File name: global_megatrends_-_webinar_2_-_our_trend_universe (240p).mp4

Moderator questions in Bold, Respondents in Regular text.

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Speaker1: It is very important for everybody to understand why we need to develop a megatrend universe, because it is going to impact business, economies, and even individual. Now, the megatrends researches are, is, is actually a long-term futuristic approach to understand a certain crucial forces that has the capability to transform any business economy, or even the way we are living our lives. And by megatrends we understand, we mean, those vital transformative trends that can shift the future and they also the capability to act as key drivers for growth across social, business, economic, political, environment, and technological systems.

So, a little bit of background about this particular megatrends research approach. So, in the last few years, we have seen the emergence of lot of disruptive forces like the geopolitical shift, by geopolitical shifts we mean the ongoing Ukraine-Russia war, or the Israel-Hamas conflict. Then we have also seen the growing impact of climate crisis, like the increasing frequency of-, frequency and intensity of some extreme weather conditions like hurricanes, heatwaves, drought, and flood, and we have also witnessed a lack of resilience in our supply chains because the world was exposed to certain events, like the global pandemic. And then, of course, we have seen the rapid advancement of technologies like generative AI. Now, all of these events actually highlight a, a, a real need to investigate the future global scenarios, in order to understand how our future world and its inhabitants will evolve, and also, we need to know what, kind of, actions can be taken to ensure the best possible outcomes for business, citizens, economies, and the environment. And, from here we get the idea to build the megatrends research, and so we began to examine the transformational megatrends to 2030.

So, the pie that you see here, at the left hand side of this slide, is the megatrends universe, which includes 23 megatrends, that has been categorised across five major themes, and we call these themes as the base framework. So, in the periphery of this circle, you will see there are a certain, certain names put in like the business model transformation, which is the B in the base framework, then economic and political shifts is the E, and the environmental priorities is again the E in base framework. Technology and advancements stands for the T in the base framework, and S for the social trends. So, across each of these 23 megatrends clusters that you see within the circle, we have gone a level down, and we have identified over 70 sub-trends that have very strategic and operational importance, and these sub-trends, it's like, it can be applied across various major industries. For example, if we pick up the economic and political shifts that is the E of the base framework, and try to understand the megatrend, suppose the new growth centres of the global economy, this particular megatrend means which economies will have a higher growth in figures than any other economies in the world. Then, the stock trends that we find within

these-, within this particular megatrend cluster are number one, the Africa emerging as as an economic battleground, and number two, the centre of global economy shifting towards the western side-, shifting from the western side towards the Asian countries. Now, this particular framework of megatrends and sub-trends was not built in a day, or a month, or in a year, in fact it was built through intense research we have done, done all the year around by constantly monitoring, analysing, and, and trying to conceptualise other observations within each of these themes.

Now, from that investigation, we have identified some key transformational shifts that are of strategic importance to all industries, and we believe by galvanising and leveraging these megatrends can actually help companies unlock new opportunities and will also ensure long term success in a, a rapidly changing world.

Captions by Verbit Go

File name: global_megatrends_-_webinar_2_-_megatrend1_-_emerging_demographic_patterns (240p).mp4

Moderator questions in Bold, Respondents in Regular text.

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Speaker1: Imagine demographic patterns. Before I get into this particular megatrend, let just give you an overview of how we have designed each of these megatrend slides so that it's easier for the audience to understand the flow of each of these slides. Within each megatrend slide, what we have done instead, we have highlighted the respective sub-trends and we have also provided some of the notable data-driven and qualitative signals that actually demonstrates how this-, how any particular trend would be emerging or evolving in future. And then we have also included the future trend outlook for each of these megatrends, starting from what it is going to be in the short term, that is the time between today and, and, and within the next three years then the mid-term that is-, that is the time of, of-, between the next four to eleven years, and long term that is next twelve to sixteen years.

