

Volume 1, Issue 1

Research Article

Date of Submission: 02 Mar, 2026

Date of Acceptance: 31 Mar, 2026

Date of Publication: 20 Apr, 2026

Technology and the Growth of Society

V. Basil Hans*

Research Professor, Srinivas University Mangalore, India

***Corresponding Author:** V. Basil Hans, Research Professor, Srinivas University Mangalore, India.

Citation: Hans, V. B. (2026). Technology and the Growth of Society. *J Digi Health Rec Med AI Info Sys*, 1(1), 01-11.

Abstract

The link between technology and society has always been two-way. Society and its needs have pushed technology forward, and technology has also caused unexpected changes in society.

Technology has played a big role in how society has grown by changing how people live, work, and interact with one other. Advances in technology have sped up economic growth, improved healthcare, made education better, and brought people closer together. This includes everything from the printing press to the growth of digital technologies like AI and the internet. These new technologies have made it easier for people to talk to each other, obtain information, and develop smart infrastructure. All of these things have made life better.

But the quick pace of technological progress also causes a lot of challenges. Digital inequality, job loss due to automation, worries about data privacy, and repercussions on the environment are all examples of how technology and society are connected in a tangled way. Technology can help people meet new people and find new jobs, but if you don't utilise it correctly, it can make social and economic gaps worse.

So, to make society grow in the long run, we need a plan that balances new ideas with moral, social, and environmental concerns. Policymakers, businesses, and individuals all need to work together to make sure that new technologies are fair, open to everyone, and in keeping with what people value. This is how technology can continue to be a powerful tool for improving society.

Keywords: Social Change, Economic Development, Digital Transformation, and Innovation Sustainability, the Digital Gap, and Automation

Introduction

There are several facets to making society better, including politics, government, the economy, social issues, and the environment. But it's evident what science, technology, and innovation (STI) do behind each aspect. All areas of society's actions show, respond to, and follow the technocratic framework in some way. STI interferes with different kinds of governments, which modifies the technical procedures they take to rule. Society interacts with an industrial framework through technical change, either through economic expansion driven by the enterprise-oriented market or through reforms designed to improve infrastructure. People can say that formal education is the main method that technology and society interact. Changes in society are making many kinds of education, from elementary to higher education, change. This change could happen directly or indirectly. Digital technology has a major effect on how people exchange knowledge, especially when it comes to quickly solving difficulties that come up with knowledge. Technological innovation may oversimplify educational functions, and although society works to reformulate educational needs for increased teaching quality, technological advancements continuously propose alternate options for knowledge acquisition [1].

Governments don't want to lag behind in technology; the only difference is how they choose to get it. The connection between technology and society is also important for this government's power and control. Technical help is a key part of making policy since it makes the government run better and gives individuals better services. When a nation-state pledges to improve governance for the public benefit, substantial scientific inquiry is rarely neglected, thus stimulating both direct and indirect investment in research and development. When society officially recognises the shortcomings of the existing governmental framework, a significantly altered dynamic arises; substantial multinational corporations,

especially in emerging fields such as information technology, inherently assume a prominent observational role in the technological procurement process of the respective nation-state.

The Conceptual Framework of Technological Progress

Technological development is any improvement in technology, such as making a new bacteria, learning more about genetics, making computers better, or making political institutions better. The usefulness of a new technology depends on whether it can assist or injure people. People all over the world may share information more easily because of technology. They can also be a problem.

Today, the balance of technical innovation is shifting toward more mass organising and transferring industries upstream, with a focus on scalability. Ultimately, this process typically requires increasingly valuable resources to sustain or expand. To distinguish correlations from causations, economic progress technology must concentrate on universally accessible metrics. Since around 1940, there has been clear and consistent movement toward bringing industry back to residential areas, even though it is getting tougher to find ways to communicate [2].

Definitions and Metrics

People have talked about the word "technology" in different ways and it has caused a lot of debate [3]. People believe that creating different kinds of technology and knowing how to use them can help clear up misunderstanding and make the problem easier to understand. They might be a tool to see how technology changes society throughout time. Technology is a collection of information, skills, and the physical and non-physical tools and methods that people use to make and use things. This sets it apart from other ways people think about the natural world. People who study organization also have very diverse beliefs about what science and technology are.

Many researchers have devoted themselves to developing a relevant definition of science and technology. One clear definition of technology is a collection of both formal and informal ideas and ways of doing things. There are scientific facts in groupings of publications and books regarding technology.

Different areas of study have grouped technology into different groupings and types. In the field of regional science, it is common for researchers to make classifications based on different types of technology. There is a lot of information on these types of technology. One essential technique to sort technologies is into four groups temporary, construction, production, and operating technology. The tools, machines, and methods utilised in any stage that comes after another, like production or recycling, are called operation technology. Each of the above technology categories has more subcategories. By looking at fundamental products like furnace steel, it's clear that the performance of secondary products can quickly and immediately show how manufacturing techniques have improved in ways that aren't always obvious. This helps to narrow the research down to certain groups of people and technology that are clear and well-defined. Another key method to organise technologies is by how well-known they are or what they can perform.

