For UN IGF recognized Dynamic Coalition on Data Driven Health Technologies Collection 2021, Health Matters, Technologies Driving Change in Health Care, A Community of Thought

Opinion Pieces from Amali De Silva - Mitchell

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Cloud Technology & Its Impacts For Healthcare Technologies On The Internet

By Amali De Silva-Mitchell

Due to the cost effectiveness and ease of day-to-day operations management of Cloud Technologies, entities both small and large, such as Labs, General Practices, Hospitals and Ministries of Healthcare are moving away from traditional in-house server hosting to this technology for their needs. Infrastructure supports such as security, as well as the distributing and democratization potential of Cloud Technology make it very supportive for users in multiple ways. Hospitals for instance can move away from expensive 24/7 Information Technology teams and outsource the whole technology and connectivity operation to a service provider. Just as SaaS Software as a Service became universal to business and home, CaaS Cloud as a Service; BaaS Back-End as a Service, DaaS Data as a Service, DRaaS Disaster Recovery as a Service have the potential for global reach and are expected to expand fast.

Specialist technology companies can provide a customized niche service and maintain it to the highest standards in a cost-effective manner, however, there will be long term dependencies on these service providers with additional costs along the way, which can especially be an issue for legacy systems. Use of the platform providers ability to reach geographically across a continent or continents in a secure manner, with almost zero downtime is an advantage from the perspective of providing 24/7 care. Networks and their interoperability issues can be taken care of by the CaaS provider as additional services.

The Internet of Things accompanied with AlaaS, Artificial Intelligence as a Service and using CaaS, BaaS, DaaS, DRaaS et al. (1), can customize patient care in a very specific and detailed manner and the patient can be serviced real time at their own personal location through the internet and wireless technologies. Typical updates to technologies can be managed by the cloud service provider and rolled across their service line and the general practice or hospital does not have to have a specialist department to take care of these matters, especially if the functionality or security service is for all customers. Of course, there is customization of the service by each client, of the service, to make it their own brand, as the healthcare provider is also providing a unique service. Economies of scale can also be achieved for similar functions provided to multiple entities across geographical areas.

The impact for telemedicine can be enormous with patients receiving standard services of excellence over wide geographical regions or even internationally. Research data hubs and statistics hubs can be maintained and accessed with ease for collaboration and partnership, including P3 public, private partnerships. However, with these advantages and conveniences, the issues of data protection and sharing, privacy, security and so forth do not recede. If there are advantages for isolation, they are lost but can be maintained independently. Common standards achieved by off the shelf applications can lose their effectiveness but can be customized at a charge.

Bundling of services however, could be cost effective on CaaS and there is potential for a platform provider to not only bundle healthcare services but perhaps even bundle rural agricultural services et al. for instance and with supply chain features. This packaging together for cost effectiveness across sectors could make financial investment support for extension of networks by CaaS suppliers a reality, as this will increase their user base and geographical reach, making it a profitable business endeavor for CaaS to invest in networks. The cloud has the ability to enable the connectivity to the last mile (2) to be achieved far faster, and with the support of satellite technology, timely health care for All, through the use of ICTs could become a reality for 2030 and meet the UN Sustainable Development Goals.

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Quantum's Impact On The Culture of Technology For Healthcare On The Internet

By Amali De Silva-Mitchell

Quantum technology has been with us as a concept for decades. Einstein said of quantum that it had a "spooky" side to it when he spoke of quantum entanglement. But that feature is what makes quantum very interesting for the future and what it can potentially impact in healthcare. The care of the person, is physical, mental and spiritual, and quantum permeates all three spaces, something never invaded together by a technology before!

Quantum is breaking the common understanding of the natural laws of science, and right now this is only a beginning. What we have taken for granted is being uprooted daily by developments all around the world in a proliferation of laboratory research taking place at breath-taking speed. Not only will it speed-up the common systems and applications but is will be able to cope with increasingly greater values of data within data bases and the like. This makes the computational power of Artificial Intelligence for instance much greater than was initially envisaged. But also the actual manner of Quantum methodologies will change the very assumptions of physics leading to outcomes that were not previously envisaged. So what does this mean for healthcare?

Oceans of Data The New Paradigm

Vast amounts of data in a variety of forms will be collected, stored, analyzed and shared. Like an Ocean there will be sections that will shift to the bottom and out of sight to be regenerated and crashed to the lands edge as it were, in reporting out for a purpose. Will the data be fit for purpose? Was the data collected for purpose, sorted and analyzed as such? Was bias removed and errors minimized? What will optimization look like and what will the physical controls on the data and reporting look like. It would be risky to trust innocently outputs that complex algorithms generate and an open mind is always a must. Fast backup services.

Healthcare Patient Privacy & Security:

There is an expectation that with block-chain, patient records are going to be more secure for the future. However, it is noted that unless quantum encryption itself i.e., Quantum Key Distribution QKD and Secret Sharing, which is very sophisticated is used, these traditional securities could be invaded and disabled by algorithms working with Quantum Technologies at different layers such as at the control, management or service levels of infra-structure. Genome data for instance is already protected under these technologies in certain facilities and are useful in data transfer as well. QSaaS quantum security as a service. 5G and beyond user privacy is highlighted and Q can be very supportive.

Brainwave Readings:

This is an area that Quantum Technology is going to prove to be very supportive of supporting the needs of serious disabled citizens to gain the power of speech, mobility and perhaps even sight in to the future/ The manner in which light and energy from the brain in addition to traditional sound wave signals will have the opportunity to be analyzed in more complex situations.

Holograms:

Currently used in education, brain scanning for surgical application and also for tele-presence will have the opportunity to have enormous sources of data and power to make this technology more readily available. Intelligent seals using QKDs

Telemedicine and Diagnostics:
This will be made available even in out of space or perhaps even on the moon on another planet for the future. Quantum entanglement may mean that medical procedures on planet earth could be enacted in out of space let alone in rural communities on our very own planet earth.

Robotics & Transport System:
Quantum technology will be able to power more powerful robots but also may in to the future be able to use the powers of Quantum Entanglement to make operations such as remote surgery more effective and hosted at a distance that is even situatable for out of planet travel and stay. Autonomous vehicles are already being equipped with quantum key technology and will include medically equipped vehicles.

Drug Development & Climate Impacts on Health, Nutrition and Wellbeing:
The opportunity to fast-track drug research in times of global pandemics as we are currently experiencing, using the computing power and novel denominations of Quantum Computing and sensing is very helpful for society. Patient unique developmental drugs could also be developed faster. Secure Quantum Computing with Privacy Preservation and Distributed Quantum Computing could be very useful for collaborating on drug development in general on a global level.