So coming to this megatrend that is emerging demographic pattern, this particular megatrend reflects the major shifts in population dynamics, fertility rates, ageing population, as well as migration. Now, the future global population will be dominated by the younger set of generations, like the Generation Z and Generation Alpha. Now, born between 2010 and, and, and 2025, is the Generation Alpha, which is expected to account for 23% of global population by 2040. Now, this generation is different from the other generation because they are permanently connected to internet because they were born in an-, in a-, in a digital era. They are more socially aware and they are more culturally diverse than the previous generation and so we expect them to be a prime motivator, or the prime driver of how these businesses will operate in 2040.

Again, the-, another young set of generation that will dominate the global population would be the Generation Z. That is they are born between 1995 to 2010. They will also lead important business's decisions and will also promote social and economical causes through innovations like high automation or by adapting a, a very inclusive lifestyle of health and wellness and also growing urbanisation will also have a greater influence on how this generation is being shaped. Both this generation will be driven with technology and digital-based services. Generation Z and Generation Alpha are poised to supercharge economic participation, digital engagement, and also sustainable practices.

Now, from this generation, let's, let's move onto the other sub-trends that we see reducing or the declining global fertility rate. Now, the trend signal shows that by 2050, the global fertility rates are projected to

decline significantly to 76% of countries having fertility rates below the replacement level of 2.1 children per, per woman, and this is quite alarming. Some of these factors that is actually leading to this could be the changing family structures, like increasing single household-, single-headed families, or families with zero children and, and then also other societal norms and, and government policies that are actually driving this continued decline in global birthrate.

Some of the implication of this particular trend would be that there could be a, a, a, a potential reduction in the global age population, which could lead to labour shortages and even the lower birthrate could raise the family dependency ratio. That means there will be fewer working-age individuals that would be able to support a growing and elderly population.

Again, there will be an impending pressure of accelerated migrated, migrated flow, which refers to a large scale displacement of population because of certain factors and extreme climate-related-, climate change-related events and, and, and resource scarcity, and also for-, and also, like getting more better infrastructure and so we see more and more rural population being moving towards the urban settlements, and then there could be a migrated-, migratory flow because of the escalation of the geopolitical conflicts that is the ongoing inter-regional war that is going on.

So during the next 30 years it is-, it is expected that this climate change or, or any kind of geopolitical shifts will actually lead to displace 143 million people globally. Now, we also see that there would be at least 1.6 billion new urban residents in cities and by cities, we mean primarily in developed nations, which will be-, which will have the ability to support this flow.

So, in terms of evolution of this megatrend, in the short trend, we expect to witness more and more expansion of cities, especially in the developed countries due to rural exodus and also, Gen Zs will be able to bring in new collaborative and procreative business models here to cater to their way of-, their way of, you know, looking towards the digital, you can say, services like online shopping, or maybe mobile apps. And in the midterm, we see that this new Generation Z will enter the workforce and so they will face a landscape where many routine jobs will already be automated and this will lead to, you know, coming up of new roles that will require more of human machine collaboration.

Now, there-, now the, the unique experience and expectation of this particular generation will actually drive significant changes in how organisations actually engage them as their employees and also how they-, how companies see them as consumers and, and, and so we find-, and so we'll see that more and more companies or more and more, how you can say, workplaces will be emphasising more on the need of this particular generation, and so there could be some innovative approaches coming up, both in education, as well as in the workplace.

So, in the long term, we see that most of the labour supply globally will be dominated by the African region and this is because this particular region will see a, a surge in their working-age population. By 2040, we'll also see Generation Alpha to be entering the workforce and with them entering the workforce, they will bring in some distinct preferences which will be valued by, by businesses and organisations and we will see significant changes in how businesses operate. Organisations will proactively adapt to these shifts by embracing maybe advanced technologies or by bringing up some diversified, you can say business models, or some flexible business models for the purpose to better position them and so we expect to see a very evolving landscape of work by 2040.

Captions by Verbit Go

File name: global_megatrends_-_webinar_2_-_megatrend2_-_advanced_materials (240p).mp4

Moderator questions in Bold, Respondents in Regular text.

