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RESEARCH AND REVIEWS IN HUMANITIES, COMMERCE AND MANAGEMENT

Editors:

Dr. Anita Singh

Mrs. Afshan Khan

Mr. Vishal Kumar Shukla

Mr. S. Vinothkumar



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Editors

Dr. Anita Singh

Mahatma Gandhi Chitrakoot
Gramodaya Vishwavidyalaya,
Chitrakoot, Satna, Madhya Pradesh

Mrs. Afshan Khan

Swami Vivekanand Government Post
Graduate College, Harsud,
New Harsud, Madhya Pradesh

Mr. Vishal Kumar Shukla

Principal,
Genius Planet C.S. School,
Itarsi, Madhya Pradesh

Mr. S. Vinothkumar

Department of Commerce,
Dr. N.G.P Arts and Science College,
Coimbatore, Kalappati



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E-mail: bhumipublishing@gmail.com



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PREFACE

The present volume, *Research and Reviews in Humanities, Commerce and Management*, is a collective effort aimed at providing a comprehensive insight into the latest developments, trends, and scholarly discussions across multiple domains of social sciences. This compilation brings together a series of carefully curated research articles, reviews, and conceptual papers, reflecting the rich intellectual diversity of contemporary academic inquiry in humanities, commerce, and management.

Our objective in compiling this volume is to create a resource that serves both the academic community and practitioners by bridging theoretical frameworks with practical applications. The chapters included in this book cover a wide range of topics, including organizational behavior, financial management, marketing strategies, human resource practices, cultural studies, and ethical perspectives in business and society. Each contribution demonstrates a commitment to rigorous research methodology, critical analysis, and thoughtful interpretation of data, providing readers with both depth and breadth of knowledge.

We believe that interdisciplinary approaches are essential to address the complex challenges of today's globalized world. By integrating insights from humanities with applied research in commerce and management, this volume fosters a holistic understanding of contemporary issues and emerging trends. The book also highlights innovative perspectives and empirical findings that can inform policy-making, organizational strategies, and academic discourse.

We extend our heartfelt gratitude to all the authors for their valuable contributions and to the reviewers for their meticulous evaluation, which has ensured the quality and integrity of the work presented. It is our hope that this volume will serve as a useful reference for scholars, students, researchers, and professionals seeking to expand their understanding of the dynamic interplay between human, commercial, and managerial dimensions.

We trust that this book will inspire further research, foster knowledge sharing, and contribute meaningfully to the academic community.

- Editors

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THE FUTURE OF MALAYSIA'S WASTE-TO-ENERGY (WTE) PLANTS

**Nur Radiah binti Muda, Noor Azleena binti Razali,
Noor Aina binti Mohd Shukri and Mohd Haris Abdul Rani***

Faculty of Law,
Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia

*Corresponding author E-mail: harisrani@uitm.edu.my

Abstract:

The issue of wastage management is no longer new as it has been an ongoing problem not only in Malaysia but also other countries. Thus, to resolve this matter, waste-to-energy (WTE) technologies have been developed in Malaysia with the hope that this technology may be able to treat the solid waste efficiently without polluting the environment. Besides, it provides a highly valued source of renewable energy (1). However, whether or not this new technology is successful in managing the issue of wastage remains to be seen. This article analyses and adapts the doctrinal methodology to investigate whether the implementation of WTE is significant in resolving the wastage issue in Malaysia.

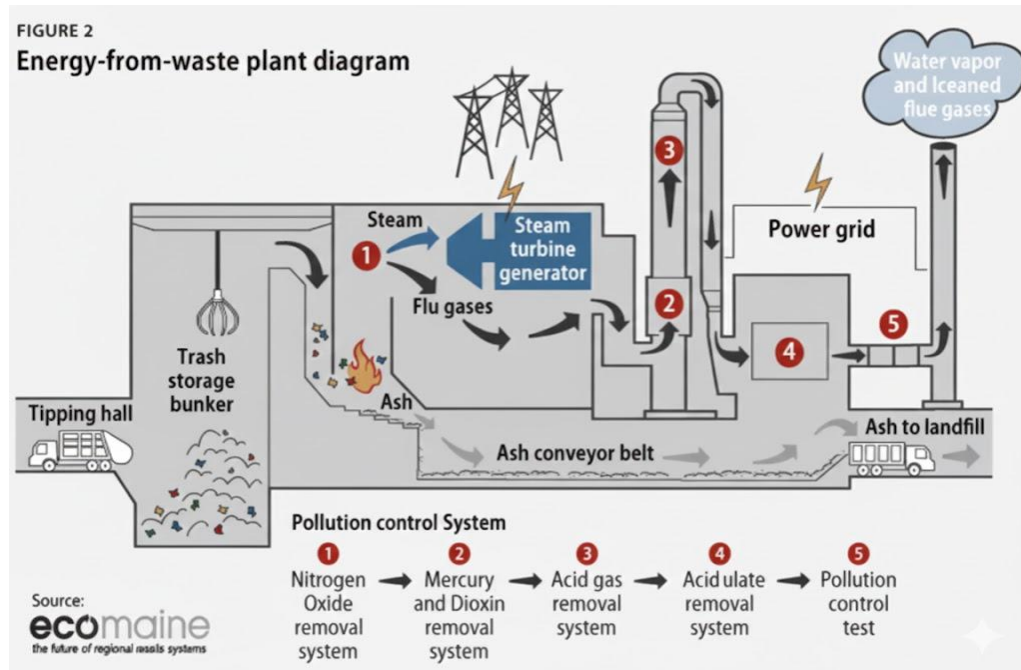
Keywords: Waste Management, Waste-To-Energy, Renewable Energy, Environmental Sustainability, Malaysia.

Introduction:

The issue on waste which has been prominent day by day is becoming severe especially in Malaysia where Malaysians tend to opt for dumping all the waste in the landfills without even having a second thought on how much energy has been consumed and wasted in order to create this final product now known as municipal garbage. Municipal garbage refers to waste of every item that has been built and created whereas in the process of creating all these items has utilised much energy and incurred a very high cost. During the upstream, where the raw material was being extracted from whatever the sources are and being processed to be converted to the final products, there has been much energy that has been utilised. Yet, despite all the cost and usage of energy utilised to create all these finished products, there has been the worldwide wastage of these products which directly contributed to a wastage of energy. People opted for a simple and easy way by throwing all those things away without even having a second thought on how this wastage can be avoided. While they can choose to manage the waste by recycling or reuse the final processed products, they choose to just dispose of them to the incinerator.

However, it is said that it can be solved by the well developed technologies nowadays. For instance, the government through the Ministry of Housing and Local Development put into

place the plan for efficient and sustainable waste management strategies by introducing waste-to-energy (WTE) technologies. It has been made known to the public that the waste-to-energy (WTE) technology is the solution to manage municipal waste by converting them to energy.



WTE is an energy recovery process that utilizes waste conversion technologies to generate heat and electricity from non-reusable and non-recyclable waste materials.

In discussing this matter, the holistic approach is taken into consideration given the fact that the problem regarding the waste negatively affects not only human beings but also flora and fauna and the ecosystem. This approach will help to identify the problem of energy poverty as well as injustice in the distribution of energy.

To ensure that wastage is properly managed, the law must provide adequate justice in terms of distributive, recognition and procedural justice or else, it will affect the environment and health. WTE plants have been developed with the aim to manage the garbage effectively to avoid more pollution. This function of this technology indeed gives justice to the living creatures as it may manage the emission of the dangerous gas to the environment and it may be an alternative energy source replacing the non renewable sources. Despite the positive traits of the technology, nonetheless, there is still injustice occurring from the implementation of this new technology especially to the residents living near these plants, which can significantly degrade their quality of life (QoL).

Supposedly, as according to justice in the context of energy law, the people should be treated fairly and there shall be not a single creature suffering from energy poverty. Energy poverty may cause suffering due to the effects of using such energy without experiencing many

of its benefits, leaving one side to benefit from causing perceptible drawbacks (Umar *et al.*, 2023) (2). With respect to this matter, WTE did cause many injustices to occur during its implementation due to few flaws. Waste to energy offers the chance to recover some resources, but it typically destroys a lot more.

Recognition justice comes all the way to suggest for the injustice to be resolved. Recognition justice is more than just tolerance; it demands that people be fairly represented, wary of bodily harm, and given complete and equal access to political rights. The recognition is essential in order to help us to avoid ignoring the patterns of energy poverty. In the context of procedural justice, there is no fair process as the implementation of WTE actually causes injustice to certain groups. There is no justice upheld considering that the bad impact of WTE outweighs the benefit it should bring upon.

For instance, through the process of incineration as part of process to WTE technology, the ones who will suffer are those people who live next to a waste incinerator which may raise the risk of cancer, birth abnormalities, and other negative health effects (3). Often, the low-income and communities of color also bear the brunt of this toxic burden, with 80% of U.S. municipal solid waste incinerators situated in communities where more than 25% of people identify as “minority,” living below the federal poverty rate, or both. And, the impacts are far-reaching as well. A number of the emitted substances from waste incineration are considered the “worst of the worst”—persistent organic pollutants that do not break down, move across the globe, and build up in people and wildlife, harming their health. For example, toxics like PFAS, dioxins, and mercury compounds are found in the environment, people, and marine mammals in the Arctic, far from any industrial sources. One study found that past municipal waste incineration in the U.S. has been responsible for 70-80% of dioxins found in the far North (4).

Thus, it is important to achieve justice and this can only be attained if all the types of justice including distributional justice, recognition justice and procedural justice are well tackled. The jurists, whether eastern or western in their theories, also promote justice in their views.

This research will explain the energy efficiency to be achieved by implementing the WTE plants in curbing the issue of wastage of energy caused by the waste. Plato and Aristotle explained this concept through their means of virtue which is to act in order to produce a result that is advantageous to both the self and others (5). In relation to energy efficiency, this concept of virtue points out that it is important to maximise energy efficiency but at the same time to keep environmental harm to a minimum. In this scope, energy efficiency can be achieved by eliminating any wastage of energy. It is either the wastage due to the pile of waste being thrown

out or energy wastage because of the consumption to achieve the goal of so-called sustainability energy through the WTE plants.

It is important to determine whether or not the WTE plants that have been implemented by the government are in line with the concept of energy efficiency. This is because the major issue revolving around this matter is the wastage of energy which refers to the waste of energy that has been utilised in order to create the final products before it is disposed of. With the implementation of WTE, it does not mean that the issue of wastage of energy would be solved. The WTE technology process includes the process of municipal waste burned in the incinerator to be converted to energy through certain specific procedures. Nonetheless, is the energy produced by the technology worth the energy that is being utilized in the process and is it considered to have been in line with the principle of energy efficiency.

Existing Problem

Sustainability of energy according to (Johnston *et al.* 2007) is the capacity to use resources such as water and energy more effectively, to prevent resource depletion from harming future generations (6). In the context of WTE, energy sustainability is planned to be achieved by the process of WTE to convert the garbage to electricity as to substitute non renewable sources of energy for instance fuels with renewable sources.

In discussing this matter, there is a problem to explicitly acknowledge that WTE did serve its purpose to contribute to the energy sustainability principle. In this context, incinerators which are used in the process of WTE technology may be a waste of energy. Incinerators consume a lot of recyclable materials while only creating small amounts of energy. According to Global Alliance for Incinerator Alternatives (GAIA), due to the low calorific value of waste, incinerators are only able to generate small amounts of energy while destroying large amounts of reusable materials. While older incinerators generate electricity at very low efficiency rates of 19-27%, a study in the United Kingdom found that conversion efficiencies of new incineration technologies are even lower (7). Furthermore, since most trash in Asia is organic, incinerators would require additional energy input to treat the waste before burning it, which would have a negative impact on the energy balance of these facilities (8). This shows how in order to get the non-renewable energy produced by WTE, there is much energy that needs to be utilized first which could contribute more to wastage of energy.

Thus, the purpose of this study is to give readers a clearer understanding of the current environmental and energy wastage problems caused by Malaysia's ongoing garbage production. The paper discusses whether the waste-to-energy (WTE) technology currently opted in Malaysia is relevant to sustainability of energy or other options can be adopted.

Research Methodology

This part outlines and explains the methodology that we will use in achieving the objectives of this study. Here, we employ doctrinal research methodology. In order to gather pertinent data and scientific facts on our core issue, waste-to-energy (WTE), we have depended on and cited web databases including ScienceDirect, Google Scholar, National Library of Medicine, ResearchGate and Springer. It entails analyzing primary and secondary legal materials that are accessible in Malaysia. The law, policies and regulations in the context of waste management in Malaysia are also being analysed.

Inadequacy of Malaysian Policy

Green Technology Master Plan Malaysia (GTMP) 2017-2030

Currently, the government has implemented quite a few policies to govern the management of waste Malaysia. The newest alternative is by introducing the WTE plants. The waste-to-energy (WTE) plants are suggested as the alternative to the waste management in Malaysia and the newest policy regarding this matter has been included in the Green Technology Master Plan Malaysia (GTMP) 2017-2030. This policy is, in large part, a result of the Eleventh Malaysia Plan (2016-2020), which has identified green growth as one of six game changers that would transform the direction of the country's growth. The current endeavours of the government concerning WTE plants presently centre on enhancing the project viability of WTE plants in Malaysia. Given that technology can be expensive to create and maintain, this plan also takes into account the technology's level of maturity and the availability of a long-term financing source (9).

This policy suggested implementing WTE plants as compared to recycling due to the fact that recycling is considered to take time to be adopted besides this matter actually needs a change of behaviour. In comparison with WTE plants, this alternative is said to be more efficient but the only flaw of this technology is that it needs high capital to be implemented.

United Nation Sustainable Development Goal(s)

The implementation of WTE plants is said to have complied with the United Nation Sustainable Development Goals (UN-SDG). This policy introduced by the UN is said to be designed to be a "shared blueprint for peace and prosperity for people and the planet, now and into the future". Needless to say, it is regarded that implementation of WTE is proven to have achieved the SDG 3 in the policy which concerns universal access to excellent health and wellbeing.

This element can be said to be fulfilled because WTE can drastically reduce the amount of MSW that ends up in landfills. This aids in preventing and reducing the production of toxic

leachate that comes from complicated mixed garbage in the landfill and contains persistent, carcinogenic substances and other pathogens (10).

This actually helps in reducing much pollution from happening including the contamination of local groundwater and surface water sources, which could be the source of water for residents downstream. As a result, there are much fewer incidences of illness and deaths brought on by water pollution and water borne diseases

Nonetheless, the policy introduced can be said to not be adequate since we need a clear cut policy that will mainly govern the implementation of WTE in Malaysia. The example of other countries' policies indicates that they are far more advanced than us. This brings to the point that Malaysia should have comprehensive policies that are to cope with this so-called problem that has been evolving around us.

Jamaica's National Energy- from-Waste Policy 2010-2030

This policy is one of six (6) sub policies within the National Energy Policy 2009–2030 that are meant to aid in the accomplishment of the National Energy Policy's objectives. In accordance with the National Energy Policy, by 2030 there should be "A modern, efficient, diversified, and environmentally sustainable energy sector providing affordable and accessible energy supplies with long-term energy security and supported by informed public behaviour on energy issues and an appropriate policy, regulatory, and institutional framework."

The National Energy-from-Waste Policy is being created to make sure that "Jamaica is the regional leader in supplying inexpensive and clean energy from waste contributing to a sustainable future."

With the added benefit of producing clean energy, energy-from-waste is proven an efficient way to manage waste and reduce waste volume. In several nations throughout the world, waste processing is already a sizable source of renewable energy. Wastes produced by agribusiness, wastewater treatment, and municipal solid waste (MSW) all have the potential to be used to develop renewable energy sources. Energy-from-waste programmes can effectively handle waste that cannot otherwise be processed through waste minimization, recycling, or composting programmes while also helping to meet renewable energy goals.

In Jamaica, several options for energy-from-waste (EFW) technology application are already being pursued. This Policy will provide consistency to the situation at hand and address other potential (11).

Consequently, there is a pressing need for Malaysia to explicitly introduce and implement the WTE policy just like the other countries in order to ensure that this technology is in line with its aim as to solve the issue of wastage.

Literature Review

The Effects of Waste

The major contribution of waste significantly impacts our environment in a way we are not perceiving as the effects seem unreal because it is merely due to the waste we dumped. Day by day, we are generating too much waste that is impossible for us to handle since it affects our surroundings. Here we shall address what are the effects of wastage that in fact it slowly harms us.

According to Felicia Babs-Shomoye and Russell Kabir (2016), improper solid waste disposal can be threatening and is frequently influenced by air pollution from burning waste, soil contamination from direct contact with waste, uncontrolled methane release from anaerobic decomposition of waste, or disease transmission through various vectors like birds, insects, and rodents. The act of dumping waste at the open dumpsites, burning the waste and simply throwing waste into the sea is the result of today's situation on environment and human health. This can be supported with the writing of Hussein I. Abdel Shafy and Mona S.M. Mansour (2018), the serious environmental issues, including soil, air, and water contamination, are being triggered by the poor management and disposal of municipal solid waste.

Apart from that, Felicia Babs-Shomoye mentioned the uncontrolled waste disposal provokes environmental degradation, which in turn causes an increase in the amount and variation of hazardous waste and, as a result, water contamination. We can take the example of environmental pollution by plastic waste in which Okunola A Alabi (2019) highlight the disposal of waste from plastics and plastic products carelessly can contribute to environmental pollution, which is visible in a number of ways, for instance deterioration of the environment's natural beauty, entanglement and death of aquatic organisms, sewage system blockage, particularly in developing nations, leading to the breeding of mosquitoes and other disease-carrying vectors and the production of unpleasant smells, reduction in water percolation and normal agricultural soil aeration, which leads to decreased productivity in such lands.

Besides, these authors also mentioned that during the microbial biodegradation of plastics, methane, a hazardous greenhouse gas that greatly contributes to global warming is emitted. The greenhouse gas in fact will pose a serious health risk to humans. As Hussein said, due to the rise in greenhouse gas emissions, these environmental issues are linked to complications of human health.

Pros and Cons of WTE

According to an article written by Chen Liu, Toru Nishiyama, Katsuya Kawamoto, So Sasaki, WtE incineration offers the benefit of using waste as a resource to produce energy (12).

This can be strengthened by an article written by the U.S. Energy Information Administration where it states that every 100 pounds of MSW in the United States, about 85 pounds can be burned as fuel to generate electricity (13). Generated energy also can be used or sold through regulatory incentives such as FIT schemes or also can act as an alternative way to back-up power, especially in the event of a power failure because of a disaster (14).

This type of incineration also lowers carbon emissions by substituting for the demand for energy from fossil fuel sources and reducing the amount of methane produced by landfills. (IPCC, 2007).

However, the introduction of WTE incineration faces its own challenges (Karim and Corazzini, 2019; GAIA, 2019), including (1) high construction and operating costs for incinerators, (2) a lack of revenue from energy and waste sales to cover all costs, (3) the minimal amount of feedstock necessary for operations, which could potentially divert waste away from the 3Rs, and (4) health risks for people (15). The same view shared by O'Brien and Jeremy K where generating electricity from incineration releases more CO₂, SO₂, NO_x and mercury than natural gas or renewables which will harm people (16).

In addition to making waste "disappear," they also assert that the process of 'waste-to-energy' generates electricity. However, research has proven that there is no scientific basis for this claim. The act of incineration merely converts waste into various waste forms that are more hazardous and difficult to contain than the original waste, such as toxic ash and air and water pollution (17). In addition, incinerators are essential contributors of carcinogenic chemicals as well as microscopic dust particles that can cause heart arrhythmias, heart attacks, and early death (18). Can we imagine these people everyday will breathe the air that is already contaminated by these dangerous gasses because they merely want to produce energy for the government? The name is misleading because it wastes fuel that can only be used inefficiently, and these facilities can hardly produce any energy at all.

Cost

Without a doubt, waste incineration is expensive and capital-intensive. An incinerator with a yearly processing capacity of 1 million tonnes of waste is expected to cost between USD 190 million and USD 1.2 billion to construct. Not just that, WTE incineration also needs significant improvements, such as maintaining and upgrading pollution control technology to meet emission standards. Because the earnings are insufficient to cover the higher costs, expensive renovations sometimes become a major reason for plant closure. At least 31 municipal solid waste incinerators in the US shut down between 2000 and 2020, mostly as a result of the expense of complying with mandatory pollution control regulations (19).

In other cases, for the construction and operation of a WTE incinerator, the American city of Detroit spent more than USD 1 billion over the course of three decades. The incinerator itself cost USD 478 million to build, and an additional USD 179 million was needed for pollution control technology (20).

Cost of WTE in Malaysia

The cost in implementing the WTE plant did not limit to the cost to build the facilities but also includes the other additional cost which contributed more in achieving this goal.

Generally, WTE projects require huge capital costs. As according to The Malaysian Reserve (TMR), the construction of Melaka's waste-to-energy (WTE) incinerator project which located at the Sungai Udang Sanitary Landfill would cost about RM280 million and additional RM3.64 million for the cost of acquiring the land as pointed out by Melaka Chief Minister Adly Zahari (21).

Meanwhile, the cost for the other WTE plant which is the Ladang Tanah Merah plant in Negeri Sembilan, owned by Cypark Resources Bhd is much higher which is RM300 million to develop and can generate 25mw (22).

Findings

The Ministry of Local Government and Housing (MHLG) Malaysia began a number of incineration projects with an initial investment of RM 187.74 million to manage MSW back in 2011. These featured five rotary kiln-style small-scale incinerators that were built in five popular tourist destinations: Pulau Langkawi (100 tonnes per day), Pulau Labuan (60 tonnes per day), Cameron Highlands (40 tonnes per day), Pulau Pangkor (20 tonnes per day), and Pulau Tioman (10 tonnes per day). (Bashir MJ, K.; Ng, C.A.; Sethupathi, S.; Lim, J.W. Assessment of the Environmental, Technical and Economic Issues Associated with Energy Recovery from Municipal Solid Waste in Malaysia. IOP Conf. Ser. Earth Environ. Sci. 2019, 268, 012044). Table 1 shows the incineration plants in Malaysia, current status, and energy production rate

Table 1: Incineration plants in Malaysia, current status, and energy production rate

Location	Capacity (MSW tonnes/day)	Electricity Generation	Current Status	Year of Completion
Pulau Pangkor	20	Nil	Active	2009
Pulau Tioman	15	Nil	Closed	2010
Pulau Langkawi	100	1 MW	Active	2010
Cameron Highlands	15	Nil	Active	2010
Labuan	60	Nil	Active	2010

Although the WTE process is known for its effectiveness in handling the solid waste, the question here is to what extent it could do the same for our country considering the environment, financial and global issues which could impact the process. If we posed the question whether the WTE plants contributes much to minimize the amount of solid waste we produced then the answer is straightforward because the adoption of WTE technology and methods greatly reduces the overall amount of garbage that is dumped in landfills, lengthens the life of already-existing landfills, and dramatically reduces the negative effects of burning fossil fuels to produce energy.

However, from different perspectives, there are underlying factors that actually affect the sustainability of WTE.

Problem in Installing WTE Plant in Malaysia

The quality of waste in Malaysia somehow contributes to inefficiency of the process of incineration due to the elements contained in municipal solid waste. It should be pre-dried before entering the combustion chamber in order to reduce the moisture content because Malaysian MSW has a large fraction of organic compounds, which in turn contributes to a high moisture content. This is owing to the fact that a high moisture content will decrease calorific value due to the latent heat of evaporation and reduce MSW's burning rate. For instance, because of the unsorted MSW being used as feedstock, which has a high moisture content and was found to contain wet organic material like food waste in 2008, small-scale incinerators that operated on Malaysia's tourist islands were shut down (23).

Besides, in Malaysia it reflects poor infrastructure because of the conditions of the disposal sites which contributes to non effectiveness of WTE. The issue concerns here regarding lack of space as most landfills are small which could not afford large volumes. Consequently, these landfills are unable to produce enough LFG to be useful for gas extraction (24).

Recycling or Waste-to-Energy

The questions on whether or not the WTE has been effective might as well be answered by comparing recycle and waste-to-energy. It is to dig deeper on whether or not the function of WTE can overtake the advantages of recycling.

Recycling has been one of the alternatives introduced by the government in order to curb the problem of waste as well as wastage of energy. The introduction of recycling actually did not only promote the decrease of the municipal waste but it also contributed to the lesser consumption of energy to create a finished product or in a simple word, recycle promotes the reduction of energy wastage.

Recycling is defined as the process of gathering, treating, or processing used or waste materials or by-products of manufacturing and consuming activities in order to make them

suitable for reuse without destroying the essential form or nature of the aforementioned materials (25).

In most countries, the government opted for WTE as they rely on the belief that by dumping all the municipal waste to the WTE's incinerators, the outcomes would be the alternative energy, namely the heat or electricity. But little did they realize that the process of transmitting all that waste up till the end of the WTE process which is burning of the waste incurred a high cost. This has been voiced out by the groups such as Zero Waste Europe and the Global Alliance for Incinerators Alternatives where they pointed out that it is far more efficient to focus on recycling rather than incinerating given that as compared to the cost for the process for recycling includes the cost to transport and processing of the materials, the process of WTE cost far more energy (26).

Furthermore, recycling uses far less energy in its process. Compared to using or recycling what we already have, extracting virgin resources from the ground, manufacturing, and processing these into new materials to replace the ones burnt, burns up enormous quantities of energy (27).

Consumption of Cost and Energy

WTE project requires higher cost to maintain its service from the beginning to and end. Since the plant focuses on the reduction of pollution, then it is very important to ensure that the outcomes of the project comply with its objectives. Thus, in establishing this matter, the advanced air pollution control has been opted to reduce air pollution and this has been the main contribution to the high cost of WTE project (28).

Nonetheless, the expenses incurred did not always guarantee the efficiency of the project. This thus raises another issue of waste of budget and money since the amount incurred is not in par with the outcomes. Studies have shown that operating the most environmentally friendly WTE systems may not necessarily be the most financially wise choice, which presents a problem for proponents (29).

Furthermore, even in the process of WTE incineration, the fuel needs to be consumed to keep the operation of the project. Not to mention the manpower and also the skilled and professional employees have to maintain and keep the operation of the facility. This shall not only be taken in account in the context of the expenses but also shall be viewed in the scope on how there was already wastage of energy in the beginning of the WTE process before the outcomes can be produced.

WTE is no doubt promoting energy wastage, this is because, during the process, we need to replace the items we burn with new ones, incinerators squander more energy than they

produce (30). The issue on wastage of energy is indeed a stumbling block in accomplishing the anticipated outcomes of the WTE plant. Thus, it is the responsibility of the concerned parties to decide whether or not to continue with the current implementation or initiate or develop the current plant with a more efficient project.

WTE's Myth

Furthermore, the fact that the WTE technologies actually promote reduction of greenhouse gases emissions has been rebut in few researches as a mere myth. The fact that in WTE, it still needs to go through the process of incineration which refers to the process of which the waste will be burned shows the impossibility in achieving the reduction of greenhouse gas emission as in line with the Paris Agreement which aim to keep global warming by 2100 to below 2 °C with 1.5 °C as a target (31).

Almost all of the carbon dioxide released during waste burning is carbon. Biomass, such as food scraps and paper, makes up a significant portion of the waste used to power WTE plants. The term "carbon-neutral" fuel is frequently used to describe biomass. However, the burning of this kind of waste, as well as plastic and other oil-based items, releases detrimental greenhouse gases in the same way as burning fossil fuels (32).

Besides, it was actually reported that the amount of the greenhouse gasses emitted from the process of WTE are far less in a good percentage as compared to the usual carbon intensity than a conventional electricity generation. It was reported that WTE produced 2.5 times as much carbon dioxide (CO₂) in order to generate the same quantity of electricity as a coal power station (33).

It has also been reported that the concentration of the carbon dioxide produced from incinerators is higher than the carbon intensity from the energy produced by the fossil fuel sources.

Dr. Jorge Emmanuel, the environmental scientist in the new Public Service Announcement (PSA) by the Global Alliance for Incinerator Alternatives (GAIA) in WTE, was not guaranteed that the dangerous gasses would not be emitted despite the adoption of emission standards by the plant. It was further agreed by him that WTE actually released more total carbon emission per kWh as compared to coal, oil or natural gasses (34).

This thus defeated the original purpose of the WTE technology to be introduced which is to promote sustainability of energy as in the context of reducing pollution in Malaysia. This is due to the reason that carbon emission is dangerous to the environment and can be detrimental to the ecosystem. (Zarif, *et al.*, 2022), acknowledged this of the increased atmospheric temperature brought on by the trapping of heat by the greenhouse gases that make up carbon emissions (35)

—also known as "greenhouse gases"—include carbon dioxide, methane, and other substances like nitrogen oxide and fluorinated gases could have disastrous consequences for the planet (36).

Health Issue

In the context of health issues, by introducing WTE indeed it eradicates serious diseases, germs and other dangerous microorganisms contained in MSW. However, it defeats the intention and purpose of WTE due to the fact that the existence of harmful gas released from the incineration process also impacts people's health. The risk of developing non-lymphomas Hodgkin's and soft tissue sarcoma is elevated by the flue gasses from incinerators that involve acidic gasses (SO₂, NO_x, N₂O, HCl, HF), specific metals (arsenic, beryllium, chromium, cadmium, lead and mercury), carbon monoxide (CO), carbon dioxide (CO₂), dioxins, furans, polyaromatic hydrocarbons. These so-called hazardous gases come from the incinerator itself which causes people to suffer from it. In addition, the National Research Council identifies chest pain, dizziness, irritability, and lack of coordination as other possible health effects from exposure to incineration flue gas. Here, it reflects though the harmful gas from MSW itself could be lessened due to WTE nevertheless it creates another suffering that people should bear i.e. the complication of the incineration.

The solution for the above problem is that the incineration should be placed somewhere in a rural and deep area which is far from the cities and residents. This is because we wish to eliminate the possibility that the release of harmful gas will have an effect on people living near the incineration. However, the Malaysian Environmental Quality Act, 1974 Act (127) and the Clean Air Regulation 2014 by the Department of Environment Malaysia (DOE) do not incorporate any standards that specify the distance of incineration or WTE plants from and housing areas or city centres, or how many kilometres, in radius, of a buffer zone to prevent the breach of toxic flue gas comprising dioxin and furans. There is no precaution taken by the government to address this concern relating to people's health due to the WTE process. Despite its providing the best technologies of WTE, the people shall not be sacrificed in order to curb the problem of waste management in Malaysia.

Conclusion and Recommendation

Malaysia as a developing nation with a goal of becoming a first-world nation has vowed to support climate action and the UN-SDGs needs to move toward a circular city metabolism where MSW-to-energy is widely used. However, from the research conducted, WTE in fact undoubtedly produces more harm than a better environment to deal with the waste produced. As all measures have been compared, indeed WTE is not an effective way considering that it brings greater impact to the people and we must choose the option that causes less impact. It is

undeniable that all steps taken have their own cons but it is better to opt for the process that has the least consequence.

Alternatively, recycling is better than WTE due to the reason that recycling does not involve the process of burning or incinerating the waste which is a must in the WTE. Incineration process did contribute to the heat combustion which affected the environment.

This proves that recycling would be more effective if to be discussed on the environmental protection as far as waste management is concerned. Furthermore, it would be less energy consumption if recycling is opted as compared to WTE. This is because material recovery saves both virgin material and energy since production processes using recovered material utilise less energy than the processes using virgin material (37).

Despite the cons that WTE could promote, there might be some useful recommendations that can contribute to the likelihood of success to deal with the municipal solid waste. While the WTE practise may be a viable option for addressing waste management and energy issues, its implementation prompts proper design, operation, and emissions management (monitoring) and control, as well as ongoing environmental and health monitoring and surveillance, in order to maximise economic and environmental benefits while minimising health impacts or risks. When it comes to the planning and design of WtE facilities, it's critical to conduct health risk analyses backed by thorough exposure monitoring, robust modelling (such as detailed emissions modelling plus atmospheric modelling and real population data), and health risk assessments for any proposed WtE facilities. This will help to ensure that protective measures are created with the greatest care and that emissions standards are implemented correctly (38).

