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Trade 2030 & The Fourth Industrial Revolution (4IR)

Bringing the Vision and Thoughts of the Youth to the World

A collective action of the Global Shapers Community, orchestrated by the Geneva Hub and presented to the 2018 Public Forum of the World Trade Organization.

ACKNOWLEDGMENTS

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EXECUTIVE SUMMARY

- The surveyed hubs all agree that the top technologies which will have the most impact on the future of trade are Artificial Intelligence, Blockchain, and Internet of Things. Following along are 3D Printing and Augmented Reality/Virtual Reality.
- These technologies will help create smarter supply chains, more sustainable global value chains and ethical trade paths by eliminating forced labor; they will ease the import/export of goods and services by enhancing current operational models, especially in developing economies, enforcing stricter policies (eg integration of tax policies) by fighting illegal trade and measuring impact more accurately.
- The 4IR, if well managed, can help commodity exporting countries by increasing efficiency and sustainability, small countries thanks to decentralization, neighboring countries by enhancing of cross-border trade via standardization and traceability.
- Young people see the 4IR as an evolutionary process that will redefine the workplace and the way we work, in a way similar to the previous Industrial Revolutions: it is definitely a disruptive force with hard labor-force consequences, particularly in the short-term, but it will also create significant industrial opportunities and impell the adoption of a brand new skill set needed to handle the new reality.
- The changes brought about by the new technologies will redefine both business models (eg "blended" learning pedagogical strategies), business processes (eg data analytics technologies in manufacturing) and tasks (eg in healthcare).
- The Youth in almost all of the countries surveyed (except three) perceives their country to be under-equipped and not ready to embrace the impact of the new technologies and on the job market by 2030.

- The top 2 perceived blockers from being "4IR-ready" are (i) an inadequate education system and (ii) the lack of political will, vision and coordination between different policymaking bodies. The Youth situates the heart of the debate around the investment in people, their skills, and a human-based trade system: this requires national and multilateral leadership to ensure equality of opportunities.
- Determining the right skills on which to invest is a strategic question that is based on megatrends and the demand for specific proficiencies, as even coding will become obsolete: what will be required is cultivating skills that cannot be replaced, such as growth mindset, empathy and resilience, as well as developing a continuous improvement outlook, "learning how to learn".
- While new technologies are quickly advancing, the Youth acknowledges and requests that governments and international organizations operate together in order to set up the framework for all actors to follow. In particular they are calling for a new collaboration model around global trade standards, which should be led by the WTO.
- The WTO is also perceived responsible for establishing the rules of the game and minimum standards in areas that could be perceived as going beyond its core mandate, such as education, climate change, IP and entrepreneurships. The key challenge for WTO seems to be situated in the flexibility of its policies and regulations to address these issues.
- The Youth asks to be given a seat at the table, in order to be able to shape the policies of the future: as the generation of tomorrow, we are more concerned with ethics and moral values as opposed to pure financial profit and we want to realise a new vision that is just, fair, inclusive and equitable.

INTRODUCTION

The 4th Industrial Revolution is here. New and emerging technologies are already transforming everyday life for people all over the world. It is inevitable that these technologies will impact the global economy and the future of trade, as well as potentially provide solutions that will contribute to overcoming some of today's social, economic and environmental problems.

The WTO Public Forum 2018 is considering the Future of Trade from the perspective of Future Generations. The WTO has recognized the value of the vision and thoughts of the youth on the technologies of the 4th Industrial Revolution that will shape the Future of Trade.

With this in mind, the Geneva Hub of the Global Shapers Community has leveraged the opportunity of the WTO Public Forum 2018 to bring the voice of youth to issues of the future of trade in the context of the fourth industrial revolution and to ask:

How will advancements in technology affect the future of trade for the youth of today and for future generations?

More specifically, we asked the Global Shapers Community to respond to four key questions about the types of technologies that will affect the future of trade, the implications of these changes, the types of intervention required from government and multilateral organizations in order to respond to this changing environment, and the specific contributions that young people can bring.

Trade 2030 and The Global Shapers Community

This year's theme of the annual WTO Public Forum 2018 is Trade 2030, referencing the role of trade in achieving the 2030 Agenda for Sustainable Development. This future-focused theme is the perfect backdrop for adding the *first-ever* youth-led workshop to the Forum, planned by the Global Shapers Geneva Hub.

The Global Shapers Community is a youth initiative of the World Economic Forum. In an effort to bring the authentic youth voice to global leaders and policy makers, the Geneva Hub has surveyed more than 1000 global shapers from 50+ hubs, addressing 4 key questions on the impact of technology on the future of trade on a local and a global level.

The aggregated submissions of Hubs from Global Shapers Community representing their experiences with technology and trade form the basis for this report, which will be launched for during the 2018 Public Forum workshop.

The goal of the workshop is to inspire participants to co-create the ecosystems needed to achieve a more sustainable, inclusive and prosperous trade system, and to overcome the main challenges facing trade today including the inequitable distribution of the benefits of trade contributing to global inequality.

The WTO Public Forum

The World Trade Organization is the central forum for international governments and trade organizations to work together to create an open opportunity trade system for all. The collaboration of global trade institutions through WTO processes and forums supports the development of agreements and policies for enhancing economic growth and development in all countries across the globe.

The participants of the WTO Public Forum include policy-makers, members of civil society, academia, business, the media, governments, parliamentarians and inter-governmental organizations.

Participants in the WTO Public Forum 2018 will have the opportunity to gain new insights, discuss, debate, and propose their ideas on enhancing the future of trade - through developing sustainable trade, enabling trade through technology, and creating a more inclusive global trading system**.**

The 4th Industrial Revolution (4IR)

With the 4th Industrial Revolution already underway, new and emerging technologies are transforming everyday life for people all over the world and reshaping global economies and trade itself. In addition, these technologies have the potential to provide solutions to overcoming some of today's greatest social, economic and environmental problems.

This report outlines five top technologies that are becoming mainstream in the 4th Industrial Revolution, and their potential to address global trade challenges and opportunities. It discusses the opportunities, threats, and challenges that policymakers and key stakeholders must take into account when implementing these technologies at scale. And finally, it explores the role of youth in shaping the future of technology, trade and sustainable development.

THE TOP TECH PAVING THE ROAD TO SUSTAINABLE TRADE ACCORDING TO THE GLOBAL SHAPERS COMMUNITY

The surveyed Global Shapers Hubs all agree that the technologies that will have most impact on the future of trade are **Artificial Intelligence, Blockchain,** and **Internet of Things.** These are followed by 3D Printing and Augmented Reality/Virtual Reality.