KEY: **Unable to decipher** = (inaudible + timecode), **Phonetic spelling** (ph) + timecode), **Missed word** = (mw + timecode), **Talking over each other** = (talking over each other + timecode).

Speaker 1: The next megatrend, that is the advanced materials. Within this megatrend we clearly see two most important shifts, that is the 4D materials will revolutionise the material science and manufacturing, and further increase adoption of biopolymers, will pave the way for the development of more environment-friendly products. Now, the programmable materials refer to materials compositions that are highly dynamic in form and function, and capabilities such as 4D printing allows companies to fully programme these materials to change shape, size, appearance and also function based on the surrounding environment or need. We see a lot of development in this space, like the Diverse Engineered Living Materials Programme, which is a pioneering programme where the living biomaterials are integrated using advanced technologies like 4D technology to create materials that will not only possess the structural integrity of traditional construction materials but will also exhibit certain dynamic properties, such as self-repair and environmental adaptability. Now, the goal of this particular programme is to create a new class of building materials that are not only cost-effective but are also sustainable and are also capable of evolving and responding to their environment. Next, the adoption of polymers has the potential to significantly reduce plastic waste and transform the material ecosystem. Now, by biopolymers we refer to polymers which are made from natural sources and include biodegradable polymers or biocompatible polymers. Biopolymers are chemically synthesised from a bio-based material or they are entirely bio-synthesised by using living organisms. The main signals that we observed here was that in 2022 the recycling landscape of plastic packaging revealed significant challenges, that is only 14% to 18% of plastic packaging was returned to a recycling system. And out of this merely 15% were effectively recycled into new products. But then we also see another significant signal that this biodegradable plastic market is expected to reach approximately $6.12 billion by 2023. As it grew (ph 03.13) from dollars, $3.2 billion in 2028, which is almost a growth of 15.1%. Now, this particular growth was mainly driven by increasing demand across various industries, particularly in packaging and consumer goods. And, and, and, this-, and this demand was basically due to the heightened environmental awareness and also regulatory support for sustainable material.

In terms of trend evolution, we see that in short-term synthetic biodegradable polymers will be increasingly recognised as vital materials when it comes to preparing medicines and also when it comes to applications such as drug delivery, tissue engineering and other biomedical devices. In the mid-term, the advancement in 4D printing and programmability of materials will, will, will transform the various industries by enabling the commercialisation of adaptive technologies and shape, shape-changing materials. And finally, in the long-term we see that the online-, ongoing research that is happening within the 4D printing and programmable material suggests that there could be smart systems in place that can automatically adapt and respond to their environments. And this will obviously lead to some breakthroughs, not only in the sectors like healthcare but also in the fields like robotics, construction and

environmental monitoring.

Captions by Verbit Go

File name: global_megatrends_-_webinar_2_-_megatrend3_-_biotechnical_intervention (240p).mp4

Moderator questions in Bold, Respondents in Regular text.

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Speaker 1: Biotechnical intervention is a technology that allows humans to manipulate nature. Now, this include technology areas such as synthetic biology, which comprises many tools for engineering organisms, be it through things like artificial DNA or gene editing. Now, the, the, the field of this particular synthetic biology is, is, is poised to have a, a, great economic impact. And it is estimated that this could generate annual revenue of £3.6 trillion, yes, that is 6-, $3.6 trillion by between 2030 and 2040. Now, this particular projection is based on a pipeline of approximately 400 potential use cases that we see here around various sectors, including healthcare, agriculture, materials and energy. Another significant trend signal was that as early as 2022 there were around 24 gene therapies which were approved globally, which includes genetically modified cell therapies. And additionally, 51 non-genetically modified cell therapies were also approved. Now, what does this signals mean? So, this marks a growing trend in the approval of innovative therapies which are aimed at treating various conditions, especially things like rare genetic diseases. Now, in terms of the trend outlook, in the short-term we'll see more and more interplay between government and GC funding to escalate and to promote the technological advancement of gene editing. Now, this collaborative approach will not only foster innovation but we also expect that this will broaden the scope of applications. Again, environmental concerns, health trends and changing consumer preferences will also lead to an increasing demand for certain plant-based and artificial, artificial proteins. And, and this is likely to lead to transformative changes in sourcing, production and marketing of artificial meat products. In the mid-term we expect the integration of technologies like artificial intelligence with synthetic biology, which is expected to accelerate the research and production process. AI will have the capability to optimise the design of synthetic DNA and streamline testing, and this will allow several researchers to evaluate thousands of genetic variations simultaneously. And this particular capability will be crucial for advancing the field and developing new biotechnological solutions in the mid-term. Finally, in the long-term the integration of new encapsulation CRISPR and 3D printing technologies are projected to significantly come together and enhance the food production system. And this particular system will address both the yield and sustainable challenges within the agriculture sector.