Connectivity & Interconnectivity:
The power of the quantum computer is defined by its internal design connectivity design for qubits. This will also extend to the networks that will develop around it. The internet and internet of things / industrial control systems issues + issues will be for interoperability, data transmission and so forth. It would be beneficial while planning infrastructure in the now to look forward 20 or 30 years with emerging technologies so that legacy systems that we have now can be replaced appropriately with a vision in mind. Connecting with Stallelite systems through optical fiber networks and Quantum and simulated services and internationally to ranges up to 2500km right now QKD

All Things Nano:
Technology in its physical size is trending smaller for energy, storage and ease of incorporation within applications as well as intelligent. Quantum Computers will probably become desktop applications a few decades from now if not sooner. This means the power in the hands of the average citizen is going to increase exponentially and this has many implications. For medical devices with incredible power and operations could be implanted further in to the human body to provide monitoring and support. High sensitivity sensing and network clock synchronization / Quantum-enabled 6G technology will provide enhanced visual services.

Impact on Community:
New and emerging technologies uptake can be limited with the elderly, disabled, and groups who have not been exposed to the technology or who are at an age that they cannot take up the technology quickly. Children as always can be innocent about the technology. These groups must be protected through education, in build design and trust standards. Application Design issues and standards.

Future:
At this stage of Quantum Technology Development and assimilation in to main stream society through applications and systems, as for Artificial Intelligence or Machine Learning the future is full of opportunity marred by pot-holes in the areas of ethics, human rights, security, data protection or sharing, equity, access, bias and error, connectivity, responsible design, and so forth. This means that public discussion on the impacts, risks, gaps, harms, opportunities, benefits of Quantum Technology for Healthcare is a must. Discussion is critical for a technology that is going to change our norms significantly and shape our future cultural values. A balanced world is a world that can have access to Quantum Technologies equally either through the for instance a quantum secure cloud or other device or service, otherwise inequities will arise that could be dis-functional in the long-term.

A laisez-faire attitude could lead to undesirable outcomes. To unentangle a myriad of spiders webs already in place is harder and costlier than to spin a super web by design. To harness the full potential for the opportunities that could be available and effectively used for health care, there is a need to collaborate globally, through research, data and information sharing, testing of drugs and trials, opensource, portals, wikis, standard setting , best practice and other forms of collaboration and education.

First, we will encounter hybrid systems including hybrid internet systems and then we will see pure quantum internet for the future unless upstarted by yet another revolutionary technology! The technology is being developed in silos and hence there is a lack of standardization or harmonization across this newly emerging industry. There is a need for medical technologists to be part of the process so that a common understanding of terms and values for a culture of quantum technology for medical applications exist and which can be applied internationally for collaboration. Quantum Technology in itself when applied to medical science such as for brain wave transmissions means that the properties itself of the science must have a common understanding across the disciplines. Definitions by language may be difficult to establish while concepts or understanding easier to establish. Universal access to this technology that are compatible with current standards including material standards for components is a must.

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The Role of Statistics In Healthcare, A Dependency For The Future
By Amali De Silva-Mitchell

Statistics was conceived a thousand years ago, and the modern mathematical field of statistics came in to being in the late 19th century. Some of the earliest of this work centered on an interest in understanding human characteristics such as height and weight (Galton,F (1877) "Typical Laws of Heredity" Nature 15(388) 492-553). The pioneers Galton with Pearson founded Biometrika which was the first journal of Biostatistics. Today statistics is key to analyzing quality health care service delivery. It is also critical in the development of drugs and especially in the testing phase on humans and in other medical technologies and in to the future with Quantum Technology applications in to healthcare. It is vital in the management of public health during crises as we have witnessed over the course of the past 18 months with the Covid-19 Pandemic.

Statistics speaks a common language to a number of stake-holders in the ehealth and mhealth space. Namely the computer programmers, the medical researchers, the pharmaceutical companies, the doctors, the financiers and accountants, the data managers, the public health economists involved in the allocation of resources amongst others including infrastructure builders, services providers, insurance companies, transport and logistics providers to name a few. As a result, the evidence-based values provide tangible outputs for performance measurement, acceptance and understanding across this multi-stakeholder group. This allows for betterment for healthcare through ehealth.

Statistics forms the basis for inference for the new technologies such as machine learning and artificial intelligence. which are being rapidly taken up for health care applications on the internet and for the internet of things. Emerging technologies that are imminent such as Quantum technologies, are also founded in the use of statistical inferences for its core functionality. With regards to data management and health information science, statistics is are the core of these functions. As such the study and future development of the body of knowledge of statistics is key. to the success of data driven health technologies for the future.

The Age of Telehealth, Internet A Partner For Resilient Economies

By Amali De Silva-Mitchell

The word "tele" refers "to at a distance" and from Greek it means "far off" (2). The delivery of medical services from a distance, or telehealth or ehealth (electronic health) and mhealth (mobile health) came of age, world-wide, and during the Corvid-19 pandemic of 2020. Such an infectious virus meant that health practitioners had to be protected immediately, for themselves as well as to protect public health. Fortunately, forward thinking medical services had already embraced telehealth during the decade 2010-2020 and the opportunities to service remote populations through telehealth had become a mandate in some jurisdictions. In 2020 what was originally envisaged as a service for rural communities, or after office hours support became a universal service for urban communities. Even veterinary services were being carried out remotely!

There are a variety of issues that constrain the performance of the computer networks that can also then impact the performance of the devices that are used to access the internet or that is used to provide service. The quality of the internet impacts the sophistication and range of healthcare that can be provided to the public. The quality of the internet became a defining factor. for a how successful telemedicine could be. Some telemedicine services are being carried over the telephone, where internet connectivity has not reached the last mile or is of poor or limited quality. Mobile phone telehealth is more sophisticated than analog telephone supported health care. Using dial up telephone to access the internet is also a manner for connecting for telehealth. Quality of service or QoS, is the collection of features that define the overall performance of the internet services provided and received by the customer and is imperative for effective e/m health care.

Providers of medical services, find the cost savings of providing telehealth can range from increased number of patients serviced, reducing costs of space at medical facilities, increasing the contact ratios of doctors to patients, faster administration times, increase in hours of operation to 24/7 and so forth. This benefits the population as a whole, as attentive healthcare becomes universally achievable as a model. Preventative health care also has tremendous opportunities though the ease and speed of trusted health information to communities and individuals. Patient specific support through monitoring can be provided by wearables and other medical devices. The patient and the health practitioner can be at a distance so that specialist consultations which may only be available in urban areas can now be available everywhere, allowing for equal access to health care services.

Telemedicine is getting to be more sophisticated and this is evidenced not only at the diagnostic level but also in surgery at a distance, robotic surgery which is called telesurgery. This idea had been worked upon since the 1970s in the United States as a tool for supporting astronauts in space. Others have developed technologies to be used under-water. New technologies such as holograms are also being used for diagnosis as well to train doctors and other medical staff at a distance using the internet.