Legend:
- Africa
- Europe
- Americas
- Middle East
- Asia & Australia

AI — sum 40
BLOCKCHAIN — sum 38
IOT — sum 25
3D PRINTING — sum 19
AR/VR — sum 17

ROBOTICS — sum 11
PLATFORMS (i.e. eCommerce) — sum 12
CRYPTOCURRENCIES — sum 10
FINTECH — sum 5
QUANTUM COMPUTING — sum 5
TELECOMMUNICATION NETWORKS (5G) — sum 2
AUTONOUMOUS MOBILITY — sum 4
DRONES — sum 4
CYBERSECURITY — sum 3
VOICE RECOGNITION — sum 2
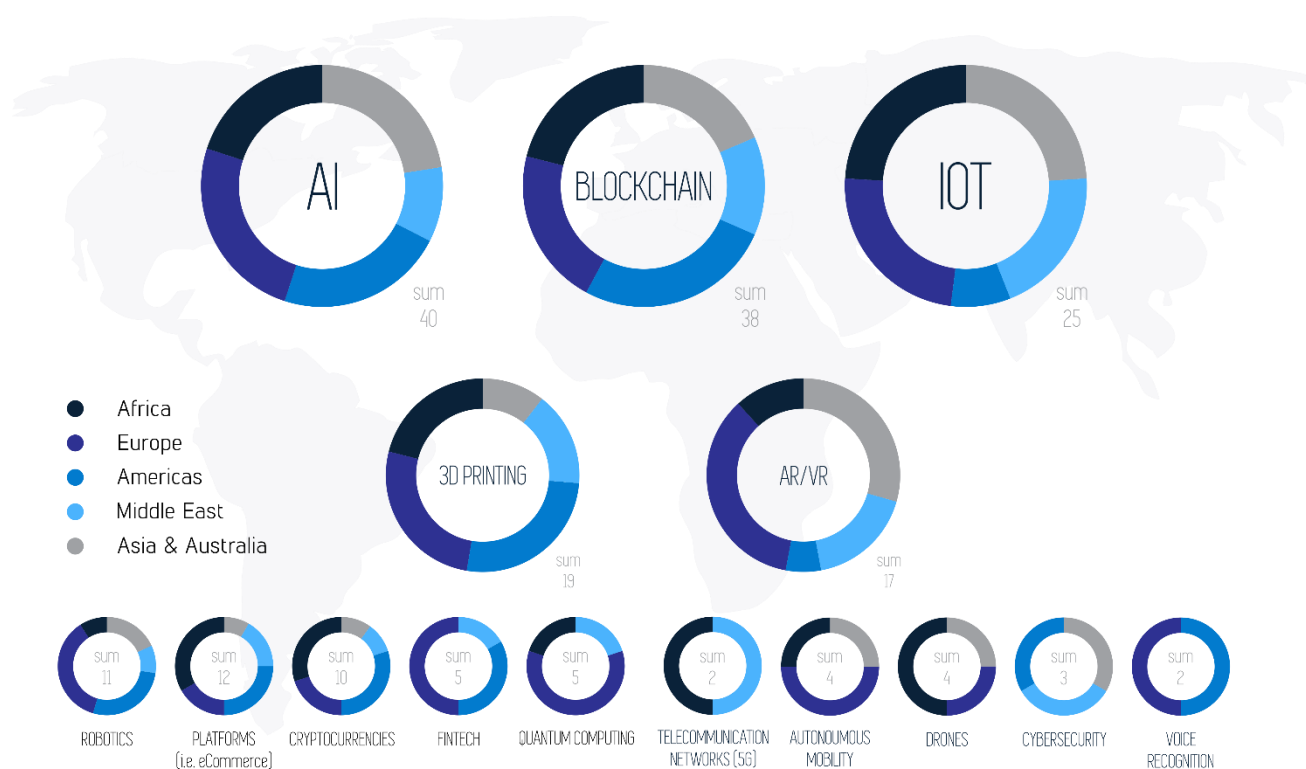
The Top 5 Technologies seen as having the greatest impact to the Future of Trade by the Global Shapers Community.

TOP TECH #1 - ARTIFICIAL INTELLIGENCE

"We believe that new rating systems could be implemented to "grade" companies so that those who follow ethical standards are compensated by better grades from a completely neutral entity (not based on their PR and marketing efforts, but based on a thorough examination of their processes and their scandal history). Having AI select winners in the case of public contracts could reduce the incentive for corruption as the machine would make its decision purely objectively based on the pre-selection criteria with no personal feelings involved."

Artificial Intelligence (AI) is a way to augment human intelligence – not a threat but an opportunity. Human minds cannot process the same amount of data as modern machines but many actors in the global supply chain operate with old technologies and Excel spreadsheets, leaving room for errors. Large scale adoption of AI can open up new business opportunities, make Trade more efficient, and reduce its ecological footprint on our planet, leaving us with a more sustainable Future for Trade.

While AI is in constant development, we see the majority of the efforts having been undertaken by the private sector. Business operators have specific needs, hence most of the AI applications we see are "narrow" as they try to solve business problems. In order for AI to be a primary driver of future trade, we believe governments, policy makers, and other public actors need to come together and invest in what is commonly known as Artificial General Intelligence (AGI). Such AGI would be focused on tackling large scale problems in healthcare, security, space exploration and many other parts of the economy. It could facilitate implementation of policies, reduce the amount of counterfeit products, and increase cross-national collaborations.

The Global Shapers Community sees further applications for AI that the reader should consider in its capacity:

- **Improved Customer Services**: AI in its human-friendly format will allow for faster and more accurate handling of consumer questions, improving customer satisfaction, and forcing companies to invest resources in ensuring their products, services, and support systems are identified and appreciated by the end user.
- **Improved Delivery Systems**: The fusion between AI and Autonomous Vehicles (Drones, Trucks, Cars, etc) will enable quicker deliveries in any part of the World, making the purchase of goods easier and eventually driving population "migration" towards suburban and rural areas.
- **Improved Decision Making:** Certainly one of the biggest impacts of AI is in supporting humans in making decisions. For public-private managers this means being able to leverage data more accurately, opening new business opportunities that may be currently impossible to evaluate.
- **Re-Shaping Jobs:** Manually intensive jobs in Logistics, Demand Planning, Manufacturing, Customer Service will be automated thanks to the application of AI and other technologies.
- **Considering the ethical side of technology**: While we have yet to take a serious look at the many ethical debates that technology will continue to raise, AI may well force key stakeholders to include ethical discussions in the global agenda. We believe we cannot consider building the Future of Trade unless we include ethics in the debate.

TOP TECH #2 – BLOCKCHAIN

If we were to run our survey just 12 months ago, Blockchain would have never made it to the top five technologies, let alone take second place after AI. Once again, this demonstrates the speed of change we are all subject to and the rate of global adoption that some technologies can have, at least in our minds. Blockchain is still in its infancy and yet, from nearly every corner of the World, is viewed as a big opportunity for the Future of Trade. Are key stakeholders listening?

Blockchain has the potential to revolutionize the global economy, currencies, company structures, payments, contracts, and all forms of transaction where trust is key.

"The Bank of Canada is undergoing experiments with digital currency and distributed ledger technology (DLT), of which an example is blockchain, in collaboration with stakeholders from the Canadian banking industry and payments companies. Their intention is to devise a DLT-based system for clearing high-value interbank payments as well as foreign exchange and securities assets. The true value of DLT technology is its ability to create a more level and transparent playing field on which people can transfer ownership of intangible goods."

Here again, most efforts are coming from the private sector while the public sector has mostly reacted to the cryptocurrencies side of blockchain, with only few exceptions making direct pledges to the blockchain technology itself. We believe a more concerted and harmonized effort is needed by all trade stakeholders to leverage the usage of blockchain as the global platform to enable Trade in 2030.

According to the Global Shapers the impact of blockchain on the future of trade could entail:

- **Improving Cross-Border Payments**: Blockchain can reduce fees and currencies exchange rate costs. Moreover, for emerging markets the idea of "zero" transaction costs can encourage international trades.
- **Improving track & trace along the Supply Chain**: Thanks to blockchain, we expect the exchange of goods and services to improve in quality. Moreover, it provides consumers with the ability to choose which products to purchase based on their history and reliability. A side-effect of track & trace is the possibility to better identify counterfeit products and so reduce the incentive for criminal activities.
- **Reducing the need of the middle-man**: where many transactions require a "middle man" for trust, findability, and negotiation, with growing blockchain penetration we expect this role to be re-designed and eventually gradually disappear.