Furthermore, there is no indication that there is no hope in the WTE process because what the government could do in order for incineration technology to be successful in the country, adequate funding, strict waste disposal enforcement in accordance with the SWPCM Act 2007, and adequate human capital are required. In order to address public concerns, the government could also think about improving the image branding for incineration by incorporating the best equipment or technologies already on the market to reduce the dangers of environmental contamination and threatening the standard of social health.

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HOW TO SHIFT BUSINESS FOCUS FOR RURAL DEVELOPMENT THROUGH CSR

S. Vinothkumar*¹ and K. Ponumani²

¹Department of Commerce with Information Technology,

¹Department of Commerce with International Business,

Dr.N.G.P. Arts and Science College (Autonomous), Coimbatore, Tamil Nadu, India

*Corresponding author E-mail: vinothkumar0089@gmail.com

Abstract:

Corporate Social Responsibility is a key concept in the business world particularly in the Developing countries like India. In India many companies or industries have modified their Policies, activities and are engaged into Corporate Social Responsibility (CSR) especially on Rural development beyond their financial aspects. India is the first country following and implementing legally and made a regulation in the constitution under the “companies’ act.2013, Section 135, clause VII.

Keywords: Corporate Social Responsibility, Rural Development, India

Introduction:

Corporate social responsibility (CSR) is a self-regulating business model that helps a company be socially accountable to itself, its stakeholders, and the public. By practicing corporate social responsibility, also called corporate citizenship, companies can be conscious of the kind of impact they are having on all aspects of society, including economic, social, and environmental.

Understanding Corporate Social Responsibility (CSR)

Corporate social responsibility is a broad concept that can take many forms depending on the company and industry. Through CSR programs, philanthropy, and volunteer efforts, businesses can benefit society while boosting their brands. For a company to be socially responsible, it first needs to be accountable to itself and its shareholders. Companies that adopt CSR programs have often grown their business to the point where they can give back to society. Thus, CSR is typically a strategy that’s implemented by large corporations.

Objectives

- To know CSR and their role in rural development.
- To find how the benefits of CSR in rural development.
- To study the impact of CSR on shifting business focus on rural development.

Types of Corporate Social Responsibility

In general, there are four main types of corporate social responsibility. A company may choose to engage in any of these separately, and lack of involvement in one area does not necessarily exclude a company from being socially responsible.

Environmental Responsibility

Environmental responsibility is the pillar of corporate social responsibility rooted in preserving mother nature. Through optimal operations and support of related causes, a company can ensure it leaves natural resources better than before its operations.

Ethical Responsibility

Ethical responsibility is the pillar of corporate social responsibility rooted in acting in a fair, ethical manner. Companies often set their own standards, though external forces or demands by clients may shape ethical goals.

Philanthropic Responsibility

Philanthropic responsibility is the pillar of corporate social responsibility that challenges how a company acts and how it contributes to society. In its simplest form, philanthropic responsibility refers to how a company spends its resources to make the world a better place.

Financial Responsibility

Financial responsibility is the pillar of corporate social responsibility that ties together the three areas above. A company make plans to be more environmentally, ethically, and philanthropically focused; however, the company must back these plans through financial investments of programs, donations, or product research.

Advantages of CSR for Rural Development in India

The rural economy has been subdued due to several reasons. Unemployment is one of the more prominent contributors, but the right use of CSR in rural development can deliver change. Here is a complete plan a company can use to increase rural livelihoods and bring back rural demand:

1. Identify struggling rural areas- impact more than learning CSR full form

Rural India is diverse. Some rural communities are almost as advanced as the urban sectors, with high literacy and low unemployment rates. On the flip side, there are others suffering from extreme poverty and high unemployment. Although many of us know CSR full form, not many are aware of its contextualisation in rural development.

The first step to using CSR In the context of rural development is to identify communities that need more help. Research and data are readily available on the internet and can be used by companies to create a shortlist of rural areas in desperate need.

2. Partner with local organisations

Implementing rural projects can be challenging. Companies usually do not have dedicated teams that look after the implementation of CSR projects from the ground up. Hence, it is vital for companies to partner with organisations specialising in CSR initiatives. Many local bodies have significant experience in spearheading CSR projects. They have the right plans and ideas to improve various facets of society, including rural livelihood, but funds are a problem. Partnering with such bodies ensures CSR funds are used effectively and sustainably.

3. Think long-term

Triggering a short-term impact isn't the correct use of CSR funds. Companies should focus on the long-term effects of their CSR initiatives and how they can improve rural livelihoods for generations. Since rural livelihoods are central to the fundamentals of several businesses along with the Indian economy, it is in organisations' best interest to focus on long-term goals. They can do so by identifying activities and industries where the impact can be long-term. Some examples include agriculture, small-scale industries, educational hubs, and health centres.

4. Measure and optimise the impact

After deploying CSR funds, companies must monitor impact the same way they regularly measure their business growth. Success with CSR only comes with regular tracking, as companies can understand what works and what doesn't. Based on their findings, they can optimise their spending in industries and activities that have more room for impact. Several evaluation and monitoring tools are available, while companies can also consult local communities to gather feedback on their initiatives. The latter can prove especially useful as local communities have a wider reach.

5. Stay committed and patient

It is vital for companies to stick to their CSR goals to create lasting impact. Initiatives like rural livelihood development take time to bear fruit. They depend on several factors, including government policies and commodity prices, which are susceptible to change. Therefore, it is central for companies to demonstrate patience and commitment. They must take time to figure out what they want to do with their CSR funds and stick to it in every situation.

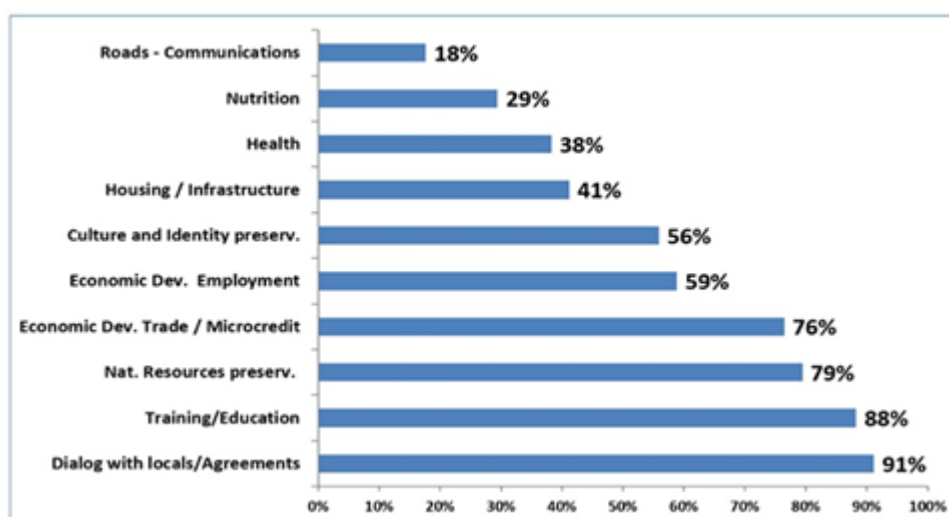
Analysis of Allocation of Fund for Various Welfare Measures

Impact of CSR

- **Livelihoods:** The Grameen-LABS is a program implemented by Dr. Reddy 'Foundation in collaboration with rural Development Department; GOI is to provide livelihood to Around 35,000 youths in the rural India between the age of 18-25 Years in 7 states of

India. Outcomes of livelihood support Programs by Bharat Petroleum show that SHG members are in the stable income group with INR 2,000 p.m. and members of the banana plantations and poultry are working to earn extra income of INR 7000-8000 p.a.

- **Health:** The study shows that many companies organize a series of health camps to create health awareness and education on health on various issues such as vaccination, blood donation, water purification pills, condom distribution etc. Till 2007-08, SAIL conducted 267 health camps for the benefit of over 4.5 lakh people. In Lanjigarh (Orissa) Vedanta Aluminium Ltd. covers 53 villages with 32,000 inhabitants, providing free medicine, treatment and referral service their mobile units. Tata Family Health Initiatives Foundation (TSFIF) has established "Lifeline Express" Wheeled Hospital has helped more than 50,000 patients in Jharkhand, Orissa and Chhatisgarh.



- **Education:** Aditya Birla Group provided education to 62,000 children living near the plants by running 26 formal schools. SAIL maintains approximately 138 schools in outlying areas of SAIL plants/units in the country where more than 80,000 children receive education (Kumar 2008). Asian Paints establishment of "Shree Gattu Vidyalaya", a school providing education to 25,000 children from class I to X, by this effort formal education have reached to rural areas and helped the children there. Similarly, Satyam Computers have developed 170 modern schools benefiting 40,000 rural children. Schools "Project Smiles" with the support of Coca-Cola India Inc. was started and completed in 20 schools. It left its impact on the lives of approximately 10,000 children.
- **Environment:** Towards Sustainable Development and management of natural resource, many companies have been working on tree plantation, watershed management, and waste management, wind farms etc; for example, SAIL has planted 13.5 million trees in and around the SAIL plants or mines till date. Watershed Development Programme by

Ambuja Cement Ltd has covered 9,000 hectares in the last four years. Sustainable water management continues to lead the priority list of Coca-Cola India Inc. So far, the company water initiatives have improved the lives of more than 1,40,000 people & raise awareness on the essential importance of water conservation among the millions of people.

- **Infrastructure:** Of the 12 companies surveyed only six companies offer different infrastructures facilities such as construction and road development, installation of electricity, water, sanitation, schools, health Centre, community, etc. Welfare Lupin Human welfare and Research Foundation initiated the scheme "Apna Gaon Apna Kam". This scheme covered 38,000 villages in Rajasthan and almost all areas have the school buildings, potable water, ponds, connecting roads, community

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ENHANCING EMPLOYEE PERFORMANCE THROUGH CHATGPT INTEGRATION IN THE TRAVEL AND HOSPITALITY SECTOR: THE MEDIATING ROLE OF JOB SATISFACTION

Anjel Raj Y

GNA Business School, Phagwara, Punjab

Corresponding author E-mail: anjeljos82@gmail.com

Abstract:

The integration of artificial intelligence tools, such as ChatGPT, is rapidly reshaping the landscape of the travel and hospitality industry. This chapter delves into the ways ChatGPT's applications namely personalized travel recommendations, workload reduction, service efficiency, and training and skill development act as key drivers of employee performance. Central to this dynamic is the mediating role of employee job satisfaction, which serves as a bridge between AI usage and tangible performance outcomes. By enhancing employees' capabilities and reducing their cognitive load, AI tools like ChatGPT enable employees to focus on more value-driven tasks, thereby fostering satisfaction and motivation. Drawing upon current literature and industry case studies, this chapter not only explores the promising opportunities presented by AI in enhancing operational workflows and customer service but also examines the broader implications of adopting such technologies. Ultimately, the chapter underscores the importance of integrating AI in a way that prioritizes human-centric values to maximize both employee well-being and organizational performance.

Keywords: Employee Performance, Hospitality Sector, Job Satisfaction, Personalized Travel Recommendations, Workload Reduction.

Introduction:

Technological innovation, particularly in the domain of artificial intelligence (AI), has revolutionized service delivery across industries, with the travel and hospitality sector witnessing some of the most profound transformations. AI systems are increasingly integrated into customer service platforms, operational workflows, and decision-making frameworks, driving both efficiency and personalization. Among the cutting-edge AI applications, ChatGPT, developed by OpenAI, stands out due to its ability to simulate human-like interactions using advanced natural language processing (NLP). It has rapidly emerged as a versatile tool capable of assisting customers, automating repetitive tasks, and even generating real-time travel recommendations, itineraries, and content. However, while the external, customer-facing benefits of ChatGPT are

well-documented, its internal implications especially those concerning employees remain an underexplored yet critical domain.

In service-driven industries like travel and tourism, the quality of employee performance is a primary determinant of customer satisfaction and organizational success (Chen, Wang, & Chu, 2019). The role of frontline employees is not only operational but also emotional and experiential, as they are often responsible for co-creating value with customers. Thus, any technological advancement that alters how services are delivered must be evaluated not only for its technical efficacy but also for its impact on employee roles, expectations, and psychological well-being.

While AI is often viewed through the dual lens of promise and peril offering increased efficiency on one hand and raising fears of job displacement, depersonalization, and intensified monitoring on the other (Davenport & Ronanki, 2018) there is growing evidence to suggest that AI tools like ChatGPT can also serve as enablers of employee development. ChatGPT can handle the repetitive, time-draining, or less thought-intensive tasks, freeing up employees to dive into the more creative, strategic, and human-centered parts of their work. Plus, it can help people learn on the spot, make services faster and more accurate, and give employees the tools to provide care that's more tailored and personal.

This chapter makes the case that when used wisely, ChatGPT doesn't take jobs away from people it actually supports them, boosting both their happiness at work and how well they do their jobs. This chapter sketches out a clear picture of how four big ideas tailored travel suggestions, lighter workloads, quicker service, and better training team up to help employees in travel and hospitality do their jobs better, with feeling good about their work tying it all together. It turns the usual fear of robots taking over on its head, painting AI like ChatGPT as a friendly teammate that boosts people up instead of nudging them out the door. Through this lens, the chapter takes a deep, well-researched dive into what ChatGPT can mean for places like hotels or travel agencies. Mixing real-life know-how with strong theories, it shows that using AI the right way doesn't just make customers happier it lights a fire under employees, making them more excited about their work, more satisfied, and better at what they do. That's the secret sauce for building a service business that thrives for the long haul.

Independent Variables and Their Impact

1. Personalized Travel Recommendations:

ChatGPT's knack for creating tailor-made travel ideas is a game-changer for folks working in travel and hospitality. It helps them bond with customers in a way that feels personal and heartfelt, turning every interaction into something truly memorable. Imagine a travel agent

or hotel staffer who, instead of spending hours digging through options or guessing what a guest might like, gets a helping hand from AI that quickly spots patterns in what travellers want whether it's a quiet beach getaway or a foodie adventure (Gretzel, Sigala, Xiang, & Koo, 2015). This kind of insight means employees can offer spot-on recommendations that hit the mark every time, making the whole process smoother and the customer's experience that much richer. For the employees, this isn't just about saving time it's like having a trusty sidekick that takes the heavy lifting off their shoulders. Instead of feeling drained by endless research, they can focus on the human stuff: listening to a guest's story, offering a warm smile, or going the extra mile to make someone's trip unforgettable. That kind of work feels good it boosts their confidence, gives them room to shine, and makes them feel like they're really making a difference. When employees feel capable and valued like this, it sparks a sense of pride and satisfaction in their job. By blending ChatGPT's smarts with the day-to-day tasks of frontline staff, it's like giving them a superpower that helps them excel, keeping them engaged and happy in their roles while creating moments that customers will rave about.

2. Workload Reduction:

One of the biggest perks of using AI tools like ChatGPT in the travel and hospitality world is how they take the boring, repetitive stuff off employees' plates, completely changing what their day-to-day looks like. Picture a hotel concierge or travel agent drowning in a flood of emails asking the same questions things like "What's the check-in time?" or "Can you confirm my booking?" ChatGPT can step in to handle those routine tasks, like answering FAQs, sorting out booking details, or fielding standard customer queries, quick as a flash (Huang & Rust, 2018). That means employees aren't stuck in a loop of monotony they get to focus on the juicy parts of their job, like solving tricky problems, dreaming up unique travel plans, or having real, heartfelt conversations with guests. This shift does wonders for how employees manage their time. Instead of slogging through endless admin work, they can pour their energy into things that feel meaningful like helping a family plan a once-in-a-lifetime trip or calming a stressed-out traveler with a friendly chat. It's not just about efficiency; it's about cutting down on the mental exhaustion that comes from doing the same dull tasks over and over. When the grunt work is handled, employees feel more in control of their roles and more connected to the bigger picture, which lights up their sense of purpose (Tarafdar, Pullins, & Ragu-Nathan, 2015). Plus, lightening the load means less stress and fewer moments of feeling totally burned out things that can really drag down how happy someone is at work.

For someone working in a bustling hotel or travel agency, this kind of support is a game-changer. Imagine a front-desk worker who, instead of juggling a dozen repetitive emails, gets to

spend time personalizing a guest's stay or brainstorming ways to make a tour group's experience unforgettable. That's the kind of work that makes you feel alive and valued. By clearing away the administrative clutter, ChatGPT gives employees the space to dive deeper into what they love about their jobs, sparking not just satisfaction but a real passion for what they do every day.

3. Service Efficiency:

ChatGPT is like a super-smart assistant that helps things run smoothly in the travel and hospitality world by giving quick, spot-on answers that make customers happy and keep the workday flowing. Imagine a busy airport hotel where guests are firing off questions left and right about shuttle times, local restaurants, or room upgrades. ChatGPT is like a trusty sidekick for front-line staff in travel and hospitality, delivering quick, spot-on answers that keep things moving and make every guest interaction feel effortless (Lu, Cai, & Gursoy, 2019). This instant support lets employees handle questions with confidence and stay calm under pressure, giving customers reliable responses that build trust and keep them coming back for more. It's not just about being fast ChatGPT irons out those little communication wrinkles that can trip things up, making the whole experience feel polished and dependable, like everything's running smoothly behind the scenes.

For employees, this is a huge win. Imagine a newbie at a travel agency, nervous about messing up a client's request. Customers walk away happy, no fuss, no muss, while employees—whether it's a concierge locking in a perfect dinner spot at the last second or a tour guide nailing a complex travel plan—rack up those small victories. These moments add up, leaving staff feeling skilled, appreciated, and truly excited about their work. Less stress, fewer fumbles, and more chances to shine ChatGPT's efficiency doesn't just keep the service humming; it lifts spirits and drives employees to perform at their best, day in and day out.

4. Training and Skill Development:

ChatGPT isn't just about knocking out repetitive tasks—it's like having a personal coach right at your fingertips, helping employees in the travel and hospitality world keep growing and sharpening their skills. Imagine a hotel staffer who needs a quick refresher on a new destination or a tricky customer situation. ChatGPT can step in with instant, tailored info, walk them through realistic practice scenarios, or even offer feedback on the spot, acting like a mentor who's always ready to help (Wirtz *et al.*, 2018). In an industry that moves as fast as travel and hospitality where you've got to stay on top of new hotspots, services, and what guests are loving—this kind of just-in-time learning is a lifesaver.

Employees can dive into these mini-training moments whenever it suits them, learning at their own pace without the pressure of a formal class. It's like having a conversation with a

knowledgeable friend who's there to guide you, whether you're brushing up on local dining tips or practicing how to handle a tough complaint. This freedom to learn on their terms boosts confidence and makes employees feel more capable, which is a big part of loving their job. Plus, when people see their workplace offering tools like ChatGPT to help them grow, it sends a message: "We've got your back." That kind of support lights a fire under them, making them feel valued and eager to stick around. Take a tour guide, for example. They could use ChatGPT to explore new ways to talk about a city's history or get tips on engaging a group of travellers. Each little lesson builds their skills and their sense of pride in their work. By weaving ChatGPT into training, it's not just about levelling up what employees can do—it's about creating a workplace where people feel inspired, satisfied, and ready to give their all for the long haul.

5. Employee Job Satisfaction:

Job satisfaction is like the heartbeat of a workplace it's the emotional and mental spark that connects fancy new tech like ChatGPT to how well employees actually perform. At its core, it's about how people feel when they reflect on their job: Are they fulfilled? Do they feel appreciated? (Locke, 1976). When AI tools like ChatGPT step in to make work smoother say, by speeding up tasks, cutting out the boring stuff, or helping employees learn new skills people start to feel like they're really good at what they do and that their workplace has their back (Kiron *et al.*, 2017). It's that warm, "I'm valued here" feeling that makes them pour their heart into their work, stay excited about their role, and even feel loyal to the company.

Think of a travel agent who used to dread slogging through repetitive bookings but now uses ChatGPT to zip through them, leaving time to dream up amazing itineraries for clients. That shift doesn't just make their day easier—it makes them proud of their work, eager to dive in each morning. Job satisfaction is the magic that turns those AI perks into real action. Happy employees show up with energy, roll with changes like champs, stick around longer, and just plain do better at their jobs. So, when companies bring in AI that lifts employees up—like tools that make them feel capable and respected—they're not just sparking innovation. They're building a team that's fired up, connected, and ready to help the whole organization shine.

6. Employee Performance:

In the fast-paced world of travel and hospitality, employee performance is a big deal it's measured by things like how productive someone is, how quickly they respond, how creative they get, and how well they connect with customers. When tools like ChatGPT come into play, it's like giving employees a super-smart assistant that helps them work faster, handle routine tasks automatically, and tap into clever insights on the spot (Nguyen, 2021). Imagine a hotel receptionist who can instantly pull up tailored recommendations for a guest or zip through

booking updates without breaking a sweat. This kind of tech support lets staff focus on what really matters making customers happy, solving problems creatively, and thinking big instead of getting bogged down in paperwork.

But here's the catch: those performance boosts only stick around if employees are genuinely happy in their jobs. When ChatGPT makes work less stressful, helps them learn new tricks, or reminds them they're valued, employees don't just tolerate the tech they embrace it and use it to shine. Picture a tour guide who's brimming with confidence because AI, like ChatGPT, is there to back them up whether it's quick facts about a destination or tips for handling a curveball question. That support gives them the freedom to pour their heart into creating trips that travellers will never forget, like sharing a hidden gem of a café or weaving a story that brings a city to life. Job satisfaction is the magic that ties it all together. It creates a workplace where employees feel pumped up, fully in the game, and genuinely invested in what the company's trying to achieve. That kind of energy means those standout moments—like a perfectly crafted tour—aren't just a one-off; they become the way things are done, day in and day out.

Theoretical Implications:

This chapter jumps into the lively discussion about how humans and AI can join forces in spots like hotels, travel agencies, and restaurants, spotlighting how ChatGPT can make work more rewarding for employees. It leans on a cool concept called socio-technical systems theory, which is all about people and tech syncing up like a perfectly timed dance routine. By zooming in on job satisfaction as a major piece of the puzzle, the chapter drives home that rolling out AI isn't just about shiny gadgets it's about boosting employees, making them feel backed up and appreciated in what they do every day.

Beyond that, the chapter flips the script on how we approach managing teams and shaping workplaces. It challenges the old-school mindset, showing that AI like ChatGPT can spark a whole new way of working—one where employees aren't just cogs in a machine but empowered players who are happier and more connected to their roles. It's a fresh take that pushes companies to think about how tech can fuel not just efficiency but also a workplace where people genuinely thrive. It argues that happy employees aren't just a nice bonus of using tools like ChatGPT they're the secret sauce that makes the tech actually improve how people perform. This flips the usual tech story on its head, pushing for AI that's designed with humans in mind, not to take over their jobs but to make them even better at what they do. It's like giving a chef a sharper knife not to replace them, but to help them cook up something amazing. Plus, it

sparks ideas for future studies to explore how digital tools can create happier workplaces and keep performance strong, especially in fast-moving, AI-driven fields like travel and hospitality.

Practical Implications:

This chapter serves up some really helpful ideas for hotels, travel agencies, and other hospitality businesses looking to bring AI tools like ChatGPT into the fold to boost how well their teams perform and how happy they feel at work. This chapter jumps into the lively discussion about how humans and AI can join forces in spots like hotels, travel agencies, and restaurants, spotlighting how ChatGPT can make work more rewarding for employees. It leans on a cool concept called socio-technical systems theory, which is all about people and tech syncing up like a perfectly timed dance routine. By zooming in on job satisfaction as a major piece of the puzzle, the chapter drives home that rolling out AI isn't just about shiny gadgets—it's about boosting employees, making them feel backed up and appreciated in what they do every day. Beyond that, the chapter flips the script on how we approach managing teams and shaping workplaces. It challenges the old-school mindset, showing that AI like ChatGPT can spark a whole new way of working—one where employees aren't just cogs in a machine but empowered players who are happier and more connected to their roles. It's a fresh take that pushes companies to think about how tech can fuel not just efficiency but also a workplace where people genuinely thrive.

Conclusion:

The travel and hospitality scene is buzzing with the AI revolution, and tools like ChatGPT are shaking things up with a blend of thrilling opportunities and a few challenges to sort out. When rolled out with care, ChatGPT can totally change the game picture guest experiences so personalized they feel like pure magic, daily tasks that flow without a hitch, lightning-fast service, and even moments for employees to learn and grow on the job. These aren't just time-savers; they're the kind of things that can put a real smile on workers' faces, firing them up to do their best every day.

But here's the heart of it: nailing AI isn't just about plugging in cutting-edge tech. It's about building a workplace where employees feel like they've got a true partner in tools like ChatGPT. Think of a hotel crew that's not bogged down by endless repetitive tasks because AI's got that covered freeing them to swap stories with guests, dream up fun surprises, or just bring their A-game to every moment. When businesses focus on the human side, making sure their teams feel confident, excited, and motivated to use AI, they create a space where everyone can shine. That's the spark that turns AI's big potential into real, lasting wins—not just for the

company but for every person crafting those unforgettable travel moments in a world that's always on the move.

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DIGITAL FINANCIAL INCLUSION AND ITS IMPACT ON HOUSEHOLD RESILIENCE IN EMERGING ECONOMIES

Tina Singh

Dashmesh Khalsa College,
Zirakpur, Dist. Mohali, Punjab, India

Abstract:

Digital financial inclusion has emerged as a key policy instrument for promoting economic stability and reducing vulnerability among households in emerging economies. By expanding access to digital payment systems, mobile banking, and fintech-based financial services, digital inclusion has the potential to enhance households' ability to manage economic shocks and uncertainties. This study examines the relationship between digital financial inclusion and household resilience, focusing on income stability, savings behavior, access to credit, and shock-coping capacity. Using secondary data and empirical analysis across selected emerging economies, the study finds that greater digital financial access is positively associated with improved household resilience, particularly among low-income and rural populations. The findings highlight the role of digital finance in strengthening economic security and supporting inclusive development.

Keywords: Digital Financial Inclusion, Household Resilience, Emerging Economies, Fintech, Economic Stability

1. Introduction:

Household resilience—the capacity of families to withstand, adapt to, and recover from economic shocks—has emerged as a critical issue in emerging economies, where large segments of the population remain economically vulnerable. Households in these regions are frequently exposed to financial stress due to persistent income volatility, widespread informal employment, limited access to formal credit markets, and underdeveloped social protection systems. External shocks such as economic downturns, health emergencies, natural disasters, and price fluctuations further exacerbate these vulnerabilities, often pushing households into cycles of debt and poverty. Strengthening household resilience is therefore essential for promoting long-term economic stability and inclusive growth. In this context, digital financial inclusion has gained increasing attention as a transformative mechanism for expanding access to affordable, secure, and reliable financial services. Digital financial inclusion refers to the provision of financial services through digital platforms, including mobile phones, internet-based applications, and

electronic payment systems, to populations that have traditionally been excluded from formal banking. Services such as mobile money, digital wallets, online banking, and fintech-based lending platforms have significantly reduced geographical, administrative, and cost-related barriers to financial access. By enabling faster transactions, lower service fees, and greater convenience, these technologies have broadened financial participation among low-income, rural, and marginalized households.

This paper examines how digital financial services contribute to household resilience by enhancing financial flexibility, strengthening risk management capabilities, and enabling quicker recovery from economic shocks. Access to digital payment systems allows households to receive income, remittances, and government transfers in a timely and secure manner, thereby improving cash flow management. Digital savings and credit facilities encourage precautionary saving and provide access to emergency funds, reducing reliance on informal and high-cost borrowing. Additionally, digital insurance products and remittance platforms help households mitigate risks and smooth consumption during periods of financial distress. Through these mechanisms, digital financial inclusion plays a vital role in empowering households to better cope with uncertainty and build sustainable economic resilience in emerging economies.

2. Literature Review

Existing literature consistently highlights a strong relationship between financial inclusion and poverty reduction, emphasizing the role of access to formal financial services in improving household welfare and economic security. Traditional models of financial inclusion, centered on brick-and-mortar banking institutions, have contributed to development outcomes in many regions. However, these approaches have often struggled to reach marginalized and low-income populations due to high transaction costs, stringent documentation requirements, limited branch networks, and inadequate financial infrastructure in rural and remote areas. As a result, large segments of households in emerging economies remain excluded from formal financial systems and continue to rely on informal, high-risk financial arrangements. Recent studies suggest that digital financial services have the potential to overcome many of these structural barriers by providing low-cost, scalable, and easily accessible alternatives to conventional banking. Mobile money platforms, digital payment systems, and fintech-based financial products enable households to conduct transactions, save, and access credit without the need for physical bank branches. Empirical evidence indicates that households with access to mobile money services are more likely to engage in regular saving behavior, maintain emergency funds, and manage short-term financial needs more effectively. These services also facilitate smoother consumption patterns during periods of income volatility, thereby reducing financial stress.

Research conducted in regions such as Sub-Saharan Africa and South Asia further demonstrates that digital payments and mobile money significantly enhance remittance flows, both domestic and international. Faster and more secure remittance channels help households cope with adverse shocks, including natural disasters, health emergencies, and economic disruptions, by providing timely financial support. Despite these documented benefits, the existing literature reveals notable gaps in understanding the broader and long-term impact of digital financial inclusion on household resilience. In particular, there is limited cross-country empirical evidence examining how digital financial access influences households' ability to withstand, adapt to, and recover from economic shocks across diverse emerging economies. Addressing this gap forms the central objective of the present study.

3. Conceptual Framework

Digital financial inclusion enhances household resilience through multiple interrelated channels that collectively improve households' ability to manage financial resources, mitigate risks, and respond effectively to economic shocks. One of the most important mechanisms is income management. Digital payment systems enable secure, fast, and reliable income transfers, including wages, remittances, and government benefits. By reducing delays, transaction costs, and leakages associated with cash-based systems, digital payments improve cash flow stability and allow households to plan expenditures more efficiently, thereby reducing short-term financial stress. Another critical channel is savings and asset building. Digital savings platforms, such as mobile wallets and app-based savings accounts, lower barriers to formal saving by offering convenience, flexibility, and low minimum balance requirements. These platforms encourage regular saving behavior, even among low-income households, and help build precautionary buffers that can be used during periods of income disruption. Over time, consistent digital saving contributes to asset accumulation and strengthens long-term financial security. Access to credit represents a further pathway through which digital financial inclusion supports household resilience. Fintech-based lending platforms utilize alternative data sources, such as transaction histories and mobile usage patterns, to assess creditworthiness, enabling households without formal credit histories to access short-term and emergency loans. This expanded access to credit allows households to manage unexpected expenses, smooth consumption, and avoid reliance on informal lenders who often charge exorbitant interest rates.

Finally, risk mitigation is enhanced through digital insurance products and remittance services. Mobile-based insurance schemes provide affordable coverage against health, agricultural, and climate-related risks, while digital remittance platforms facilitate rapid financial support from social networks during crises. Together, these services help households absorb

shocks, reduce vulnerability, and accelerate recovery following adverse events. Through the combined effects of improved income management, increased savings, enhanced credit access, and strengthened risk mitigation, digital financial inclusion significantly bolsters households' capacity to withstand, adapt to, and recover from economic stress. This integrated framework highlights the pivotal role of digital finance in promoting resilience and inclusive economic development in emerging economies.

4. Research Objectives

The primary objective of this study is to examine the extent and patterns of digital financial inclusion in selected emerging economies. This involves assessing access to and usage of digital financial services such as mobile money accounts, digital payment platforms, online banking, and fintech-based savings and credit products across different population groups. Special attention is given to variations by income level, gender, geographic location, and employment status in order to identify existing gaps in digital financial access. The study further aims to analyze the relationship between digital financial access and key indicators of household resilience. These indicators include savings behavior, income stability, consumption smoothing, access to emergency funds, and reliance on informal credit. By employing empirical analysis, the research seeks to determine whether households with greater access to digital financial services exhibit stronger resilience compared to those with limited or no digital financial access. Another important objective is to assess how digital financial services influence households' ability to cope with economic shocks, such as income losses, health emergencies, price fluctuations, or natural disasters. The study examines the role of digital payments, fintech credit, remittances, and digital insurance in helping households manage short-term financial disruptions and recover more rapidly from adverse events.

