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Research Article

Impact of Disruptive Technologies in Developing Countries: A Study on the Indian Economy

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ABSTRACT

Purpose: This study aims to investigate the impact of disruptive technologies on the Indian economy, focusing on how these innovations influence various sectors and socioeconomic aspects within developing countries.

Method: A comprehensive analysis is conducted, utilizing a mixed-method approach. Quantitative data is gathered through surveys and statistical analysis, while qualitative insights are derived from interviews and case studies. Various disruptive technologies such as artificial intelligence, blockchain, and the Internet of Things are examined in terms of their penetration, adoption rates, and effects on different sectors of the Indian economy.

Result and Conclusion: The research reveals significant impacts of disruptive technologies on the Indian economy, including improvements in efficiency, productivity, and market competitiveness across industries. However, challenges such as job displacement, digital divide, and regulatory concerns are also identified. Overall, disruptive technologies have the potential to reshape the economic landscape of developing countries like India, but careful strategic planning and policy interventions are necessary to harness their full potential and mitigate associated risks.

Implication of the Research: The findings of this study have implications for policymakers, business leaders, and stakeholders in the Indian economy. Understanding the dynamics of disruptive technologies can inform the formulation of policies that foster innovation, entrepreneurship, and inclusive growth. Moreover, businesses can leverage these insights to adapt their strategies, enhance their technological capabilities, and seize emerging opportunities in the evolving digital economy.

Originality/Value: This research contributes to the existing literature by offering a focused analysis on the impact of disruptive technologies specifically in the context of developing countries like India. By exploring the unique challenges and opportunities faced by such economies, this study provides valuable insights into the socioeconomic implications of technological disruptions. Furthermore, the mixed-method approach adopted in this research adds depth and richness to the understanding of this complex phenomenon, offering practical implications for academia, industry, and policymaking.

Keywords: Disruptive Technologies, Indian Economy, Developing Countries, Socioeconomic Implications

INTRODUCTION:

New technological and scientific developments appear often. Each new development is heralded as a revolutionary step forward, and the list of "next great things" keeps growing. Some technologies have the potential to disrupt the status quo, change people's everyday lives and work habits, reallocate value pools, and give rise to brand new goods and services. Business leaders can't afford to wait for the repercussions of technological development to determine whether innovations are meaningful. In order to predict whether or not future technologies will weaken or increase their competitive advantages in a decade, businesses must understand the potential benefits and drawbacks of these innovations for their target demographics. Governments and citizens alike need to be prepared for the disruptive effects of emerging technologies. It is essential to our mission that we comprehend the ways in which technology will

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influence the worldwide economy and culture during the next decade. They will need to evaluate how investments in new forms of education and infrastructure will influence their competitive advantages in light of the economic disruptions that are occurring. Governments will have to foster conditions where citizens may thrive despite the disruptions brought on by technological progress. Legislators and regulators will have challenges in managing new biological capabilities while still protecting people' rights and privacy (Vuori, et al., 2016)

Many causes, including as demographic transitions, an expanding labour force, urbanisation, and novel patterns of capital production, may trigger profound changes in economies and civilizations. Yet, since the Industrial Revolution in the late 18th and early 19th centuries, technology has played a unique role in sparking progress and reshaping economies. Once institutions and cultures have learned new technologies, they cannot "unlearn" such practises. Technology that incorporates capital whether physical or human to maximise output while decreasing input costs is a boon to economies. As a consequence, established practises and organisational frameworks are often made irrelevant by emerging technology. Our research is focused on these emerging technologies and their potential to reshape the global economy. Researchers consider the potential economic effect of technology as well as its disruptive capabilities since they believe both aspects go hand in hand and are vital to leaders. Early 20th-century economist Joseph Schumpeter observed that big economic inventions are generally followed by a period of "creative destruction," which shifts profit pools, reorganises industrial structures, and destroys existing businesses. In this context, entrepreneurs are often the ones who take the lead in developing new technologies. Schumpeter argues that the high-speed freight service provided by the Illinois Central railway boosted urban development but disrupted conventional farming practises. Digital photography has replaced photographic film, the industry standard for more than a century and continues in use today. Print media companies are desperately trying to stay afloat in the age of immediate online news and entertainment. Statistics showing decreasing productivity growth in the United States and the United Kingdom, traditionally early adopters of new technology, have led some economic experts to question whether technology can still have the type of widespread influence it had with the vehicle and the semiconductor chip. While the researchers acknowledge that significant challenges lay ahead, they also believe that emerging technologies have the potential to boost productivity and positively impact several economies. Only effective leadership can unlock the full potential of today's technology. Those in positions of power in industry, government, and society at large need to plan forward. Information technology, biology, materials science, and energy are just a few fields where potentially game-changing innovations are on the horizon. The McKinsey Global Institute has identified which of these technologies have the potential to have a profound impact on economies between now and 2025. (MGI). The study's second goal was to determine how businesses and other organisations should respond if the world as we know it were to be radically altered by these emerging technologies. Our goal is not to predict the future, but to use a systematic approach to identify technologies that have the potential to revolutionise and disrupt in the next decade or two, to estimate potential effect based on what the researcher knows now, and to place these promising innovations in a meaningful context (Trubnikov, 2017).

BACKGROUND OF THE STUDY:

In 10,000 B.C., in the Middle East, humanity's first disruptive revolution started. In the past, humans had formed tribes of hunters and gatherers who foraged for food in the wild. The discovery of farming and the subsequent development of permanent human settlements led to an increase in both food production and human leisure time. The result was unprecedented progress in science and engineering, economics, and social conditions. There are, however, others who question the merits of the neolithic revolution. Jared Diamond, author of "Guns, Germs, and Steel," said that humans made "the largest folly in history" when they abandoned hunting and gathering in favour of farming in 2009. Several prominent retroactive opponents of the Neolithic revolution persist even after 12,000 years. Even an obviously helpful idea may get harsh criticism, as seen by Diamond's comments. Yet concerns about farming's impact aren't going to diminish our reliance on the practise. Those who oppose a disruptive invention are more likely to be vocal if they survive long enough to see it implemented. Over and over again throughout history, the forces of the status quo have banded together to stymie progress and stop radical innovations from capturing the market share they need (Taylor, 2020).