Trends in the Past

In contemporary socio-economic discourse, technological growth is frequently acknowledged as a driver of enhancements in well-being. But there is a lot of dispute about what technical progress really is and what it signifies. A lot of the worry about the phenomenon stems from fear of the terrible social impacts that can come with its rise, like displacement, loss of authority, and harm to the social fabric. A lot of the writing on the subject emphasises that we should look closely at how it affects people and the economy. Consequently, it is imperative to possess robust and accurate elucidations of the trajectories of technology-driven transformation, alongside assessments of current or anticipated modifications.

Advancements based on knowledge are a unique event in human history. However, the main traits of this event and its impacts on society are similar to those that happened after modern knowledge-based technologies were first developed. The analysis is predicated on the linear progression of the research, industry, and service sectors. Within this paradigm, the substantial influence of basic material science and industrial technology is seen in the emergence of a new sector focused on knowledge-intensive services and goods. Early multi-dimensional developments are very important because they let us compare current multi-dimensional phenomena to their early equivalents.

The establishment of historical trajectories for science-driven technological enhancement constitutes the basis for delineating sectoral progress. Knowledge-based advances are one-of-a-kind, wide-ranging events in human history. The main goal is to spread new information and communications technologies throughout the economy. This is what has caused a lot of people to be interested in the social and economic effects of technological progress lately. The main aspects of information and communications technology, the idea of convergence, and how the Internet boom has changed society are all talked about. Knowledge-based technology is still very important, especially since the service economy that goes along with it is increasing. Nonetheless, the by-products of a considerable pre-existing linear progression have already incited important modern endeavours across multiple fields, including fundamental science, pure research, and political, legal, ethical, privacy, and security concerns [4].

Economic Aspects of Technological Progress

Economic variables are important for both the growth of technology and the widespread usage of new technologies

[5]. It's easier to buy machines, computer systems, and share tech know-how when the economy is growing and there are more locations to buy things. Proprietary technology that depends on restrictive patents is what drives most of the technical progress in India and the Philippines. This is not true in many countries with advanced economies. In these advanced economies, a large part of technological progress comes from informal technology transfer that is made possible by reverse engineering. When developing economies with weak governments want more modern technologies, they opt for proprietary ones.

Growth and Productivity

Multiple studies have demonstrated a sustained correlation between technological innovation and productivity enhancement. These studies have examined aspects such as novel products and industrial robots [6]. Since the middle of the 2000s, productivity in developed countries has been going down. People are now more concerned in whether the current ways of doing things and rules for innovation will succeed. Important new things from the United States can be used all over the world. The Internet has changed a number of things, but not all of them have been the same in every economy. The way Europe reacted to the 1993 Lisbon Summit was comparable to how the US reacted to Sputnik in the 1960s. At that time, policies were meant to bring technology back to life by improving education, giving more money to science and technology, and training more competent workers and engineers. In reaction to the economic crisis, the European Commission and the European Central Bank both supported investments in new technologies and people with skills that would work well with them. Innovation systems in industrialised countries may take very different trajectories, depending on things like the kind of online and mobile services they offer or how productive their financial sectors are.

After writing a famous paper about automation, people have started paying greater attention to how important labour and capital are. Data on the worker share of income and other factors show that technical progress is just as important now as it was after World War II. The United Nations University Institute for New Technologies is where the World Input-Output Database is kept. It helps you learn more about things like outsourcing, globalisation, and offshoring in the real world. The raw data is used to combine macro-level econometrics with inter-sectoral, vintage-based simulation models that look at how goods and services can be transferred and how knowledge can be transferred. Now that the World KLEMS database has the four primary inputs (capital, labour (employment), energy, and materials) and the gross output value added, it's easier to investigate sectors in Europe, the US, Japan, Canada, and Australia. Since the early 1970s, the cost of capital, labour, and energy has gone up in these countries, while the cost of materials has gone down.

Work, Money and Inequality

Many people believe that the major reason production and growth have been rising for a long time is because of new technology [7]. Most economists believe that new technologies create new ways to make goods and new business opportunities. Some people also think that technical progress helps either capital or labour. Historical data from industrialised economies indicates that throughout the initial century after the Industrial Revolution, technological progress predominantly facilitated labour. It seems that after the 1970s, there were less advancements in technology that made labour easier. Changes in productivity and production growth, capital-labor substitution elasticities, and relative capital intensities substantially support these concepts [8]. A unified framework has been developed to evaluate shifts in relative wages resulting from technological advancements, enabling a more precise measurement of technology-driven growth in the capital-augmented economy pertinent to modern society. This idea clearly includes inputs that increase labour and capital, different sectors that generate capacity, and differences in the supply of factors, the elasticity of substitution, and biases that are special to certain goods.

Policies and Systems for New Ideas

Technological growth is mostly driven by innovative activities that emerge from integrated national, regional, and industry innovation systems. Policy may change how innovation systems are set up and how they run, what sorts of new activities are done, and how easy it is for individuals to access and exchange new information inside and between these systems. Also, because eco-innovation systems are complicated and the people who take part in them and the meta-governance mechanisms that could encourage eco-innovation are all different, it is important to put an eco-innovation governance framework in place in education, research, production, and consumption [9].