However, one issue is evident. Not all the worlds' citizens have equal access to internet nor equal access to quality internet services and devices. Affordability is an issue at the individual internet user level and the cost of financing at the internet service provider level. To provide universal health care and meet the United Nations Sustainable Development Goal Number Three of Health and Well-Being for All, there is an imminent need to improve the access and quality of internet provided globally to all citizens of the planet. In this endeavor all countries, organizations and persons should partner to provide the necessary

infra-structure required through knowledge sharing, financing and perhaps the re-purposing of technology to overcome the Digital Health Gap and enable the Global UN SDG #3 Goal of Health Care For All. A healthy society is a resilient society and a resourceful and economically strong society.

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The United Nations Sendai Framework, Risk Management Considerations For Mobile and E-Health Initiatives on the Internet

By: Amali De Silva-Mitchell

The United Nations Sendai Framework For Disaster Risk Reduction was adopted by the UN General Assembly in June 2015. The need for the new framework has an emphasis on disaster risk reduction, by management of risk ex-ante, rather than the disaster itself, ex-post so as to achieve the 2030 United Nations Sustainable Development Goals. This approach has implications for health care management in times of crisis. Prevention, preparedness, response, and recovery with an all-hazards risk mitigation approach are key features of the framework for healthcare service provision for business continuity and resiliency for large and small entities including associated service providers to the healthcare sector.

With regards to the use of technology, the Sendai Framework document explicitly states the following (3).

> *Innovation and technology (para 25i): "Enhance access to and support for innovation and technology as well as in long-term, multihazard and solution-driven research and development in disaster risk management."People-centered early warning, communication and technological systems (para 33b): "Invest in, develop, maintain and strengthen people-centred multi-hazard, multisectoral forecasting and early warning systems, disaster risk and emergency communications mechanisms, social technologies and hazard monitoring telecommunications systems. Develop such systems through a participatory process. " Training (para 33f): "Train existing workforce and voluntary workers in disaster response and strengthen technical and logistical capacities to ensure better response in emergencies."*
> *Health data (para 33n): "Establish a mechanism of case registry and a database of mortality caused by disaster in order to improve the prevention of morbidity and mortality.*

With the Corvid 19 Global Health Pandemic, international floods and fire, earthquakes, tsunamis to name but a few of the catastrophes that have impacted the world in recent times, we have had to pull together quickly for disaster relief efforts for all segments of society in all geo-graphic areas. Geo-political instabilities have also caused crisis situations and impacts of Climate Change are expected to become more frequent and prevalent in the decade to come. The Pandemic impacted the world with no warning and 2 years later we are still withering its effects while each country deals with its new wave or upsurge. Each wave gets treated with the new information and knowledge learnt from the previous wave and from international collaboration. Putting down good foundations for warning or alert systems, monitoring and analysis can either prevent or mitigate the crisis situation. Hence, the importance for countries to work together to implement a Sendai Framework for managing health care as a crisis, as an outcome of a crisis, as a support for a crisis, as preventative measures etc. is important.

The Sendai Framework sets out four specific priorities for action (3):

1) Understanding disaster risk
2) Strengthening disaster risk governance to manage disaster risk
3) Investing in disaster risk reduction for resilience
4) Enhancing disaster preparedness for effective response and to Build Back Better in recovery, rehabilitation and reconstruction

In the health care spaces the Sendai Framework can be applied very broadly across the board from a non-clinical and clinical perspective, to public health and the issues that then permeate in to overall economic resilience. Technology applications in health care take time to plan, finance, implement, test and deliver and as such a good head start is the best starting point for mitigating the risks of no health care, in times of crisis. Building a common knowledge base, understanding and comfort level amongst stakeholder who come together in times of crisis prior to events occurring, can assist with smooth and fast roll-out of medical support and lost time, when disasters

occur. Of course, all disasters cannot be predicted but, common approached can be developed and support, back-up, preventative and crisis systems put in place.

We first need to understand the risk. The worlds future is increasingly unpredictable and learning from one another can be of tremendous benefit. The World Health Organization, the International Telecommunications Union and other UN Agencies and forums such as UN DESA IGF are bodies that strive to bring diverse groups of stakeholders together to share and collaborate on technologies for Global Good. The ITU and WHO have initiated the Focus Group on Artificial Intelligence (AI) for Health and the risk management process of AI itself has been proposed by the European Union for example.

Examples where risk management can be applied are to supply chains of products including drugs and their manufacture, research and development; food supply chains for healthy nutrition and elimination of hunger; insurance claims; drug research and development and collaboration; safe housing for wellness; education and training for staff and citizens alike, telemedicine and access to thereof; patents for drugs, copyrights on resources and other data and intellectual property sharing, hospital capacity, mobile and wireless technology, robotics, wearables and personal monitors, assisted health devices, measurement devices and sensors, patient records management with block chain.

Other social technology application issues are risks such as the elderly not being able to access technology that provides health services or children at risk, or income disadvantaged at risk. Here the actually onboarding of citizens is critical. As important it is to manage as the physical or communications technology devices, work that has been developed by ITU. The management of data itself is taking on a dimension that is unique and that is of its own.

Quality data that is Useful; Available; Transparent; Consistent; Accurate; Relevant; Verifiable; Complete; Timely; Accessible and so forth is critical. Increasingly data silos are being broken down and oceans of data are being created. Like any ocean there is drag, froth and bubble and at the shore line which could be called the reporting line the data can only be a part of the whole data set, influenced by many factors that as it were drive it to shore. Leaving reporting only in the hands of automated devices are to be questioned for bias, errors, standardization and of formats and other issues such as the need for ethical algorithms by design:

Privacy and data sharing has come of age. Also, the new data sets created through machine learning and data inferences created by Artificial Intelligence and issues of biased data etc. are all now prevalent as well as data sovereignty and choices for the data consumer as well as the need for knowledge for the data consumers and protections and securities.

Investments in telemedicine and mobile technology for health care were well returned during the Covid-19 pandemic, when most countries embraced these technologies as much as was available. Lack of inter-operability or internet connections and affordability hampered an almost universal uptake which would have been the ideal standard. Health services were able to be more effective with general medical practices opting to serve customers in the same manner in the new normal with increases in productivity and perhaps profitability for private enterprises.

Actual medical device development and drug development are typically demand driven within the private sector. Public health services are also supported in some countries by the private sector. However, ehealth access through communication networks has been predominantly commercially driven and city or large user, metropolitan focused but the Corvid 19 pandemic highlighted the need for Equal Affordable Access for all citizens. Hence for the future there is an imminent need for public support either through innovative public funding or state funding.

The used of technologies such as satellites to support the surface or local area wireless networks is essential as large-scale natural disasters could leave these traditional forms of internet connectivity at risk. Having parallel

forms of network support would be a strong form of preparedness for times of predicament. Collaborating with neighbors whether locally or nationally such as for land locked countries or island states is becoming essential and the support of the international community to facilitate such projects important.

There is an opportunity that one country or community's ehealth or mobile health waste could be another community's opportunity to leverage that technology as a stepping stone to betterment of their existing health systems. Non-governmental organizations could provide a very helpful role in facilitating this technology transfer with the associated knowledge transfer that will ensue.