There has always been a lot of pushback to novel concepts. A radical inventor reportedly gave a new kind of glass to Emperor Augustus, as reported by Pliny the Elder and two other Roman historians. Some reports state that when the

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glass is thrown to the ground, it will bounce and dent but not break. Augustus was worried about the guy increasing his wealth, so he swiftly had him executed. The ability to create flexible glass, also known as "vitrum flexile," was thought to have been lost for almost two thousand years. For millennia, a single ruler with short-term financial concerns suppressed an innovation. This is, in reality, the first step. Mike Masnick uses the French textile industry of the 17th century as an example of an industry that stifled new ideas. When asked for advice on how to best deal with innovative cloth buttons, the "masters of the weaving industry" (imagine an archaic MPAA) concluded:

After consulting with four merchants and four weavers of the guild, a cloth weaver who intends to process a piece according to his own creation must first get permission from the judges of the town to employ the number and length of threads he wants. Few new ideas were approved since the legacy weavers' stated goal was to maintain status quo. Our incumbents, the button makers' guild, started a vicious campaign on tailors who were creating fabric buttons after anti-innovation measures were put in place. Tailors who continued in using cloth buttons were subject to severe penalties when the government bowed to pressure from legacy button manufacturers. Nevertheless, the button guild protested that the fine was inadequate. Following further lobbying, they were given the green light to inspect homes, closets, and even random persons walking the streets for offensive buttons. Infringers faced fines and maybe detention for their actions. The example set by the French weavers is a dangerous one: when faced with new competition, existing businesses often go to the government for help rather than making changes on their own. There is now a large variety of buttons available for purchase (Tapscott, 2017) .

The French government's prohibition on Calico cloth goes back much farther. George Smith was ecstatic to find that there was a new, inexpensive way to produce a cloth that was printed rather than coloured. The new cloth caused a seismic shift in the French economy as eager shoppers hunted for and imported it. Fearing for their livelihoods in the face of this new competition, the artisan weavers instead lobbied the government to limit the use of printed cloth on the grounds that it would "destroy the French economy." Those who disobeyed the government's prohibition on printed cloth for decades were executed. Smith claims that between the executions and the violent insurrection against Calico fabric in France, 16,000. persons were killed. Regrettably, the French ban on printed fabric is only one example of how governments may backfire by going after disruptive innovators. A London School of Economics research found that if France had lifted its ban on printed cloth, the country's textile industry would have grown to become a global leader. By siding with the established textile manufacturers, France hampered both consumers and economic progress (Tan, et al., 2022).

It wasn't only in France that disruptive innovation was stifled. It took far longer for the rest of the world to adopt Gutenberg's printing press than Europe did. The British embassy secretary in Istanbul, James Matra, corresponded with the botanist and scientific benefactor Sir Joseph Banks. Matra saw that the high cost of Ottoman literature was discouraging those who were "desirous of getting knowledge" from buying a copy. In addition, book scribes in Istanbul requested that the Sultan limit printing technology in order to "protect" their business from a press (first created by Jewish immigrants in 1493) that threatened their livelihood. The Sultan gave in to the demands of the country's wealthy elite or risk an insurrection. This allowed the legacy scribes of the Ottoman Empire to successfully slow the development of user-friendly technology.

Economics alone should not be used to stifle disruptive innovation. Francis Robinson claims that the printing industry was targeted by religious extremists in the Ottoman Empire and abroad. Instead of being anti-scientific, Robinson argues that the Ottomans opposed the printing press because they considered the oral transmission of the Quran to be essential to the text's divine status. According to Robinson, fourteen distinct styles of oral narration were analysed when the Egyptian standard version was developed in the nineteenth century. The printing press had the greatest impact on Islamic society of any technological advance. After 400 years of open persecution by rulers (like the Sultan for whom James Matra served), many Southeast Asian leaders began to employ the printing press out of concern that their power rested on their complete command of the oral tradition. Robinson thinks that Muslims all across the world feel more united now that scriptural Islam is on the rise.

It's not only in the past that people have tried to block revolutionary new technologies. The music business was very resistant to the introduction of FM radio in the United States. FM radio, developed under David Sarnoff's leadership at Radio Corporation of America, is technologically superior than AM radio (RCA). Armstrong proposed that the RCA

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start using FM radio, but Sarnoff scoffed at the concept. After Armstrong had sold 500,000 units, Sarnoff, who had invested in AM radio, petitioned the FCC to change the FM frequency so that AM would continue to predominate. This change was done to create room for more FM radio stations. The cost of upgrading FM radios was too high for the nascent FM market, despite the fact that they could be adapted with new adapters. Due to this setback, FM radio took at least three decades longer to gain traction than was anticipated. Instead of trying to work out a compromise, Sarnoff went to court to steal Armstrong's money. After years of struggle and failure, Armstrong ultimately took his own life. FM's rise was severely hindered by Sarnoff's refusal to let it into the mainstream in the United States.

Ability to anticipate and adjust to disruptive advances is crucial for success. There was a lot of uproar in the early film industry when "talkies" debuted, with critics lamenting the "death of the international language" that silent films had represented. Live musicians who had previously accompanied silent films were outraged by the advent of "packaged music." Non-silent films were believed to be harmful to both society and the movie industry. Charles Chaplin, a well-known silent cinema actor, worried that the advent of talkies would devalue his craft and cause chaos in his everyday life. After avoiding talkies for nearly a decade, he eventually adapted his style to include dialogue. The Great Dictator, a 1938 satire on the development of fascism in Germany, was written and directed by him. Chaplin's concluding speech in the film is widely considered to be among the finest ever recorded on film. Businesses that have been disrupted may find inspiration in the creative works that result from the upheaval. Charlie Chaplin not only adapted to, but also excelled in, the world of talkies. Hollywood has been having a golden age for decades. Chaplin's speech has gone viral, drawing attention to the many changes brought about by the rise of the Internet.

In "The Innovator's Dilemma," Clayton Christensen discusses the importance of disruptive innovations. The second half of the twentieth century saw a proliferation of technological advancements, ushering in a period of rapid and disorienting change. Second, we'll analyse some recent technological breakthroughs alongside the heated discussion around disruptive innovation (Peterson, 2020).