Changes in Society and Culture

Technological advancements in material, biological, and social domains enhance the transmission of experiences across individuals and generations, revolutionise institutional methods of delivering, receiving, endorsing, processing, and storing information, foster the establishment of new institutions, and promote the development of an increasingly interconnected global society. The crude, dubious, and contentious aspects of 20th-century progress—such as the imposition of a Western-style growth model on numerous developing nations; the governance and management of social relationships, institutions, and societies through technology; and the erosion of social circles and categories—elicit feelings of discontent. Two of the most common forms are transitional socio-technical systems and the co-evolution of species, societies, and technologies. Three interlinked views on the effects of technological and scientific advancement continuously arise in the expectations, grievances, and anxious hopes linked to its rapid development: communal welfare, collective freedom, and the satisfaction of essential needs.

Teaching, Learning, Sharing Skills and knowledge

Individuals who set policies and teach all across the world are particularly interested in how well schools work and how they help individuals learn new skills. To help their kids compete better, many countries have adjusted their school curriculums to focus on the skills that help them think critically, apply what they know in new ways, and solve complicated problems. When technology is a part of instruction, pupils are more interested in what they're learning. Education is vital for more than just learning skills. It also helps society move forward with technology by teaching people new ideas. In the era of the digital economy, officials are increasingly focused on the connections between technology and education [10].

An empirical examination of historical and contemporary technology diffusion in both developed and developing nations reveals a clear correlation between educational attainment and knowledge acquisition. In the 19th century, worldwide enrolment rose in all areas. The rate of expansion in the accumulation of human capital was twice as fast in Europe and North America as it was in Latin America and Asia [11]. The main intellectual aspects of growing economic knowledge are passing on knowledge, using information technology, having opportunities and being available, and having passion and love. Every country has a part to play in making knowledge. Based on its particular language and situation, each country gives its people coding terminology to help them learn more about technology [12].

Everyday Life, Privacy and Social Norms

People who believe in the right to privacy and don't enjoy being observed are anxious that tracking, storing, analysing, and sharing information about them could infringe their private rights. You usually desire more control over information that is more private. Electronic grocery lists, loyalty cards, automated toll systems, speed cameras, digital receipts, e-book readers, and electronic surveillance of phone systems are all new ways to observe people. People are comfortable with some surveillance because they think it's safe or useful, but the laws that regulate surveillance don't do a good job of figuring out how much people appreciate surveillance technologies.

Surveillance has many aims than only catching criminals. E-profiles that show how people shop and search online can help with targeted advertising, help potential customers locate what they want, provide stores information about their competition, and help manufacturers decide if they need to update their product lines. One of the most popular social conventions is to be social. Social networks modify what privacy really means, even when people know what they want to say. People who are part of a social network not only reveal information about themselves, but they also expect others to do the same. People go higher in society when they share information. One way that privacy is compromised in digital places is by giving up control over information. [13]

Governance, Trust and Ethical Concerns

Blockchain and AI are examples of technologies from the Fourth Industrial Revolution that have come a long way and can now be deployed all across the world at speeds never previously seen. But there are still a lot of flaws that need to be fixed. Governments, businesses, and civil society all have a lot of trouble with governance because they are worried about things like algorithmic bias, privacy breaches, digital fraud, safety issues, unemployment, surveillance, digital literacy, and market polarisation. These issues demonstrate the necessity for intelligent legal, ethical, policy, regulatory, and governance solutions, as well as the imperative to utilise these technologies responsibly.

Governance solutions for disruptive digital technologies must strike a balance between fostering innovation and mitigating risks [14]. There have been more and more conversations around the world about digital governance since 2017. Some of the things that have come up in these discussions are "ethics by design" and the social and legal ramifications of blockchain apps. People who work in the industry prefer to embrace practices that place protecting new ideas first. The Partnership on AI and the Blockchain Association, for instance, are in favour of a light-touch approach to regulation. The public sector has also made a number of governance frameworks, strategic roadmaps, and policy ideas to help digital innovation while also dealing with societal risks.

Global and Institutional Perspectives

The study of technology-driven progress is inherently global, demonstrating the interplay of economic, political, and cultural factors across temporal and spatial dimensions. Examining the impact of institutions across several nations on technology utilisation and its consequences for growth, employment, inequality, the environment, and daily living indicates that governments must formulate policies that promote equitable and efficient usage. Differences in income and power around the world can alter the technology choices that different countries have, which can affect security and resilience. At the local level, technology governance regimes can either safeguard or undermine privacy, liberty, and social justice.

It is prudent to recognise that developing technologies may not guarantee positive outcomes. Technologies create both opportunities and risks that directly affect the continual quest for human dignity, immediate health, and long-term sustainability in an increasingly interconnected world. The larger question of technology-driven progress includes things like surveillance, business models that rely on addictive surveillance, levels of inequality that have never been seen before, the possibility of a police state thanks to new technologies, and the rise of artificial intelligence that threatens empirical knowledge, human decision-making, autonomy, and eventually jobs. There aren't any set social goals or

effects that come with a new technology. Instead, the effects of the technology typically depend on how society designs, develops, adopts, and uses it, as well as the larger institutional context in which these things happen.

Groups that Affect How People Use Technology

The technological processes described above are fundamentally linked to institutions. Institutions are both the cause and consequence of technical advancement, but research that compares different countries usually doesn't look at how important institutions are in the adoption of new technology. Understanding institutions remains ambiguous, with socio-economic circumstances neglected in favour of the institutional aspect. However, when used, technologies radically change institutions; on the other hand, the institutional framework makes installations easier [15].

