syrups: Rambutan can be used to infuse flavor into syrups, sauces, and vinegars. Rambutan-infused syrups can be drizzled over pancakes, waffles, or yogurt, while rambutan-infused vinegars can be used in salad dressings and marinades.

VALUE ADDED PRODUCTS FROM RAMBUTAN



Value-added products derived from rambutan offer innovative ways to extend the fruit's shelf life, enhance its marketability, and cater to diverse consumer preferences. Here are some popular value-added products made from rambutan:

1. Rambutan Jam: Rambutan jam is a sweet and flavorful spread made from cooked rambutan pulp, sugar, and sometimes added pectin or lemon juice for thickening and flavor enhancement. Rambutan jam can be enjoyed on toast, pastries, or as a filling for cakes and pastries.

2. Rambutan Jelly: Rambutan jelly is a translucent and jiggly dessert made from rambutan juice, sugar, and gelatin or agar-agar. It can be served on its own as a refreshing dessert or used as a topping for ice cream, yogurt, or fruit salads.

3. Rambutan Juice: Rambutan juice is a refreshing beverage made by blending or pressing rambutan flesh and then straining the juice. It can be served chilled on its own or mixed with other fruit juices for a tropical fruit punch.

4. Rambutan Syrup: Rambutan syrup is a concentrated sweet syrup made from rambutan juice and sugar, often used to flavor beverages such as cocktails, mocktails, and sodas. It can also be drizzled over pancakes, waffles, or desserts for added sweetness.

5. Rambutan Concentrate: Rambutan concentrate is a thick, concentrated form of rambutan juice, usually made by evaporating water from rambutan juice. It is used as a base for making rambutan-flavored beverages, sauces, and desserts.

6. Rambutan Preserves: Rambutan preserves are made by cooking rambutan fruit with sugar and sometimes added spices or flavorings until thickened and preserved. Rambutan preserves can be spread on toast, biscuits, or used as a topping for yogurt or ice cream.

7. Dried Rambutan: Dried rambutan is made by dehydrating fresh rambutan fruit until it becomes leathery and chewy. Dried rambutan makes a convenient and portable snack or can be used as an ingredient in trail mixes, granola bars, or baked goods.

8. Rambutan Wine: Rambutan wine is a fermented alcoholic beverage made from rambutan fruit, sugar, and yeast. It has a sweet and fruity flavor profile and can be enjoyed on its own or paired with desserts or cheese.

9. Rambutan Ice Cream: Rambutan ice cream is a creamy frozen dessert flavored with rambutan juice or puree. It offers a unique tropical twist to traditional ice cream flavors and is often served as a refreshing treat on hot days.

CONCLUSION

While rambutan fruit shows promise as a health-promoting food, it's essential to consume it as part of a balanced diet rather than relying solely on its medicinal properties. Further research, including clinical trials, is needed to fully understand the specific health benefits of rambutan and its potential applications in disease prevention and treatment. In conclusion, the review underscores the immense potential for value addition on rambutan through innovative processing techniques and product development, thereby fostering economic growth, promoting sustainability, and meeting the evolving demands of consumers in both domestic and international markets. By leveraging the unique qualities of rambutan and harnessing technological advancements, stakeholders across the rambutan value chain can unlock new opportunities for growth and prosperity. These value-added products not only help reduce postharvest

losses of rambutan fruit but also provide consumers with a diverse range of delicious and innovative ways to enjoy this tropical delicacy throughout the year.

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**IMPACT OF PERCEIVED SOCIAL SUPPORT ON
PROFESSIONAL HELP-SEEKING BEHAVIOR: A
COMPREHENSIVE REVIEW**

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ABSTRACT

This review examines the impact of perceived social support on professional help-seeking behavior. Perceived social support, defined as an individual's belief in being cared for and valued within a supportive social network, significantly influences the likelihood of seeking professional help for psychological or emotional issues. The review integrates various theoretical frameworks, including the Social Support Theory, Health Belief Model, and Theory of Planned Behavior, to explain this relationship. Empirical evidence demonstrates that higher levels of perceived social support are associated with increased intentions to seek help, particularly emotional support. Furthermore, perceived social support mitigates the negative impact of mental health stigma and reduces barriers to seeking help. The influence of social support varies across demographics and cultural contexts. Mechanisms such as the stress-buffering hypothesis and enhanced self-efficacy are explored. The review underscores the importance of enhancing support networks, public awareness campaigns, and integrating social support into mental health services to promote help-seeking behavior. Tailored interventions that consider demographic and cultural differences are recommended to improve mental health outcomes.

INTRODUCTION

Perceived social support refers to an individual's belief that they are cared for, valued, and part of a supportive social network. This perception can significantly influence various aspects of mental health and well-being, including the likelihood of seeking professional help when facing psychological or emotional difficulties.

THEORETICAL FRAMEWORKS

Social Support Theory

Social Support Theory is a framework that explores how relationships and social networks contribute to individual well-being and resilience. It posits that social support can mitigate the negative effects of stress and improve overall mental and physical health. Social Support Theory emphasizes the importance of social relationships and networks in promoting well-being and mitigating the impacts of stress. By understanding the different types and sources of social support, individuals and organizations can foster environments that enhance support systems, ultimately contributing to improved health outcomes and overall quality of life.

Key Components of Social Support Theory:

1. Types of Social Support:

Emotional Support: Expressions of empathy, love, trust, and caring. This type of support involves listening and providing a sense of belonging.

Instrumental Support: Tangible assistance such as financial help, services, or physical aid.

Informational Support: Providing advice, suggestions, and information that can help someone solve a problem or manage a situation.

Appraisal Support: Providing feedback and affirmation that helps someone evaluate themselves and their situation.

2. Sources of Social Support:

Family: Immediate and extended family members often provide a primary source of support.

Friends: Close friends can offer a significant amount of emotional and instrumental support.

Community: Neighbours, local groups, and community organizations can also play a role.