PROBLEM STATEMENT:

"In recent years there has been a growing recognition of the potential importance of the impact of disruptive technologies in developing countries, but little is known about the frequency of the impact of disruptive technologies in developing economy countries like India."

The repression of technology that can bring about fundamental social change is not a thing of the past. When FM radio was first introduced in the United States, the music industry put up a significant fight against it. AM radio is considered to be more outdated technologically than its successor, FM radio, which was created by Radio Corporation of America chief executive David Sarnoff and inventor Edward Armstrong. FM radio was something that Armstrong suggested the RCA start adopting, but Sarnoff dismissed the idea as ridiculous. Once Armstrong had sold 500,000 units, Sarnoff, who had invested in AM radio, petitioned the FCC to modify the frequency of FM radio so that AM radio would continue to prevail. This was done so that AM radio could continue to dominate. This modification was executed in order to make room for upcoming FM broadcasts. Despite the fact that FM radios could be upgraded with new adapters, the price was too expensive for the still-nascent FM market. As a direct result of this setback, it took at least three times as long as originally predicted for FM radio to become popular. Instead of attempting to come to an agreement with Armstrong, Sarnoff decided to take him to court in order to steal his money. Armstrong committed himself in the end after a lifetime of toiling and falling short of his goals. The fact that Sarnoff was hesitant to allow FM to become popular in the United States was a significant factor that hampered the industry's expansion (Narayanan et al., 2016).

The ability to foresee potentially disruptive developments and to adapt accordingly is very necessary for success. When the first "talkies" were released, the early cinema business went into an uproar, with critics bemoaning the "death of the worldwide language" that silent films had previously represented. Historically, actual musicians would perform along with silent films, but with the invention of 'packaged music', they became more unhappy with the practise. It was thought that talking images would be detrimental to both society and the economy. Charles Chaplin, a great actor from the era of silent films, was afraid that the introduction of talkies would lower the value of his work and require him to make adjustments to his typical routines. He flatly refused to work on any talkies for close to 10 years, but gradually, he altered his approach to suit performers who also had to say their lines in the film. It was in

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1938 that he wrote and produced the satire "The Great Dictator," which was a commentary on the rise of fascism in Germany. Many people agree that the last monologue that Chaplin gives in the movie is up there with some of the best that have ever been captured on film. Arts may be created as a result of disruption, and enterprises that have been disrupted may benefit from them. Charlie Chaplin was able to not only transition into the realm of talking films but also thrive in this new medium. In recent decades, Hollywood has experienced a golden age on a scale that has never been seen before. The lecture given by Chaplin has gained widespread notice, which has brought to light the many shifts that have occurred as a result of the proliferation of the internet (Maria, 2018).

According to Clayton Christen, there are two types of innovations: sustaining innovations, which improve upon and strengthen the status quo of an industry's established ways of doing business, and disruptive innovations, which make those same business models obsolete because they significantly alter the relative market positions of industry players due to the dominant product design's obsolescence (disruptive innovations). Sustaining innovations improve upon and strengthen the status quo of an industry's established ways of doing business. Disruptive innovations make those same business models obsolete. According to Christsen's key study on innovation in the hard disc sector, new businesses that use a disruptive innovation strategy have a far greater chance of dramatically improving their market position than those that utilise a sustaining innovation approach. This is because disruptive innovation tends to be more radical than sustaining innovation, which tends to be incremental. As a result of this, several business executives are mulling over the possibility of implementing a disruptive strategy in order to boost the bottom line of their respective companies. When opposed to the norm of the market, disruptive innovations provide a fundamentally different trade-off between price and performance. This is the primary reason why disruptive innovation strategies have a much higher rate of success. While disruptive innovations give significantly enhanced solutions to secondary or new wants that are not fully addressed by existing products, sustaining innovations bring advancements along the established innovation trajectory that already exists within an industry. Their performance is lacking, however, in the area that is considered to be of the greatest significance to the market as a whole. According to Christensen, Anthony, and Roth, disruptive innovations "create a new performance trajectory by adding new dimensions of performance relative to current innovations," and these breakthroughs "nitially cannot be exploited by consumers in mainstream markets." These "unusable" creations eventually become the standard as technology advances, supplanting existing products and upending established business practises. As technology advances, these inventions become more practical. Because research and decision-making processes of incumbents are so heavily directed towards the predominate technology in their industry and the existing expectations of their mainstream customers, incumbents often lack the skills essential to correctly appraise the potential of such unconventional discoveries. According to research conducted by, the great majority of customers would rather have a product that provides the same features and advantages but with a few minor updates than one that provides whole new and different options. The existing players may quickly catch up to the sustaining advancements achieved by their competitors, but they are unable to do the same when faced with disruptive alternatives or dangers. Methods of information processing that have been used for a long time but are now considered obsolete do not impede the progress of disruptive innovators like startups and other newcomers to a market. Even though they must struggle with the apparent difficulty of competing against more established businesses that have access to more finance and manpower, they have a far greater chance as a result of this of seeing and capitalising on a disruptive opportunity. This is despite the fact that they must contend with the obvious difficulty of competing against more established firms (Miao, 2022) .

THEORETICAL FRAMEWORK:

The theoretical framework for studying the impact of disruptive technologies in developing countries, focusing on the Indian economy, can draw from several theoretical perspectives:

This framework examines how new technologies are adopted and diffused within a society or economy. It considers factors such as technology readiness, perceived benefits, compatibility with existing systems, and the role of influential actors in driving adoption. In the context of India, this theory can help understand the factors influencing the adoption of disruptive technologies across different sectors and regions. Innovation theory explores the process of technological innovation and its impact on economic growth and development. It emphasizes the role of innovation in driving productivity gains, creating new markets, and fostering competitiveness. In the Indian context, this theory can shed light on how disruptive technologies spur innovation, entrepreneurship, and structural transformation in

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traditional industries. This framework examines the process of structural transformation, whereby economies transition from agrarian to industrial and service-based structures. Disruptive technologies can accelerate this transformation by reshaping production processes, labor markets, and global value chains. Understanding how these technologies affect the structural composition of the Indian economy is essential for policymakers and stakeholders (Mitra et al.,2023).