TOP TECH #3 - INTERNET OF THINGS (IOT)
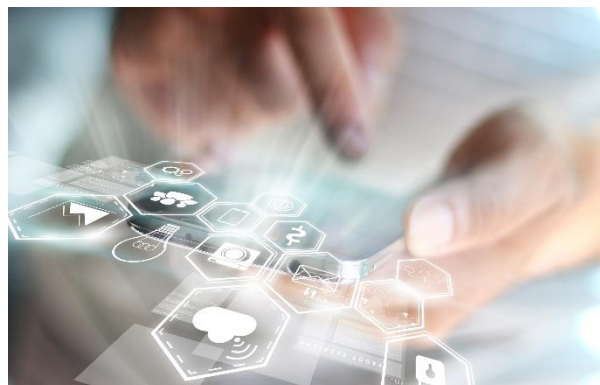
"The face of advertising will change with the fusion of AR, VR and IOT."

Internet of Things (IoT) devices are slowly entering every part of our lives. From the manufacturing floor to the supply chain to the transformation of cities into connected urban areas to our homes and offices. The result is a hyper-connected ecosystem where data can flow in any direction providing information on trends, tastes, and purchases. Entrepreneurs will have the information needed to create new ideas to add value to our lives while governments can improve the tracking of the flow of goods.

The impact of IoT is still hard to comprehend, but we believe it is going to be a key enabler once used in combination with other technologies (including AI and blockchain) as it acts as a data creator as well as an enabler for easier access to the World of goods and services.

"The rise of IoT devices such as smart mirrors which let customers try on clothing items virtually will completely change the way consumers shop online."

According to the Global Shapers the impact of IOT on the future of trade could entail:

- **Improving Energy Consumption**: A simple yet highly relevant usage of IOT is seen in energy consumption for commercial usage. Given the size of the global economy, being able to drive efficient energy consumption can have a positive impact on environmental sustainability.
- **Enabling real time decisions with precision:** Knowing what happens in every step of the manufacturing line or the location of all containers moving daily around the World while interpolating that data with millions of others available from public and private sources will enable managers to take real-time decisions with the precision of knowing the now and where.
- **Connecting Consumers & Manufacturers**: As connected homes become a reality and voice-enabled devices slowly make it through our latest habit change, IoT allows producers to know how consumers shop and use their products. This will enable smart companies to work on "customer centricity" and personalization.

TOP TECH #4 - 3D PRINTING

It has been around for a while but only in the last decade 3D printing has become a widely known technology by the global consumer. As smaller, more efficient and diversified (more materials) machines enter the shop floor, we see an opportunity for a global network of 3D printing facilities to print parts anytime, anywhere, reducing the need for transportation and labor. While this is still a far fetched reality, key trade stakeholders need to acknowledge the possible impact as designing the World of Trade in 2030.

India, for instance, has started its journey from a service-based economy to a product-based economy. This entails investment into creating new age manufacturing entrepreneurs who are trained to make the best use of technologies such as 3D Printing. This will enable them to quickly manufacture goods locally and to move from prototype to product.

"3D printing will revolutionize the 'Made In', since it will be used as 'Made with'"

TOP TECH #5 - ECOMMERCE AND DIGITAL PLATFORMS A SOCIAL ELEMENT OF THE REVOLUTION

As much as 3D printing has been around for a while, digital platforms do not represent a new paradigm for innovation. However they might be a **major social-tech element of the 4th Industrial Revolution.**
E-commerce is moving towards becoming the future of retail, as most of the growth in the retail sector is taking place in the digital space. E-commerce is enabling many small players to sell goods in any part of the World. With the increasing number of online shoppers and the adoption rate of the internet in developing countries, e-commerce is growing steadily anywhere.

Digital platforms have given consumers the ability to express their opinions, exchange recommendations and discuss producers. As we move forward, other technologies like AR & VR will impact the World of Trade and digital platforms will act as enabler for the emerge of a global shopper audience that will see no national borders.

"The sustainable use of e-commerce digital platforms is expected to reduce inequalities, advantaging people trapped in poverty, marginalised in their communities or living in areas unserved by services. Digital platforms might be for instance an important vehicle for Women Economic Empowerment, encoding sustainable human values in the global value chains."

Technologies such as Artificial Intelligence, Blockchain, Internet of Things, 3D Printing and Augmented Reality/Virtual Reality will help to create smarter supply chains, more sustainable global value chains, and ethical trade paths, thus eliminating forced labor and modern slavery. They can help improve the accuracy of market predictions and reduce the human bias in key decisions thanks to decentralization. We see their role as an enabler for small and medium enterprises to enter the global market and take a bigger bite of the global trade pie.

Looking specifically at emerging and developing economies, these technologies can be used to ease the import/export of goods and services by enhancing current operational models, enforce stricter policies (in particular the integration of tax policies) by accurately measuring the impact using AI in specific locations around the world where illegal trade is rife. The combined usage of these top technologies is seen as an opportunity to provide, for example, sustainability to farming countries such as Brazil and other agricultural and commodity exporting markets. If well applied in the agricultural field, with adequate governmental support and policies, technology can exponentially increase business and make it easier to export locally made products – improving their quality and supporting the transformation of raw materials in the country of origin, thus increasing the value of the goods sold. This presents a unique opportunity to shift raw materials producers from the role of price-taker to that of price-maker. The technologies can provide increased safety and respect for workers while fostering investments in their education to transform the goods in semi-finished products.

In recent times, collaboration with neighboring countries has been aimed at ensuring that some form of standardization could be leveraged from coming together. However, with the inception of technologies, like Blockchain, gains can be made more quickly. Commodity trading for example needs standardization and efficiency in tracking and tracing of goods. With the modern consumer requesting trust and traceability, through the implementation of large scale blockchain projects we see both the producer and the shopper able to gain significant advantages.

While these technologies are quickly advancing, we recognize, acknowledge and request that governments and international organizations operate together in order to set up the framework for all actors to follow. Such a framework cannot come from the effort of a single startup or nation as it is a unique role that only cross-country collaboration can establish as will be discussed at a later stage of the report

WHAT IMPACT WILL SUCH TECHNOLOGIES HAVE ON THE JOB MARKET?

As described before, automation technologies such as machine learning and robotics play an increasingly excessive role in everyday life. Their potential effect on the job market has, unsurprisingly, gathered a lot of attention especially on the impact of new technologies in the job market that changed the rules, resulting in a huge amount of opportunity across both the private and public sectors.

Opportunities that introduction of these Technologies can create in the Job Market and global trade by 2030

1. Creation of new jobs. While some jobs will disappear as a result of technological development, the history has shown that previous industrial revolutions also created a number of job opportunities. Consequently, the 4IR will change the existing picture in the labor market. Some of the arising professions will be: experts in robotics, cyber security, data science, and artificial intelligence. Besides the narrow professions, there will be also a need for innovation experts and supervisors, who will be able to give solutions to existing problems by using creative and interdisciplinary approaches.