Professional Help: Therapists, counsellors, and support groups provide specialized support.

3. Functions of Social Support:

Buffering Hypothesis: Social support acts as a buffer against stress, reducing the negative effects of stressful events.

Direct Effects Hypothesis: Social support directly contributes to well-being, regardless of the presence of stress.

HEALTH BELIEF MODEL (HBM)

Health Belief Model (HBM) is a psychological framework that explains and predicts health-related behaviors by focusing on individuals' attitudes and beliefs. It was developed in the 1950s by social psychologists Hochbaum, Rosenstock, and Kegels, and it remains one of the most widely used models in public health. The model suggests that people's beliefs about health problems, perceived benefits of action, and barriers to action can predict health-related behaviors. The Health Belief Model provides a useful framework for understanding health behaviors and designing public health interventions. By considering individual perceptions of susceptibility, severity, benefits, barriers, cues to action, and self-efficacy, health professionals can create more effective strategies to promote healthy behaviors and manage diseases. Despite its limitations, the HBM remains a foundational model in health psychology and public health practice.

KEY COMPONENTS OF THE HEALTH BELIEF MODEL:

1. Perceived Susceptibility:

The individual's assessment of their risk of getting a condition or disease.

2. Perceived Severity:

The individual's belief about the seriousness of contracting an illness or of leaving it untreated, including medical and social consequences.

3. Perceived Benefits:

The belief in the efficacy of the advised action to reduce the risk or seriousness of impact.

4. Perceived Barriers:

The individual's assessment of the obstacles to behavior change. This includes both tangible and psychological costs of the advised action.

5. Cue to Action:

Factors that activate readiness to change. These cues can be internal (e.g., symptoms) or external (e.g., media campaigns, advice from others).

6. Self-Efficacy:

The level of a person's confidence in their ability to successfully perform a behavior.

THEORY OF PLANNED BEHAVIOR (TPB)

Theory of Planned Behavior (TPB) is a psychological theory that explains human behavior through three core components: attitudes, subjective norms, and perceived behavioral control. Developed by Icek Ajzen in the 1980s, TPB is an extension of the Theory of Reasoned Action (TRA) and is widely used to predict and understand a variety of behaviors. The Theory of Planned Behavior provides a comprehensive framework for understanding and predicting human behavior by examining attitudes, subjective norms, and perceived behavioral control. Despite its limitations, TPB is a valuable tool for designing effective interventions across various domains, including health, environmental, and organizational behaviors. By addressing these core components, practitioners can create strategies that more effectively promote desired behaviors and achieve better outcomes.

KEY COMPONENTS OF THE THEORY OF PLANNED BEHAVIOR:

1. Attitude toward the Behavior:

- Refers to the degree to which a person has a favorable or unfavorable evaluation of the behavior in question.
- This component is influenced by the individual's beliefs about the outcomes of the behavior and their evaluations of these outcomes.

2. Subjective Norms:

- Refers to the perceived social pressure to perform or not perform the behavior.

- This component is influenced by normative beliefs about whether important others think they should engage in the behavior.

3. Perceived Behavioral Control:

- Refers to the perceived ease or difficulty of performing the behavior, based on past experiences and anticipated obstacles.
- This component is similar to self-efficacy and is influenced by control beliefs about the presence of factors that may facilitate or hinder performance of the behavior.

BEHAVIORAL INTENTION AND ACTUAL BEHAVIOR:

- According to TPB, the most immediate predictor of behavior is the intention to engage in that behavior. Intentions are formed by the combination of attitudes, subjective norms, and perceived behavioral control.
- While behavioral intention is a strong predictor of behavior, actual performance of the behavior can be influenced by additional factors such as unforeseen circumstances or changes in perceived control.

EMPIRICAL EVIDENCE

1. Positive Influence of Social Support:

- Studies consistently show that higher levels of perceived social support are associated with greater intentions to seek professional help.

2. Types of Social Support:

- Emotional Support: Involves empathy, care, and reassurance, which is particularly influential.
- Informational Support: Provides advice and information.
- Instrumental Support: Offers tangible aid and services.

3. Mediating Role of Mental Health Stigma:

- Perceived social support mitigates the negative impact of stigma, making individuals more likely to seek help despite potential judgment.

4. Differences across Demographics:

- Younger individuals and women report higher levels of social support and are more likely to seek help compared to older individuals and men.

5. Contextual Factors:

- Cultural context affects the influence of social support. In collectivist cultures, strong community and family bonds enhance the impact of social support on help-seeking behavior.

MECHANISMS AND MODERATORS

1. Stress-Buffering Hypothesis:

- Social support buffers the negative effects of stress, promoting coping mechanisms and increasing the likelihood of seeking professional help.

2. Self-Efficacy:

- Enhanced self-efficacy, or the belief in one's ability to manage difficulties, is a result of strong social support, which promotes help-seeking behavior.

3. Barriers to Seeking Help:

- Perceived social support reduces both practical (e.g., financial costs, accessibility) and psychological barriers (e.g., concerns about confidentiality) to seeking help.

IMPLICATIONS FOR PRACTICE AND POLICY

1. Enhancing Support Networks:

- Interventions aimed at strengthening social support networks, such as community-building activities and support groups, can encourage professional help-seeking behavior.

2. Public Awareness Campaigns:

- Increasing awareness about the importance of social support and reducing stigma associated with mental health issues can foster a more supportive environment for help-seeking.

3. Integrating Social Support in Mental Health Services:

- Mental health services can benefit from integrating family and friends into the treatment process, leveraging their support to improve treatment outcomes and adherence.

4. Tailored Interventions:

- Recognizing the diversity in how different groups perceive and utilize social support can help in designing tailored interventions that address specific needs and barrier

CONCLUSION

Perceived social support plays a crucial role in influencing professional help-seeking behavior. By understanding and leveraging the different facets of social support, mental health professionals and policymakers can develop more effective strategies to promote help-seeking behaviors, ultimately improving mental health outcomes across diverse populations.