Big changes in institutions still happen over the course of years and decades. This is why the deterministic institution theory is still useful. Many individuals globally continue to hold the belief that institutions exert a deterministic influence on the socio-economic evolution of society. The inappropriate reliance between institutions and technology is enough for governments to create situations in which institutions are expected to change before technologies [16].

Transferring Technology and Global Inequalities

It's disturbing that access to technology is becoming more unequal around the world, and that makes it hard for policymakers to make decisions. Access to communication technologies and infrastructure including electricity, water, sanitation, the Internet, and personal transportation varies greatly from country to country. The movement of trade and investment in telecommunications and information technology gear demonstrates that technology-related trade is heavily concentrated in a small number of nations [17]. These trends suggest that developing, transitional, and strategically less advanced countries may still be at risk of being left out of the benefits and processes of technological progress. People of all ages who don't have access to technology may not be able to learn new skills. These sorts of unfairness might make it hard for people to grow and learn for a long time. Countries that traded and exchanged technology with the Soviet Union were able to get the probable benefits of technological growth and spread. But when the USSR split apart, these countries were left with nothing [18]. Some rich countries still want to create and disseminate new technology, but they haven't done much to tackle the peculiar problems that emerge from colonial history and even apartheid. Functional technology spread in underdeveloped and transitional countries when communication equipment was made to work in specific settings. More complex tools, on the other hand, were not available to systems that could work with them. Working together on telecoms software led to a successful low-cost trade in industrial glue (Ghafari, 2021).

Safety, Rules and Resilience

Historians, anthropologists, and philosophers have observed the emergence of resilient cultures that have endured significant bloodshed and turmoil for centuries. Societies that don't change much for a long period may look stable, yet they often respond to varied amounts of stress with consequences that seem to be constantly changing. Society as a whole may not change, even if one system, region, or industry keeps increasing. Slowly, systems that have been broken start to work again, and cultures don't seem to be able to come up with new technology, but they do come up with new gadgets all the time that are quite useful. This kind of persistence may be seen in Greece, Egypt, Mesopotamia, China, Japan, and more recently, Italy, Spain, Portugal, the Ottoman Empire, Argentina, India, and East Africa. In the last fifty years, the fatty-acid profile of popular oils like coconut oil has become less varied. People and groups that use different types of technology that don't work well together can have health and safety problems that can lead to diabetes. The friction between industrial and biological production is steadily moving common oils in one direction.

Systems theory says that resilience, or the ability of a system to handle disruption and re-form after it has been disturbed [19], should be a useful goal for policies that want to speed up and drive technological progress. The way resilience is handled (or not handled) can affect other systems, much like the tendency to not put up adequate regulatory barriers might. These contagion effects make it possible for purposeful social inventions to happen that are aimed to make weak subsystems even more "anti-resilient." For instance, there are numerous methods to harm a densely populated urban community space while maintaining its physical integrity, which complements the more prevalent concept of resilience augmentation (Metcalfe et al., 2009). O'Flynn et al. assert that current techniques for remote, isolated systems predominantly emphasise traditional concepts of resilience. The ease and difficulty of locating and monitoring resiliencers and anti-resiliencers also warrant consideration of more straightforward indicators or proxies. If standard resilience metrics don't work well for keeping an eye on networks of negative effects, facilitative technologies that stay visible may still speed up instruction through expression on several platforms.

Remote Sensing and Geo Science

Geoscience and Remote Sensing are fields that are quite similar and help us learn about the Earth—its structure, processes, and changes—often utilising advanced technology like satellites and sensors.

What is Geoscience?

Geoscience is the study of the Earth, which includes its Layers, rocks, and minerals make up the structure. Processes like volcanoes, earthquakes, and erosion History (fossils, plate tectonics)

Air and water

Big Branches

Geology is the study of rocks and the structure of the Earth.

Weather and climate are parts of meteorology.

Oceanography is the study of oceans and marine systems.

Hydrology - systems for water

What Does "Remote Sensing" Mean?

Remote sensing is the science of getting information about the Earth without being there, usually by using

Satellites

Drones

Sensors on aeroplanes

It quantifies energy that is reflected or given out, such as radio waves, heat, or light.

How They Work Together in geoscience, remote sensing is a technology that lets you look at Earth systems on a big scale.

For Example

Mapping different types of rocks and landforms

Keeping an eye on deforestation and city growth

Keeping an eye on climate change and weather patterns

Finding natural calamities like floods, earthquakes, and cyclones

Important Technologies in Remote Sensing

Optical sensors take pictures in the visible and infrared ranges.

Radar (SAR) works even when it's cloudy or dark.

LiDAR employs lasers to measure the height and shape of the land.

Uses

Agriculture (keeping an eye on the health of crops)

Protecting the environment

Managing disasters

Finding minerals and oil

Planning cities

Satellite Shows That Are Popular

ISRO (India)

NASA (the United States)

ESA (Europe)

Why It Matters

Geoscience and remote sensing work together to help us

Learn about the past of Earth and make predictions about what will happen in the future.

Take care of natural resources wisely

Take action to protect the environment [20-23].