Captions by Verbit Go

File name: global_megatrends_-_webinar_2_-_megatrend4_-_ecotransparency (240p).mp4

Moderator questions in Bold, Respondents in Regular text.

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Speaker1: Starting with ecotransparency, this megatrend lays emphasis on sustainable practices adopted by companies, which is reflected by transparency in reporting measures, and changing consumer preferences towards brands that integrate eco-friendly practices. At a global level, we are facing aggravating environmental events, including climate change, global warming, biodiversity collapse, etc. Now, all these events are giving rise to conscious consumption, and governments across economies are becoming more stringent with sustainability reporting measures. With consumers prioritising brands involving eco-friendly practices, there's a higher transparency required from the companies. Now, we anticipate that by 2040, reporting and disclosure on environmental, social, and corporate governance practices will become mandatory, which we usually call as ESG reporting. Radical reporting sub-trend will see short-term developments that include better data gathering technologies, which will enable accurate reporting, and consumers will be able to leverage data to gain reporting insights on extent of, of the sustainable practices that are adopted by the organisations. Some companies like Klima and Good On You have developed apps to support consumer sustainability priorities, and there's Morningstar Sustainalytics, which is an example of a database with ESG-related risk scores.

Now, by 2040, it is expected that consumers will completely rely on companies that prioritise eco-friendly practices, as well as business ethics and transparency, as we just discussed, and these factors will influence consumers' purchasing decisions as well. So, there are technologies, such as blockchain, big data, AI, Internet of Things, all these are providing increased access to green credentials, as well as suggested purchasing for consumers. These advancements will make sustainable purchasing highly convenient for consumers. Now, here I'd like to mention a very interesting example. IBM introduced Food Trust blockchain platform that uses blockchain technology to improve transparency and traceability in the food supply chain. This enables consumers to access detailed information about the origin and sustainability of their food products. Now, on other note, IBM also uses AI and IoT, that is Internet of Things, for its environmental monitoring systems, which helps companies to track their carbon footprints and improve their green credentials. Globally, companies are coming together to combat climate crisis, and work towards sustainable initiatives. One of the initiatives is from Amazon, in collaboration with Global Optimism, and, they have co-founded the Climate Pledge initiative in 2019, which aims for signatories to achieve net-zero carbon emissions by 2040.

And, as you can see here, we have mentioned that within four to five years of this initiative, the number of signatories have gone beyond 500. These signatories include, just to throw some light, they include companies of diverse range, these companies are committed to regular reporting of GHG emissions,

implementing the carbonisation strategies which are aligned with Paris Agreement, and also neutralising any remaining emissions to credible offset.