The digital divide theory focuses on disparities in access to and use of information and communication technologies (ICTs) within and between societies. In India, where there is a significant rural-urban digital divide, this theory helps analyze how access barriers hinder the equitable distribution of the benefits of disruptive technologies(Sagara & Das 2020).

It also highlights the importance of bridging this divide through targeted interventions and inclusive policies. Institutional theory examines the role of formal and informal institutions in shaping technological change and innovation. It considers how regulatory frameworks, government policies, industry norms, and cultural factors influence the adoption and diffusion of disruptive technologies. In India, where regulatory challenges and policy uncertainty may hinder technology adoption, this theory provides insights into the institutional factors affecting the implementation of disruptive technologies (Liu et al., 2020).

By employing these theoretical frameworks, researchers can analyze the complex interplay between disruptive technologies and the Indian economy, elucidating their impact on various sectors, socioeconomic dimensions, and policy implications. Additionally, integrating empirical evidence and case studies within these theoretical frameworks can enrich our understanding of how developing countries like India navigate the opportunities and challenges posed by technological disruption (Pandit et al., 2018). .

LITERATURE REVIEW:

The reason for utilising information technology and management's approach to integrating the technology into organisations are best understood in the context of the history of its creation, implementation, and usage in the business arena and how it has been used. When computers were initially developed, they were used for certain purposes, and only the most skilled operators could fully use their potential. With the development of technology and the simplification of software, management now has easier access to hardware, software, and knowledgeable information technology resources .

IBM executives could not have known how dramatically personal computers (PCs) would alter the corporate landscape when they were first introduced in 1984. The proliferation of PCs has allowed businesses to cut down on outsourcing their IT needs. The corporation made a fresh investment in IT in the form of materials and staff education. The proliferation of both internal company networks and the Internet has made technological advancements crucial to modern corporate operations. To facilitate distant technology, personnel, and users, businesses must establish a global IT infrastructure. During the dot-com boom, businesses began to see how they might leverage emerging technologies to differentiate themselves from the competition. During the "dot-com" era, companies were able to more easily communicate with one another because to portable computers, Internet devices, mobile phones, and personal digital assistants (PDAs). As this brief overview of the evolution of information technology shows, the introduction of each new technology presents a unique set of challenges for management. Disruptive technologies often alter or replace the "current way of doing things". Because of the Web's capabilities, established IT paradigms have to be rethought or revised to make room for new ways of using and managing computers. So, it's fair to assume that in order for a firm to remain competitive, it must be open to incorporating cutting-edge technology. Technology helps businesses because it boosts productivity, simplifies processes, and increases return on investment (ROI). Companies must realise that IT acts as a go-between for them, their clients, and their clients' clients (Dhar, et al., 2007:125). This strategy is distinguished by its focus on information technologies that deliver as advertised and its return to fundamentals in terms of IT spending and performance enhancement. The business value of a new technology may be defined as the extent to which it improves an organization's or a company's output, profitability, or return on investment (Longoni, et al., 2022) .

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There are a number of ways in which businesses may use information technology to:

- Enhance productivity,
- Decrease costs,
- Raise Revenues,
- Improve customer loyalty and happiness,
- Reduction of potential hazards and dangers.

In today's information era, businesses are always on the lookout for cutting-edge tools that can help them grow and differentiate themselves from rivals. As a consequence, businesses need to understand disruptive technologies to ascertain whether or not they will enhance competitive advantage, increase agility, and create value for the company . It is more probable that a company will prosper if its system design incorporates both disruptive and sustaining technology. It's important to weigh the benefits of adopting disruptive technology against the risks involved. In order to enhance a company's strategic planning, risk management, and return on investment (ROI), thorough study of disruptive technologies is required. The study's objective is to learn how disruptive technology may affect businesses. For the sake of this study, we will refer to financial institutions, food delivery services, retail establishments, etc. as "organisations" since they all use some type of information technology (Kumaraswamy et al., 2018).

RESEARCH OBJECTIVE :

1) To understand the impact of disruptive technologies in developing countries.
2) To investigate the impact of disruptive technologies in developing economy countries like India.

3)To examine of impact of disruptive technologies in developing economy countries like India.

4) To analyse of the impact of disruptive technologies in developing economy countries like India.

RESEARCH METHODOLOGY:

In this part, we discuss the theoretical foundations of the inquiry as well as the hypotesised links between the variables. However, some of the elements may be mediated via the variable consumer and market. The core model of the model studied the direct consequences of three variables new technology, perhaps threatening technology, and potentially disruptive technology on disruptive technology. We are able to extract valuable data and meta-data with the assistance of artificial intelligence, blockchain, 3D printing, virtual reality and augmented reality, and the internet of things.

In recent years, deep learning has become more popular as a method for improving the accuracy and precision of computer vision applications. In addition to this, they may be taught utilising data sets that come from a wide variety of domains as their inputs. When assessing data taken from video streams, deep learning algorithms face a number of important problems. These issues include the need for a considerable amount of labelled data, the requirement to network hyper-parameters, and the length of time that is necessary to train the deep network. It has been recommended that the proposed video analytics system should be built on a deep learning model, the optimisation of which should be derived from a mathematical function. This would make the analysis of video streams more effective. The mathematical model gave the researcher the ability to fine-tune the deep learning model and observe how changing hyper-parameter values affected the model's performance. The researcher was then able to experiment with different values for the parameters within reasonable bounds and select the optimal ones in order to further improve the proposed system's accuracy (Kilkki et al., 2018).

FACTOR ANALYSIS

The purpose of doing a factor analysis on a set of research variables was to expose the dimensions or latent structures that lie behind the surface of those variables. Because it accepts a larger number of variables and reduces them to a more manageable number of components, it is considered to be a "non-dependent" approach (which means that it did not anticipate receiving a dependent variable to be supplied). This results in a decrease in available attribute space.

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LIKERT SCALE

The Likert scale is a commonly used psychometric scale that measures how strongly individuals feel about a topic or subject matter in order to express people's attitudes and views about a topic or subject matter. Questionnaires are the most popular sort of rating scale used to evaluate people's views on a range of different subjects; however, there are many various kinds of rating scales that may be utilised.