The worlds future is increasingly unpredictable and learning from one another can be of tremendous benefit. The UN IGF recognized Dynamic Coalition on Data Driven Health Technologies provides a space where international collaborations between stakeholders in the technology health care space can come together and exchange values, ideas, norms, issues of risk, approaches for betterment, gap analysis and so forth so as to mitigate the risks that

For global level crisis it is however, important the the international community collaborates at the highest levels to prepare for disasters, manage disasters and then support the move to long term economic resiliency. A special focus group at the High-Level Panel on Internet Governance at the Internet Governance Forum could take on this role and be a champion for its development internationally vis a vis the use of technology in health care for the support of disaster relief efforts with a motivation to support betterment of existing day to day health care technology systems. This applies to ehealth as well as to mhealth applications.

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Plato's Modern Artificial Intelligence Humanist Society

By Amali De Silva-Mitchell

Abstract: Civilization is at the visible stage of a crescendo of change created due to the merger of human actions and technology, both in tangible and intangible forms. Artificial Intelligence (AI) is going to fracture the way people manage, control, impact and govern society. However, Plato's "classes" can still remain a classic, analytical framework, for a peaceful, global society. Plato's, workers (individuals and businesses), guardians (national defense, police, legal frameworks and security including internet, UN Security Council, Internet Governance Forum) and Ruler (government, third sector, United Nations, royalty and theological philosophers) classes will be populated by humans and AI alike. Human peace with AI will only be vested if there is a recognition of an additional "wrap class" of a knowledge and information collective of human consciousness, not restricted to religion or rational expectations theory but alive and adapting, through perhaps a pure democracy class governance model. This class of human mentality will be the ultimate decision makers of global society, monitoring and advancing the human existence in collaboration with the AI algorithm, at a time when man is destined to be equated with machine. Is there a glass ceiling for AI? Civilization is at a defining point in history.

Advances in AI technology have been fast and slow over the past few decades, driven by the interests of individuals, governments and corporations, rather than by a systematic globally inclusive plan. As AI becomes more prevalent, less research or hobby oriented, and primarily profit motivated, we are at a time where coordination of AI development efforts is required. The internet itself showed such a development in the 1990s and the first United Nations (UN) coordination of global multi-stake-holder effort began in 2002 with the first prepatory conference for the UN World Summit on the Information Society (WSIS). This summit, whose focus was on internet and communication technologies, allowed all stakeholder groups to participate in a significant manner and continues to encourage the participation, of the third sector, businesses and individuals with government in real terms annually, through the global Internet Governance Forums. It set a precedent for remote participation in UN conferences for those without the financial means to do so. It was a Summit with access for all for input from all. Recently the UN Summit on AI for Good was convened to similarly now develop the multi-stakeholder dialogue around the issue of use of AI for meeting the UN Sustainable Development Goals (SDGs).

But is AI just the next industrial revolution 4+1 to the Internet of Things (IoT)? Is it just part of the UN WSIS mandate for the future (Reference: https://cyber.harvard.edu/wsis/DeSilva.html)? Will there be confusion with dealing with AI activities out of the UN WSIS IGF forum? Can AI international development be managed by just another international institution such as the International Telecommunications Union (ITU) or only by ITU itself? There are a lot of questions to be addressed and a lot of planning work to be carried out soon, for smooth transition in to an AI dominated Information Society (AIIS). The Information Society (IS) was seen as developing with a Knowledge Society (KS) to create an Informed Society (InS) and now we are the crest of a tsunami that will use IS, KS and InS with Internet Of Things (IoT) and AI to create an AIIS society.

Although human society has developed its sophistication over thousands of years, some of the old Eastern and Western philosophers still have something to contribute, with regards to the evolving AI Society where AI can have a conversation with humans, not predicted even a few hundred years ago. Socrates, an ancient philosopher of the Western world, would probably have said that AI was only second best to the human mind, as it was based on sources of information from secondary sources. He would probably also say that machine created inferences, based on algorithms created from established beliefs, values and norms was good, but not as good as a human's who was in the source creator of these very same beliefs, norms and values. Confucius said that "ritual" was good for society. In the present-day, algorithms could be considered the next family of rituals. But should these algorithms, once established in regular life or become common place be considered the law that drives human existence, where a human deviation from the standardized practice be considered unlawful rather than a creative human action?

The Buddha talked about the path to the cessation of suffering, which involved steps such as; recognition that suffering actually exists; understanding the obstacles for happiness or that which creates suffering; and recognizes the need to get rid of suffering to reach human bliss. The AI tools to end global suffering / poverty by following the path of Sustainable Development Goals (SDGs) has been proposed by the UN Summit on AI for Good, so as to reach a happy economic society (Richard Layard). Karma, the ancient Hindu understanding of the world of cause and effect would also be rationalized within this process of the use of AI learning tools for good. An AI society has the potential to induce a near nirvana state, for all humans.

Philosophers such as Kant argued that as mind shapes and structures experiences, there are then common structures in human experience.

We see this type of analysis in the pattern building profiles common in computer science work in algorithms today. In the present day, we could say that Kant is validating the use of algorithms in the creation of artificial intelligent beings. Modern economists for Game Theory provide "the study of mathematical models of conflict and cooperation between intelligent rational decisionmakers. Game theory is mainly used in economics, political science, and psychology, as well as logic, computer science and biology. Originally, it addressed zero-sum games, in which one person's gains result in losses for the other participants. Today, game theory applies to a wide range of behavioral relations, and is now an umbrella term for the science of logical decision making in humans, animals, and computers." (Wikipedia authors collective (2)).

Where, however, will the adaptive leaning AI algorithms take us with respect to winners and losers in society? Modern economic information theorists such as Eugene Fama "in the May 1970 issue of the Journal of Finance, entitled "Efficient Capital Markets: A Review of Theory and Empirical Work," proposed two concepts that have been used on efficient markets ever since. First, Fama proposed three types of efficiency: (i) strong-form; (ii) semi-strong form; and (iii) weak efficiency. They are explained in the context of what information sets are factored in price trend. In weak form efficiency, the information set is just historical prices, which can be predicted from historical price trend; thus, it is impossible to profit from it. Semi-strong form requires that all public information is reflected in prices already, such as companies' announcements or annual earnings figures. Finally, the strong-form concerns all information sets, including private information, are incorporated in price trend; it states no monopolistic information can entail profits, in other words, insider trading cannot make a profit in the strong-form market efficiency world. Second, Fama demonstrated that the notion of market efficiency could not be rejected without an accompanying rejection of the model of market equilibrium" (2). Will we see AI applications based on the three forms of information content available to the AI developer? What will be societies standards for information sourcing learning algorithms?