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**Stand Alone Display with Hardware Implementation Based on
Institution Management**

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Abstract

This paper presents a novel approach to user interaction with a standalone display system through voice commands and touch input. The system provides users with the capability to access various management systems, including canteen, library, and transport, using voice commands or touch gestures. By integrating voice recognition technology, users can conveniently interact with the display system without the need for physical input devices. The system architecture is implemented using Raspberry Pi, combining both software and hardware components to enable seamless integration and efficient operation. The software implementation includes the development of intuitive user interfaces and backend systems for managing the diverse functionalities of the management systems. Hardware components such as displays, sensors, and input devices are integrated to provide a robust and interactive user experience. This paper discusses the design considerations, implementation details, and practical aspects of deploying the standalone display system in various environments. The proposed system offers enhanced usability, accessibility, and versatility, making it suitable for a wide range of applications in different domains.

INTRODUCTION

Effective management of Modern facilities like libraries, canteens,

and transport services is essential for smooth operations and providing users with a positive experience. It introduces a new and innovative way to improve how these places are run.

The proposed solution involves special standalone display that come with integrated invoice system. This display has several important features. First, they have a user-friendly interface, making it easy for people to interact with them. They can generate invoices conveniently and process them efficiently. Users can interact with these displays either by touching the screen or using voice commands, making the whole management process much more streamlined and reducing the need for manual work..

OBJECTIVE

- Users can give their instructions through voice in this Stand Alone Display.
- Access canteen management system, library management system and transport management system using voice.
- Intelligent Personal Assistant (IPAs) embedded with standalone display.

PROBLEM STATEMENT

To develop a software for students and employees to assist them and to perform the tasks using voice commands on the standalone display system.

METHODOLOGY

The methodology used to create the above content involves the following steps:

Research: Extensive research conducted to gather information on the concept of Intelligent Personal Assistants (IPAs), their characteristics, and their applications in different domains such as canteen management, library management, and transport management systems. Reputable sources such as articles, research papers, and authoritative websites consulted. Understanding User Needs: The focus is on understanding the challenges and limitations of traditional approaches in canteen management, library management, and transport management. This understanding helped to identify how IPAs can address these issues and provide improved services and user experiences.

Content Organization: The gathered information organized into coherent sections, covering the definition and goals of IPAs, their applications in specific domains, and the benefits they offer. The content is structured logically to provide a clear and comprehensive overview.

Language and Clarity: The content is written in clear and concise words like open canteen, open library, open transport and they also include regional languages. • **Review and Refinement:** The content is reviewed to ensure accuracy, coherence, and relevance. Any inconsistencies or gaps are addressed, and the content is refined to provide a comprehensive understanding of the topic. Attention is given to ensure the content effectively conveys the importance of IPAs and their utilization through standalone displays. By following these steps, the IPA is developed to provide an informative and accessible standalone display system with its significance in canteen management, library management, and transport management systems.

WORK PLAN

Intelligent Personal Assistants (IPAs) Embedded with Standalone display system can have specific applications in various systems such as canteen management, library management and transport management, particularly when these systems are voice command-based. Each management system has their own administrator. IPAs offer numerous benefits, including enhanced efficiency, improved experience, and streamlined operations. We are planning to transit the static web pages into dynamic ones and we have integrated these three management systems into a single package. Let's see into each system and explore how IPAs can be beneficial in more detail:

Speech-to-Text (STT):

Speech-to-Text often referred as Automatic Speech Recognition (ASR), is the technology responsible for the conversion of spoken language to text and emphasize its ability to analyse and respond to certain predefined conditions, treating them as input parameters. These conditions are typically in the form of linguistic or contextual constraints.

The ASR system analyse the input speech against these conditions during the transcription process. when it works ASR combines the capabilities of speech-to text conversion with conditional processing, allowing it to dynamically adapt its transcription behaviour based on

predefined task. In such cases where the conditions are not fulfilled, the ASR system will respond by aborting the transcription task and issuing an alert or error message, often referred to as an abort message like "try again".

Text-to-Speech (TTS):

Text-to-Speech is a technology that turns written text into spoken words. It functions by taking written textual content as its starting point and then generates a synthesized audio output that closely mimics human speech. During this process, if specific conditions are met, the technology will perform the task and provide an audio speech output as confirmation of task completion.

CANTEEN MANAGEMENT SYSTEM

Implementing an IPA embedded with standalone display in a canteen management system can bring about a revolutionary change in the food ordering process.

- **User access:** Users can interact with the IPA through standalone displays to remotely place their orders. The IPA can handle payment processing, credit computation, and credit record management, thereby reducing manual errors and saving time for both customers and canteen staff. This approach offers a more convenient and efficient way to manage canteen operations.
- **Admin access:** Administrators can view users once they have placed their orders. The user details cannot be altered by the admin, but the admin can add or delete products for the users and modify their information.

LIBRARY MANAGEMENT SYSTEM

Standalone display system can significantly enhance library services by providing users with a more accessible and efficient means of accessing resources.

- **User access:** Users can interact with the IPA to search for books, check availability, place holds, and even receive personalized reading recommendations. In this system, a First-In-First-Out (FIFO) model is employed, ensuring that the first person to place an order can borrow the book.
- **Admin access:** Librarians can benefit from the IPA's ability to organize and manage information effectively, simplifying tasks such as cataloging, tracking borrowed items, and generating

reports. Overall, the IPA improves the user experience and optimizes library operations.