In Nigeria, the development of a credit economy will lead to the creation of currently non-existent industries and an increase in job opportunities in existent industries. For instance credit card companies – which are almost unheard of in the present Nigerian economy would form a crucial industry in a credit economy. We see opportunities for more high-level and white-collar jobs in enabling technologies for e-commerce, such as developers, shipment managers, UX/UI designers, digital marketers. At the same time, automation and other technologies will likely cause a reduction in the number of SMEs that produce locally in big commercial hubs, such as **Singapore** that will increase the reliance even further on imports for consumption. Further, threats include a trade deficit, death of SMEs in retail and subsequent loss of jobs as the cost of production will be much higher than SMEs in neighboring countries of such hubs with lower labour costs. It must be noted however, whilst low skilled jobs would be at risk due to automation, at the same time technological advances would create a new segment of low skilled jobs (e.g. identifying photos/taking photos for supervised machine learning).

Finally, these technologies are an incredible opportunity for Sub-saharan African countries, such as Madagascar to jump over the 2nd and 3rd industrial revolution and reach directly the fourth, as Technology can ease doing business in Africa and will create new employment opportunities.

2. Mobility of labor. The rise of technology has already made workforce more mobile nationally and internationally. This is especially relevant for the experts working in the IT sector as those professionals after gaining some work experience in their home country prefer to move to other enterprises abroad.

3. Diverse collaboration between teams. As the technology becomes more human-centered, interactions between people will play a crucial role and a skill like being a "team player" will be among the most important ones. Also, international collaboration will become a necessity and more international and remote teams will evolve.

4.. Optimization of recruiting processes. New technologies will create digital solutions for the recruitment processes which will allow the employers to make the recruitment process more efficient and effective in terms of identifying the right skills and requirements for the specific position, determining the right target relevant for the position, decreasing the costs and time for the staffing. On the other hand, the job search will become more efficient saving time for job seekers and providing opportunity to find the right job position perfectly matching with the employer. The AI and big data analytics will allow to match the perfect candidate to the right employer thus cutting time and resource wasting on current recruitment cycle.

5. Boost in entrepreneurship. Regional **SMEs** have a great chance to rise and be acquired by larger international players as for example, Amazon's recent acquisition of Middle Eastern e-commerce firm Souq.com).
The upcoming technologies will favor entrepreneurship in Brazil due to the reduction of costs and the emergence of professionals working independently, specially in the technology field, one example is the exponential growth of startups in the country.

6. Transformation of farming and agriculture. What we have found out from the research is a positive impact of these technologies in farming and agriculture in a plethora of countries.

For example, industries employ only a small fraction of Cameroonian workers. More than 90% of labor is either in services or farming. AI is expected to be used in Cameroon to modernize and render the production and transformation process more efficient. This will increase income for all stakeholders across the value chains. As far as cotton is concerned for example, in Cameroon currently 94% of the cotton production is exported at the crude state. 300.000 farmers are involved in the cotton production process. AI will facilitate the industrialization of cotton into an efficient semi-finished product that matches international standards thereby increasing both output and the quality of cotton. This will, if equitably distributed, increase the income of farmers.

On the same page, in Guatemala, smallholder farmers are working hand in hand with large industries in the better use of technology into their work to augment their productivity.
Finally, Nigeria studies the use of AI to predict favorable weather will lead to an increase in the productivity and efficiency of the farmers.

7. Efficiency enhancement from the use of Blockchain technologies. We have also found out from almost all the countries for high expectations of the impact of blockchain technologies. We are particularly encouraged by the possible effects of blockchain in the supply chains of companies alongside wider applications in international trade. The possible efficiency improvements as a result of blockchain integration could lead to huge gains in global economic growth.

8. Manufacturing and Supply Chain Excellence. Drones in Logistics, Quality Control Check on Manufactured Products, Automatic Monitoring Operations, automated planning systems can offer unprecedented opportunities and significant gains across the value chain operations. If we take an over presented technology as an example, 3D printing requires less labor and many industries that rely on manual labor will switch, if not already to 3D printers. Even retaining spare or rare parts is no longer required, given the possibilities of 3D printing that brings significant cost reduction to industries.

Most of the industries across different countries already have started investing on 4IR initiatives and the transformation and management of traditional Operations into "Smart & Intelligent" Operations is now a reality.

Blockchain technologies can also help the tracking of supply chains on a real time basis, which is leading to businesses making better decisions. Since blockchain provides a more secure and transparent platform to store and track information, a lot of industries in supply chain and logistics will witness automation and replace a lot of redundant jobs today. This shall reduce costs and increase profits for businesses.

9. Fundamental changes on the Public sector. Governments typically have the biggest and largest supply chains. Blockchain would be able to for example, easily facilitate the launch and creation of businesses or lead to improvements in the transparency of the monetary system in

countries where regulation is typically low to non-existent.

If Italy, for example, was to incorporate blockchain in its trading system, big opportunities both in infrastructure development and software development would arise. Clerks and bureaucrats who currently manage the papers related to trade would be threatened by the use of blockchain. In particular, the use of AI may indirectly affect the trade system by lowering the relevance of administrative workers.

These technologies will help to improve transparency and efficiency, especially in the public and financial sectors as well as resource management systems across the country of developing countries, like Pakistan. All the processes have been managed manually up till now, for example, the documentation of criminals by the police, the case management systems in the local courts, the registration of domiciles. All these will now be digitized.

Finally, Indonesia that stands as another accurate example, is increasingly utilizing blockchain as a driver for economic development. In Indonesia's mapping activities, an increased use of blockchain & AI has led to a more transparent process in developing geospatial information, thus avoiding and reducing the need for extensive analysis by GIS experts (including lowering GIS job posts) towards efficient sustainable land use analysis and planning.

10. Productivity boost. In the U.S., these technologies are critical because a massive shortage of blue-collar workers does exist. To close some of the infrastructure gaps in labor, there is a need to invest in automation since it is too expensive to manufacture using human resources for all the production steps.

By 2030, is expected a significant fall-off in per-capita productivity with people staying in the workforce too long, new entrants being unable able to join the workforce or people not being re-trained fast enough. *These shifts in employment and skill sets will lead to a $5T GDP loss in the U.S. that will ultimately be tied to the loss of millions of low-skilled jobs. Therefore, investing in automation to solve the impending productivity gap will be significant. Doing so would also require finding a way to retrain or support those people who would become structurally unemployed as a result.*

On top of some blue collar jobs, automatable white collar jobs of today, which take up about 50% of a white collar worker's week (email, CRM management, financial controller, etc.) are going to be replaced. These roles will be replaced with good tech jobs that actually account for 85%+ of all roles in technology (project management, marketing, sales, etc.) and those people automated out will need to be retrained. These roles will have technology augmenting them to help the people in those roles be better, which means they can have significantly less training going into the roles with technology augmenting them.

11. Transformation of the traditional IT business. India has become an IT services powerhouse over the years and can serve here as a solid example. The IT sector has not only contributed largely to Indian exports but has provided employment to millions of Indians in the last two decades. But recent trends in effective Machine Learning (ML) algorithms being built and AI systems getting better and better, have started to become a threat to a lot of these redundant jobs. This possesses a huge challenge to the Indian growth story. Automation is a serious concern affecting many job positions in India. Jobs have always been at risk with the advancement in technology. Emerging technologies will affect trade and disrupt various industries as ML and other AI technologies are bound to make a lot of jobs obsolete in a couple of years by automating the processes and disrupt the IT job market. On the other hand, new needs for managing others, applying expertise that only humans can perform will grow.

Possible threats from the introduction of these Technologies can create in the Job Market and global trade by 2030

At a second stage, the threats of the introduction of these technologies can be significant; therefore, a rigorous analysis of them has to be realized in advance, supported by a proper transformation plan to prepare the ground for sound implementation.