In the 2000s the UN Millennium Development Goals (MDGs) and now recently the UN SDGs provided frameworks and guiding principles for society's social responsibility including corporate and citizen responsibility. In the internet sphere the Internet Governance Forum (IGF) continues in real time to provide a platform for development of the everevolving global internet and communications technology platform. AI is part of that overall sphere although now carving out its own distinct eco-space. The SDGs for the first time talks of the sustainability of the human life, the recognition that there is an opportunity that the world as we know it, can be lost, if we don't manage it or control it. Society is at a point where all the risk management tools will have to be utilized in full and developed further, to enable human life, due to changes in climate, over population, new diseases, political strife, income inequality and the unknow to name a few issues. Like the education of a child to adult, any product or service goes through the common product life cycle. There are stages and steps, where the product is fledgling and controllable and then in maturity it has the potential to become complex, self-sustaining and a creator of its own environment, when once it was part of some other environment. This is where we are at with AI. We are out of the research lab in to commercial production and it is starting to have a form of its own independence apart from the regular internet and regular industrial robots (mechanical nonAI), which were simply seen as enhancing connectivity, productivity and easing work tasks.

But AI is more sophisticated, it is about the application developing itself by machine learning, developing complex inferences and creating the ultimate fear, that it will itself take "life". AI is now rapidly becoming a whole box of complex technological "self-living" applications and robots. What is self? The online free dictionary states the following; "a person's essential being that distinguishes them from others, especially considered as the object of introspection or reflexive action. A person's particular nature or personality; the qualities that make a person individual or unique; the essential qualities distinguishing one person from another. The ego. One's own interests, welfare, or advantage. thinking of self alone." All these attributes and features are now commonly seen in AI applications and especially robots. Robots can be seen as gaining a sense of "self". The Oxford on-line dictionaries (1) define "life" as follows: "the condition that distinguishes animals and plants from inorganic matter, including the capacity for growth, reproduction, functional activity, and continual change preceding death". With AI robots, life still continues to be inorganic, but they have the capacity to replicate, to continually change (series of lives) and die by disposal or malfunction. It can be seen that the robot would non-exist or die in spirit but leave perhaps a legacy of information which will enable the owner / designer to sire (creator) a new model. AI robots, will increasingly become part of the way of life of humans, integrating fully into society as nurse robots, as warehouse hands etc. Life's attributes such as "vitality, vigor, or energy (1)" is perhaps where the human existence is pressured by solar energy powered robots. Are robots becoming organic like a plant using renewable energy to come alive? Is society about to deal

with Pandora's box? People are debating AI robots as being living entities with rights as a person. Yes, the robot shows vigor of action, but at this time it is not different from a train travelling at full speed, which we would not consider as having a life, but rather having a life as a "term" of usage.

Do we call a seed living, or does it have the potential for life if given the correct environment? Should we fear the seeds existence in the present or in the future? Should we call the algorithms living, that give life to the AI application? Are these algorithms to be feared, like a section of DNA that gives rise to human congenital disease or is it their actual application from the designer to be feared more? Should the acronym for AI be Ai (lower case) where the "i" is still indicates machine intelligence with human control? Isn't our real fear that AI robots are becoming "self-living" entities, rather than that they have artificial intelligence itself? AI when broken in to its component words deliver the following meanings: 4 Artificial is defined as "not naturally occurring, insincere or affected (1)". Interesting that the "intent" of a non-original action could be an issue. The owner or the designer of the robot is then the person with the intent, not the AI application until it exerts adaptive learning techniques. Intelligent is defined as" to be clever · bright · brilliant · quick-witted · quick on the uptake · smart · canny · astute · intuitive · insightful · perceptive · perspicacious · discerning · knowledgeable · able · gifted. (1) "These are definitely the qualities of an AI robot that the developers are after, and perceived as the qualities closest to human attributes. But it does not indicate that AI is actually living! AI still seems to refer to computer applications that are designed by humans. However, we are now embarking on a new era of machine learning. Should the term now be "self-living" entity applications? Those definitions already mentioned however, don't talk about the attributes of being human, which are centered around emotion, which the online free dictionary states as "a mental state that arises spontaneously, rather than through conscious effort and is often accompanied by physiological changes". The emerging fear is that with big data systems, AI will be able to emulate emotion.

The concept of a "self-living" inorganic entity is now a reality. So, then what will be the advantages of the artificial, self-living being (service, product etc.) over humans? Will humans retain the exclusive right to the higher states of being such as nirvana? This state "in Buddhism (1), a transcendent state in which there is neither suffering, desire, nor sense of self, and the subject is released from the effects of karma and the cycle of death and rebirth, represents the final goal of Buddhism" Will it be that AI reaches human capabilities of self-living first, before humans get to grips with their own perfect behavior? Do humans want to create AI, as this may be the closest, we get to a nirvana state living on earth? It is almost as if the being that we are creating is going to experience human type bliss, before we do it as humans. Are we humans going to be jealous of AI? Given these definitions and issues and how they can be interpreted, there are a long list of benefits of AI, such as increased productivity, tools for complex and remote decision making, value added to human functions, doing complex actions in difficult to reach places etc. But there is also the development of the so-called dark side of AI, of hazardous, dangerous AI with no social benefit etc. It's about the traditional tussles between night and day or Aniket and Darth Vader, who were two sides of the same family in the Star Wars movies. As always, it is the worries or concerns of new concepts that have the potential to impact society force-fully. Some of these concerns are; the role and development of ethics, data, algorithm and ownership transparency, accountability, fairness and equity, accessibility, governance, delivery, ownership, auditability, relevance, corrections, misconceptions and misrepresentation, fraud, safety, compassion, tolerance, residual uncertainty, standards of conformance, legal rights and treaties, control and dictatorship, privacy, citizenship, e-waste, care, freedoms, freedom of expression, trust etc.

A serious concern is how our now finely connected by IoT, relatively stable and homogeneous world can be cushioned from impacts of wide or sudden societal change due to new AI applications. There is no opportunity to flush out AI now, we have to live with it, in symbiosis, as there are also many good virtues of the new AI world. However, we still have the opportunity to provide guiding principles for governing this emerging AI society space so as to reduce human anxiety. As Socrates (scientific method), Plato (social classes), Confucius (rule based, akin to algorithms), Buddha (tools for AI for Good), Kant (algorithms for defined / expected results), provided guidelines for current human existence, motivated by the traumas around them in their time, management of the world is still possible under international governance structures. There is a definite need for an international philosophical framework to guide the next few steps of society's AI development for the World, including human-computerized interaction with other planets. People will be increasingly fearful of the unknown implications of new technology, which can lead to planetary instability, if there are no recognized structures to deliver the future. Refer to view points at, http://www.pewinternet.org/2017/02/08/theme-3- 5 humanity-and-human-judgment-are-lost-when-dataand-predictive-modeling-become-paramount/.