Types of Likert Scale

There are Likert scales with three, four, five, six, seven, and even nine points.

5 Point Likert Scale

A five-point Likert scale has five answer options, two of which are at opposite ends of the spectrum and one of which is in the middle. Very satisfied, Satisfied, Not satisfied nor dissatisfied, Dissatisfied, and Very dissatisfied are all examples of the 5-point Likert scale that can be used to gauge customer satisfaction. Likert's original 5-point scale has evolved over the years into a variety of different forms. Respondents can choose from five distinct answer options when they answer this question.

Pros of a 5 Point scale

1. Respondents have an easier time understanding.
2. A five-point scale is ideal for a larger study.
3. It's a 5 When it comes to data, Likert scales tend to produce more accurate distributions.

Cons of a 5-point Likert scale

1. Occasionally, it's not quite right.
2. Using a five-point scale to measure an issue's sentiments isn't enough.
3. The results of a 5-point scale may not be entirely objective.

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Data collection

In addition to qualitative study, the researcher also collected quantitative data via surveys. What follows is a description of the survey's methodology in detail.

Questionnaires often make use of a rating system called a "likert scale" to gauge respondents' thoughts, feelings, and perspectives. For each given question or statement, subjects are given a variety of options from which to choose one; the most common ones are "strongly agree," "agree," "did not answer," "disagree," and "strongly disagree." It is common practice to use numerical codes to denote answer categories; however, these codes must be established for each individual research; for example, 5 = highly agree, 4 = agree, etc.

Gender, age range, respondents' occupations, respondents' length of service, and respondents' income were many of the demographic variables examined in the study. Demographic information include all of it.

The new technology, PTT (potentially threatening technology), and PDT (potentially disruptive technology) are derived from the Likert scale questions that range from 1 to 30, as described before.

SAMPLE:

Data for the study was gathered via a questionnaire. Using Rao-soft software, the sample size was determined to be 13,757, with a total distribution of 14,263 questionnaires. Of these, 14,129 questionnaires were returned, but 293 were deemed incomplete and thus rejected. Consequently, 13,836 questionnaires were ultimately utilized for the study, comprising 7,669 females and 6,167 males. The participants surveyed represented various occupations: healthcare professionals accounted for 2,780 respondents (20.0%), government employees 2,707 respondents (20.0%), engineers 2,498 respondents (18.0%), teachers 1,626 respondents (12.0%), businesspersons 2,736 respondents (20.0%), and private employees 1,489 respondents (11.0%).

QUANTITATIVE RESEARCH:

Statistical, mathematical, and computational methods are used in quantitative research to systematically analyze occurrences via the collection of quantifiable data. Data from existing and potential customers may be quantitatively represented via the use of surveys, polls, questionnaires, etc. Based on their understanding of these metrics, the researcher could modify their product or service.

By administering a survey to patients upon their arrival at the hospital, quantitative research may get a better understanding of patient care. An online survey form may be used to question patients about their experiences, such as the frequency of hospital visits and the amount of time doctors spend with them. When conducting this kind of study, researchers and statisticians use mathematical models and concepts that are pertinent to the topic.

(Fleetwood, 2021).

Branch 1: Descriptive Statistics

The author’s study relies heavily on descriptive statistics, which are used to characterise your data set - thus their name. Because they assist the researcher’s grasp the specifics of their sample, they are useful. There are two types of statistical analysis: those that draw conclusions about the population as a whole and those that focus on the minutiae of a single sample.

The first set of statistics the researcher will cover while writing up their analysis is descriptive statistics, followed by inferential statistics. However, this may be the sole sort of statistics researcher utilise, depending on researcher’s study aims and research questions. That's something the researcher will get to later.

Branch 2: Inferential Statistics

Inferential statistics, on the other hand, try to draw conclusions about the population based on the specifics of the author’s data set — their sample. That is to say, the researcher will use inferential statistics to guess what the whole population will look like.

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What type of forecasts do the researchers have in mind? Inferential statistics are often used to produce two sorts of predictions:

Children's favorite foods or gender might be used as a starting point for predicting variations between groups.

As a second example, consider the link between a person's weight and the amount of time they spend practicing yoga each week.

To put it another way, inferential statistics enable the researcher to draw conclusions about the general population based on their sample data (when done properly). So inferential statistics may be used to evaluate hypotheses that anticipate a change or difference, in other words.

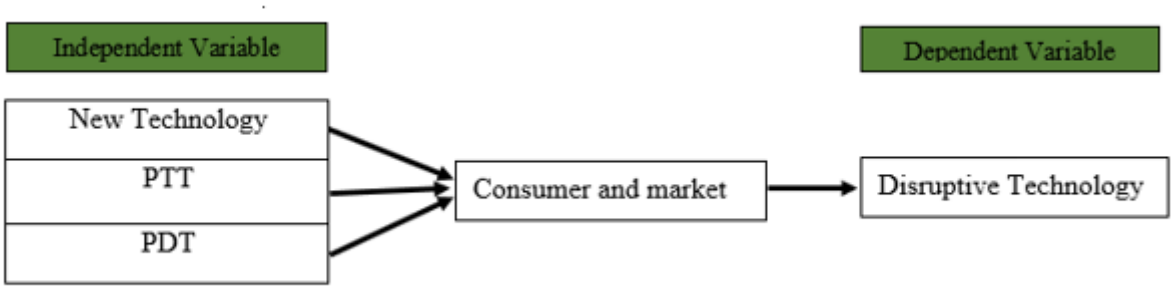
It goes without saying that when using inferential statistics, the make-up of your sample is critical. As a result, if your sample is not representative of your target audience, your results will be of little value.

It's impossible to draw conclusions about a community based on a sample that's 80 percent male when their group of interest has a 50-50 gender split (Jansen, 2022).

One-Way Analysis of Variance (ANOVA) – An unrelated group one-way ANOVA is conducted if there are two or more statistically significant independent variables. This research used a one-way analysis of variance to see whether age, gender, and occupational level were significantly related to different aspects of NVA awareness and surveillance. The researcher will use the statistical significance threshold to evaluate statistical significance at both the 5% and 95% confidence intervals. To accept the null hypothesis, the p-value must be larger than 0.05. Even though one-way ANOVA is a general test statistic, it only tells the researcher that there were differences between at least two groups and not which ones were statistically significant. It follows that a post-hoc test is required if the significance level is less than 0.05 and the data is found to have an aberrant distribution according to the approved alternative hypothesis. Utilizing a post-hoc test allowed for the identification of groups that were statistically different from one another.

i. **Data analysis Software** – Data may be analysed with the help of SPSS version 25.