TRANSPORT MANAGEMENT SYSTEM

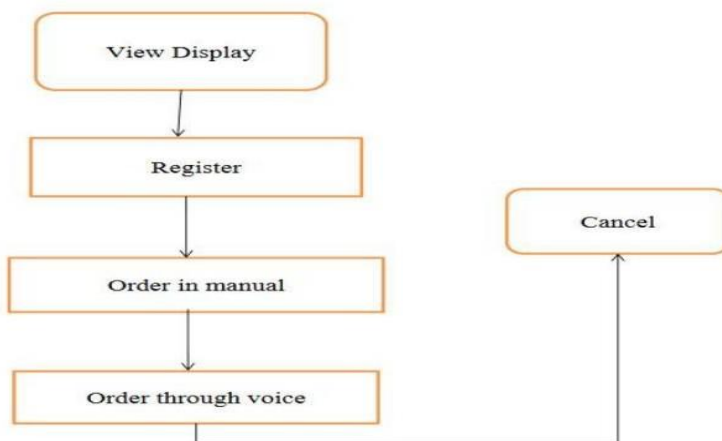
Integrating an IPA into a transport management system can provide users with real-time information about bus routes, schedules, and other relevant details.

- User access: Users can interact with the IPA to inquire about bus arrival times, enabling them to identify the appropriate bus for their desired route. This simplifies the communication process and enhances the user's transportation experience.

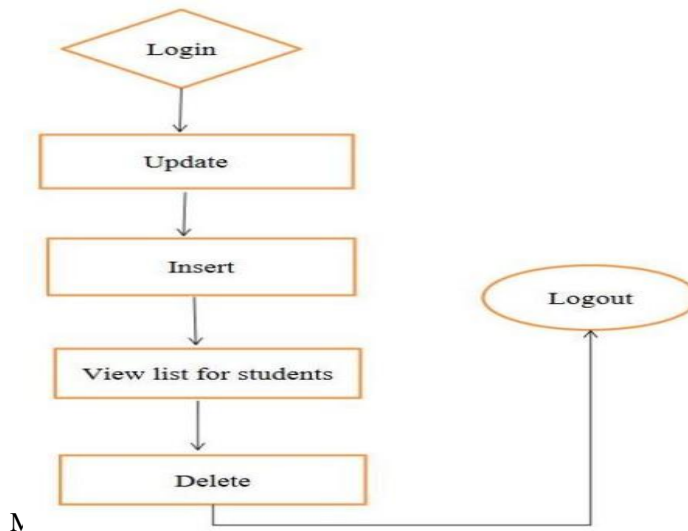
- Admin access: The administrator has able to modify bus routes, bus details and include additional information about the buses. By leveraging IPAs in these systems, institutions can automate processes, improve accessibility, and enhance overall efficiency. IPAs facilitate seamless communication between users and the systems, reducing manual effort and optimizing resource utilization. Their ability to understand human speech and respond through synthesized voices makes them ideal for creating interactive and user- friendly interfaces. To access these management systems, users can utilize standalone displays within the institution. Users must register or log in to use these systems, providing necessary details for their usage. Upon registration, admins can view user information when orders are placed.

FLOW DIAGRAM

FOR USER:



FOR ADMIN:



In the context of a standalone display system, the terms "master" and "slave" are used to describe the relationship between two or more devices that work together to perform a specific function. The master device controls the operation of the slave devices and coordinates their activities to achieve a unified display output. Here's a brief overview of how the master-slave configuration might work in a standalone display system:

Master Device:

The master device is responsible for managing the overall operation of the display system.

It receives input signals, processes them, and sends commands to the slave devices to generate the desired display output.

The master device may have additional features such as user interface controls, connectivity options, and advanced processing capabilities.

Slave Devices:

The slave devices are controlled by the master device and are used to display the output generated by the master.

They receive commands from the master device and synchronize their display output to create a cohesive and coordinated visual presentation.

Slave devices can vary in type and functionality, such as LCD panels, LED displays, projectors, or any other display medium.