Effects on the Environment

Technological progress puts stress on the environment, and this stress changes depending on where and when it happens [24]. In developed, Western economies, eco-innovation policies have made industrial production less detrimental to the environment. Cleaner production methods are favourable for the environment in these economies. In certain cases, technological progress has a negative impact on the environment, which is good for everyone because it makes the ecological footprint smaller over time. On the other hand, countries like China that adopted Western technologies in the 1990s and early 2000s had higher ecological footprints because more people moved to cities and factories, which made things less balanced. People were particularly interested in developments in technology at that time, and green technologies became a priority because too much development leads to too much pollution [25].

Using Resources and Making Sure they Last

People are still using up natural resources, and pollutants are getting into the air and water. Landfills are also filling up with solid trash. People use methods that waste resources to get goods that affect the environment, such as acid rain, desertification, hazardous waste, and water pollution. Cleaning up pollution costs more than stopping it from happening in the first place in more than 90% of cases. But a lot of technologies that could help fix the problem aren't being made because they don't earn enough money [26]. By employing innovative tools, materials, processes, and ways of doing things, we may make better use of resources and energy. These modifications make the air cleaner and safer.

Overall, technology can have more good than bad effects on pollution. However, new approaches typically make the environment better [27]. In many cases, simple solutions to cut down on pollution work and pay for themselves.

Biodegradable materials that can be chemically changed into food help reduce solid waste. Very easy water-based solutions get rid of plastic waste from polyester fibres, cut down on oil use by a lot, and help battle climate change. There are traces of attempts like making structures that are small, energy-efficient, and consume few resources, as well as creating buildings that blend in with nature. Systems thinking looks at the economy, the environment, and society to make sure that progress lasts. The three working together in a way that benefits each other, together with the availability of resources, gives society a chance for the future [28].

Adaptation and Mitigation to Climate Change

Climate change affects the environment, ecosystems, and systems that people use. These consequences make issues and pressures that are already there worse in many locations and make new ones in others. We need both mitigation and adaptation methods to deal with climate change while keeping or improving the health of ecosystems and people. People are affecting the way temperatures, rainfall, and other climate factors behave. This is producing a lot of problems that will only become worse in the future. There is a lot of scientific proof that we need to do both proactive things to stop climate change and things to get used to it. Climate adaptation considers alterations in the socio-economic system in reaction to current and expected environmental stimuli and their impacts to mitigate potential harm [29].

Ways to Find Out How Much of a Difference

There are many different approaches to find out how technical progress affects things. This is because there are so many various kinds of new technologies, varied ways they are employed, and indirect consequences that happen when they are introduced. For instance, technology that work well in one country might not work as well in another. There are three basic groups of consequences: economic, social, and environmental. There are several ways that these consequences can happen, both directly and indirectly. The first-tier effects are the ones that happen right away, such changes in the economy and society. The second-tier effects are the ones that are bigger and less direct. The fact that first-tier effects are varied in different regions means that they only show half of how a technology could change things.

Technology has a direct impact on society in areas like education, knowledge, fairness, health, and empowerment. It also has effects on the economy that aren't straightforward. Societal implications of ICTs on education and government are also influenced by the economy's capacity to produce and sell information commodities and services. These linkages significantly complicate the direct analysis of the social impacts of ICT development [30].

Quantitative Indicators

Quantitative indicators have been set up to see how technology influences society. Their use implies that precise measurements can surpass subjective evaluations of the influence of technologies on several aspects of human life. There are at least three different ways to look at this [1] well-thought-out efforts to find the parts of society that are affected by a dominant technological trajectory [2] rough efforts to make a single index and [3] approaches that focus on the web of interactions between networks of indicators. There are a number of social qualities that can be used to explain how people's actions change society. A lot of people think of the Gross Domestic Product (GDP) as a way to quantify how well an economy is performing. Three indicators are more effective for figuring out how technology affects culture the amount of schooling, the structure of the economy (the economic sectors), and cultural consumption. People often look at income per capita to see how well off people are, but it's too broad to illustrate how technology affects people. For this purpose, income distribution is superior because it looks at the share of the poor, middle class, and rich [31].

Evaluations that are not Quantitative

Technologies develop swiftly, and communities often react in ways that are unanticipated and cause problems. New technologies that individuals use every day impact how people do things and how society and the government work as a whole. For example, better information and communication technology have transformed how people and governments share knowledge, created new means to share knowledge that could be used for undesirable things, and caused social systems to be shocked at a high rate. By keeping these things in mind, we may better understand how technology is changing and improving in bigger systems. Looking at social factors helps people see problems coming, get around barriers to growth, and avoid missing out on chances.

Information and communication systems and other technology touch every element of our lives, from how we talk to each other to how the government shares information, how we handle money, how we make personal texts, and a massive library of music and movies, to name just a few. As a result, major socioeconomic problems arise. Smartphones, information and communication technologies (ICTs), and intelligent systems are now as widespread as the printing press, electricity, and the internal combustion engine [32]. New technologies often emerge in the context of existing institutions, technology, and social norms. They have an effect on both the technological infrastructure and the ways of life that people live by: how, for whom, and under what conditions material life takes place. So, it's helpful to make forecasts about easier transitions and popular support.

