



The Future of Work

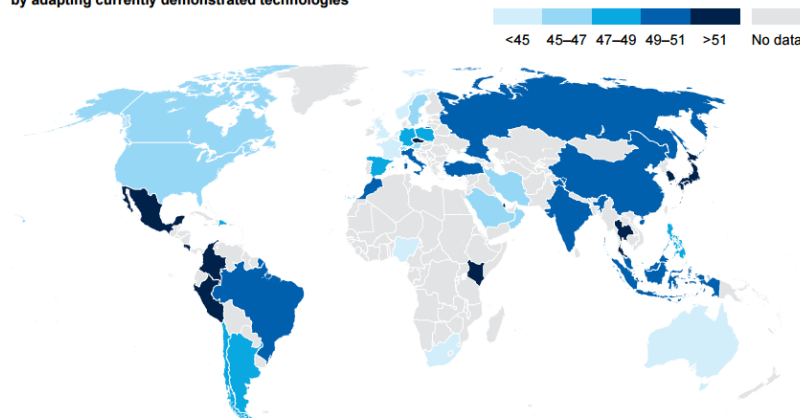
2019 Global Economic Forum Background Briefing Paper

“The Future of Work can be the future we want – one that provides decent and sustainable opportunities for all.”
- Guy Ryder, ILO Director-General, at the 13th G20 Summit in Argentina

Introduction – The Fourth Industrial Revolution

Much like the **industrial revolution** in the 18th and 19th centuries, the era of modern **manufacturing** techniques and advanced robotics has the potential to alter the course of humanity. Shifting labor dynamics, an exploding global population and massive advancements in technologies will together threaten the modern conception of work. By the year 2050, the Earth will likely hold over 9 billion people, and advancements in robotics, **automation** and

Employee weighted overall % of activities that can be automated by adapting currently demonstrated technologies¹



Source: World Economic Forum, “How automation and technology will change the buildings we live in”

agriculture will likely force millions of people out of traditionally stable and **gainful employment**. How the world grapples with these complex and difficult issues will determine whether we will be able to cope with one of the most fundamental changes to the world economy since the industrial revolution.

Massive shifts in the ‘future of work’ have potential effects on all corners of the world, with significant threats and opportunities to both **developed and developing nations** alike. Developed nations are likely to have a greater percentage of current jobs affected by automation in the coming decades. Generally, developed nations have an older, more educated workforce engaged in **diversified national economies** that will need job retraining and economic **sector mobility** in order to stay relevant in shifting economies.

Many developing nations are experiencing a population boom, and will need to spend significant resources on agricultural production, housing, and other critical infrastructure systems. A potential opportunity for these nations lies in the building of **infrastructure**, energy, and transportation systems

capable of serving massive populations. Developing nations often have less educated workforces who, due to socioeconomic factors, find it challenging to move upward in society. All of this will need to be addressed in order for these nations to succeed in the shifting economies of the future.

Automation and Manufacturing

The global economy of the 21st century emerged from the successes of the industrial revolution and the mass production of goods and services. National economies were rooted in the idea that millions of workers could rely on stable manufacturing jobs that could be obtained with standard levels of education. Additionally, over the course of decades the international community has come together to propose and mandate stronger **labor laws**, which allow workers in all sectors to live healthy and productive lives. However, the status quo in the manufacturing sector is being challenged by technological innovations, like robotics and automated manufacturing processes, which threatens the livelihoods of millions around the world.

In the coming decades, the industrial and manufacturing sectors are likely to see the greatest shift in labor dynamics. Automation “fundamentally exists to substitute work activities undertaken by human labor with work done by machines, with the aim of increasing quality and quantity of output at a reduced unit cost”.¹ The continued innovation in the areas of artificial intelligence, robotics, 3D printing and advanced mechanics will likely remove humans from the production line altogether, and will force millions of people around the world into different fields of work. McKinsey & Company, a renowned **think tank**, proposes a midlevel estimate of 400 million jobs worldwide lost due to automation in the manufacturing sector. This fundamental shift threatens one of the foundational sectors developed countries’ economies have relied on for decades.

According to experts, developing countries will likely rely on human manufacturing techniques longer than developed countries. Human labor is generally less expensive than cutting edge technologies, and developing countries will continue to employ humans over automation for the foreseeable future. This is promising in that it will continue to employ millions worldwide, but unfortunately textile and manufacturing jobs are often dangerous and rife with issues of **forced or coerced labor**.