Finally, the study seeks to identify relevant policy implications for strengthening digital financial ecosystems in emerging economies. This includes evaluating regulatory frameworks, digital infrastructure, financial and digital literacy initiatives, and consumer protection measures. The findings aim to provide actionable recommendations for policymakers, financial institutions, and development agencies to promote inclusive, secure, and resilient digital financial systems.

5. Research Methodology

This study adopts a quantitative research design to empirically investigate the relationship between digital financial inclusion and household resilience in selected emerging economies. The analysis is based on secondary data obtained from reputable and widely used sources, including the World Bank Global Findex Database, International Monetary Fund (IMF) reports, and national household surveys. These datasets provide comprehensive and comparable

information on financial access, usage of digital financial services, and household-level socio-economic characteristics across countries and over time. Key explanatory variables capturing digital financial inclusion include indicators such as digital account ownership, frequency of mobile and electronic payment usage, access to digital savings instruments, and participation in fintech-based financial services. Household resilience is measured using outcome variables such as consumption stability, the presence of emergency savings or funds, the ability to meet unexpected expenses, and reduced dependence on informal borrowing during periods of income disruption. Control variables include household income levels, educational attainment, employment status, gender, age, and urban–rural location, which are incorporated to account for socio-demographic heterogeneity. To analyze the impact of digital financial inclusion on household resilience, the study employs econometric techniques, primarily regression analysis. Multivariate regression models are estimated to isolate the effect of digital financial access while controlling for confounding factors. Where appropriate, robustness checks and alternative model specifications are applied to ensure the reliability and validity of the results. This empirical approach enables a systematic assessment of the extent to which digital financial services contribute to strengthening household resilience in emerging economies

6. Results and Discussion:

The empirical findings of this study reveal a positive and statistically significant relationship between digital financial inclusion and household resilience across the selected emerging economies. Households with access to digital financial services exhibit notably higher savings rates, reflecting an increased capacity to build precautionary financial buffers. These households also demonstrate improved access to emergency credit through digital and fintech-based lending platforms, which enables them to respond more effectively to unexpected financial needs without resorting to high-cost informal borrowing. Moreover, digitally included households show a greater ability to maintain stable consumption patterns during periods of income volatility, indicating enhanced capacity for consumption smoothing and financial shock absorption.

The impact of digital financial inclusion is found to be particularly pronounced among rural households and women, groups that have traditionally faced significant barriers to accessing formal financial services. For rural households, digital finance reduces geographical constraints by enabling remote access to payments, savings, and credit services, thereby improving financial security and resilience. Similarly, enhanced access to digital financial tools empowers women by increasing their financial autonomy, strengthening control over household resources, and improving their ability to manage economic risks. These findings underscore the

inclusive potential of digital financial systems in narrowing socio-economic disparities and promoting equitable financial participation. Despite these positive outcomes, the study also identifies several challenges that may constrain the effectiveness of digital financial inclusion initiatives. Digital literacy gaps remain a significant barrier, particularly among older populations and those with limited educational backgrounds, reducing their ability to fully utilize digital financial services. Unequal access to internet connectivity and digital infrastructure, especially in remote and underserved regions, further limits the reach and impact of digital finance. Additionally, cybersecurity risks and concerns related to data privacy and fraud pose growing threats to user trust and adoption. Addressing these challenges is essential to ensuring that digital financial inclusion translates into sustainable and widespread improvements in household resilience.

7. Policy Implications

Policymakers should prioritize investments in digital infrastructure, promote financial and digital literacy programs, and support regulatory frameworks that encourage innovation while ensuring consumer protection. Strengthening partnerships between governments, financial institutions, and fintech providers can further enhance household resilience.

Conclusion:

Digital financial inclusion plays a critical and transformative role in strengthening household resilience in emerging economies. By expanding access to affordable, secure, and efficient financial services, digital finance equips households with the tools necessary to manage financial risks, cope with income volatility, and respond effectively to economic shocks. Services such as digital payments, savings platforms, fintech-based credit, and mobile insurance enable households to smooth consumption, build precautionary savings, and access timely financial support during emergencies, thereby enhancing overall financial stability.

The findings of this study underscore that digital financial inclusion is particularly beneficial for vulnerable groups, including low-income households, rural populations, and women, who have traditionally been excluded from formal financial systems. By reducing geographical, informational, and institutional barriers, digital finance promotes greater financial autonomy and inclusion, contributing to more equitable economic outcomes. However, realizing the full potential of digital financial inclusion requires addressing persistent structural challenges such as digital literacy gaps, inadequate internet infrastructure, and concerns related to cybersecurity and consumer protection. Continued and coordinated efforts by policymakers, financial institutions, and technology providers are essential to expand digital access and create supportive regulatory environments. Investments in digital infrastructure, targeted financial education initiatives, and robust regulatory frameworks can ensure that digital financial

ecosystems remain inclusive, secure, and resilient. In doing so, digital financial inclusion can serve as a powerful catalyst for inclusive and sustainable economic development, strengthening household resilience and narrowing socio-economic inequalities in emerging economies.

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APEDA'S FINANCIAL ASSISTANCE GIVEN TO EXPORTERS IN INDIA

Harshitha Mallik*¹ and Divya L²

¹Mysore Makkala Koota and Shri Dharmasthala Manjunatheshwara Mahila Maha Vidyalaya
(MMK & SDM MMV), Mysuru, Karnataka

²JSS College of Arts, Commerce and Science, Mysuru, Karnataka

*Corresponding author E-mail: harshithamallik99@gmail.com

Abstract:

Agriculture is the major sector that feeds the country's trade. The agriculture sector's growth is a critical driver of the country's overall economic development as approximately 50% of the country's population is involved in agriculture and allied activities. The Agricultural and Processed Food Products Export Development Authority (APEDA) is accountable for monitoring exports of cereals, processed foods, Animal Products, Processed fruits and vegetables, fresh fruits and vegetables, cashew, floriculture & seeds. The agency plays a critical role in enhancing India's agricultural exports by facilitating the export of various agricultural commodities and providing financial schemes for farmers and exporters. These financial schemes were not reaching the exporters properly. For this purpose, data was collected using a questionnaire, and collected data was analyzed through descriptive statistics. The study found that very few exporters were making use of financial schemes provided by APEDA.

Keywords: Financial Assistance, Schemes, APEDA, Exporters

Introduction:

Under Ministry of Commerce and Industry, the Agricultural and Processed Food Export Development Authority (APEDA) of India a statutory body is established by Government of India under APEDA act 1985. Its primary objective is to promote export of agricultural and processed food products from India by providing financial assistance to market development, infrastructure, transport, quality control to the exporters.

Since its incorporation, APEDA has played an important role for the growth of India's agriexport. It deals with scheduled products such as fresh fruits and vegetables, processed fruits and vegetables, animal products, other processed food products, floriculture and organic products. APEDA a platform where the farmers, exporters and the international market.

APEDA is giving financial assistance to exporters through various schemes such as market development scheme for conducting fairs and exhibition about the products, pesticide management, market development, packing and labeling. Infrastructure development scheme

for providing services such as common storage facilities, cold storage and packing house. Quality development scheme for quality control, providing labs for the checking of quality, certifying agencies. Transportation assistance for transporting of products which require cold vehicles, trucks for transportation which can improve the shelf life of the products. It also encourages exporters to participate in international trade fair, buyer-seller meet, brand inventions and international summit. With the concept of sustainability, food safety and internationally accepted standards, APEDA continue its growth towards agri-export from India to support the vision of global food hub.

Research Gap

Despite the important function of Agricultural and Processed Food Products Export Development Authority (APEDA) for the promotion of agricultural exports from India, there is less systematic academic assessment of its legislative framework and schemes. Although policy and annual reports contain descriptive accounts, few independent academic studies that critically evaluate performance of APEDA's schemes.

There are studies on regulatory constraints to agricultural export focuses on general trade barriers or international standards and regulations. Nevertheless, there is a lack of empirical studies to investigate regulatory requirements in general and more specifically APEDA's regulations, infrastructure, quality, packing, marketing standards and other measures.

Infrastructure Development Scheme (IDS) of APEDA suffered a lack of systematic evaluation. Emphasis is also laid on the amount sanctioned and utilized towards IDS but little evidence exists about their utilization and contribution to reduce post harvest losses and export competitiveness. Similarly, the Quality Development Scheme (QDS) initiatives are typically reported in a certification perspective with little research linking with fund allocated to improve the quality standards in the international market. There is no research done on fund utilization, supplementary funds and financial performance under quality development schemes of APEDA.

The market performance efforts carried out by APEDA including trade fairs and buyer-seller meets are evaluated more in terms of output count rather than outcomes. No studies done on financial performance in consideration of fund sanctioned and fund utilized under Market Development Schemes (MDS) to improve the domestic and international markets. Similarly, the transport aid measures need to be further researched, in particular fund allocated and fund utilized under Transportation Development Scheme (TDS) of APEDA to provide transportation support throughout different regions. There are no studies on contribution of Research and Development Scheme (RDS) towards the export performance of APEDA.

Previous studies pay less attention to the perception of exporters' towards APEDA's financial assistance schemes. A very less research done on awareness, preference, attitude, satisfaction and challenges faced by exporters. This gap forms the motivation and contribution of this study that will assess the overall effectiveness of APEDA's regulation system and its key support towards financial performance of different schemes of APEDA promoting agricultural exports.

Need for the Study

India is one of the major countries in exporting of agricultural products. The Agricultural and Processed Food Export Development Authority of India was established in 1984 which was insisted to support exporters through finance, market assistance, transportation assistance, infrastructure facilities and quality controlling to the products which are exported. Over the period APEDA has introduced various schemes for promoting the exports.

The examination of regulatory problems is critical as exporters often face trouble with existing national regulations and international norms. Discussions of these regulations can inform how processes can be simplified in a way that India's exports to remain competitive in international markets.

Equally, there is a need to measure the infrastructure development projects to see if the fund sanctioned is utilized completely for the improvements of cold chains, testing facilities and pack houses that helps to reduce post-harvest losses. Similarly, Quality development programmes of APEDA are also important with the global standards on quality and safety. It is necessary to study the allocated funds are utilized fully for improving the quality and reducing the rejection rate.

The market development scheme efforts must be studied to find out if projects such as trade fairs and buyer-seller meets are conducted by utilizing the funds sanctioned under market development scheme of APEDA. Likewise, examining performance of transportation development scheme in order to know whether the transportation benefits are fully utilized with sanctioned funds and reaching to different regions. There is a need to analyze funds allocated under research and development scheme to promote the export performance of APEDA. It is necessary to understand exporters' awareness, preference, attitude, satisfaction, and challenges faced by them will help in improving the design and implementation of these schemes.

Thus, this study is needed to bridge the gap in analyzing APEDA's regulatory frameworks to meet the standards at international market and to evaluate the proper utilization of sanctioned funds under different schemes for promotion of export.

Objective of the Study

- To analyze the regulatory issues related to export of agricultural and processed food products under APEDA.
- To evaluate the performance of infrastructure development scheme of APEDA .
- To assess the performance of quality development scheme of APEDA.
- To analyze the performance of market development scheme of APEDA.
- To evaluate the performance of transportation assistance scheme of APEDA.

Profile of APEDA

Agricultural and Processed Food Export Development Authority (APEDA) of India, a statutory body is established by Government of India under APEDA act 1985. Its primary objective is to promote export of agricultural and processed food products from India, providing better income to the farmers by giving higher value to each unit of export, to create employment opportunities to the rural areas by encouraging value added exports under APEDA. Under Ministry of Commerce and Industry, APEDA is an autonomous organization. The main aim of this organization is to create a strong link between Indian farmers and the international market. APEDA also undertakes the counseling and explaining about the affective sources given by the government policies and procedures.

The APEDA has taken initiative to develop and promote many promotional programmes to increase the exports. Main among them is buyer sellers meet, international fairs and exhibitions, pesticide management programmes, product development, publicity and information broadcasting, problem solving programmes and advisory services.

Apart from promotional programmes, APEDA is also providing financial assistance to promote agri-exports in India through different schemes. This financial assistance is given to registered members such as producers, exporters and other institutions. The financial assistance is available for market development, transportation facilities, quality improvement, infrastructure facilities and so on.

APEDA also play an important role in promoting the agri-export. It has identified many export promotion zones which provides financial and advisory services for exporting the scheduled products such as fresh fruits and vegetables, processed fruits and vegetables, animal products, floricultural products and other processed food products.

Functions of APEDA

- Development of industries concerning the scheduled products for export through providing financial assistance or otherwise for conducting surveys and feasibility studies, participation in inquiry capital through joint ventures and any other reliefs and subsidy schemes;

- Registration of persons as exporters of the scheduled products on payment of fees;
- Setting of standards and specifications for the scheduled products to be exported;
- Inspecting meat and meat products in slaughter houses, which include meat processing plants, storage premises, conveyances or other places where meat and meat products are kept or handled or from which they are conveyed with a view to ensuring the quality of such products;
- Enhancement of packing of the Schedule goods;
- Enhancing the marketing of the Scheduled goods outside India;
- Export oriented production and development of the Scheduled products.
- Population of statistics from the owners of factories or establishments engaged in production of processing, packaging, marketing or export of scheduled products or from such additional persons as may be prescribed on whatever matter in relation to the scheduled products and create the statistics thus collected or of any portion thereof or extracts there from;
- Training in different components of the businesses associated with the planned products

Schemes of APEDA

APEDA has been constantly involved in the promotion of the markets as well as up gradation of infrastructure and quality to enhance the products. In its effort to facilitate agro exports, APEDA has been continuously providing financial assistance to registered exporters of APEDA food products in terms of developing export infrastructure, quality and market development under the following schemes:

- Scheme for Market Development
- Scheme for Infrastructure
- Scheme for Quality Improvement
- Scheme for Research and Development
- Scheme for Transport Assistance

Scheme for Market Development

This component supports exporters to gain market access in new markets and helps to sustain their position in existing markets. It includes organized marketing strategies for food products export, market intelligence for informed decision making, international exposure, skill development, capacity building and value-addition packaging.

The aid provided under this component also includes participation with market development assistance in international trade shows, exchange of trade delegations, to arrange buyer seller meets, preparing standards for new products packaging and upgrading existing standards. Similarly, some of the significant features of this scheme are: market development

assistance for export of food items, to get market intelligence for informed decisions, giving international exposure, skill development, capacity building and quality packaging, participation in international exhibitions, exchanges of trading delegations, arranging and organizing buyer-seller meets, attaining market access in new markets and maintaining presence in existing markets etc., where standardization of packaging is most critical to the product quality and its prestige at the international level. Therefore, developing the international packaging standards for the new products and upgradation of the existing standard through Indian Institute of Packaging (IIP) is need of the hour. This is done through the market development component of scheme APEDA. The following table shows the different components and pattern of assistance under schemes for market development as per APEDA guidelines 2021-22 to 2025-26

Components and Pattern of Assistance under Schemes for Market Development

Component	Sub-component / Activity	Pattern of Assistance
Component 1: Development of New Market	Sub-component 1: Activity for product development through feasibility studies	50% funding from APEDA with a maximum ceiling of ₹10,00,000 per study. 100% funding for activities initiated by APEDA.
	Sub-component 2: Assistance for multimodal transportation to test new products and packaging	50% funding from APEDA with a maximum ceiling of ₹10,00,000 per beneficiary.
	Sub-component 3: Activity for registration of brand in the international market	50% funding from APEDA with a maximum ceiling of ₹20,00,000 per beneficiary. 100% funding for activities initiated by APEDA.
Component 2: Packing Development	Sub-component 1: Product packing as per standards required in the international market	100% to be implemented by APEDA.
	Sub-component 2: Participation in buyer-seller meets, trade delegations, fairs, and events	100% to be implemented by APEDA.

Source: APEDA Guidelines (2021–22)

Scheme for Infrastructure

Under development scheme of export infrastructure, related activities are supported by APEDA by the way of financial assistance. Development of adequate infrastructures is crucial for the agro-food sector development and its exports. The APEDA reflected on the post harvest

export infrastructure facilities which have the loopholes and led to huge wastage and also provide a better efficiency in exporting the agro-processed food product.

The scheme covers both fresh produce and processed food products and prioritize: carrying and establishing post-harvest facilities, reducing losses caused by spoilage, producing quality agro products, providing financial assistance to the exporters, building infrastructure, pack house facilities, equipment for collection, cleaning, washing, sorting/ grading, pre-cooling, packing, cold storage, handheld near infrared spectroscopy , hot water dip treatment (HWDT), cableway system for handling of crops like banana, preshipment treatment facilities, vapor heat treatment (VHT), meeting the Phytosanitary requirements for controlling plant diseases, particularly in the agricultural crops of importing countries, processing facilities.

It is part of the scheme to process horticulture crops to improve and develop an infrastructure for processing facilities to cover such missing gaps which will enable a producer to support equipment and technologies of various types of screening sensors. These will detect external/internal quality of the produce, product quality for value-added products with respect to productivity, efficiency, quality. Any innovative equipment or technology for food safety and quality and purchase of insulated, reefer transport units, individually quickfrozen (IQF), cooking /blanching line or any innovative or new equipment for food safety and quality are required. The following table shows components and pattern of assistance of schemes for infrastructure as per APEDA guidelines 2021-22 to 2025-26

Components and Pattern of Assistance under Schemes for Infrastructure

Components	Pattern of Assistance
Sub-component 1	
Activity for grading, sorting, cooling, packing, hot water dip treatment	40% funding from APEDA with maximum ceiling Rs 200 lakh per beneficiary.
Sub-component 2	
Purchase of insulators, mobile pre-cooling unit including special vehicles for livestock	40% funding from APEDA with maximum ceiling Rs 200 lakh per beneficiary.
Sub-component 3	
Cable handling systems for bananas and other crops	40% funding from APEDA with maximum ceiling Rs 200 lakh per beneficiary.
Sub-component 4	
Enhancing productivity, efficiency and value-added products	40% funding from APEDA with maximum ceiling Rs 200 lakh per beneficiary.

Sub-component 5	
Common infrastructure facilities such as Integrated pack house, processing unit, Processing laboratories etc setup by central or state government institutions	90% funding from APEDA with maximum ceiling Rs 600 lakh per beneficiary. The releasing of fund is based on bank guarantee.

Source: APEDA Guidelines 2021-22

Scheme for Quality Improvement

For global trade, the adoption of the quality development and food safety requirements of the countries is needed, which is also one of the objectives of export promotional scheme. Most of these food-importing countries are now insisting on strict Maximum Residue Levels (MRLs) authorized by the respective countries. Most developed countries have established very low MRLs that require highly sensitive equipments to be installed by food testing labs and trade. To fulfill this objective, APEDA, through its scheme, enhances the capacity of Indian exporters for compliance to global quality standards.

Quality Development helps to boost export from India. Under this component, assistance is given to National Referral Laboratory (NRL), other govt. sector, institutions for monitoring agrochemical residues, pesticide control, water testing, soil, veterinary drugs, hormones, toxins, heavy metals, microbial count, procuring hand-held devices, quality implementation and certification, food safety management system training in India. Assistance is also given to attend seminars/ workshops/ outreach programs in abroad, installation of quality management systems, laboratory testing equipment, hand-held devices to capture peripheral coordinates of the farms for the traceability systems of samples, standardization & harmonization with International standards for the adoption of International Standards, strengthening of technical and managerial skills, preparation of manuals brochures and guidelines for export activities etc. which assist in achieving these prescribed standards for export. The component is also oriented towards compliance with quality and food safety and also extends financial assistance to units registered with APEDA. Monetary support is also provided for up gradation of recognized labs/in-house lab equipment, novel concept providing infrastructural as well as quality advancement in India's agri-processed food segment. The following table shows components and pattern of assistance of schemes for quality development as per APEDA guidelines 2021-22 to 2025-26.

Components and Pattern of Assistance under Schemes for Quality Development

Table. Components and Pattern of Assistance under APEDA Scheme

Component	Sub-component / Activity	Pattern of Assistance
Component 1: Food Safety and International Standards	Sub-component 1: Activity for quality certification and food safety management systems	50% funding from APEDA with a maximum ceiling of ₹5 lakh per beneficiary.
	Sub-component 2: Standardization and harmonization with international standards, especially for control of fruit fly	100% to be implemented by APEDA.
	Sub-component 3: Purchase of handheld devices to ensure traceability of produce at the farm level	50% funding from APEDA with a maximum ceiling of ₹20 lakh per cost of equipment.
Component 2: Strengthening of Managerial Skills	Sub-component 1: Domestic and international training and study tours	50% funding from APEDA for travel cost and training fee with a maximum ceiling of ₹3 lakh per participant. Only one participant is permitted per organization.
	Sub-component 2: Seminars, workshops, and outreach programmes organized/sponsored/assisted by APEDA	Up to ₹5 lakh assistance provided by APEDA.
Component 3: Testing of Water, Soil, and Pesticides	Testing of water, soil, pesticide residues, toxins, heavy metals, and other products as per APEDA schedule	50% funding from APEDA with a maximum ceiling of ₹5,000 per sample.
Component 4: Seeds and New Plants for Potential Produce	Introduction of varieties of seeds and new plants for potential produce	90% funding for the cost of seeds from APEDA with a maximum ceiling of ₹50 lakh.
Component 5: Laboratories for Export Testing	Strengthening APEDA laboratories for export certification	50% funding from APEDA with a maximum ceiling of ₹100 lakh.

Source: APEDA Guidelines (2021–22).

Scheme for Research and Development

Under Research and Development, APEDA get R&D work by the research institutions of public and private organizations to enhance the value added products through research. This scheme will promote the research and development activity which will enrich the quality of the products, improve technologies, inventions of new products and benefiting the exporters.

Financial assistance is given to both public and private research institutions which is recognized under APEDA to support relevant research for export enhancement. The following table shows components and pattern of assistance of schemes for research and development as per APEDA guidelines 2021-22 to 2025-26

Components and Pattern of Assistance under Schemes for Research and Development

Component / Sub-component	Pattern of Assistance
Sub-component 1: Support for government R&D organizations	100% to be implemented by APEDA.
Sub-component 2: Assistance for private sector R&D organizations of APEDA (subsidy to establish proof of concept for testing of food products)	50% of the total project cost with a maximum ceiling of ₹10 lakhs.

Source: APEDA Guidelines (2021–22).

Scheme for Transport Assistance

APEDA offers transport support on a port-to-port shipment destination basis. Exemption from assistance shall be applicable for freight charges for surface transportation inside the country or to the destination country as may be applicable to freight by vessels or through open sea, repair time/floating charges, reefer container freight.

In order to reduce disadvantageous freight for the exporters and to assist the commodities and to keep the competitive spirit, APEDA, offers support to the exporters of horticulture, floriculture, processed food and animal products in percentage concession in Freight on Board (FOB) (Rs. Per kg) of exports varies in type of commodity exported. Concessions are granted on first come first serve basis on receipt of applications come firstserve basis, based on the date of physical receipt of the document and contingent on availability of funds. The following table and table shows the eligible items scheduled by APEDA and permissible destinations for air and sea transport assistance which is given by APEDA.

Eligible Items and Permissible Destinations for Air Transport Assistance

Eligible Items/Products	Destinations	Assistance rate (Rs/kg)
Floriculture		
Fresh Cut Flowers	All Destinations	70
Live Plants and Bulbs		70
Tissue Culture Plants		1400
Fresh Fruits		
Litchis	All Destinations	12
Pineapples		15
Other Fresh Fruits (excluding Mangoes and Grapes)		25
Mangoes and Grapes	Only for Americas (North and South), Russia and CIS countries, Japan and Australia and New Zealand	25
Fresh Vegetables		
Fresh Vegetables (including organically grown vegetables and mixed vegetables but excluding Nendran Bananas and Fresh Mushrooms)	All Destinations	25
Fresh Mushrooms		30
Banana (Nendran variety)	Middle East only	15
Poultry Products		
Hatching Eggs	Middle East and Africa	80
Fresh Culinary Herbs	All Destinations	50
Animal Products		
Sheep Casings	All Destinations	1000

Source: APEDA Transport Assistance 2022-23

Eligible Items and Permissible Destinations for Sea Transport Assistance

Eligible Items/Products	Destinations	Assistance rate (Rs/kg)
Fresh/ Chilled Fruits		
Litchis	All Destinations	12
Pineapples		15
Banana		15
All Other Fresh/ Chilled Fruits		25
Mangoes and Grapes	Only for Americas (North and South), Russia and CIS countries, Japan and Australia and New Zealand	25
Fresh/ Chilled Vegetables (including organically grown vegetables and mixed vegetables)	All Destinations	25
Processed Vegetables		
All Dried and Preserved Vegetables (Acetic Acid/ Vinegar/ Brine) (including Onions in Acetic Acid and Potato Flakes/ Powder but excluding Pulses)	All Destinations	30
Gherkins and Cucumbers (Prepared / preserved)		15
Dehydrated Onion & Garlic (Flakes/Powder)	All Destinations except Europe	50
Mushrooms Prepared/ Preserved	All Destinations	50
Processed Fruits		
All Processed Fruit Preparations (Excluding squashes, juices and pulps)	All Destinations	40
Fruit Squash		60
Fruit Juices		45
Fruit Pulps in Frozen/ Aseptic Form		50

Poultry Products		
Table Eggs	All Destinations	40
Eggs not in Shell (Dried/Cooked)/ Whole Egg Powder		170
Frozen Poultry Meat and Processed Poultry Products		45
Animal Products		
Frozen (Boneless) Buffalo meat	West African Countries only	70
Dairy products		
Milk powder (Whole & Skimmed)	All Destinations	100
Cheese (in all forms) including in reefer containers		150
Floriculture		
Fresh Cut Flowers	All Destinations	70
Dried Flowers		40

Source: APEDA Transport Assistance 2022-23

Findings:

The scheme has led to creation of infrastructure such as integrated packhouses, cold storages, pre-cooling chambers, sorting and grading lines, irradiation facilities, laboratories. These centres have enabled the exporters to maintain product quality, minimize post harvest losses and adhere to international standards of fresh and processed products. The results indicate that infrastructure development has been focused in a few states and export clusters like Maharashtra, Gujarat, Kerala and Tamil Nadu which already possess a robust cluster base for their export growth. On the contrary, poor-performing states was allotted at a slow pace with smaller amounts and to date received comparatively low allocation of funds and progress rate of project completion, indicating regional disparity in scheme implementation.

Some of the projects approved under Infrastructure Development Scheme were delayed in completion and operational owing to procedure hold-ups, lack of coordination with state authorities and poorer technical capacity at beneficiary level. Some establishments were underutilized due to low demand, high maintenance costs, and lack of technical manpower in some cases.

Beneficiary exporters informed that the infrastructure created with the assistance of APEDA improved their export readiness, resulted in better storage utilization and minimized

transit losses. Modern processing and testing facilities being there is successful in compliance of international quality standard bring credibility for the Indian exports.

Examination of fund disbursement found moderate to high financial efficiency with majority sanctioned funds effectively used for approved components. But there are few tracking systems to assess the long-term economic and operational performance of such infrastructure projects. Post-Completion Review mechanisms for the assessment of sustainability are required. The study also observed the enhanced involvement of private partners and cooperatives in infrastructure projects sanctioned by APEDA. Public-private partnerships have enhanced resources mobilization and operational efficiency, yet small exporters continue to encounter constraints in accessing the scheme related to limited financial size and documentation requirements.

The scheme has played an important role in enhancement of national quality infrastructure through establishment/ upgradation of APEDA recognized laboratories (including NABL accreditation), residue monitoring, strengthening quality infrastructure, etc. Such facilities have helped in effective monitoring of pesticide residue, contaminants and quality compliance of export shipments. However the existence of such infrastructure is uneven and highly concentrated between exporting states (with major exporting states having several centres) while, smaller or countries under development export whereas have to rely on facilities from another region for testing and accreditation.

The results indicate that APEDA has been playing an active role in motivating exporters to obtain internationally recognized certifications, such as ISO, HACCP, GAP and BRC. The money for certification exercise has enabled exporters to increase the credibility and acceptability of their produce in the international chain. The implementation of the scheme has been partial as limited numbers of exporters can afford to find funds for getting certification themselves.

Exports receiving the assistance had led to substantial improvement in quality and decline in rejection levels abroad. Improved testing and facilities for quality control have made exportready products and also sustained adherence with standards of importing countries. The programme has contributed to a number of training schemes including: workshops, seminars and export, processing and laboratory technicians' training. These initiatives have raised awareness about quality norms, testing protocols and exports-related documentation. However, the results also show that small exporters' knowledge remains deficient and region-specific outreach programs should be expanded in order to reach a larger part of them.

Overall, the Quality development Scheme has made a significant contribution to enhancing India's export potential by facilitating exporters to meet quality standards and penetrate high value global markets. The scheme has also enhanced India's credibility as a producer of safe and quality agricultural and processed food products with developed countries.

The study shows that the Market Development Scheme has helped diversify markets, reaching beyond the traditional markets of the Middle East and South Asia to new destinations in Europe, Africa and East Asia. Further initiatives by APEDA in branding and geographical indication (GI) promotion like Basmati rice, mangoes, processed fruits have added to India's presence in the global markets. However, the success of these promotional activities is still limited to a few bestselling product categories whilst many niche and value-added products still lack global recognition.

It was found that there are few systems for the systematic evaluation and impact assessment of trade fairs and promotional events. There is limited post-event monitoring of export volumes or business achieved as a result of individual promotional actions. It thus becomes difficult to measure the long term impacts. The majority of the exporters had a positive perception on

APEDA's role towards market development, reporting that this institution helped them to enter global markets and arranged delegations & participation in major international fairs. The use of transportation assistance is highly concentrated among the a few export dominant states like Madhya Pradesh, Goa and Varanasi having well-knit logistical infrastructure and export clusters. On the other hand, exporters from interior and North Eastern regions find it difficult to get support for transportation as a result of poor connectivity, inadequate cold chain facilities, issues of last-mile connectivity to access the ports or airports. This imbalance of regional benefit to reduce the inclusiveness of the program.

Suggestions:

APEDA needs to focus on minimizing overlapping laws and documentation by integrating the processes with other trade authorities. An integrated online platform could also be worked on for the exporters to submit all registrations, certifications and documentations at one place instead of filling separate forms which would help in saving time. All registered exporters should be informed of policy changes and international standards adjustments through routine updates, digital circulars and other awareness raising campaign. The training program much to given to new exporters.

In future, funds must be utilized on more infrastructure facilities located in less served areas of the country, with particular emphasis placed on less well connected parts of the North -

Eastern and interior states to give them access to export options. A formative post-implementation testing model is suggested to evaluate the performance, use, and continuity of supported infrastructure. Efficiency and resource mobilization are likely to be enhanced through joint infrastructure endeavors between exporters, cooperatives, and private companies.

APEDA should encourage funds to create additional accredited labs in upcoming export zones to lower dependence on the distance testing units. The quality and safety certification process should be simplified for the betterment of small exporters. Organize awareness programmes and training workshops in different regions to motivate more exporters under Quality Development Scheme. There is a need to establish an online digital platform where the exporters can get information about quality, compliance, test results and certification that will not only give boost to the tracing but also increase trust in Indian products globally.

APEDA should move beyond concentrating only on the trade fairs, and must have a focus on market intelligence, branding activities and continued engagement of buyers in priority export destinations. In view of the digital type of trade, APEDA should invest more on boosting epromotion, e-market platforms and B2B digital network systems. Small exporters should receive financial support and simplified arrangements to facilitate their participation in international promotion activities. APEDA must take time bound studies of the trade fairs and promotional activities to assess its cost effectiveness.

APEDA should facilitate the claim processing and online verification to avoid delays in making payment of transportation assistance. More fund must be invested to expand support for transport logistics by combining several modes of transportation and offer it to exporters in the hinterland. The reimbursement rates should be periodically reviewed to ensure that it keeps pace with increasing international freight charges and inflation.