Mixed Methods Approaches

Technology affects and transforms practically every area of society, thus social and economic systems need to change to stay up [33]. New technologies make challenges harder to understand and explain, and the ways we analyse and

integrate them don't always work. Some paths of social and technical development, for example, show nonlinearities that traditional methods have a hard time capturing. Based on these ideas, a method was developed to enable individuals use technology to make the social changes they want. Technology breakthroughs are examined with policy requirements, design governance, and societal expectations through conceptual frameworks and various methodologies to inform strategic development. The method has been applied in numerous fields, including intelligent transportation, autonomous vehicles, data protection, and cybersecurity [34].

Issues and Conflicts

For a long time, people have disagreed on how technology has transformed the world. People are both very hopeful and very worried about what may happen in the future because of all the progress we've made [2]. The major point of the talk is the perceived gap between jobs and automation. People are worried about this because of financial speculation about the Fourth Industrial Revolution. Some people think that new technology could change the way goods are made and the economy, which could cause unemployment rates to reach all-time highs. Others, however, see a big chance for society to go forward and make life better for people [1].

There is a lot of discourse and speculation about how technology influences society, yet we still don't know much about what it does. There are still a lot of disagreements over how technology impacts people's freedom and independence. A basic question is whether progress makes life better or worse. Along with human beliefs that drive public opinion, a complete study of how technology affects society requires on objective measures and analytical frameworks.

Fairness, Jobs and Automation in Society

Technological change is becoming a big part of everyday life, affecting everything from farming to banking to transportation to education. People who are in favour of this kind of change say it could make the economy more productive and improve people's lives in general, especially in developing countries. But more and more people are anxious about how it might effect jobs, fairness, and social justice [35].

The history of economic growth and the sections of the economy that are currently active suggest that automation could create more jobs than it takes away. Current talks about its consequences, especially those brought on by the advent of generative AI, sometimes leave out important details about how prior machines and automation were used. Communities trying to mediate or recontextualise modern discourses, especially those about social justice and how to deal with or talk about connected problems, could learn a lot by focusing on these themes.

Freedom, Autonomy and Watching

Recent improvements in science and technology change how power works in society and how surveillance systems are set up. Governments keep an eye on their people. Companies collect and look at a lot of information about people. Biometrics, "smart" gadgets, and human microchips are all techniques to keep track on people in very extreme ways. People are more frightened about their freedom and independence, even though these changes are intended to make security and customer service better.

Technological networks enhanced and proliferated surveillance methodologies [36]. The widespread use of cell phones, security cameras, smart monitors, and drones makes following people easy. Social networks, user profiles, and digital currencies are wonderful places to find out what individuals think and how they will act. Peer feedback and suggestion algorithms make spying even more effective. These tools help people get in touch with each other, but they also make people less aware of surveillance because they look at personal data in a way that isn't obvious.

Tools for keeping society in order are getting better. Authorities watch how people act and what they like from birth to death while keeping the distinction between public and private spaces. People interact with the government differently when there is more surveillance during a crisis [37]. It's really crucial to keep an eye on the people in general. Dictators put a lot of emphasis on constant but hidden surveillance at semi-public meetings and other events that are vital for keeping order and making sure inhabitants are safe. Speeding up mass monitoring makes it tougher to deal with the fact that people are doing things that aren't allowed all the time. When certain conditions are met, daily things that were already happening become tools to protect rights. If these things don't happen, people may start acting in extreme ways to defend their private [38].

Licy Effects and Future Steps

Technology is absolutely altering modern cultures in a lot of different and confusing ways. People still disagree about how technology could help the economy and society thrive. The study of how technology affects public policy and how to get the most out of its benefits while reducing its negative effects is a major area of research and practical evaluation around the world [29]. People are becoming more willing to speak up about important issues, especially when it comes to the idea of lifelong learning to keep up with how quickly technology is changing. People often think that education will have a big impact on the future of society and technology. Researchers and professionals worldwide are examining advanced science and technology and their impact on socio-economic welfare; cooperative and open discussions on this subject can deepen comprehension of the issue [39]. People, corporations, and institutions all worry about and deal with technology reviews, not only governments and schools. A lot of individuals want to figure out, analyse, and

understand the societal problems that technology produces, as well as technology-assessment frameworks that would make these processes easier. A considerable concern regarding technology advancement, amid the physical world's expansion propelled by the evolution of economic and social systems, with pervasive technological stagnation, has attracted major scrutiny [30].

Education and Learning for Life

The school system has changed a lot in the last few decades. Formal education was established to meet the needs of society 250 years ago, but it doesn't work for today's needs. The idea of lifelong learning through formal, non-formal, and informal education came about since there is so much knowledge out there and it is hard to communicate it. People of all ages, including those who aren't in school anymore, can learn new things and get better at what they already know through lifelong learning. Digital technology has changed education by making it easier to share and change information on mobile devices. Putting kids first and thinking about how they learn is the best way to stay on the right road. There are a number of formal schools, but they can't meet all of the learning needs, and they aren't always ready for all types of training. People who take adult education classes desire learning materials that are easy to use and match their needs [40].

Technology moves things forward by quickly coming up with answers, even if society doesn't require them. Lifelong learning is something that people do with other people throughout their lives, and it depends on what they and society need. Metacognitive skills affect it, and it has benefits that go beyond producing money and being productive, such as moving up in social and personal status. For significant lifetime learning to occur in smart cities characterised by connectivity and cultural variety, the learning paradigm must consider cultural variation [41].