Plato, the ancient philosopher, defined a society, through a three-class system (Wikipedia authors). This paper proposes adding a further, fourth class termed "wrap", which can be applied as a distinct class or be classed omnipresent. This wrap, or bind all, or universal connectivity like a neural network, will hold the other classes or eco-systems together with a people

focused risk management process for human-computer interaction (HCI). The additional "wrap" to Plato's class structure is the recognition of the importance of human – computer interaction (HI) of spiritual, religious, philosophical moral expectations and value bases that binds humans, together, in to the existence as we know it. It is the essence of being sophisticated humans. However, this is not about the creation of a Brahmin elite or the re-invention of the tussles of church and state in governance. It is the recognition, that with a population that is well educated, treatment of a person's intellect, with respect, is critical.

Outlined below are some examples of the perceived shift in the actions of individuals within Plato's class structure in to an AI oriented society. A significant role for HCI within each class is noted.

1. Plato Class: Productive (Workers) a. Traditional Society: carpenters, mechanics, working by human hand b. AI Society: Robots, AI applications for machine and services; autonomous HCI: managing future of work issues

2. Plato Class: Protective (Guardians and Warriors) a. Traditional Society: conventional armed and security forces, lawyers b. AI Society: Robots, bio-technology, autonomous weapons, automated legal services HCI: managing the human-computer control issues

3. Plato Class: Governing (Rulers and Philosopher Kings) a. Traditional Society: Parliament of representatives, public servants (stewards) b. AI Society: Greater public dialogue, but each individual's contribution is a drop of water in an ocean due to be managed by algorithms HCI: tussle of self as a human vs self as AI entity; identity issues

4. New Class: wrap a. Traditional Society: Distinct groups of belief, risk of fragmentation for global peace or collective; either or choices b. AI Society: Pure Democracy, society is the sum of its individual constituents. AI capable of delivering the technology for full public engagement in governance of moral values. Sophisticated plastic thin wrap tools for management by committee. HCI: the development of a high-level, collective principles-based governance approach, that is fair, equitable and accessible for all. A creative common e.g., Wikipedia entry

In conclusion, there is a lot of work to be done to ensure a safe future for all. The role of media in delivering a secure planet for the future is going to be pivotal. Vast amounts of information populate the internet. There are going to have to be responsible, ethical, trusted individuals who are perceived as relatively independent and who will provide the required transparency, filters, predictions, nuances, accountability, relevance and analyses of human discussions on the new and rapidly emerging AI society. Newspapers as we know it now, may decline but we are already seeing 1000s of bloggers and internet writers who are part journalist, part politician, part mentor, guru or spiritualist evangelist who are going to emerge as the new rulers, philosophers and influencers of the AI society. Through their Twitter and other social media accounts they are developing as influences, people representatives and news creators. They are the emerging "wrap class", embalming society as we know it, perhaps as risk managers or perhaps as creators of a new method in communications for governance? Access to quality information may still be at a premium in to the future, but access to lots of information is already with us today creating issues such as fake news, misinformation. The key to a successful future world lies in tolerance and compassion for one another and excellence in human-to-human interaction with human to computer interaction for AIIS.

References:
(1);(2) et al. Wikipedia commons authors, which is dynamic

AN APPROACH TO ADDRESSING CHILDRENS RIGHTS IN AN ARTIFICIAL INTELLIGENCE DOMINATED SOCIETY ON THE INTERNET

By Amali De Silva-Mitchell

Does society require all its children for the sustainable development of the planet? An unforgiving question to ask, but an increasingly real question perhaps, from parties engaged in the pursuit of pure financial profit. The issue of the need for human existence in itself, in the future, will be defined, in a battle for resources and power, like no other we have seen before. It is going to impact the social norms of the future. An area under current, critical observation, is artificial intelligence (AI) and the internet of things (IoT) dominated work place order. What are the Rights of the Child in a society dominated by AI and IoT? Will children get the education and support to compete against robots for a job in the workplace? What are the responsibilities of the curators of such an emerging AI society? To uphold the intent of the United Nations Convention on the Rights of the Child in a sustainable future, a methodical, granular approach to AI impact risk analysis, by age group, culture, income, and special circumstances must be put in place early, globally, for good policy making for a fair AI dominated international society.

Key words: Children, Ethics, Human Computer Interaction, Future of Work, Peace and Security

In 2002 one night on the Pacific Coast of North America and early morning in European Civil Society, a group debated quickly within a manner of hours to attempt to include the Rights of the Child on the Internet within the Civil Society document statement for the first stage of the United Nations World Summit on the Information Society (WSIS). Children had been specifically forgotten in the discussions that were dominated by the youth group who took on an umbrella representation, for all those persons under the age of 29. It seemed to the public eye, that Governments to that point, had not made an explicit statement of support with regards to the Rights of the Child (ROTC) on the internet, although subsequently, openly supported by the Canadian delegation. The United Nations International Children's Emergency Fund (UNICEF) was absent from WSIS preparatory conference number one. Children did not seem to stand alone as a distinct group in society, as for instance the elderly at the other end of the age spectrum. Children's needs were just being bundled together with the young adults, just short of forgotten, a foot note, part of the adult group of interest, with no specific rights or concessions. We must not make that mistake again. We must not review the impacts on the ROTC late, for the promise made to the world's children must be kept. The issues of the impacts of AI on children are an emerging but definitely critical area of concern and must be dealt with, with the utmost of urgency. If not dealt with in a timely manner, some jurisdictions may become visible for emergency treatments of societal intervention to normalize the situation, which could have been avoided with planned treatments. AI is and will, impact further, the lives of children and their families.

"The United Nations set a common standard on human rights with the adoption of the Universal Declaration of Human Rights in 1948. Although this Declaration is not part of binding international law, its acceptance by all countries around the world gives great moral weight to the fundamental principle that all human beings, rich and poor, strong and weak, male and female, of all races and religions, are to be treated equally and with respect. Human rights apply to all age groups; children have the same general human rights as adults. In 1989, however, world leaders decided that children needed a special convention just for them because people under 18 years old often need special care and protection that adults do not. The leaders also wanted to make sure that the world recognized that children have human rights too. The Convention on the Rights of the Child (CRC) is the first legally binding international instrument to incorporate the full range of human rights including civil, cultural, economic, political and social rights. The Convention on the Rights of the Child sets out the rights that must be realized for children to develop their full potential, free from hunger and want, neglect and abuse. It reflects a new vision of the child. Children are neither the property of their parents nor are they helpless objects of charity. They are human beings and are the subject of their own rights. The Convention offers a vision of the child as an individual and as a member of a family and community, with rights and responsibilities appropriate to his or her age and stage of development. By recognizing children's rights in this way, the Convention firmly sets the focus on the whole child." *A collection of relevant references from the UNICEF website September 2017.*

The benefits of AI can be readily seen in education, entertainment, health and child protection services. These social services will be revolutionized by the quality, quantity, breadth, depth, efficiency, speed, granularity and sophistication of services for children, families, educators and guardians. Globally these AI applications easily gain popularity. AI can present itself as a robot, as an application on line etc. AI can take many forms.