Captions by Verbit Go

File name: global_megatrends_-_webinar_2_-_megatrend5_-_fragility_vs_resilience (240p).mp4

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Speaker 1: Fragility versus resilience. Within this trend, let's discuss about looming prices of species extinction and resource scarcity. But before that, let me give an overview of what do we actually mean by fragility versus resilience? The impact of environmental degradation, excessive consumerism and urbanisation due to population growth is leading to biodiversity collapse and shortage of resources. And all these issues raise the question of how far our ecosystem can hold the imbalance in biodiversity and for how long can it support the basic needs of future generations? This is what we mean by fragility versus resilience. Now, speaking of future generations, biodiversity collapse is embedded in consumer mindsets, specifically in the newer generations and as awareness and impact of this collapse is becoming greater and more acute, companies will need to focus more on sustainable practices and solutions to appeal to this growing demographic that prioritises value-based purchasing. Now, adding to declining species, there are also concerns and insecurities related to access of food, water, energy, raw materials etc. So, these also impact the ability of system to support the future generations (audio cuts out 01.47) as in the previous session, circular value chain holds higher relevance here because it is estimated that implementation of circular business models can save resources worth about $700 billion. Now, it is anticipated that in future, prevalence of malnourishment will be there, which will be caused not only by food shortages but also by sedentary lifestyles. Which will further stunt the growth of children and lead to prevalence of diseases like diabetes. Now, to combat resource scarcity the current generation needs to take action now and, as an impact of resource scarcity, in future technology innovations will happen that will help mine resources in untapped areas. And we anticipate such research and developments to take place (inaudible 02.52). Businesses, of course, businesses and regions having access to such technologies will thrive. And from a regional point of view, varying consumer perspectives will emerge either to support the less affluent nations or to oppose the same. Developed economies have already taken initiatives towards these insecurities. An example of a recent instance is of the European Commission that has set targets for mining-related critical raw material consumption in 2023. According to this act, 15% of the annual raw material consumption must be sourced through recycling. This measure, that will not only conserve the resources, but also will enhance the economic self-reliance of the nations. Overall, this trend specifies that what would be the impact of resource over exploitation, coming from the current generation, and how initiatives can be taken on national level to avoid these prices.

Captions by Verbit Go

File name: global_megatrends_-_webinar_2_-_megatrend6_-_cyberpolitical_systems (240p).mp4

Moderator questions in Bold, Respondents in Regular text.

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Speaker1: Cyber political systems. Here we will talk about how digitalisation is impacting nations at the macro level. We all know the increasing rate of digital penetration in developed, as well as emerging, nations. This has led the state of defence and governance to be controlled virtually. What this means is, that nations are prepping the potential-, prepping towards the potential future virtual war, by upgrading their technologies, and also an administrative point of view, they are embracing virtual citizenship. Now, the pros to adopting a virtual warfare system is that it offers better social control through satellite images, drones, public surveillance cameras, which are usually existing in smart cities, variable devices, and many more such technologies. The nations around the world are significantly spending to strengthen their cyber security infrastructure. We are observing that China and Russia possess capabilities of future virtual warfare, and speaking of the future outlook, in the long run, (mw 01.38) will have better access to modern technologies for virtual warfare, and this provides sufficient reason for nations to consider investing towards newer, newer technologies for training sessions. Let's say, VR and AR training programmes can be conducted to train the soldiers for new virtual war techniques. Now coming to the administrative aspect of this trend, that is virtual citizenship. Many countries nowadays are embracing virtual citizenship by implementing e-voting and e-residency programmes to reduce bureaucracy red tapes for citizens. For example, let's say, apart from Portugal, Brazil and South Africa mentioned here, Lithuania (ph 02.29) allows foreigners to apply for e-resident status for three years. Similarly, the government in Ukraine has passed the e-residents law.