X.FIGURES

I.USER VIEW

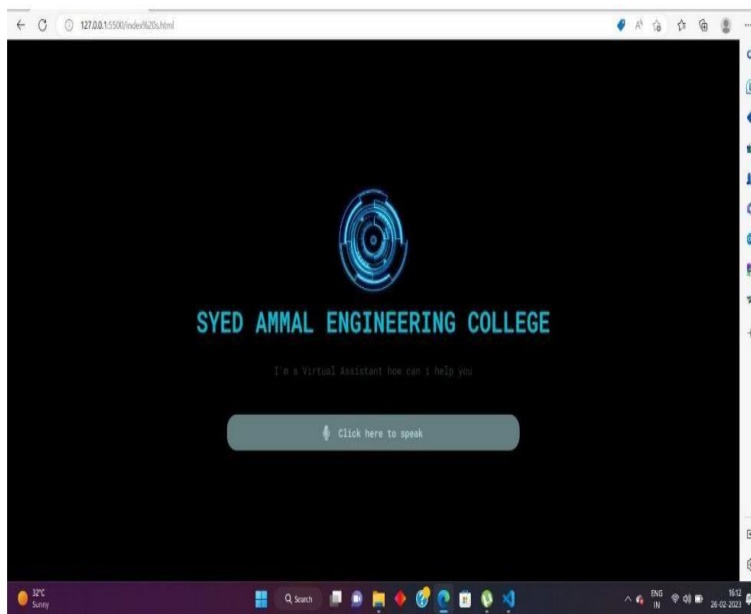


FIGURE 1.1

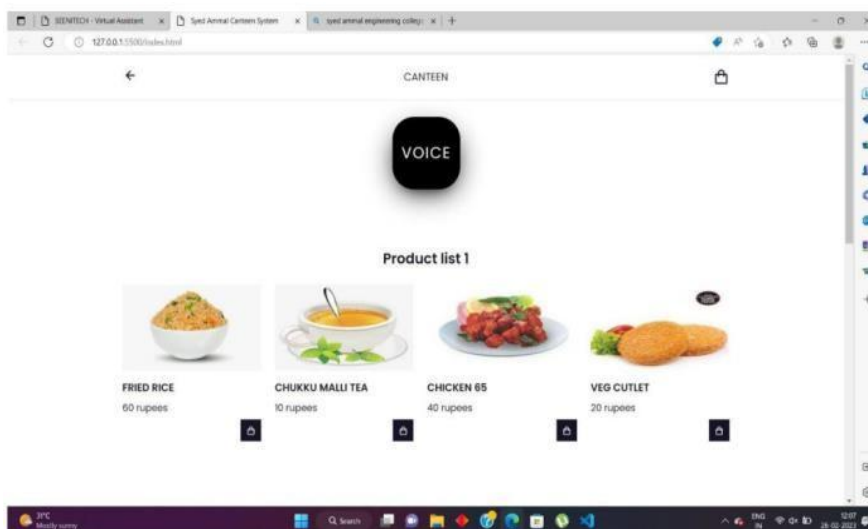


FIGURE 1.2

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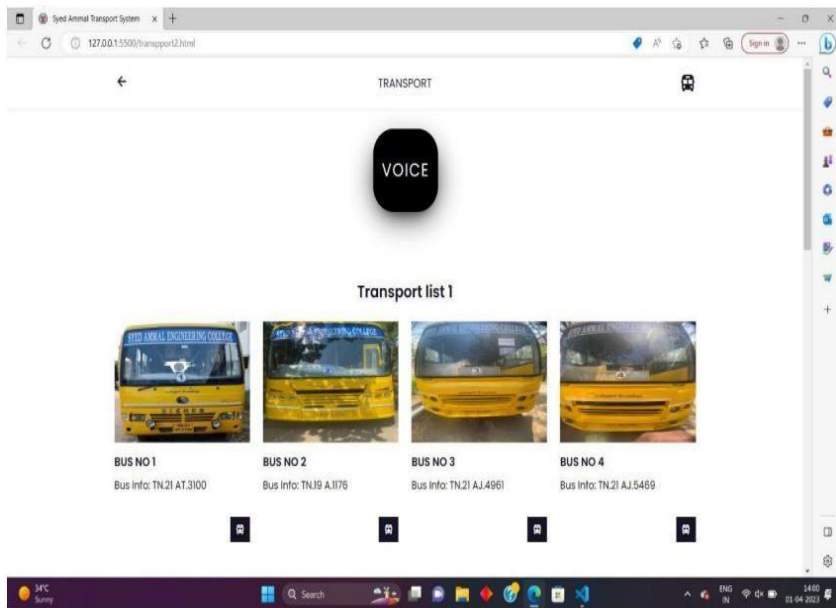
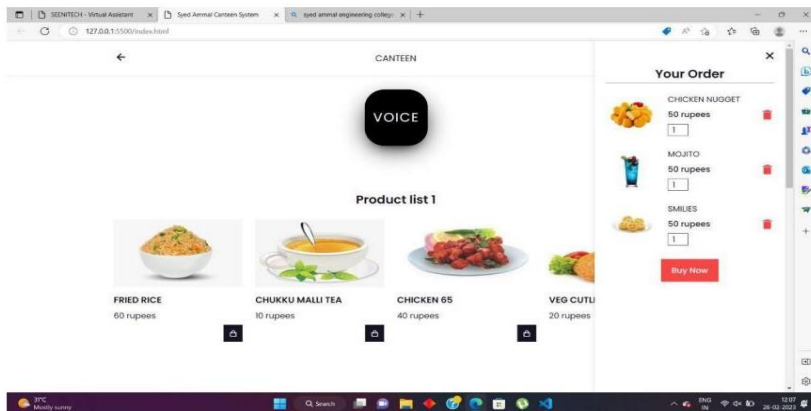


FIGURE 1.3



II.ORDER IN MANUAL

FIGURE 2.1

SHODHKAVERI: GLOBAL ACADEMIC PRACTICES OF MULTIDISCIPLINARY RESEARCH AND DEVELOPMENT

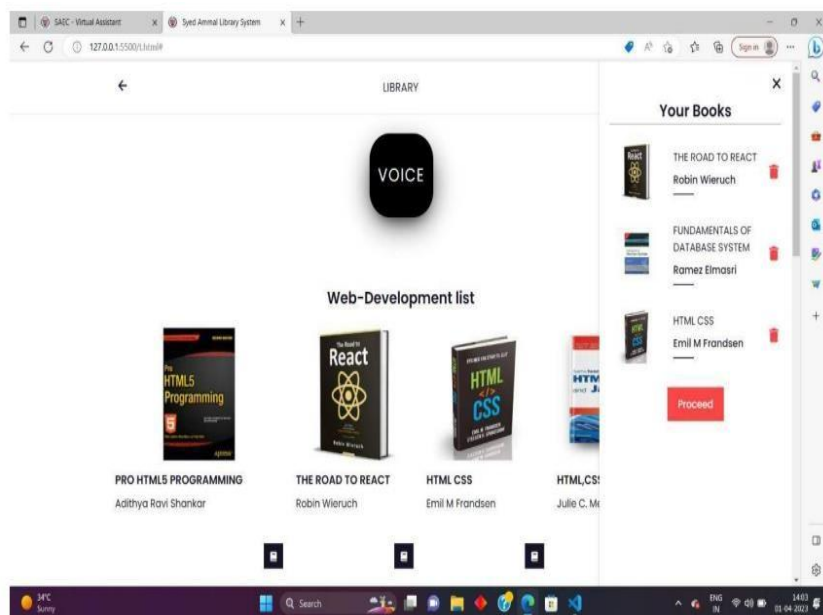
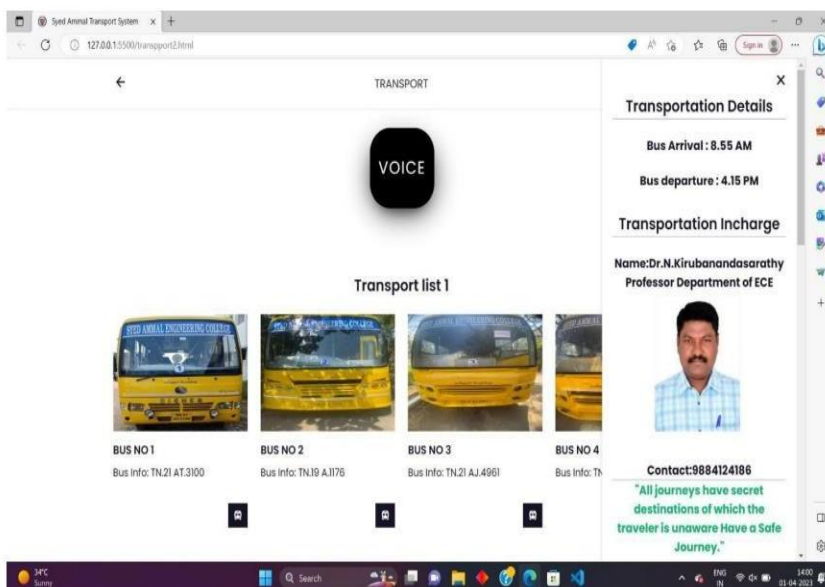