1. Increase in structural unemployment. "Is the Fourth Industrial Revolution "destroying" jobs?" is a common question in many business reports, academic articles and panels. As we have seen in previous industrial revolution numerous jobs and professional became obsolete as a result of the changes. Already today we can see this happening: Inventory management will be taken over by robots, manufacturing is going to change and unskilled labor will be lost. This is a threat in the sense that employees cannot quickly adopt current work resources to the needs of the coming job market. If no proper resource development and transformation policy is in place today's employees will be soon or later out of competition and various jobs will disappear.

More specific, OECD estimates suggest that about 14% of workers are at a high risk of having most of their existing tasks automated over the next 15 years. Another 30% will face major changes in the tasks required in their job and, consequently, the skills required. About half of all workers will confront the need to significantly adapt to the new workplace environment.

2. Reduced human interaction and isolation. As in some jobs, robots will replace human-beings and with a rise of virtual reality, not only the quantity but also the quality of human interaction will be destroyed. Some people, especially the representatives of older generation may be isolated as they were used to interact physically on a day-to-day basis.

3. Slow adaptation of formal educational institutions. This statement is particularly relevant in the context of public educational institutions. Due to the lack of skilled teachers and state funding, public schools

and universities may be left behind as opposed to the private educational institutions. Hence, this phenomenon can create a gap in the society of many countries.

4. High labor turnover. New jobs emerged as result of technological will change rapidly along with the pace of technological advancement, thus it will require continuously changing skills and qualities for employees. As a result, the employers will be in constant reach for new more flexible more adopted workforce to be able to capture technological changes. At the same time high quality skilled workforce will be in constant search of new opportunities in such a rapid changing environment. As a result of these developments there will be a high turnover on labor forces in the market that can create some social instability.

5. Personal data privacy issues. With the rise of Big Data, personal information about employees may be at risk. Ethical questions regarding access to such data will arise. The threats from data insecurity in cloud storage are important and need to be confronted to avoid mistrust in the technology and its applications.

6. Inequality among countries. AI might amplify the gaps among countries, augmenting the current digital divide. Leaders of AI adoption (especially developed countries and China that has a strategy of becoming a global leader in the AI) could increase their lead over developing countries. Therefore, the developing countries might have less incentive to push for the "trendy" technologies and fall behind. This can also affect negatively global trading operations.

7. Disparity among companies.

Potentially, technologies could lead to a performance gap between front-runners (companies that fully absorb AI tools across their enterprises over the next five to seven years) and non-adopters (companies that do not adopt AI technologies at all or have not fully absorbed them in their enterprises by 2030). At one end of the spectrum, front-runners are likely to benefit disproportionately, capture a huge market share and create a concentrated market situation.

8. Widening the divide between classes and workers.

Moreover, jobs demand would shift from jobs with recurring tasks toward those that are cognitively driven and require a more digital skillset. The former category will experience a decline, while the latter will experience a steep rise. These shifts will have an impact on wages that will affect the societies. Especially in the Middle East countries, given the widespread inequality in Jordan for example, most of these re-skilling efforts will likely affect the elites of Western Amman.

Countries' readiness (in terms of skills) to face the technologies' impact on the Job Market by 2030

All the analyzed countries and economies all over the world seem to be partially or not equipped to face these technologies impact on the job market by 2030. More specific:

Europe

Italy is not equipped for 2030. To embrace the challenge is the only way to bring positive inputs to these disruptive innovations. For instance, in the creation of a quantum computing methodology, Italy is now playing the part of a quiet observer, since all companies involved in the challenge are mainly from UK and the US, but this does not mean that such technology will not affect Italian daily life. Making complex computing-calculation easy will give a new input to the Italian manufacturing industry, which is now suffering from the lack of specific competencies and from the growing population of older employees. In the "Autonomous driving" world, our government and policy makers need to rethink the role of various low-skilled jobs. These new value-chains will overtake most of these human jobs posing into threat the world jobs' system. Policy makers need to rethink working re-integration.

Recent estimates indicate that, over the next 20 years, the share of existing jobs displaced and created by AI in the **UK** will be approximately equal at 20%, but the new jobs will likely require retraining programs that are not yet in place, but only in a "wait and see" status from the majority of institutions.

North America

Canada's banking sector is being disrupted by the application of FinTech and AI to their offerings. This is changing their labor requirements where there is higher demand for regulatory, technology and AI professionals and lower demand for customer service representatives and branch staff but there is not much that has been done on this direction. At this point, it worth sharing the feedback that Amazon provided in the city of Calgary when rejecting the bid for their HQ2. The company stated that the local universities were not producing graduates with the appropriate skills for their projects.

"Partnerships between educational institutions and the private sector should be used to both shoulder the cost burden but also to ensure that workers are getting highly relevant training" **(Calgary Hub)**

Asia-Pacific

In Singapore, the educational curriculum does not yet foster the innovation needed to build those enabling e-commerce technologies. There is still a focus on traditional math and sciences in our curriculum, but not for creative thinking, arts and design, and coding.

Indonesia has a very limited capacity to cope with such radical job market change from AI due to its labor-focused education system, preparing human as 20th-century economic factor. This might result in dissatisfied and discouraged society in general.

China has been utilizing blockchain & AI among other technologies to drive the economy development but education will need to be more focused on creativity development than ever, and creativity will be in high demand.

There is an urgent need to reskill and upskill our workforce and young graduates to take on technology focused jobs in India. Currently, the nation is not prepared to take the lead in the field of AI since our technical education system has not kept pace although they realize the big need. Private companies need to co-create effective courses with academia and train the young citizens with enough internships in these fields at university level, so they can have a qualified workforce to choose from in the future.

Latin America

The poorer parts of brazilian population rely on jobs that will become obsolete and education investments are so low that this movement may increase the inequality gap in the country. The same trend applies to other Brazilian rural areas. Development is uneven within the territory, in terms of education, market and infrastructure. While most part of Brazilian workers need to be empowered on interdisciplinary knowledge and additional skills such as digital literacy, emotional skills, reasoning, creativity, problem solving, much of the Brazilian population lives without access to basic resources such as electricity, sanitation, and has no access even to "traditional" education that makes the country underprepared.

In terms of manufacturing, most of the work in Colombia is based on low-skilled labor and on low-complexity products, which is highly vulnerable to changes in the international trade. On top of this, the education system in Colombia is not preparing people for jobs that don't exist yet, but for jobs highly possible to be replaced by robots and algorithms.

Africa

The disruptive impact of the Fourth Industrial Revolution on developing countries like Nigeria offers remarkable opportunities and tools which can solve local problems faster and more efficiently. With the rising surge in active internet users of over 102 million Nigerians, technologies such as A.I, VR, Blockchain etc will create a whole new e-commerce market and digital platforms that young people can use in designing local solutions tailored to their problems. The major threat of these technologies to Nigeria is the lack of preparedness.

The rise of technology is increasing the engineering courses at various tertiary Institutions of Ghana. Gradually, the future workforce is being equipped skill-wise to face the impact of technologies in the job market. However, at the moment, changes are mostly happening in largely urban areas. During the most recent presidential campaign in Ghana, the government committee to facilitating the establishment of one factory in each of the 200 plus districts of the country. This presented an opportunity to employ the use of technologies on both the demand and supply sides of the economic isle, employing technologies such as AI that are adept at improving business systems and operations. Indeed, uptake in technological skill sets into the mainstream economy today is slow, and needs to be rapid.