These laws not only promote tourism, but also improve the business ecosystem, and enable increased inflows of FTIs. Now from the trend growth of perspective that is a timeline point of view, in the short run, countries will be seeing gradually transitioning to virtual nations where individuals will be allowed to hold dual citizenship of physical nation as well as virtual nations. And this will create potential opportunity for businesses in the mid term to offer solutions, such as digital wellbeing tools, and focused apps that can help other users maintain balance between their physical and digital worlds. To sum up, the modernisation of technologies will not need physical wars any more, and digital borders will be the new protective layer of control. On the other hand, virtual citizenship will erode social boundaries, and more and more business opportunities will be seen emerging in the regions, that are capable of implementing virtual citizenship. With this, we come to an end of discussion on megatrends. Now, I take you through various potential threats that a few of the discussed megatrends can pose in the future. Bio technical intervention, now within this trend, one of the main concern, much like data is questions that can arise at societal level, but who owns genetic information, and how should it be used? In these cases, lack of regulatory framework can give rise to unethical practices, biological warfare, and monopolisation of practices. These practices can overpower the need to address real challenges and promote (mw 04.50) goals. Therefore, the role of government is very crucial in such instances. Another area where

government's role is highly significant is towards conservation of biodiversity, and resources, which if not controlled will be able to create social unrest, and most importantly challenges related to loss of trust in government institutions will be faced.

These can be due to the failures from the governments to address the basic needs of the citizens. On the other hand-, I mean, other than this, over exploitation of resources by current (mw 05.36) and biodiversity imbalance could lead to frequent natural calamities, and there is a risk that ecosystem will become less and less capable of recovering from these disturbances. There are more reasons for citizens to be concerned in the future, mainly around the misuse of their personal information, which could be compounded by the spread of disinformation. This will further lower the credibility of the government institutions within the consumer market. In the end, these challenges are all interconnected, and create a space of heightened uncertainty, where trust in digital and political spheres will be, could be eroding.

Captions by Verbit Go

File name: global_megatrends_-_webinar_2_-_conclusion (240p).mp4

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Speaker 1: To conclude, we bring in this slide the directions on how one can take forward the learnings from this particular presentation. So, Frost & Sullivan has identified five steps to consider. The first one being identify your business challenge, that is businesses can identify their challenge by evaluating the megatrend themes which ranges across sectors like social, economic, technology, business models, and environment, and sustainability. Next is setting up a learning management framework, that is after the identification of the challenges it becomes critical to build certain mitigation strategies. And the first step would be to upskill and reskill the human resources and build a, a very robust and efficient human capital. And for this it needs to have a appropriate understanding of the futuristic macrotrends that would be impacting the businesses as well as will have the right digital competencies, then draw up a clear transformation roadmap.

So, the next step would be the integration of this megatrend literature within strategy planning to achieve business transformation. So, here what is required is that-, to shortlist and prioritise the trends, technologies, as well as business models that, that would be critical for any company to achieve the foreseen transformation. Then it's enable or integrate into an ecosystem. So, once you have the roadmap in place the next action would be to understand the position that would be-, that the organisation or institute, or any company, will hold in the new ecosystem. After-, and in order to understand that position, one needs to evaluate and integrate some of the new trends, technologies, or business models that are already being identified in the-, in the transformation roadmap step. And then finally, build, scale-, pilot, scale, and build knowledge. That is having a good knowledge base is really important before taking any critical business decisions. And in order to create one, one needs to have (mw 02.48) understanding of the future scenarios. So, Frost & Sullivan can be that partner who can assist any organisation in all of these five steps with the help of knowledge base that we have created by this Megatrends 2040 study. So, on that note, I end this presentation and I thank everybody for listening to this session.

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Moderator questions in Bold, Respondents in Regular text.

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Moderator: So, now it's time for a Q&A session with the presenters. Thank you to everyone who's already submitted a question. If you have a specific question now, please use the questions tab on your webinar control panel to send it through to us. We've got quite a few questions through today, some of them pre-submitted, and some have come through during the session this morning. So, if you're both happy, we may make a start?

Respondent 1: Yep, yeah.

Moderator: The, the first question is, what practical steps should a cluster take to collectively address the mega-trends, and can you talk about global best practice examples?