Source: Worldbank.org, “The Future of Manufacturing-Led Development”

¹ Brookings: Automation and Artificial Intelligence - https://www.brookings.edu/wp-content/uploads/2019/01/2019.01_BrookingsMetro_Automation-AI-Workforce_Report_Muro-Maxim-Whiton.pdf

Intellectual Property and Cyber Activity

With the future of the manufacturing sector a significant outstanding question, millions of people around the world will be forced to shift their careers to high growth sectors. One of these growing sectors will be in **intellectual property, cybersecurity**, web-based employment, and data collection and storage. These sectors will likely dominate the future economies of the world.

Already, much of our lives are heavily influenced by our interactions on the internet. From online shopping to online banking and more, humans are increasingly shifting their purchasing online and relying on delivery services for goods, food, and even transportation. With this shift comes an enormous amount of **private and public data** that needs to be stored securely and efficiently. Consumers have already begun to shift toward sectors and industries that protect their data and financial information. This shift will likely only increase over time as our financial, retail, and delivery systems become more integrated in online platforms.

With the growth of e-retailers and e-banking comes an equally important growth in **cyber security** and fraud prevention. National governments are highly interested in developing secure and reliable data centers and communications that will protect crucial systems from hacking and disruption. For example, the United States has recently invested heavily in helping various states develop secure voter registration systems impervious to hacking by rogue individuals or nations. The private sector is also increasingly focused on cyber activity, as **consumer security** is a significant concern across all e-commerce businesses. This sector will ultimately employ millions of people working on data security and online financial services.

Agriculture

The agricultural sector has traditionally employed the vast majority of humans around the world. **Subsistence farming** has dominated local and regional economies for almost the entirety of human existence. Only following the industrial revolution have people in developed countries begun to move away from subsistence farming and into industrial and service-oriented jobs. However, millions of people around the world, especially in developing countries, continue to work in the agricultural sector, often performing difficult work for low wages.



Source: Robotic Industry Association (RIA)

By the year 2050, the Earth will likely have a population over 9 billion people, many located in countries with developing economies. This massive increase in the human population, coupled with the unknown effects of climate change, will likely threaten the access of affordable, nutritious food to millions of people around the world. Additionally, the threats of droughts and water shortages may impact the ability of countries to help feed many of their citizens.

Advancements in farming techniques, irrigation systems, and drought resistant crops will likely mitigate some of these issues, however, they may also threaten the place of the farmer. Smart farming technologies and advanced robotics are removing the need for large numbers of agricultural workers, and instead replacing them with sophisticated computer programs capable of remotely monitoring thousands of acres of crops or hundreds of livestock.

Social Development (Health care, education, etc.)

Automation and robotics will likely eliminate many workers from the assembly line, the agricultural field, and positions within our transportation systems. Similar effects will likely be felt in the social development sector, as millions of routinized jobs are eliminated due to automation. However, human-human interactions will likely still have significant value in the future economy, especially in the fields of health care and education.

Automation will likely allow doctors, surgeons, nurses and other healthcare professionals to perform work more efficiently and more productively, limiting the need for some routinized work. At-home health care will likely become more available to sick patients, altering the traditional notions of the doctor-patient relationship. Even with this shift in the healthcare industry, there will still exist a need for significant human to human interaction. Developed nations with aging populations will still require a healthcare system with a significant human workforce. Likewise, developing nations with growing populations will have a significant need for doctors and other medical personnel to keep pace with population growth.

Education will also likely see a significant shift in the coming years. Technology will surely shift some dynamics in education, allowing for greater connection of peoples and ideas. Online courses, wearable technologies and even augmented reality systems will change the nature of education around the world. However, as mentioned before, developed and developing economies will have a significant need for a highly educated and skilled workforce. Additionally, there is already a significant need for **job training and retraining programs** for millions of people displaced in their current work sectors. Regardless of the effects of automation, human to human services will likely continue to have a significant place in the social development sector of the future.



Source: McKinsey: Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation

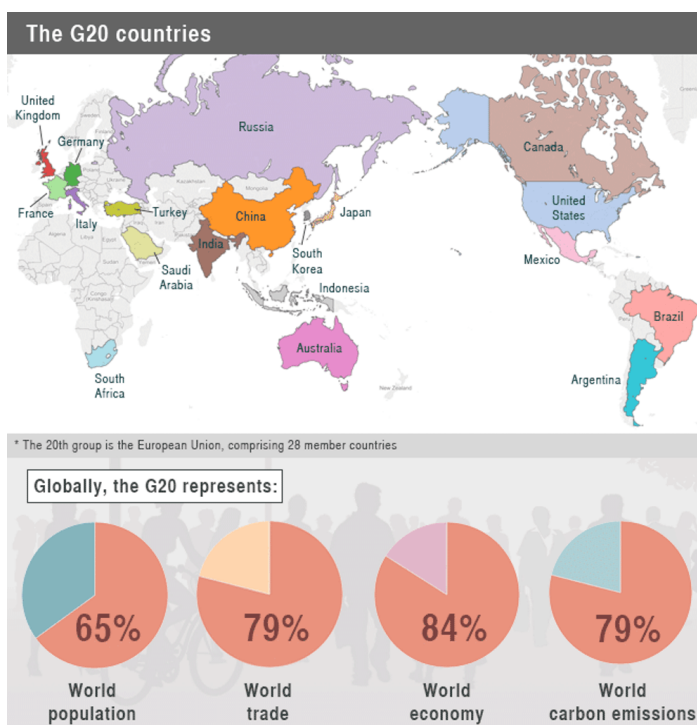
Simulation Goals: A Brief Introduction to the G20