Australia

On the basis of Australia's present educational infrastructure, Australia is under-equipped to face future challenges, such as introduction of new technologies that may result in widespread job shortages, or international conflict resulting in the potential massive withdrawal of international students that sustain the economy. Australia's capacity to innovate, to ensure job security, remain relevant and survive the impact of the 4IR is contingent on effective governance, corporate responsibility, continuous leadership and long-term inclusive, holistic strategy.

Degree of readiness per surveyed country

1 ←→ 10
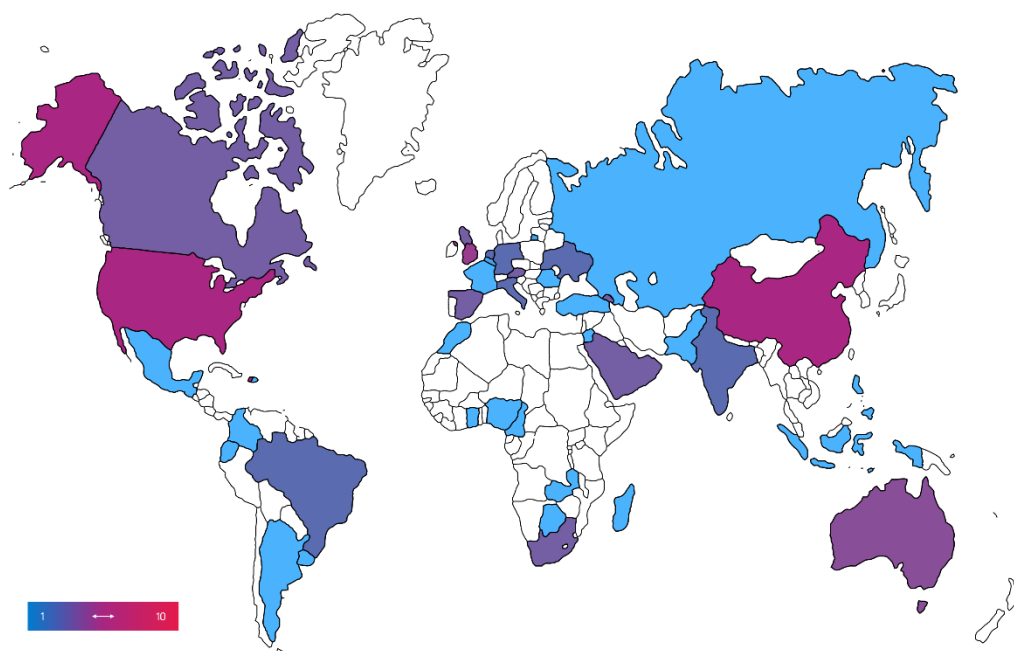
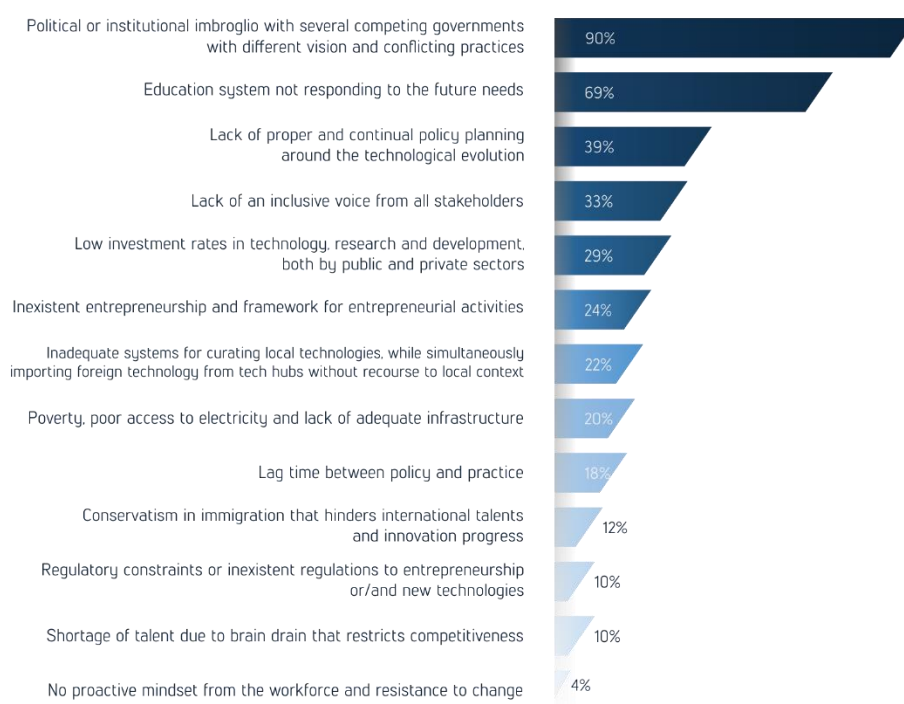*All of the countries (apart from a few exceptions) are under-equipped and not ready to embrace the new technologies and their impact on the Job Market by 2030. Action has to be taken now, given the long time that such a fundamental transformation may require.*

Main blockers that would stop a country from keeping up with these technological advances on the Job Market by 2030

The motivation and zealous are high towards the new technological advances but way is not yet properly paved due to specific roadblockers that the hubs have identifies and are listed below.

Main blockers that would stop a country from keeping up with these technological advances on
as per percentage of mentions by the 51 surveyed countries

Blocker	Percentage
Political or institutional imbroglio with several competing governments with different vision and conflicting practices	90%
Education system not responding to the future needs	69%
Lack of proper and continual policy planning around the technological evolution	39%
Lack of an inclusive voice from all stakeholders	33%
Low investment rates in technology, research and development, both by public and private sectors	29%
Inexistent entrepreneurship and framework for entrepreneurial activities	24%
Inadequate systems for curating local technologies, while simultaneously importing foreign technology from tech hubs without recourse to local context	22%
Poverty, poor access to electricity and lack of adequate infrastructure	20%
Lag time between policy and practice	18%
Conservatism in immigration that hinders international talents and innovation progress	12%
Regulatory constraints or inexistent regulations to entrepreneurship or/and new technologies	10%
Shortage of talent due to brain drain that restricts competitiveness	10%
No proactive mindset from the workforce and resistance to change	4%

The global shapers prefer to see the 4IR as an evolutionary process that will ultimately redefine the workplace and the way we work. Looking at the past, we see key similarities that might provide guidance to where we are heading. The previous Industrial Revolutions brought about new technologies and ways of working that saw many craftsmen and skilled workers replaced by machines. However, this also created significant industrial opportunity and impelled the adoption of brand new skill set needed to handle the new reality.

The 4IR is definitely a disruptive force. We will certainly face labor-force consequences as this Digital Revolution progresses. We must accept the reality that mundane and repetitive tasks will ultimately become automated. This raises a certain amount of skepticism, but this is not the same as "destroying" jobs and livelihoods but rather will lead to evolution and redefinition in several areas.

(1) Business models: For example, in education, AI and other related technologies will support learning and education without replacing the teacher through "blended" learning pedagogical strategies that will improve the learning curve.

(2) Business processes: For example, in manufacturing, simulation and advanced data analytics technologies can provide the production planner with insights and proposals that will feedback into and reshape the decision-making process.

(3) Tasks: For example, in healthcare, the use of machine vision systems can recognize cancer cells thus freeing up radiologists to better focus on critical cases and communication with patients (source HBR).

This "new" method of working will require new and updated skills in order to be "4IR-ready". The strategic action plan for the 4IR and trade consists of (1) value creating initiatives and (2) capability and resource initiatives. The challenge with the latter category is that they have to be developed before we know precisely the former category. Determining the "right" skills to be "future ready" is a strategic question that is based on megatrends and the demand for specific proficiencies.