CONCEPTUAL FRAMEWORK:



RESULTS:

Reliability

When the instrument is tested on several occasions, it must consistently provide the same measurement, otherwise it isn't dependableThe researcher conducted a global pilot test involving 10-20 participants to identify any confusing or ambiguous questions. Questions deemed vague were revised or removed accordingly. Following the pilot test, a group of students assessed the questionnaire, and the average completion time was approximately 20 minutes. Notably, the main study did not incorporate participants from the pilot survey, as mentioned earlier.

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Measurement scale qualities and questions that made it were examined as part of a reliability study in addition to the connection between items on the scale, which was done to offer information on their internal consistency. A critical step in the instrument's validation is to calculate reliability estimates.

A measurement instrument's reliability is described as "its capacity to give consistent findings over repeated applications". A statistical method called Cronbach's alpha may be used to quantify an instrument's internal consistency, which indicates the correlation between the performance of each item in the instrument and the assessment's overall performance. Results show how accurate the questions and subscales are in assessing the overall evaluation.

In this research, internal consistency was adopted to estimate the reliability of the instrument. Internal consistency measured by Cronbach's coefficient alpha, and the higher of Alpha value or the closer reliability coefficient of 1.0 is considered the highest of the measurement items, Therefore, in this study, Cronbach's Alpha values exceeded 0.7 represent acceptable reliability, while any Alpha values over 0.8 considered as entirely good.

Test for hypothesis:

Formulation of Hypothesis:

Consumers have become more empowered thanks to new technologies. As a result of this, individuals are in a position to request items and services at any time. As a result of the rise of social media, customers now have a more powerful voice and new ways to interact with companies and one other. Companies must adapt swiftly to keep up with the rapid advancement of technology and the changing habits of their customers. Brands who are quick to respond to customer needs will succeed, while those that will go out of business.

The 3 Effects of Technology on Today's Consumer.

i. **Consumers Are More Connected**

It's easier than ever for consumers to connect with businesses. It doesn't matter where they are or what they are doing, people can use cellphones to study things, ask sales inquiries, and buy products at any time. Customer service enquiries and interactions with businesses may be exchanged through social media. Moreover, they might use it as a guide to assist them make purchase selections. 54 percent of social media users have used social media to investigate items, according to Global Web lndex.

Customers' increased reliance on mobile devices has created a slew of new ways to keep in touch with them. Companies, on the other hand, must learn how to break through the clutter and deliver on customer expectations.

ii. There are several devices that consumers use.

Moreover, half of all worldwide internet traffic and 77% of all digital minutes in the United States were spent on mobile devices in 2019. As the number of households with tablets and wearables rises, customers are turning to a wider range of gadgets to access the internet and make purchases.

During the whole buying process, customers don't utilise a single piece of technology. Ninety percent of customers, according to a Google study, utilise several devices to complete a single online task. Shoppers who want to buy a product may begin their investigation on a smartphone after watching an advertising on television. It's possible they'll go online to check prices and finalise the transaction after comparing several items. When customers reach out to a company, they should be greeted with the correct message at the right moment, regardless of what device they use. The problem is figuring out how to target each audience group and how digital touchpoints relate.

iii. Increased Customer Requirements

It is because of the impact of technology that consumer expectations are at an all-time high. Customers are always comparing their experience with you to that of your rivals and the experience they obtain from Amazon, Netflix, etc. Customers want on businesses to provide them with increasingly personalised, timely, and relevant communications, goods, and services.

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In the past, companies had specified hours of operation during which customers had to wait in line before speaking with a salesperson or placing an order. Today's consumers want personalised experiences whenever they want them.

Because of this, consumers who don't like having to wait for a response from customer service or purchase a product may go for a different brand. Customers have greater expectations than ever before, and businesses must meet those expectations if they want to maintain a happy client base.

When customers have a bad experience with a business, they know they have the authority to let the firm know about it. Over half of Americans have cancelled a planned purchase due to a negative customer experience, and 74% have switched brands because the buying procedure was too cumbersome, according to American Express research (2022, April 6).

On basis of the above discussion the researcher formulated the following hypothesis, which analysed the relationship between the new technology and consumers.

H01: There is no significant relationship between new technology and consumers that has impact on disruptive technology.

H1: There is significant relationship between new technology and consumers that has impact on disruptive technology.

In the study, conducted it was found that 5335 (39.0%) respondents strongly agreed, and 5161 (37.0%) respondents agreed, and 1178 (9.0%) respondents disagreed, and 1884 (14.0%) respondents strongly disagreed that a new technology has the ability to change the world.

Likert Scale Analysis						
	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Q1	13836	1	5	52577	3.80	1.385
Q2	13836	1	5	47181	3.41	1.551
Q3	13836	1	5	49810	3.60	1.550
Q4	13836	1	5	47873	3.46	1.611
Q5	13836	1	5	54237	3.92	1.323
Q6	13836	1	5	51193	3.70	1.367
Q7	13836	1	5	50916	3.68	1.463
Q8	13836	1	5	48288	3.49	1.573
Q9	13836	1	5	53545	3.87	1.331
Q10	13836	1	5	55206	3.99	1.251
Q11	13836	1	5	50086	3.62	1.391
Q12	13836	1	5	50916	3.68	1.490
Q13	13836	1	5	52023	3.76	1.342
Q14	13836	1	5	52162	3.77	1.434
Q15	13836	1	5	49671	3.59	1.422
Q16	13836	1	5	53269	3.85	1.298
Q17	13836	1	5	51608	3.73	1.347
Q18	13836	1	5	46766	3.38	1.536
Q19	13836	1	5	54514	3.94	1.301
Q20	13836	1	5	48564	3.51	1.541
Q21	13836	1	5	52438	3.79	1.402
Q22	13836	1	5	51332	3.71	1.472
Q23	13836	1	5	52577	3.80	1.341
Q24	13836	1	5	51193	3.70	1.389
Q25	13836	1	5	46489	3.36	1.580
Q26	13836	1	5	51885	3.75	1.424