However, there is also the so called "dark side" or non-beneficial aspects of AI or its consequences which are debated extensively in the media. There are issues and risks of AI applications themselves, their development, cost, and delivery of product or service to children. Although a number of children's issues are of common concern to all age groups experiencing the dawn of the AI Society and its emergent risks and issues, a few matters for consideration, specifically for children are:

- Child under the complete control of the AI application; in essence children's loss of right to freedoms.
- Child mental or physical abuse by an AI empowered robot.
- Close monitoring and recording of a child's actions and behaviors, speech and thought by and AI application.
- False reporting of a child's activities and behaviors so as to influence human actions taken with the child.
- Brain washing or directing learned behavior so as to modify natural child behavior or growth.
- Restricting access to information and activities e.g., parental controls are defined by the service provider, not free choice of parent.
- Creating bias and cultural profiling with data engagement activities.
- Enforcing cultural norms that are alien to the child.
- Poor privacy protection of personal data.
- Data lock out as much as data hacking.
- Child tracking.
- Unethical products and services and delivery.
- Income affordability restrictions.
- Poor user guidelines and user support.
- Poor warranties.
- Poor safety standards and premature roll-outs.
- Lack of algorithm transparency, standards and accountability (algorithm trust certifications).
- Lack of published data collection procedures.
- Poor jurisdictional data sharing.
- Poor data interpretations.
- Child not prepared to use product.
- Child/adult not advised of issues with product.
- Child/adult not advised of limitations of product or service.
- Poorly tested product harming children.
- Poor resolution of poor data results.
- Physically unstable toys and environments.
- Unsuitable play outcomes.
- Poor disposal guidelines and data history clearance procedures; e-waste issues.
- Child competes with robot for life who has increasing amounts of data collected against the child which the human mind is not capable of sorting, resulting in an unfair advantage for the robot.
- Real need for trust certification of products and services similar to a United Sates Food and Drug Administration (FDA) approvals, for each class of AI product at each age group. This certification process must not be onerous or costly so as to keep product development within access for all interested developers.
- Public experts monitoring of AI freeware for unethical practices and procedures.
- Development of suitable AI application protection software.
- Lost codes and coding.
- Child to computer interaction space. Safety of the child is paramount.
- Risks of children's mind reading applications.
- Using a child's data to form other intelligent business proprietary toys without consent.
- Child's intellectual property rights.
- Child profile storage issues, data mining.
- Non-compliance with children's right to be heard, the new complaint mechanism and freedom of expression initiated by UNICEF.
- Right to fair access, free from abuse.

All these issues highlight that accountable, ethical, knowledgeable, compassionate curators or policy and standard setters of an AI society are a requirement. Some of the AI frameworks that have to be set up so as to meet the policy and best practice guidance requirements for children in an AI society include:

- Political, good governance standards.
- Socio-economic standards, e.g., first job place right over robot.
- Income accessible products and services.
- Basic and essential service levels.
- Technological and information education so as to be able to compete with robots effectively and tools to enhance human work.
- Legal, professional standards and conduct.
- Accountability, integrity and timely complaint monitoring mechanisms.
- Timely and relevant data corrections and updates.
- Financial and social benefits.
- AI catch-up training for older children.
- Health and wellness issues e.g., exposure to screen lighting.
- Cultural integrators and public safety.

- Monitoring and risk management.
- Fairness and equity.
- Accountable guardianship for Public Trustee guardianship roles.
- Unethical programming techniques; regulation with perhaps penalties and best practice sets.
- Sub-standard testing; product risk penalties, approvals and certifications.
- Legal documentation of algorithms, to allow for accountability, transparency and access to user and development partner information.
- Up to date application requirements or notifications for best practice interface connectivity of AI and IoT applications.
- Human to computer interaction best practice.
- International compliance and best practice codes of conduct for integrated AI/IoT applications across sectors and jurisdictions.

There are a number of children in special circumstances such as in child labor, child soldiers, disabled children etc. AI incorporation in to these situations must have their own set of policies, standards and performance measures so as to meet the ROTC vision.

What will be the impact of AI on **child labor?** Children may be one of the largest losers of un-skilled or semi-skilled employment under a robotize /AI future work environment. Children tend to provide repetitive, low skilled work easily duplicated by a robot. Often these children are the sole bread winners for their families or for themselves only. There will be a significant impact within this segment of society in developing countries. Should the governments of these countries take an inventory of the children working in these jobs and administer a training tax on the employers, for children displaced from these jobs? Should the children be given the first right of the job activity, competing with the robot, to show the employer that the job can be performed just as fast and to the required standard, thus preserving the human job over the robot job? But this will only be a short-term solution even if implemented. Use of robots could move children from child workers to children without work in extreme child poverty. It is not to be underestimated that population growth coupled with robotics in the work place is going to create a very unstable social economic position for some countries.

Child soldiers, tend to populate non-conventional armed forces. Some of these forces are in conflict with government armed forces that for the future could use robots with artificial intelligence capabilities. It is possible that the children will be put on the front line to test the new and unknown robot applications of the other party. Is this a simple case of combat or is it also a case of using human children to test new products? What will be the accountabilities in this situation? Will the party fighting a group whose infantry are child soldiers, fly the children a white flag, which they can use to cross the line, giving them the ability to make independent choices at whatever age? Robots the size of insects are being developed, will these be sent out to seek and identify children to receive the white flag? Well thought out compassionate policies must be made.

Displaced children due to famine, flood, drought, war etc. need to be treated just like any other child in that jurisdiction**.** Here AI applications could be very beneficial providing education and health care access at a nominal cost. However, the education material must be tailored to meet their specific needs and developments and requirements for their future lives.

Orphans and foster care children, can benefit greatly with access to educational needs, cultural orientation robots etc. However, the content and manner of delivery must be free from bias, be carefully produced and monitored. Children could be left to be led by robots or be in their exclusive care. A performance measure may see this as perfect care, but where would the human touch or contact for the children be with a responsible adult to provide guidance? Care must be taken with conflict management as well between robots and children. The choice of performance measures is critical.

Sick and disabled and special needs children are in a similar place with the prior mentioned group. Again, the robots must be monitored for inappropriate content, bullying, putting children at risk, being put in place prior to complete testing and data uploading or fully machine learned. The algorithms that are associated with these groups must be systematically audited for their upgraded programming codes, outcomes, inferences and content.

One parent families and latch-key kids, robots could be open to accepting nontraditional data feeds such as a perfect father model data input to give the child a feeling of comments from a two-parent family. However, the child must not be for instance brain washed to spite the other parent not living with them or trained to disrupt shared time of the other parent. In a family with two dominant traditions, the one that is not regularly with the child could be played out by the robot for instance, by the robot teaching the absent parent's native language to the child. The robot could potentially replace some childcare services, where for instance the child's room is monitored and if there is an issue a real human will be on the premises within 5 minutes and the robot goes in to a locked-out mode.