Currently, many individuals are investing in learning how to code. However, this will rapidly become obsolete in the future, as machines will code themselves. What will be required will be cultivating skills like that cannot be replaced and developing a continuous improvement outlook, "learning how to learn". It will be these skills that will ensure an individual remains "sustainable" within the job market over the long term. 4IR is driving changes at three levels of the workplace: tasks, business processes, and business models. Towards these, it is pivotal and important to invest in "new" skills that cannot also be replaced and are timeless, such as growth mindset, empathy, and resilience.

WHAT IS EXPECTED FROM GOVERNMENT'S, POLICY MAKERS AND THE WORLD OF BUSINESS IN ORDER TO PREPARE A HEALTHY GROUND FOR TRADE IN 2030?

"Policy makers need to update trade and investment treaties, so that they take into account the new realities of the digital economy, such as cross-border e-commerce and the platform economy" (Paris Hub)

For Global Shapers, before looking on new technologies, the focus should be on advancing the Sustainable Development Goals, especially those framed around access to education, women integration, food and water. Accordingly, discussions around trade and new technology policies should be done in a bottom up people centered manner. Such an approach can only be triggered by focusing first and foremost on education and not per se on trade and technologies.

Education as a priority focus

As the Fortaleza Hub (Brazil) reminds us, "*current educational models need to be reformulated, with a greater focus on areas such as robotics, programming, entrepreneurship, computing learning and others*". This focus, as discussed on the former question, on education includes:

- Soft skills such as problem solving and social skills needs to integrate the core of education.
- Educational reform also includes a larger role for lifelong learning and re-training of the unemployed,
- Prepare populations for the jobs of the future and ensuring that low skilled workers can transition to new jobs quickly.

The crucial role of government

Governments and new partnerships models are a central piece of this focus on education. The Calgary Hub (Canada) suggests that "*partnerships between educational institutions and the private sector should be used to assess the new*

skillset that will be required on a world driven by these technologies". More specifically, governments should:

- Embrace new collaborative models across different sectors and industries must be encouraged and developed.
- Adopt a multi-stakeholder approach providing basic incentives for technological research and promote greater interaction between key sectors, including the private and the academic.
- Create an enabling environment for start-ups and entrepreneurs, as to build their digital economy. Having an advanced proper digital infrastructure would then attract many investors and enhance their competitiveness.

To make this happen, the Accra Hub (Ghana) reminds us that "*youth representation in government and policy making is key in creating the future that is ready for us.*" Youth needs to be a part of the discussions and bringing fresh perspectives.
Governments must also show leadership, at the community, national and regional level. New models of collaboration at the regional level must also be explored. For instance, the Cambridge Hub (UK) suggests the "*development of technologies developed mutually (i.e., joint patents) between more and less developed countries, with the goal that no (or at least less) economic dependency is created*". Edinburgh Hub (UK) emphasize that "*this could be part of new "aid for trade" initiatives for developing and least-developed countries on how to prepare for upcoming technologies*".

"Governments and policy-makers (along with private sector stakeholder consultations) should do a better job negotiating and reaching multilateral trade agreements that reflect the new demands and features of a technology-driven trade world order"
(Washington DC Hub)

Ethical considerations: technologies as a complement to humans

Global Shapers also emphasize the crucial role of ethical considerations in trade and new technologies, in particular:

- A focus for government and policy makers should be incentivizing technologies that are complement to humans rather than substitutes, as the Paris Hub (France) reminds us.
- Global Shapers in San Francisco (USA) also stress that since "*these technologies will continue to generate a mistrust of personal/private data*", governments must consider this issue as a priority.

What are the implications that this can have for WTO and the governance of trade?

The Sao Paulo Hub (Brazil) is quite clear that "*since technology does not wait for laws to be developed, regulations have been trying to run after technology developments recently and this will not change*". For Global Shapers, this means rethinking the way law is done to protect both the ethical use and countries interests with the healthy continuous technological development.

A new role for WTO

Since trade and new technologies may be increasingly interrelated, this could imply a new role for WTO, such as:

- Ensuring the formation of strong regulations and policies that are accommodating the development of technologies as well as the moral issues and consequences that came with it.
- Making consumer protection a priority, especially when it comes to cyber security and intellectual property in the digital age.
- Encouraging government to implement universal access to internet and electricity, which are key trade empowers.
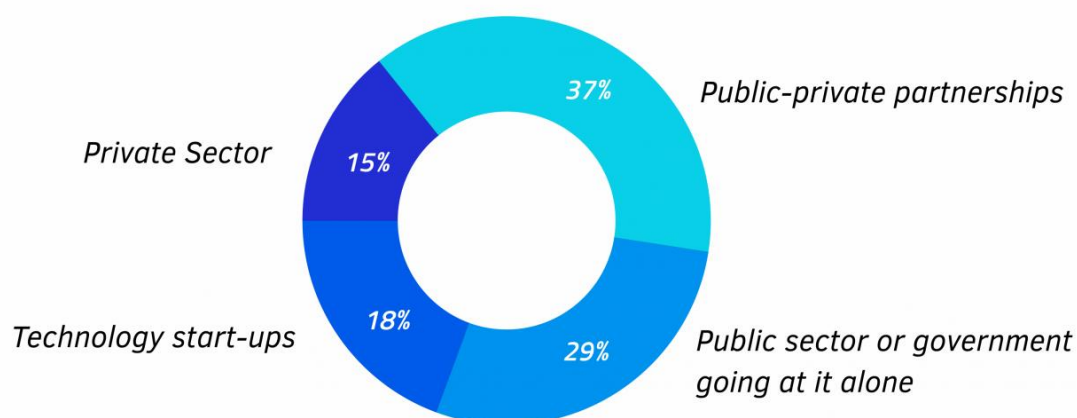
Even if free trade must be pursued, it should not be so at the expense of environmental and social dilemmas. As the Brussels Hub (Belgium) stresses, the Global Shapers Community wishes to see WTO enforcing stricter rules for energy providers that harm the climate.

Who is expected to bring the change?

On the basis of the results coming from the 60 surveyed hubs, the graph below clearly indicated that the public-private partnerships and governmental actions are the expected driving forces for innovation.

**"95% of Global Shapers mention education
as a priority issue for trade issues" (Accra Hub)**

Government Support and Policies Needed to Drive Innovations

Private Sector

Technology start-ups

37% Public-private partnerships

15%

18%

29% Public sector or government
going at it alone

**"Youth representation in government and policy making
is key in creating the future that is ready for us" (Accra Hub)**

We can see that Global Shapers situate the heart of the debate on trade around issues connected to education and a human-based trade. It requires national and multilateral leadership to ensure people have access to resources needed to benefit from the effects of the transformations to come. Only by investing in people will we reap the benefits of trade and new technologies.

Global Shapers are also calling for a new collaboration model around global standards to trade. Interestingly, because of the widespread impact of new technologies, many young leaders perceive a responsibility for WTO to establish minimum standards and rules of the game in areas that could be perceived as going beyond its core mandate, on areas such as education, climate change, intellectual property, entrepreneurships and others. The key challenge for WTO seems to be situated about their ability to be flexible in its policy and regulations to address these issues and making as to maximize the potential of the fourth industrial revolution for everyone.