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Q27	13836	1	5	54929	3.97	1.314
Q28	13836	1	5	50225	3.63	1.461
Q29	13836	1	5	51885	3.75	1.381
Q30	13836	1	5	51608	3.73	1.347
Valid N (listwise)	13836					

In the survey utilized for the study, 30 questions employing a Likert scale were included. Table 22 presents a detailed breakdown of responses, indicating that the Likert scale ranged from a minimum value of 1 to a maximum of 5. The mean for all Likert scale questions is displayed in the table, with an overall mean of 3.69. Question 10 recorded the highest mean at 3.99, while question 25 had the lowest mean at 3.36. The standard deviation (SD) ranged from 1.251 for question 10 to 1.611 for question 4.

The multiple correlation coefficient, denoted as R, is listed in the "R" column of the table. This coefficient assesses the prediction quality of the dependent variable, in this case, disruptive technologies. A value of 1.0 indicates a satisfactory level of prediction. The R2 value, or coefficient of determination, shown in the "R Square" column, signifies the percentage of total variance in the dependent variable attributed to the independent variables' effects. In our case, with a value of 1.0, the independent factors account for one hundred percent of the variance in disruptive technologies. However, it is essential to consider the "Adjusted R Square" (adj. R2) for a more nuanced interpretation of results. In our advanced tutorial on multiple regression, we delve into not only the outcomes but also the underlying factors contributing to these findings.

Table 1: ANOVA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	69291.640	3	23097.213	000.	000.[b]
	Residual	.000	96	.000		
	Total	69291.640	99			
a. Dependent Variable: SUM						
b. Predictors: (Constant), PDT, New Technology, PTT						

The table displays the multiple correlation coefficient, denoted as R, in its designated column. R serves as a measure of the prediction quality for the dependent variable, disruptive technologies, within this context. A value of 1.0 indicates a sufficient level of prediction accuracy. Additionally, the "R Square" column contains the R2 value, also referred to as the F-ratio in the ANOVA table. This value assesses whether the overall regression model accurately represents the dataset. As evidenced in the table, the independent variables demonstrate a high level of statistical significance in predicting the dependent variable ($F(5, 94) = 602388.740$, $p .0005$), indicating that the regression model fits the data well.

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Table 2: Coefficients

Coefficients[a]										
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.145	.099		.000	1.000	.000	.000		
	New_Technology	7.289	.000	.080	34883923.698	.000	2.000	2.000	.974	1.026
	PTT	7.822	.000	.156	15973115.906	.000	3.000	3.000	.054	18.660
	PDT	5.451	.000	.834	85543244.309	.000	25.000	25.000	.054	18.567
a. Dependent Variable: SUM										

The basic equation that may be used to anticipate disruptive technology based on new technology, potentially threatened technology (PTT), potentially disruptive technology (PDT) and other factors are as follows: The likelihood of including essential components, The study of PDT. Predicted disruptive technologies = 0.145 – (7.289 x New Technology) – (7.822 x PTT) + (5.451 x PDT). When all of the other independent variables are maintained constant, unstandardized coefficients may be used to determine how much the dependent variable changes with one of the independent variables. Take into consideration the influence that the new technologies has in this scenario. The unstandardized coefficient for the camera sensor, denoted by B1, is equal to -7.289.

Table 3: Coefficient Correlations

Correlations					
		SUM	New_Technology	PTT	PDT
Pearson Correlation	SUM	1.000	.214	.979	.996
	New_Technology	.214	1.000	.150	.133
	PTT	.979	.150	1.000	.973
	PDT	.996	.133	.973	1.000
Sig. (1-tailed)	SUM	.	.016	.000	.000
	New_Technology	.016	.	.068	.094
	PTT	.000	.068	.	.000
	PDT	.000	.094	.000	.
N	SUM	100	100	100	100
	New_Technology	100	100	100	100
	PTT	100	100	100	100
	PDT	100	100	100	100

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Table 4: Collinearity Diagnostics

Collinearity Diagnostics[a]							
				Variance Proportions			
Model	Dimension	Eigenvalue	Condition Index	(Constant)	New_Technology	PTT	PDT
1	1	3.859	1.000	.00	.00	.00	.00
	2	.102	6.142	.01	.33	.02	.00
	3	.037	10.196	.23	.66	.02	.00
	4	.002	45.969	.76	.01	.96	1.00
a. Dependent Variable: SUM							

In this study **H1:** There is significant relationship between new technology and consumers that has impact on disruptive technology has been accepted through multiple regression and **H01:** There is no significant relationship between new technology and consumers that has impact on disruptive technology was rejected as per the analysis.

DISCUSSION:

The impact of disruptive technologies on the Indian economy is a topic of significant discussion and debate due to its potential to reshape various sectors and socioeconomic aspects. Here's a discussion on key points related to this topic:

Disruptive technologies such as artificial intelligence (AI), blockchain, and the Internet of Things (IoT) have the potential to revolutionize traditional industries in India. For instance, AI can enhance productivity and efficiency in manufacturing and service sectors, while blockchain technology can streamline supply chains and financial transactions. The widespread adoption of these technologies could lead to significant economic transformation, driving growth and innovation. While disruptive technologies promise efficiency gains, they also raise concerns about job displacement. Automation and AI-driven processes could replace certain manual or repetitive tasks, potentially leading to unemployment in some sectors. However, it's important to note that disruptive technologies also create new job opportunities, particularly in emerging fields like data science, cybersecurity, and AI development. The challenge lies in ensuring that the workforce is equipped with the necessary skills to adapt to these changes. One of the critical challenges associated with the adoption of disruptive technologies in India is the digital divide. While urban areas and certain industries may have access to advanced technologies and digital infrastructure, rural areas and marginalized communities often lack such access. Addressing this digital divide is essential to ensure that the benefits of technological innovation are inclusive and reach all segments of society. The rapid pace of technological advancement often outpaces regulatory frameworks, creating challenges related to data privacy, cybersecurity, and ethical considerations. In India, policymakers need to develop robust regulatory frameworks that foster innovation while safeguarding consumer rights and privacy. Clear guidelines and standards are necessary to address potential risks associated with disruptive technologies and ensure responsible deployment.