Respondent 1: So, I'll take this question, thank you for this question. So, this is a very interesting question, so, yes, the-, well, when you look into the mega-trends research work, what you see is that it is structurally designed, right? It talks about what it is happening now, and what is it going to happen in next 10 to 20 years. So, that gives a wide framework of, you know, you can see how a macro thing is getting down to a micro thing, and how it is impacting a particular business industry, or even a particular company, or even it is impacting a particular individual's life. So, in that case, what happens is that, when you have this methodology, when you have this literature in hand, you can look through the macro-to-micro approach, and you can use it in your strategic planning to understand how you can-, like, how this particular macro-trend is going to impact your industry. And, when you know that, the, you can obviously leverage these trends, you can obviously go a little deeper, find a, a micro trends, and then you can apply them in your strategic decisions, and then you can, it, it would be very easier for you to understand your business needs, and then structure your goals accordingly. So, yes, this is a very, you can say, this macro-to-micro approach, off-leveraging micro-trends, it's off-leveraging this mega-trend would be an important approach, you know, how you can leverage mega-trends in your, for your business development. Yeah.

Moderator: Okay, thank you very much for that answer. And, the next question is, what will be the defining technological trend that will shape Northern Ireland's import and export?

Respondent 2: So, there are various technologies that can be-, various technologies that can be used in the current day, for example, AI, IoT, and blockchain. But, for, going through the webinar that we have been discussing today, and the topics that we have covered, quantum computing is something that can be very

useful when it comes to trade because it allows, quantum computing is nothing, but, as compared to classical computing, it does more faster, and it gives a quick responsive, a quick responsiveness towards whatever decisions that are supposed to be made on the spot. So, basically, it'll, when it comes to supply chain and logistics, quantum computing is something that can contribute a lot to the trade, and over classical computers, it does more high speed. So, I believe that this is the technology that can be very relevant when it comes to trade import and export.

Moderator: Thank you.

Respondent 1: Yeah, I would like to add to something. Quantum computing can also be used to improve the inventory management when it comes to import and export, and trade management. So, obviously, inventory management is an area which needs a lot of attention, so this particular technology, quantum computing technology is definitely going to improve that area that is inventory management. How it is going to improve? It can enable, you know, a quick calculation of, of (mw 04.23) stock labels, based on the current market conditions, and it can also enable this real-time decision-making capability of, you know, how, how the resources would be, how the weather conditions would be, or what would be the demand, which time there would be a spike in demand. So, all these kind of changes, and all this kind of, you know, information can actually be gathered on real time through a computer, this quantum computing, and this is definitely going to improve the decision-making capability when it comes to trade management.

Moderator: Oh, great, thank you very much for both of you for answering that question. We've got another question under the mega-trend bio-technical intervention. The question is, what is the largest hurdle or bottleneck for the wide space of bio-technologies for food production and medical purpose? This will be in terms of legal, regulation issues, and technical issues, etc?

Respondent 1: Yeah, okay, yeah, thank you for this question. So, yeah, this is a very important part, I would say, when talking about the challenges. Like, when you talk about technology advancement, you, you need to look into these possible challenges around it as well. So, when it comes to the wide use of bio-technologies, especially for food production and, and medical purposes, so one of the biggest hurdle that we kind of have identified through our research is definitely the strict regulations, like the lengthy approval processes for, you know, for these genetically modified organisms, and other bio-technological innovations. This, this time taking approvals, this strict regulations, these definitely lead to a delay in implementation. One example that comes to my mind right now is genetically modified rice, that is golden rice, which has the capability to produce a certain, you can say, a certain alternative of vitamin A, and, and it actually helps in combatting the vitamin A deficiency, especially in the developing countries. So, this particular genetically modified portion of rice had to face prolonged regulatory hurdles before it became-, before it was actually allowed to become commercial in countries like Philippines. And, because of its-, the main reason, reason being was the safety concerns, and the ethical concern associated with it.