Robots can play a very useful role in education and cultural integration of **culturally displaced, held back or kept down and new immigrant children**. Care must be taken with stereotyping and brain washing of the children so that they don't lose their own identities.

A global phenomenon is **street children and children in the sex trade.** AI societies can make these children very

vulnerable to manipulation from adults. However, AI can be extremely beneficial as well to provide these children with opportunities that were never accessible to them previously. On-line education and health services can be provided through access to libraries and personal internet and communication tools and technologies.

The street could also be safer with real-time position monitoring for public safety etc. The Vancouver Community Network, a non-profit organization in Canada has set up a system where those living on the street can find out where there is, for instance, a donation of food being made that day. The aim of AI should not be to only facilitate life on the street but AI could provide services such that as children and youth being housed in a warehouse manned by robots for the services such as cleaning and safety.

What has been mentioned so far are specific issues and specific risks for specific cohorts of children. There is however a single resounding issue that this paper believes to be of serious risk for children, and that is of AI applications emerging ability to **mind read.** These mind reading capabilities, are developing especially fast in applications for the disabled and now almost as capable as voice recognition control robots. These AI applications have the ability to impact on freedom of expression, privacy, and other human rights if left unregulated. This area must be strictly legislated and the monitoring must be with compassion to the human, ethical and wise. Legislation around mind reading by AI applications may perhaps be culturally specific, but minimum international standards must be maintained.

Another area of grave concern is the residual information or e-waste stored on products and within services that can impact that individual well past the childhood years in to adulthood, like a ghost especially with data mining. Recently the United Kingdom passed laws to alleviate this situation for children, which would be an example for other jurisdictions to consider.

To address carefully, at a policy level, each of the issues related to the impact of robotics and AI on children, this paper proposes breaking down the needs and risks associated with three primary age groups of children to age 18 years. This approach could be called a full life or even life cycle plug-in approach when it is with respect to a family that sees through an individual through the generations in its overall care. Here the life cycle is seen as birth to young adult. The three age groups proposed are as follows:

1. 0 to 6 years focus: learning awareness and gathering knowledge of human life. Simple educational robots that are compassionate

2. 7 to 13 years focus: learning to differentiate own mind thoughts from any other or machine. Complex robots that are computed to follow human rights and ethics and provide guidance for development

3. 14 to 18 years focus: development of own responsibility and identity. Sophisticated robots that machine learn and tailor service to the child in a complex manner and prepare the child for the future adult world.

Age 19 to 29 years are seen to be young adult or youth years which do not require special treatment from society other than for perhaps some compassion and understanding of mistakes made by that age group, especially by the courts and other authorities.

Some of the special issues associated with each of the age groups, not encountered by the other two age groups are groups are:

1. Health care requirements.
2. Educational and entertainment requirements.
3. Childcare or supervision requirements.
4. Child protection requirements.
5. Level of child service or product access trust regulation.
6. Cultural norms and legal expectations, laws, and responsibilities.
7. Types of freedoms from glass ceilings to the next age cohort or in to the workplace.
8. Acceptable freedom of expression, privacy and development of social behavior.
9. Human to computer or robotics interfaces.
10. Emotional interactions with robots and IoT.
11. Expectations of outcomes and preparations for the next stage of interaction.
12. International cross border collaboration.
13. Penalties, taxes, and other accountability measures including effective performance measurement tools.
14. Algorithmic leniency / risk allowances.
15. Content.

AI broad based child policy, will see children fall through the gaps and marginalized. With AI comes the need for fine granularity of child focused, holistic, policy making.

Development of AI within society can be beneficial as outlined during the sessions at the UN Conference AI for Good. However, if only profit seeking AI activities and approaches are pursued, it is possible that it could lead to a significant instability for society, due to increased unhappiness *(Reference: Richard Layard, London School of Economics and Political Science)* of mass society. A universal children's AI delivery plan is key to meeting the sustainable development goals (SDGs) of the UN. Governments should collectively monitor what the private sector and non-profit sector are developing and balance the economic inputs and outputs for societies good. It is possible that penalties, taxes, investments credits will be used to control the flow of specific AI sector development.

AI development for children must be guided by a universal social policy mandate that can be led by the International Telecommunications Union (ITU) with the United Nations Economic and Social Council (ECOSOC). Although UNICEF is a key partner in these matters, what AI does, is to integrate children, and the approach to their development in to the adult world at all times for the future. In today's world, children exist in a semi-autonomous world to adults, but in tomorrow's world if the child is not integrated in to the adult sphere for all thematic decision making, there is a risk that children's needs will fall through the gaps or be addressed too late for effective outcomes to meet ROTC.

Children of the future will compete neck to neck with robots for some jobs. This has to be recognized, and be at the center of decision making. Children must have a direct voice through school forums leading to national forums of children who can attend the discussions and make contributions. This could perhaps, in the case of ITU discussions, be facilitated by the students United Nations conference societies interaction through the annual national or regional Internet Governance Forum (IGF) process. It is important the IGF have a special standing theme on the emerging issues for children within an AI society.

A great risk we have is that robots will replace the majority of human work on the planet. Careful maintenance of current population levels or reduction of the population are the most obvious real-time solutions, if we are not to face mass unemployment, poverty, starvation and human embarrassment and harassment; but this is not easily or perhaps even humanly attainable.

In conclusion, the single main theme of this article is to advocate taking careful steps in the development of children's AI policy, based on AI issues identification by the fine granularity of age group's issues. Nothing new in general, but new for an AI focused society's holistic development. The framework of analysis, should have full stake-holder participation, including that of children themselves, in the risk management and planning of outcomes for an AI Society. There is a need to mitigate any major upheavals to a safe and secure society, centered on the human and human needs for all. Just minimally acceptable, sustainable socio-economic service levels, is not sufficient the need has to be a focus on a human life with dignity.

An AI international treaty similar to the UN WSIS treaty is imperative as a partner to the existing suite of Information and Communication Technologies (ICT) and human rights treaties. The UN AI for Good Summit has embarked on such an activity. Embracing AI simply as a tool for SDGs is to risk the complex and unknown consequences of AI development in society which can potentially to false positive conclusions such as the lack of need for children and hence humans in society. This would trend human civilization towards a predominantly robot only society similar to the society created for the elite in the movie Kingsman.

The interim stages of an AI society, poorly planned, will probably look like the phases of development of the industrial revolution in the west, with its mass migration of peoples to the Americas, hunger, poverty, poor environmental conditions and so forth, before the golden ages of life of the post war era of the 1950s and 1960s. In the industrial society, children were a labor resource, but with an AI Society they could easily be seen as a burden to society. In the movie Chitty Chitty Bang Bang (1964 novel by Ian Fleming), the village was all gay, but the children had to hide away when the Vulgaria's child catcher was on the prowl. The mythical Vulgaria, was a childless land. Movies and novels are the creations of dreamers and thinkers, that influence the dreams and aspirations of the public and perhaps foretell the future, but also give us the opportunity to plan for an AI for Good focused society.

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