Strategic planning and policy interventions are crucial to harness the full potential of disruptive technologies in India. This includes investment in research and development, promoting digital literacy and skill development, fostering innovation ecosystems, and supporting startups and small businesses. Additionally, policies should focus on bridging the urban-rural divide, promoting inclusive growth, and addressing social and economic disparities. Embracing disruptive technologies can enhance India's international competitiveness by enabling businesses to innovate, improve productivity, and access global markets. However, to remain competitive on a global scale, India must continue to invest in technology infrastructure, education, and research to keep pace with other leading economies.

The impact of disruptive technologies on the Indian economy is multifaceted, offering both opportunities and challenges. Strategic planning, policy interventions, and concerted efforts from stakeholders are essential to maximize the benefits of these technologies while addressing potential risks and ensuring inclusive growth.

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CONCLUSION:

The authors of this study examine how the rise of disruptive technologies might affect economic growth in certain areas. Some locations remain dominant and others behind despite technical advancement; other places suffer or flourish when structural change takes place. A summary would not do justice to the tremendous variability witnessed across time. Following decades of study in economic geography, the authors suggest that regional innovation strategies should be adapted to the unique problems that each area faces. Consistent with the extensive body of work documenting the effects of technological development, the authors stress that various technologies have varying degrees of influence. By bringing together these two perspectives, the researcher can better understand the risks and rewards of the current disruption in technology. There is usually a negative short-term effect on the macroeconomic indices of a rising economy due to technological disruption, particularly disruptions like digital transformation. It is crucial that businesses, governments, and individuals all have a strong grasp on the effects. All three parties should take the necessary measures in the near future to counteract the disruptive effects of technology and transform them into an asset. By doing so, a developing nation like India might transform technological disruption into a source of rapid economic development that is sustainable in and of itself. This article looks at disruptive technology and how it relates to other forms of new technology in a developing economy. Our investigation produced novel findings and substantial additions to the existing body of literature. The author repurposed frameworks to analyse the automotive components industry in India, a paradigmatic developing country. Our first major contribution, then, is the creation of these models for use in India's automotive industry. Nonetheless, our factor analysis only yielded two sub-dimensions of new technology, while the four that were discovered in the original study. According to the available literature, only the learning dimension existed, whereas the sensing dimension was entirely missing. In addition, the sub-dimensions responsible for integration and coordination combined into a single sub-dimension. Our first original contribution is the discovery of a distinct subset of dimensions, which differs from western hemisphere empirical research. Thus, the researchers argue that factors such as nation and industrial sector affect the feasibility of evaluating new technologies (Kilkki et al., 2018) .

Second, there was only a positive correlation between disruptive technology and one of the sub-dimensions, new technology (learning). Neither disruptive technology nor the hybrid component of new technology (integrating coordinating) were positively related to one another. This finding calls for more investigation. According to the study's authors, despite the fact that component manufacturers may seem sizable (by the norms of the Indian economy), they are, in reality, classified as SMEs when viewed from the viewpoint of the international automotive industry. Since these Indian businesses only deal in one sector, integration as a sub-dimension does not exist there. Further, because they are standalone enterprises, cooperation is not fundamental to their success. The sensory dimension also does not correlate well with innovative technologies. The study's authors state that their sampled companies have ties to major Indian conglomerates or international conglomerates. Since these manufacturers of automobile components often get extensive training and oversight from more senior affiliates, the sensing level may be low at best. Our second contribution is a reminder that the sector's organisational makeup matters greatly for the success or failure of initiatives using innovative and potentially disruptive technologies. Third, it's worth noting that the investment in R&D led to a high positive correlation between spending and disruptive innovation. But there isn't a whole lot of disruption caused by new technologies (learning) or the environment. Our final contribution is a positive and substantial link between R&D spending and disruptive technologies. Future research should investigate the generalizability of these findings across industrial sectors (Ibáñez et al., 2017).

Finally, the study's author found some intriguing findings regarding the moderating effect of research and development (R&D) expenditure and environmental turbulence on new technology (learning), in which an increase in R&D and environmental turbulence strengthens the positive correlation between learning and disruptive innovation. Although there is an established link between new technology (learning) and disruptive technology, the influence of the latter is amplified by the existence of environmental turbulence. This suggests that businesses with a stronger capacity for adapting to change will also be in a better position to use their learning capacities to take advantage of disruptive technologies. However, greater investment in research and development strengthens the beneficial link between disruptive and emerging technologies (learning). While this may seem like a natural conclusion, it really suggests that organisations that have the potential to learn but do not engage in R&D will be

badly affected by the connection between new technology (learning) and disruptive technologies. This is crucial since many component makers collaborate with big OEMs and/or foreign technology partners. Furthermore, the allocation of resources to R&D and the adaptation to environmental turbulence reduce this link, indicating that the capacity to absorb these inputs as learning is not sufficient for a disruptive technological result. Therefore, if innovation is hindered by less investment in R&D and there is a higher dependence on OEMs, the overall outcome relating to disruptive technologies declines. In this way, the study's fourth unexpected addition shows the significance of moderator factors in elucidating the connections between novel technologies and those with the potential to cause significant disruption. Future research needs to go further into this function (Geissinger et al., 2017).

SUGGESTION:

An Investigation of the Effects that Disruptive Technologies Have Had on the Indian Economy: This conversation goes into the ways in which technology such as artificial intelligence, blockchain, and internet of things are evolving industries and socioeconomic elements. The change of the economy, the creation of new jobs as opposed to the displacement of existing ones, the addressing of the digital divide, the problems posed by regulations, strategic planning, and the promotion of international competitiveness are all important considerations.

LIMITATION:

Every study has limitations. The disruption caused by technological advances results in poor real economic growth and high inflation in emerging countries. There is a risk that technological advancement may result in widespread unemployment since it will render certain vocations unnecessary. When a new technology is still in its early stages of development, there is sometimes insufficient time for testing and improvement. There is a possibility that businesses who supply this technology may have a tough time making sales of innovative new products right now.

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