Similarly, there are certain gene therapies that we have seen in the past which had-, which had to undergo

a very extensive scrutiny by regulatory bodies, like (inaudible 07.21) before they actually get approval. One such example is (inaudible 07.27), which was-, which is used for treating certain genetic disorders and also all cancer, some cancer, and it's also used for sometimes cancer treatment. So, yes, the strict, strict regulations, and this lengthy approval process is one hurdle. Second is that there are certain, you can say, necessary elements being tied up to, when it comes to bio-technically, technologically modified foods. First is that you need to ensure the transparency and proper labelling of bio-technologically modified foods and medical products so that you're not-, there is-, so there is a trust among consumers, and consumers have a very informed, kind of, and have the full information about what they are actually consuming. And then, of course, there is a, a huge cost associated with the R&D of these kind of products, which is usually very high, so that is something which needs to be understood before actually investing into these kind of bio-technically modified food. And, coming to the second part of the question that can we expect this kind of regulation to be, or, or the kind of subsidy from the government?

So, yes, we do see some kind of ease of regulation, and some kind of subsidies in form of tax incentives right now, but that is at the very, very early general prospective (ph 09.00), and at the very, very-, like, it's not that widespread right now. But, yes, in future, we, kind of, we can see certain form of tax incentives from the government coming in, or there will be some grants, or research funding, also, that will be available from the public entities. Yeah, we can expect some kind of government subsidy for this bio-technologically modified food and medical products research and development.

Moderator: Great, thank you very much for that answer. I think we have one more question.

Respondent 1: Okay.

Moderator: The question is, is there a movement towards global standardisation of calculation of environmental impact when a customer releases (ph 09.46) products regarding industrial equipment?

Respondent 1: Okay, so, global standardisation, okay, that's, that's what, can you just repeat it once?

Moderator: Yeah. Is there a movement towards global standardisation of calculation of environmental impact?

Respondent 1: Yeah.

Moderator: (audio distorts 10.06) products regarding industrial equipment?

Respondent 1: Yep, okay, yeah, thank you, thank you for this question. So, yeah, yes, we see a lot of

global standards that are already being set for calculating the environmental impact, because when sustainability is at priority for many industries right now, so there are a lot of global standards that are already functional. So, we see a lot of ISO standards that we see, like we see a typical mark being put on any product, like ISO 14001, ISO 14067. So, these are the, you can say, the global standards that are actually set for calculating the environmental impact. So, I'll just name some of them which comes to my mind. So, there is something like ISO 14001, so this is something which is a universal environmental management system, and it basically focuses on, you know, improvement of environmental performance of a, a particular product. Then, there is ISO 50001 which is a standardised environmental framework, structured framework for organisations to manage their energy efficiency. Now, the aim of this standard was to improve the energy performance of industries through, you know, strategical systematic energy management practices. Then, we also have certain regulations like product carbon footprint, yeah, which is also a, a, a metric which is used to quantify the total greenhouse gas emissions. And then, we also have certain guidelines from industrial entities like the steel world association, which provides very comprehensive guidelines in order to, you know, promote sustainability and sustainable best practices within this key industry.

Then, we also have International Council on Mining and Metals. Now, this particular organisation is, again, dedicated to enhance the sustainable development within the mining and metal industry. So, yeah, these are some of the renowned, you know, you can say, guidelines and ISO standards that is coming to my mind right now. So, all these movements are already in place, and they are actually impacting the environmental sustainability part of how customers are using products, and how custom, our products are being developed, and also how industries are actually looking into the sustainability aspect right now.

Moderator: Great, thank you very much for that. So, okay, I think it's, thank you to both our speakers for answering those questions. I think we have to conclude the session now. I hope you've found it very beneficial to our audience and the businesses who are with us today. I'd very much like to thank both our speakers for presenting today, and for being put on the spot for those questions. We tried to get through as many questions as we could. If you weren't able to ask your questions today, we'll provide an answer to, via email, to (audio distorts 13.27). To receive business updates, if you haven't already, please sign up to our email newsletter on nibusinessinfo.co.uk. Also, please do keep an eye on the Invest NI website where you can register for all forthcoming events and webinars. So, that's it for today's session, so thank you for all (audio distorts 13.47) today, and I hope you all have a nice day. Thank you.

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