FIGURE 2.2

USER VIEW DETAILS

FIGURE 3.1



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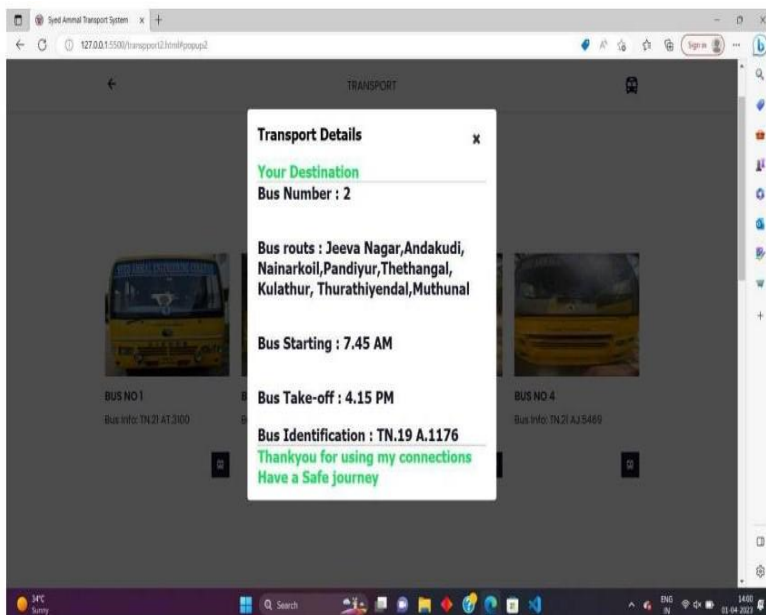


FIGURE 3.2

FEATURES Laptop/Tablet: A laptop or tablet can also be a viable option, especially if you need to display interactive elements or allow viewers to zoom in on specific sections of the paper. You can set the device to slideshow mode and configure it to automatically advance through the slides.



FIGURE-LAPTOP/TABLET

Mini PC with Monitor:

A mini PC connected to a monitor can provide a more robust solution, especially if you need to display multiple papers or allow viewers to interact with the content in a more complex way.

You can install presentation software or a custom kiosk application to manage the display

RASPBERRY PI

The Raspberry pi has two video output options – composite (Radio Corporation of America - RCA) and High- Definition Multimedia Interface (HDMI).

Display screens with VGA port can also be used by using HDMI OUT of the Raspberry pi with a HDMI to Video Graphics Array (VGA) convertor.

Therefore, the proposed method is versatile with respect to display options. The operating system used in Raspberry pi is Raspbian.

The most popular programming language for Raspberry Pi is Python. It is a high-level language and thus lesser coding effort is needed as compared to using assembly language for other microcontroller boards.

Thus, the method proposed in this paper has several advantages over the prevalent methods used to offer the same functionality.



FIGURE-RASPBERRY PI

.PROCEDURES

A standalone system is any application or software that does not need to be bundled with other software or applications, nor does it

require anything else to function.

In other words, it's software that can "stand on its own" without help from the Internet or another processor computer.

Standalone systems can refer to: Computer programs that can work offline (do not require a network connection to operate); Separate software (not part of some bundled software).

A program that runs as a separate computer process, not as an addition to an existing process; Standalone program that does not require operating system services to run; A portable application can run without installation procedures.

To illustrate the concept, consider a TiVo box, a classic example of a standalone system.

It operates independently to record television programs, not reliant on external devices or services.

In contrast, a DVR integrated into a digital cable box is not a standalone system as it relies on the cable box's infrastructure.

In the realm of retail management, ConnectPOS serves as another notable example. It's a standalone Point-of-sales system that can function with or without any eCommerce platform, offering flexibility to retailers. In contrast, Shopify POS is not standalone because it's tightly integrated with the Shopify platform; they go hand in hand.

Integrated devices often present cost savings as they combine functions in one device. However, if a business plans to scale or has specific customization needs, standalone software like Connect POS typically offers more room for tailoring solutions to unique requirements.

WORKING FUNCTION

As the name implies, the operation mode of a standalone system is to work alone, not relying on other factors, devices or software.

It performs the tasks on its own and manages common tasks for an entire organization.

To make it easy to imagine, this system will be similar to a one-member company.

A standalone program or stand-alone system usually runs alone without reference to the environment.

In e-commerce, a standalone system usually has its own operating mechanism.

For example, a system that can manage itself, support customers, and analyze necessary metrics without relying on another partner is a standalone system.

Standalone POS systems have gained significant popularity among retailers due to their ability to streamline a range of critical operations, creating a unified platform for Online-to-Offline (O2O) transactions, inventory management, and robust reporting and analytics.

What sets standalone systems like ConnectPOS apart is their adaptability to cater to the unique requirements of retailers, especially those with multiple stores.

ConnectPOS offers a high degree of customization, making it a perfect fit for diverse business needs.

It accommodates the growth of merchants by seamlessly integrating with local payment gateways like Grabpay in Asia or Flutterwave in South Africa, ensuring that it can meet the specific payment preferences of customers across various regions.