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OPTIMIZING EMPLOYEE ASSISTANCE PROGRAMS: PREDICTING AND REDUCING ABSENTEEISM FOR COST-EFFECTIVE INTERVENTIONS

Kalpana Koneru

Department of Management, School of Law & Management,
Vignan's Foundation for Science, Technology & Research,
Valdlamudi, Guntur, Andhra Pradesh, India

Corresponding author E-mail: kalpanarao.koneru@gmail.com

Abstract:

Organizational absenteeism caused by personal and job-related pressures is becoming increasingly expensive for employers. The study evaluates two strategies to reduce absence rates: Employee Assistance Programs (EAPs) and predictive analytics using machine learning. A quasi-experimental research design with a closely aligned control group was used to assess the effectiveness of EAPs. The findings showed that employees who utilized EAP services demonstrated a 4.8% to 6.5% greater decline in monthly sick leave compared to those who did not use the program. EAPs were especially effective in managing moderate to low levels of absenteeism. In addition, a decision-support framework for forecasting absenteeism was developed through machine-learning models applied to actual HR and payroll data. Employee absence was formulated as a cost-oriented binary classification task to evaluate risk. This predictive method allows early intervention by identifying employees who are likely to become long-term absentees. The research highlights the synergistic value of EAPs and AI-driven predictive analytics in minimizing workplace absenteeism, providing both responsive and preventive approaches to enhance employee well-being and organizational productivity.

Keywords: Employee Assistance Programs (EAPs), Workplace Absenteeism, Occupational Stress, Work–Life Balance Issues, Cost-Sensitive Learning, Human Resource Analytics, Machine-Learning-Based Absenteeism Prediction

Objectives:

1. Analyse the Impact of Employee Assistance Programs (EAPs) on Absenteeism:
 - Assess the effectiveness of EAPs in reducing employee absenteeism.
 - Evaluate the extent to which EAPs benefit employees with moderate to low absenteeism.
2. Explore the Role of Machine Learning in Absenteeism Prediction:
 - Develop a predictive model for absenteeism using real HR and payroll data.

- Assess the accuracy and effectiveness of machine learning algorithms in identifying employees at risk of long-term absenteeism.
3. Compare the Effectiveness of EAPs and Predictive Analytics:
 - Conduct a quasi-experimental study to measure the impact of EAPs versus AI- driven predictive models.
 - Evaluate the cost-effectiveness of both approaches in reducing workplace absenteeism.
 4. Examine the Complementary Role of Reactive and Proactive Absenteeism Management Strategies:
 - Investigate how EAPs (reactive approach) and predictive analytics (proactive approach) can work together to improve employee well-being and reduce absenteeism.
 - Provide insights into the integration of AI-driven predictive models with traditional HR programs.
 5. Assess the Organizational and Financial Implications of Absenteeism Reduction Strategies:
 - Quantify the cost savings and productivity improvements associated with reduced absenteeism through EAPs and predictive analytics.
 - Provide recommendations for HR professionals and business leaders on implementing an optimal absenteeism management strategy.

1. Introduction:

Employee absenteeism, defined as the failure to attend scheduled work due to health or personal reasons, imposes substantial costs on organizations, disrupting operations and reducing productivity. The financial burden of absenteeism is particularly significant in countries within the Organisation for Economic Co-operation and Development (OECD), where it accounts for an estimated 1.2% to 2% of total GDP—amounting to approximately 0.6 to 1 trillion US dollars. Given these economic implications, employers are increasingly seeking effective strategies to mitigate absenteeism and support employee well-being.

Two key approaches have been explored in managing absenteeism: Employee Assistance Programs (EAPs) and predictive analytics using machine learning. EAPs provide employees with behavioural health support, addressing stress, mental health concerns, and work-related challenges that contribute to absenteeism. Previous research suggests that EAPs can reduce absenteeism, particularly among employees with moderate to low absenteeism levels. However, studies often rely on self-reported data and lack well-matched control groups, making it difficult to measure their true impact.

Alternatively, predictive analytics leverages machine learning to identify employees at risk of prolonged absenteeism before it escalates. By applying advanced data analysis techniques to HR and payroll records, organizations can proactively implement targeted interventions, optimize resource allocation and improving overall workforce health. A key innovation in this approach is the use of a cost-sensitive decision-making framework, which models absenteeism as a classification problem and evaluates intervention strategies based on cost- effectiveness.

This study examines both approaches, assessing the impact of EAPs through a quasi-experimental design with a well-matched control group while also developing a predictive absenteeism model using machine learning. The research introduces a misclassification cost matrix tailored for absenteeism prediction and evaluates model performance using cost-based metrics. By integrating reactive solutions (EAPs) with proactive strategies (predictive analytics), this study aims to provide organizations with a comprehensive framework for managing absenteeism efficiently and improving employee well-being.

2. Review of Literature:

Workplace absenteeism due to personal and job-related stressors has long been a concern for organizations. Research highlights that absenteeism leads to significant financial and operational costs, making it essential to develop effective intervention strategies. Two primary approaches have gained traction in recent years: Employee Assistance Programs (EAPs) and predictive analytics using machine learning. This literature review explores their effectiveness, theoretical foundations, and comparative advantages.

- **The Cost of Absenteeism**

Organizations across industries face substantial losses due to employee absences. Psychological stressors, including anxiety, depression, and substance abuse, contribute significantly to absenteeism (McTernan, Dollard, & LaMontagne, 2013; Goetzel *et al.*, 2002). These absences result in both direct costs, such as hiring temporary staff and overtime payments, and indirect costs, including reduced productivity and increased workload on remaining employees (SHRM/Kronos, 2013). Given these challenges, businesses are looking for solutions that not only address current absenteeism but also prevent long-term disengagement.

- **Employee Assistance Programs (EAPs) as a Support System**

EAPs have been widely implemented to help employees navigate personal and professional challenges. These programs offer short-term counselling, stress management strategies, and referrals to specialized services (Attridge, 2012). By addressing mental health concerns and work-life balance issues, EAPs play a critical role in reducing absenteeism and enhancing employee well-being. Richmond *et al.* (2016) conducted a quasi-experimental study

demonstrating that employees who engaged with EAP services experienced a significant reduction in sick leave compared to non-users. However, some studies suggest that while EAPs are effective for employees with moderate absenteeism, they may not fully address chronic absenteeism issues (Macdonald *et al.*, 2000; Spetch *et al.*, 2011).

- **Theoretical Framework: Conservation of Resources (COR) Theory**

Hobfoll's (1989) Conservation of Resources (COR) Theory provides a strong foundation for understanding absenteeism. This theory suggests that individuals strive to protect and retain their psychological and physical resources. When employees experience excessive stress, their resources become depleted, leading to disengagement and, ultimately, absenteeism (Bakker *et al.*, 2003). EAPs serve as a mechanism for replenishing these resources, helping employees regain stability and remain productive in their roles.

- **The Rise of Predictive Analytics in Absenteeism Management**

With advancements in HR analytics and machine learning, organizations are now turning to data-driven approaches to predict and mitigate absenteeism. Unlike EAPs, which are reactive, predictive analytics provides a proactive solution by identifying employees at risk of extended absences before problems escalate (Burdorf, 2019). Machine learning models analyse HR and payroll data to detect absenteeism patterns, allowing organizations to implement targeted interventions (Lawrance, Petrides, & Guerry, 2021). Some models apply cost-sensitive learning, which ensures that predictive interventions are both effective and financially sustainable (Lawrance *et al.*, 2021).

- **Bridging the Gap: The Complementary Role of EAPs and AI-Based Models**

While traditional EAPs offer personalized support, predictive analytics enables organizations to take preventive action by forecasting potential absenteeism risks. Research suggests that integrating both approaches could be the most effective way to manage absenteeism. AI-driven insights help identify employees at risk, while EAPs provide the necessary emotional and psychological support (Lawrance *et al.*, 2021). This combination allows businesses to balance immediate intervention with long-term employee well-being strategies.

- **The Need for More Rigorous Research**

Despite their promise, both EAPs and predictive models come with limitations. EAPs often rely on self-reported data, making it difficult to establish causation between program use and absenteeism reduction (Richmond *et al.*, 2016). On the other hand, machine learning models require high-quality HR data and may not account for underlying health conditions or personal stressors that drive absenteeism (Lawrance *et al.*, 2021). Future research should focus on refining

predictive models and improving the integration of human-centred approaches with data-driven solutions.

The literature suggests that a hybrid approach, combining EAP-driven support with AI-powered predictive analytics, is the most promising strategy for tackling workplace absenteeism. While EAPs provide reactive assistance, machine learning helps organizations intervene before absenteeism becomes a long-term issue. As research continues to evolve, companies must consider how to best integrate these strategies to create healthier, more resilient workplaces.

3. Methodology:

This study employs a quasi-experimental design to examine the effectiveness of Employee Assistance Programs (EAPs) in reducing absenteeism while also leveraging machine learning to predict at-risk employees before absenteeism becomes chronic. By integrating traditional HR interventions with predictive analytics, the study aims to assess both reactive and proactive strategies for managing workplace absenteeism.

Study Design

The research adopts a two-pronged approach:

1. EAP Effectiveness Analysis – A matched control group study using propensity score matching to compare absenteeism trends between employees who used EAP services and those who did not.
2. Predictive Analytics for Absenteeism – Machine learning algorithms were applied to HR and payroll data to identify employees likely to take extended sick leave.

The study collected data from multiple organizations spanning industries such as administration, education, healthcare, and human services, ensuring a diverse sample.

- **Participants and Data Collection EAP Evaluation Approach**

- Participants were divided into two groups:

EAP Users – Employees who voluntarily sought counselling, stress management, or mental health support through their company's EAP.

Control Group – Matched employees based on job role, absenteeism history, and mental health indicators but did not use EAP services.

- HR timecard data was used to measure absenteeism trends over 12 months before and after EAP usage.
 - Predictive Analytics Approach
- Data was collected from 280 companies across Belgium from January 2018 to March 2019, covering:

Demographics: Age, gender, marital status, education. o Work Environment Factors: Salary, contract type, overtime, shift work, holiday patterns. o Absence History: Frequency and recency of sick leave, cumulative absences over the past year.

Data Preparation

- Handling Missing Data – Missing values were imputed using the median to ensure data completeness.
- Encoding Variables – Categorical variables were one-hot encoded, while outliers in continuous variables (e.g., unrealistic ages) were removed.
- Data Partitioning – The dataset was split into: 60% for training, 20% for validation, and 20% for testing, o Repeated 50 times with different random seeds for robustness.

Analytical Methods

EAP Effectiveness Measurement

- Propensity Score Matching (PSM): Used to compare EAP and non-EAP employees, ensuring a fair comparison of absenteeism rates.
- Regression Models:
 - o Linear mixed models to track absenteeism trends.
 - o Negative binomial regression for absenteeism reduction estimates.
- Absenteeism Categorization: Employees were grouped into low, moderate, and high absenteeism levels to analyse how EAP effectiveness varies across risk levels. □ Predictive

Predictive Analytics & Machine Learning

- Machine Learning Models Applied:
 - o Decision Trees (CART) o Random Forest o Bagging & Boosting Algorithms (AdaBoost, RUS Boost) o Cost-sensitive learning models to focus on high-risk employees.
- Evaluation Metrics:
 - o AUC (Area Under the Curve) for model accuracy.
 - o False Positive Rate (FPR) and False Negative Rate (FNR) to assess prediction reliability.
- Cost-Sensitive Learning: Models optimized intervention strategies by predicting employees at risk before absenteeism escalates.

Key Findings from Methodology

- EAP users showed a 4.8% to 6.5% greater reduction in sick leave per month compared to non-users.
- EAPs were most effective for employees with moderate absenteeism, but had limited impact on chronic absenteeism.

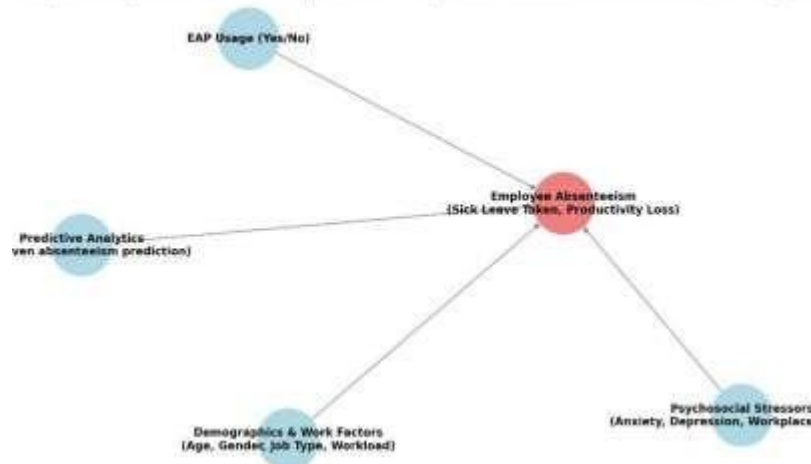
- Machine learning models successfully identified high-risk employees before extended absenteeism occurred, allowing for targeted intervention strategies.

Software & Tools Used

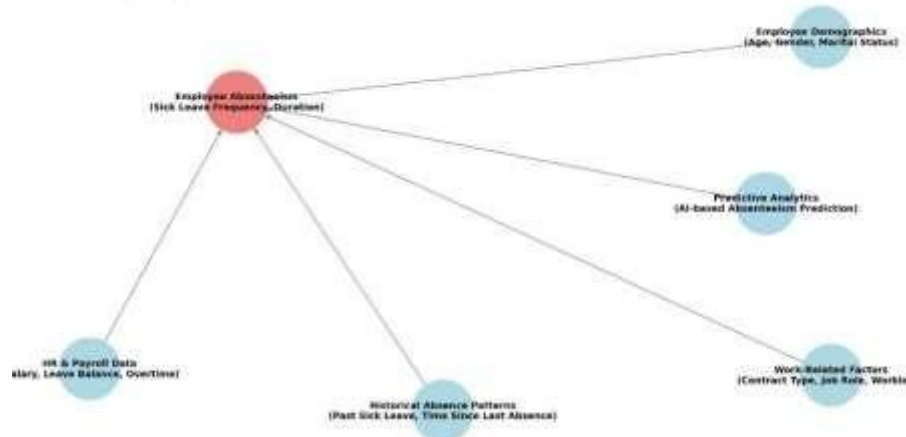
The study utilized Python (v3.6.6), leveraging libraries such as:

- Scikit-learn for machine learning models.
- Imbalanced-learn for handling class imbalance.
- CSVKit for efficient data processing.

Graphical Representation of Independent & Dependent Variables in Absenteeism Analysis



Graph Representation of Independent & Dependent Variables in Absenteeism Prediction



Analysis:

This study examines how organizations can effectively reduce absenteeism through Employee Assistance Programs (EAPs) and predictive analytics powered by machine learning. The analysis explores both methods' strengths and limitations, providing insights into how workplace interventions influence employee attendance.

1. Impact of EAPs on Absenteeism

The findings show that employees who participated in EAP services experienced a 4.8% to 6.5% reduction in absenteeism per month compared to those who did not. EAPs were

particularly effective for employees with moderate absenteeism, while those with chronic absenteeism showed limited improvement.

To ensure fair comparisons, the study employed propensity score matching, eliminating potential biases between EAP users and non-users. This aligns with Conservation of Resources (COR) Theory, which suggests that when employees receive psychological and emotional support, they are more likely to retain stability and remain engaged at work.

2. Statistical Models Used to Evaluate EAP Effectiveness

To quantify the impact of EAPs, researchers applied various statistical models, including:

- Linear Mixed Models – Showed a steady decline in absenteeism among EAP users over a 12-month period.
- Negative Binomial Regression – Confirmed that absenteeism reductions were statistically significant, particularly for moderate absenteeism cases.
- Categorization of Sick Leave – Employees were grouped into low, moderate, and high absenteeism categories, revealing that EAPs were most effective in shifting employees from moderate to low absenteeism levels.
- Logistic Regression Analysis – Indicated that employees facing workplace conflicts benefited the most from EAP services, while those with severe mental health challenges showed minimal improvement in attendance.

3. Predictive Analytics for Absenteeism Management

The study also explored machine learning models to predict absenteeism, allowing organizations to proactively identify employees at risk before absenteeism becomes chronic. Various models were tested using HR and payroll data, including:

- Decision Trees (CART)
- Random Forest
- Boosting Algorithms (AdaBoost, RUS Boost)
- Cost-sensitive Learning Models

Model Performance Evaluation

To assess prediction accuracy, the study measured:

- AUC (Area Under the Curve) – A metric to determine how well the model distinguishes between employees at high and low risk of absenteeism.
- False Positive Rate (FPR) & False Negative Rate (FNR) – Used to reduce misclassification errors and improve targeting of interventions.

Key Findings

- Machine learning models successfully identified employees at risk of long-term absenteeism before it became a recurring issue.
- Cost-sensitive models enabled HR teams to implement targeted interventions, preventing absenteeism from escalating into long-term absences.

4. Comparative Analysis: EAP vs. Predictive Analytics

Approach	Strengths	Weaknesses
EAPs	Personalized counselling, work-life balance support	Reactive approach, less effective for chronic absenteeism
Predictive Analytics	Early intervention, cost-effective targeting of high-risk employees	Requires high-quality HR data, may not capture underlying health conditions

Key Takeaways

- EAPs provide immediate psychological support but act reactively by addressing absenteeism after it happens.
- Predictive analytics enables organizations to intervene early, helping employees before absenteeism becomes chronic.
- The best strategy is to combine both methods, allowing for AI-driven insights to identify at-risk employees while EAPs provide necessary emotional and psychological support.

5. Cost-Effectiveness and Organizational Impact

The study assessed the financial benefits of reducing absenteeism through both approaches:

- EAPs helped reduce absenteeism costs, but their effectiveness varied based on the severity of absenteeism.
- Predictive analytics demonstrated potential cost savings by allowing organizations to focus interventions on employees who need them most.
- Companies that adopt both methods may see higher productivity improvements and lower long-term costs compared to using either approach alone.

Findings:

This study provides compelling evidence that Employee Assistance Programs (EAPs) play a significant role in reducing absenteeism while predictive analytics offers a proactive solution for identifying at-risk employees before absenteeism becomes chronic. The findings highlight the strengths, limitations, and cost-effectiveness of both approaches, underscoring the need for an integrated strategy.

1. Impact of EAPs on Absenteeism

- Employees who participated in EAP services experienced a 4.8% to 6.5% reduction in absenteeism per month compared to those who did not.
- Moderate absenteeism cases benefited the most, as EAPs helped them transition to lower absenteeism levels.
- Chronic absenteeism cases showed limited improvement, suggesting that EAPs alone may not be sufficient for severe absenteeism issues.
- These results align with Conservation of Resources (COR) Theory, which suggests that employees who receive psychological and emotional support through EAPs are better able to restore stability, engagement, and attendance at work.

2. Statistical Insights from EAP Analysis

- Linear Mixed Models demonstrated a steady decline in absenteeism among EAP users over a 12-month period.
- Negative Binomial Regression confirmed that the absenteeism reduction was statistically significant, particularly for moderate absenteeism cases.
- Categorization of Sick Leave revealed that EAPs were most effective in shifting employees from moderate to low absenteeism levels.
- Logistic Regression Analysis indicated that employees who sought EAP services due to workplace conflicts benefited the most, whereas those with severe mental health issues saw minimal change in absenteeism rates.

3. Predictive Analytics for Absenteeism Management

- Machine learning models successfully predicted employees at risk of long-term absenteeism before it became chronic.
- The most effective models included:
 - o Decision Trees (CART)
 - o Random Forest
 - o Boosting Algorithms (AdaBoost, RUS Boost)
- Cost-sensitive learning models enabled HR teams to provide targeted interventions, supporting employees before absenteeism escalated.

4. Comparative Analysis: EAPs vs. Predictive Analytics

- EAPs focus on reactive solutions, helping employees cope with stress after absenteeism occurs.
- Predictive analytics provides a proactive approach, identifying at-risk employees before absenteeism worsens.

- The best absenteeism management strategy is to integrate both methods, allowing AI-driven insights to identify at-risk employees while EAPs offer the necessary psychological support.

Approach	Strengths	Limitations
EAPs	Personalized counselling, work-life balance support, mental health interventions	Reactive approach, less effective for chronic absenteeism cases
Predictive Analytics	Early intervention, cost-effective, identifies at-risk employees before absenteeism escalates	Requires high-quality HR data, may not capture underlying health conditions

5. Cost-Effectiveness and Organizational Impact

- EAPs helped reduce absenteeism-related costs, but their effectiveness was limited for high-risk absenteeism cases.
- Predictive analytics demonstrated potential cost savings by allowing organizations to focus on early interventions for employees at risk.
- Organizations that combine EAPs with AI-driven absenteeism prediction may achieve higher productivity, reduced absenteeism costs, and a healthier workforce.

6. Future Research Directions

- Future studies should incorporate health-related data to further improve predictive model accuracy.
- Research should explore how AI models can be integrated with corporate wellness programs to enhance absenteeism management.
- A long-term cost-benefit analysis is needed to quantify financial savings and productivity improvements from absenteeism reduction strategies.

Conclusion:

This study highlights the significant role of Employee Assistance Programs (EAPs) and predictive analytics in managing workplace absenteeism. Findings indicate that EAPs are highly effective in reducing absenteeism among employees with moderate attendance issues, leading to a 4.8% to 6.5% decline in sick leave per month. However, chronic absenteeism cases require more intensive interventions, suggesting that EAPs alone may not be sufficient for high-risk employees. This supports the Conservation of Resources (COR) Theory, emphasizing the importance of psychological and emotional stability in workplace performance.

At the same time, predictive analytics using machine learning offers a proactive approach, helping organizations identify at-risk employees before absenteeism becomes chronic. Models such as decision trees and cost-sensitive learning demonstrated high accuracy, allowing HR professionals to develop targeted interventions that prevent longterm absenteeism.

A hybrid strategy, combining EAPs (reactive support) and AI-driven predictive analytics (proactive intervention), emerges as the most effective approach for absenteeism management. Organizations that integrate data-driven decision-making with employee well-being initiatives can create a healthier, more engaged workforce while reducing absenteeism-related costs.

Key Takeaways for Organizations

- A balance between reactive and proactive strategies ensures optimal absenteeism management.
- Cost-sensitive learning models improve intervention effectiveness, delivering greater financial savings compared to standard HR strategies.
- AI-powered predictive analytics enhances HR decision-making, enabling early intervention for at-risk employees.

Future Research Directions

- Investigate long-term cost savings associated with AI-driven absenteeism reduction strategies.
- Explore causal inference models to assess how employees respond to different interventions.
- Incorporate health-related data and absenteeism categorization to refine predictive accuracy.

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PERCEPTION OF POPULAR CULTURE

N. Mallesham

Department of History,

Govt. Degree College, Alair Yadadri-Bhuvanagiri District, Telangana State

Corresponding author E-mail: mallesham.n71@gmail.com

1. Introduction:

The idea of 'popular culture' as opposed to 'learned culture' is a late 19th-century phenomenon, first formulated by the German writer J.G. Herder. Of course, there were some writings that were describing popular customs in the late 17th century, but what was new in Herder and Grimms is the emphasis on people and their beliefs, which were reflected in proverbs, etc., were part of a whole, expressing the spirit of particular people.

2. Changes in Historical Writings:

The state of historical writings on popular culture provides a useful framework for analyzing the ongoing transformation in the discipline of history. Such a trend starting over the last two decades was conditioned both by major intellectual shifts and broader world developments. The late nineteenth-early twentieth century academic stress, conventionally associated with the heritage of the Rankean paradigm, was a legitimate protest against moralizing history (1), remarked that the task of a historian was 'simply to show how it really was' (*wie es eigentlich gewesen*) on archival documentation. At the end of the last century and the beginning of this century, many diverse proposals were made for new historical approaches. The German historian Karl Lamprecht fiercely rejected the approach to historical research espoused by Ranke and used the word 'new' to describe his ideas in his most controversial essays, published in 1896 under the title of *Alte und neue Richtungen in der Geschiswissenschaft*. A review of Lamprecht's History of Germany in the *American Historical Review* of 1897-1898 entitled "Features of New History" (2).

The 'new histories' are also called 'modern histories' and lasted from the 1920s to 1970. The chief 'new histories' that brought about a real revolution in the historiographical practices are; Marxist historiography, the Annales School, the American "social scientific" history, the Past and Present group, and the 'Bielefeld School'. The concern of professional history was mainly on ruling groups, statecraft, organized politics, and economic history, but at the same time the 'social' and the 'cultural' aspects were correspondingly marginalized to folklore and anthropology, distinct disciplines that were defined as opposite of history, where studying

‘people without history’ in the sense of precise chronology presumably meant ‘progressive’ change. Radical and socialist historical writing was a notable exception, but here too, there was a strong tendency to concentrate on ‘class consciousness’ groups, parties, and systematized ideologies. The diverse and at times contradictory neo-Marxism of 20th century all have their source in the thought of Karl Marx. Eric Hobsbawm, defining Marxist historiography remarks, “The primary function of historical research is to analyze the process of social production; and that research into the modes of production must isolate the dominant system of relations within society, a system which is hierarchical, in conflict, and ever-changing”.

3. The Annales Historiography:

In European historiography, a major shift had begun in the 1930s with the Annales. The Annales historians generally agreed that the aim of historical writings "histoire totale". It required open cooperation from other human and social sciences. The first of the two assumptions, that historians must study their own objects of study, is a product of writers like the German Oexle and the Italian Cedronio, who termed the "Kantian matrix" (3) in the thought of the founders of Annales; the philosophers who exerted the greatest influence in their formative years all belonged to the school of the leading French neo-Kantian philosophers of the last quarter of the nineteenth century, Charles Renouvier and Emile Boutroux. The second principle of Annalist thought, advocacy of *Histoire totale*, Jacques Revel and Roger Chartier (4) have found in the sociologist Francois Simiand's article published in 1903 under the title of "Method historique et science social" before the formal birth of the Annales school.

In contrast to the traditional French historiography, which inherited a narrow and parochial framework, the historians of the Annales school realized that open cooperation with other human sciences, including ethnology, sociology, psychology, demography, geography, biology, linguistics, and the history of art and literature, was necessary. These sciences all study human beings from their own individual positions and when all of them are taken into account, a considerably broader and more detailed picture of the historical development of humans in society may be gained. The main thrust of the Annales School is the study of mentality (5). The interest of historians of new historiography is the phenomena of the inner life, which could be called the socio-cultural aspect of society. The socio-cultural aspects of analysis are found in New French historiography. The new French historiography is paying great attention to historical analysis of themes like time, space, gesture, marriage, family, sexuality, women, childhood, death, disease, acculturation, and marginal elements of society on themes like popular culture (6).

As a result of efforts made by 'new histories,' there was a new appreciation of the radical possibilities of unconventional, more or less unorganized groups that up till now had been 'hidden from history' but were now 'becoming visible'. Social and cultural history suddenly emerged as a dominant historical concern, and the study of 'popular culture' came to be recognized as one of its central preoccupations. Peter Burke (7), in his pioneer work, *Popular Culture in Early Modern Europe* (1978), defined popular culture as "the culture of the non-elite, the 'little' as opposed to the 'greater tradition'; a system of shared meanings, attitudes, and values and the symbolic form... in which they expressed 'the structure of feelings' of the 'subordinate classes. " Therefore, 'popular culture' has been normally conceptualized indirectly in opposition to 'elite or official culture and bureaucratized states in annals histories.

4. Post-Modern Historiography:

The 1970s saw the emergence of the various types of new historical writing that came to be known as 'postmodern historiography,' which is radically different from the earlier modern histories. Fernand Braudel (8) used the term "nouvelle histoire" to refer to his own work and described the work of Le Roy Ladurie and other members of his school as "nouvelle nouvelle histoire" (9). The postmodern cultural historical practice developed in capitalist countries like the U.S.A. is the internal and structural expression of a whole new wave of American military and economic domination throughout the world. The postmodern historians argue that there is no uniformity of different regions in a given society. Therefore, the diversities between various regions become important. In order to study the diversities, they study society at a micro level and fail to identify the similarities/commonalities of region. Therefore, the problem with postmodern histories is that they do not see the interlinking factors in various societies, and therefore postmodern historiography gets a fragmented view rather than a total view of history.

As a part of the specialization of work in history, John Frisk, Isaac Sequera, and Indira Devi are some of the historians who are writing on popular culture. For them, popular culture is the interface between folklore and elite culture. Popular culture is one aspect of postmodernism shown on a vertical scale, with elite culture and folk culture occupying 10% of the top and the lowest slot, respectively, and the large middle slot of 80% occupied by popular culture. These sections are not watertight compartments, but there is ongoing interaction among them. The postmodern historical writing perceives "popular culture in contrast to folklore and is transmitted impersonally; through showing salesmanship to large audiences, it relies on extreme professionalization (e.g., technicians, editors), quick turnover of materials and personals (e.g., songs and stars), and multiple and exact reproduction (e.g., best-selling books and records) that sell by the thousands or even the millions".

Popular culture, in other words, can be distinguished from folklore. It is commercially produced, in standardized form, for mass consumption, with an emphasis on individual authorship. For instance, film music, popular magazines, advertisements, films, and television programs lie (Chitrahar, Chitralahari, Ek se badkar Ek, Paaduta Thiyyaga, Kon Badega Karodpathi, Jabardasth etc.). Here, in this paper the approach followed by postmodern historiography is not take into consideration the postmodern historiography in the sense that, in the name of total history, the entire society was fragmented. The specialization of work in history, which led to any link between historians working on different eras and territories running the risk of disappearing, while at the same time putting up higher and higher barriers between these areas of history and moving away from their original idea of 'total history'.

5. Importance of Modern Historiography:

As the annalists Bernard Lepetit and Jacques Revel emphasized, the aim of the historian is an attempt to encompass all aspects of society, which should be reformulated. This implicitly united all the social sciences. The glimpse of future united social sciences has been challenged by postmodernism, studying diversities of different fragments of society without linking them to the whole. This theory led to the present uncertainty about our future. All this led to a gloomy picture of delinking one aspect of society from another, one part of territories from another, which is contradictory in the study of any history or subject in any society. Studying the history without interlinking its structures does not give a correct and clear picture. Finally, post-structuralist thought, and in particular, deconstruction, robs history of its coherence: the coherence of inner relationship between events, in Krieger's perception, without which history would be no more than a chronicle.

This worldwide recession in historical writings (historiography) connected with many current postmodernistic moods. This again renewed conformity, surrender to the attractions and pressures of the international, U.S.-dominated, academic market. Therefore, it is prefer to apply modern historiography in our research in popular culture. All the 'new histories' have a common approach in studying the past. They want to study social sciences on similar lines of natural sciences as their model. The modern historiography considers permanent collaboration with other social sciences and shares a common goal, namely, the study of human sciences. The aim of representatives of new historiography is the study of society primarily 'from below.' The interest of the scholars of the new trend is concentrated on the widest strata of society. The new French historiography also gave sufficient space to every minute detail, where the study of popular culture came to be recognized as subject matter.

6. Perception of Popular Culture:

Popular culture may be perceived as the cultural practices of the people outside the sphere of the dominant culture. This has been a constant feature of literary, political, and cultural debate since the eighteenth century. The concept of popular culture did not develop completely until the nineteenth century, but we may recognize the emergence of a distinct way of talking about it as early as the 1730s. Since then, the concept of popular culture has remained a powerful element in the cultural analysis. Popular culture has become an object of study in various disciplines such as literature, history, and anthropology. They assumed the concept of popular culture was an unproblematic term and accepted uncritically the set of attitudes towards 'people' and 'culture' (10).

The phrase "popular culture" consists of two terms, "popular" and "culture." The problem of popular culture is one of definitions (11). It is better to precisely have the meaning of "popular" and "the people," then the problem would hopefully disappear. In order to get meaning of particular word, one has to approach a book or dictionary. In the same line, the investigator approaches any book on popular culture, it begins with a list of possible meanings of the term "popular". Here a question may arise as to who are the "people." What is the culture?. The phrase 'popular culture' contains two serious ambiguities (12). If any one wish to know the meaning of a particular word, the normal response, presumably, is to refer to the dictionary. The *New English Dictionary on Historical Principles*, commonly known as *The Oxford English Dictionary* (OED), does offer an account of different meanings of particular words, supported by citation and a certain degree of analysis.