The Group of 20, informally known as the G20, is a gathering of the world's twenty largest economies in a yearly forum meant to address some of the world's most pressing economic issues. The following are members of the G20: Argentina, Australia, Brazil, Canada, China, Germany, France, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United Kingdom, the United States, and the European Union. In addition, the hosting country (which rotates yearly) is allowed to invite a number of other countries, important international organizations such as the **World Health Organization** or the **World Trade Organization** and leaders of international bodies like the President of the **African Union (AU)** or the President of the **Association of Southeast Asian Nations (ASEAN)**.

The leadership summit, which takes place over 2-3 days, brings together the leaders of numerous countries for high level discussions on crucial economic issues. However, the leadership summit represents the culmination of efforts by career **diplomats** who work year-round on these important issues. These negotiators and diplomats work tirelessly to find common ground and fair solutions to global issues, which are almost unanimously agreed upon by the heads of state during the final summit.

The major policy outcomes that result from the G20 summit vary greatly year-to-year. Some years, progress is significant, with leaders agreeing to significant changes to international policies. However in others, the G20 fails to produce significant policy change and leaders agree to continue pursuing dialogue on crucial issues. Near the end of each summit, it is tradition for the leaders of each nation to sign a **joint communique** that reflects the progress and achievements made during that year's meetings.

The most recent G20 summit, hosted by Argentina in November of 2018 focused on the crucial topic of the future of work. The topic has broad implications for each member state of the G20 and diplomats worked hard to secure significant policy and regulatory advancement. However, the summit was overshadowed by significant global incidents like the ongoing trade war between the United States and China, as well as Saudi Arabia's role in the murder of a **dissident journalist**. Summit officials and international observers indicated that the summit didn't produce significant **multilateral action** on this crucial issue.



Source: G20 Studies Centre, The Lowy Institute & The Global Carbon Atlas

Conclusion

By 2050, the world will undoubtedly undergo significant changes in both the global climate, as well as the economic and political landscapes that dominate today. The changes to the global economy will be drastic and will likely impact all countries across the world. These changes present significant opportunities and challenges to future world leaders and existing citizens. Decisions made in the short-term, the next 5-10 years, will likely have lasting impacts that will alter the lives of billions over the course of decades.

The **2019 Global Economic Forum** will simulate a modified G20 Summit with representatives from the world's largest economies devoted to a single issue, the future of work. Students will be assigned a country which they are tasked to represent and research in addition to a topic in which to explore. Students, in their designated teams, are expected to come to the Forum with a proposal, taking the form of a short, 3-5 minute PowerPoint presentation addressing their specific topic and potential policy solutions to that topic. Over the course of the program, students will work with members of other countries to develop combined proposals and solutions. Ultimately, students will present their final PowerPoints to a panel of business and civic leaders from the Philadelphia area. This panel will select a winning team based on their ability to effectively define the issue, the opportunities and challenges associated with that issue and ultimately, draft policy proposals that encourage the achievement of fair and **sustainable workforce conditions and development** for all.

Questions to Consider (from the perspective of your assigned country)

1. Briefly describe the economy of your assigned country. Does it have an agriculture-based economy, a manufacturing-based economy or both? Does it primarily import goods or export goods? Does it have a diversified economy or does it rely on a single commodity (i.e. oil export)?

2. What sectors of your assigned country's national economy are susceptible to automation in the next 30 years? What sectors of your assigned country's economy are **not** likely to disappear in the coming decades?

3. What are the major threats and opportunities associated with the shifting future of employment for **developed countries**?

4. What are the major threats and opportunities associated with the shifting future of employment for **developing countries**? How might this impact (either create additional challenges or opportunities) for developed countries like yours?

5. Research the future of work in terms of your assigned topic. Will your assigned sector likely grow or shrink in the future? What kinds of policies can help people transition into or out of this line of work?

6. In terms of your assigned topic, and using your assigned country as a case study, are there any innovative programs or policies being instituted (by your country's government, private sector, or otherwise) that would either help/hinder global economic growth?