Moreover, ConnectPOS can be implemented with Enterprise Resource Planning (ERP) solutions like NetSuite, consolidating and simplifying the management of all essential retail operations within one cohesive platform.

This versatility and adaptability make standalone POS systems like ConnectPOS a valuable asset for retailers looking to optimize their operations and grow their businesses.

CHARACTERISTICS

A standalone system usually has its own characteristics.

First of all, standalone software usually works without an Internet connection. It includes both anti-virus software and software installed on the computer via CD, USB or downloaded from the Internet.

Standalone systems will never be part of a package. It works with a full interface, such as a desktop program with a USB-enabled label printer.

It runs separately from all other processes. This type of system does not rely on any other software to function. The most common example is today's computer operating systems.

Although the operating system contains many related files, it does not depend on any of them — it runs on its own without

any companion software or an Internet connection.

Standalone systems excel in scenarios where simplicity, reliability, and data security are paramount, as they are less susceptible to disruptions caused by network issues or external dependencies.

This autonomy grants them the ability to operate seamlessly and efficiently, making them ideal choices for applications such as offline software, point-of-sale terminals, and self-contained industrial or embedded systems.

ADVANTAGES AND DISADVANTAGES

When considering the implementation of a standalone system, it is important to weigh its advantages and disadvantages.

This comparison enables you to make informed decisions about the most suitable system for your needs.

ADVANTAGES:

Damage control: Standalone systems are less likely to suffer widespread damage due to issues such as a virus attack or a hardware failure, as they are isolated from other systems.

Simplicity: Managing this system is relatively straightforward since it requires less expertise than overseeing multiple systems or an entire network.

Convenience: It offers easy access to attached peripherals like printers and scanners, which are usually within reach.

In contrast, networked devices may be located far from the user's computer.

Resource allocation: Users on standalone systems typically don't impact the resources or performance of other users because everyone operates individually. This encourages more efficient use of system resources.

DIS-ADVANTAGES

Limited access: Users operating on standalone systems are typically limited to a single device and cannot access their files or data from different computers, in contrast to networked systems where data sharing is more fluid.

However, by opting for a cloud-based POS solution like Connect POS, all information is centralized in a unified platform, eliminating concerns about access restrictions.

Users can securely access and manage their data from any location or

device with an internet connection, providing a seamless and flexible experience that transcends the limitations of traditional standalone systems.

Scaling challenges: Businesses may struggle to install or manage similar systems across multiple standalone devices instead of efficiently managing network updates and installations.

Higher costs: Connecting each system to a single device is generally more cost-effective than purchasing individual devices for each standalone system.

Monitoring difficulties: Traditional standalone systems are inherently challenging to monitor and track. In today's competitive technological landscape, the adoption of a next-generation POS system like Connect POS offers a transformative solution.

By harnessing micro-service and headless technologies, Connect POS effectively mitigates the limitations of traditional standalone systems, enabling comprehensive tracking and monitoring of multiple touch points concurrently.

This empowers businesses with real-time insights and control, enhancing their ability to adapt and excel in a fast-paced digital environment.

HARDWARE COMPONENTS

Hardware Components of the System:

Processor (CPU): The central processing unit (CPU) is the brain of the standalone display system.

It processes instructions, executes programs, and manages data.

Memory (RAM and ROM): RAM (Random Access Memory): Provides temporary storage for data and instructions that the CPU needs to access quickly.

ROM (Read-Only Memory): Stores firmware or software that is permanently written onto the system and is not erased when the power is turned off.

Storage (Hard Drive/SSD): It provides long-term storage for programs, data, and other files. Solid-state drives (SSDs) or hard disk drives (HDDs) are commonly used.

Display Screen: The screen or monitor displays the output from

the system. It can be a touchscreen or non- touchscreen depending on the application.

Input Devices (Keyboard, Mouse, Touchscreen): These devices allow users to interact with the standalone display system, inputting data or commands.

Graphics Card (GPU): Responsible for rendering graphics and images to be displayed on the screen. It accelerates the image creation process for smoother and faster display performance.

Power Supply Unit (PSU): Provides electrical power to all components of the standalone display system.

Connectivity Ports (USB, HDMI, VGA, Ethernet): These ports allow the system to connect to external devices, networks, or peripherals.

Hardware Implementation:

Assembly: The hardware components are assembled together according to the system's requirements.

This involves connecting the CPU, memory modules, storage drives, graphics card, and other peripherals to the motherboard.

Installation of Operating System: A standalone display system typically requires an operating system (OS) to manage its resources and provide a user interface.

The OS is installed onto the storage drive (HDD/SSD) from an external source like a USB drive or CD/DVD.

Install a lightweight operating system like Raspbian Lite on the SD card.

Configure the Raspberry Pi to boot directly into your display application.

Learn about the Raspberry Pi's GPIO pins if using an LCD display.

Choosing Display Software:

HDMI Display: No additional software needed, the Raspberry Pi will recognize it as a secondary display.

LCD Display:

Several libraries are available for different display types.

Configuration: Once the OS is installed, the system needs to be configured with the necessary settings, drivers, and software applications for its intended purpose.

This may include display settings, network configurations, security settings, and software installations.

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Testing: After assembly and configuration, the standalone display system undergoes testing to ensure all hardware components are functioning correctly and the software applications are running smoothly.

Deployment: Once tested and verified, the standalone display system is ready for deployment in its intended environment, whether it's for digital signage, information kiosks, point-of-sale systems, or other applications.

HARDWARE

Raspberry Pi: Any model will work, but Raspberry Pi 4 offers the best performance for complex displays.

Display: You have several display options: HDMI Display: Most common choice.

Requires an HDMI cable to connect the Pi to a monitor or TV.

LCD Display: Connects directly to the Pi's GPIO pins using an interface like SPI or I2C. Offers a more compact solution but requires additional configuration.

Touchscreen Display: An LCD display with a touchscreen overlay. Great for interactive applications.