The term "popular" was first used in the OED as a legal term (13). It denotes action open to all people living under a particular government. The legal definition of the concept of "popular" in the OED defines it as pertaining to common people (14). Or the people as a whole as distinguished from any particular class. At another time, 'popular' refers quite clearly to one part of the social formation: those of low birth, belonging to the commonality or populace, or plebeian (15). In these two definitions, the concept of 'the people' is never subjected to sociological or political analysis and produced some interesting blind spots in the analysis of popular culture. 'Popular' emerges as a legal and political term at the time when most women had few political rights (16). There is another set of meanings of the word, which refers to text, language, and forms of knowledge; 'popular' refers to a cultural form that is 'intended for ordinary people' (17). In the analysis of popular culture, it should not bring philosophical debate, because it was always in the hands of the elite class and can't be understood by the people but is also contradictory to the popular culture. Hence, Gabriel Harvey (18) protested against the dilution of philosophical debate into the popular and plausible themes.

By the nineteenth century, the term was increasingly applied to cultural forms that applied to people generally. The people were generally identified with folk. Folk as an old-fashioned segment living on the margins of civilization, and that matter was equated to the concept of peasant (19). The folk were understood to be 'the illiterate in a literate society' (20). More recently the term was changed to non-literate." Therefore, folk or popular culture may be characterized as (illiterate or) non-literary, rural, and lower stratum as against elite culture, characterized as literate, urban, and upper stratum within a given society. The popular culture is more often non-elitist and local in its outlook. Oral literature comprised a wide spectrum of social classes and religious institutions, but it often was controlled by the lowest castes. The question may arise, why do we accept folk as people? It is because of one version of people's history; in the Marxist perception, the people are constituted by relations of exploitation, in another (folklorist), by cultural antinomies, and in a third, by political rule (21). The study of the popular consciousness as affected by the infusion of new, external ideas must be an important aspect of any people's history. This means that a people's history cannot be a mere narrative of conditions of the common people. It must go beyond and study interconnections of classes. And also revolutionary Marxists perceived folk, who were real people, had the sense that they were participating in the modes of production. Therefore, identify the 'folk' as the people of the non-literary, rural, and lower stratum of a given society as 'popular'.

Another question may arise: what is culture? Which is the suffix of the phrase popular culture? The primary meaning of culture is the cultivating of natural growth, and by extension, in recent times, it became the cultivating of the human mind (22). Strictly speaking, the word 'culture' is far from having a single meaning. Even though there is broad consensus on the core meaning denoted by the term. This general agreement is most widespread among cultural anthropologists but also recognized outside anthropology as well. Culture, in the simplest sense, is the entire way of life followed by a people. What has been termed the classical definition of culture was provided by the 19th-century English anthropologist Edward Burnett Taylor in his *Primitive Culture* (1871). "Culture is that complex whole which includes knowledge, belief, art, morals, law, customs, and other capabilities and habits acquired by man as a member of society". The emphasis of anthropologists on culture as a unique to human social activity also found Karl Marx's social theory, where he argues that "Man (sic) can be distinguished from animals by consciousness and also by the fact that they produce their means of subsistence". In Marx's theory, human productive activity is most fundamental for the organization of social, political, and cultural life. For Marx, the term 'consciousness' is important in the sense that he seems to mean not simply the human species, capacity for thought but the organization and patterning of human thought and activity in a collective sense.

With regard to the relationship between consciousness and ‘material life,’ according to Marx, it is not the consciousness of men that determines their beings, but on the contrary, their social being that determines their consciousness. In the social production of their life, men enter into definite relations that are indispensable and independent of their will, relations of production that correspond to a definite stage of development of their material productive forces. The sum total of these relations of production constitutes the economic structure of society, which is the real foundation to rises, a legal and political superstructure and to which correspond definite forms of social consciousness. According to this model, the culture is determined by or dependent on the economic base or infrastructure. Each type of historic economic structure ‘mode of production’—has a corresponding superstructure, which includes social, political, legal, and cultural institutions and customs. Culture is not a simple phenomenon but is produced by and integral to a particular type of economic system and dependent on the type of technology that prevails.

The external practices of culture, to quote the *New Encyclopedia Britannica*, "Culture may be defined as 'behavior specific to Homo sapiens, together with material objects used as an integral part. Part of this behavior, especially culture, consists of language, ideas, beliefs, customs, codes, institutions, tools, techniques, works of art, rituals, ceremonies, and so on. (23). A modern definition of culture refers to “organization of experience” shared by members of a community, including "their standards for perceiving, predicting, judging and acting" (24). This means culture includes all the standardized ways of seeing and thinking about the world; of understanding relations among people, things, and events; of establishing preferences and purposes; and of carrying out actions and pursuing goals. Among the historians of the eighteenth and nineteenth centuries, "culture" and "civilization" became synonyms, but there are differences between them. Culture is a description of a particular way of life, which expresses certain meanings and values not only in art and learning but also in institutions and ordinary behavior. Whereas the civilization referred to by Taylor is the total achievement of the most advanced people. Civilization is a broader spectrum, in which culture is a part. Therefore, it came to an understanding that popular culture is seen as a description of a particular way of life followed by the illiterates in a literate society. Hence, it is perceived that popular culture prevailed in the non-literary rural lower stratum of society and was non-hegemonized in the sense of being politically, economically, and socially outside the sphere of power, and it had an oral living tradition, in contrast to elite culture.

Therefore, the study of folklore should be studied as a "view of the world," as a reflex of the life that they were living and would continue to live, as Gramsci noted: "It would be necessary to study (folklore). as ‘a view of the world and life,’ to a great extent implicit, of

determinate strata of the society, counter-posed to the' official 'views of the world. A view of the world which is not only systematic and elaborate because the people... by definition cannot have systematic, elaborate, and politically organized and centralized conceptions even in contradictory development, but, indeed, multiple not only in the sense of diverse and juxtaposed but also in the sense of stratified from the least to the most vulgar—if, indeed, it is not a matter of having to speak of an undigested heaping up of fragment of all the views of the world and of life which have followed one another throughout history, the larger part of which has left surviving mutilated and contaminated traces only in folklore” (25).

Dai Smith (26) defined popular culture as the analysis of popular tastes, customs, folk beliefs, manners, and entertainments within a given social order. In short, it is the culture of the people as opposed to the culture of organized thought transmitted by various elites. By 1930, social anthropologist Robert Redfield offered a residual definition of popular culture as the tradition of the non-learned, the unlettered, and the non-elite. His perception was narrow because it excludes the upper classes, who participate in popular culture and to whom popular culture was secondary culture. According to Peter Burke, popular culture would study the history of the excluded, the dominated, and the subordinate groups and classes (27). It not only studies their standard of living but also their culture as well. It is not exclusive like high culture. It is open to all. In Burke's opinion, strategy should not concentrate on people or any group but on the interaction between learned and popular cultural traditions (28).

Douglas Haynes and Gyana Prakash, in their book *Contesting Power: Resistance and Everyday South Asia* (29), mentioned that popular culture, referring to those activities that texture the people's daily lives, provides an especially important arena for studying the 'everydayness' of resistance. English Marxist historians have rightly insisted that popular is the expression of a 'whole way of conflict' rather than a kind of 'whole way of life' (30). Gerald M. Sidder demonstrated that there is a relationship between production relations and the growth of hegemonic and also counter-hegemonic forces. For him, the ruling class appropriates as much material production as possible from the people for their survival and luxurious life. They adopt a particular culture, unifying the people by catching the minds of the people by adopting particular cultural forms. And also divert the attention of people from the production. M. Sidder felt that the people's resistance to hegemony can be seen as resistance to elite values rather than to the values themselves.

Therefore, it may tentatively reach an understanding that the study of popular culture can be seen at two levels. At first level, the study of popular culture as culture connects social and economic aspects in any given society. It reveals the importance of cultural form in historical contexts and also constructs the history of those hitherto excluded, the dominated, and

subordinate groups and classes in history. It constructs the cultural history of the people hitherto excluded 'outside the walls,' beyond political society and the triangle of power. In fact, they were never outside the large field of social forces and cultural relations. They were linked with a multitude of traditions and practices. At the second level, popular culture can be seen as a tool of dissent and protest. As long as their traditional life and beliefs were not touched by anybody, they followed their own way of life, belief, and practices. If their cultural life was disturbed or intervened or destroyed by the ruling class for their selfish ends, then the people use their cultural forms as a 'weapon of the weak,' as an arm of resistance as well as one of domination. The interest of scholars in studies of popular culture represents some sort of attempt to broaden the basis of history.

7. Folk Culture:

For the conceptual framework of popular culture, we prefer to apply new historiography. The new historiography identified popular culture with folklore. In order to get a general picture of popular culture in India in general and Andhra in particular, it is necessary to deal with folk cultural forms. Folk literature can be broadly divided into three main branches, i.e., songs, prose, and drama.

8.1 Folk Songs:

The first branch (Songs) may be again divided into two categories. One is simple songs, and two is ballads. The simple songs are generally known as folk songs. These folk songs can be grouped on the basis of emotional content as love songs, humorous songs, songs of pathos, etc. Or on the basis of subject matter as philosophical songs, devotional songs, ritualistic songs, etc., and also on the basis of the persons singing them as labourer's songs, women's songs, and children's songs. Like classical literature, folk literature also amorous songs are abundant. The emotion of love is depicted according to the taste of the folk, who sing them. Refined love is also very skillfully portrayed in a few songs. If we assume the moon is the lover's friend, let's have a stanza on how love is reflected. This is a typical example of a Telugu song addressed to the moon: "He won me by his love and I fell in love with him. And I called him my sweet heart Oh moon, sweet moon...".

Folk songs present a better picture of real humor in Telugu (31). Satire, repartee, parody, and caricature find their best examples in Telugu songs. *Viyyalavari Patalu* contain delicate humor, which the Telugu womenfolk enjoyed during the fun and frolic of wedding ceremonies. As hardship overrides happiness in life. There are number of folk songs depicting pathos are appear in folk literature. Folk literature is not only a means of giving knowledge and enjoyment but also of giving relief from work. Basically peasants and working class were participating in

the modes of production. In order to forget the hardship, peasants used to sing songs that they knew. These songs relieved peasants and workers from hardships.

Another model of dividing songs on the basis of subject matter is philosophical, devotional, ritualistic songs and songs describing nature. The illiterate rustic sings and talks of great philosophical truths in songs called *Tatvalu*, which are metaphysical truths (32). These are mainly monistic and are popular among rustics. Very often, the criticism of the customs, rites, and rituals of the higher castes find in the philosophical songs. The songs of blessed souls and mystics like Pothuluri Virabrahmana, Vemana (33), Dudekula Siddappa, etc., are commonly heard all over Andhra. Vemana posed the question, why do we differentiate between men on the basis of caste when it is the same blood that runs in the veins of all?. This poem is a masterpiece of Vemana in criticizing traditional social values.

As devotion is the easiest way for salvation, thousands of folk songs belong to Saivism, Vaisnavism, and other cults are found in Andhra. Jangmas, Haridasas, and other street singers also eke out their livelihood by singing these devotional songs. Songs of Badrachala Ramadas, Tumu Narisimhadas, etc., are the mainstay of wandering mendicants. Besides these, *Melukolupu patalu* (awakening songs), *Gobbillu patalu* (Singing on Sankranti festival in Andhra Pradesh), *Lalipatalu* (caressing songs), and *Jolapatalu* (lullabies) can also be included among devotional songs. A lullaby is sung while a baby is going to sleep. Another version of dividing folk songs on the basis of person is who is singing them: children's songs and women's songs. Children's songs are of two categories. One is songs composed by elders for children, and second is songs composed by children themselves. Among the songs composed by elders are *Lalipatalu* (caressing songs) and *Jolapatalu* (lullabies) are important. These songs are sung during feeding and massaging babies' limbs at the time of giving a bath. Among the songs sung by children, some are entirely their own compositions, while other songs are originally composed by elders but altered and adopted by children. Most of the sports songs of the boys and girls come under the category. Most popular are the songs of womenfolk. The singing song is always a part of their daily work. In their working life, commencing early in the morning and ending at night, they sing songs while doing the work. They used to forget the hardship of working. Singing is, however, spontaneous. Realism is more predominant than the poetic imagery in this song.

8.2. Ballads:

The second group of songs are a special variety of story poems or narrative songs called ballads. The size of a ballad depends upon the story content and, accordingly, the length; they are ballads and ballad cycles. These songs cover a variety of stories from mythology, religion, epics, Puranas, history, legends, fables, and local events. Stories from the Vedas, Ramayana and Mahabharata, and Puranas form a large core among folk songs because the villages have natural

devotion to everything connected with mythology. For the sake of clear understanding, we may divide the epics into two types: 'martial' and 'sacrificial' epics. The martial epics centre on male warriors, who die a hero's death in battle (34), like *Palanadu Virulakathalu*, *Katamarajukathalu*, and *Bobbilikatha*, which are very popular throughout Andhra. The sacrificial epics centre on women who immolate themselves (*Kanyakammakathas*, *Kamammakatha*, *Sanyasammakatha*, *Erukala Nancharammakatha*, etc.), stories depicting the fearful lives of those either persecuted or sacrificed.

9. Prose:

The second branch of folk literature is prose. It can be divided into three. One is prose narrative, second is proverbs, and third is riddles. Prose narrative is once again grouped under mythological, legendary, and simple folk tales with subdivisions known as popular tales, fairy tales, etc.

9.1 Prose Narratives: Like Telugu poetry, prose narrative also goes back to the days of yore, when disappointed Gunadya narrates his '*Kathasaritasagara*' to the animals in the forest during the Andhra Satavahana period. Stories from ancient anthologies like *Kathasaritsagara*, *Panchatantra*, *Sukasaptati*, *Hamsavimsati*, and stories of Buddhist, Saivite, and Vaisnavite saints and devotees are the treasury bequeathed to posterity by word of mouth. All these prose narratives retained the local character and cultural complex of the Telugu region and society.

9.2 Proverbs: The second division of prose literature is the proverbs. There is a very rich treasure of different kinds of proverbs dealing with domestic life and different kinds of professions like agriculture, trade, and commerce. These are many didactic proverbs that were used by common people. Following are one or two examples of proverbs: "The family name is Musk, but the family smells filthy" (35). "How would a barren woman know labour pains?".

9.3 Riddles: The third group under prose literature is the riddles. They provide pleasure and knowledge. They are meant for testing one's ability. They were witty and complex. The riddles sharpen intellect and provoke thought. Rural folks during their leisure time form into two groups while one group puts riddles and the other group tries to answer. Riddles are known in Telugu as *Podupukathatu*. *Podupukatha* is a nomenclature because of the story embedded in riddles. The following are a few examples of riddles: "A tailless bird travelled a hundred miles" - Letter. "The doors constantly slam but do not make a sound" - Eyelids. "A tinny fellow had dressed innumeraably" - An Onion.

10. Drama:

The third branch of Telugu folk literature is that of the drama. The history of Telugu folk arts is as old as the history of Telugu. There are many kinds of performing folk art that are popular in rural Andhra. These were the performing art forms like *Yakshagana*, *Pagativeshalu*,

Tholubommatalu, *Kolatam*, etc., that were prevalent in medieval Andhra. All these performing art forms belong to the category of *desi* (36). This folk drama is un-self-conscious, spontaneous, and boisterous. These fine art forms spread in rural areas. And also these have mass appeal and cater to the lowest common denominators and the ordinary man. These were, in brief, different popular cultural forms of the non-literary groups in Andhra (37).

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IMPACT OF INDUSTRY 4.0 TECHNOLOGIES ON OPERATIONS MANAGEMENT: A COMPREHENSIVE REVIEW WITH REFERENCE TO INDIAN MSMES, SERVICE, AND HEALTHCARE SECTORS

B. Vasanthi

Department of Master of Business Administration,
Rathinam Technical Campus, Coimbatore, India

Corresponding author E-mail: b.vasanthi152@gmail.com

Abstract:

The Fourth Industrial Revolution, commonly referred to as Industry 4.0, has emerged as a transformative force reshaping operations management across manufacturing and service sectors. The integration of advanced digital technologies such as artificial intelligence, the Internet of Things, big data analytics, cyber-physical systems, and intelligent automation has fundamentally altered how organizations plan, execute, monitor, and improve operational processes. This chapter presents an extensive review of contemporary literature on Industry 4.0 and operations management, synthesizing insights from leading academic contributions to examine technological disruptions, operational transformations, and managerial implications. Moving beyond a purely technological perspective, the chapter conceptualizes Industry 4.0 as a paradigm shift that redefines decision-making logic, process architecture, and the strategic role of operations management. Particular emphasis is placed on the relevance and applicability of Industry 4.0 in the context of Indian micro, small, and medium enterprises (MSMEs), service organizations, and healthcare operations, where resource constraints and institutional factors influence adoption strategies. The chapter proposes an integrative Industry 4.0–Operations Management framework and identifies key research gaps, policy implications, and future directions for scholars and practitioners.

Keywords: Industry 4.0, Operations Management, Digital Transformation, Review Study, MSMEs, Service Operations, Healthcare Operations

1. Introduction:

Operations management (OM) has long been recognized as a critical function responsible for transforming inputs into outputs efficiently and effectively. Traditional OM paradigms emphasized cost minimization, productivity improvement, standardization, and control of physical processes. Over time, advancements such as lean manufacturing, total quality management, and supply chain integration expanded the scope of operations management.

However, the emergence of Industry 4.0 represents a more fundamental and systemic transformation of operations management than previous waves of innovation.

Industry 4.0 refers to the convergence of digital technologies with physical operational systems, enabling intelligent, connected, and adaptive operations. Unlike earlier industrial revolutions that focused on mechanization, electrification, or automation, Industry 4.0 integrates data, intelligence, and connectivity into the core of operational decision-making. As a result, operations management is no longer confined to internal process optimization but extends to real-time coordination across organizational boundaries and value networks.

Recent academic discourse highlights that Industry 4.0 technologies act as disruptive forces that challenge existing operations management theories and practices. Decision-making increasingly relies on algorithms and analytics rather than solely on managerial intuition. Processes become dynamic and self-adjusting instead of static and sequential. The role of operations managers evolves from direct supervision toward strategic orchestration of digital systems. This chapter seeks to consolidate and critically review this growing body of literature, with a particular focus on how Industry 4.0 reshapes operations management in emerging economy contexts such as India.

2. Review Methodology and Scope

This chapter employs a narrative and integrative review methodology to examine the relationship between Industry 4.0 technologies and operations management. The review draws on conceptual papers, review studies, and analytical research published in leading journals in operations and production management. Rather than adopting a systematic bibliometric or meta-analytic approach, the objective is to critically synthesize theoretical frameworks, conceptual arguments, and empirical insights in order to develop a comprehensive understanding of Industry 4.0-enabled operations management. Seminal and contemporary contributions by scholars such as Choi *et al.* (2021), Mithas *et al.* (2022), Koh *et al.* (2019), and Schiavone and Sprenger (2017) are particularly relevant, as they conceptualize Industry 4.0 as a disruptive force that reshapes operational decision-making, process integration, and the strategic role of operations management.

The scope of the review is structured around three interrelated dimensions. First, the chapter conceptualizes Industry 4.0 as a disruptive paradigm that fundamentally reconfigures the principles and practices of operations management, particularly in terms of decision-making logic, system interconnectivity, and process adaptability (Choi *et al.*, 2021; Koh *et al.*, 2019). Second, it examines key Industry 4.0 technologies—including artificial intelligence, the Internet of Things, and advanced analytics—and analyzes their implications for core operations

management functions such as planning, scheduling, quality management, and performance control (Mithas *et al.*, 2022). Third, the chapter contextualizes these insights within the setting of Indian MSMEs, service organizations, and healthcare systems, where technology adoption is influenced by resource constraints, institutional environments, and socio-economic considerations. This integrative review approach supports theory development, contextual interpretation, and enhanced managerial relevance.

3. Industry 4.0 as a Disruptive Paradigm in Operations Management

3.1 Conceptual Foundations of Industry 4.0 in Operations Management

Industry 4.0 represents a fundamental departure from traditional approaches to operations management by embedding digital intelligence, connectivity, and automation into operational systems. Earlier paradigms of operations management were largely grounded in efficiency-oriented models emphasizing standardization, economies of scale, and centralized control. In contrast, Industry 4.0 introduces decentralized, data-driven, and adaptive operational structures in which physical processes are closely integrated with digital technologies. This paradigm shift redefines how operational activities are designed, monitored, and optimized, moving operations management from a function focused primarily on execution toward one centered on continuous learning and system intelligence.

From a conceptual perspective, Industry 4.0 aligns operations management with broader digital transformation strategies. Operations are no longer treated as isolated functional activities but as interconnected systems supported by real-time data flows and intelligent decision-support mechanisms. This shift challenges traditional operations management theories and necessitates the development of new conceptual frameworks that account for dynamic system behavior, digital interdependence, and human–technology interaction.

3.2 Disruption of Decision-Making Logic in Operations Management

One of the most significant disruptive effects of Industry 4.0 lies in its impact on operational decision-making. Traditional operations management relied heavily on historical data, periodic reporting, and managerial judgment to guide planning and control decisions. Industry 4.0 replaces this reactive logic with predictive and prescriptive decision-making enabled by artificial intelligence and advanced analytics. Decisions related to demand forecasting, production scheduling, inventory management, and maintenance planning are increasingly supported by algorithms that process real-time and high-volume data.

This transformation does not eliminate the role of managers but reshapes it. Operations managers are required to interpret analytical outputs, validate algorithmic recommendations, and ensure alignment with strategic objectives. Consequently, decision-making authority becomes

shared between human managers and intelligent systems, introducing new challenges related to transparency, trust, and accountability in operations management.

3.3 Transformation of Process Architecture and Operational Design

Industry 4.0 also disrupts the architectural design of operational processes. Conventional operations management emphasized linear process flows and fixed production configurations optimized for stability and efficiency. Industry 4.0 enables modular, flexible, and reconfigurable process architectures capable of responding dynamically to demand fluctuations, customization requirements, and operational disruptions.

Cyber-physical systems and digital twins allow organizations to simulate, test, and optimize process designs in virtual environments before implementation. This capability enhances process innovation while reducing operational risk. As a result, operations management increasingly focuses on adaptability and resilience rather than mere cost efficiency, reflecting a broader redefinition of operational excellence in the Industry 4.0 era.

3.4 Integration of Digital Technologies Across Operations Functions

Industry 4.0 disrupts operations management by integrating digital technologies across traditionally separate operational functions. Planning, scheduling, quality management, logistics, and maintenance are no longer managed as discrete activities but are coordinated through integrated digital platforms. The Internet of Things enables continuous monitoring of machines, materials, and workflows, while analytics platforms transform operational data into actionable insights.

This functional integration enhances visibility and coordination across the operations value chain. However, it also increases system complexity and interdependence, requiring operations managers to adopt systems thinking and cross-functional collaboration. The success of Industry 4.0-enabled operations therefore depend not only on technological capabilities but also on organizational alignment and governance structures.

3.5 Changing Role of Operations Management and Managers

The disruptive nature of Industry 4.0 extends to the evolving role of operations management within organizations. Traditionally viewed as a support function focused on efficiency and cost control, operations management increasingly assumes a strategic role in driving competitiveness and innovation. Operations managers are expected to contribute to digital strategy formulation, technology investment decisions, and organizational change initiatives.

This shift demands new competencies, including digital literacy, data interpretation skills, and the ability to manage human-machine interaction. The literature suggests that operations

managers must transition from operational controllers to system orchestrators who coordinate technology, people, and processes in digitally enabled environments.

3.6 Implications for Emerging Economies and Indian Context

In emerging economies such as India, the disruptive impact of Industry 4.0 on operations management is shaped by contextual factors. Indian MSMEs, service organizations, and healthcare institutions often face resource constraints, skill gaps, and infrastructural limitations that influence the pace and nature of digital transformation. Nevertheless, Industry 4.0 offers significant opportunities to enhance operational efficiency, quality, and responsiveness through incremental and context-specific adoption strategies.

For Indian operations managers, the challenge lies in balancing technological ambition with practical feasibility. Adopting Industry 4.0 as a disruptive paradigm requires aligning digital initiatives with organizational maturity, workforce capabilities, and societal priorities. Consequently, the transformation of operations management in the Indian context is likely to be evolutionary rather than revolutionary, emphasizing adaptability, inclusion, and sustainability.

4. Review of Industry 4.0 Technologies and Their Operational Implications

4.1 Artificial Intelligence and Advanced Analytics

Artificial intelligence (AI) occupies a central position in Industry 4.0–enabled operations management. The reviewed literature emphasizes that AI systems enhance forecasting accuracy, production scheduling, quality prediction, and maintenance planning by learning from historical and real-time data. Unlike traditional decision-support systems, AI-driven tools continuously improve their performance as new data become available.

From an operations management perspective, AI facilitates a transition from reactive problem-solving to proactive and prescriptive decision-making. For example, predictive analytics enable managers to anticipate equipment failures, demand changes, or quality deviations before they occur. Prescriptive analytics further recommend optimal courses of action, reducing reliance on trial-and-error approaches. However, the literature also cautions that AI systems must be aligned with organizational processes and human judgment to avoid overreliance on automated decisions.

4.2 Internet of Things (IoT)

The Internet of Things refers to networks of interconnected devices and sensors that collect and transmit data across operational environments. In operations management, IoT enables continuous monitoring of machines, inventories, logistics flows, and service processes. The reviewed studies highlight that IoT significantly improves visibility and traceability, which are essential for effective coordination and control.

IoT-enabled operations allow managers to track asset utilization, monitor process conditions, and respond quickly to deviations from expected performance. In supply chain contexts, IoT enhances coordination across suppliers, manufacturers, and distributors by providing real-time information on inventory levels and shipment status. The literature emphasizes that IoT acts as a foundational technology that supports higher-level analytics and intelligent decision-making in Industry 4.0 systems.

4.3 Big Data Analytics

Big data analytics complements AI and IoT by enabling the processing and interpretation of large volumes of structured and unstructured data. Operations management research highlights that analytics transforms raw data into actionable insights that support performance measurement, process improvement, and strategic planning. Unlike traditional performance metrics, analytics-driven systems capture complex relationships among variables and identify patterns that may not be visible through conventional analysis.

The literature suggests that big data analytics enhances operational transparency and accountability by enabling evidence-based decision-making. However, it also points to challenges related to data quality, integration, and governance. Effective analytics adoption requires not only technological infrastructure but also organizational capabilities in data interpretation and cross-functional collaboration.

4.4 Cyber-Physical Systems and Digital Twins

Cyber-physical systems (CPS) integrate physical operational processes with digital control and computational intelligence. These systems enable real-time monitoring, simulation, and adaptive control of operations. Digital twins, as a specific application of CPS, create virtual representations of physical assets, processes, or entire systems.

The reviewed literature emphasizes that digital twins support operations management by enabling simulation-based planning, capacity analysis, and risk assessment. Managers can test alternative scenarios, evaluate process changes, and anticipate disruptions without interrupting actual operations. This capability represents a significant shift in operations design philosophy, moving from static planning to continuous experimentation and learning.

4.5 Automation and Smart Robotics

Automation remains a core component of Industry 4.0, but its nature has evolved significantly. Smart robotics differ from traditional automation by being adaptive, collaborative, and capable of learning. The literature highlights that these technologies enhance speed, precision, and consistency in operations while enabling flexible production and customization.

From an operations management perspective, smart automation raises important questions about workforce roles, skill requirements, and job design. Rather than replacing human labor entirely, Industry 4.0 automation often reconfigures tasks, requiring closer collaboration between humans and machines. Managing this transition effectively is a critical challenge for operations managers.

5. Comparative Analysis of Industry 4.0 Technologies and Operations Management Functions

A comparative synthesis of the reviewed literature indicates that different Industry 4.0 technologies influence distinct operations management functions. Artificial intelligence primarily affects planning and control activities by enabling predictive and prescriptive decisions. IoT strengthens monitoring and coordination through real-time data capture. Big data analytics enhances performance management by identifying trends, inefficiencies, and improvement opportunities. Cyber-physical systems influence process design by enabling adaptive and self-regulating operations. Automation and robotics impact execution by improving speed, reliability, and consistency, while digital twins support capacity planning and system optimization.

This comparative perspective underscores that Industry 4.0 adoption should not be viewed as a uniform or all-encompassing transformation. Instead, organizations must align specific technologies with their operational priorities, capabilities, and strategic objectives. Such alignment is particularly important for resource-constrained organizations, including MSMEs and public service institutions.

6. An Integrative Industry 4.0–Operations Management Framework

Building on the reviewed literature, this chapter proposes an integrative framework linking Industry 4.0 technologies with operations management functions and performance outcomes. The framework conceptualizes digital transformation as a multi-layered process rather than a direct cause-and-effect relationship.

At the foundational layer are Industry 4.0 technologies, including AI, IoT, analytics, automation, and cyber-physical systems. These technologies enable new forms of data generation, connectivity, and intelligence. The second layer consists of core operations management functions such as planning, scheduling, quality management, maintenance, and logistics. Digital technologies reshape how these functions are performed, shifting from periodic and manual processes to continuous and automated ones.

The third layer represents operational performance outcomes, including efficiency, flexibility, quality, resilience, and sustainability. These outcomes are not automatic consequences

of technology adoption but depend on effective integration with operational processes. The final layer comprises contextual moderators such as firm size, sectoral characteristics, workforce skills, regulatory environment, and organizational culture. This framework emphasizes that the impact of Industry 4.0 on operations management is contingent on organizational and institutional context.

7. Industry 4.0 in the Indian Context

7.1 Industry 4.0 and Indian MSMEs

Indian micro, small, and medium enterprises (MSMEs) play a vital role in employment generation, regional development, and economic growth, yet they face significant structural and resource-related constraints in adopting advanced digital technologies. High initial investment requirements, limited access to digital infrastructure, inadequate cybersecurity preparedness, and shortages of digitally skilled labor often restrict large-scale Industry 4.0 implementation. Nevertheless, the literature suggests that phased and application-specific adoption strategies can deliver meaningful operational improvements without excessive financial burden.

For example, manufacturing MSMEs in sectors such as auto components and textiles increasingly deploy IoT-enabled sensors for basic machine condition monitoring to reduce unplanned downtime and maintenance costs. Similarly, the adoption of cloud-based production planning and inventory management systems enables small firms to improve order visibility and coordination with suppliers and customers. From an operations management perspective, these incremental digital interventions support better scheduling, improved quality control, and data-driven performance monitoring. MSME-focused operations strategies therefore emphasize affordability, interoperability, and gradual capability building rather than full-scale smart factory transformation.

7.2 Industry 4.0 in Service Operations

Service operations differ fundamentally from manufacturing due to their reliance on customer interaction, service variability, and real-time delivery. In the Indian context, Industry 4.0 technologies are increasingly shaping service operations across sectors such as banking, logistics, hospitality, and education. Digital platforms and analytics tools enable service organizations to manage demand variability and personalize service offerings more effectively.

For instance, AI-driven demand forecasting systems are used by logistics and transportation service providers to optimize fleet allocation and route planning, reducing service delays and operational costs. In customer-facing services, chatbots and intelligent service portals handle routine service requests, allowing human employees to focus on higher-value interactions. Operations management in services thus increasingly involves coordinating digital

service channels, managing real-time data flows, and ensuring seamless integration between automated and human-delivered services.

7.3 Industry 4.0 in Healthcare Operations

Healthcare operations represent one of the most socially critical applications of Industry 4.0, particularly in a resource-constrained healthcare system such as India's. Digital technologies are increasingly applied to improve patient flow management, clinical decision support, and operational efficiency in hospitals and diagnostic centers. For example, predictive analytics tools are used to forecast patient admissions and optimize bed allocation, thereby reducing waiting times and congestion in emergency departments.

IoT-enabled systems support real-time tracking of medical equipment and patient vitals, enhancing asset utilization and patient safety. During public health emergencies, data-driven dashboards assist hospital administrators in coordinating staffing, inventory, and critical care resources. However, these advancements also highlight the need for robust data governance, ethical safeguards, and human-centered operational design. Operations management in healthcare must therefore integrate technological efficiency with clinical judgment, regulatory compliance, and compassionate patient care.

