IoT vision – next 20 years

Looking forward over the next 20 years, many ideas will become reality and many will not. One thing is for certain Data will become the number 1 commodity that will be generated and traded. Financial, commercial, medical and social networks will dominate the world wide data space. Data will not be constrained by political, national or physical boundaries. Politicians, law enforcement and leaders will try and constrain this but all attempts will ultimately be irrelevant. This is because there no single political ideology exists across the world. Islam, Catholicism, Western Democracy, Communism and Dictatorships all have a different spin on how they will control the data space by trying to control the human mind. All politicians and leaders will loose their grip on power as the control of the narrative becomes the domain of the people (Arab spring for example). All individuals that consume and generate data do so without thought to a higher purpose (either god or rulers).

Individuals interact with the world wide data space using a variety of devices. Some of these (smart phones for example) connect humans directly to the data space other devices (hotel door for example) offer indirect connections that we are unaware of.

Individuals will have access to this data with unrestricted bandwidth and with computing farms will allow unimaginable data analysis. Personal DNA sequencing will sample your blood, send this to the cloud where algorithms run on massively linked computing, to send the results back to your smart phone (or implant). This will allow instantaneous diagnosis of all conditions with potential remedies. With many common human ailments such as Diabetes an implanted molecular dosing machine will upload data to the cloud, request a dosage computation and then moments later synthesize insulin to give the perfect dosage.

Human body physiology will all be massively enhanced with cloud access and molecular machines providing everything the modern human will need:- mood enhancers, Alzheimer's, Parkinson's, cancers, stroke, heart attacks, cholesterol monitoring, food digestion and intake, athletic performance enhancements, stress management. All of this is possible when aggregated data across 6 billion humans is used to mine for solutions to the human condition. The resistance of the masses to be connected to the world data space will melt away when the choice between life and death touches everyone.

Human mind enhancement is already here. People with sight and hearing loss can have augmentation embedded into their body. Now multiply that by billions through high capacity data links to the world data cloud. Now chess moves can be thought of,

uploaded to the cloud, sifted through all possible billion trillion combinations and then acted upon. Language becomes a thing of the past because all hearing functions of speech are automatically routed through Google translate AI engine for instant translation. In fact what is the point of talking, we can just think the speech, open the port to the world data cloud, find our point address of the person standing in front of us and send them the data message. They receive the message and reply via the telepathic cloud router. The world data cloud allows us to reduce the physical world to one IP address away. We will travel the world using augmented 3-d using of our data connection. When we journey to distant places we can have an instant 3-d virtual tour and be acquainted with our destination before we get there. Bitten by a poisonous snake whilst on holiday? – no problem your biological implant will detect the pathogens in the blood stream, upload them to the data cloud, search for a match and notify your smart watch (sorry 3d vision implant) that you need medical assistance. It will alert the hospital on arrival (or in the ambulance) and staff will have the antidote ready. They will have synthesized the antidote on site from the biological molecular 3-d printer.

Research into simple sugar based batteries that can be implanted into the human body is well underway, with small scale trials in biological tissue (not human!). These use the most prolific earth power source (ATP) and convert it to electrical energy. These will produce power levels in the 1mW at the 1v range and will be used by your biological implant to drive this embedded medical computing.

Augmented reality is already here and set to expand, but its our interaction with our physical world that is set to expand exponentially.

Every device that performs some task for us (from holding our coffee, transporting us to the top floor of our office block, or extracting energy from our urine) will be connected to the world data cloud. We will interact with our surroundings in a seamless and integrated manor. Daily transport will understand our needs and take us to our destination without complicated instructions. Transactions to purchase goods such as food will happen automatically at the point of removal from the store, using the micro transponder in the equipment and our implant or smart device. This will be linked to our crypto-currency account and debited automatically. If we tried to take our goods that we cannot pay for the smart revolving door will automatically lock and a friendly robot will come over and remove the offending goods.

Once home with our goods, we will place them in our smart refrigerator/freezer and the unit will keep them at ideal storage temperature. It will itemise the food according to best-before date and advise us on the best mineral/protean/fat/carb balance for each meal,

based upon our physical condition and needs. Again the micro transponder is bio-degradeable and is powered by sugar from the food.

One area of intense research that is an enabler for large data is Artificial Intelligence. Google are investing significant time and effort into their AI engine. This is used to analyse and predict solutions within the large data sets. This “data mining” is used by devices like Amazon's Alexa and Google's search engine to answer users questions with a higher degree of accuracy.

AI is the driving force behind Robots. The idea is to replace all tasks performed by humans that we are either not good at doing, repetitive, dangerous or that we just don't like doing.

Examples of the development of the robot are everywhere. UK produce picked in the fields was done by hundreds of migrant workers, but in recent months large portions of the migrant workers are returning home to Europe (to higher wages in the EU). In the UK we are replacing these workers with autonomous picking machines (robots) because UK workers do not want to do the back breaking work. These farming robots are learning the best conditions to pick fruit, spray with insecticide, when to plant etc. They require access to the world data collection to download data, on weather, ripening times, pesticide usage, etc.

The elderly across the western world are living longer and require social care at larger and larger quantities. These health systems are struggling to cope with the higher demand. Social care at home is more effective than care in hospital but requires investment in working staff. In response to this the technology industry is developing smart AI systems that can interact with the Elderly as someone to talk to, provide meals, do medical analytics and alerts. These home help AI systems require access to the global data bank to upload annomonised data on their patient, they need this access to answer users questions. Family members need access to the home care AI unit to interact with their relative.

In the next 100 years the shift from fossil fuels to renewables will accelerate. Long term iinvestmet funds (pensions etc) are moving their funds from traditional investment in fossil energy companies into renewables. China is investing in renewables at an increasingly fast rate. All this is made possible by connectivity to the world data cloud. Critical information on climate change is used by businesses to plan where to place renewable energy systems. Instantaneous weather reports allow sections of the solar grid to

dynamically reconfigure IN ADVANCE of the clouds rolling in. All this requires connection to the data cloud.

In this hyper-connected, cloud based existence, security in everything is critical. A security chip that can be used in all IoT, from medical implants to robotics will happen. This chip requires physical attributes that allow it to be used in applications with the overarching attribute of low power with modest bit rates. This chip requires connectivity to the cloud with an access package that allows companies and users to seamlessly access the IoT devices from anywhere on the web. It needs to be scalable and fit into a global security architecture that exists from the cloud to the IoT, that is installed in all devices from medical implants to smart AI drones.

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