GLOBAL SHAPERS REPORT

WHAT IS THE ROLE "YOUTH" CAN PLAY TO FURTHER BUILD A COHESIVE SUSTAINABLE ECOSYSTEM

*"Before focusing on technology, the focus should
be on advancing the Sustainable Development Goals"*
(Amman Hub)

We stand at the precipice of a major turning point in history; a turning point which will see every aspect of our lives revolutionised. The Fourth Industrial Revolution is an opportunity that is unique and unparalleled in the history of mankind; one that has the power to unleash a wave of human potential and improve living standards for all globally.

Whether from Bogota or Brussels, Montevideo or Manama, many Global Shapers expressed their eagerness and optimism in shaping a technological future that is fast approaching.

Each of the hubs expressed its hope for a future that is both economically inclusive and environmentally sustainable; one where inequality and poverty are minimal.

Yet, many of the Global Shapers also feel frustrated at the dysfunction shown by governments, policymakers and corporations alike in considering how to build an ecosystem fit for the future.

Over 42 percent of the global population is under 25 and rising. In South Asia and Sub-Saharan Africa, the number of people aged 12-24 has steadily risen to almost half the global youth population. Jeddah hub, for example, expressed their optimism and concern for their future in that whilst Saudi Arabia has a bright future with over 60% of the population under the age of 34, the only avenue to express their wishes and engage politically was through social media.

It is, therefore imperative that governments, policymakers and corporations take note of the underlying demographic trends and embrace us, the youth in addressing the regional and global socio-economic problems of today, in order to shape the policies and economies of tomorrow.

Shaping the digital economies of tomorrow

According to UNESCO[1], the world today faces a critically low level of investment in education, with over $3 trillion dollars of investment spending in education required compared to $1.2 trillion spent today. Additionally, UNESCO notes that little to no progress has been made over the past few years in reducing the number of out-of-school or unemployed youth globally.

This chimes with many of the sentiments expressed by the Global Shapers from both developing and developed countries; in that they see Education as being the top priority for the Fourth Industrial Revolution.

*"The communication of the values of the technologies, rather than
a constant focus on the "how-to" of these technologies, will be
an important factor in developing this tripartite engagement
strategy of an inclusive trade 2030"* *(Singapore Hub)*

"More attention should be paid to the representation of minorities, women and vulnerable populations in the economy"
(Amsterdam Hub)

Specifically, several of the hubs mention that new and creative ways should be found to enhance both the quality of education and its delivery to as wide an audience as possible. Many hubs expressed their wish to engage with their peers and engage not in the didactic form of education, but rather in disseminating knowledge transfer; educating older generations and equipping their peers in other regions and countries with the right digital skills. Other hubs also mentioned the huge potential that digital platforms present in skills development and self-learning.

In Port Harcourt in Nigeria, for example the hub recently undertook a project to provide 1000 youth with basic digital literacy skills. In Bangalore, the Global Shapers Hub collaborated with Intel and a local government think tank to encourage local youth digital participation.

What is clear is that whilst these initiatives are sorely needed, there are huge gaps and inconsistencies between regions, between countries and between continents in their approach to delivering the digital skills that are wanted and needed.

This is where we believe the active role of multilateral bodies, governments, policymakers and corporations is needed in order to achieve the following:

- Raise the level of investment in education and offer access to key digital infrastructure as widely as possible
- Improve the delivery of education through multiple online/blended platforms that are better suited to the future, compared to the prescriptive education systems of the past
- Improve and enhance education systems nationally and internationally by encouraging the right creative and critical thinking skills that can take advantage of a digital world
- Empower Youth to cross mentor and exchange skills with others thereby accelerating adoption of digital skills
- Encourage greater private sector collaboration to assist in the development of the digital economy

Shaping the environment of tomorrow

Over the next 20-40 years, the world will undergo significant and in some place, cataclysmic climate change. In the last 10 years, we have seen significant melting of the ice caps, the raising of global temperatures and extreme weather events on a frequency unprecedented in history.

Many hubs have expressed concern about a range of environmental issues from the use of plastics and waste, through to areas such as reducing the effects of pollution from transportation and logistics as a result of long supply chains.

On a smaller level, many hubs see technology as the means by which some of these challenges can be overcome. For example, the "SDG Video Project" by Fortaleza Hub was a video series created to spread awareness about the UN Sustainable Development Goals with over 2000+ people engaging.

30

The Youth should be encouraged to build solutions that can tackle climate and sustainability challenges at a smaller and larger scale as these are issues which will cause huge social disruption and instability in the near term future.

Establishing a Youth Climate Change Board and encouraging the spread of practical and sustainable solutions from other regions should be the role of large multilateral organisations such as the WTO, in conjunction with support from Government, NGOs and Corporations.

Shaping the inclusiveness and fairness policies of tomorrow

Several hubs voiced their anxieties that the impending Fourth Industrial Revolution could lead to a loss of jobs and that with many of the governance structures having been put in place decades ago; current structures are not fit for purpose. Technology has enabled us to connect with our peers like never before and we are acutely aware of the obstacles and differences faced by our peers more than ever before.

Cambridge Hub mentions the inequality of technologies developed globally and it is interesting to note that the majority of patents globally are still filed within the G8 countries, penalising less developed countries. Enabling the creation of intellectual property in an equitable way to ensure that countries are all able to fairly benefit from technological advances is a must.

Rabat Hub makes the point that ecommerce and open trade can be both positive and negative. Too often, unfair and unquestioned ecosystems hinder the ability

of the youth to make the most of local and national opportunities. By providing youth with the opportunities to seek new audiences and build new partnerships with peers who have complementary skillsets, these challenges can be overcome. For example, ensuring that fair taxation of digital companies is used to drive youth skills and exchange development should be a priority for governments and corporations' alike – incentivising and empowering youth to use their new found skills to empower others.

As Generation Z and Millenials, we want to play our part in addressing challenges at a local level and can do so in a fa more agile and nimble manner compared to governments and corporations alike. Many hubs have expressed their determination to share knowledge across boundaries and seek common grassroots approaches to challenges compared to the top-down politically-dependent approach that has characterised previous historical approaches. In many respects, the youth have shown considerable foresight compared to the majority of Governments today. Yet, there is considerable concern around the lack of empowerment and a sense of frustration.

Establishing a Ministry or Department for 2030 alongside Youth Advisory Committees that are grandfathered within multilateral organisations such as the WTO would present some intriguing and interesting possibilities to embed the youth directly and enable them to have input into wider government and multilateral policy, Governments and multilateral bodies would also be in a position to better understand the adaptation at a local and regional level required for the Fourth Industrial Revolution.

"It is important to rethink the way the law is enacted in order to promote ethical use and countries interests with healthy continuous technological development". (Sao Paulo)

Additionally, given the problem solving abilities of the Youth, this could provide an avenue for Governments to inject some fresh thinking and find new and interesting solutions to solve some of the challenges of our times.

As we move towards the Fourth Industrial Revolution, we will be moving towards a future where the possibilities are limitless and the potential endless.

We will be moving towards a future that is truly interconnected, where as individuals, we will be connected digitally and socially, across geographic and cultural boundaries alike.

We are keen to build a better future for ourselves, to build an ecosystem that is truly sustainable and an ecosystem that is truly equitable.

In order to do this, we are asking to be given the tools with which to do so. We are asking to be given a seat at the table, to be given the opportunity to shape the policies of the future, to work with our peers in a multicultural, multilateral and multidisciplinary approach.

As the Generation of tomorrow, we are more concerned with ethics and moral values as opposed to pure financial profit and we want to build a new vision that is just, fair and equitable; one that is inclusive of all individuals, regardless of their access to technology, their background and the economic environment in which they grew up in.

Together, we want to and can build a better tomorrow.

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