8. Managerial and Policy Implications

The reviewed literature consistently suggests that operations managers must develop new and expanded competencies to effectively leverage Industry 4.0 technologies. Beyond traditional skills in planning and control, managers are increasingly required to possess digital literacy, analytical capability, and systems thinking in order to interpret data-driven insights and integrate advanced technologies into operational processes. For example, operations managers overseeing IoT-enabled production systems must understand sensor data, dashboard analytics, and performance indicators to make timely and informed decisions. Similarly, managers using AI-supported scheduling or forecasting tools must be capable of validating algorithmic outputs and aligning them with operational priorities and business objectives.

Industry 4.0 also necessitates proactive change management and workforce transformation. The introduction of automation, analytics, and digital platforms often alters job roles and work processes, requiring operations managers to lead reskilling and upskilling initiatives. For instance, machine operators in digitally enabled plants may transition into roles involving system monitoring and exception handling, while service employees increasingly manage technology-mediated customer interactions. Effective managers foster a culture of continuous learning and collaboration, ensuring that employees view digital technologies as enablers rather than threats. Cross-functional coordination between operations, information

technology, human resources, and strategy functions becomes critical for successful implementation.

From a policy perspective, particularly in emerging economies such as India, the diffusion of Industry 4.0 technologies depends heavily on the broader institutional and infrastructural environment. Government investments in digital infrastructure, such as broadband connectivity, cloud platforms, and cybersecurity frameworks, are essential to support technology-enabled operations across manufacturing and services. Skill development initiatives that focus on data analytics, automation, and digital operations management can help address workforce capability gaps, especially among MSMEs.

Targeted policy interventions, including MSME-focused financial incentives, technology adoption subsidies, and innovation clusters, can lower entry barriers and encourage incremental digitalization. For example, government-supported industrial clusters and incubation centers can provide shared access to digital tools, training facilities, and expert guidance. Public–private partnerships also play a vital role in piloting Industry 4.0 solutions in sectors such as healthcare, logistics, and public services, thereby accelerating technology diffusion while ensuring alignment with societal needs. Together, managerial capability development and supportive policy frameworks are critical for realizing the full potential of Industry 4.0 in operations management.

9. Research Gaps and Future Directions

Despite growing scholarly attention to Industry 4.0, several significant research gaps persist, particularly in the context of emerging economies such as India. While conceptual frameworks and review studies have highlighted the technological potential of Industry 4.0, empirical investigations remain limited, especially for micro, small, and medium enterprises (MSMEs), public service organizations, and healthcare systems. The majority of existing studies focus on large-scale manufacturing firms in developed economies, leaving a substantial knowledge gap regarding adoption barriers, implementation strategies, and performance outcomes in resource-constrained and institutionalized environments.

Another critical gap concerns the human and behavioral dimensions of Industry 4.0–enabled operations management. Research has largely focused on technical and process-oriented aspects, while factors such as trust in algorithmic decision-making, resistance to automation, workforce adaptation, and human–machine collaboration remain underexplored. For instance, in healthcare operations, clinicians’ trust in AI-based diagnostic tools significantly influences adoption and integration into clinical workflows. Similarly, service employees interacting with AI-driven scheduling or customer management systems may experience role ambiguity, stress,

or skill misalignment, which can affect operational outcomes. Understanding these behavioral and socio-technical interactions is essential for designing effective, human-centered operations management strategies.

There is also a pressing need for theoretical development in operations management to explicitly incorporate digitalization, sustainability, and ethical considerations. Traditional OM theories primarily emphasize efficiency, cost reduction, and resource optimization, while Industry 4.0 requires frameworks that account for real-time data integration, adaptability, environmental responsibility, and ethical implications of technology adoption. For example, issues of data privacy, algorithmic bias, and equitable access to digital tools are particularly relevant in healthcare and public service operations.

Future research should adopt interdisciplinary approaches, integrating insights from information systems, behavioral science, sustainability studies, and management theory. Longitudinal and mixed-method designs are recommended to capture the dynamic nature of Industry 4.0 adoption, measure performance impacts over time, and understand the evolution of human-technology interactions. Comparative studies across sectors and geographies can also shed light on context-specific enablers and barriers, offering actionable guidance for managers and policymakers. Addressing these gaps will enhance the practical relevance, theoretical rigor, and societal impact of Industry 4.0 research in operations management.

Conclusion:

This review chapter demonstrates that Industry 4.0 fundamentally reshapes operations management by embedding intelligence, connectivity, and adaptability into operational systems. The integration of digital technologies such as artificial intelligence, Internet of Things, big data analytics, cyber-physical systems, and smart automation transforms the way organizations plan, execute, monitor, and optimize operational processes. While these technologies offer significant potential to enhance efficiency, flexibility, responsiveness, and overall operational resilience, their successful implementation is contingent upon contextual alignment, managerial capability, workforce readiness, and organizational culture.

For Indian MSMEs, service organizations, and healthcare operations, Industry 4.0 presents both substantial opportunities and notable challenges. Incremental and context-specific adoption strategies can enable resource constrained firms to realize tangible performance gains, while large-scale or poorly planned implementations may encounter operational, financial, or human barriers. Operations managers must therefore balance technological innovation with human-centered design, ethical considerations, and process integration to achieve sustainable and inclusive outcomes. As Industry 4.0 continues to evolve, operations management will remain

pivotal in driving organizational competitiveness, supporting innovation, and fostering long-term operational excellence across diverse sectors. The insights synthesized in this chapter provide a foundation for both scholars and practitioners to navigate the complex interplay between technology, strategy, and human capital in digitally enabled operational environments.

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HOPE IS A SKILL: PRACTICAL WAYS TO GROW IT EVERY DAY

Sajad Hussain¹, Nishi Fatma² and Aditya Pareek^{*2}

¹Department of Clinical Psychology, Tele-MANAS, UT of Ladakh

²Department of Psychology, NIMS University, Jaipur, Rajasthan

*Corresponding author E-mail: adityaapareek06@gmail.com

Abstract:

Hope is defined as the perceived ability to produce pathways to achieve desired goals and to motivate one to use those pathways. Snyder's cognitive model of hope includes goals (abstract mental targets that guide human behaviors), and pathway thinking (the ability to generate multiple routes or strategies to achieve desired goals, even when obstacles arise), agency thinking (motivational belief in one's capacity to initiate and sustain action toward those goals: often described as willpower or "I can do this" mindset). Together, these create a goal-directed motivational state. Higher hope levels are consistently linked to better outcomes in academics, mental health (e.g., lower depression and stress), physical health, relationships, and overall well-being. Hope isn't blind optimism—it's an active, learned skill tied to realistic planning and persistence.

Keywords: Hope Theory, Agency Thinking, Pathway Thinking.

Introduction:

Hope Theory is a well-researched psychological framework developed by psychologist by Charles Richard Snyder in the 1990s and early 2000s. It is one of the core theories in positive psychology and explains hope not as wishful thinking or blind optimism, but as a practical, cognitive way of thinking that drives motivation and success in overcoming obstacles. Hope is learnable. Through therapy, coaching, or deliberate practice, people can strengthen both pathways and agency thinking.

According to Snyder, hope is a learned way of thinking that helps people pursue their goals even when life is difficult. It consists of three interconnected components:

1. Goals (Goals Thinking)

- Hope always starts with having clear, valued goals — something you want to achieve or move toward.
- These can be big (e.g., "I want to become a doctor") or small (e.g., "I want to finish this project today").

- Hopeful people set goals that are personally meaningful and approach-oriented (moving toward something good) rather than avoidance-oriented (just trying to escape something bad).

2. Pathways Thinking

This is your ability to generate one or more realistic routes to reach your goal.

- High-hope people are good at mental route-planning: “How can I get there?”
- When one path is blocked (e.g., you fail a test), they quickly think of alternative paths (“I’ll study differently,” “I’ll take a summer course,” “I’ll ask for help”).
- Key phrase: “I can find a way.”

3. Agency Thinking (Motivational Component)

This is the belief in your own ability to start and keep going along the chosen paths.

- It’s the internal self-talk like: “I can do this,” “I’m not going to give up,” “I’ve overcome hard things before.”
- Agency is the energy and confidence that fuels persistence, especially when obstacles appear.

The Hope Formula

Hope = Goals + Pathways Thinking + Agency Thinking

All three parts must be present. You can have great plans (pathways) but no motivation (low agency), or strong motivation but no idea how to proceed (low pathways) — in both cases, hope is low.

Strategies to Cultivate Hope

Hope is a powerful mind-set that can help individuals navigate everyday challenges, from work stress to personal setbacks. To develop hope, clinicians can help clients identify unique hopes, set explicit and measurable goals, foster interpersonal relationships, reinforce successes, and encourage internalization of hope through spirituality and personal meaning, while maintaining a positive outlook throughout the counseling process (Yeasting & Jung, 2010).

Based on psychological insights and practical advice, here are evidence-based strategies to cultivate hope.

1. Set Achievable Goals

Start by defining what you want in different areas of life (relationships, health, work). Break them into small, realistic steps. Goal-setting behaviors and the importance of agency and pathways in achieving goals, suggesting that fostering these elements may enhance an individual's sense of hope (Snyder *et al.*, 1991). Emphasizing the importance of inquiry and problem-solving encourages individuals to take actionable steps toward

their goals, transforming hope into a dynamic process. Moreover, focusing on short-term, feasible goals helps maintain motivation and fosters a sense of progress, which is essential for sustaining hope (Stitzlein, 2022) and improving emotional well-being (Penno *et al.*, 2022). To develop hope, fostering goal-setting, motivation (Ruini, 2017), and flexible thinking about pathways to achieve goals are essential for building hope in young people (Gillham & Reivich, 2004) and pursuing their goal/s effectively. It has been also observed that goal setting mediates the relationship between creative thinking and academic hope (Khalooaskari *et al.*, 2023) by helping them set higher and achievable goals (Wong & Cheung, 2025).

2. Develop Multiple Pathways

Pathways thinking helps one adapt when things don't go as planned. Brainstorm several ways to reach your goals, anticipating obstacles and alternatives. In other words, hope is closely related to goal setting, as it involves making plans to achieve goals and the determination to act on those plans. Luthans and Jensen (2002) suggest that developing alternative action plans is as crucial as establishing goals, enhancing motivation, and persistence in achieving desired outcomes. Higher hope individuals believe in their success and can generate strategies to overcome obstacles in goal attainment. (Westburg & Martin, 2003). Also, goal setting helps students conceptualize clear objectives and develop strategies to achieve them. This process fosters agency and persistence, ultimately enhancing students' motivation and pathways to success in their academic pursuits (Kibby, 2015). Lopez *et al.*, (2014) suggest that hope can be developed by focusing on reachable goals thinking by clearly conceptualizing goals, improving pathways thinking by developing specific strategies to achieve those goals, and fostering agency thinking to initiate and sustain motivation for using those strategies effectively.

3. Build a Supportive Network

Surround yourself with people who provide genuine encouragement and understanding, rather than those who dismiss your struggles. This fosters a sense of connection and shared strength during tough times. Identifying reliable friends or mentors can make obstacles feel more manageable by reminding you that you're not alone. The said statement has been support by multiple studies in varied situations such as in a study, Munoz *et al.* (2020) demonstrated that social connectedness has a significant effect on life satisfaction, and enhances a positive perspective on life (Merolla *et al.*, 2024), which subsequently boosts hope. In a connected study, Stoddard *et al.* (2021) reported that nurturing positive relationships with mothers and supportive adults encourages

hopefulness, which can help lessen the likelihood of violence among youths living in impoverished urban areas. A similar pattern has also been noted in the financially disadvantaged communities, in which social connections creates a feeling of belonging and support, empowering individuals to chase their aspirations, developing hope, resulting in their enhance overall wellness (Baker *et al.*, 2021). Also, healthy connections with others plays a crucial role in maintaining profound hope at the end of life for patients facing terminal conditions (Coulehan, 2011) and executive functioning of inpatients (Cowan *et al.*, 2021).

4. Engage in Acts of Service

Volunteerism is deeply intertwined with the concept of hope, as it serves as a catalyst for collective action and personal engagement in social and environmental causes. The emotional responses of hope and optimism can inspire individuals to participate in volunteer activities, fostering resilience against despair and promoting positive change in communities.

Volunteering significantly enhances hope, as individuals engaged in charitable activities report greater happiness, optimistic future expectations, and increased meaningfulness in life. This altruistic mindset contributes to selflessness, neteer overall well-being and fosters a hopeful outlook (Slezáčková & Krafft, 2017) which may contribute to a sense of hope and purpose in individuals' lives (Pancer, 2020).

Furthermore, Jafari and Jafari (2023) indicates that altruism and prosocial behaviors, such as volunteering, significantly predict hope levels among individuals, suggesting that engaging in volunteerism can enhance one's hopeful outlook towards the future, accounting for approximately 38% of hope's variance. According to Dancy & Wynn-Dancy (1996), volunteerism in geriatric settings embodies hope through the act of caring, which includes trust and the ability to empathize. This engagement fosters emotional and social well-being, enhancing the overall quality of life for older adults.

5. Practice Positive Emotions

Positive emotions play a crucial role in fostering hope, which in turn contributes to various psychological outcomes, including life satisfaction and overall well-being. According to Cohen-Chen and Pliskin (2025), hope is in itself viewed as a positive emotion; it can also lead to negative experiences and dysfunctional outcomes in group contexts, challenging the notion that hope is universally beneficial. In a study, hope agency was identified as a mediator between positive mood and suicide protection, suggesting that positive emotions enhance hope, contributing to greater life satisfaction

and reasons for living (Chang *et al.* 2021). Likewise, hope agency partially mediates the relationship between positive emotions and life satisfaction among the elderly (Chan *et al.*, 2023). In school settings, higher hope levels lead to adaptive emotional appraisals, enhancing positive feelings such as sympathy and cheerfulness, particularly in perceived good relationships between teachers and students (Stephanou, 2020). Furthermore, positive emotions enhance work-related hope, which in turn predicts work engagement dimension (vigor, dedication, and absorption) and work engagement on the following day (Ouweneel *et al.*, 2012).

6. Prioritize Physical Well-Being

The relationship between physical health and hope is increasingly recognized in psychological and public health research. Hope, conceptualized as a positive motivational state, has been linked to various health outcomes, particularly among older adults. This connection suggests that fostering hope can lead to improved physical health and overall well-being.

Hope plays a significant role in physical health (Abdolahrezaee *et al.*, 2020), influencing health behaviors and specific health outcomes such as pain management, cancer, and chronic illness (Rasmussen *et al.*, 2023), increased exercise frequency, improved sleep, and reduced stress (Scioli *et al.*, 2016) as it can enhance resilience (Zhang *et al.*, 2022), promote healthier behaviors, and reduce stress contributing positively to overall well-being (Freire de Figueiredo *et al.*, 2023). Higher levels of hope are associated with a decreased likelihood of developing diseases such as hypertension and diabetes mellitus (Richman *et al.*, 2005). Likewise, hope was positively associated with better physical health (Khan *et al.*, 2023), reduced all-cause mortality, fewer chronic conditions, lower cancer risk, and less sleep (Long *et al.*, 2020) in the elderly. It has also been reported that high-hope individuals are likely to take actions in the present to ensure a healthy future. They are able to generate several pathways toward a goal and reroute when faced with obstacles. High-hope individuals are also able to sustain the motivation, discipline, and harness resources to persevere despite obstacles in reaching their goals. Such perseverance and discipline can also apply to engaging in behaviors that promote health (Rasmussen *et al.*, 2023).

7. Reframe Challenges Creatively

Make obstacles more engaging by reframing them as intriguing puzzles worth solving. This increases motivation and turns potential roadblocks into opportunities for growth. For example, view a work conflict as a chance to learn new communication skills.

Reframing challenges creatively can significantly enhance hope by transforming obstacles into opportunities for growth. This process involves utilizing various therapeutic techniques that encourage individuals to view their difficulties as manageable challenges rather than insurmountable barriers. The following sections outline how this reframing can be achieved through different approaches. According to Lopez *et al.* (2000), reframing insurmountable obstacles as challenges to be overcome is a key component of hope therapy. This process enhances hope by promoting goal-directed thought and encouraging clients to view difficulties as opportunities for growth, thereby increasing their overall sense of agency. Likewise, reframing challenges creatively enhances hope by allowing clients to view crises as opportunities for growth, which in turn fosters resilience and self-agency, leading to transformative experiences that inspire a renewed sense of hope (Hurford, 2021). Also, Knight and Knight (2013) reported that reframing challenges creatively enhances self-empowered hope by shifting focus from despair to actionable solutions. Doing this fosters individual and collective motivation, enabling effective conservation efforts and reinforcing the belief in one's ability to achieve favorable outcomes, ultimately leading to personal growth and a sense of empowerment in overcoming obstacles (Wadhawan, 2020).

8. Connect Religiosity-Spirituality

Religiosity-Spirituality have been shown to enhance hope across various populations, including veterans, older adults, and those facing health challenges. Spirituality-religiosity positively influences hope among Chilean students, with religious practices indirectly related to hope through spiritual experiences, thereby enhancing subjective well-being (Wnuk, 2023). A significant correlation has been also reported between dimensions of spirituality/religiosity (such as motivation, devotion, and coping), with hope for the future among the employees of public hospital (Nadi & Ghahremani, 2014). As demonstrated by Salgado (2014) spirituality-religiosity serve as sources of strength and hope, contributing to lower anxiety (DiPierro *et al.*, 2018), greater life satisfaction and emotional support, which can enhance individuals' ability to cope with challenges and foster resilience in difficult situations. Consistent with the previous study, Wnuk and Marcinkowski (2014) found that spirituality-religiosity significantly enhance hope, which mediates the relationship between spiritual experiences and psychological wellbeing, leading to increased satisfaction with life and positive affect while reducing negative affect among individuals.

Conclusion:

Hope is a powerful mindset that can be cultivated, even in challenging times. According to positive psychology, particularly Hope Theory by Snyder, it involves three core elements: setting meaningful goals, identifying multiple pathways to achieve them, and building agency (the motivation and belief that you can succeed).

Hope Theory shows that real hope is an active, strategic mindset — not just “wishing” things will get better, but believing and planning that you can make them better. The Hope theory is widely used in therapy (especially Hope Therapy), coaching, education, and healthcare to help people overcome daily and major life obstacles. Setting achievable goals, developing multiple pathways, building a supportive network, engaging in acts of service, practice acceptance and proactivity/positive emotions, prioritizing physical well-being: reframing challenges creatively and connecting religiosity-spiritually are some of the evident based strategies to cultivate hope. Implementing even a few of these can gradually build inner strength, turning daily obstacles into stepping stones rather than roadblocks.

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IMPACT OF EMOTIONAL INTELLIGENCE AND DIGITAL COMPETENCE ON ACADEMIC PERFORMANCE AND EMPLOYABILITY OF MANAGEMENT STUDENTS: A MULTIDISCIPLINARY ANALYSIS

Sayantani Ghosh, Sneha Chatterjee and Om Dey

Dr. B. C. Roy Academy of Professional Courses, Durgapur

Maulana Abul Kalam Azad University of Technology (MAKAUT), West Bengal

Corresponding author E-mail: drsayantani Ghosh@gmail.com,

snehachatterjee755@gmail.com, omdey2023@gmail.com

Abstract:

The research being proposed will investigate the effect of emotional intelligence and digital competency on academic achievement and on how students are prepared for the workplace through a cross-disciplinary study, which considers management studies, psychology, and educational technology as a whole when examining each of the areas mentioned in the title above. In terms of emotional intelligence, key competencies such as self-awareness, self-regulation, empathy, and social competence have been defined as the core components of emotional intelligence; thereby affecting how students approach their learning behaviour, team member work spirit, leadership capability, and their adaptability to the dynamic academic and work environment. On the other hand, the development of digital competency, including the ability to use digital tools and techniques, data literacy, the ability to work online with others, and the ability to solve technology-driven problems, has become a “must-have” for students to achieve excellence in academic achievement and prepare for employment in a digital economy. Using a mixed-methods approach, the proposed research will investigate the interactions between these two dimensions as they relate to students’ academic achievement, employability, and self-perceived employability within colleges and universities, ultimately arriving at conclusive evidence that students with higher levels of emotional intelligence and digital competency are more likely to achieve better academic success, demonstrate stronger employability characteristics, and show greater resilience in transitioning successfully from the academic environment to the workplace environment.

Keywords: Emotional Intelligence; Digital Competence; Academic Performance; Employability; Management Students; Higher Education; Multidisciplinary Approach; Skill Development

Introduction:

In the contemporary knowledge-driven and technology-intensive economy, the success of management graduates depends not only on cognitive abilities but also on a combination of emotional and digital competencies that enable effective learning, collaboration, and professional adaptability. Emotional intelligence, encompassing self-awareness, emotional regulation, empathy, and interpersonal skills, plays a crucial role in shaping students' academic engagement, stress management, and teamwork, while digital competence has emerged as an essential skill set for navigating technology-enabled learning environments and meeting evolving workplace demands. As organizations increasingly seek graduates who are both emotionally resilient and digitally proficient, higher education institutions face the challenge of preparing students for academic excellence and sustainable employability. Against this backdrop, the present study explores the impact of emotional intelligence and digital competence on the academic performance and employability of management students through a multidisciplinary perspective, emphasizing the need for a holistic educational approach that integrates emotional and digital skill development within management education.

Literature Review

The significance of emotional intelligence in improving academic performance among students has emerged strongly in previous studies. The role of emotional intelligence in academic performance was highlighted by Goleman in 1998. The major emotional dimensions under this theory include self-awareness, self-regulation, and motivation in enhancing learning effectiveness. Moreover, a research study carried out by Sánchez-Ruiz et al. in 2010 concluded that students with higher emotional intelligence tend to have good time management of stress, improved concentration, and better performance in examinations.

Studies have proven a strong correlation between EQ and collaborative learning too. Boyatzis *et al.* in 2000 stated that empathy and social skills can promote teamwork and leadership in a learning institution. Additionally, Cabello & Fernandez-Berrocal in 2015 stated that students with higher emotional intelligence have better communication skills, conflict resolution, and group cohesion in an academic project. Such qualities are important in management education since teamwork and interaction with people are core in all pedagogical practices

Digital Competence and Academic Efficiency

Digital competence has emerged as a critical determinant of academic efficiency in higher education. Spante *et al.* (2018) noted that students with strong digital literacy are better equipped to use learning management systems, online resources, and collaborative tools, leading to improved academic productivity. OECD (2019) further emphasized that digital skills enhance

students' ability to access information, analyze data, and engage in technology-supported learning environments, thereby positively influencing academic performance.

Digital Competence and Employability

Several studies have demonstrated a strong relationship between digital competence and graduate employability. Martínez-Cerdá *et al.* (2020) found that university students possessing advanced digital skills and socio-emotional competencies were more adaptable to labor market demands and reported higher employability perceptions. Similarly, the World Economic Forum (2020) highlighted digital proficiency as a core employability skill in response to rapid technological advancements and workforce digitalization.

Emotional Intelligence as a Predictor of Employability

Emotional intelligence has been widely recognized as a key predictor of employability and workplace success. Pool and Sewell (2007) proposed that emotional competencies such as self-confidence, adaptability, and interpersonal effectiveness significantly enhance graduates' employability. Jackson (2016) further suggested that emotional intelligence supports professional identity formation, enabling graduates to transition more effectively from academic environments to organizational settings.

Integrated Role of Emotional Intelligence and Digital Competence

Recent literature emphasizes the combined influence of emotional intelligence and digital competence on academic and career outcomes. Martínez-Cerda *et al.* (2020) argued that the integration of emotional and digital skills creates a holistic competence framework essential for sustainable employability. This integrated perspective aligns with multidisciplinary approaches in management education, underscoring the need for curricula that simultaneously develop emotional resilience and digital proficiency to meet contemporary academic and professional challenges.

Objective of the Study

- To examine the influence of Emotional Intelligence on academic performance and collaborative learning outcomes of management students, with specific reference to emotional awareness, stress management, empathy, and relationship management as reflected in their responses to team-based work, exams, and academic interactions.
- To assess the role of Digital Competence in enhancing academic efficiency and employability prospects of students, and to analyze how the combined effect of emotional intelligence and digital skills contributes to task completion, digital collaboration, and perceived job readiness across multidisciplinary student groups.

Research Methodology

The present study adopts a quantitative research design to examine the impact of emotional intelligence and digital competence on the academic performance and employability of management students. Primary data were collected through a structured questionnaire administered to a sample of 100 students drawn from management and allied disciplines using convenience sampling. The instrument comprised items measured on a five-point Likert scale ranging from strongly disagree to strongly agree, covering dimensions of emotional intelligence, digital competence, academic performance, and employability. The collected data were coded and analyzed using SPSS software, employing descriptive statistics to summarize respondent perceptions, reliability analysis (Cronbach's alpha) to test internal consistency, Pearson's correlation to examine relationships among variables, and multiple regression analysis to assess the predictive influence of emotional intelligence and digital competence on employability. The methodological approach ensured statistical rigor and provided empirical support for achieving the stated research objectives. Here Sample size is 100.

Data Analysis

Table 1: Descriptive Statistics of Emotional Intelligence

Emotional Intelligence Dimensions	Mean	Std. Deviation
Emotional awareness & academic performance	4.10	0.72
Stress management during exams/projects	4.05	0.78
Empathy and understanding in group work	4.18	0.74
Maintaining positive relationships	4.22	0.70
EI in team-based academic projects	4.25	0.68
Overall Emotional Intelligence	4.16	0.73

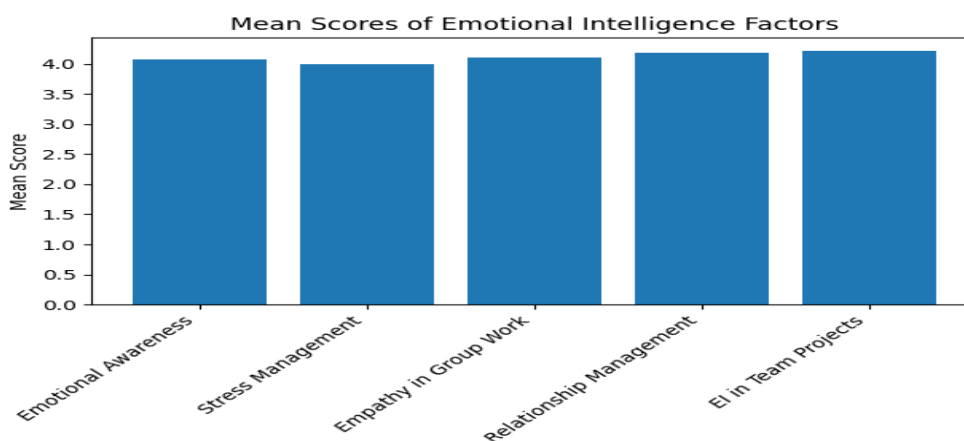


Figure 1: Bar Chart Showing Mean Scores of Emotional Intelligence (SPSS Bar Diagram)

Interpretation:

The overall Emotional Intelligence mean score of 4.16 reflects a high level of emotional competence among management students. The highest mean value is observed for *EI in team-based projects (4.25)*, highlighting the importance of emotional intelligence in collaborative academic environments. Low standard deviation values indicate consistency in responses.

Table 2: Descriptive Statistics of Digital Competence

Digital Competence Dimensions	Mean	Std. Deviation
Use of digital tools for learning & research	4.20	0.75
Digital collaboration platforms	4.12	0.80
Continuous digital skill up gradation	4.00	0.85
Digital competence enhances task efficiency	4.26	0.71
Overall Digital Competence	4.15	0.78

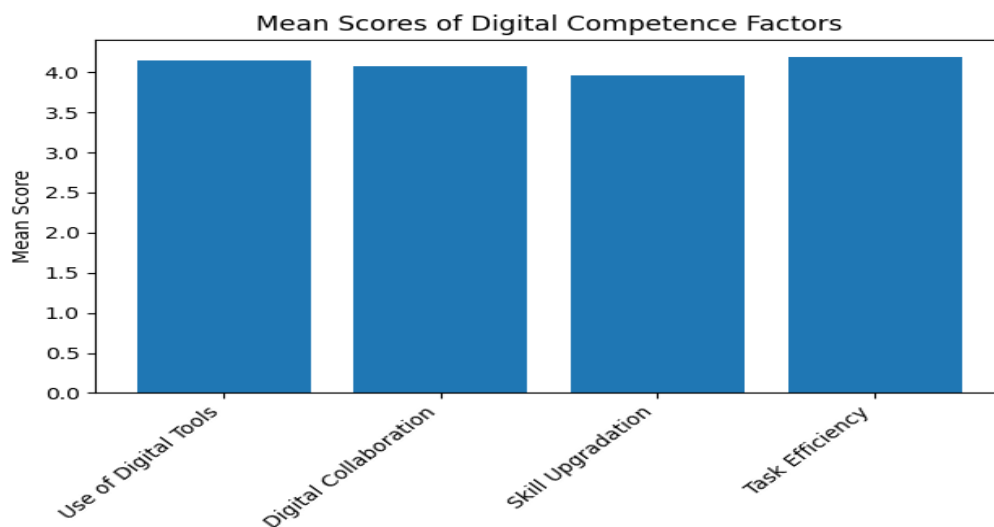


Figure 2: Bar Chart Showing Mean Scores of Digital Competence

Interpretation:

The overall mean score of 4.15 indicates that students possess strong digital skills and are comfortable using digital platforms for academic and collaborative purposes. Slight variation in skill upgradation suggests scope for structured digital training programs.

Table 3: Pearson's Correlation Analysis (N = 100)

Variables	Emotional Intelligence	Digital Competence	Academic Performance	Employability
Emotional Intelligence	1			
Digital Competence	0.54**	1		
Academic Performance	0.63**	0.59**	1	
Employability	0.67**	0.71**	0.66**	1

** Correlation is significant at the 0.01 level

Interpretation:

Emotional intelligence has a strong positive correlation with academic performance ($r = 0.63$). Digital competence shows the strongest correlation with employability ($r = 0.71$). The positive interrelationship confirms a multidisciplinary and integrated impact.

Dependent Variable: Employability

Independent Variables: Emotional Intelligence, Digital Competence

Table 4: Multiple Regression Analysis

Predictor	Standardized Beta (β)	t-value	Sig.
Emotional Intelligence	0.43	5.12	0.000
Digital Competence	0.49	5.87	0.000
R²	0.61		
F-value	76.45		p < 0.01

Interpretation:

The regression model explains 61% of the variance in employability, indicating a strong predictive relationship. Digital competence has a slightly higher beta value, showing the SPSS-based numerical analysis confirms that emotional intelligence and digital competence significantly influence academic performance and employability of management students. Their combined effect demonstrates a synergistic and multidisciplinary impact, emphasizing the need to integrate emotional and digital skill development within management education curriculum.

Findings:

1. The Emotional Intelligence (mean score = 4.16) = is indicative of high emotional awareness, stress management, empathy and relationship building skills which directly correlate to academic engagement.

2. A strong positive correlation ($r = 0.63$, $p < 0.01$) exists between Emotional Intelligence and Academic Performance thus confirming students with higher emotional intelligence achieve better results in exam, project performance and collaborative academic activities.
3. The highest emotional intelligence mean score (mean = 4.25) was reported on Team Based Projects indicating that emotional intelligence is paramount for success in teamwork, leadership and group learning.
4. The Digital Competence (mean score = 4.15) indicates strong student skill level with Digital Tools, Online Learning Platforms and Technology Enhanced Collaboration.
5. Digital Competence ($r = 0.71$, $p < 0.01$) is the strongest correlation to employability therefore an individual who is digitally skilled can see themselves as more competitive in the job market.
6. Multiple Regression Analysis reveals that both Emotional Intelligence ($\beta = 0.43$) and Digital Competence ($\beta = 0.49$) are significant predictors of Employability and account for 61% ($R^2 = 0.61$) of the variance in employability factors.
7. The fact that digital competence has a somewhat significant predictive influence on employability indicates the importance of digital skills in management education and preparing employees for the workplace, more so than emotional intelligence.
8. The combination of the results of the descriptive, correlation, and regression analyses show that both emotional intelligence and digital competence work together to create a positive impact on both academic performance and employability, demonstrating support for the multidisciplinary framework of the study.