Ecosystems for Regulation and Innovation

Regulation can either promote or impede innovation, depending on how it is put up [42]. Regulation makes it more expensive for current businesses to breach the laws, which makes it easier for new competitors to enter the market. It also eases end-users' anxieties about safety and trust, which inhibits innovation [43]. It costs money and personnel to follow the rules, which can make people less likely to try new solutions that are beneficial for the environment or that help things work better. Unregulated experiments in the early stages, which may be employed instead of or in addition to regulated innovation, have certain limits and generate grey areas.

Working Together and Making Decisions on a Global Level

Technological advancement is a complicated process shaped by the dynamic interplay of institutions, global conditions, developments in digital macro-infrastructure, emerging digital technologies, governance frameworks, and substantial socio-economic shifts [44]. There are at least two significant waves of technologies coming together that will have a big effect on civilisation. These waves are based on innovative ideas in digital tech. One wave is about how both the public and private sectors are using and combining more and more digital macro-infrastructure and important technology. This is helping to make the economy "smart." The second wave is when biological, informational, and physical technology all come together. This wave is entirely in line with past well-known technical revolutions that revolutionised how people thought about life, intelligence, and nature. Expanding and intensifying the study of the first wave of technology shows that there have been big changes in how governments work and how countries work together. The progress of science and technology is important for human civilisation because it helps people live longer, feel better physically, and think more clearly. But just because technology is growing better doesn't mean that the world's issues, including poverty and the environment, aren't still very important. The basic purpose of governing technology is to move civilisation forward for the benefit of everyone and make the world a better place. The results of the investigation could serve as a framework for technology governance and the development of relevant systems.

Telecommunications are growing very quickly, and this is having a huge effect on the digital world. New technologies like 5G, the Internet of Things (IoT), artificial intelligence (AI), blockchain, and edge computing are making this happen. These new technologies are changing communication networks, making them more reliable and speedier. They also let programs that use a lot of data work in many different places. This article goes into detail about these issues and considers additional ways to fix them so that new technology can be incorporated to telecom systems in a secure and long-lasting fashion. Businesses may perform well in the long run by using smart spectrum allocation, open standards, AI-driven security measures, and working with regulators. Investing in research and new ideas, training personnel, and building up the infrastructure are also vital for getting the most out of next-generation telecoms.

Conclusion

Technological progress has a big effect on society, but the way it impacts different countries and areas is very different in terms of how it affects them, how far it goes, and how long it lasts. It gets harder to say if technology is good or negative as it becomes more a part of everyday life. Strategies for ensuring enduring societal advantages can solely arise from comprehensive assessment of the varied repercussions of technology. There are six institutional hubs that are all linked to each other that determine how technologies effect society.

First, institutions that individuals interact with every day, including work and school, shape how they utilise technology and how they gain new skills. Second, organisations that manage social spaces assist develop trust by making rules

about privacy and sharing information. Third, those that control big groups of people, like the government, help make laws about how people can use technology and what sorts of monitoring and spying are okay. Fourth, organisations that define the rules for testing new technologies, such those that control entrepreneurship and innovation, can either promote or discourage the use of new tools that can influence other parts of society. Fifth, organisations that govern the flow of technology around the world decide how and where technology travels from one country, region, or city to another. Lastly, groups that promote technical resilience and security encourage active experimentation while also minimising risks that could cause problems [30].