Glossary of Terms

Term	Description
African Union (AU)	A continental union made up of all 54 countries on the continent of Africa. The main objectives of the AU are to promote unity among African States, to coordinate and promote cooperation for development, and to defend the security of the member states and to promote international cooperation.
Agriculture	The industry concerned with raising crops, livestock as well as farming to provide food and other products.
Association of Southeast Asian Nations (ASEAN)	Intergovernmental organization comprising 10 countries in Southeast Asia to support regional cooperation and stability.
Automation	The use of technology and equipment to monitor or complete a production process (especially within factories, manufacturing and agriculture) without the direct control of humans.
Consumer security	The protection of sensitive, private information individuals provide during everyday transactions (e.g. credit card number or social security number).
Cybersecurity	The protection of internet-connected systems such as mobile devices from cyberattacks and unauthorized access to data.
Developed nations	Countries that are generally wealthy with advanced economies, mostly based on the service sector which provides more wealth than the industrial sector. Geographically, the developed economies of the world can mostly be found in North America, Europe, and Oceania.
Developing nations	Relatively poor, usually agricultural, countries that are seeking to become more advanced economically and socially. Geographical regions for developing countries worldwide are as follows: Africa, East Asia, South Asia, Western Asia, and Latin America and the Caribbean.
Diplomats	An official appointed by his or her national government who represents the country's interests in a foreign country. Also referred to as an ambassador.
Dissident	A dissident is an activist, journalist or vocal citizen who is critical of a government or institution of power. Often dissidents operate in countries with limited protections for free speech and risk threats of jail, harassment or harm.
Diversified national economies	Systems in which countries have many different industries and sectors to support growth and reduce risk. Economic diversification is the opposite of placing 'all one's eggs in one basket,' and therefore the greater the diversification in an economy, the safer this country is from economic downturns. Countries who operate economies based on one major resources (e.g. oil) are <i>not</i> diversified.
Forced or coerced labor	Refers to situations in which people are made to work through violence or intimidation tactics such as threat of penalty.
Gainful employment	Situation in which employees receive consistent work and payment from the employer, with the necessary components of a safe working environment, steady income, satisfaction, respect and purpose.
Group of 20	International forum of 19 countries plus the European Union (the twenty most economically developed countries) to discuss global economic concerns.
Industrial revolution	Refers to the late 1700s and early 1800s timeframe in which many manufacturing, agriculture and transportation advancements caused production to become more large-scale through machine operation. The second industrial revolution brought with it mass production, the third involved computers and communication technology, and the fourth comes with new robotic and artificial intelligence technologies.
Infrastructure	Fundamental facilities and structures needed for a country, society or enterprise to function (e.g. buildings, roads, bridges, power and electricity).
Intellectual property	A product of the human mind, or intellect, such as an invention or artistic design, which can be protected by law through patents and trademarks.

Job training programs	Programs designed to prepare an employee with the skills and knowledge needed to perform the tasks of a job.
Joint communique	An official message, statement or agreement signed by two or more countries. These documents announce important information by officials or leaders in unions such as the G20.
Labor laws	Laws that establish rights and responsibilities of workers. Labor laws set the standards for both wages and working conditions. These laws typically set a minimum wage and prohibit child (and other forced) labor.
Manufacturing	Industry in which goods are made using manual labor and large-scale machinery. The Fourth Industrial Revolution is altering the manufacturing industry, requiring less manual, or human, labor and relying more on technology, machines and robots.
Multilateral action	An agreement or alliance of multiple countries pursuing a common goal. This can involve treaties, trade agreements, or military alliances such as NATO.
Private and public data	Personal information provided for everyday transactions. Public data includes name, hometown, source of employment, and more, and can be found easily through the internet and social media. Private data is information used with no intention of being publically shared, but this data is vulnerable to hacking and theft.
Sector mobility	(See: <i>Diversified national economies</i>) The ability of a country to diversify its economic sectors. Sector mobility is a positive tactic which allows countries to have stable economic growth. Again, a country who relies on one major economic sector (e.g. oil) does <i>not</i> have sector mobility.
Subsistence farming	A system of farming in which farmers grow enough crops to feed their families. In subsistence farming, there is typically not much extra product for sale.
Sustainable development	Economic development that is conducted without the depletion of natural resources.
Think-tank	A group (typically comprised of experts on a given topic) organized to study and provide ideas or advice for specific political or economic issues.
World Health Organization	Specialized United Nations agency committed to achieving complete physical, mental and social well-being in all communities of the world.
World Trade Organization	International institution that regulates the global rules of trade between nations.
2019 Global Economic Forum	Simulation of the G20 Summit concerned with the global future of work.