Suggestions:

- Management schools should build Emotional Intelligence (EI) skills in their course work through the inclusion of Self-Awareness, Stress Management, Empathy and Interpersonal Skills.
- Management institutions should also strengthen their use of Experiential Learning in developing EI skills through means such as Group Projects, Role Plays, Case Studies and Simulations where students can apply their newly acquired EI skills in real-world academic and professional settings.
- Digital Competency Training Programs should be developed and structured to provide students with a working knowledge of advanced digital tools, Data Analytics, Learning Management Systems and Virtual Collaboration Tools to increase their academic performance and employability.

- Management institutions should continuously conduct Faculty Development Programs (FDP) to help faculty become more effectively trained in integrating EI skills as well as digital tools into the Teaching/Learning process.
- Career Development Cells should provide Workshops on Skill Development as a means of preparing students for Employability. These Workshops would integrate EI training with Digital Skills Development, Interview Preparation and Successful Workplace Adaptability.
- Evaluation of student learning/academic performance should include (in addition to traditional examination-based methods), the use of technology, collaborative projects within teams that will evaluate a student's ability to work as part of a group, use of emotion (emotional intelligence), and digital tools.
- Institutes of higher learning should partner with industries to create programmes that provide students with the knowledge and abilities required to close the gaps in their digital skills and soft skills required by employers today.
- To continuously evaluate a student's emotional intelligence and digital competencies, institutions should have regular assessment methods in place to perform evaluations on a continuous basis and provide timely intervention when necessary to enhance both their success in academics as well as in careers.

Conclusion:

The findings of this research indicated emotional intelligence and digital capability are two components that collectively and significantly contribute to the academic success and employability of management students. Empirical data based on 100 respondents indicates that students demonstrating a greater degree of emotional awareness, stress management skills, empathy, and interpersonal communications will be more highly engaged academically and have achieved better collaborative learning results than those who do not possess these same skills. Digital competence will also have an effect on academic achievement by increasing a student's ability to efficiently utilize digital tools, work together in groups on the digital applications, and the ability to upgrade skills continually. Descriptive, correlation, and regression statistical analyses conducted have provided strong empirical confirmation of the joint positive effect of emotional intelligence and digital competence on employability. Together these results indicate how both emotional intelligence and digital capability benefit students in preparation for the dynamic, technology-driven world of work and demonstrate the synergy which exists between emotional intelligence and digital capability. Therefore, this research suggests education institutions should adopt a holistic approach by including emotional intelligence development as

well as digital capabilities training into the curriculum so that education institutions will be developing well-rounded graduates, capable of successfully adapting to an increasingly dynamic, technology-intensive world of work.

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FINTECH AND CONSUMER FINANCIAL RESILIENCE: FROM FORTITUDE TO SUSTAINABLE GROWTH

Hitesh Kumar and Supreet Sandhu

University Business School,
Guru Nanak Dev University, Amritsar, Punjab

Corresponding author E-mail: hiteshubs.rsh@gndu.ac.in, supreet05@yahoo.co.in

1. Introduction:

The diffusion of ubiquitous financial technologies provides quick and easy access to a variety of digital financial services, bringing both opportunities and challenges in managing an individual's personal financial affairs (International Finance Corporation [IFC], 2017; Lyons & Kass-Hanna, 2021). With the help of digital technologies, financial services can be provided at an affordable cost and in ways that are sustainable to individuals (Gomber *et al.*, 2017; Morgan, 2022). However, digital technologies also carry inherent risks such as digital identity theft, impulsive buying, and over-indebtedness due to ready access to digital financial services (Alliance for Financial Inclusion [AFI], 2021; Ozili, 2022; Yue *et al.*, 2022). This may be attributed to issues such as digital fraud and scams, information asymmetry, limited knowledge and skills to make digital payments, and lack of trust in digital financial service providers (Organization for Economic Cooperation and Development [OECD], 2021). Therefore, financial literacy and the capability of consumers in an era of growing fintech is still questionable and need exploration as these issues are deeply intertwined with the *financial resilience* of individuals.

Financial resilience implies the ability of an individual to quickly recover from a sudden fall in income or an unavoidable rise in expenditure (Salignac *et al.*, 2019). It requires individuals to engage in desirable financial behaviours and practices that lead to financial security (Kass-Hanna *et al.*, 2022). These desirable behaviours may be defined as one's saving and borrowing habits, and risk management strategies regarding preparedness for emergencies (Lyons *et al.*, 2022). Financially resilient individuals are more likely to have a greater sense of present and future financial security, as they are better equipped to handle unexpected financial events without experiencing significant financial stress (Abbott-Chapman *et al.*, 2008; Muir *et al.*, 2016).

However, despite being an important aspect of financial planning in the face of financial turmoil, the overall level of financial resilience remains low (Demirguc-Kunt *et al.*, 2020).

According to a report by the Reserve Bank of India (RBI), a significant proportion of Indian households do not have access to financial services or have limited access, which directly affects their financial resilience (RBI, 2019). The report also stated that 36% of Indian households are excluded from the formal financial system, and only 48% of the population has a formal bank account. Additionally, the COVID-19 pandemic has highlighted the financial vulnerability of many Indian households. A survey conducted by the Centre for Monitoring Indian Economy (CMIE) in April 2020 found that over 20 million salaried employees lost their jobs due to the pandemic and subsequent lockdowns (CMIE, 2020).

In recent years, fintech has emerged as a disruptive force in the financial industry, offering innovative solutions to traditional financial practices. Fintech refers to the utilization of computers and associated digital technologies within the financial services landscape, which can be demonstrated as the marriage of “finance” and “information technology” (Sangwan *et al.*, 2020). It involves using digital devices such as smartphones, software, applications, and digital platforms to provide financial services to consumers and businesses and has been identified as a potential solution to promote financial inclusion (Morgan, 2022; Sangwan *et al.*, 2020). Fintech has the potential to improve financial inclusion and promote financial resilience, particularly in times of economic uncertainty and volatility. Fintech has played a significant role in mitigating the impact of the pandemic by providing digital payment and lending services, as well as financial education and advisory tools (Morgan, 2022).

The present work is an attempt to integrate the scholarly work on the “impact of fintech on financial resilience and to synthesize the key research themes”. To this end, a systematic review of the literature has been conducted, guided by the Review Question (RQ): *How can the use of fintech support financial resilience, and what are the key research themes in this domain?*

This chapter contributes to the existing body of literature in several ways. First, it explores the literature concerning the “impact of fintech on financial resilience” specifically in the context of individuals, consumers, or households. Second, we use a systematic review methodology followed by bibliometric analysis to identify the key research themes in the domain. Following the PRISMA framework, we reviewed 21 research articles utilizing the largest database of indexed articles, i.e., Scopus. Finally, drawing on clusters based on the co-occurrence of keywords, we suggested directions for future research that can provide useful insights and recommendations for policymakers, practitioners, and researchers.

The remainder of the chapter is structured as follows: Section 2 presents the findings of the review, Section 3 exhibits major propositions and discusses the agenda for future research, and Section 4 concludes the chapter.

2. Findings of the Review

2.1. Analysis of journals, countries, and sample characteristics

The review indicates that research on consumers' financial resilience has been published in 18 different journals. However, only three journals have published more than one article on this topic, providing an overall coverage of 6 publications. These journals are *Emerging Markets Review* (2), *Journal of Open Innovation* (2), and *Review of Economics and Finance* (2). The rest of the 15 journals have one publication each (see Table 1). With regards to the countries contributing to the consumer's financial resilience research, out of 21, only two publications were based on developed countries (Germany and the United States), whereas 11 publications considered emerging countries' perspectives, and 4 publications covered multiple countries (see Figure 1). However, international collaboration appeared to be limited, as the research was primarily manifested through single-country publications. Table 1 also presents the sample size and sampling unit of the reviewed studies. It can be seen that the sample size varies considerably, ranging between 120 to 1,930 units where the study is restricted to one country, and 897 to 150000+ in the case of multiple countries. Concerning sampling, the literature has extensively focused on studying individuals as the sampling unit without concentrating on specific characteristics of the population under investigation. Only a few focused specifically on low-income consumers, bank consumers, international tourists, rural adults, and textile factory workers. Table 1 exhibits sample characteristics of reviewed articles.

Table 1: Analysis of Articles, Authors, Sources, Countries, and Sample Characteristics

Author	Year	Source	Country/Region	Sample size	Sampling unit
Al Nawayseh	2020	Journal of Open Innovation	Jordan	500	Individuals
Billore and Billore	2020	Transnational Marketing Journal	India	120	Low-income Consumers
Jünger and Mietzner	2020	Finance Research Letters	Germany	323	Individuals
Senyo and Osabutey	2020	Technovation	Ghana	294	Consumers
Shaikh <i>et al.</i>	2020	Foresight	Malaysia	205	Bank Consumers
Singh <i>et al.</i>	2020	Management Decision	India	439	Consumers

Daragmeh <i>et al.</i>	2021	Journal of Behavioural and Experimental Finance	Hungary	1120	Gen-X
Setiawan <i>et al.</i>	2021	Journal of Open Innovation	Indonesia	485	Consumers
Radic <i>et al.</i>	2022	Journal of Travel and Tourism Marketing	China, Korea and the USA	897	International Tourists
Al-Khawaja <i>et al.</i>	2023	Review of Economics and Finance	Jordan	1930	Bank Consumers
Demirguc-Kunt <i>et al.</i>	2020	The World Bank Economic Review	Multiple countries (140)	150000+	Individuals
Hasan <i>et al.</i>	2021	Financial Innovation	Bangladesh	852	Rural Adults
Akeju	2022	Journal of Sustainable Finance and Investment	Nigerian	1000	Individuals
Hasan <i>et al.</i>	2022	Journal of the Knowledge Economy	Bangladesh	817	Rural Adults
Kass-Hanna <i>et al.</i>	2022	Emerging Markets Review	South Asia and Sub-Saharan Africa	72858	Individuals
Khan and Alhadi	2022	Review of Economics and Finance	Saudi Arabia	1009	Individuals
Lyons <i>et al.</i>	2022	Emerging Markets Review	Multiple countries (16)	21121	Individuals
Sakyi-Nyarko <i>et al.</i>	2022	Journal of Development Studies	Ghana	1000	Individuals
Kakinuma	2022	International Journal of Social Economics	Thailand	345	Individuals
Pandey <i>et al.</i>	2022	Sustainability	India	1325	Consumers
Ahmad and Wongsurawat	2023	Journal of Science and Technology Policy in China	Bangladesh	400	Textile Factory Workers

Source: Author's work

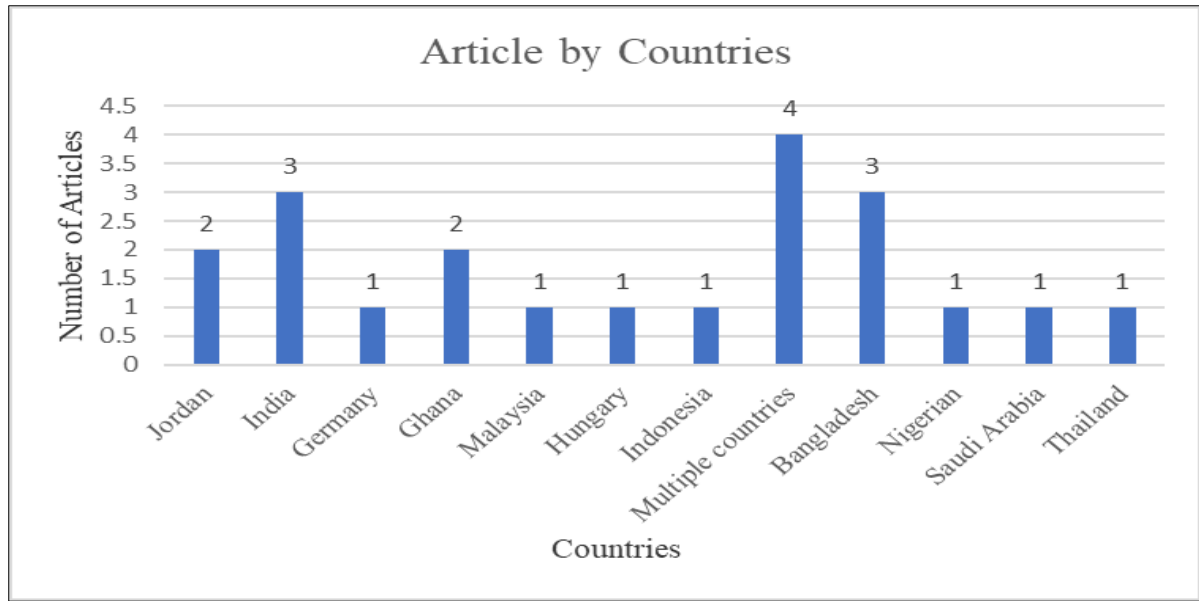


Figure 1: Articles by Countries

2.2. Themes and topics in consumer financial resilience research

The science mapping of financial resilience research was conducted using a keyword co-occurrence analysis. Examining the co-occurrence of keywords constitutes a method of content analysis where the keywords provided by authors are utilized to explore the conceptual framework within a particular field (Callon *et al.*, 1983). This analytical approach operates under the presumption that when words co-occur in a document, the associated concepts are expected to be closely interlinked. This method is often employed to identify the thematic areas or clusters that constitute the foundational topics of the investigated field, thereby identifying the theoretical building blocks (Manesh *et al.*, 2021). Out of 102 keywords provided by authors to denote the key topics in their research publications, 12 keywords met the threshold of a minimum of 2 occurrences. The five most occurring keywords were financial inclusion (9), financial literacy (6), fintech (7), mobile money (3), and financial knowledge (2) (see Table 2). These keywords can be divided into two major thematic clusters. Cluster 1 (red) shows the Nexus between fintech and financial capabilities, with studies focusing on the impact of “COVID-19” on intentions to use fintech, and consequently the association of “fintech” with “financial literacy”, “financial knowledge”, and “inclusive finance”. Cluster 2 (green) represents components of financial resilience such as “financial inclusion”, “saving behaviour”, and “mobile money usage” among consumers and households (see Figure 2). These observations are also corroborated by the density visualization diagram in Figure 3, which shows that brighter and highly dense keywords represent greater occurrences of the topic in the field (e.g., financial inclusion, financial literacy, and fintech).

Table 2: Keywords co-occurrence network summary

Cluster 1 (red): Nexus between fintech and financial capabilities			Cluster 2 (green): Components of consumer's financial resilience		
Keyword	Occurrence	Link strength	Keyword	Occurrence	Link strength
Financial literacy	6	10	Covid-19	2	1
Fintech	7	10	Financial inclusion	9	18
Financial knowledge	2	7	Mobile money	3	8
Inclusive finance	2	7	Financial resilience	2	6
Bangladesh	2	5	Savings	2	6
Financial services	2	2			

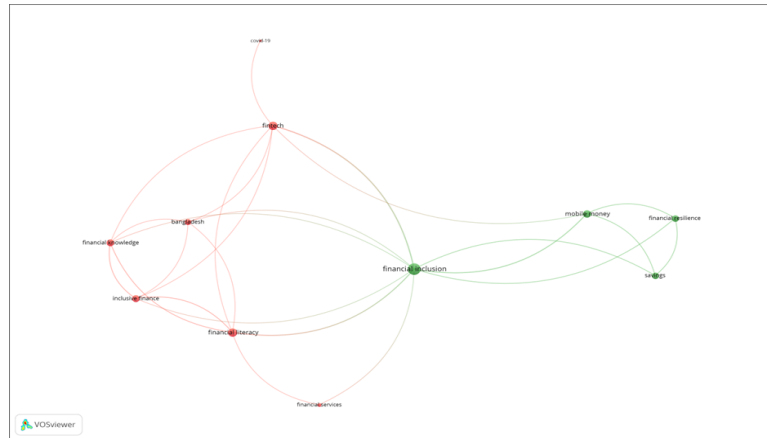


Figure 2: Keyword co-occurrence network diagram

Note(s): Cluster 1 (red) = Nexus between fintech and financial capabilities. Cluster 2 (green) = Components of consumer's financial resilience. The keyword "Bangladesh" can be ignored as it is reported for transparency and replicability.

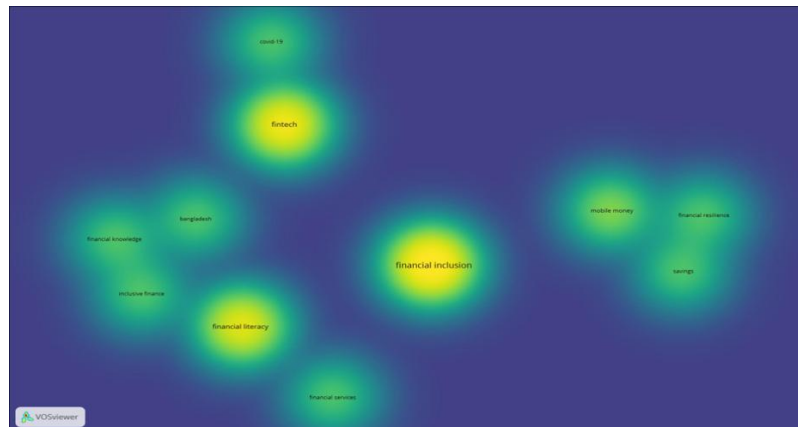


Figure 3: Density visualization diagram of the co-occurrence of keywords

After conducting a thorough full-text review of the selected papers, literature on the intersection of fintech and financial resilience exhibited three major research themes: (1) Drivers of fintech adoption, (2) Nexus between fintech and financial capabilities (financial education/literacy, financial inclusion, and financial management behaviours/practices), and (3) Fintech and sustainable growth (see Table 3). The first theme has 10 papers and describes the factors influencing intentions to use fintech. The second theme consists of eight articles and incorporates research focusing on the association of fintech with financial education/literacy, financial inclusion, and financial management behaviours. Finally, the third theme has three papers and describes the impact of fintech adoption on sustainability in terms of quality of life and overall well-being.

Table 3. Key research themes

S. No.	Themes	Reviewed articles
1	<i>Drivers of Fintech Adoption</i>	Al Nawayseh (2020); Billore and Billore (2020); Jünger and Mietzner (2020); Senyo and Osabutey (2020); Shaikh <i>et al.</i> (2020); Singh <i>et al.</i> (2020); Daragmeh <i>et al.</i> (2021); Setiawan <i>et al.</i> (2021); Radic <i>et al.</i> (2022); and Al-Khawaja <i>et al.</i> (2023)
2	<i>Role of Fintech in Building Financial Capabilities</i>	Demirguc-Kunt <i>et al.</i> (2020); Hasan <i>et al.</i> (2021); Akeju (2022); Hasan <i>et al.</i> (2023); Kass-hanna <i>et al.</i> (2022); Khan and Alhadi (2022); Lyons <i>et al.</i> (2022); and Sakyi-Nyarko <i>et al.</i> (2022)
3	<i>Fintech and Sustainable Growth</i>	Kakinuma (2022); Pandey <i>et al.</i> (2022); and Ahmad and Wongsurawat (2023)

Theme 1: Drivers of fintech adoption

The focus of this cohort of research was to investigate the underlying behavioural intentions for fintech adoption and usage of fintech products and services (Senyo & Osabutey, 2020). The most cited article in this cohort was by Al Nawayseh (2020), which aimed to examine the factors affecting Jordanian citizens' intentions to use fintech applications during COVID-19. The study found that perceived benefits and social influence significantly impact the intention to use fintech applications; however, the perceived risk associated with technology was non-significant. Billore and Billore (2020) found that awareness, trust in fintech services, fear, and social influence were significant antecedents of customer intention to adopt new fintech products and services. Jünger and Mietzner (2020) asserted that households with low levels of trust, financial expertise, and a preference for transparency are more likely to adopt fintech services. Senyo and Osabutey (2020) identified the technological and behavioural factors and showed that

intention to use mobile money services was positively related to performance expectancy and effort expectancy. Surprisingly, factors that were usually considered important, such as price value, hedonic motivation, social influence, and perceived risk, did not have any impact on the intention and actual usage of mobile money services. Shaikh *et al.* (2020) concluded that perceived ease of use, perceived usefulness, and consumer innovativeness were the key determinants of Islamic fintech acceptance by users of Islamic banks in Malaysia. Singh *et al.* (2020) contemplated that perceived usefulness and social influence are the key factors that influence the intentions to use fintech services; however, social influence has a significant negative impact. A study by Daragmeh *et al.* (2021) indicated that perceived COVID-19 risk, perceived usefulness, and subjective norms significantly influenced Hungarian Gen-X's behavioural intentions to use mobile payment services during the pandemic, and perceived usefulness also mediated the association of perceived ease of use and subjective norms with behavioural intentions. Setiawan *et al.* (2021) found that user innovativeness played a significant role in predicting the adoption of fintech in Indonesia. Radic *et al.* (2022) examined the behavioural intentions of international tourists toward the adoption of central bank digital currency (CBDC) as a payment method and found that the proposed framework strongly supported the Digital Korean Won and Digital Yuan as digital payment methods for international tourists. Finally, Al-Khawaja *et al.* (2023) asserted that the perceptions of Jordanian bank consumers about COVID-19 have a significant positive impact on the dimensions of fintech, such as ease of use, reliability, responsiveness, assurance, interface design, and privacy.

Theme 2: Nexus between fintech and financial capabilities

Capabilities imply having the potential to achieve a range of 'functionings' (Sen, 1993). These functionings may be thought of as the activities that a person undertakes or all the possible states that a person can achieve. Financial capability is defined as a combination of people's *ability to act* and the *opportunity to act* in their financial self-interest, emphasizing an individual's knowledge and behaviour as well as the external environmental conditions, such as the availability of financial products and services (Johnson & Sherraden, 2007; Sherraden, 2013). Xiao *et al.* (2014) defined financial capability as a person's internal ability to apply financial knowledge and perform desirable financial behaviours.

Studies in this cluster/theme are focused on the nexus between fintech and financial capabilities (financial literacy, financial inclusion, and financial behaviours/practices). The articles by Demirguc-Kunt *et al.* (2020) and Hasan *et al.* 2021 were the most cited. The share of adults with a mobile money account increased by 7% from 2014 to 2017 (Demirguc-Kunt *et al.*, 2020). However, access to digital technology was found to be lower among women, poorer

adults, the less educated, and other disadvantaged groups. Hasan *et al.* (2021) explored the influence of financial literacy on financial access and reported that financial literacy significantly improves financial access. Similar findings were reported by Akeju (2022), who investigated the role of financial inclusion on household savings and borrowing behaviour towards building resilience among Nigerian households. Hasan *et al.* (2023) found that financial literacy and knowledge of digital financial services significantly impact access to fintech services. The study by Kass-Hanna *et al.* (2022) corroborated that financial and digital literacy are critical components in promoting inclusivity and financial resilience. Khan and Alhadi (2022) concluded that being male, educated, and rich indicates financial inclusiveness, while education significantly reduces the barriers to financial inclusion. Lyons *et al.* (2022) examined the linkages between the growth of fintech and the need for savings, borrowing, and remittances in the 16 prominent and emerging economies of the world and found that there exists a strong and positive relationship between fintech development and financial inclusion. The study by Sakyi-Nyarko *et al.* (2022) showed that financial inclusion significantly improves household financial resilience, with savings and formal account ownership yielding more pronounced resilience effects.

Theme 3: Fintech and sustainable growth

This is the most novel and emerging theme/cluster that primarily explores the social, environmental, and regulatory concerns associated with fintech adoption by individuals, and its long-term impact on their sustainable growth in terms of improved financial inclusivity, enhanced quality of life, and overall well-being. Kakinuma (2022) revealed that fintech adoption mediates the relationship between financial literacy and quality of life, indicating the importance of digital literacy in a society that is increasingly reliant on digital technologies. Furthermore, the study showed that leisure time moderates this relationship. The findings by Pandey *et al.* (2022) asserted that drivers such as usage, digitalization, and fintech play a significant role in promoting financial inclusion. Also, financial literacy acts as a mediator in the relationship between drivers of financial inclusion and sustainable growth. Ahmad and Wongsurawat (2023) assessed the impact of mobile financial services on the economic well-being of textile factory workers from Bangladesh and revealed that financial innovation has aided low-income households in saving money, as well as facilitating and safeguarding their exchange transactions, leading to a rise in their economic welfare. However, the implementation of new technology has decreased the financial autonomy of married women by limiting their independence from their husbands. Table 4 presents the major findings of each of the articles included in the review in a summarised manner.

Table 4: Major findings of the reviewed articles

Themes	Author (Year)	Major findings
<i>Theme 1: Drivers of Fintech Adoption</i>	Al Nawayseh (2020)	PB and SI→IUF; PR→PT→IUF
	Billore and Billore (2020)	ACS, PT, PF, and SI→IUF
	Jünger and Mietzner (2020)	PT, T, and FE→IUF
	Senyo and Osabutey (2020)	PE and EE→IUMMS; PE and EE→MMU
	Shaikh <i>et al.</i> (2020)	PEOU, PU, and UI→AIFS
	Singh <i>et al.</i> (2020)	PU→BIF; SI→BIF (negative); PEOU and SI→ AUFS
	Daragmeh <i>et al.</i> (2021)	PCR, PU, and SN→IUMPS; PEOU→PU→IUMPS; SN→PU→IUMPS
	Setiawan <i>et al.</i> (2021)	BRIM, Attitude, FL, and UI→FA; PEOU→PU→FA; FL→UI→FA; GS→FL→FA; GS→UI→FA
	Radic <i>et al.</i> (2022)	MM and FOMO→Att_CBDC; RA, Att_CBDC, PBC, and PR→BI; FOMO→SN
	Al-Khawaja <i>et al.</i> (2023)	PCP→PEOU, Reliability, Responsiveness, Assurance, ID, and Privacy
<i>Theme 2: Role of Fintech in Building Financial Capabilities</i>	Demirguc-Kunt <i>et al.</i> (2020)	Usage_DFS and FI→FR
	Hasan <i>et al.</i> (2021)	FL→F_access
	Akeju (2022)	F_access→FI
	Hasan <i>et al.</i> (2023)	FL→AFS
	Kass-Hanna <i>et al.</i> (2022)	FL→FRB; DL→FRB
	Khan and Alhadi (2022)	Male, Educated, and Rich→FI; Education→FIB (-ve)
	Lyons <i>et al.</i> (2022)	FD→FI
	Sakyi-Nyarko <i>et al.</i> (2022)	FI→FR
<i>Theme 3: Fintech and Sustainable Growth</i>	Kakinuma (2022)	FL→FA→QoL; FL and Leisure→QoL
	Pandey <i>et al.</i> (2022)	DFI→FI; DFI→FL→SG; FIN→SG
	Ahmad and Wongsurawat (2023)	MFS→HFWB

Abbreviations used: ACS-Awareness of context and services, AFS-Access to fintech services, AIFS-Adoption of Islamic fintech services, AT-Agent trust, Att_CBDC-Attitude towards CBDC

payments, AUFS-Actual use of fintech services, BI-Behavioural intentions, BIF-Behavioural intentions to use fintech, BK-Banking knowledge, BM-Borrowing motivation, BRIM-Brand image, CI-Consumer innovativeness, DB-Digital behaviour, DFI-Drivers of financial inclusion, DL-Digital literacy, E-comm-E-commerce dealing, EE-Effort expectancy, F_access-Financial access, FA-Fintech adoption, FC-Facilitating conditions, FD-Fintech development, FE-Financial expertise, FH-Financial health, FI-Financial inclusion, FIB-Financial inclusion barriers, FIN-Financial initiatives, FL-Financial literacy, FOMO-Fear of missing out, FR-Financial resilience, FRB-Financially resilient behaviour, FT-Fintech training, Gen_DFS-General accessibility of DFS, GS-Government support, HFWB-Household financial well-being, HM-Hedonic motivation, ICT-ICT infrastructure, ID-Interface design, IUF-Intention to use fintech, IUMMS-Intention to use of mobile money services, IUMPS-Intentions to use mobile payment services, KFP-Knowledge of financial products, MFS-Adoption of mobile financial services, MK-Microfinance knowledge, MM-Mass media coverage, MMU-Mobile money usage, OIP-Ownership of investment products, P2P-Peer to Peer transactions, PB-Perceived benefits, PBC-Perceived behavioural control, PCP-Perception of covid-19 pandemic, PCR-Perceived covid-19 risk, PE-Performance expectancy, PEOU-Perceived ease of use, PF-Perceived fear, PR-Perceived risk, PT-Perceived trust, PU-Perceived usefulness, PV-Price value, QoL-Quality of life, RA-Relative advantage, Reg_DFS-Regulatory environment related to digital financial services, SB-Saving behaviour, SG-Sustainable growth, SI-Social influence, SM-Savings motivation, SN-Subjective norm, SP-Savings patterns, SR-Saving rate, ST-Service trust, STXN-Service transactions, UFA-Usage of fintech applications, UI-User innovativeness, Usage_DFS-Usage of digital financial services

3. Propositions and Future Research Directions

- Presently, the fintech disruption seems more like a consumption switch in haste (Billore & Billore, 2020), which may be associated with the Covid-19 pandemic, fear of missing out, or social influence (Radic *et al.*, 2022; Singh *et al.*, 2020). Further research reflecting the positive inclinations, such as the perceived benefits of consumers toward fintech adoption, could be explored.
- It is noteworthy that price is not the only influencer that promotes fintech adoption (Jünger & Mietzner, 2020), as the findings from the review suggest that other factors, such as perceived ease of use, social influence, subjective norms, etc., are also important. However, studies provide contradictory evidence on the significance of some factors such as price value, social influence, and perceived risk (Al Nawayseh, 2020; Senyo & Osabutey, 2020; Shaikh *et al.*, 2020). Thus, future scholarship can focus on the intricacies

of these relationships to understand the relative contribution of each factor in influencing fintech adoption.

- Concerning the timeframe, the review covers the most recent articles from 2020-2023. Most articles utilized the Unified Theory of Acceptance and Use of Technology (UTAUT), the Theory of Planned Behaviour (TPB), and the Diffusion of Innovation Theory to measure the behavioural intentions to adopt fintech (Jünger & Mietzner, 2020; Radic *et al.*, 2022). Although some recent research studies focused on exploring more complex relationships and models (Kakinuma, 2022; Pandey *et al.*, 2022), the theoretical lenses that have been explored in the existing research are limited. Future research can incorporate new theoretical lenses to frame the conceptual framework and research model.
- The majority of the articles on this topic were published during and after 2020, in response to the COVID-19 pandemic. Thus, studies vis-à-vis consumers' financial resilience are still in their infancy phase, and the area remains mostly underexplored, with research primarily coming from emerging economies, India, and Bangladesh in particular. International collaboration appeared to be scarce, as the research was primarily manifested through single-country publications. These insights suggest that our current understanding of the role of fintech in shaping consumers' financial resilience is limited and skewed toward samples from emerging countries only. It also implies a lack of understanding of the role of culture in determining financial resilience, since a country-wise comparison between developed and developing economies remains missing in available literature.
- Regarding the population of the studies reviewed, the literature has extensively focused on studying individuals as the sampling unit, unable to focus on specific characteristics of the sample population. Only a few concentrated specifically on low-income consumers, bank consumers, Gen-X, International tourists, rural adults, and textile factory workers (Ahmad & Wongsurawat, 2023; Billore & Billore, 2020; Daragmeh *et al.*, 2021; Hasan *et al.*, 2023; Radic *et al.*, 2022; Shaikh *et al.*, 2020). As significant diversities across population groups and geographic regions indicate that gaining access may not necessarily result in increased usage of financial services leading to financial resilience (Lyons *et al.*, 2022), future research can include marginalised communities, young adults, women, underprivileged, and rural populations who have limited access to fintech as its sample population.