References

1. Hronszky, Imre. "NEW TECHNOLOGIES AS SOCIAL PROBLEM (A Reflection on the History the Social Role of Technology)." *Periodica Polytechnica Social and Management Sciences* 4.2 (1996): 125-148.
2. Waite, C. (2006). Notions of Progress. *Explorations in Media Ecology*, 5(2), 115-126.
3. Coccia, M. (2004). Technology and Technometrics approachesne (No. 200405). CNR-IRCrES Research Institute on Sustainable Economic Growth-Torino (TO) ITALY-former Institute for Economic Research on Firms and Growth-Moncalieri (TO) ITALY.
4. Michael, D. N. (1973). Technology and the Management of Change from the Perspective of a Culture Context. *Technological Forecasting and Social Change*, 5(3), 219-232.
5. R. Nelson, "On the Uneven Evolution of Human Know-How," 2001. *Research Policy* Volume 32, Issue 6, June 2003, Pages 909-922
6. Waśniewski, K. (2017). Technological change as intelligent, energy-maximizing adaptation. *Energy-Maximizing Adaptation* (August 30, 2017).
7. Taniguchi, H., & Yamada, K. (2020). The race between technological progress and female advancement: Changes in gender and skill premia in OECD countries. arXiv preprint arXiv:2005.12600.
8. D. Li and B. Bental, "What dictates the trajectory of technological advancement?" 2016. Li, Defu & Bental, Benjamin, 2023. "What Determines the Direction of Technological Progress (2023.11.16)?" MPRA Paper 119211, University Library of Munich, Germany, revised 16 Nov 2023. Handle: RePEc:pra:mprapa:119211
9. Aghion, P., David, P. A., & Foray, D. (2006). Linking policy research and practice in 'STIG systems': Many obstacles, but some ways forward.
10. Herani, G. M., Rajar, A. W., Zaman, N., & Alam, A. (2007). Knowledge Transformation and Economic Development: The Role of Digital Technology-An Analysis.
11. N. Kumar and S. Rego. (2009)."Links between educational success and the spread of technology in developing countries,".
12. Al-Zboon, M. S., Al Mwadih, R., Al Jaafreh, A., Al-Rabdi, I., & Mohammad, M. (2014). Future justification for the shift towards the knowledge based economy in Jordan from educational experts' viewpoint'. *Journal of Economics and Sustainable Development*, 5(6), 160-171.
13. J. M. Blanke, "Privacy and Outrage," 2018. The 13th IEEE International Conference on the Internet of Things (iThings 2020) will take place in November 2020.
14. Kalenzi, C. (2022). Artificial intelligence and blockchain: how should emerging technologies be governed?. *Frontiers in Research Metrics and Analytics*, 7, 801549.
15. Frolov, D. P., Inshakova, A. O., & Davydova, M. L. (2017). The institutional factors of strategic development and the tactical regulation of nanotechnology.
16. Werle, R. (2011). Institutional analysis of technical innovation: A review.
17. Cozzens, S. (2009, October). Distributional assessment of emerging technologies: Summary. In 2009 Atlanta Conference on Science and Innovation Policy (pp. 1-8). IEEE.
18. Zimm, C. (2019). Methodological issues in measuring international inequality in technology ownership and infrastructure service use. *Development Studies Research*, 6(1), 92-105.
19. Arner, D. W., Barberis, J., & Buckley, R. P. (2016). FinTech, RegTech, and the reconceptualization of financial regulation. *Nw. J. Int'l L. & Bus.*, 37, 371.
20. Lillesand, T., Kiefer, R. W., & Chipman, J. (2015). Remote sensing and image interpretation. John Wiley & Sons.
21. Jensen, J. R. (1996). Introductory digital image processing: a remote sensing perspective.
22. " Indian Space Research Organisation (free study material) "Principles of Remote Sensing
23. Edward J. Tarbuck and Frederick K. Lutgens "Earth: An Introduction to Physical Geology"
24. Lian, M. (2024). The impact of cleaner energy sources, advanced technology firms, and economic expansion on ecological footprints is critical in sustainable development. *Heliyon*, 10(11), e31100-e31100.
25. Aithal, S., & Aithal, S. (2016). Opportunities & challenges for green technology in 21st century.
26. Brenya, E., & Warden, E. W. (2014). Sustainable Development: Can New Technology and Economic Growth Be the Answer?. *Sustainable Development*, 5(7).
27. Ho, S. M., & Metcalfe, C. F. (2009). Life-Cycle Thinking: What can IT do to be green?.
28. Gausemeier, P., Seidel, J., Riedelsheimer, T., & Seliger, G. (2015). Pathways for sustainable technology development—The case of bicycle mobility in Berlin. *Procedia CIRP*, 26, 202-207.
29. Tait, P. W., & Hanna, E. G. (2015). A conceptual framework for planning systemic human adaptation to global warming. *International Journal of Environmental Research and Public Health*, 12(9), 10700-10722.
30. J. Oluoch and J. Osida. (2015) "Measuring the Effects of Information and Communication Progress on Development in the 21st Century,".

31. J. Oluoch and J. Osida, "Measuring the Effects of Information and Communication Progress on Development in the 21st Century," 2015.
32. P. Brauner, "Mapping Acceptance: Evaluating Emerging Technologies and Concepts via Micro Scenarios," 2024.
33. Veitas, V. K., & Delaere, S. (2018). Policy scan and technology strategy design methodology. arXiv preprint arXiv:1806.03235.
34. Park, C. (2017). Technology from the perspective of society and public interest (Doctoral dissertation, Purdue University).
35. L. Nerhus, "Automation and the Labour Force," 2014. Conference: XV International Conference "Russian Regions in the Focus of Changes" (ICRRFC 2020).
36. A. Roger, "An examination of contemporary surveillance methodologies and their prevalence in our society," 2022.
37. Liu, Z. (2023). How Technology Changes Authoritarian State Surveillance: Evidence from China.
38. Grafanaki, S. (2016). Autonomy challenges in the age of big data. *Fordham Intell. Prop. Media & Ent. LJ*, 27, 803.
39. Caytas, J. D. (2015). Legal Aspects of Technology Assessment and Systems Analysis in Sustainable Urban Development. *Consilience*, (14), 71-89.
40. I. Pureta, (2015). "Lifelong Learning Process Utilising Digital Technology,". The 2015 Interdisciplinary Management Research Conference will be held in Opatija.
41. Brown, K., Larionova, V. A., & Lally, V. (2018). Lifelong learning as a tool for the development of smart cities: technology enhanced learning as an enabler. *R-Economy*. 2018. Vol. 4. Iss. 4, 4(4), 133-143.
42. Pelkmans, J., & Renda, A. (2014). Does EU regulation hinder or stimulate innovation?.
43. Almpantopoulou, A., Ritala, P., & Blomqvist, K. (2019). Innovation ecosystem emergence barriers: Institutional perspective.
44. Battaglia, E. M., Mei, J., & Dumas, G. (2018). Systems of Global Governance in the Era of Human-Machine Convergence. arXiv preprint arXiv:1802.04255.
45. V. Basil Hans. New Technologies and Telecommunications. *Journal of Telecommunications, Switching Systems, and Networks*. 2026; 12(01):- . You can get it at