Power Supply: MicroUSB power supply for the Raspberry Pi

SD Card: For the Raspberry Pi's operating system and application files.

Enclosure (Optional): A case to protect the Raspberry Pi and display (if separate).

Implementation:

Setting Up the Raspberry Pi:

Popular options include TFT_LCD library for SPI displays and fbtf for I2C displays.

Developing the Display Application:

You can use Python libraries like Pygame or Kivy to create the content you want to display (text, images, etc.).

The application will continuously update the display with your desired information.

Optional: Autostart and Power Management

Configure the Raspberry Pi to automatically launch your display application on boot.

Look into options for power management to turn off the display when not in use (power saving mode).

Procedure

Materials Needed:

1. Raspberry Pi (any model, but the Raspberry Pi 4 is recommended)

for better performance)

2. Micro SD card (at least 16GB, Class 10 recommended)
3. Power supply for Raspberry Pi
4. HDMI cable
5. Display (TV or monitor with HDMI input)
6. Keyboard and mouse (for initial setup)
7. Internet connection (Ethernet or Wi-Fi)

STEPS

1. Install Raspberry Pi OS:

Download the latest version of Raspberry Pi OS from the official Raspberry Pi website.

Use a tool like Raspberry Pi Imager to flash the OS onto the micro SD card.

2. Initial Setup:

Insert the micro SD card into the Raspberry Pi.

Connect the Raspberry Pi to the display using the HDMI cable.

Connect the keyboard and mouse to the Raspberry Pi.

Power on the Raspberry Pi.

Follow the on-screen instructions to complete the initial setup (language, Wi-Fi settings, etc.).

3. Configure Display Settings:

Once the Raspberry Pi OS desktop is loaded, go to Preferences
□ Raspberry Pi Configuration.

In the System tab, set the resolution and overscan settings according to your display.

If you want the display to auto-login and run a specific application (e.g., a web browser in kiosk mode), you can configure this in the System tab as well.

4. Install Required Software:

Depending on your use case, you may need to install additional software.

For example, for digital signage, you might want to use software like Screenly or Xibo.

To install software, open the terminal and use commands like: bash

Copy code `sudo apt update`

`sudo apt install [software-name]`

5. Configure Auto-Start (Optional):

If you want your display system to automatically start your chosen application (e.g., a web browser in kiosk mode) upon boot, you can configure this by editing the autostart file.

Open the autostart file using a text editor: `bash`

Copy code

```
nano ~/.config/lxsession/LXDE-pi/autostart
```

Add the following line to auto-start a web browser (replace chromium-browser with the browser of your choice):

```
sql
```

Copy code

```
@chromium-browser --kiosk [URL]
```

Replace [URL] with the URL you want to display.

6. Finalize and Test:

Reboot the Raspberry Pi to test your configuration.

Make any necessary adjustments to the display settings, software configuration, etc.

Once you're satisfied with the setup, you can disconnect the keyboard, mouse, and possibly even the monitor if you're using SSH or VNC for remote management.

Functionality

A standalone display management system using a Raspberry Pi typically refers to the software and hardware setup that allows you to control and update the content displayed on a screen without needing a constant connection to a separate computer. Here's a breakdown:

Components: Hardware:

Raspberry Pi (any model)

Display (HDMI, LCD, Touchscreen LCD) based on your needs

Power Supply SD Card

Enclosure (optional)

Software:

Operating System (lightweight like Raspbian Lite) Display library
(specific to LCD type -

TFT_LCD/fbtf) - optional for HDMI

Display application (written in Python with Pygame/Kivy)

Functionality:

The Raspberry Pi runs the operating system and your display application.

The application manages the content displayed on the screen, like text, images, or videos.

You can update the content beforehand and store it on the SD card.

Alternatively, you might design the application to pull content from a local source (USB drive) or a network location (if internet access is

added).

Benefits:

Standalone: Operates without a dedicated computer.

Customizable: Content and applications can be tailored to your needs.

Portable: Compact size makes it suitable for various locations.

Limitations:

Complexity: Setting it up requires some technical knowledge.

Limited Interactivity: Basic setups might not allow for real-time content updates.

Scalability: Difficult to manage multiple displays from a single unit.

Additional Considerations:

Power Management: You can configure the system to turn off the display when not in use for power saving.

Autostart: The application can be set to launch automatically on boot.

Overall, a standalone display management system with Raspberry Pi offers a cost-effective solution for simple digital signage or informational displays.

However, for complex setups with multiple displays or real-time content updates, network-based digital signage solutions might be more suitable.

CONCLUSION

A standalone display system serves as an independent unit capable of presenting information, visuals, or multimedia content without the need for external devices or connections.

This system offers flexibility, simplicity, and ease of use, making it ideal for various applications such as digital signage, information kiosks, interactive displays, and more.

Key features and benefits of a standalone display system include:

Autonomy: Operates independently without requiring constant connectivity to a computer or network, ensuring uninterrupted performance.

Ease of Installation: Simple setup process without the need for complex wiring or configurations, allowing for quick deployment in various environments.

Versatility: Suitable for a wide range of applications including retail, hospitality, education, healthcare, and corporate settings, providing a versatile solution for displaying content.

User-friendly Interface: Intuitive controls and user-friendly interfaces make it easy for users to manage and update content, ensuring smooth

operation and minimal maintenance.

Reliability: Built with robust hardware and software components, offering high reliability and durability to withstand continuous usage and environmental factors.

Customization: Allows for customizable content and branding options, enabling businesses to tailor the display system to their specific needs and preferences.

In conclusion, a standalone display system offers a convenient and efficient solution for presenting information and engaging audiences in various settings.

Its autonomy, ease of installation, versatility, and reliability make it a valuable tool for businesses and organizations looking to enhance their communication and interaction with customers, visitors, or employees.

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Publications

Kanyakumari, Tamilnadu, India.

ISBN: 978-81-973085-4-3



978-81-973085-4-3

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