Conclusion:

While there are challenges in building financial resilience among consumers, there are also opportunities for improvement, particularly through increased digital access to financial services and products, greater fintech adoption, as well as digital financial education and literacy programs. This chapter presents a seminal synthesis of research on consumers' financial resilience, reflecting its current state and agenda for future research. The article is a valuable resource for academicians and practitioners interested in understanding the potential of fintech in building financial resilience. Nevertheless, further research is needed to better understand the implications of fintech for the financial sector and to develop effective regulatory frameworks to ensure that fintech innovations are safe and sustainable over the long term. Despite the valuable insights provided by this research, it is important to acknowledge certain limitations. Primarily, the study exclusively included articles accessible through the Scopus database. Second, this study is limited to some techniques of the bibliometric-content analysis; as such, new reviews that employ alternative review methods are encouraged to overcome the shortcomings. Third and finally, this study is limited to consumer and household financial resilience as a result of fintech adoption. There are other perspectives also, such as the role of financial socialization in shaping financial resilience. New reviews integrating these domains are encouraged.

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MOTIVATION AT WORK: AN HR PERSPECTIVE

Aruna Battur*, Harish Kumar and Laxmi Patil

KLE Society's Institute of Management Studies & Research

Hubli, Karnataka

Corresponding author E-mail: arunabatturimsr@gmail.com

Abstract:

This paper focuses on work motivation of employees from the viewpoint of human resource (HR) professionals. The main purpose of the study is to understand what motivates employees to perform well and remain committed to their work. A qualitative research method is used, where focus group discussions help in collecting detailed opinions and real experiences of HR professionals working in different types of organizations and HR roles. This approach allows open discussion and deep understanding of employee motivation at the workplace. The findings show that employee motivation is influenced by both internal and external factors. Internal factors include interest in work, sense of achievement, recognition, personal growth, and job satisfaction. External factors include fair salary, incentives, supportive leadership, good working conditions, work-life balance, and opportunities for training and career development. The study also highlights that motivation is not the same for all employees and can change based on individual needs, job roles, and organizational culture. This paper focuses on work motivation of employees from the viewpoint of human resource (HR) professionals. The main purpose of the study is to understand what motivates employees to perform well and remain committed to their work. A qualitative research method is used, where focus group discussions help in collecting detailed opinions and real experiences of HR professionals working in different types of organizations and HR roles. This approach allows open discussion and deep understanding of employee motivation at the workplace. Although the study is based on a limited number of HR professionals, it provides valuable insights into how organizations can improve motivation by creating positive work environments and employee-focused HR practices. Motivated employees are more productive, loyal, and engaged, which ultimately helps organizations achieve better performance and long-term success.

Keywords: Work Motivation, Employee Performance, Job Satisfaction

Introduction:

Employee motivation plays a very important role in achieving high performance at the workplace. There is a direct connection between how motivated employees are and how well

they perform their jobs. When employees feel motivated, they put in more effort, work with interest, and achieve better results. Because of this, it is important for managers to understand which factors motivate employees in their daily work. Identifying these factors helps organizations improve employee performance. This paper focuses on developing a clear framework to study the relationship between employee motivation and work performance. It also highlights the need to clearly understand how both intrinsic factors (such as interest in work, satisfaction, and personal achievement) and extrinsic factors (such as salary, rewards, and recognition) influence employee performance and help in measuring performance levels.

Motivation is closely related to human behavior. People perform actions because they are driven by motives such as needs, goals, and personal desires. These motives push individuals to act in order to achieve something they want. Motivation can be described as an internal condition that directs a person's behavior toward achieving goals. In simple terms, motives are the reasons behind actions, and motivation is the force that encourages a person to act. Motivation involves mental and emotional processes that start, guide, and sustain goal-oriented behavior. In the workplace, motivation means the willingness of employees to work hard, perform well, and achieve targets.

Motivation is not a single action but a continuous process. It usually starts with a need or desire that creates inner pressure in a person. This pressure encourages the individual to act in a certain way to fulfill that need. As employees work toward their goals, they evaluate their actions and results. If their needs are satisfied, motivation increases; if not, they may change their behavior. In organizations, managers must understand this motivation process because it strongly affects employee behavior and job performance. By supporting employee needs and providing motivating conditions, managers can improve both employee satisfaction and overall organizational performance.

Work Motivation

Work motivation means the internal and external forces that encourage employees to start working, guide how they work, how much effort they put in, and how long they continue working. It explains why employees choose to give their time and energy to their job. Work motivation helps employees direct their efforts toward achieving organizational goals while also satisfying their personal needs. Employee motivation can be understood by observing their attitudes, such as job satisfaction, and their behavior, such as effort, involvement, and performance. Different motivational factors encourage employees to work harder and help organizations achieve better results.

Employees are motivated in different ways depending on their needs and situations. Motivation can be divided into two types: intrinsic motivation **and** extrinsic motivation. Intrinsic motivation comes from within the individual and is related to interest in work, personal growth, satisfaction, and achievement. Extrinsic motivation comes from outside the individual and includes rewards such as salary, bonuses, supervision, rules, and working conditions.

Motivational Factors According to Herzberg's Two-Factor Theory

Herzberg's Two-Factor Theory helps explain employee motivation and satisfaction at work. According to Herzberg, there are two types of factors that affect motivation: motivators and hygiene factors. Motivators are intrinsic factors that increase job satisfaction and performance. These include achievement, recognition, responsibility, personal growth, and opportunities for advancement. When these factors are present, employees feel satisfied and motivated to perform better.

Hygiene factors are extrinsic factors related to the work environment, such as salary, job security, company policies, supervision, safety, and working conditions. These factors do not increase satisfaction, but their absence can cause dissatisfaction. Herzberg explained that improving hygiene factors only reduces dissatisfaction, but real motivation and high performance come mainly from intrinsic factors. Therefore, to improve motivation and performance, organizations should focus more on enriching jobs and providing meaningful work rather than only offering financial rewards.

Link between Motivation and Performance

Motivation is closely linked to employee performance. Employees want their work to be meaningful and satisfying, and this encourages them to use their skills effectively. When employees are highly motivated, especially through intrinsic motivation, they enjoy their work and willingly invest more effort and time. This leads to better job performance and higher productivity. According to Herzberg's theory, intrinsic motivation leads to job satisfaction, which in turn improves performance.

Extrinsic rewards such as salary and incentives can influence performance, but they do not always guarantee high performance if intrinsic motivation is absent. Intrinsic motivation encourages creativity, learning, and responsibility, which are essential for long-term performance. Employees respond to both intrinsic and extrinsic incentives, and when these are balanced properly, they contribute positively to organizational goals.

A motivated employee completes tasks efficiently, shows initiative, and actively participates in work activities. Such employees develop positive attitudes toward their job and help improve organizational productivity and performance.

Human Resources Performance

Employee performance refers to how well an employee completes job tasks and achieves expected results. To improve performance, managers should create work structures that allow employees to use their skills, take responsibility, and work independently. Training and development programs also play an important role in improving performance by increasing motivation. Motivation pushes employees to work harder, and increased effort leads to better performance.

Performance is influenced by motivation, ability, and role clarity. When employees are motivated and understand their roles clearly, they perform better and contribute more effectively to organizational success.

Performance Criteria and Research Framework

To measure employee performance in relation to motivation, performance criteria should focus on individual behavior and results. Since motivation affects behavior, performance measurement should also be behavior-based. A research framework can be developed by linking motivational factors (intrinsic and extrinsic) with performance criteria.

The research framework aims to understand how motivation influences employee performance in industrial organizations. The main objective is to identify how strongly motivation affects performance and whether intrinsic or extrinsic motivation plays a greater role. This approach helps managers design better motivation strategies that match employee needs and improve overall organizational performance.

Literature review

- 1. Maslow (1943):** Maslow explained motivation through the *Hierarchy of Needs*. He stated that employees are motivated by different needs such as basic needs, safety, social belonging, esteem, and self-actualization. According to him, employees try to satisfy lower-level needs first, and once they are met, higher-level needs motivate them to perform better at work.
- 2. Herzberg (1959):** Herzberg introduced the *Two-Factor Theory of Motivation*. He divided motivational factors into intrinsic factors (achievement, recognition, responsibility) and extrinsic factors (salary, working conditions, job security). He concluded that intrinsic factors increase job satisfaction and performance, while extrinsic factors only reduce dissatisfaction.
- 3. McGregor (1960):** McGregor proposed *Theory X and Theory Y*. Theory X assumes employees dislike work and need strict supervision, while Theory Y assumes employees enjoy work and are self-motivated. He emphasized that motivated employees perform better when they are trusted and given responsibility.

- 4. Vroom (1964):** Vroom developed the *Expectancy Theory of Motivation*. He stated that employees are motivated when they believe their effort will lead to good performance and rewards. Motivation depends on effort, performance, and rewards being clearly connected.
- 5. Porter and Lawler (1968):** Porter and Lawler explained that motivation leads to performance, and performance leads to satisfaction. They emphasized that rewards must be fair and linked to performance to keep employees motivated.
- 6. Hackman and Oldham (1976):** They introduced the *Job Characteristics Model*, which states that employees are motivated when jobs include skill variety, task identity, task significance, autonomy, and feedback. These job features increase job satisfaction and performance.
- 7. Deci and Ryan (1985):** Deci and Ryan developed the *Self-Determination Theory*. They focused on intrinsic motivation and stated that employees are motivated when their needs for autonomy, competence, and relatedness are fulfilled. Intrinsic motivation leads to better performance and creativity.
- 8. Locke and Latham (1990):** Locke and Latham proposed the *Goal-Setting Theory*. They stated that clear, specific, and challenging goals motivate employees to perform better. Feedback on goals further improves motivation and performance.
- 9. Robbins (2005):** Robbins explained motivation as the willingness to exert effort to achieve organizational goals while satisfying personal needs. He highlighted the importance of rewards, leadership, and work environment in motivating employees.
- 10. Rusu and Avasilcai (2013):** Rusu and Avasilcai studied the relationship between employee motivation and performance in organizations. Their research showed that intrinsic motivation has a stronger impact on work performance compared to extrinsic motivation. They emphasized the role of motivation in improving organizational productivity.

Conclusion:

Employee motivation plays a very important role in improving employee performance and overall organizational success. The literature clearly shows that motivated employees are more committed, productive, and satisfied with their work. Both intrinsic and extrinsic motivation influence employee behavior, but intrinsic motivation has a stronger and longer-lasting effect on performance. Factors such as recognition, achievement, responsibility, and personal growth increase job satisfaction and encourage employees to give their best efforts. Extrinsic factors like salary, job security, and working conditions help reduce dissatisfaction but alone cannot ensure high performance. Motivation is not the same for all employees, as individual needs and expectations differ. Effective leadership and supportive management practices help create a motivating work environment. Theories of motivation provide useful

guidance for managers to understand employee needs and design suitable motivation strategies. When motivation is properly managed, employees show positive attitudes toward their work. This leads to better quality of work, higher efficiency, and improved productivity. Motivated employees are more willing to accept challenges and contribute innovative ideas. Organizations that focus on motivation can reduce employee turnover and absenteeism. Overall, employee motivation is a key factor in linking individual effort to organizational performance and long-term success.

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CLICKING TOWARDS SATISFACTION: UNCOVERING THE KEY FACTORS AFFECTING ONLINE CUSTOMER SATISFACTION

Archita Singla* and Saraswati

*Corresponding author E-mail: archita.singla551@gmail.com

Abstract:

In today's digital environment, customer satisfaction has emerged as a prerequisite for sustaining customer relationships. This review paper delves into the literature from different research databases to identify the factors impacting customer satisfaction. The findings highlighted that the optimization of key variables, such as efficiency, reliability, website usability, information quality, service quality, trust, and fulfillment, can enhance customer satisfaction. This study will aid managers and future researchers working in this domain in optimizing the factors affecting customer satisfaction and strengthening customer relationships.

Keywords: Customer Satisfaction, E-commerce, Efficiency, Service Quality, Digital Environment

Introduction:

In today's market, a company's capacity to provide high-quality service that results in satisfied consumers is a must for maintaining a competitive advantage (Shemwell *et al.*, 1998). To measure customer satisfaction in e-commerce, Expectancy Disconfirmation Theory (EDT) is identified as a significant theory that can assess consumer satisfaction from the perceived quality of goods or services (Oliver, 1980; Patterson *et al.*, 1996). According to the Expectancy Disconfirmation Paradigm, customers buy goods and services with expectations of how they would perform beforehand. Expectations are often viewed as judgments of what people or organizations believe will or should happen in a specific situation (James 2009). When the product or service has been used, the results are compared against expectations. Confirmation takes place if the result is as anticipated. Disconfirmation happens when expectations and results don't match up. A customer's satisfaction or dissatisfaction is thus determined by the difference between expectations and perceptions (Van Ryzin, 2013; Yuksel & Yuksel, 2001).

Customer satisfaction represents the expected outcome of a service experience, including the evaluation of whether the service has met consumers' expectations and requirements (Orel & Kara, 2014). When shopping online, both cognitive and affective experiences may play a role in the development of customer satisfaction (Homburg *et al.*, 2006; Khalifa & Liu, 2007). Customer experience is the perception that consumers create once they engage in an activity, and

customer satisfaction results when they create a favorable perception and recognition (Janda & Ybarra, 2005; Kim, 2005). Through linkages with brand personalities, brand experience might also influence customer satisfaction both directly and indirectly (Brakus *et al.*, 2009). Favorable experiences have a positive effect on satisfaction (Bhattacharya *et al.*, 2019; Lu *et al.*, 2019), which will then affect the intention to share good word-of-mouth (Torres *et al.*, 2014).

Customer satisfaction has been found to mediate consumer learning from earlier experiences and explain important post-purchase behaviors, including complaining, word-of-mouth marketing, and product use (Westbrook & Oliver, 1991). Higher levels of satisfaction may ultimately lead to greater levels of customer loyalty (Moreira & Silva, 2015) and repurchase intentions (Yu, 2007). An increased level of satisfaction has been found to boost loyalty, encouraging more frequent site visits, purchases, and spending (Flavian *et al.*, 2006).

Research on customer satisfaction with e-commerce services has been performed in the area of online retail (Tandon *et al.*, 2016), online grocery shopping (Singh, 2020), online travel agencies (Gao & Bai, 2014) and online hotel reservations (Polites *et al.*, 2012).

Literature Review

In the service sector, customer satisfaction is a complicated customer experience that may be described as an assessment of what the consumers have experienced (Ban & Kim, 2019). The factors that affect customer satisfaction are the focal point of this study

The impact of perceived usability and perceived usefulness was checked on online shopping customer satisfaction in India. It was found that both perceived usability and usefulness positively impacted customer satisfaction (Tandon *et al.*, 2016). Information quality, design of the website, security, e-service quality, product quality, payment method, product variety and delivery service were found to positively impact the satisfaction of Chinese consumers (Guo *et al.*, 2012). Singh (2020) studied the effect of customer service, product experience, website experience, delivery and brand experience on the online grocery shopping experience. The impact of experience was checked on satisfaction, which was further related to repurchase intention and word of mouth. It was found that customer service, brand experience and website experience significantly impacted the online shopping experience. Pleasant customer experience led to greater satisfaction as well. The impact of flow experience and the subsequent effect on satisfaction and purchase intention was also studied for online travel agencies. It was concluded that flow experience completely mediated the impact of informativeness, entertainment and effectiveness with regard to satisfaction and purchase intention (Gao & Bai, 2014). Polites *et al.* (2012) studied site satisfaction and site stickiness for online hotel booking. Information quality

and perceived usefulness were important in determining site satisfaction and stickiness. System quality also significantly impacted e-satisfaction.

Various studies have been conducted in different countries on customer satisfaction factors. Through content analysis of the identified studies, numerous factors have been found to affect customer satisfaction in the digital environment.

Author	Context and Country	Factors Identified	The Dependent Variable
Khan <i>et al.</i> (2024)	Sustainable e-banking in South Punjab, Pakistan	Efficiency, reliability, responsiveness, safety, and security	Customer satisfaction
Abdullah <i>et al.</i> (2022)	Telecommunication companies operating in the Kurdistan region	Service quality, service attributes and price	Customer satisfaction
Prasetyo <i>et al.</i> (2021)	Online food delivery service in Indonesia	Hedonic motivation, price, information quality, and promotion	Customer satisfaction and loyalty
Nguyen <i>et al.</i> (2021)	Online shopping in Vietnam	Responsiveness, trust, convenience, delivery, information quality and perceived website usability	Customer satisfaction and repurchase intention
Widagdo & Roz (2021)	Online shopping in Pakistan	Website Design, trust, privacy and reliability	Customer satisfaction
Ngubelanga & Duffett (2021)	Use of mobile commerce applications by millennials in South Africa	Perceived usefulness and perceived ease of use	Customer satisfaction
Widagdo & Roz (2021)	Online shopping in Indonesia	Website quality, hedonic shopping motivation and impulsive buying	Customer satisfaction
Tandon (2021)	Public internet service in Vietnam	Quality of core service, promotion, and advertising, convenience of joining service, brand image, price of service, add-on service, and customer support service	Customer satisfaction

Ali <i>et al.</i> (2021)	Online meeting platforms in different nationalities	Efficiency, fulfilment, price and system availability	Customer satisfaction
Khairusy <i>et al.</i> (2021)	Online shopping in Indonesia	Value Chain, service Quality and web Quality	Customer satisfaction
Tandon (2021)	Online shopping in India	Performance expectancy, effort expectancy, social influence, price value, reverse logistics, social media and POD mode of payment	Customer satisfaction
Taherdoost & Madanchian (2021)	Cross border e-commerce	Performance, trust, usability, user-friendliness, design, training, security and quality	E-commerce customer-satisfaction
Vasic <i>et al.</i> (2021)	E-commerce in Serbia	Availability, delivery time, shipping costs, delivery reliability, product quality and condition, consumer complaints and return policy, and information quality	E-consumer's perception and satisfaction
Ngubelanga & Duffett (2021)	Use of mobile commerce applications by millennials in South Africa	Perceived usefulness and perceived ease of use	Customer satisfaction
Ahmed <i>et al.</i> (2020)	E-banking service in Pakistan	Efficiency, fulfilment, privacy and service availability	Customer satisfaction
Pooya <i>et al.</i> (2020)	Self-service banking in Mashhad city	Perceived quality of service, technology readiness and perceived value	Customer satisfaction
Evelina <i>et al.</i> (2020)	E-commerce in Indonesia	Hedonic and utilitarian value, and perceived risk	Customer satisfaction
Dirgantari <i>et al.</i> (2020)	E-commerce in Indonesia	System quality, service quality, information quality and use	User satisfaction
Changchit & Klaus (2019)	Online reviews of students of Southwestern United States University	Product certainty and review helpfulness	Product satisfaction

Discussion:

Different E-S-QUAL attributes, constructs of the theory of planned behavior, IS Success model, technology acceptance model and unified theory of acceptance and use of technology have been found to affect customer satisfaction suited to diverse contexts. The findings highlight that customer satisfaction can be enhanced through the optimization of key variables, such as efficiency, reliability, website usability, information quality, service quality, trust, and fulfilment, depending on the specific industry and regional context. To capitalize on the increasing importance of customer satisfaction, companies should focus on continuously improving their service offerings to maintain a competitive advantage. Future research should further explore the mediating effects of customer satisfaction and test the identified factors across diverse sectors and technological environments. Understanding and leveraging these insights will enable businesses to build lasting customer relationships and thrive in an increasingly digital economy.

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FINANCIAL INFIDELITY: HIDDEN MARRIAGE KILLER

Manisha Anil Gur

Department of Commerce,

Smt. Chandibai Himathmal Mansukhani College, Ulhasnagar, Maharashtra

Corresponding author E-mail: manisha.a.gur@gmail.com

Introduction:

The new age married couple is worried about a new kind of infidelity. No, it is not cheating on your partner with someone else. It is something that could not only destroy marriages but also entire families. In the new age marriages of India, a new form of domestic friction is killing the dinner table conversations. And no, it is not an extra-marital affair. Nor is it an argument over household chores or in-laws. It is the hidden SIP, the undisclosed credit card debt, or the secret crypto currency wallet.

It is an act of intentionally hiding financial assets, liabilities, or transactions from a spouse. While it lacks the scandal of an affair, its impact on a family's long-term wealth compounding is devastating. In many cases, it ends up destroying marriages and families.

For generations, the Indian household operated as a single economic unit. The common pot was the rule, usually managed by a patriarch. However, as dual-income households become the standard, the shift toward "yours, mine, and ours" accounts has inadvertently created a veil of secrecy. While financial autonomy is a hallmark of the modern Indian, when independence transforms into cover-up, the family's balance sheet begins to fracture.

Meaning of Financial Infidelity

Financial Infidelity is when one partner in a relationship lies about or hides money-related activities, such as secret debts, hidden accounts, undisclosed purchases, or secret spending, which breaks trust and harms financial and emotional intimacy. Financial infidelity, at its core, is about deception related to money within a relationship. It's the act of keeping financial secrets or engaging in financial behaviors that one's partner would disapprove of, had they known. This can range from small, seemingly insignificant omissions to large-scale deceptions that can have devastating consequences. Unlike traditional infidelity involving romantic or sexual betrayal, financial infidelity centers on the misuse or concealment of financial resources and information.

Several forms of financial infidelity exist, each with varying degrees of severity:

- **Secret Spending:** This is perhaps the most common form, involving hiding purchases or spending habits from a partner. This could include buying items the partner would disapprove of, indulging in secret hobbies, or accumulating debt without their knowledge.
- **Maintain secret Accounts:** Maintaining secret bank accounts, credit cards, or investment accounts is a significant red flag. These accounts are often used to stash away money or engage in financial activities the partner is unaware of.
- **Hiding Income:** This involves deliberately misrepresenting one's income to a partner, either by claiming to earn less than they actually do or by failing to disclose additional sources of income.
- **Undisclosed Debt:** Accumulating debt without informing a partner can create significant financial strain and erode trust. This could involve taking out loans, racking up credit card debt, or gambling losses.
- **Financial Sabotage:** In extreme cases, financial infidelity can involve deliberately sabotaging a partner's financial well-being. This could include damaging their credit score, stealing their money, or making unauthorized transactions.

Key factors/Drivers of Financial infidelity

- **Poor Communication:** Poor communication about finances is a major driver. When couples avoid discussing money openly and honestly, it creates an environment where secrets can thrive.
- **Power Imbalances:** In relationships where one partner has significantly more financial control, the other partner may feel compelled to hide their financial activities out of fear or resentment.
- **Differing Financial Values:** Couples with conflicting views on spending, saving, and debt management are more prone to financial infidelity. One partner may feel the need to hide their behavior to avoid conflict.
- **Low Self-Esteem:** Some individuals engage in secret spending as a way to cope with low self-esteem or feelings of inadequacy. They may use purchases to boost their ego or seek temporary gratification.
- **Addiction:** Gambling addiction, shopping addiction, or other compulsive behaviors can lead to financial infidelity as individuals try to hide the extent of their problem from their partner.

- **Past Trauma:** Past experiences with money, such as growing up in poverty or experiencing financial hardship, can influence an individual's financial behavior and lead to secrecy

Examples of Financial Infidelity:

➤ **The Safety Gap: Why Partners Hide Money**

Why do otherwise honest partners lie about money? In the Indian context, it is rarely about malice; it is about a lack of safety. A husband might hide a Rs 10 lakh loss in volatile stock market in futures and options trading because he fears being labelled “irresponsible.” A wife might maintain a secret rainy day fund digital evolution of the cash hidden in rice *dabbas*, as a hedge against household volatility or to support her parents without triggering an argument.

However, these innocent secrets carry a heavy Transparency Tax. When assets are siloed, they cannot be optimized for tax or growth. If one spouse is hoarding cash in a 3% savings account while the other is paying 14% on a personal loan, the family is effectively burning money. In a transparent household, that surplus cash would have cleared the debt, creating an immediate, risk-free 14% return, in a manner of speaking.

➤ **The Friction Gap: How Silence Costs Lakhs**

The deterioration of trust is the real cost of financial infidelity. Time and scale are necessary for compounding. A couple loses the ability to leverage their combined capital when they divide their investments into two separate, uncoordinated pools. One needs to understand what Friction Gap is to comprehend this better.

Consider Anil and Jaya as a couple. Fearing that Jaya would want to use the Rs 5 lakh bonus for an opulent trip, Anil conceals it in a regular savings account. Unaware of this sum, Jaya takes out a top-up home loan for Rs 5 lakh at 9.5% interest to renovate her kitchen. Now, that Rs 5 lakh in a savings account increases to about Rs 6.7 lakh over a ten-year period. While for the loan Jaya took out, the family pays almost Rs 7.8 lakh including interest costs.

Had they been transparent about this, they could have invested the EMI amount in a Nifty 50 Index fund, used the bonus, and saved the interest. This could have made them almost Rs 48.5 lakh over a 15-year period considering a CAGR of 10-12%.

➤ **From Gold Stashes to ETFs: Modernizing Stree Dhan**

We must address the cultural elephant in the room. The concept of *Stree Dhan* (woman's wealth) was historically a woman's only financial safeguard in a patriarchal society. In today's time, this legacy often manifests as a psychological need for secret savings.

While the intent is nothing but security, the execution often fails the modern portfolio. A woman holding Rs 20 lakh in physical gold jewellery, many a times undisclosed to the husband to avoid it being used for business or something else, is holding an asset that has historically underperformed equity (you may disagree with this statement in light of the recent surge in the price of gold, but, in general, the fact holds).

If the couple were transparent, they could have gone for Sovereign Gold Bonds (SGBs) or Gold ETFs, earning an additional 2.5% interest plus capital appreciation, all while maintaining the wife's sole ownership. Transparency doesn't need to mean giving up your money; it means powering up your money.

➤ **Financial PTSD: The Long-Term Cost of Betrayal**

Financial infidelity often leads to what psychologists call "Financial PTSD." When a secret is finally revealed, usually during a major life event like buying a house or a medical emergency the betrayed spouse loses more than trust; they lose their sense of future security. In India, where family social standing is often tied to financial stability, the revelation of a hidden debt can lead to social isolation and a total breakdown of a marriage.

We are seeing an uptick in grey divorces (divorce after age 50) specifically triggered by the discovery that one partner has depleted the retirement corpus through secret, poor investments or lending money to relatives without consent.

Consequences of Financial Infidelity:

- 1. It Leads to Erosion of Trust:** Trust is the foundation of any healthy relationship and financial infidelity can damage or destroy it. Once trust is broken, it can be difficult to rebuild.
- 2. It Increases Conflicts:** Discovering it often leads to heated arguments, resentment, and a breakdown in communication.
- 3. It Creates Financial Strain on Relationships:** Secret debt, hidden accounts, and other forms of financial infidelity can create significant financial strain on the relationship, leading to stress and instability.
- 4. It Creates Emotional Distress:** Being betrayed financially can cause feelings of anger, sadness, anxiety, and betrayal. It can also lead to feelings of insecurity and self-doubt.
- 5. It Leads to Separation or Divorce:** In severe cases, financial infidelity can lead to separation or divorce. The betrayal can be too much to overcome, especially if it involves significant financial losses or a pattern of deceit.

Addressing Financial Infidelity

➤ **The Monthly Money Date: A Roadmap to Transparency**

The antidote to financial infidelity is the institutionalization of transparency. Set up a “Monthly Money Date.” This is not a time for accusations, but a strategic review of your family’s money.

- **Reveal Everything:** Both partners open their banking apps, trading apps, portfolios, and credit card statements. All of it and be truthful.
- **The “Why” Behind the Buy:** Discuss the rationale for expenses. Was that Rs 20,000 Zara spending or that Rs 80,000 new television a stress-reliever or a necessity?
- **The Shared North Star:** Align on goals. Are you saving for a second home or for your kids’ education?

When the goals are shared, the temptation to hide money vanishes. You aren’t reporting to a boss; you are consulting with a partner.

➤ **Piggyback on Technology**

In the age of Account Aggregators (AA), keeping secrets is anyway becoming harder. New fintech platforms allow couples to link their views without merging their actual funds. This provides the best of both worlds: individual autonomy with total family visibility. Embracing these tools is the first step in moving from a culture of private stashes to unified wealth. Embrace Trust, the Ultimate Asset Class.

In the world of high finance, we must value low-friction environments. A marriage is the most significant financial partnership most people will ever enter. Financial infidelity introduces friction that grinds the gears of compounding to a halt.

While a secret account might provide a temporary sense of control, it is a high-interest loan against your future. Real wealth in the Indian context isn’t just about the size of your portfolio; it is about the velocity of your capital, which is maximized only through total transparency.

➤ **Embrace Trust, the Ultimate Asset Class**

In the world of high finance, we must value low-friction environments. A marriage is the most significant financial partnership most people will ever enter. Financial infidelity introduces friction that grinds the gears of compounding to a halt.

While a secret account might provide a temporary sense of control, it is a high-interest loan against your future. Real wealth in the Indian context isn’t just about the size of your portfolio; it is about the velocity of your capital, which is maximized only through total

transparency. Stop hiding the receipts start building a legacy that can withstand the scrutiny of both the tax department and your spouse.

Conclusion:

Financial infidelity is a serious issue that can have devastating consequences for relationships. It erodes trust, creates resentment, and can ultimately lead to the breakdown of the partnership. However, with open communication, transparency, and a commitment to rebuilding trust, couples can overcome financial infidelity and create a stronger, more resilient relationship. The key is to address the underlying issues that led to the infidelity, establish clear financial goals and values, and create a system for managing finances that is transparent and equitable. By prioritizing open communication and seeking professional help when needed, couples can prevent financial infidelity and foster a healthy and trustworthy financial partnership. Ultimately, a relationship built on honesty and transparency, including financial matters, is more likely to thrive and withstand the challenges that life inevitably brings.

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About Editors



Mrs. Anita Singh holds B.Lib.I.Sc. and M.Lib.I.Sc. degrees obtained from Sarojini Naidu Girls College, Barkatullah University, Bhopal. She is currently a Research Scholar at Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya, Chitrakoot, Satna. Previously, she served as Head of the Department of Library and Information Science at Sam Global University, Bhopal. Her research interests include digital libraries, bibliometric studies, rural library development, information literacy, and medical librarianship. She has published two research papers, presented six papers at international seminars, and contributed two book chapters. Mrs. Singh currently serves as a Co-Editor of the IP Indian Journal of Library Science and Information. She is a life member of the Madhya Pradesh Library Association, Bhopal, and the Indian Library Association, New Delhi. She promotes professional ethics and lifelong learning.



Mrs. Afshan Khan has been working as a Librarian at Swami Vivekanand Government Post Graduate College, Harsud, New Harsud, Madhya Pradesh (450116), since 2019. She earned her academic qualifications —B.Sc., B.Lib.I.Sc., and M.Lib.I.Sc.—from Jiwaji University, Gwalior, and has also qualified the UGC-NET examination in Library and Information Science. Her professional role involves academic library management, information services, and user support for teaching and research activities. With a strong foundation in library science and information management, Mrs. Khan is committed to promoting effective information access, academic support services, and continuous improvement of library resources in higher education institutions.



Vishal Kumar Shukla is a senior education professional with over twenty years of experience in school leadership, teaching, and training. He is currently pursuing a Ph.D. in Education, focusing on students' learning towards Social Science at the secondary level in Itarsi city. His subject expertise includes Social Sciences, Social Studies, and Environmental Science. He has served as Principal and In-Charge Lecturer at Shanti Niketan Montessori School, Hoshangabad/Budhni, and presently works as Principal of Genius Planet C.S. School, Itarsi, affiliated with CBSE. He has presented eight research papers, published two articles, and participated in national training programs. Dr. Shukla is an Academic Counselor at IGNOU, a CBSE resource person, academic advisor, examination superintendent, and active member of academic quality and alumni bodies across multiple educational institutions.



Mr. S. Vinothkumar holds M.Com. (CA), MBA, M.Phil., and is currently pursuing a Ph.D. He has been working as an Assistant Professor at Dr. N. G. P. Arts and Science College (Autonomous) since 2019. Prior to this, he served at Sri Kumaran College of Arts and Science from 2016. With over ten years of teaching experience, he has developed strong expertise in both academics and research. Mr. Vinothkumar has authored eighteen research articles published in various reputed journals. His teaching and research interests primarily focus on Accounting and Finance, where he is actively involved in mentoring students and contributing to scholarly activities. His academic career reflects dedication to quality teaching, continuous learning, and meaningful research contributions in the field of commerce and management.

